# Student Engagement at School

## A SENSE OF BELONGING AND PARTICIPATION

### RESULTS FROM PISA 2000

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Programme for International Student Assessment

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**OECD**
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

# FOREWORD

Most students participate in academic and non-academic activities at school, and develop a sense of belonging – their friends are there, they have good relations with teachers and other students, and they identify with and value schooling outcomes. But many students are not engaged. They do not believe their school experience has much bearing on their future, and they do not feel accepted by their classmates or teachers. Gradually these students withdraw from school life, and become disaffected from school. Some disaffected students are disruptive in class, and exert a negative influence on other students.

Can we meet the needs of students who have become disaffected from school? Can we identify schools that have high levels of student engagement, and if so, what factors contribute to their success? What is the relationship between student engagement and academic performance? These questions are of great concern to educators around the world.

The OECD Programme for International Student Assessment (PISA) offers a unique opportunity to study student engagement across several countries as students approach the end of compulsory schooling. The data collected in PISA include information on students' attitudes and values, as well as reliable and valid data on students' literacy skills. The data also include information on students' family backgrounds and on several features of the schools they were attending. This report examines several questions concerning students' participation and sense of belonging. These two aspects of student engagement are considered important, not only because of their relationship with student learning, but also because they represent a disposition towards schooling and life-long learning.

The results indicate that there is considerable variation among countries in their levels of student engagement and in the prevalence of disaffected students. Moreover, the prevalence of disaffected students varies considerably within and among schools within most countries, and this variation is not attributable solely to students' family background. The results also provide evidence that literacy performance and student engagement do not necessarily go hand-in-hand; in most countries there is a significant number of students with a strong literacy performance who are nevertheless disaffected from school. The analyses also identify some of the school factors related to engagement, and provide evidence that achieving strong student engagement at school does not have to be at the expense of their reading performance.

PISA is a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests. Participating countries take responsibility for the project at the policy level through a Board of Participating Countries. Experts from participating countries serve on working groups that are charged with linking the PISA policy objectives with the best available substantive and technical expertise in the field of international comparative assessment of educational outcomes. Through participating in these expert groups, countries ensure that the PISA assessment instruments are internationally valid and take into account the cultural and curricular contexts of OECD Member countries, that they provide a realistic basis for measurement, and that they place an emphasis on authenticity and educational validity. The frameworks and assessment instruments for PISA 2000 are the product of a multi-year development process and were adopted by OECD Member countries in December 1999.

This report is the product of a concerted effort between the author, Jon Douglas Willms, the countries participating in PISA, the experts and institutions working within the framework of the PISA Consortium, and the OECD. The report was prepared by the OECD Directorate for Education under the direction

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of Kooghyang Ro and Andreas Schleicher. Its development was steered by the Board of Participating Countries, chaired by Eugene Owen of the National Center for Education Statistics in the United States. Annex C of the report lists the members of the various PISA bodies as well as the individual experts and consultants who contributed to it and to PISA in general. Special thanks are extended to Elizabeth Fairbairn and Cara Fedick for their assistance in preparing the manuscript.

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*Chapter*

**1**

# PISA AS AN INTERNATIONAL STUDY OF STUDENT ENGAGEMENT

### A definition of student engagement

School is central to the daily life of many youths. They view schooling as essential to their long-term well-being, and this attitude is reflected in their participation in academic and non-academic pursuits. These students tend to have good relations with school staff and with other students – they feel that they *belong* at school. However, some youths do not share this sense of belonging, and do not believe that academic success will have a strong bearing on their future. These feelings and attitudes may result in their becoming disaffected from school (Finn, 1989; Jenkins, 1995). They may gradually withdraw from school activities, and in some cases participate in disruptive behaviour and display negative attitudes towards teachers and other students. Meeting the needs of youths who have become disaffected from school is perhaps the biggest challenge facing teachers and school administrators.

Researchers have recently used the term *engagement* to refer to the extent to which students identify with and value schooling outcomes, and participate in academic and non-academic school activities. Its definition usually comprises a *psychological* component pertaining to students' sense of belonging at school and acceptance of school values, and a *behavioural* component pertaining to participation in school activities (Finn, 1989, 1993; Finn and Rock, 1997; Goodenow, 1993; Goodenow and Grady, 1993; Voelkl, 1995, 1996, 1997; Wehlage *et al.*, 1989). The psychological component emphasises students' sense of belonging or attachment to school, which has to do with feelings of being accepted and valued by their peers, and by others at their school. Another aspect of the psychological component concerns whether or not students value school success – do they believe that education will benefit them personally and economically (Johnson *et al.*, 2001). Students who do not feel they belong at school, or reject school values, are often referred to in the literature as *alienated* or *disaffected*. The participation component of engagement is characterised by factors such as school and class attendance, being prepared for class, completing homework, attending lessons, and being involved in extra-curricular sports or hobby clubs.

In this report, the term *student engagement* is used in this broad sense to refer to students' attitudes towards schooling and their participation in school activities. The term *disengaged from school* is used to characterise students who do not feel they belong at school and have withdrawn from school activities in a significant way. Student engagement, as used in this report and in the literature, differs from *reading engagement*, as used in the OECD thematic report, *Reading for Change: Performance and Engagement across Countries* (OECD, 2002). Reading engagement refers specifically to students' motivation and interest in reading, and the time students spend reading for pleasure and reading diverse materials.

Most of the research on engagement has been concerned with its relationship to academic achievement and whether or not students are likely to complete secondary school. Variables describing engagement have therefore usually been treated in analyses as predictors of other schooling outcomes, particularly academic performance. This report considers sense of belonging and participation as important schooling outcomes in their own right. Engagement is seen as a *disposition* towards learning, working with others and functioning in a social institution, which is expressed in students' feelings that they belong at school, and in their participation in school activities. It has yet to be examined whether disengagement from school during the adolescent years will have longer term effects. However, it can certainly be expected that students' attitudes towards school and their participation strongly affect their decision whether or not to pursue post-secondary studies. It is known that youths who have behavioural problems tend to be disaffected from school (Offord and Waters, 1983): longitudinal studies that have followed young people with behavioural problems into adulthood have found that nearly one-half of them continue to suffer from psychological and social difficulties as adults (Offord and Bennett, 1994). Thus, engagement is probably


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closely tied to students' economic success and long-term health and wellbeing, and as such deserves to be treated alongside academic achievement as an important schooling outcome. Moreover, engagement is not an unalterable trait of individuals, stemming solely from students' genetic make-up or their experiences at home. Rather, it entails attitudes and behaviours that can be affected by teachers and parents, and shaped by school policy and practice.

The Programme for International Student Assessment (PISA), conducted by the Organisation for Economic Co-operation and Development (OECD), offers an opportunity to study student engagement across several countries. PISA is an assessment of how well young adults, at age 15, are able to use the knowledge and skills they have acquired to meet the challenges facing them as they approach completion of their compulsory schooling. Thirty-two countries participated in the first PISA survey in 2000. It included 28 Member countries of the OECD, and four non-OECD countries. In 2002, another 11[1] non-OECD countries completed the survey. The PISA assessment includes a series of written tasks that measure reading, mathematical and scientific literacy, and a questionnaire regarding students' family background, experiences at school and attitudes towards learning. The focus of PISA in 2000 and 2002 was on reading literacy, and therefore included an extensive set of tasks in this domain. In 2003, the emphasis will be on mathematics literacy, and in 2006, on scientific literacy. The first international report, *Knowledge and Skills for Life: First Results from the PISA 2000* (OECD, 2001*a),* focuses on student performance in reading, mathematics and scientific literacy, and how performance in these domains relates to students' family background and features of the schools they attend.

This report examines students' sense of belonging and participation at school, two of the most important measures of student engagement. Criteria are established to identify students who could be considered *disaffected* – those who have a very low sense of belonging at school compared with the majority of their peers – and those who are consistently absent. The analyses provide estimates of the prevalence of students who have a low sense of belonging or low participation for each of the 42 countries that participated in PISA 2000, and for the schools within each country. The analyses also assess the strength of the relationship between these two aspects of engagement with performance in reading, mathematics and scientific literacy. Finally, the analyses examine the relationships between these two measures of engagement with gender, family structure and socio-economic status, and the characteristics of the schools students were attending when surveyed. The results have important implications for teachers, school administrators and policy-makers, as they stress the importance of viewing engagement as a fundamental schooling outcome.

### Student engagement and academic success

Most recent studies of student engagement treat it as a predictor of academic achievement, inferring that being disengaged, or disaffected from school, *causes* poor academic achievement. However, the theoretical literature argues that it is *low achievement* that causes students to withdraw from school, or that engagement and academic achievement go hand-in-hand. Bloom (1976) noted:

> "At the other extreme are the bottom third of students who have been given consistent evidence of their inadequacy…over a period of five to ten years. Such students rarely secure any positive reinforcement in the classroom… from teachers or parents. We would expect such students to be infected with emotional difficulties [and to] exhibit symptoms of acute distress and alienation from the world of school and adults."

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Longitudinal research on child development suggests that there is a core set of risk factors, including poverty, poor temperament, cognitive problems, learning disabilities and physical and mental handicaps, that are evident in many children when they enter school. Children who display behaviour problems or cognitive deficits during the early years of schooling are *vulnerable*, in the sense that without concerted and prolonged intervention their chances of succeeding at school or leading healthy and productive lives are diminished (Willms, 2002*a*). Many of these children struggle with learning to read (Rowe and Rowe, 1992), and their problems worsen when mathematics and other school subjects place greater demands on reading skills. By the middle school grades (*e.g.,* grades 5 to 7), many of these children display a low commitment to educational activities, a disaffection towards school, poor social bonding, and poor peer relations. These characteristics continue into the secondary school years, which place these children at a very high risk of conduct disorders, low achievement, and early school withdrawal (Coie and Jacobs, 1993; Coie *et al.*, 1993; Hawkins *et al.*, 1988; Rumberger, 1983, 1995; Yoshikawa, 1994). Moreover, the longer-term health and wellbeing of these children is also compromised (Power *et al.*, 1991; Pulkkinen and Tremblay, 1992; Rodgers, 1990). To summarise, the literature suggests that there are risk factors for both school disaffection and poor achievement that are evident when children enter school, and these risk factors are *cumulative* and *predictive* of longer-term life outcomes.

However, it cannot be inferred that low student engagement during the secondary school years is simply the consequence of family-related risk factors, such as poverty, low parental education or poor cognitive ability. Many children who grow up in poor families, or have behaviour problems and cognitive difficulties during their primary school years, prove to be remarkably resilient. They graduate from high school and lead happy and productive lives (Werner and Smith, 1992). Conversely, the onset of antisocial behaviours that are associated with engagement (Jenkins, 1995) begins late for many adolescents (Moffit *et al.*, 1996). Small classroom- and school-based studies have found that the correlation between academic achievement and engagement is moderate – generally between 0.25 and 0.30 (Goodenow, 1993; Voelkl, 1995) – which suggests that there are many students with high achievement who are not engaged and vice versa. Moreover, there is ample evidence that the school environment has a strong effect on children's participation and sense of belonging (Bryk and Thum, 1989; Fine, 1986; Finn and Voelkl, 1993; Johnson *et al.*, 2001; Lee and Smith, 1993).

### Engagement and the school environment

A few recent studies have treated engagement as an outcome variable, and have attempted to explain why schools vary in their levels of engagement (Finn and Voelkl, 1993; Johnson *et al.,* 2001; Lee and Smith, 1993). Lee and Smith (1993) found modest effects of school restructuring – heterogeneous grouping, team teaching and reducing the extent to which schools are organised by subject-area departments – on levels of student engagement. Finn and Voelkl (1993) found that attendance was less consistent and at-risk students were less engaged in schools where rules were not enforced rigidly. This is consistent with Rumberger's (1995) finding that students are less likely to drop out of school before graduation when students perceive the discipline policy is fair.

Johnson *et al.* (2001) also examined the compositional or contextual effects associated with school mean grade-point average and the percentage of *own race/ethnicity* students in the school. The term *contextual effects* is used in the literature to refer to the effects of a classroom or school's aggregate characteristics, such as the average level of socio-economic status or average ability, on student outcomes, over and above the effects associated with students' individual characteristics (Willms, 2001). Johnson *et al.* (2001) found small but significant effects of racial and ethnic composition on levels of attachment (sense of belonging),


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but no significant effects for participation (skipping school, paying attention in class, doing homework). However, they did find that levels of participation were strongly associated with the mean grade-point average of the school. Significant contextual effects were also reported by Rumberger (1995): students were more likely to drop out of school if they attended schools with a high percentage of minority students or a low average socio-economic status.

An important question addressed in this study is, therefore, whether the average socio-economic status of the school has an effect on students' engagement, over and above the effects associated with students' own family backgrounds. Contextual effects have been found to have strong effects on student achievement in a number of educational studies (Gamoran, 1992; Willms, 1999*a*), including the first international report for PISA (OECD, 2001*a*). They are important for educational policy, as they suggest that when students are segregated along social-class lines into different schools or educational programmes, students from disadvantaged backgrounds tend to have markedly worse outcomes.

### The Programme for International Student Assessment (PISA) as a study of student engagement

The OECD PISA has a number of strengths for examining student engagement. First, it is based on large, nationally representative samples of 15-year-old students in 43 countries. This allows comparison of results across countries. Second, PISA has effective measures of literacy skills in reading, mathematics and science at the student level. It also includes several items in the student questionnaire that directly pertain to student engagement. These items are used in this report to construct outcome measures describing students' sense of belonging and participation. The study also has a comprehensive set of measures describing several aspects of students' family background. Therefore, it is possible to examine for each country the relationships among achievement and engagement outcomes and their relationships with a comprehensive set of variables describing students' family background. Third, the sample design entailed sampling schools within countries and students within schools. With this type of multilevel design it is possible to discern whether disaffected students tend to be concentrated in a relatively small number of schools, or fairly evenly distributed across schools within each country. Fourth, PISA includes extensive information describing school context, school resources, school policy and practice, and classroom practice. Multilevel statistical models (Bryk and Raudenbush, 2002) can be used to explore the relationship between levels of student engagement and family and school factors (See Box 1.1).

The remainder of this report comprises four chapters. The next chapter describes the two engagement measures used in this study: sense of belonging and participation. Criteria are established to identify youths with low scores on these measures, making it possible to estimate the prevalence of students who could be considered disaffected. The analyses examine the extent to which the average scores for sense of belonging and participation, and the prevalence of youths with very low scores on these two measures vary among countries. An important policy issue is whether efforts to reduce student disaffection should be targeted at particular schools, or whether it requires a more universal intervention that is focused on all schools. The analyses address this issue by estimating the prevalence of disaffected students within each school, and determining the range of prevalence estimates across schools within each country.

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**Box 1.1 Hierarchical Linear Modelling (HLM)**

Survey data in the social sciences are often structured *hierarchically*. In the case of PISA, for example, students are nested within schools, which are nested within countries. Hierarchical linear modeling (HLM) is a specialised regression technique designed to analyse hierarchically structured data (Goldstein, 1995; Bryk and Raudenbush, 2002). With traditional regression approaches, such as multiple regression and logistic regression, an underlying assumption is that the observations are *independent*. This means that the observations of any one individual are not in any way systematically related to the observations of any other individual. The assumption is violated, however, when some of the children sampled are from the same family, or the same classroom or school. When the assumption of independence is violated, the regression coefficients can be biased, and the estimates of standard errors are smaller than they should be. Consequently, there is a risk of inferring that a relationship is statistically significant when it may have occurred by chance alone.

In addition, the interest from a policy perspective is usually in the relationships within schools, whether these relationships vary among schools, and if so, whether the variation is related to school characteristics. For example, the average level of students' engagement (either sense of belonging or participation), and the relationship between engagement and socio-economic status, may vary among schools within a given country. The policy analyst may be interested in whether schools with high average engagement and more equitable engagement have smaller class sizes, different kinds of instructional techniques, or differing forms of school organisation (Lee *et al.*, 1990; Raudenbush and Willms, 1995).

The basic idea underlying HLM is that there are separate analyses for each school (or the unit at the lowest level of a hierarchical structure), and the results of these analyses – usually regression coefficients – become the dependent variables for analyses at the school level (or at the next level of the hierarchy). Willms (1999*b*) provides an introduction to HLM for the non-statistical reader, with a general discussion of its applications to educational policy issues. Goldstein (1995), and Bryk and Raudenbush (2002) provide comprehensive texts on HLM that can be understood fairly easily by those familiar with basic regression analyses.

Chapter 3 of the report examines the relationships between the three measures of literacy performance – reading, mathematical and scientific literacy – and the two engagement outcomes: sense of belonging and participation. The simplest and most straightforward approach is to estimate the correlations among these five variables. However, there is a second-order question that asks whether these variables are strongly related at the school level; for example: do schools with high literacy performance also tend to have strong student engagement, and vice versa? It is likely to be the case, as the same school processes that affect literacy performance, such as a positive climate for learning and maintaining discipline, positive student-teacher relations and parental involvement, probably also engender a sense of belonging at school, and increased participation. However, it may be that high expectations for literacy performance and an emphasis on academic subjects may cause many students to become disaffected from school. The analyses employ a multivariate, multilevel statistical model to estimate the correlations among these variables at both the student and school levels. The results of these correlational analyses call for a different kind of multivariate analysis, which asks whether students *cluster* into particular groups based on their profile of scores on the engagement and literacy measures. Therefore, cluster analyses are conducted for each country, revealing patterns of association that have important implications for educational policy.


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Chapter 4 extends the analyses that treat sense of belonging and participation as outcomes in their own right. The first set of analyses examines the relationship between student disaffection – that is, low sense of belonging and low participation – and the students' gender, family structure, and whether they are living in a high or low socio-economic status family. These relationships differ significantly among countries, and therefore separate results are displayed for each country. The second set of analyses examines the effects associated with school factors. These relationships also differ among countries; however, there is not a large enough sample size within each country to examine these relationships separately by country. The analyses therefore estimate the average relationship for all participating countries combined. These analyses reveal that four school factors have particularly strong relationships with the two engagement outcomes. The section concludes with a presentation of how these factors vary among countries.

The final chapter, Chapter 5, presents a summary of the study, discusses its implications for educational policy, and makes recommendations for further research.

**Notes**

1. The data results for Romania are not included in this report due to delayed submission of data.

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# READERS' GUIDE

### Data underlying the figures

The data referred to in Chapters 2 to 4 of this report are presented in Annex B and with additional detail, on the web site *www.pisa.oecd.org*.

### Calculation of international averages

There are three kinds of international averages:

The **OECD average**, sometimes also referred to as the country average, is the mean of the data values for all OECD countries for which data are available or can be estimated. The OECD average can be used to see how a country compares on a given indicator with a typical OECD country. The OECD average does not take into account the absolute size of the student population in each country, *i.e.*, each country contributes equally to the average.

The **OECD total**, sometimes also referred to as the total average, takes the OECD countries as a single entity, to which each country contributes in proportion to the number of 15-year-olds enrolled in its schools. It illustrates how a country compares with the OECD area as a whole.

Readers should, therefore, keep in mind that the terms OECD average and OECD total refer to the OECD countries included in the respective comparisons.

The Netherlands are excluded from the estimation of these three averages because low response rates preclude reliable estimates of mean scores. In the case of other countries, data may not be available for specific indicators, or specific categories may not apply.

### Index of central tendency

In order to give an overview of the average trend observed among countries, the average of the OECD countries is reported. In some cases the OECD average is not reported because an average of within-country relationships does not provide meaningful information about relationships across all countries.

### Reporting of student data

The report usually uses 15-year-olds as shorthand for the PISA target population. In practice, this refers to students who were aged between 15 years and 3 (complete) months and 16 years and 2 (complete) months at the beginning of the assessment period and who were enrolled in an educational institution, regardless of the grade level or type of institution and of whether they are full-time or part-time students.

### Reporting of 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

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presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

### Rounding of figures

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

### Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see the *Knowledge and Skills for Life: First Results from PISA 2000* (OECD, 2001), *PISA 2000 Technical Report* (OECD, 2002*a*) and the PISA Web site (*www.pisa.oecd.org*).



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*Chapter*

**2**

# A PROFILE OF STUDENT ENGAGEMENT

## Introduction

The construct of engagement generally includes an affective or *feeling* component pertaining to students' sense of belonging at school and how much students identify with and value schooling outcomes, and a behavioural component pertaining to students' participation in academic and non-academic activities. This chapter begins with a description of how these two dimensions of engagement were measured in PISA and how they were used to construct two indicators of student disaffection. It then examines the extent to which countries vary in their levels of engagement and in the prevalence of disaffected youths. The analyses then provide estimates of the extent to which the prevalence of disaffected students varies among schools within each country. The chapter concludes with a discussion of the policy issues relevant to the findings in this chapter.

## How student engagement is measured in PISA

The construct of engagement derived from the PISA results for this report has two dimensions: sense of belonging and school attendance. Details of the student engagement measures and the construction of PISA engagement index are described in Annex A.

Sense of belonging was based on students' responses to six items describing their personal feelings about being accepted by their peers and whether or not they felt lonely, "like an outsider" or "out of place". Like literacy performance or virtually any schooling outcome, sense of belonging is affected by students' experiences at home and in their community, as well as by their school experience.

The second component is participation, which is measured by the frequency of absence, class-skipping and late arrival at school during the two weeks prior to the PISA 2000 survey. There are two issues concerning the validity of participation measure that warrant discussion. One issue is that the measure of participation could be more extensive. It was measured in this study with a rather narrow focus on student absenteeism. Part of the problem is that the very nature of school participation varies considerably among countries, making it difficult to measure participation with a broader focus that includes time spent on homework, participation in classroom discussions and involvement in sports and other extra-curricular activities. Also, the meaning of the construct itself undoubtedly has a cultural component and thus varies among countries and among subgroups within countries. Although a broader measure of participation would be desirable, student absenteeism is the most important aspect of participation. This is because there is generally a progression in students' withdrawal from school. For example, students who are mildly disaffected may spend less time on homework and participate less in classroom discussions; then they may skip a few classes from time to time; eventually, they may skip classes and miss full days on a regular basis (see Finn, 1989).

The second issue pertains to how participation is measured. A number of students may have missed school because of illness or for other legitimate reasons. Thus, the measure of participation should be viewed as a measure of absenteeism, rather than as a measure of truancy, or participation *per se*. Related to this issue is the problem that students who are absent more often are less likely to have been at school on the day the PISA questionnaires were administered. This would result in a bias such that the prevalence of low participation is under-estimated. The PISA data include a design weight that adjusts for non-response at the school level, and to some extent this would reduce this bias. However, when considering the magnitude of the prevalence of low participation, it is likely that it is to some extent under-estimated.

The two indicators of student engagement at school were also constructed from these measures. Students were considered to have a low sense of belonging if they scored below 3.0 on the sense of belonging scale (before standardisation). These students, on average for the six items, responded "disagree" or "strongly


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disagree" more frequently than "agree" or "strongly agree". Students who feel that they "belong" can be expected on average at least to "agree" with the positive statements and "disagree" with the negative ones. Those with a lower average score are classified as having a "low sense of belonging". This does not mean that they express negative attitudes overall, but they do in at least one respect. Also, analyses of the distribution of the scaled scores suggested that 3.0 was an appropriate cut-point. The sense of belonging scale was negatively skewed – -0.70 for participating OECD countries – which indicates that there were a number of students with exceedingly low scores. Almost one-quarter (24.5 per cent) of all students scored below 3.0 on the unstandardised scale, which corresponded to scores at or below 426 or lower on the standardised scale. There is a marked break in the distribution at this point. Students with scores of 3.0 or higher had scaled scores of 460 or higher. Thus, the criterion used for classifying students as having a low sense of belonging has a simple substantive interpretation and is based on a significant break in the observed distribution of scores.

There was another reasonable cut-point for this scale, which would consider youths to have a "low sense of belonging" if they scored below 2.8 on the sense of belonging scale before standardising. Defining low sense of belonging in this way yielded a prevalence of 16.4 per cent rather than 24.5 per cent. However, comparisons across countries in the prevalence of students with a low sense of belonging are not substantially affected by this choice: the correlation at the country level between a variable based on this cut-off score and the one selected was 0.97.

Students were considered to have low participation if they scored less than or equal to 10 on the unstandardised participation scale. This also has an appealing substantive interpretation. For example, all students were considered to have low participation if they responded "1 or 2 times" to all three items, or "3 or 4 times" to "miss school", or "3 or 4 times" to both "skip classes" and "arrive late for school". The participation variable was also strongly skewed negatively – -1.82 for participating OECD countries. As with the sense of belonging scores, this indicates that there are a number of students with exceedingly low scores. With these criteria set at 10 or lower on the participation scale, 20 per cent of students in participating OECD countries were classified as having low participation.

As with sense of belonging, there are other reasonable cut-points to define low participation. Using a cut-point of 9.0 instead of 10.0 yielded a prevalence of 13.8 per cent, while a cut-point of 11.0 yields a prevalence of 29 per cent. But in this case also, the choice of cut-points has little effect on international comparisons: the correlation at country level between the variable with the lower cut-off score and the one selected was 0.99, while the correlation between the variable with the higher cut-off score and the one selected was 0.96.

Although the choice of cut-points does not materially affect international comparisons, they do of course affect the estimates of prevalence. Thus, when making substantive interpretations of *low sense of belonging* or *low participation*, the reader needs to be cognisant of the definitions set out above.

### Variation among countries in student engagement

Figure 2.1 displays the country mean for the sense of belonging and participation indices. Descriptive statistics for the two measures of engagement for each country are also reported in Tables 2.1 and 2.2. The first column of each table is the mean score on the measure, which is followed in the second column with the standard error of the mean. The OECD average was fixed at 500, and therefore countries with scores above 500 have more favourable engagement scores, while those with scores below 500 have less

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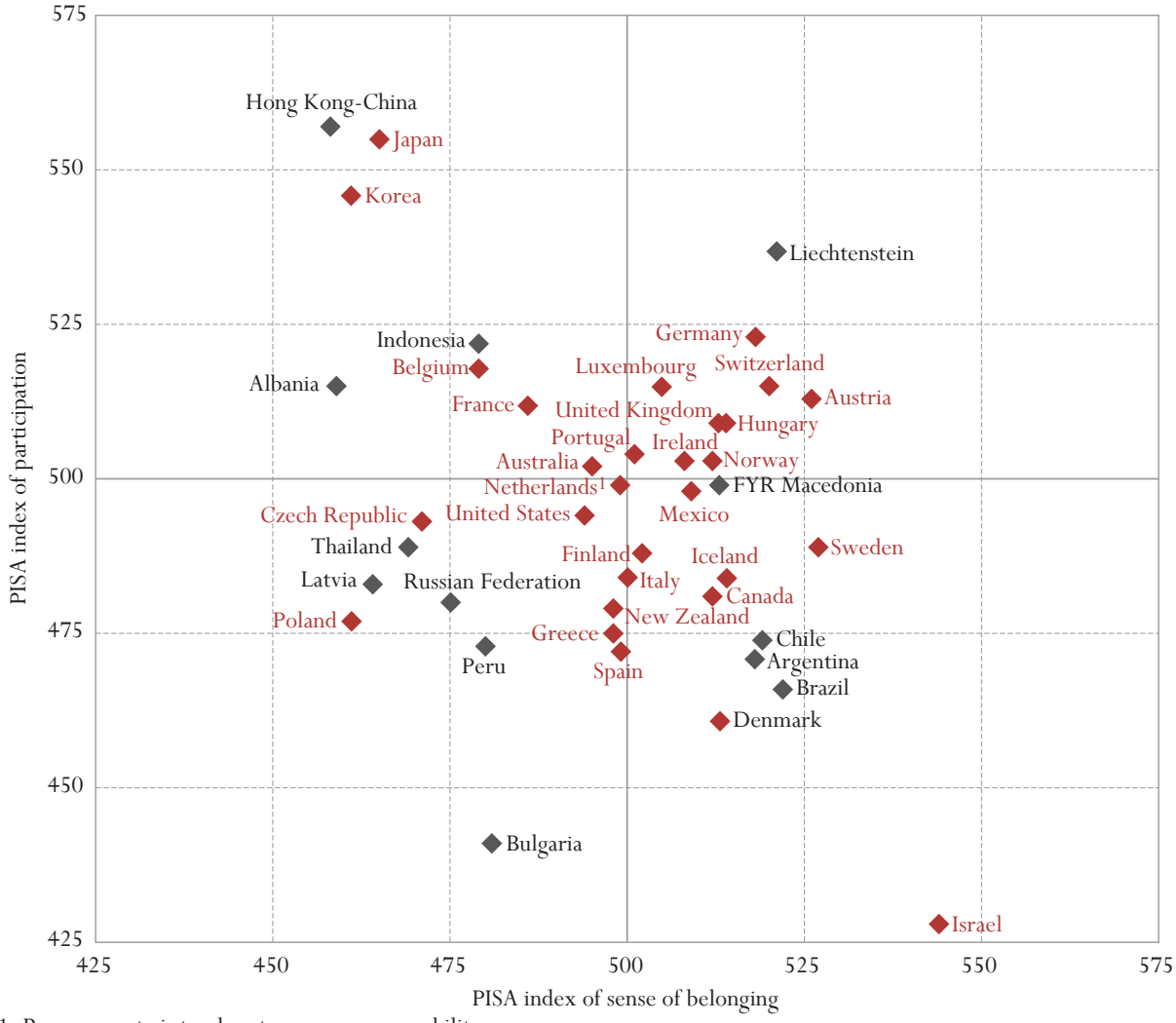
favourable scores. The standard error gives an indication of how accurately the outcome was measured for each country, which depends mainly on the sample size. The 95 per cent confidence interval encompasses the mean score, below and above two standard errors. If PISA could be repeated several times, the mean score would be expected to fall within that interval 19 times out of 20. The third column gives the standard deviation of the outcome measure. This is an indication of the overall variability of scores within each country. The standard deviation of each measure was set to 100 for all OECD countries.

OECD countries varied in their levels of sense of belonging, ranging from 461 for Korea and Poland to 527 for Sweden (see Table 2.1). However, most countries had scores that did not differ significantly from the OECD average. Among the OECD countries, only three countries had scores that were significantly above 515: Sweden, Austria, and Switzerland.[1] Five countries had scores below the OECD average: Belgium, the Czech Republic, Japan, Korea and Poland. Among the non-OECD countries, two countries, Brazil and Israel, had scores that were statistically significantly above the OECD average, while eight of the other non-OECD countries had relatively low scores, at least 15 points below the OECD average.

Figure 2.1

Country mean on the indices of sense of belonging and participation




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA Database, 2003. Tables 2.1 and 2.2.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Levels of participation vary considerably more among countries. Among the OECD countries, three countries had scores significantly above the OECD average: Japan, Korea and Germany. In contrast, six countries had average scores below the OECD average: Canada, Denmark, Greece, New Zealand, Poland and Spain. It is interesting to note that Denmark and Sweden had relatively high scores on the sense of belonging measure, but relatively low scores on the participation measure. Among the non-OECD countries, three countries had scores that were significantly above the OECD average: Hong Kong-China, Indonesia and Liechtenstein. All of the other non-OECD countries, except Albania, Latvia, FYR Macedonia and Thailand, had relatively low scores, significantly below the OECD average. The correlation at the country level between sense of belonging and participation among non-OECD countries is also negative: -0.44.

### Variation among countries in low sense of belonging and low participation

Figure 2.2 displays the prevalence of youths considered to have a low sense of belonging and participation for the 28 OECD countries and the 14 non-OECD countries. Standard errors of these frequencies are displayed in Table 2.3.

The prevalence of students with a low sense of belonging in most countries did not differ substantially from the OECD average of 24.5 per cent. There were four countries with averages above 30 per cent: Belgium (32 per cent), Japan (38 per cent), Korea (41 per cent) and Poland (41 per cent). The prevalence was below 20 per cent in only three countries: Hungary (19 per cent), Sweden (18 per cent) and the United Kingdom (17 per cent).

The prevalence of students with a low sense of belonging in the non-OECD countries varied considerably, from 17 to 40 per cent. The prevalence was above 30 per cent in 6 of the 14 countries: Albania (40 per cent), Hong Kong-China (33 per cent), Latvia (36 per cent), Peru (37 per cent), the Russian Federation (33 per cent) and Thailand (33 per cent). The prevalence was below 20 per cent in Brazil (17 per cent). Figure 2.2 displays the prevalence of students considered to have low participation.

The prevalence of students with low participation varies more among countries than the prevalence of students with a low sense of belonging. While the average level of low participation students among OECD countries is 20.0 per cent, the prevalence was above 25 per cent in six of the 28 countries: Canada (26 per cent), Denmark (33 per cent), Greece (29 per cent), New Zealand (27 per cent), Poland (29 per cent) and Spain (34 per cent). In contrast, the prevalence was below 15 per cent in four countries: Germany (13 per cent), Japan (4 per cent), Korea (8 per cent) and Luxembourg (13 per cent).

Low participation appears to be a greater problem in the non-OECD countries. The prevalence of low participation was above 25 per cent in seven of the fourteen countries. It was below 15 per cent in Hong Kong-China (3 per cent) and Liechtenstein (9 per cent).

### Variation among schools in low sense of belonging and low participation

The prevalence of students with a low sense of belonging may also vary considerably among schools within each country. Determining the extent of this variation is important for at least two reasons. If there is considerable variation among schools, then it may be more efficient to target certain schools for intervention, whereas if the prevalence is fairly uniform across most schools in a country, then a more universal intervention is likely to be preferable. The second reason is that if there is considerable variation among schools in the prevalence of disaffected students, it may be possible to discern whether particular school

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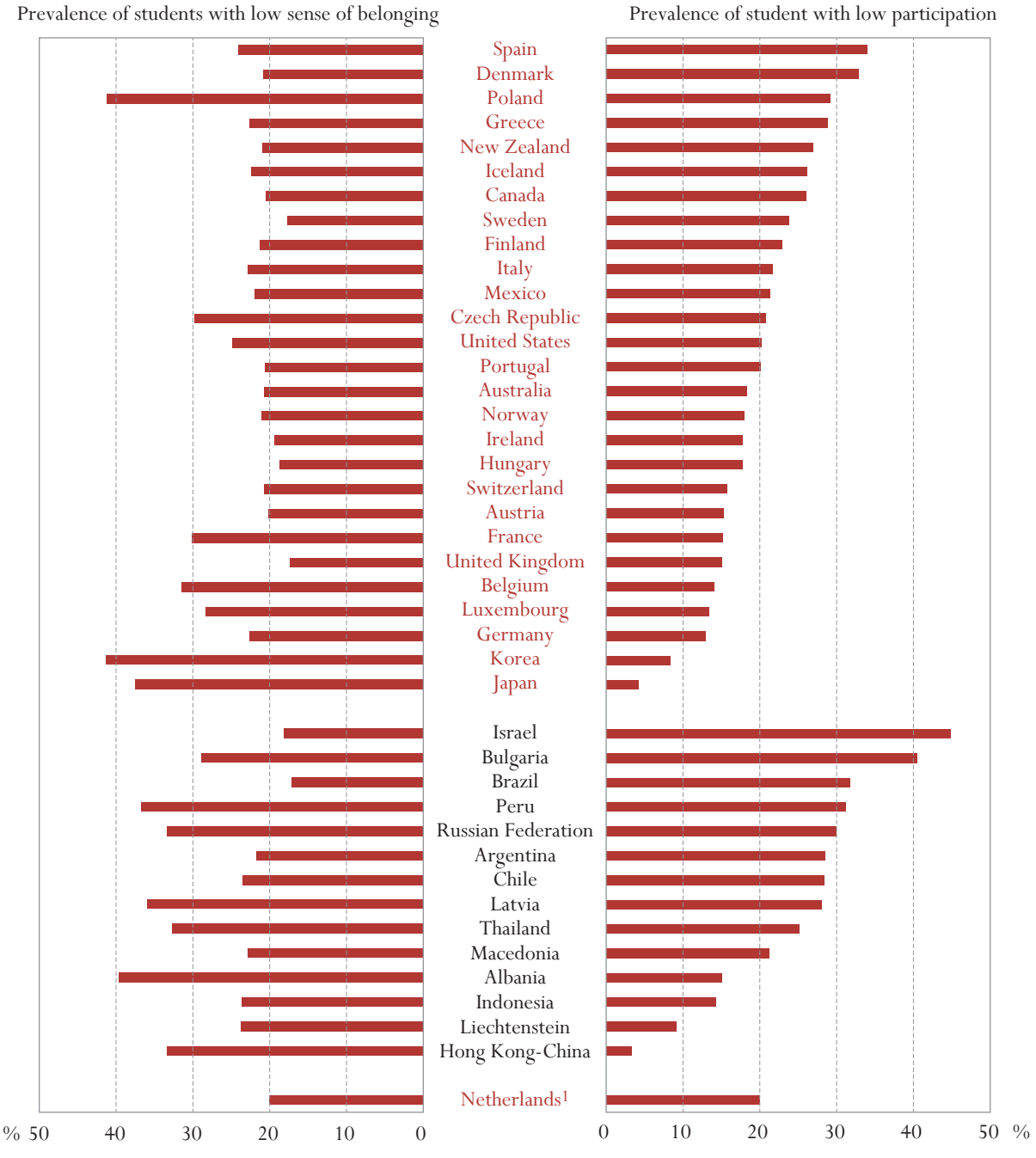
Figure 2.2

## Prevalence of students with low sense of belonging and low participation




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA database, 2003. For data see *www.pisa.oecd.org.*

factors are related to either sense of belonging or participation, thereby providing some direction for what kinds of interventions might be most effective.



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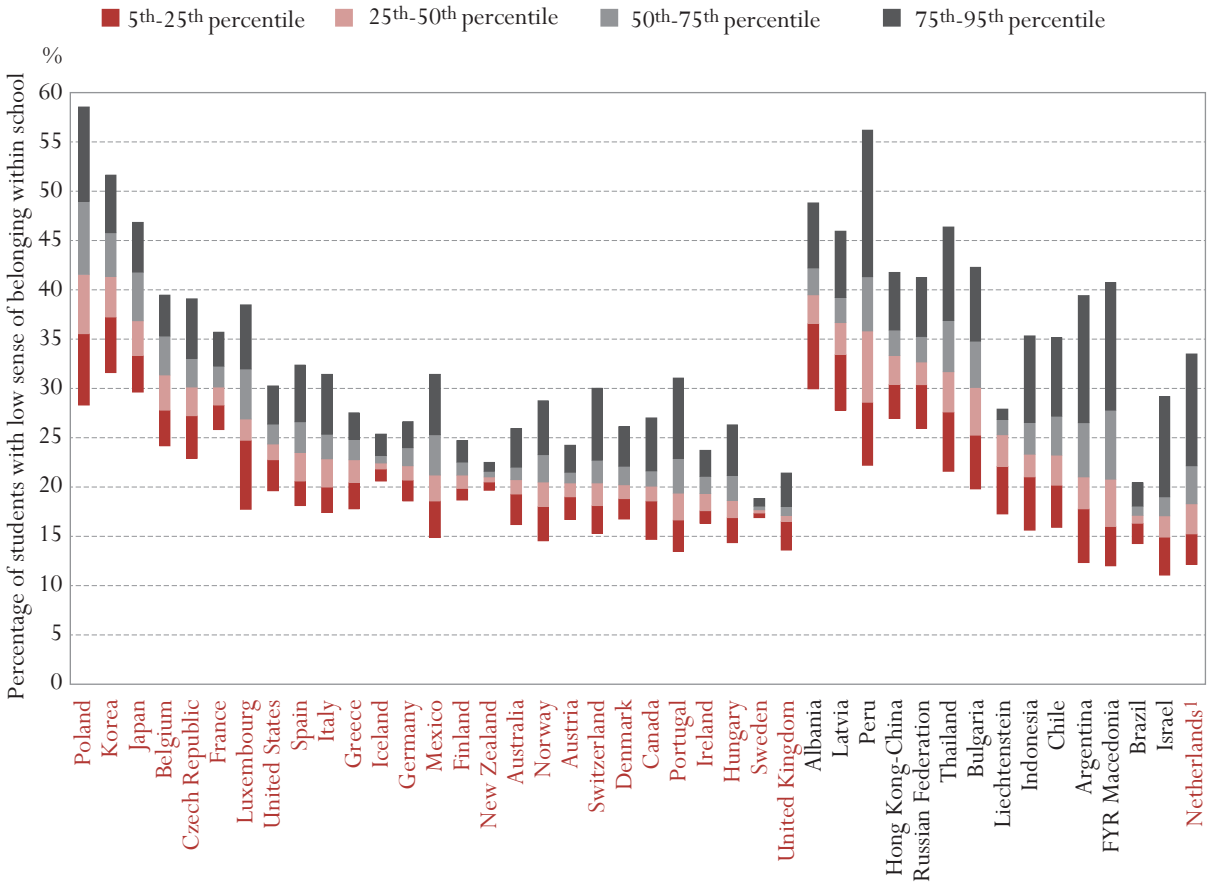
For each country, therefore, the prevalence of students with a low sense of belonging and low participation was calculated for each school. These were calculated for low sense of belonging and for low participation by fitting separately for each country a *null* multilevel logistic regression model on the dichotomous (*i.e.,* two-category) outcome measure. The multi-level analysis yields estimates of the prevalence of low sense of belonging or low participation for each school. These estimates are adjusted to take account of the sample size with which each estimate was calculated. With the sample sizes in PISA, it is not possible to get a very accurate estimate of the prevalence for any particular school; however, the analysis gives an accurate portrayal of the variation in prevalence estimates across all schools in a given country.

Figure 2.3

Variation among schools in the prevalence of low sense of belonging, by country




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA database, 2003. For data see *www.pisa.oecd.org.*

Figures 2.3 and 2.4 display the variation in the estimates of the prevalence of students with low sense of belonging and low participation within each country. These are displayed as *percentile plots* (see Box 2.1), which show the median prevalence for all schools in the country, and the 5th, 25th, 75th and 95th percentiles for the distribution of prevalence estimates for all schools in the country.

On average, across 28 OECD countries, the median prevalence was 24 per cent. The average prevalence at the student-level for all OECD countries was 25.5 per cent. Within every country, except Iceland, New Zealand and Sweden, the prevalence of students with a low sense of belonging varied significantly among schools. The average inter-quartile range was 4.8 per cent, and the average range from the 5th to the 95th percentiles was 12.6 per cent. In three countries, Korea, Luxembourg and Poland, the range exceeded 20 per cent, indicating considerable variation among schools.

**Box 2.1 Percentile plots**

The percentile plots display the distribution of the prevalence of student disaffection for each school as follows:

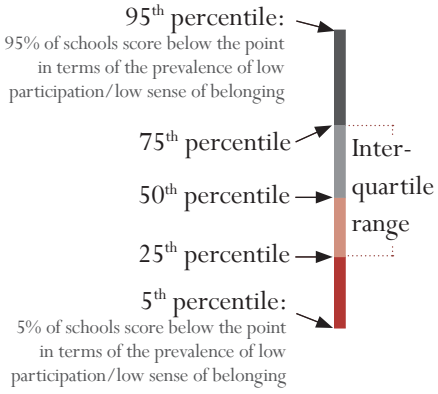
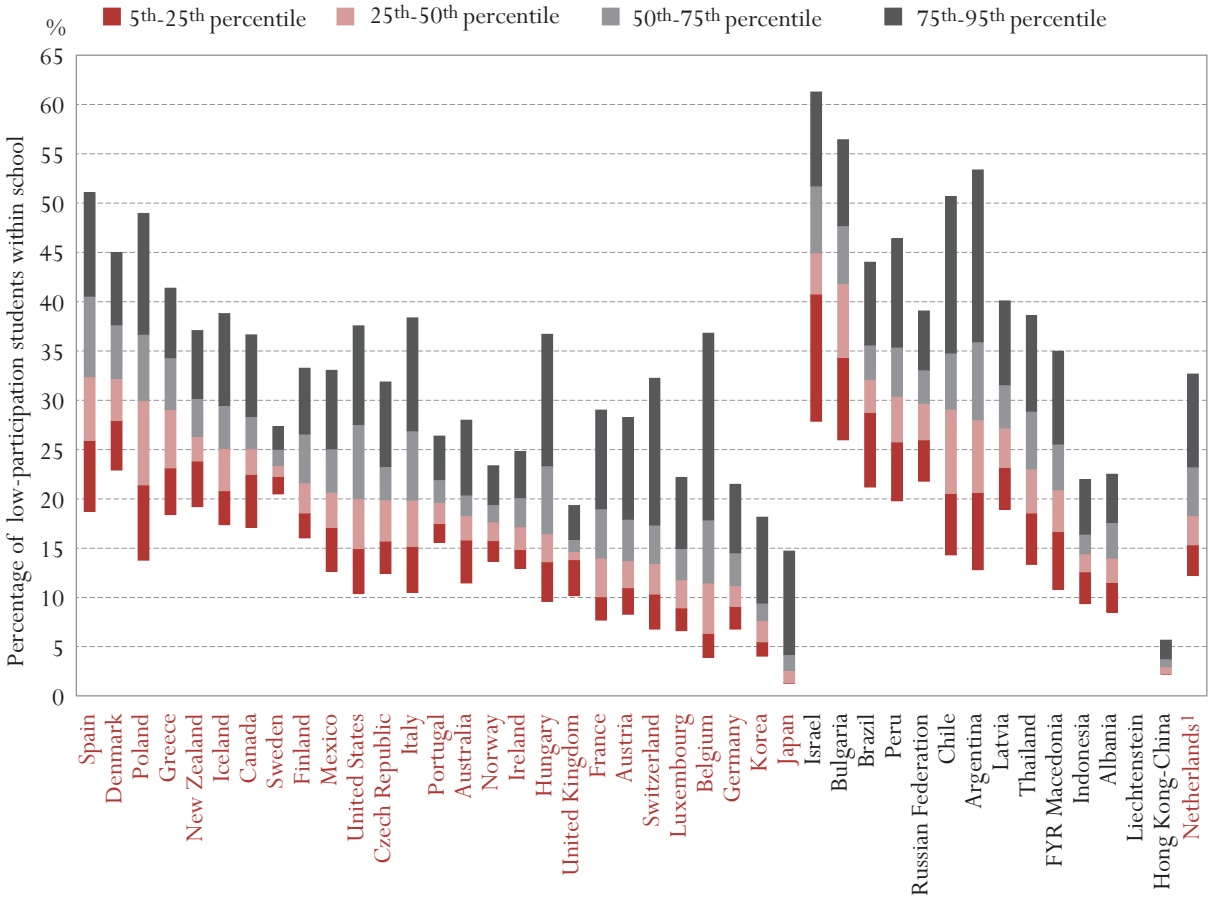



Figure 2.4

Variation among schools in the prevalence of low-participation students, by country




1. Response rate is too low to ensure comparability.

*Source:* OECD PISA database, 2003. For data see *www.pisa.oecd.org.*



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On average, for the non-OECD countries, the median prevalence of students with a low sense of belonging was 27.7 per cent. In all countries except Brazil and Liechtenstein, the prevalence varied significantly among schools within each country. On average, the inter-quartile range was 6.9 per cent, and the average range (from the 5th to the 95th percentile) was 19.9 per cent.

On average, across the 28 OECD countries, the median prevalence of low participation students was 19 per cent, which is slightly lower than the average prevalence at the student-level of 20 per cent. The prevalence of low participation students varied significantly among schools in every OECD country. The average inter-quartile range was 7.3 per cent, and the average range (from the 5th to the 95th percentiles) was 19.8 per cent. Note that these figures indicate that there was considerably more variation among schools in the prevalence of students with low participation than for low sense of belonging. The range exceeded 25 per cent in six countries: Hungary, Italy, Poland, Spain, Switzerland and the United States.

The average median for the non-OECD countries was 24.9 per cent. In all countries, except Liechtenstein, the prevalence of low participation students varied significantly among schools. The average inter-quartile range was 8.3 per cent, and the average range (from the 5th to the 95th percentiles) was 22.0 per cent.

### Conclusion

The analyses in this chapter examined the distribution of scores on two measures of student engagement: sense of belonging and participation. Students who had very low scores on these measures were considered to be disaffected from school, and the analyses also estimated the prevalence of disaffection based on these two indicators. The following findings are particularly noteworthy:

*(a)* **There is a high prevalence of students who can be considered disaffected from school in terms of their sense of belonging or their participation. On average, across the OECD countries, about one in four students are classified as having a low sense of belonging, and about one in five students has very low participation. The prevalence of both types of disaffection was higher among non-OECD countries.** These results depend on the criteria (or cut-off scores) established in this study to determine whether a student was considered to have a low score on the sense of belonging and participation measures. Although it could be argued that the criteria were too liberal, thereby yielding high prevalence estimates, a case can easily be made that the criteria are quite conservative. Most students reported that they agreed, either moderately or strongly, with most statements regarding their sense of belonging. These students scored above 3.0 on the unstandardised scale. However, about one in every four students scored below 3.0. These students did not agree with all statements, and had indicated that they disagreed, either moderately or strongly, with at least one of the statements concerning their sense of belonging at school. Students were not considered to have low participation if they missed school 1 or 2 times in the previous two weeks of school, or had skipped classes and arrived late for school on 1 or 2 occasions during the previous two weeks. To be considered a student with low participation, a student had to have missed school at least 3 or 4 times, or had a combination of missing school, skipping classes and arriving late for school that resulted in missing about 3 or more days of schooling in the previous two weeks.

*(b)* **Countries did not vary substantially in their levels of sense of belonging, or in the prevalence of students with a low sense of belonging.** Most countries had mean scores on the sense of belonging scale that were within 15 points of the OECD average of 500. Similarly, the prevalence of disaffected students across the OECD countries was close to the average prevalence of 24.5 per cent

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in most countries. There was somewhat more variation in the prevalence of students with a low sense of belonging among non-OECD countries.

*(c)* **Countries varied considerably more in their levels of participation and in the prevalence of low participation students.** Mean scores on the participation scale were below 450 in two countries (Bulgaria and Israel), and above 550 in two countries (Japan and Hong Kong-China). Similarly the prevalence of low participation students varied substantially: it was less than 5 per cent in Hong Kong-China, while it was over 30 per cent in Bulgaria, Denmark, Israel and Spain.

*(d)* **In nearly every country, the prevalence of disaffected students varied significantly among schools.** It is possible with the PISA measures to distinguish among schools that have a particularly high or low prevalence of disaffected students, even though the data are not sufficient for reporting results for individual schools. The results suggest that the variation among schools in the prevalence of students with a low sense of belonging is less than that of low participation. The analyses that follow in subsequent chapters examine to what extent some of this variation is attributable to family and school factors.

These findings have important implications for educational policy. First, they indicate that disaffection from school is not limited to a small minority of students. Sense of belonging and participation are important schooling outcomes that deserve attention in nearly every country participating in PISA. While the prevalence of students with a low sense of belonging or low participation varied significantly among schools in nearly every country, the analyses also found that all schools in nearly every country had a prevalence of low sense of belonging of at least 15 per cent, and a prevalence of low participation of at least 10 per cent. This suggests that virtually all schools need to deal with problems associated with disaffection, and thus most countries cannot adequately address the problem with interventions that are targeted at particular schools.

The analyses also found that some countries had a relatively high prevalence of students with a low sense of belonging, but a low prevalence of students who were regularly absent. This suggests that policies directed at increasing student engagement need to consider students' sense of belonging and their participation as separate issues. In the next chapter, the relationships among the engagement variables are considered in greater detail, alongside measures of literacy performance.

**Notes**

1. Although the mean score for Germany is above 515, it is not significantly greater than 515 at a probability level of 0.05. This criterion is also applied in comparing the means scores for other countries with particular threshold values.


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*Chapter*

**3**

# ENGAGEMENT AND LITERACY SKILLS

## Introduction

The first international report for PISA, *Knowledge and Skills for Life* (OECD, 2001*a*), provided convincing evidence that not only did countries differ in their average levels of literacy performance, but also that there was considerable variation in performance among schools within each country. The results in the previous chapter indicate that schools vary in the prevalence of students who are disaffected from school. A common approach to the study of engagement is to presume that it precedes academic outcomes, and that when students become disengaged from school, their academic performance begins to suffer. This may be the case for some students; however, an equally plausible model is that a failure to succeed in academic work at school results in student disaffection and the withdrawal from school activities. A third model, which is equally plausible, is that a range of other factors, including individual, family and school factors, jointly influence both engagement and academic outcomes. It may also be that the causal relationships differ, depending on the students' temperament, academic ability, and family and school contexts. An understanding of the causal mechanisms associated with engagement and academic achievement is central to educational policy, in that it affects decisions about when and how to intervene.

The PISA study cannot determine the causal relationships among engagement and achievement outcomes. However, it can provide an indication of how strong the relationships are among these outcomes at age 15, and determine how strongly they are related to family and school factors. This chapter examines the relationships among engagement and achievement outcomes using two different approaches. The first approach employs a multivariate, multilevel analysis to estimate the strength of the correlations among these variables at the individual and school levels. The second approach employs a statistical technique called cluster analysis. Its aim is to discern whether there are certain "clusters" or types of students characterised by their profile of engagement and achievement outcomes.

### *The relationships between student engagement and literacy skills*

The two engagement outcomes (sense of belonging and participation) and the three measures of literacy skills (reading, mathematics and science) are analysed as outcome measures together in a single analysis. The analysis is multilevel because it takes account of the hierarchical structure of the data, that is, students are nested within schools in each country (see Box 1.1). The analysis discerns whether students who are more engaged in schooling tend to have better literacy skills and vice versa. The correlations among two outcome variables can be partitioned into within- and between-school components. The within-school component indicates how closely two variables are related among students within the same school. The school-level component indicates whether schools that have higher average scores on one outcome measure also tend to have higher average scores on the other outcome measure, and vice versa.

The multivariate, multilevel analysis was conducted separately for each of the 42 participating countries. The results include 10 student-level correlation coefficients and 10 school-level coefficients. These are presented in Tables 3.1 and 3.2. The results indicate that these relationships vary considerably among countries, but generally the relationships among the two engagement measures are much weaker than the relationships among the three measures of literacy performance, at both the individual and school levels. Also, the relationships between sense of belonging and the measures of literacy performance tend to be weak in most countries, while the relationships between participation and literacy performance are somewhat stronger.


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Figure 3.1 shows the average relationships among these variables for all participating OECD countries. Student-level correlations are shown below the diagonal, while school-level correlations are shown above the diagonal. At the student level, the average correlation between sense of belonging and participation is only 0.07. This is a very weak correlation, which suggests that they are markedly different outcome measures. There may be many students who lack a sense of belonging, but despite these feelings, they attend school regularly. Similarly, there may be many students who have a strong sense of belonging, but miss school often, and regularly skip classes and arrive late for school. The relationships between sense of belonging and the three measures of literacy performance are also very weak, ranging from 0.04 to 0.06, The relationships between participation and academic performance are somewhat stronger, ranging from 0.13 to 0.14.[1] In contrast, the correlations among the three measures of literacy skills are fairly high, ranging from 0.68 to 0.79 at the student level.

Figure 3.1

Student-and school-level correlations among measures of engagement at school and performance on the reading, mathematical and scientific literacy scales[1]

Student-level correlations | School-level correlations

| | Sense of belonging | Participation | Reading literacy performance | Mathematical literacy performance | Scientific literacy performance |
|---|---|---|---|---|---|
| Sense of belonging | | 0.37 | 0.51 | 0.48 | 0.50 |
| Participation | 0.07 | | 0.48 | 0.50 | 0.49 |
| Reading literacy performance | 0.06 | 0.14 | | 0.97 | 0.99 |
| Mathematical literacy performance | 0.04 | 0.13 | 0.71 | | 0.99 |
| Scientific literacy performance | 0.04 | 0.14 | 0.79 | 0.68 | |

1. Only OECD countries are included.

The correlation between sense of belonging and participation at the school level is 0.37, indicating a moderately strong relationship. Thus schools with high average levels of sense of belonging also tend to have high average levels of participation. The school-level correlations between the two engagement outcomes and the three measures of literacy performance are also moderately strong, ranging from 0.48 to 0.51. In contrast, the school-level correlations among the three measures of literacy performance are very strong, ranging from 0.97 to 0.99.

These findings have a number of implications for educational policy and practice. The weak correlations at student level suggest that teachers and guidance counsellors are likely to encounter students who have a very low sense of belonging, even though they participate in school activities, and their literacy skills are fairly strong. Students with low participation are likely to have somewhat poorer literacy skills than those who have attended most classes; however, there are many students who miss school, skip classes and arrive late for school who also show reasonably strong literacy skills.

The moderately strong school-level correlations among the engagement measures and literacy performance suggest that schools that have high levels of engagement also tend to have high levels of academic performance. It cannot be infered from these findings that efforts to increase student engagement are likely to lead to better literacy skills. However, they do provide strong evidence that an emphasis on student engagement is seldom at the expense of literacy skill development, and vice versa: schools with low levels of student disaffection tend also to have strong literacy performance.

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### A typology of youth based on student engagement and literacy skills

Another analytical approach to understanding the relationships among achievement and engagement is cluster analysis. Cluster analysis is commonly used to form clusters of individuals based on how similar they are with respect to a number of defining characteristics. The researcher decides which characteristics are most relevant. For example, if 100 students were being considered, the analysis would examine their characteristics, and in the first step form a cluster comprising the two students who were most similar. The next step would examine the characteristics of the 99 clusters (the newly formed cluster of two students and the 98 single student clusters) to find the two clusters that were most similar. It would join them into a new cluster. It would continue in this way, step by step, until a small number of clusters was formed that had relatively dissimilar characteristics. The researcher decides when to stop the process of joining clusters based on how dissimilar the clusters are at each step.

Cluster analysis is used in this report to discern whether there are *types* of students based on their profile of engagement and literacy skills. The cluster analysis was performed for a sample of students comprising a random sample from each of the OECD countries. The analysis used the data describing students' sense of belonging and participation, and their performance in reading and mathematical literacy. [2]

Figure 3.2

Categories of students in OECD countries based on a cluster analysis of their sense of belonging, participation and reading and mathematical literacy performance

| | | Cluster mean on the indices below | | | |
|---|---|---|---|---|---|
| Student category | Percentage of students | Sense of belonging | Participation | Reading | Mathematics |
| Top students | 25.6 | 531 | 530 | 610 | 609 |
| Engaged students | 27.3 | 575 | 529 | 491 | 488 |
| Students feeling isolated | 20.4 | 387 | 526 | 521 | 522 |
| Absentee students | 9.6 | 490 | 271 | 449 | 454 |
| Non-academic students | 17.1 | 472 | 509 | 366 | 369 |
| *All clusters* | *100.0* | *500* | *500* | *500* | *500* |

Figure 3.2 displays the results for the cluster analysis for the OECD student sample. In this analysis the clustering process was terminated at five clusters. The decision about where to stop the clustering process is somewhat arbitrary – any number of clusters can be chosen. However, after examining the results of numerous analyses, with attention to the composition and size of the clusters, five clusters seemed most appropriate. Figure 3.2 shows the percentage of students in each cluster, and the average scores on each of the four outcome variables for each cluster. These results are based on all students in participating OECD countries.

The first cluster, which comprises about one-quarter of all students, is labelled *top students*. These students are engaged in schooling and have relatively high scores on reading and mathematical literacy. The second group, *engaged students*, have above average scores on the two engagement measures, but on average have reading and mathematical literacy scores that are about 10 points below the OECD average of 500. Although these students do not tend to be among those with high literacy skills, they feel they belong at school and they are not absent from school on a regular basis. They also comprise about one-quarter of all students. The third group of students, labelled *students feeling isolated*, comprise about one-fifth of all students. These students on average have low scores on the sense of belonging scale, but above average levels


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of participation. Their achievement scores tend to be fairly strong – on average about 20 points above the OECD average. The fourth group of students, labelled *absentee students*, has very low participation scores. Their literacy skills also tend to be below norms – on average about 50 points below the OECD average – but their sense of belonging is close to the OECD average. These students comprise about 10 per cent of the sample. The last group, labelled *non-academic students*, comprises students who have low literacy skills, on average about 130 to 135 points below the OECD average. These students on average have low scores on the sense of belonging scale, but are not absent from school on a regular basis. They comprise about 17 per cent of the sample.

An important finding revealed by this analysis is that students who have a low sense of belonging are found in two separate groups. There are students who feel lonely and isolated from their classmates, even though they have relatively high literacy skills. There are other students who have these feelings and have very poor academic performance. This split to some extent explains the relatively low correlations between sense of belonging and literacy skills (see Figure 3.1). An important issue concerning these results is whether students in the cluster with high literacy skills tend to pursue further education beyond the period of compulsory schooling.

The cluster analysis also shows that students with very low literacy skills are not generally those with particularly low scores on the two measures of engagement. The analysis did not yield a cluster of students who had low scores on all four outcome measures.

In the next chapter, the relationship between the two measures of student disaffection and students' characteristics, family background, and school factors are examined in detail. However, it is informative to observe the relationship between the prevalence of the five *types* of students with family socio-economic status. This study employed the same measure of socio-economic status as was used in Chapter 8 of *Knowledge and Skills for Life* (OECD, 2001*a*). It is a statistical composite of the educational level of the parents, the occupational status of the parents, the PISA indices of family wealth, home educational resources and home possessions related to classical *culture*. The gradients associated with each of the five *types* of students were determined by regressing each student type (*e.g.*, a dummy variable denoting *top student* versus *other*) on socio-economic status and the square of socio-economic status. A logistic regression model was used, which is discussed in detail in the next chapter. The gradients are shown in Figure 3.3.

In Figure 3.3, the student socio-economic status is standardised so that the average socio-economic status among the OECD country students becomes 0 and the standard deviation is 1. The gradients indicate, for each of the five types of students, the expected prevalence, or percentage of students, associated with varying levels of socio-economic status. For example, the gradient for *top students* indicates that the likelihood of a student being in this category is strongly related with socio-economic status: the prevalence of *top students* among those of average socio-economic status (measured by the International Socio-Economic Index of Occupational Status and standardised to have an OECD average of 0 and a standard deviation of 1) is 24.6 per cent, while the prevalence among those with a socio-economic status that is one standard deviation above the OECD average is 39.8 per cent. The gradient lines are drawn from the 5$^{th}$ to the 95$^{th}$ percentiles of socio-economic status for each group of students, thereby showing the range of socio-economic status for each group. The gradient line for *top students* ranges from -0.93 to 1.73 on the scale for socio-economic status.

The likelihood of a student being in the group labelled *non-academic students* is strongly negatively related to family socio-economic status. The range (from the 5$^{th}$ to 95$^{th}$ percentiles) is from -2.43 to 0.95. A student with average socio-economic status has a likelihood of 14.2 per cent of being among the non-academic

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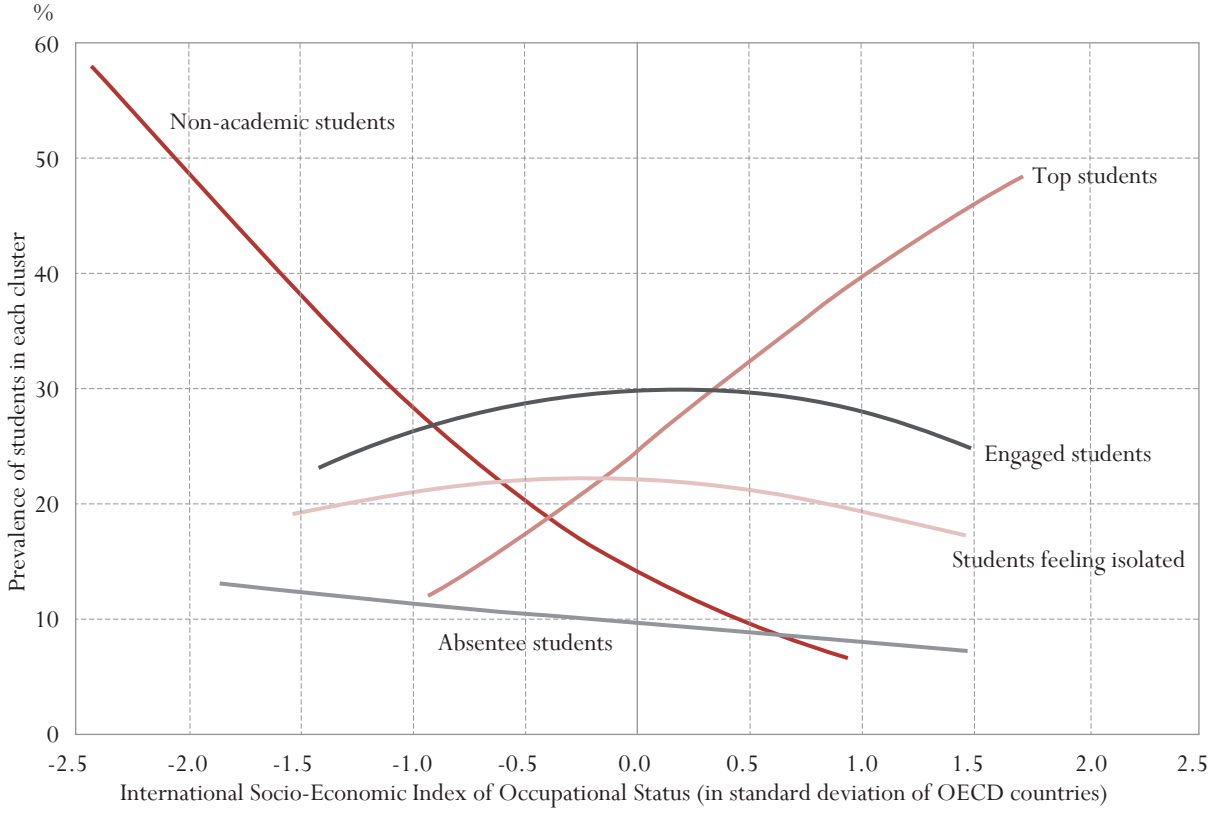
Figure 3.3

Prevalence of students by socio-economic backgrounds, OECD countries




*Source:* OECD PISA database, 2003. For data see *www.pisa.oecd.org*.

group, whereas a student with a family socio-economic status that is one standard deviation below the OECD average is twice as likely – 28.4 per cent – of being in the non-academic group.

In contrast, students in the other three categories tend to be from a wide range of family backgrounds, ranging from well below the OECD average to well above the OECD average. The prevalence of students in each of these three groups is not strongly related to socio-economic status. The gradients are markedly non-linear for the engaged and isolated groups, with students of average socio-economic status more likely to be in these groups than students with low or high socio-economic status.

A separate cluster analysis was also performed for each country. The results are presented in Table 3.3. The analyses revealed that the five-cluster model presented above fits for 25 of the 42 countries. However, in nine of the 42 countries, a solution based on four clusters provided a more interpretable fit to the data, while in eight of the 42 countries, a three-cluster model was more appropriate.

The countries with a four-cluster solution included Belgium, Finland, France, Iceland, Korea, the Netherlands, Norway, Portugal and Spain. In these countries, there was a cluster of students who had relatively high scores on all four outcome measures. The cluster is referred to as *well-rounded students*. However, this cluster did not have the highest average literacy performance. A second cluster comprised students who had high average reading and mathematics performance, but tended to have a low sense of belonging. This



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cluster was a fairly large cluster, comprising from 33.1 to 44.2 per cent of the students within each country. The other two clusters had low average reading and mathematics performance. One cluster, which in all nine countries was the larger of the two, included youths who tended to have a low sense of belonging, while the other included youths who were regularly absent from school. As in other countries, there was no cluster of students with low average scores on all four outcomes.

The three-cluster solution was used for eight countries: Bulgaria, Hungary, Indonesia, Israel, Italy, Luxembourg, the Russian Federation and Thailand. One of the clusters also comprised *well-rounded* students; these students, compared with other students in their country, had fairly high scores on all four outcomes. The other two clusters included a non-academic group of students who had a low sense of belonging, and a cluster of non-academic students who had fairly high scores on the two engagement measures, despite their low performance on the literacy measures.

### Conclusion

This chapter examined the relationship between student engagement and literacy skills. A number of important findings emerged:

*(a)* **Students' sense of belonging is not strongly related to participation, or to any of the measures of literacy skills at the individual level. Many of the students who have a low sense of belonging tend to cluster into two groups, one that that has relatively high academic achievement, and another that has very low literacy performance. Students with a low sense of belonging tend to have a wide range of socio-economic status.** These results call for a conceptualisation of disaffection from school in the way that differs from how it has commonly been portrayed in the literature. Disaffection should not be simply thought of as an attitude that precedes and causes poor literacy skill development, but rather as a disposition towards schooling that is shared by youths from varying socio-economic backgrounds and with varying levels of literacy skills. These results indicate that poor literacy skill development is not the primary cause of disaffection. It may be that youth feel disaffected from school for a host of other reasons, such as their talent in sports, their personal appearance, or their ability to make friends easily. Further research could attempt to achieve a better understanding of when students become disaffected from school, the reasons underlying their disaffection, and how it is related to other academic and non-academic outcomes. It is important to understand how students' sense of belonging at school affects their decisions concerning post-secondary education.

*(b)* **Students' participation is weakly related to measures of literacy performance. In many countries there is a small group of students who are absent from school on a regular basis and have achievement scores that are on average about 50 points below the OECD average. However, the majority of students who have very low literacy skills are not absent from school on a regular basis.** About 10 per cent, or one-half of the students considered to have low participation, were in a cluster of students whose literacy performance was about one-half of a standard deviation below the OECD average, whereas those with very low literacy performance (more than 100 points below average) had participation scores that were close to the OECD average. More detailed analyses are required to understand why these students have low levels of participation. It may be that many of them have already decided upon a post-secondary destination that does not require high secondary school grades. If this is the case, they may be content with achieving passing grades, and therefore are more or less *marking time* until they have completed secondary school.

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*(c)* **Over one-half of all students are engaged at school and have strong or at least average literacy skills. The other half can be classified into three groups. One group, comprising about 20 per cent of all students, has a low sense of belonging, but fairly high literacy skills. Another group, comprising about 10 per cent of all students, is regularly absent from school, and their academic literacy skills are below average. The remaining students are those with very poor literacy skills.** The students in the latter group tend to come from families of lower socio-economic status. Although they have poor literacy skills, they are not strongly disaffected from school, nor are they regularly absent from school. The results of the previous chapter indicated that in most countries disengaged students are prevalent in most schools. Therefore, *universal* interventions, aimed at improving engagement for all students, may be more practical than *targeted* interventions focused on particular schools. These results, however, suggest that it may be practical to develop different kinds of school interventions aimed at helping students with particular types of problems. Youths who lack a sense of belonging at school are likely to need a different kind of intervention than those who are regularly absent.

Taken together, these findings do not lend support to the popular belief that efforts to increase student engagement will result in large gains in literacy skills. This may be the case for a small proportion of students who are regularly absent from school and are performing slightly below norms in their academic work. Rather, the findings indicate that there are many students who are disaffected from school who are doing well academically, and vice versa. Engagement should not thus be viewed simply as a precursor to academic achievement and treated as a control variable in monitoring activities and in educational research. Engagement is an important outcome in its own right, as there are many students who lack a sense of belonging at school, and do not participate fully in school activities. These students would likely benefit from school policies and practices that increased their sense of belonging and participation.

## Notes

1. These correlations are weaker than those reported in the literature based on smaller-scale studies conducted in the United States (*e.g.*, Goodenow, 1993; Voelkl, 1995). However, the estimates in this study for the United States, which range from 0.12 to 0.15 for sense of belonging, and 0.19 to 0.22 for participation (see Table 3.1), are more consistent with the previous literature.

2. Science performance was not used in these analyses because reading and science are highly correlated at the student level. Preliminary analyses indicated that the inclusion of science performance did not appreciably affect the results of the cluster analysis.


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*Chapter*

4

# FAMILY AND SCHOOL FACTORS ASSOCIATED WITH STUDENT DISAFFECTION

## Introduction

The aim of this chapter is to identify the principal family and school factors related to student disaffection. The outcome variables in these analyses are the measures used earlier that classified students as either having or not having a low sense of belonging or low participation. The first set of analyses examines the relationships between the engagement measures and the students' gender, socio-economic status, whether they were foreign-born, and whether they were living in a one-parent or two-parent family. These analyses are conducted for all OECD countries together and then separately by country. The second set of analyses estimates the effects associated with a number of factors describing the schools students were attending. These factors are categorised into three groups: school context, school resources, and school policy and practice. The results of these analyses call for a closer examination of the variation among countries in some of the key predictors of student disaffection.

### Box 4.1 Logistic regression and odds ratios

Multiple linear regression is generally used to express the relationship between an outcome (or dependent) variable, such as students' reading performance, and a set of predictor (or independent) variables, such as family income, parents' education, and the sex of the child. The researcher posits a model of the relationship between the dependent and independent variables, which is usually based on some theory or on prior research. The data are *fit* to the model, yielding a set of weights called regression coefficients. These denote *the expected change in Y (the dependent variable) for a one-unit change in X (the independent variable), given all other variables in the model are held constant.* Multiple regression is a powerful tool for policy purposes, because the effects of a policy variable of interest (*e.g.*, the effects of the classroom pupil-teacher ratio on reading performance) can be examined, while holding other variables constant (*e.g.*, the family background of students).

Multiple regression is appropriate when the outcome variables are continuous, such as the measures of reading, mathematics, and science performance used in PISA. However, when the outcome variable is dichotomous, such as whether or not a child repeated a grade at school, a variant of multiple regression called logistic regression is appropriate. It is also a useful policy device, because often the interest is in the prevalence of certain traits, such as children with disabilities, or in this study, youth considered disaffected from school or regularly absent. The policy analyst is interested in the *probability* or *likelihood* of the child having the trait, or experiencing the event at a particular time, and how various characteristics of the child, such as age, sex, or family income, or a characteristic of the school, such as pupil-teacher ratio, affect that probability. The regression coefficients from a logistic regression can be easily transformed to *odds ratios*, which can be simply interpreted for policy purposes.

The *odds* of an event occurring is the likelihood of the event *occurring* divided by the likelihood of the event not occurring. For example, if an event has a 75 per cent chance of occurring, then the odds of it occurring are [0.75/(1-0.75)], which is 3.0. An event with an odds of 1.0 has an equal chance of occurring or not occurring. An odds ratio is simply the ratio of the odds for two different sets of circumstances. For example, the odds of an event occurring for girls and for boys could be assessed, and the ratio of the odds could be calculated. Odds ratios are interpreted in a fashion similar to multiple regression coefficients: they denote the ratio of the odds of an event occurring after a one-unit change in the independent variable, compared to what it was previously, given all other independent variables in the model are held constant.


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In Figure 4.1, for example, the results from two logistic regression analyses are presented. In the first analysis, the outcome variable is whether or not a student had low sense of belonging. One of the independent or predictor variables is whether or not the student was born in the country. The odds ratio is 1.37. This indicates that the likelihood of a youth who was foreign-born being disaffected is 1.37 times that of a youth who was born in the country. The predictors for a logistic regression can include continuous variables, such as a child's age, or a continuous measure of socio-economic status. In Figure 4.4, for example, the analysis includes a number of variables describing school resources, and classroom and school policy and practice. The odds ratio for low participation associated with disciplinary climate is 0.95. This indicates that the odds of a child displaying low participation is about 5 per cent less for each one-point increase on the scale for disciplinary climate. Norusis/SPSS Inc. (1992) provides a simple introduction to logistic regression.

The analyses in this chapter use a regression technique called logistic regression. This technique is appropriate when the outcome variable for a regression analysis is dichotomous, such as whether or not a child has a low sense of belonging. In this case, the outcome denotes whether or not a student has a low sense of belonging or low participation. What is of interest is the *probability* or *likelihood* of the student being disaffected, and how various characteristics of the student, such as age, sex, or family income, or characteristics of the schools they attend, affect that probability. Also, because the data are hierarchically nested (students nested within schools, and schools within countries), the appropriate model is a multilevel logistic regression. This adds some complexity to the analysis, but for the non-statistical reader, the interpretation is reasonably straightforward. Box 4.1 provides a discussion of logistic regression.

### The relationship between student engagement and family background

Figure 4.1 displays the odds ratios for five variables describing students' characteristics and family background. These results are based on a three-level multilevel logistic regression model, with students nested within schools, and schools nested within countries. The results indicate that the odds of a female having a low sense of belonging are 0.98 that of a male. This is close to 1.0, and not statistically significant, indicating that males and females are equally likely of having a low sense of belonging. For low participation, however, the odds ratio is 0.93, which suggests that the odds of a female having low participation is about 7 per cent less than that of males. This difference is statistically significant. The results also indicate that for low sense of belonging, the odds ratios for gender vary significantly among schools within countries, and among countries. This calls for further analyses that examine gender differences separately for each country. Country-level results are reported in Table 4.1.

Living in a family of high socio-economic status (top quartile within the country) offers some protective effect from having a low sense of belonging. The odds ratios is 0.86, which indicates that the odds of having a low sense of belonging for a student living in a high socio-economic status family is about 14 per cent less than the odds for students living in families of average (middle two quartiles) socio-economic status. The odds ratio for low participation is 0.94, and not statistically significant.

The deleterious effects on students' engagement associated with living in a family of low socio-economic status (bottom quartile within the country) are considerably greater. The odds of having a low sense of belonging are about 38 per cent greater for students living in low socio-economic status families than for

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Figure 4.1

Student characteristics and family background factors associated with low sense of belonging or low participation (logistic regression coefficients, standard errors and odds ratios)[1]

| | Low sense of belonging | | | Low participation | | |
|---|---|---|---|---|---|---|
| | Effect | Standard error | Odds ratios[2] | Effect | Standard error | Odds ratios[2] |
| Female student | -0.018 | (0.03) | 0.98[sc] | -0.076 | (0.03) | **0.93**[c] |
| High socio-economic family background | -0.157 | (0.02) | **0.86**[c] | -0.063 | (0.03) | 0.94[c] |
| Low socio-economic family background | 0.324 | (0.02) | **1.38**[c] | 0.234 | (0.04) | **1.26**[c] |
| Foreign-born student | 0.313 | (0.03) | **1.37**[c] | 0.261 | (0.06) | **1.30**[c] |
| Single-parent family | 0.159 | (0.01) | **1.17** | 0.302 | (0.02) | **1.35** |

1. Only OECD countries are included.
2. Odds ratios in bold text are statistically significant ($p < 0.05$). Odds ratios with a superscript s vary significantly among schools within countries, and those with a superscript c vary significantly among countries.

those living in average socio-economic status families. Low socio-economic status is also a risk factor for low participation; the odds ratio is 1.26.

Students who were foreign-born[1] are also at greater risk of having low sense of belonging or low participation. The odds ratios are comparable to those associated with low socio-economic status: 1.37 for low sense of belonging and 1.30 for low participation.

Students living in single-parent families[2] are also more likely to be disaffected from school: the odds ratio for low sense of belonging is 1.17 and for low participation is 1.35.

Many students have multiple risk factors. For example, many students who have experienced immigration to a new country also live in low socio-economic families. In most countries, a disproportionate number of youths living in single parent families are also of low socio-economic status. Odds ratios indicate the effects associated with each predictor variable, given that all other variables in the model are held constant. Odds ratios can be multiplied. Thus, the odds of being disaffected for a youth living in a single-parent, low socio-economic status family is about (1.38 * 1.17 =) 1.61 times that of a youth living in a two-parent family of average socio-economic status.

The results indicate that the protective effects of living in a high socio-economic status family and the risks associated with being foreign-born or living in a low socio-economic status family vary significantly among countries, but not among schools within countries. These results emphasise the need for examining these effects for each country separately.

Estimates of the odds ratios for low sense of belonging associated with students' characteristics and family background are reported in Table 4.1. The results for low participation are displayed in Table 4.2. The results displayed in Figures 4.1 to 4.3 reveal that living in a low socio-economic status family is one of the most important risk factors for student disaffection and low participation.

In seven OECD countries – Hungary, Iceland, Luxembourg, Norway, Poland, Portugal and the United States – and in four non-OECD countries – Argentina, Bulgaria, Latvia and the Russian Federation – students with low socio-economic status backgrounds were more than 50 per cent more likely than their peers with average socio-economic status backgrounds to have a low sense of belonging. In all but three


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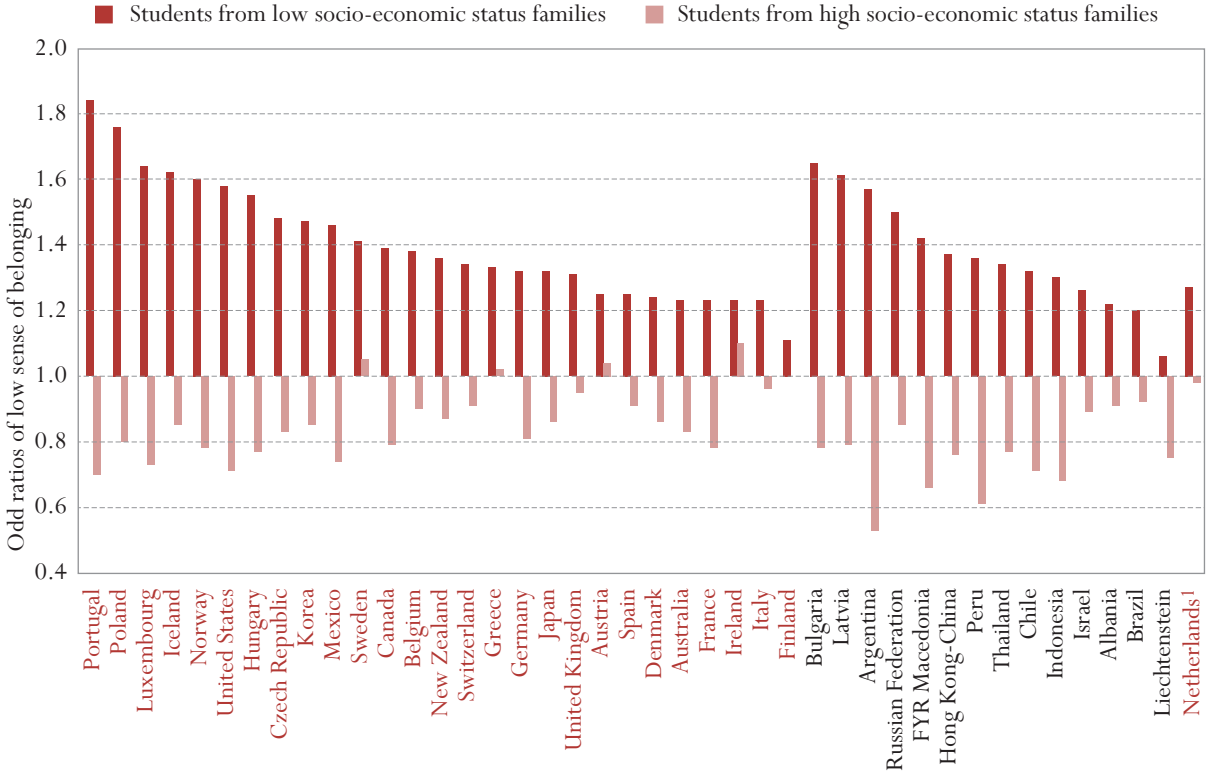
countries – Brazil, Finland and Liechtenstein – the odds ratios exceeded 1.20, stressing that in virtually every country students from poor families are more likely to feel lonely or feel like an outsider at school.

Generally students from affluent families were less likely to experience these feelings, but the effect was less pronounced. Living in a high socio-economic status family was a significant protective factor in 14 of the 28 OECD countries, and in 10 of the 14 non-OECD countries. In 17 of those 24 countries, the odds ratio was 0.80 or lower, indicating that the odds of low sense of belonging for students with high socio-economic backgrounds were at least 20 per cent less than for their peers with average socio-economic backgrounds.

Figure 4.2

Student characteristics and family background factors associated with low sense of belonging




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA database, 2003. Table 4.1.

Being a foreign-born student is also an important risk factor for low sense of belonging (see Table 4.1). On average, across all participating OECD countries, the effect is of the same magnitude as the effect of living in a low socio-economic family. Considering that foreign-born students in many countries tend to also work in low status occupations, the effects are compounded for many students. The odds associated with being foreign-born vary considerably among countries. In 14 of the 28 OECD countries, and in two of the 14 non-OECD countries, the odds ratios were statistically significant. In most of these countries, the odds ratios exceeded 1.50, indicating that the odds of low sense of belonging for foreign-born students in these countries were at least one and a half times as great as those for students who were born in the country.

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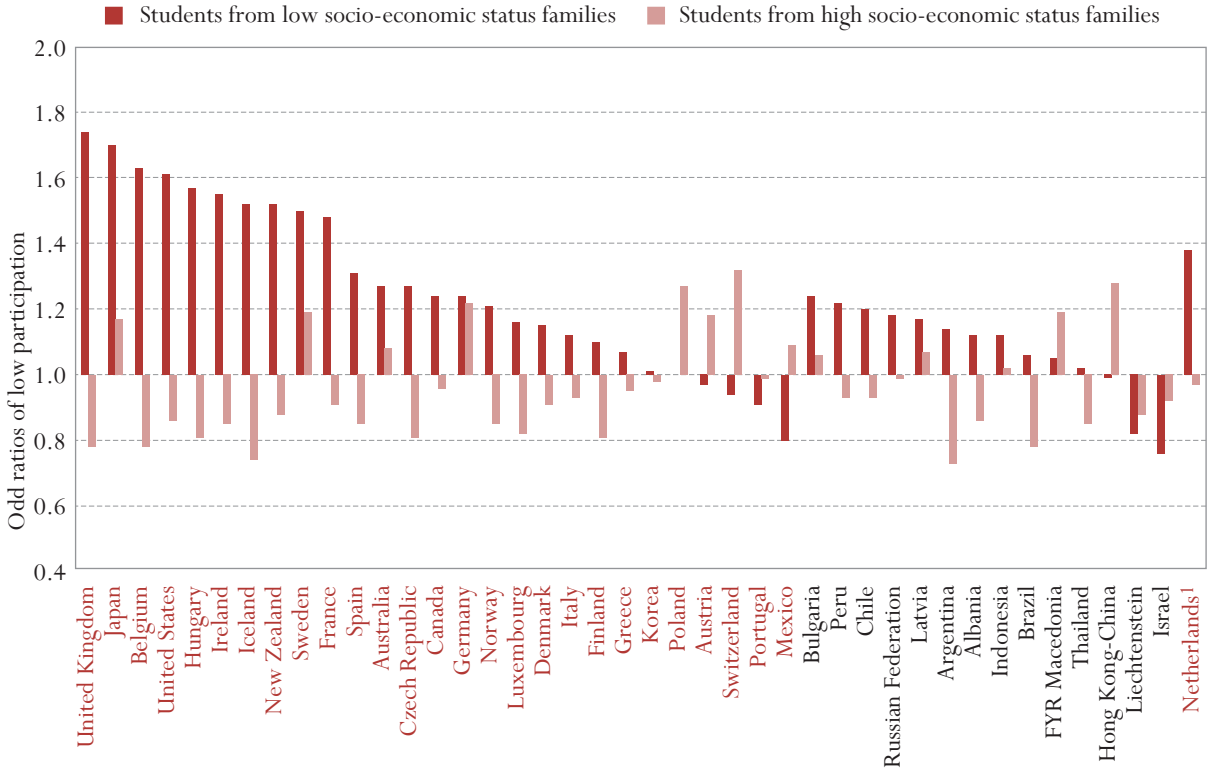
Students in single-parent families were significantly more likely to have a low sense of belonging in 9 OECD countries, and 4 non-OECD countries. However, on average the magnitude of the effects was not as large as those associated with being foreign-born or living in a low socio-economic family (see Table 4.1).

Figure 4.3

Student characteristics and family background factors associated with low participation




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA database, 2003. Table 4.2.

Table 4.2 shows the country-level results for low participation. In nine of the OECD countries – Belgium, Iceland, Ireland, Hungary, Japan, New Zealand, Sweden, the United Kingdom and the United States – the odds ratio for living in a low socio-economic family was at least 1.50. These results indicate that the odds of low participation for students from low socio-economic families in these countries were at least one and a half times as great as the odds for students from average socio-economic status families. In non-OECD countries, living in a low socio-economic status family was a less important risk factor for low participation. In all countries the odds ratios were less than 1.25.

Similar to the results for low sense of belonging, the protective effect of living in a high socio-economic status family is smaller than the deleterious effect of living in a low socio-economic status family. On average, the risk associated with living in a single parent family is slightly greater than the risk of living in a low socio-economic status family. The odds ratio for single-parent families was 1.50 or greater in eight of the OECD countries and in one non-OECD country.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In seven of the 28 OECD countries, and 10 of the 14 non-OECD countries, females were significantly *less* likely than males to have low participation (see Table 4.2). However, in three – Liechtenstein, New Zealand and Spain – females were more likely than males to have low participation. On average, across the OECD countries, the odds of low participation for females was about 93 per cent that of males.

The results pertaining to foreign-born students are especially interesting because they vary considerably among countries. On average, for the 28 OECD countries, the odds ratio was 1.30. However, in most OECD countries, low participation was not significantly related to whether the youth was foreign-born, while in four countries – Belgium, France, Norway and Switzerland – the odds ratios ranged from 1.51 to 2.00. Non-OECD countries also vary considerably in their results for foreign-born students. It is a significant risk factor in only two countries – Indonesia and Liechtenstein. In Israel, the prevalence of low participation was lower among foreign-born students than among those born in the country.

### The effects of family and school factors on levels of student engagement

In the next set of analyses, the model presented above is extended to include variables describing school context, school resources, and school policy and practice. One of the important findings presented in *Knowledge and Skills for Life* (OECD, 2001*a*) was that the average level of socio-economic status in a school was associated with higher student achievement. In nearly every country, the effect was large and statistically significant, indicating that a student with average family background characteristics tended to have higher achievement if he or she attended a school with high socio-economic levels. This effect tended to be slightly stronger for males and students from low socio-economic backgrounds. Consequently, when students are segregated along socio-economic lines, students from advantaged backgrounds fare slightly better in their literacy skills, while those from less advantaged backgrounds fare considerably worse. The analyses in the first international report also pointed to a number of important factors regarding school policy and practice, and concluded that:

> "… from those factors that were examined in PISA, there is no single factor that explains why some schools or some countries have better results than others. Rather, successful performance is attributable to a constellation of factors that includes school resources, school policy and practices and classroom practices." (OECD, 2001, p. 212)

For student performance in reading, the most prominent factors included: lower student-teacher ratios (at least below 25), larger schools (at least up to 1,000 students), a high proportion of teachers with specialised training in their subject domain, students' use of school resources (*e.g.*, school library, computers, calculators, laboratories and the internet via the school), school climate, teacher morale and commitment, school autonomy, student-teacher relations, disciplinary climate of the classroom, and academic press, which is a measure of the extent to which teachers have high expectations for student success and emphasise academic performance. These school-level measures are described in *Knowledge and Skills for Life* (OECD, 2001*a*).

The results for low sense of belonging and low participation are presented in Figure 4.4. The first model in these analyses includes the set of variables describing student characteristics and family background, plus two measures of school context: the percentage of students from high socio-economic families and the percentage of students from low socio-economic families. The results indicate large and significant effects associated with school context. Students who are attending schools with a higher percentage of students from low socio-economic status families are more likely to have a low sense of belonging and

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low participation than those attending schools with few students from low socio-economic status family. An increase of 10 per cent in the percentage of students from low socio-economic status families in the school is associated with a 5 per cent increase in the odds of a student having a low sense of belonging, and a 7 per cent increase in the odds of low participation. The percentage of students in the school living in high socio-economic status families was not significantly related to either a low sense of belonging or low participation.

Figure 4.4

Family and school factors associated with a low sense of belonging or low participation (odds ratios), OECD countries

| Family and school factors | Meaning of one unit increase | Low sense of belonging | | | Low participation | | |
|---|---|---|---|---|---|---|---|
| | | Model I | Model II | Model III | Model I | Model II | Model III |
| Student-level | | | | | | | |
| Female student | | 0.99[sc] | 1.00[sc] | 1.01[sc] | **0.93**[sc] | 0.96[sc] | 0.96[sc] |
| High socio-economic status family | | **0.87**[c] | **0.88**[c] | **0.87**[c] | 0.99[c] | 0.96[c] | 0.99[c] |
| Low socio-economic status family | | 1.33[c] | 1.35[c] | 1.32 | 1.20[c] | 1.23[c] | 1.20[c] |
| Foreign-born student | | 1.36[c] | 1.35[c] | 1.36[c] | 1.28[c] | 1.23[c] | 1.27[c] |
| Single-parent family | | 1.17 | 1.17 | 1.17 | 1.35 | 1.33 | 1.35 |
| School context | | | | | | | |
| Percentage of students from high socio-economic families | 10 per cent | 1.01 | | **1.02**[c] | 1.00[c] | | 1.01[c] |
| Percentage of students from low socio-economic families | 10 per cent | **1.05**[c] | | 1.04[c] | 1.07[c] | | 1.06[c] |
| School resources | | | | | | | |
| School size | 100 students | | 0.98 | 0.98 | | 1.02[c] | 1.02[c] |
| School size squared | | | 1.00 | 1.00 | | 1.00[c] | 1.00[c] |
| Student-teaching staff ratio | 1 student | | 1.00 | 1.00 | | 0.97[c] | 0.97[c] |
| Student-teaching staff ratio squared | | | 1.00 | 1.00 | | 1.00[c] | 1.00[c] |
| Quality of school infrastructure (10-point index) | 1 point | | 1.00 | 1.00 | | 0.99 | 1.00 |
| School administrator's assessment of teaching staff (10-point index) | 1 point | | 1.00 | 1.00 | | 0.99 | 0.99 |
| School policy and practice | | | | | | | |
| Use of formal assessment (10-point index) | 1 point | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Teacher morale and commitment (10-point index) | 1 point | | 1.00 | 1.00 | | 1.00[c] | 1.00[c] |
| Teacher autonomy (10-point index) | 1 point | | 1.00 | 1.00 | | 1.01 | 1.01 |
| Principals' autonomy (10-point index) | 1 point | | 1.01 | 1.00 | | 1.00 | 0.99 |
| Classroom practice | | | | | | | |
| Use of informal assessment (10-point index) | 1 point | | 1.00 | 1.00 | | 0.99 | 1.00 |
| Student-teacher relations (10-point index) | 1 point | | 0.95 | 0.95 | | 0.96 | 0.96 |
| Disciplinary climat (10-point index) | 1 point | | 0.98 | 0.98 | | 0.95[c] | 0.95[c] |
| Achievement press (10-point index) | 1 point | | 0.99[c] | 0.99[c] | | 0.97[c] | 0.97[c] |

*Source*: OECD PISA database 2003.

The second model includes independent variables describing student characteristics and family background, and measures describing school resources together with school policy and practice. In this model, as with those presented earlier, the odds ratio for each independent variable denotes the ratio of the odds of an event occurring after a one-unit change in the independent variable, compared to what it was previously, given that all other independent variables in the model are held constant. The measures of school resources, school policy and practice were derived as follows:



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*School size* was derived from the school administrators' report of the school enrolment. One unit on this scale represents 100 students.

*Student-teaching staff ratio* was defined as the number of full-time equivalent teachers divided by the number of students in the school. One unit on this variable represents a change of one student per teacher.

*Quality of school infrastructure* is a summary measure derived from school principals' reports of the extent to which the learning of 15-year-olds was hindered by *(a)* poor condition of buildings; *(b)* poor heating, cooling and/or lighting systems; *(c)* lack of instructional space (*e.g.,* classrooms); *(d)* lack of instructional material (*e.g.,* textbooks); *(e)* not enough computers for instruction; *(f)* lack of instructional materials in the library; and *(g)* inadequate science laboratory equipment. One unit on this scale represents 10 percentile points, with higher scores indicating a better quality of school infrastructure.

*School administrators' assessment of teaching staff* was derived from school principals' reports of the extent to which the learning of 15-year-olds was hindered by: *(a)* low expectations of teachers; *(b)* poor student-teacher relations; *(c)* teacher turnover; *(d)* teachers not meeting individual student needs; *(e)* teacher absenteeism; *(f)* staff resisting change; *(g)* teachers being too strict with students; and *(h)* students not being encouraged to achieve their full potential. One unit on this scale represents 10 percentile points, with higher scores indicating more positive ratings of teaching staff.

*Use of formal assessment* was derived from school principals' reports on the frequency with which standardised tests were used, and on whether or not the assessments were used to monitor the school's progress from year to year and monitor the school's progress from year to year. One unit on this scale represents 10 percentile points, with higher scores indicating greater use of formal assessments.

*Teacher morale and commitment* was derived from school principals' reports on the extent to which they agreed with these statements concerning teacher morale and commitment: *(a)* the morale of teachers in this school is high; *(b)* teachers work with enthusiasm; *(c)* teachers take pride in this school; and *(d)* teachers value academic achievement. One unit on this scale represents 10 percentile points, with higher scores indicating a higher level of teacher morale and commitment.

*Teacher autonomy* was derived from a question asked of principals as to who had the main responsibility for: *(a)* hiring teachers; *(b)* firing teachers; *(c)* establishing teachers' starting salaries; *(d)* determining teachers' salary increases; *(e)* formulating the school budget; *(f)* deciding on budget allocations within the school; *(g)* establishing student disciplinary policies; *(h)* establishing student assessment policies; *(i)* approving students for admittance to school; *(j)* choosing which textbooks are used; *(k)* determining course content; and *(l)* deciding which courses are offered. This scale indicates the extent to which teachers had responsibility for these activities. One unit on this scale represents 10 percentile points, with higher scores indicating a higher level of teacher autonomy.

*School autonomy* was derived from the same question described above. In this case, the scale indicates the extent to which principals had responsibility for the various activities. One unit on this scale represents 10 percentile points, with higher scores indicating a higher level of principal autonomy.

*Use of informal assessment* was derived from school principals' reports on the frequency with which students were assessed using teacher-developed tests, teachers' judgemental ratings, student portfolios and student assignments/projects/homework, and on how frequently assessment information was formally commu-

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nicated to parents and the school principal. One unit on this scale represents 10 percentile points, with higher scores indicating greater use of informal assessments.

*Student-teacher relations* was based on students' reports of the extent to which they agreed or disagreed with the following statements concerning student-teacher relations: *(a)* students get along well with teachers; *(b)* most teachers are interested in students' wellbeing; *(c)* most of my teachers really listen to what I have to say; *(d)* if I need extra help, I will receive it from my teachers; and *(e)* most of my teachers treat me fairly. The student scores were aggregated to the school level, and scaled such that one unit on the scale represents 10 percentile points, with higher scores indicating better student-teacher relations.

*Disciplinary climate* was based on students' reports of the extent to which they agreed or disagreed with the following statements concerning student-teacher relations: *(a)* the teacher has to wait a long time for students to quieten down; *(b)* students cannot work well; *(c)* students don't listen to what the teacher says; *(d)* students don't start working for a long time after the lesson begins; and *(e)* there is noise and disorder. The student scores were aggregated to the school level, and scaled such that one unit on the scale represents 10 percentile points, with higher scores indicating a more positive disciplinary climate.

*Achievement press* was based on students' reports of the extent to which they agreed or disagreed with the following statements concerning teachers' expectations: *(a)* the teacher wants students to work hard; *(b)* the teacher does not like it when students deliver careless work; *(c)* the teacher checks students' homework; and *(d)* students have a lot to learn. The student scores were aggregated to the school level, and scaled such that one unit on the scale represents 10 percentile points, with higher scores indicating greater press for academic achievement.

For the first variable, school size, one unit represents 100 students. Thus the odds ratio for low sense of belonging, 0.98, indicates that the odds of a student having a low sense of belonging decreases by about 2 per cent for a 100-student increase in school size. For the student-staff teaching ratio, the odds ratio indicates the ratio associated with a one-student change in the student-staff teaching ratio. For low participation, for example, a one-student increase in the student-staff teaching ratio is associated with a 3 per cent decrease in the odds of a student having low participation. For both these variables, a squared term is also included. The analysis indicated that some of these relationships were curvilinear; for example, in the case of school size for low sense of belonging, the relationship becomes weaker with increasing levels of school size.

The other variables describing school resources, policy, and practice were scaled on a 10-point scale, such that the results pertain to an increase or decrease in the odds associated with a one-point increase on the 10-point scale. They were scaled such that a school that scored 3.4 on this scale, for example, would be at the 34$^{th}$ percentile among all OECD schools participating in the survey. Similarly, a school with a score of 7.5 would be at the 75$^{th}$ percentile. This helps to assess the importance of the effects of these variables in an easily interpreted metric, which can be compared across the policy variables. For example, for low sense of belonging, the odds ratio for student-teacher relations is 0.95. This indicates that a one-point increase on the 10-point scale, which represents, for example, the difference between a school at the 50$^{th}$ percentile in student-teacher relations versus a school at the 60$^{th}$ percentile, is associated with about a 5 per cent decrease in the odds of a student having a low sense of belonging.

The models fit to the full data set could be fit separately for each country. However, the results for many countries are not very stable, as the number of schools sampled in each country is rather small for estimating models with a large number of school variables. Therefore, the strategy is to use the full international


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data set to determine the effects associated with each of the policy variables, and then examine how countries fare on the most relevant variables.

Three school-level factors emerged as having a significant impact on students' sense of belonging. Students in larger schools were less likely to have a low sense of belonging; however, the effect is small: an increase of 100 students is associated with a decrease in the odds of about 2 per cent. The model also included a term for the square of school size. Its effect was also statistically significant, and slightly above 1.0, indicating that the benefits associated with school size level off with increasing school size. However, this effect is also very small. The more important effects for low sense of belonging pertain to students' assessments of student-teacher relations and the disciplinary climate of the classroom, which respectively were associated with 5 per cent and 2 per cent decreases in the odds for each one-point increase on the 10-point scales.

Considering the models for low participation, five of the 12 school-level factors emerged as statistically significant predictors. Larger schools tend to have a slightly higher prevalence of low participation students, but the relationship is fairly weak: a 100-student increase is associated with a 2 per cent increase in the odds. A one-student increase in the student-staff teaching ratio is associated with a 3 per cent *decrease* in the odds of a low participation. This is contrary to expectations, as one would expect higher levels of participation in smaller classes. The most important effects were associated with student-teacher relations, disciplinary climate and achievement press. For these factors, a one-point increase on the 10-point scale was associated with decreases in the odds, respectively, of 4 per cent, 5 per cent and 3 per cent.

The final model, Model III, includes all of the factors discussed above. This model was estimated to discern whether some of the contextual effects associated with living in either a low or high socio-economic background were attributable to school resources, policy and practice. Recall that the odds ratios denote the ratio of the odds of an event occurring after a one-unit change in the independent variable, compared to what it was previously, *given that all other independent variables in the model are held constant.* Findings in *Knowledge and Skills for Life* (OECD, 2001, see Table 8.6) showed that certain aspects of school resources, policy and practice are correlated with school context. For example, in many countries schools with a high average socio-economic status tend to have more positive student-teacher relations and greater achievement press. Therefore, these classroom factors could be expected to explain some of the effects of school context on engagement, and vice versa. Kraemer *et al.* (2001) provide a useful discussion of mediating and overlapping factors.

In the full model for low sense of belonging, the odds ratios do not change substantially from those discussed above. The strength of the contextual effect associated with high socio-economic families is slightly stronger, and statistically significant, while the strength of the contextual effect associated with low socio-economic families is slightly weaker. The contextual effect associated with high socio-economic families is contrary to expectations. This is the estimated effect after controlling for all of the other variables in the model, which may be slightly greater than 1.0 because the percentage of students of high socio-economic status is correlated with some of the school process variables. In any event, the effect is very weak, and not important in substantive terms.

Similarly, the odds ratios for low participation differ only slightly from the estimates for Models I and II. The odds ratios for the contextual effects are slightly weaker, suggesting that some of the contextual effect is attributable to school resources, policy and practice. However, the estimated effects associated with school resources, policy and practice were virtually unchanged. Thus, contextual effects and the three school policy and practice factors – student-teacher relations, disciplinary climate and achievement press – remain the most important variables.

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Figure 4.5 shows the mean scores on the three school policy and practice variables which were found to be important predictors of disaffection from school. These measures have been scaled such that 5.0 is the average score for all OECD schools. The scores indicate how a country's schools fare in terms of the OECD distribution of scores. For example, the score of 7.0 for Japan indicates that the average school in Japan would rank at about the 70th percentile on the OECD distribution.

On the measure of disciplinary climate there are five OECD countries with relatively high average scores, that is, at or above 6.0 or the 60th percentile. These are: Austria, Japan, Mexico, Poland and Switzerland. Seven of the non-OECD countries had similarly high levels on this index: Albania, Indonesia, Latvia, Liechtenstein, FYR Macedonia, the Russian Federation and Thailand. There are five OECD countries with relatively low scores on this measure, below 4.0: Greece, Italy, the Netherlands, Norway and Sweden. Among the non-OECD countries, four had scores that were below 4.0: Argentina, Brazil, Chile and Israel.

Ten of the OECD countries had relatively high scores, above 6.0, on the measure of teacher-student relations: Australia, Canada, Denmark, New Zealand, the Netherlands, Portugal, Sweden, Switzerland, the United Kingdom and the United States. Only two non-OECD countries, Brazil and Thailand, had scores above 6.0 on this measure. Five of the OECD countries – Austria, Germany, Japan, Luxembourg and Poland – had scores below 4.0, while none of the non-OECD countries were at this level. These results indicate that there is considerable variability among countries in their levels of student-teacher relations.

The average scores for achievement press also vary substantially among countries. Eight OECD countries had scores above 6.0: Canada, Hungary, Iceland, Ireland, Italy, New Zealand, the United Kingdom and the United States. Three of the non-OECD countries met these criteria: Hong Kong-China, Latvia and the Russian Federation. In contrast, seven OECD countries scored below 4.0: Austria, Belgium, the Czech Republic, Greece, Japan, Korea, Luxembourg and the Netherlands. Five non-OECD countries – Argentina, Bulgaria, Indonesia, Israel and FYR Macedonia – scored below 4.0 on this measure.

As mentioned earlier, the strategy used in this last set of analyses was to use the full international data set for participating OECD countries and try to discern which family and school variables have the greatest impact on student engagement. Individual countries can then assess how well they are performing on the most important indicators. The limitation to this approach is that the effects associated with school factors such as disciplinary climate, student-teacher relations, or achievement press, may be strong in some countries but not in others. The school-level analyses should be conducted separately within each country, but, as mentioned earlier, the statistical power of the analyses would be weak for most participating countries. Thus, a very large sample of schools is needed to get some purchase on the potential effects of school-level variables. Although this analysis was successful in identifying some of the key aspects of schooling that affect student engagement at a very macro level, there are likely to be other schooling factors that affect engagement within particular countries.


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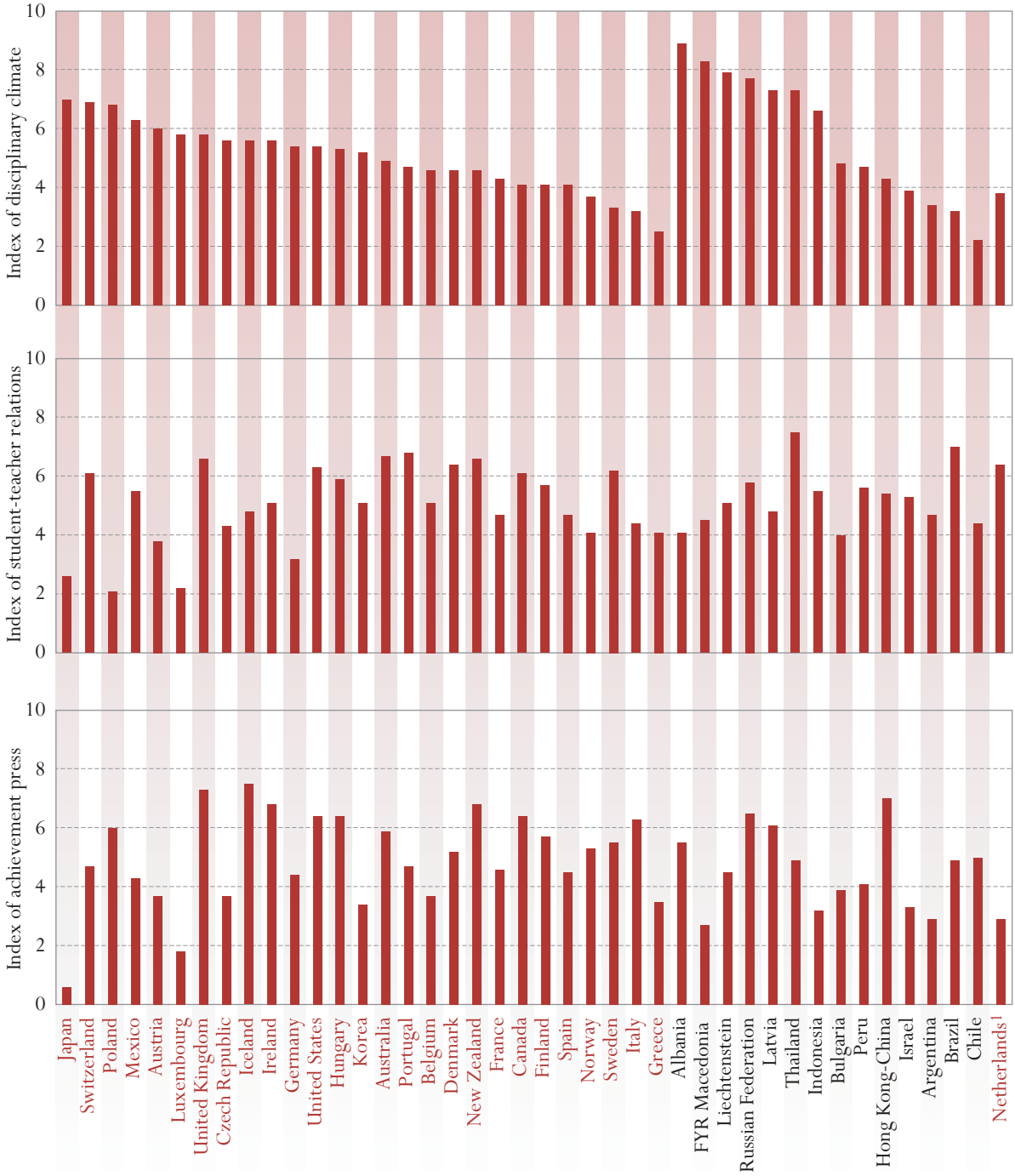
Figure 4.5

Mean indices of disciplinary climate, student-teacher relations and achievement press




1. Response rate is too low to ensure comparability.
*Source:* OECD PISA database, 2003. Table 4.3.

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## Conclusion

This chapter examined the relationships between student engagement and family and school factors. Several of the findings are particularly relevant to educators and school administrators:

*(a)* **On average, females were equally as likely as males to have a low sense of belonging, but were about 7 per cent less likely to exhibit low participation. However, gender differences for both aspects of engagement varied considerably among countries.** The measure of students' sense of belonging included questions about whether students feel accepted at school, make friends easily or feel like an outsider. It might be expected that females would be as likely as males to experience such feelings, which may be affected more by the nature of the peer group in a school than by family or school processes.

*(b)* **Students born outside the country are more likely than other youths to have a low sense of belonging.** This finding points to the importance of classroom and school policies and practices that teachers and principals can implement to promote social inclusion (Cuban, 1989; Reichl, 2000). The findings also indicate that students are more likely to be disaffected from school if they are in low socio-economic schools. The results did not suggest that this contextual effect differed for foreign-born students than for those born in the country. Taken together, therefore, these findings suggest that it is important to ensure that foreign-born youths are not disproportionately represented in low socio-economic status schools.

*(c)* **Students from low socio-economic families are more likely to be disaffected from school, as are students who attend schools that have a high percentage of students of low socio-economic status. As these risk factors compound, students from low socio-economic status families are even more likely to be disaffected from school.** This phenomenon of *double jeopardy* (Willms, 2002*b*) is also evident in analyses of student achievement: low socio-economic status students who also attend schools that predominantly serve low socio-economic status students are especially at risk of poor school performance because they have two factors working against them.

Students are more likely to be engaged at school if they attend schools that have a high average socio-economic status, a strong disciplinary climate, good student-teacher relations and high expectations for student success. This study found that measures of engagement were correlated with these school factors. The discussion at the beginning of this report emphasised that student engagement begins early in a child's life. However, the data describing school resources and school policy and practice in this study reflect students' and administrators' most recent experiences. Therefore, it is likely that the observed effects on engagement would be even stronger if students could be tracked over several years, with measures of engagement alongside comparably strong measures of school and classroom processes. Also, a point that should not be overlooked is that the most important factors affecting engagement are not necessarily the most expensive. For example, the results suggest that engagement is related to factors associated with classroom practice, yet unrelated to the quality of the school infrastructure.


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## Notes

1. Students were considered *foreign-born* if they were not born in the country where they were tested. This measure does not take into account how long they may have been in the country, or the ethnic origin of their parents.
2. Families were considered to be *single-parent* families if they were headed by any *one* of: the mother, the father, a female guardian, or a male guardian.

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*Chapter*

**5**

# INTERNATIONAL FINDINGS ABOUT STUDENT ENGAGEMENT AND THEIR IMPLICATIONS FOR PUBLIC POLICY

## Introduction

One of the primary aims of the OECD PISA is to provide a richer understanding of how well youths are prepared to meet the challenges they will encounter after finishing secondary school. PISA not only measures the broad set of knowledge and skills that young people will need as they enter the knowledge society, it also assesses how well students can apply these skills in real-life situations. This report examines student engagement at school, which is viewed theoretically as a "*disposition* towards learning, working with others and functioning in a social institution". PISA offers an opportunity to study student engagement because it has collected reliable and valid data on students' literacy skills at age 15 alongside detailed information on students' attitudes and values, their family background and the social and organisational structures of the schools they attend. Moreover, the sheer magnitude of PISA, with data for 224,058 students in 8,364 schools, across 42 countries, provides a means for estimating relationships between engagement and family and school factors that can be generalised to the population of 15-year-old students in each country and compared cross-nationally.

Student engagement refers to whether students feel they belong at school, accept the broader societal values associated with schooling and participate in school activities. PISA includes two measures of engagement. One pertains to students' sense of belonging – whether students feel accepted at school, as opposed to feeling lonely or rejected. The other pertains to student attendance, which in most studies of engagement is considered the primary indicator of participation. These two measures were standardised to have a mean of 500 and a standard deviation of 100, similar to the measures of reading, mathematics and science performance. In addition, two benchmarks were constructed that specified whether or not students had particularly low scores on the sense of belonging or participation scales.

Although PISA is in many respects effective in studying student engagement, it also has some limitations. The chief limitation is that the data are cross-sectional; that is, collected from the respondents on only one occasion. Students' level of engagement undoubtedly varies with age. An important question is whether there are critical periods when students develop an attachment to school, or whether it is a disposition that is cultivated continuously by families, peer groups and schools. A fuller understanding of engagement could be achieved by a study that followed students from an early age. Longitudinal data would also provide a better purchase on how aspects of school environments affect student engagement and whether there is a causal link between the acquisition of literacy skills and engagement.

In Chapter 2, some of the issues concerning the measurement of students' sense of belonging and participation were discussed. Because PISA is a multi-purpose study, aimed at meeting the policy-driven interests of many countries, it is not possible to measure all constructs in detail. Also, these constructs have a cultural component and a local context that cannot be fully captured in a large international study. Further research within countries could examine the nature of student engagement in schools and the role that parents and educators could play in bringing about greater participation and a stronger sense of belonging. Smaller, more focused studies of student engagement could include questions that assessed the extent to which students value school success and view it as important to their future.

The data collected in PISA furnish reliable estimates of the average levels of sense of belonging and participation at country level. They also provide reliable estimates, across and within countries, of the relationships between the engagement measures and a broad set of factors describing family background. The data are also sufficient for estimating the overall relationships between engagement and school factors for all countries. However, the number of schools sampled in most countries is not sufficient to make strong


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claims about the relationships between measures of engagement and school-level factors at the country level. Because of this limitation, country-by-country estimates of the potential impact of school-level factors can only be considered indicative. More accurate estimates could be garnered by taking larger samples of schools, while maintaining within-school sample sizes, but this is costly. When data become available for future cycles of PISA, it may be possible to combine the data across several cycles to achieve more accurate estimates of the relationship between engagement and school-level factors. Future analyses can also examine whether changes in countries' school policies and practices are related to changes in levels of student engagement.

### Key findings

**An important finding of this study is that students' reports of their sense of belonging and absenteeism indicate that there is a high prevalence of students who are disaffected from school.** Among OECD countries, about 25 per cent of all students were considered to have a low sense of belonging, and about 20 per cent were regularly absent from school. The prevalence of both low sense of belonging and low participation was even higher among non-OECD countries. Moreover, the prevalence of low sense of belonging was high in all countries, ranging from 17 per cent to 41 per cent among OECD countries, and from 17 to 40 per cent among non-OECD countries. The prevalence of low participation varied more among countries, ranging from 4 to 34 per cent among OECD countries, and from 3 to 45 per cent among non-OECD countries.

**However, the emphasis of this study on student disaffection diverts attention from the fact that most students are not disaffected from school. Indeed, about 75 per cent of all students have a moderate or strong sense of belonging at school and 80 per cent attend classes regularly; they are not consistently absent.** Moreover, the findings suggest that there are a number of students who are engaged in school, even though they are from low socio-economic families or have relatively weak literacy skills. Thus, these students are *resilient* in that they maintain a positive stance towards schooling despite the personal challenges they face.

Any claims about the prevalence of youths who are disaffected depend on how the construct is defined and measured and on where the critical *cut-point* is set for determining who is at risk and who is not (Willms, 2002*a*). It could be argued that the definitions used in this report lead to rather liberal estimates of the prevalence of disaffected youths. However, they may also be too conservative. On affective measures such as sense of belonging, students tend to report a rather positive view. Those who indicated that they agreed, either moderately or strongly, with statements asserting they felt "lonely" or "like an outsider" may be even more disaffected from school than their responses indicate. Similarly, the cut-point for the measure of absenteeism is set at a rather conservative level; students were not considered to have a low level of participation unless they had missed a considerable amount of school in the previous two weeks. Unfortunately, there is no universal definition of truancy and therefore international comparative data on truancy rates are not available. When tracking truancy within a country, it would be helpful to document how many students are truant on particular days during the school year and how many youths have episodes of prolonged truancy.

There are seven other robust findings concerning student engagement that have important implications for social policy. They are robust in that they are statistically significant, large in substantive terms and consistent across the majority of countries that participated in the study. Some of these findings challenge conventional wisdom about student engagement.

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*(a)* **The prevalence of disaffected students varies significantly among schools.** In nearly every country, there is a wide range among schools in the prevalence of students considered to have a low sense of belonging and low participation. This variation is only partially attributable to the family background of students attending each school. This suggests that there are aspects of school policy and practice that contribute to the success of schools in reducing student disaffection.

*(b)* **At school level, the correlation between sense of belonging and participation is about 0.37 and both measures of student engagement are moderately correlated (on average, about 0.50) with student performance in reading, mathematics and science.** These results provide evidence that achieving strong student engagement does not have to be at the expense of the development of literacy skills. In fact, schools that have strong student engagement tend to have strong literacy performance.

*(c)* **Students' sense of belonging and participation are not strongly related to each other at the individual level and both of these dimensions of student engagement are only weakly related with literacy performance.** Many studies treat student engagement as a unidimensional construct and assume that the process of disengaging from school results in poor academic performance. Others maintain that those who cannot succeed academically are prone to disengagement because schooling offers no intrinsic or extrinsic rewards. The results of this study suggest that there may be other processes, both in and out of school, that lead to student disaffection.

*(d)* **On average, across all OECD countries, only about one-quarter (26%) of all students have high levels of engagement and strong literacy skills.** Another group, also comprising about one-quarter of all students (27%), are highly engaged at school and have average levels of literacy skills. The remaining students can be classified in three groups: one that has a low sense of belonging, but has fairly high literacy performance (about 20% of all students), another that is regularly absent from school and has moderately low levels of literacy performance (about 10% of all students) and a third group that has very low literacy performance, but average levels of engagement (about 17% of all students). These results challenge the popular notion that student disaffection and poor literacy performance go hand-in-hand. Instead, it suggests that there are many disaffected students who have fairly high levels of literacy skills and vice versa. The five-cluster pattern provided a practical classification in 25 of the 42 countries in this study. A three- or four-cluster categorisation provided a better description of students in other countries; in these countries also there was no group that had low scores on the engagement measures and the measures of academic achievement.

*(e)* **There are three dominant risk factors for student disaffection: living in a family of low socio-economic status (i.e., in the lowest national quartile for the country), living in a single-parent family and being foreign-born.** Living in a high socio-economic status family (*i.e.,* the top national quartile) was a relatively weak protective factor for low sense of belonging, but was not significantly associated with low participation. Females were equally as likely as males to have a low sense of belonging, but were less likely to be regularly absent from school.

*(f)* **Students who attend schools where there is a concentration of students from low socio-economic families are more likely to be disaffected from school.** The findings suggest that some, but not all, of the negative contextual effect is attributable to factors such as the disciplinary climate of the school and student-teacher relations. Some of the *contextual effect* may also be attributable


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to *peer effects* – it might be expected, for example, that students would be more prone to disaffection if their friends were also disengaged.

*(g)* **Schools have higher levels of student engagement when there is a strong disciplinary climate, good student-teacher relations and high expectations for student success.** Levels of school resources do not appear to play a strong role in affecting student engagement. The effects associated with school size were inconsistent and relatively weak. Students were less prone to low participation in schools with smaller student-staff teaching ratios, but this factor was unrelated to students' sense of belonging. Rather, student engagement has more to do with the culture of the school and teachers and principals can play a strong role is creating a positive culture.

### Implications for public policy

The *social policy* of a country, a schooling system, or a community, is concerned mainly with achieving particular outcomes for its citizens, especially for those who are vulnerable. From this perspective, the findings of this study raise three important questions:

- Does engagement matter?;
- Can schools effect meaningful change? and if so;
- What policies and practices lead to higher levels of student engagement?

These questions are discussed in the light of the findings of this research.

**Does engagement matter?** It may be that student disengagement follows a similar course as anti-social behaviour, with an *early onset* group setting the base-level prevalence during the elementary school years and a large *late onset* group causing a dramatic increase in the prevalence during the secondary school years (Moffit, 1993). Deviant behaviour and attitudes tend to increase sharply during early adolescence, peak at about age 16 or 17 and then decrease slowly (Raudenbush and Chan, 1993; Tonry *et al.*, 1991). Researchers have found a similar pattern for criminal behaviour across many societies, leading Gottfredson and Hirschi (1990) to refer to the pattern as one of the *brute facts* of criminology. Thus, when assessing student engagement at age 15 in PISA, the peak of the curve may be approached when students are least engaged in school. It might be argued, therefore, that feeling disaffected from school or withdrawing from school life are a normal part of adolescent development and that most youths will re-engage in a significant way after the period of compulsory schooling.

One counter-argument is that student disaffection is a precursor to other activities that render youths vulnerable to more serious problems. Other studies have documented a link between disaffection and substance abuse (Huizinga *et al.*, 1995), delinquency (Bell *et al.*, 1994) and dropping out of school (Dryfoos, 1990). Disaffection from school is therefore associated with engaging in activities that can have long-term harmful consequences. If family and school interventions can dampen the rise of disaffection during adolescence, it is likely to reduce the prevalence of more serious problems. The findings of this study indicate that the prevalence of disaffection varies among countries and among schools within countries, which suggests that high levels of disaffection do not have to be the norm.

Another important counter-argument is that the last two or three years of secondary school are a critical transition period for most youths. Their success at school during this period strongly influences their

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access to post-secondary education and for those who do not plan to pursue further schooling, it affects their entry to the labour market. This study suggests that in most countries there is a significant cluster of students who are disaffected from school, or have low levels of participation, even though they have relatively strong literacy skills. It cannot be discerned from these data whether these students are less likely to pursue post-secondary schooling, but it is reasonable to infer that students' attitudes to school during this critical period affect their decisions. For those who enter the labour market, engagement is also a critical outcome. Many employers are less concerned with their workers' academic credentials than they are with whether they can work well with others, contribute new ideas and align themselves with the goals of the organisation (Conference Board of Canada, 1999; OECD, 2001*b*). It might be expected that students who are aligned with the goals of schooling will subsequently be engaged in their work environments, leading to success in the labour market. In the case of extreme levels of student disaffection from school, several studies have suggested that disaffection and truancy in particular are associated with marital problems, violence, adult criminality and incarceration (Baker *et al.*, 2001).

Finally, student engagement is associated with several positive social outcomes. Research from a number of fields has provided compelling evidence that feeling included and being engaged in social pursuits are essential to people's health and wellbeing (Keating and Hertzman, 1999; Putnam, 2000). Increasing student engagement will thus contribute to the quality of life of youths, which is important in its own right, without consideration of its effect on their development of literacy skills or long-term health and economic wellbeing.

**Can schools effect meaningful change?** The findings of this study offer compelling evidence that many schools *do* have high levels of engagement and that this is not achieved at the expense of developing literacy skills. On average, schools with high levels of engagement tended to have high levels of literacy skills.

The results also suggest that the prevalence of disaffected students varies considerably among schools within each country. In some countries, the prevalence of disaffection is relatively low and may not be a national priority. However, in these countries disaffection from school may be a concern in particular schools or particular regions of the country. This finding calls for more detailed studies of engagement and disaffection within countries. In many countries, it would be relatively inexpensive to include measures of student engagement in their national monitoring programmes. This would enable policy analysts to conduct detailed within-country analyses.

The findings also suggest that creating smaller schools, or reducing class sizes, is not necessarily the best solution. Rather, the findings indicate that certain school processes – the disciplinary climate of the school, student-teacher relations and achievement press – play a bigger role in affecting student engagement.

**What policies and practices lead to higher levels of student engagement?** Reforms aimed at helping particular students who are disaffected from school usually require some mechanism for identifying youths who could benefit from particular types of programmes or services. However, targeting programmes and services to those who need them the most is a difficult issue (Offord *et al.*, 1999). One of the most surprising findings of this research is that in every country there is a sizeable proportion of students who have high levels of literacy skills yet lack a sense of belonging at school or have low levels of participation. Educators cannot thus presume that youths with average or above-average literacy skills necessarily feel they belong at school, or value schooling outcomes. It seems that many students lack a sense of belonging but suffer in silence, while others display their disaffection by withdrawing from school activities or


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skipping classes. The results indicate that in many countries students who are foreign-born and those from single-parent families and low socio-economic families are more prone to being disaffected from school. These relationships are sufficiently strong to call for educators to be sensitive to these issues, but are not strong enough to warrant targeting programmes to groups on this basis.

Taken together, these findings suggest that targeting programmes to particular students is likely to be difficult in most schools. Schools may require two or three different kinds of programme to meet the needs of disaffected students and these need to be designed with considerable attention to access and selection. For example, some students may be disengaged from school because they lack knowledge about post-secondary education or do not have a good understanding of the links between particular school programmes and employment opportunities. Others may lack a sense of belonging mainly because of their perceived ability to make friends and be accepted among their peers. Some students may withdraw from school activities because they seldom or never experience the intrinsic rewards of schooling that are felt by those who experience success in academic pursuits.

Many educators would argue that addressing the problem of student disaffection requires whole-school reform. They argue that schools need to be *restructured* to create smaller learning communities, emphasise a core academic programme, eliminate tracking or streaming, achieve greater parental involvement, give teachers and students greater autonomy and evaluate students and schools in more authentic ways (Crevola and Hill, 1998; Fullan, 2001; Lee and Smith, 1993). Other reformers argue that increasing student engagement requires curricular reform. For example, Wehlage *et al.* (1989) contend that "the dominant learning process pursued in schools is too narrow in that it is highly abstract, verbal, sedentary, individualistic, competitive and controlled by others as opposed to concrete, problem-oriented, active, kinaesthetic, cooperative and autonomous". They also maintain that educators are overly obsessed with covering the subject matter, as opposed to pursuing a small number of topics in depth and focusing on acquiring greater competency in the use of skills and knowledge.

PISA does not include information that is detailed enough to assess the likely effects of efforts to restructure schools. However, this research does provide some guidance as to what elements are key to improving student engagement. The results indicate that students are more engaged in schools where there is a strong disciplinary climate, positive student-teacher relations, and high expectations for student success. The results also show that students who attend schools where there is a concentration of students from low socio-economic families are more likely to be disaffected from school. Efforts to reduce streaming or tracking and promote social inclusion are thus likely to increase levels of student engagement.

**Concluding remarks.** Accommodating diversity is a central challenge for educators and policy-makers. This report suggests that in every country there is a substantial number of youths who are disengaged from school at the critical period when they are completing their final years of compulsory schooling. Meeting the needs of these students is critical if they are to use the knowledge and skills they have acquired to participate as active citizens in mainstream society. PISA can provide only a broad understanding of the nature of student engagement, how it varies among countries and schools and how it is related to family and school factors. The findings in this study point to the need for more detailed, focussed research within countries aimed at understanding these relationships, assessing current policy and practice and evaluating interventions. This study also found that within every country there are many students who are engaged in schooling and many schools that are highly effective. Their success gives a reason to be optimistic and provides an image of what is possible.

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*Annex*

**A**

# PISA MEASURES OF STUDENT ENGAGEMENT

### PISA measure of student engagement

PISA 2000 student questionnaire includes items to measure two components of student engagement at school – sense of belonging and participation. Student sense of belonging is measured using the question:

School is a place where:

*a* I feel like an outsider (or left out of things)

*b* I make friends easily

*c* I feel like I belong

*d* I feel awkward and out of place

*e* Other students seem to like me

*f* I feel lonely

*g* I do not want to go to school

*h* I often feel bored.

Students were asked to indicate how they felt about each item using a four-point scale: "strongly disagree", "disagree", "agree" and "strongly agree". The positive items (b, c and e) were simply scored 1, 2, 3 and 4, and the negative items (a, d, f, g and h) were reverse-scored 4, 3, 2 and 1, thereby yielding items with high scores indicating more positive attitudes.

A factor analysis of the responses to this question revealed that the responses comprise two factors, one that is based primarily on the first six items and describes whether students feel accepted and included by their classmates, and another that is based primarily on the last two items and describes whether students like school and find it interesting. The analysis also revealed that the six belonging items contributed almost equally to the first factor.[1] Therefore, the measure of sense of belonging used in this report is based on a Rasch scaling of the first six items, and standardised to have a mean of 500 and a standard deviation of 100 across all participating OECD countries, similar to the measures of reading, mathematics and science performance used in PISA. Data from items g and h were not used in the analysis. Although these two items are arguably related to the construct, sense of belonging, they did not correlate strongly with the other items comprising the overall scale. It appears there is a separate aspect of engagement related to youth being bored with school, but these two items were not sufficient to construct a separate scale.

The measure of student participation was based on a question that asked students how frequently they had been absent from school:

How many times in the previous two weeks did you …

- miss school?
- skip classes?
- arrive late for school?

The possible responses were on a four-point scale, "none", "1 or 2", "3 or 4" and "5 or more".



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Deriving a scale based on this item was difficult, because a high response on one item can lead to a low response on another. For example, a student who misses school a number of times is less likely to skip classes or be late for school. Similarly, some students who arrive late for school may decide to skip the first class altogether, rather than arriving late for class.

Also, in terms of the amount of instruction a student misses, the three aspects of low participation do not deserve an equal weighting. Therefore, the participation scale for this report assigned scores as follows: for missing school, the four responses ("none", "1 or 2", "3 or 4" and "5 or more") were coded 6, 4, 2, and 0; for skipping classes they were coded 4.5, 3.0, 1.5, and 0; and for arriving late to school they were coded 3, 2, 1 and 0. The participation scale was then the sum of the three item scores, which was also scaled to have a mean of 500 and a standard deviation of 100 for all participating OECD countries.

The reliability of a measure refers to the consistency of measurement for repeated measurements of the same phenomenon. Often researchers are interested in how well a test instrument can differentiate among individuals in a group in their *true* scores for some abstract construct, based on a set of observed scores. But observed scores include measurement error – a portion of the score that is not directly related to the construct being assessed (Ward *et al.*, 1996). The estimate of reliability depends on the magnitude of measurement error relative to the variation in true scores among the group being assessed. Reliability coefficients range from 0.0 to 1.0, and when they are high (approaching 1.0) it suggests that individuals in a group can consistently be differentiated.

Reliability of measurement can also pertain to how well differentiations among observations describing groups, such as the mean score in reading performance in a school, or the prevalence of disaffected youth in a country, can be made. In such cases, researchers are concerned with whether the measurement process can consistently differentiate among groups in their observed scores. In this study, most of the analyses are concerned with the reliability of estimates of sense of belonging and participation at the school level, or at the country level. In these cases, reliability depends not only on the magnitude of the measurement error at the individual level, but also on how accurately school or country means (or other statistics such as regression coefficients) are estimated. The size of the within-school samples affects reliability, as does the amount of variation among groups in the statistic being assessed (Rowan *et al.*, 1991).

The measures of sense of belonging and participation are highly reliable at the country level: the reliability coefficients are 0.99 for both sense of belonging and participation. Thus, the measurement process helps to differentiate among countries in their mean scores with a high degree of consistency. The measures are less reliable at the school level – 0.38 for sense of belonging, and 0.60 for participation – for the full set of OECD schools. This varies somewhat among countries, ranging from 0.10 to 0.76 for sense of belonging, and from 0.38 to 0.87 for participation. The estimates for each country are shown in Annex Table A.1. These lower estimates suggest that schools cannot be distinguished as reliably as countries. In most countries, PISA data do not furnish estimates that are accurate enough to report findings for a particular school. The relatively lower estimates of reliability also mean that the analyses that attempt to estimate the relationships of these variables with measures of schooling processes will lack statistical power. Thus, the analyses in the last section, which estimate the effects associated with a range of school-level variables, are limited to the full sample of OECD students and schools.

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Table A.1
**Reliability of the sense of belonging and participation indices**

| | | Sense of belonging | Participation |
|---|---|---|---|
| OECD COUNTRIES | Australia | 0.36 | 0.45 |
| | Austria | 0.28 | 0.66 |
| | Belgium | 0.49 | 0.82 |
| | Canada | 0.31 | 0.47 |
| | Czech Republic | 0.45 | 0.62 |
| | Denmark | 0.34 | 0.58 |
| | Finland | 0.21 | 0.61 |
| | France | 0.30 | 0.70 |
| | Germany | 0.28 | 0.63 |
| | Greece | 0.43 | 0.64 |
| | Hungary | 0.55 | 0.71 |
| | Iceland | 0.10 | 0.49 |
| | Ireland | 0.31 | 0.53 |
| | Italy | 0.39 | 0.81 |
| | Japan | 0.58 | 0.87 |
| | Korea | 0.55 | 0.62 |
| | Luxembourg | 0.76 | 0.78 |
| | Mexico | 0.59 | 0.56 |
| | New Zealand | 0.22 | 0.51 |
| | Norway | 0.41 | 0.46 |
| | Poland | 0.52 | 0.71 |
| | Portugal | 0.53 | 0.49 |
| | Spain | 0.47 | 0.72 |
| | Sweden | 0.26 | 0.41 |
| | Switzerland | 0.45 | 0.62 |
| | United Kingdom | 0.27 | 0.38 |
| | United States | 0.46 | 0.70 |
| NON-OECD COUNTRIES | Albania | 0.49 | 0.68 |
| | Argentina | 0.62 | 0.72 |
| | Brazil | 0.34 | 0.43 |
| | Bulgaria | 0.54 | 0.67 |
| | Chile | 0.58 | 0.73 |
| | Hong Kong-China | 0.36 | 0.64 |
| | Indonesia | 0.42 | 0.47 |
| | Israel | 0.48 | 0.56 |
| | Latvia | 0.52 | 0.6 |
| | Liechtenstein | 0.46 | 0.08 |
| | FYR Macedonia | 0.66 | 0.61 |
| | Peru | 0.65 | 0.61 |
| | Russian Federation | 0.45 | 0.59 |
| | Thailand | 0.53 | 0.63 |
| | Netherlands[1] | 0.57 | 0.54 |

1. Response rate is too low to ensure comparability

## Notes

1. Principal components factor analysis with varimax rotation was used for the weighted sample of all students in participating OECD countries, except The Netherlands. As in the first international report, The Netherlands was excluded because its response rate to the survey did not meet the standards set for PISA. The factor weights for the first principal component of the rotated matrix were: 0.579, 0.777, 0.629, 0.529, 0.730, 0.595, 0.096, and 0.011. The weights for the second factor were: 0.378, -0.017, 0.248, 0.494, -0.115, 0.425, 0.803, and 0.791.



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*Annex*

**B**

# DATA TABLES

Table 2.1
**Country mean and standard deviation for the index of sense of belonging**

| | | Mean index | Standard error | Standard deviation |
|---|---|---|---|---|
| OECD COUNTRIES | Australia | 495 | (2.0) | 97 |
| | Austria | 526 | (2.3) | 109 |
| | Belgium | 479 | (1.3) | 90 |
| | Canada | 512 | (1.1) | 110 |
| | Czech Republic | 471 | (1.6) | 78 |
| | Denmark | 513 | (2.2) | 104 |
| | Finland | 502 | (1.4) | 96 |
| | France | 486 | (1.6) | 94 |
| | Germany | 518 | (1.8) | 107 |
| | Greece | 498 | (2.0) | 95 |
| | Hungary | 514 | (1.6) | 97 |
| | Iceland | 514 | (1.8) | 109 |
| | Ireland | 508 | (1.7) | 101 |
| | Italy | 500 | (1.6) | 92 |
| | Japan | 465 | (1.9) | 89 |
| | Korea | 461 | (1.6) | 81 |
| | Luxembourg | 505 | (1.8) | 110 |
| | Mexico | 509 | (2.2) | 98 |
| | New Zealand | 498 | (1.9) | 98 |
| | Norway | 512 | (2.2) | 104 |
| | Poland | 461 | (1.9) | 85 |
| | Portugal | 501 | (1.9) | 88 |
| | Spain | 499 | (1.6) | 91 |
| | Sweden | 527 | (1.8) | 103 |
| | Switzerland | 520 | (2.0) | 105 |
| | United Kingdom | 513 | (1.4) | 101 |
| | United States | 494 | (3.1) | 111 |
| | *OECD average* | *500* | *(0.4)* | *100* |
| NON-OECDCOUNTRIES | Albania | 459 | (1.6) | 80 |
| | Argentina | 518 | (3.7) | 107 |
| | Brazil | 522 | (2.4) | 102 |
| | Bulgaria | 481 | (1.9) | 85 |
| | Chile | 519 | (2.3) | 110 |
| | Hong Kong-China | 458 | (1.3) | 73 |
| | Indonesia | 479 | (1.7) | 72 |
| | Israel | 544 | (2.9) | 115 |
| | Latvia | 464 | (2.1) | 79 |
| | Liechtenstein | 521 | (5.5) | 113 |
| | FYR Macedonia | 513 | (1.7) | 98 |
| | Peru | 480 | (2.5) | 99 |
| | Russian Federation | 475 | (1.6) | 85 |
| | Thailand | 469 | (1.5) | 77 |
| | Netherlands[1] | 499 | (2.8) | 84 |

1. Response rate is too low to ensure comparability.

Table 2.2
**Country mean and standard deviation for the index of participation**

| | | Mean index | Standard error | Standard deviation |
|---|---|---|---|---|
| OECD COUNTRIES | Australia | 502 | (2.1) | 89 |
| | Austria | 513 | (2.2) | 85 |
| | Belgium | 518 | (1.7) | 94 |
| | Canada | 481 | (1.1) | 104 |
| | Czech Republic | 493 | (2.2) | 99 |
| | Denmark | 461 | (2.4) | 124 |
| | Finland | 488 | (2.1) | 103 |
| | France | 512 | (2.1) | 93 |
| | Germany | 523 | (1.9) | 85 |
| | Greece | 475 | (2.7) | 112 |
| | Hungary | 509 | (1.9) | 96 |
| | Iceland | 484 | (1.8) | 110 |
| | Ireland | 503 | (2.1) | 89 |
| | Italy | 484 | (2.6) | 98 |
| | Japan | 555 | (1.9) | 57 |
| | Korea | 546 | (1.5) | 71 |
| | Luxembourg | 515 | (1.4) | 96 |
| | Mexico | 498 | (2.1) | 89 |
| | New Zealand | 479 | (2.1) | 110 |
| | Norway | 503 | (2.0) | 102 |
| | Poland | 477 | (3.7) | 119 |
| | Portugal | 504 | (1.8) | 91 |
| | Spain | 472 | (2.5) | 118 |
| | Sweden | 489 | (1.5) | 99 |
| | Switzerland | 515 | (1.9) | 90 |
| | United Kingdom | 509 | (1.5) | 86 |
| | United States | 494 | (3.9) | 100 |
| | *OECD average* | *500* | *(0.4)* | *100* |
| NON-OECD COUNTRIES | Albania | 515 | (2.1) | 89 |
| | Argentina | 471 | (6.2) | 124 |
| | Brazil | 466 | (2.9) | 109 |
| | Bulgaria | 441 | (3.4) | 133 |
| | Chile | 474 | (2.9) | 111 |
| | Hong Kong-China | 557 | (1.2) | 51 |
| | Indonesia | 522 | (1.7) | 79 |
| | Israel | 428 | (5.3) | 129 |
| | Latvia | 483 | (2.7) | 103 |
| | Liechtenstein | 537 | (4.1) | 79 |
| | FYR Macedonia | 499 | (1.6) | 109 |
| | Peru | 473 | (2.5) | 113 |
| | Russian Federation | 480 | (2.5) | 114 |
| | Thailand | 489 | (2.1) | 97 |
| | Netherlands[1] | 499 | (2.8) | 92 |

1. Response rate is too low to ensure comparability.



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Table 2.3
**Percentages of students who have a low sense of belonging and low participation**

| | Low sense of belonging | | Low participation | |
|---|---|---|---|---|
| | % | Standard error | % | Standard error |
| Australia | 20.7 | (0.8) | 18.3 | (0.8) |
| Austria | 20.3 | (0.7) | 15.3 | (0.8) |
| Belgium | 31.6 | (0.6) | 14.1 | (0.6) |
| Canada | 20.5 | (0.4) | 26.0 | (0.5) |
| Czech Republic | 29.8 | (0.7) | 20.7 | (0.8) |
| Denmark | 20.9 | (0.7) | 32.9 | (0.9) |
| Finland | 21.3 | (0.7) | 22.9 | (0.9) |
| France | 30.2 | (0.7) | 15.3 | (0.7) |
| Germany | 22.6 | (0.6) | 12.9 | (0.7) |
| Greece | 22.7 | (0.9) | 28.8 | (1.0) |
| Hungary | 18.8 | (0.6) | 17.7 | (0.7) |
| Iceland | 22.4 | (0.7) | 26.0 | (0.8) |
| Ireland | 19.4 | (0.7) | 17.8 | (0.7) |
| Italy | 22.9 | (0.8) | 21.7 | (0.9) |
| Japan | 37.6 | (1.0) | 4.2 | (0.6) |
| Korea | 41.4 | (1.1) | 8.4 | (0.6) |
| Luxembourg | 28.3 | (0.8) | 13.4 | (0.5) |
| Mexico | 22.0 | (0.9) | 21.4 | (0.8) |
| New Zealand | 21.1 | (0.8) | 26.9 | (0.9) |
| Norway | 21.1 | (0.8) | 17.9 | (0.8) |
| Poland | 41.2 | (1.2) | 29.2 | (1.3) |
| Portugal | 20.7 | (0.9) | 20.1 | (0.7) |
| Spain | 24.0 | (0.7) | 34.0 | (1.0) |
| Sweden | 17.7 | (0.5) | 23.8 | (0.6) |
| Switzerland | 20.8 | (0.7) | 15.7 | (0.7) |
| United Kingdom | 17.4 | (0.6) | 15.0 | (0.6) |
| United States | 25.0 | (1.0) | 20.2 | (1.1) |
| *OECD average* | *24.5* | *(0.15)* | *20.0* | *(0.15)* |
| Albania | 39.7 | (0.9) | 15.0 | (0.8) |
| Argentina | 21.9 | (1.7) | 28.4 | (2.6) |
| Brazil | 17.1 | (0.7) | 31.8 | (1.2) |
| Bulgaria | 29.0 | (1.2) | 40.5 | (1.1) |
| Chile | 23.6 | (0.9) | 28.4 | (1.2) |
| Hong Kong-China | 33.4 | (0.8) | 3.3 | (0.3) |
| Indonesia | 23.8 | (1.1) | 14.5 | (0.6) |
| Israel | 18.5 | (0.9) | 45.4 | (1.9) |
| Latvia | 36.0 | (1.1) | 28.0 | (1.3) |
| Liechtenstein | 23.9 | (2.1) | 9.1 | (1.7) |
| FYR Macedonia | 22.9 | (0.7) | 21.2 | (0.6) |
| Peru | 36.9 | (1.2) | 31.2 | (1.0) |
| Russian Federation | 33.4 | (1.0) | 30.0 | (0.9) |
| Thailand | 32.7 | (0.9) | 25.4 | (0.9) |
| Netherlands[1] | 20.1 | (1.2) | 20.0 | (1.2) |

1. Response rate is too low to ensure comparability.

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Table 3.1
**Student-level correlations among five outcome measures**

| | | Sense of belonging - Participation | Sense of belonging - Reading literacy | Sense of belonging - Mathematical literacy | Sense of belonging - Scientific literacy | Participation - Reading literacy | Participation - Mathematical literacy | Participation - Scientific literacy | Reading literacy - Mathematical literacy | Reading literacy - Scientific literacy | Mathematical literacy - Scientific literacy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OECD COUNTRIES | Australia | 0.03 | 0.02 | 0.01 | 0.02 | 0.12 | 0.16 | 0.12 | 0.79 | 0.88 | 0.79 |
| | Austria | 0.04 | 0.07 | 0.08 | 0.05 | 0.09 | 0.08 | 0.10 | 0.67 | 0.80 | 0.62 |
| | Belgium | 0.07 | 0.05 | 0.02 | 0.02 | 0.16 | 0.18 | 0.16 | 0.71 | 0.75 | 0.69 |
| | Canada | 0.02 | 0.04 | 0.02 | 0.01 | 0.20 | 0.18 | 0.19 | 0.77 | 0.86 | 0.74 |
| | Czech Republic | 0.07 | 0.11 | 0.11 | 0.08 | 0.18 | 0.18 | 0.15 | 0.67 | 0.77 | 0.67 |
| | Denmark | 0.09 | 0.04 | 0.06 | 0.01 | 0.16 | 0.20 | 0.16 | 0.81 | 0.85 | 0.72 |
| | Finland | 0.00 | -0.04 | -0.03 | -0.03 | 0.18 | 0.18 | 0.18 | 0.70 | 0.81 | 0.71 |
| | France | 0.06 | 0.03 | 0.05 | 0.01 | 0.18 | 0.13 | 0.18 | 0.57 | 0.69 | 0.61 |
| | Germany | 0.03 | 0.00 | -0.03 | 0.01 | 0.10 | 0.10 | 0.10 | 0.65 | 0.77 | 0.64 |
| | Greece | 0.09 | 0.09 | 0.03 | 0.10 | 0.13 | 0.11 | 0.12 | 0.57 | 0.65 | 0.65 |
| | Hungary | 0.03 | 0.09 | 0.03 | 0.03 | 0.06 | 0.06 | 0.04 | 0.63 | 0.68 | 0.44 |
| | Iceland | 0.04 | 0.02 | 0.01 | -0.01 | 0.24 | 0.22 | 0.22 | 0.77 | 0.80 | 0.68 |
| | Ireland | 0.05 | 0.00 | 0.00 | 0.02 | 0.14 | 0.09 | 0.16 | 0.81 | 0.89 | 0.81 |
| | Italy | 0.03 | -0.01 | -0.01 | 0.00 | 0.14 | 0.12 | 0.12 | 0.66 | 0.75 | 0.59 |
| | Japan | 0.10 | -0.02 | 0.01 | -0.05 | 0.12 | 0.10 | 0.13 | 0.60 | 0.73 | 0.57 |
| | Korea | 0.08 | 0.05 | 0.02 | 0.06 | 0.11 | 0.15 | 0.13 | 0.63 | 0.73 | 0.66 |
| | Luxembourg | 0.10 | 0.16 | 0.11 | 0.14 | 0.13 | 0.13 | 0.13 | 0.77 | 0.83 | 0.75 |
| | Mexico | 0.10 | 0.14 | 0.10 | 0.05 | 0.05 | 0.02 | 0.03 | 0.62 | 0.70 | 0.64 |
| | New Zealand | 0.03 | 0.05 | 0.03 | 0.02 | 0.19 | 0.15 | 0.23 | 0.83 | 0.90 | 0.80 |
| | Norway | 0.08 | 0.06 | 0.02 | 0.05 | 0.20 | 0.18 | 0.19 | 0.76 | 0.85 | 0.76 |
| | Poland | 0.01 | 0.07 | 0.04 | 0.07 | 0.11 | 0.04 | 0.11 | 0.61 | 0.69 | 0.65 |
| | Portugal | 0.04 | 0.20 | 0.13 | 0.14 | 0.07 | 0.07 | 0.09 | 0.78 | 0.81 | 0.67 |
| | Spain | 0.04 | 0.05 | 0.01 | 0.03 | 0.18 | 0.19 | 0.17 | 0.74 | 0.81 | 0.66 |
| | Sweden | 0.08 | -0.04 | -0.01 | -0.05 | 0.13 | 0.15 | 0.15 | 0.81 | 0.86 | 0.75 |
| | Switzerland | 0.06 | 0.08 | 0.08 | 0.07 | 0.13 | 0.09 | 0.09 | 0.70 | 0.79 | 0.63 |
| | United Kingdom | 0.09 | 0.06 | 0.06 | 0.03 | 0.21 | 0.22 | 0.24 | 0.81 | 0.87 | 0.83 |
| | United States | 0.08 | 0.13 | 0.15 | 0.12 | 0.19 | 0.22 | 0.20 | 0.81 | 0.87 | 0.76 |
| | *OECD average* | *0.07* | *0.06* | *0.04* | *0.04* | *0.14* | *0.13* | *0.14* | *0.17* | *0.79* | *0.68* |
| NON-OECD COUNTRIES | Albania | 0.05 | 0.10 | 0.12 | 0.11 | 0.14 | 0.11 | 0.09 | 0.62 | 0.68 | 0.51 |
| | Argentina | 0.07 | 0.13 | 0.06 | 0.13 | 0.16 | 0.12 | 0.15 | 0.61 | 0.66 | 0.42 |
| | Brazil | 0.07 | 0.10 | 0.02 | 0.04 | 0.11 | 0.07 | 0.09 | 0.64 | 0.61 | 0.47 |
| | Bulgaria | 0.08 | 0.15 | 0.15 | 0.08 | 0.15 | 0.12 | 0.09 | 0.62 | 0.66 | 0.55 |
| | Chile | 0.05 | 0.10 | 0.09 | 0.04 | 0.14 | 0.10 | 0.11 | 0.67 | 0.67 | 0.40 |
| | Hong Kong-China | 0.08 | 0.06 | 0.05 | 0.01 | 0.12 | 0.10 | 0.11 | 0.67 | 0.76 | 0.59 |
| | Indonesia | 0.06 | 0.15 | 0.06 | 0.14 | 0.05 | 0.06 | 0.06 | 0.48 | 0.45 | 0.49 |
| | Israel | 0.05 | 0.06 | 0.00 | 0.00 | 0.09 | 0.08 | 0.10 | 0.58 | 0.67 | 0.66 |
| | Latvia | 0.07 | 0.08 | 0.08 | 0.08 | 0.14 | 0.11 | 0.14 | 0.63 | 0.72 | 0.73 |
| | Liechtenstein | 0.14 | 0.16 | 0.09 | 0.08 | 0.22 | 0.14 | 0.25 | 0.60 | 0.79 | 0.49 |
| | FYR Macedonia | 0.05 | 0.13 | 0.11 | 0.03 | 0.15 | 0.09 | 0.10 | 0.68 | 0.72 | 0.62 |
| | Peru | 0.08 | 0.20 | 0.07 | 0.09 | 0.10 | 0.08 | 0.03 | 0.49 | 0.50 | 0.38 |
| | Russian Federation | 0.07 | 0.08 | 0.09 | 0.07 | 0.13 | 0.07 | 0.08 | 0.64 | 0.72 | 0.51 |
| | Thailand | 0.13 | 0.19 | 0.15 | 0.17 | 0.27 | 0.20 | 0.21 | 0.68 | 0.76 | 0.65 |
| | Netherlands[1] | 0.01 | 0.01 | -0.02 | -0.03 | 0.16 | 0.23 | 0.13 | 0.69 | 0.79 | 0.67 |

1.Response rate is too low to ensure comparability.



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Table 3.2
**School-level correlations among five outcome measures**

| | | Sense of belonging - Participation | Sense of belonging - Reading literacy | Sense of belonging - Mathematical literacy | Sense of belonging - Scientific literacy | Participation - Reading literacy | Participation - Mathematical literacy | Participation - Scientific literacy | Reading literacy - Mathematical literacy | Reading literacy - Scientific literacy | Mathematical literacy - Scientific literacy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OECD COUNTRIES | Australia | 0.47 | 0.48 | 0.51 | 0.48 | 0.32 | 0.35 | 0.37 | 0.98 | 0.99 | 1.00 |
| | Austria | -0.09 | 0.44 | 0.34 | 0.42 | -0.02 | 0.04 | 0.01 | 0.95 | 0.99 | 0.98 |
| | Belgium | 0.25 | 0.37 | 0.31 | 0.35 | 0.91 | 0.90 | 0.89 | 0.98 | 0.99 | 0.99 |
| | Canada | 0.05 | 0.23 | 0.19 | 0.22 | 0.18 | 0.27 | 0.21 | 0.95 | 0.99 | 0.97 |
| | Czech Republic | 0.56 | 0.51 | 0.52 | 0.53 | 0.67 | 0.73 | 0.71 | 0.95 | 0.98 | 0.99 |
| | Denmark | 0.08 | 0.48 | 0.47 | 0.41 | 0.26 | 0.29 | 0.28 | 1.00 | 1.00 | 0.99 |
| | Finland | 0.23 | 0.43 | 0.37 | 0.37 | 0.01 | 0.21 | 0.03 | 0.96 | 0.98 | 0.96 |
| | France | 0.26 | 0.41 | 0.38 | 0.41 | 0.76 | 0.77 | 0.77 | 0.99 | 1.00 | 1.00 |
| | Germany | 0.46 | 0.79 | 0.76 | 0.73 | 0.46 | 0.53 | 0.53 | 0.99 | 0.98 | 1.00 |
| | Greece | 0.51 | 0.58 | 0.55 | 0.58 | 0.65 | 0.63 | 0.63 | 0.99 | 1.00 | 1.00 |
| | Hungary | 0.84 | 0.97 | 0.95 | 0.97 | 0.88 | 0.85 | 0.87 | 0.98 | 0.99 | 0.99 |
| | Iceland | 0.54 | 0.27 | 0.23 | 0.27 | -0.01 | -0.03 | -0.08 | 1.00 | 1.00 | 0.99 |
| | Ireland | 0.09 | -0.17 | -0.23 | -0.19 | 0.55 | 0.44 | 0.55 | 0.89 | 0.96 | 0.98 |
| | Italy | 0.21 | 0.01 | -0.05 | -0.02 | 0.91 | 0.88 | 0.89 | 0.95 | 0.99 | 0.98 |
| | Japan | 0.56 | 0.60 | 0.64 | 0.59 | 0.69 | 0.67 | 0.67 | 0.98 | 0.99 | 1.00 |
| | Korea | 0.57 | 0.63 | 0.77 | 0.73 | 0.69 | 0.63 | 0.68 | 0.94 | 0.97 | 0.99 |
| | Luxembourg | 0.65 | 0.82 | 0.75 | 0.81 | 0.73 | 0.64 | 0.70 | 0.98 | 1.00 | 0.99 |
| | Mexico | 0.25 | 0.74 | 0.71 | 0.72 | 0.09 | 0.08 | 0.08 | 1.00 | 1.00 | 0.99 |
| | New Zealand | 0.05 | -0.07 | -0.01 | -0.05 | 0.72 | 0.73 | 0.79 | 0.94 | 0.96 | 0.99 |
| | Norway | 0.12 | 0.55 | 0.45 | 0.52 | 0.47 | 0.64 | 0.48 | 0.96 | 0.96 | 0.97 |
| | Poland | 0.62 | 0.81 | 0.80 | 0.82 | 0.67 | 0.69 | 0.69 | 0.98 | 0.99 | 0.99 |
| | Portugal | 0.13 | 0.92 | 0.94 | 0.94 | 0.19 | 0.22 | 0.22 | 0.99 | 1.00 | 1.00 |
| | Spain | 0.08 | 0.32 | 0.08 | 0.23 | 0.39 | 0.40 | 0.31 | 0.93 | 0.97 | 0.96 |
| | Sweden | 0.08 | 0.39 | 0.48 | 0.37 | 0.10 | 0.22 | 0.07 | 0.98 | 0.98 | 0.94 |
| | Switzerland | 0.55 | 0.49 | 0.43 | 0.48 | 0.15 | 0.15 | 0.18 | 0.98 | 0.99 | 0.99 |
| | United Kingdom | 0.22 | 0.15 | 0.20 | 0.15 | 0.69 | 0.67 | 0.70 | 0.99 | 0.99 | 0.99 |
| | United States | 0.40 | 0.37 | 0.25 | 0.34 | 0.69 | 0.65 | 0.70 | 0.98 | 1.00 | 0.99 |
| | *OECD average* | *0.37* | *0.51* | *0.48* | *0.50* | *0.48* | *0.50* | *0.49* | *0.97* | *0.99* | *0.99* |
| NON-OECD COUNTRIES | Albania | 0.32 | 0.15 | 0.24 | 0.18 | 0.59 | 0.56 | 0.56 | 0.96 | 0.97 | 0.96 |
| | Argentina | 0.62 | 0.92 | 0.88 | 0.91 | 0.80 | 0.80 | 0.79 | 0.99 | 0.99 | 1.00 |
| | Brazil | 0.65 | 0.53 | 0.51 | 0.50 | 0.76 | 0.70 | 0.73 | 0.98 | 0.99 | 1.00 |
| | Bulgaria | 0.86 | 0.93 | 0.90 | 0.91 | 0.73 | 0.70 | 0.71 | 0.97 | 0.98 | 1.00 |
| | Chile | 0.81 | 0.83 | 0.82 | 0.82 | 0.68 | 0.66 | 0.64 | 0.99 | 0.99 | 1.00 |
| | Hong Kong-China | 0.10 | 0.70 | 0.68 | 0.70 | 0.59 | 0.58 | 0.58 | 0.99 | 0.99 | 1.00 |
| | Indonesia | 0.16 | 0.59 | 0.58 | 0.59 | 0.33 | 0.37 | 0.41 | 0.98 | 0.98 | 1.00 |
| | Israel | 0.16 | 0.39 | 0.35 | 0.23 | -0.24 | -0.25 | -0.16 | 0.99 | 0.95 | 0.94 |
| | Latvia | 0.09 | 0.72 | 0.77 | 0.67 | 0.22 | 0.26 | 0.19 | 0.98 | 0.99 | 0.98 |
| | Liechtenstein | 0.25 | 0.25 | 0.17 | 0.27 | 0.58 | 0.54 | 0.47 | 0.97 | 0.99 | 0.96 |
| | FYR Macedonia | 0.42 | 0.83 | 0.77 | 0.84 | 0.48 | 0.44 | 0.38 | 0.98 | 0.97 | 0.97 |
| | Peru | 0.38 | 0.86 | 0.85 | 0.81 | 0.49 | 0.53 | 0.53 | 0.99 | 0.98 | 1.00 |
| | Russian Federation | 0.40 | 0.52 | 0.48 | 0.46 | 0.41 | 0.42 | 0.39 | 0.96 | 0.99 | 0.98 |
| | Thailand | 0.79 | 0.67 | 0.68 | 0.64 | 0.52 | 0.51 | 0.52 | 0.97 | 0.98 | 0.99 |
| | Netherlands[1] | 0.59 | 0.68 | 0.64 | 0.68 | 0.72 | 0.73 | 0.70 | 1.00 | 1.00 | 1.00 |

1. Response rate is too low to ensure comparability.

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Table 3.3
**Categories of students based on a cluster analysis of their sense of belonging, participation and reading and mathematical literacy performance**

| OECD COUNTRIES | Student category | Percentage of students | Cluster mean: Sense of belonging | Participation | Reading literacy | Mathematical literacy |
|---|---|---|---|---|---|---|
| Australia | Top students | 26.5 | 470 | 534 | 640 | 628 |
| | Engaged students | 17.1 | 650 | 517 | 544 | 543 |
| | Students feeling isolated | 30.1 | 449 | 534 | 501 | 518 |
| | Absentee students | 10.5 | 462 | 323 | 531 | 526 |
| | Non-academic students | 15.8 | 482 | 497 | 378 | 408 |
| | All Clusters | 100.0 | 495 | 502 | 528 | 533 |
| Austria | Top students | 26.6 | 599 | 531 | 592 | 599 |
| | Engaged students | 24.5 | 617 | 533 | 460 | 465 |
| | Students feeling isolated | 24.8 | 425 | 540 | 552 | 549 |
| | Absentee students | 9.6 | 493 | 328 | 515 | 515 |
| | Non-academic students | 14.5 | 448 | 524 | 373 | 390 |
| | All Clusters | 100.0 | 526 | 513 | 507 | 514 |
| Belgium | Well-rounded students | 21.9 | 597 | 539 | 540 | 540 |
| | Academic students who feel isolated | 44.2 | 442 | 548 | 585 | 593 |
| | Non-academic, disaffected students | 24.9 | 447 | 529 | 389 | 410 |
| | Non-academic, absentee students | 8.9 | 449 | 272 | 392 | 410 |
| | All Clusters | 100.0 | 479 | 518 | 507 | 515 |
| Canada | Top students | 18.2 | 612 | 512 | 614 | 599 |
| | Engaged students | 16.4 | 640 | 498 | 484 | 485 |
| | Students feeling isolated | 32.1 | 441 | 512 | 601 | 590 |
| | Absentee students | 10.6 | 493 | 262 | 487 | 495 |
| | Non-academic students | 22.7 | 444 | 503 | 443 | 455 |
| | All Clusters | 100.0 | 512 | 481 | 534 | 533 |
| Czech Republic | Top students | 20.5 | 473 | 526 | 611 | 620 |
| | Engaged students | 15.4 | 592 | 525 | 531 | 533 |
| | Students feeling isolated | 32.1 | 434 | 518 | 510 | 509 |
| | Absentee students | 12.0 | 451 | 301 | 436 | 428 |
| | Non-academic students | 20.0 | 454 | 523 | 407 | 400 |
| | All Clusters | 100.0 | 471 | 493 | 492 | 493 |
| Denmark | Top students | 29.6 | 469 | 524 | 578 | 583 |
| | Engaged students | 21.6 | 650 | 511 | 514 | 530 |
| | Students feeling isolated | 26.1 | 464 | 511 | 408 | 442 |
| | Absentee students | 15.0 | 498 | 308 | 533 | 542 |
| | Non-academic students | 7.6 | 498 | 211 | 369 | 399 |
| | All Clusters | 100.0 | 513 | 461 | 497 | 514 |
| Finland | Well-rounded students | 21.9 | 626 | 511 | 548 | 535 |
| | Academic, disaffected students | 39.4 | 466 | 521 | 619 | 597 |
| | Non-academic, disaffected students | 27.1 | 460 | 514 | 467 | 471 |
| | Non-academic, absentee students | 11.6 | 497 | 267 | 495 | 494 |
| | All Clusters | 100.0 | 502 | 488 | 546 | 536 |
| France | Well-rounded students | 24.8 | 594 | 536 | 529 | 543 |
| | Academic, disaffected students | 37.2 | 446 | 540 | 579 | 586 |
| | Non-academic, disaffected students | 29.1 | 444 | 528 | 429 | 442 |
| | Non-academic, absentee students | 8.9 | 475 | 285 | 419 | 446 |
| | All Clusters | 100.0 | 486 | 512 | 505 | 517 |
| Germany | Top students | 23.3 | 570 | 546 | 605 | 603 |
| | Engaged students | 24.8 | 621 | 541 | 468 | 469 |
| | Students feeling isolated | 27.7 | 423 | 538 | 526 | 530 |
| | Absentee students | 5.2 | 484 | 276 | 407 | 415 |
| | Non-academic students | 19.0 | 463 | 529 | 361 | 374 |
| | All Clusters | 100.0 | 518 | 523 | 484 | 485 |
| Greece | Top students | 25.5 | 467 | 496 | 578 | 566 |
| | Engaged students | 16.6 | 641 | 527 | 520 | 480 |
| | Students feeling isolated | 30.1 | 454 | 512 | 464 | 436 |
| | Absentee students | 11.2 | 480 | 242 | 421 | 384 |
| | Non-academic students | 16.5 | 497 | 487 | 354 | 306 |
| | All Clusters | 100.0 | 498 | 475 | 474 | 447 |


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Table 3.3 (continued)

**Categories of students based on a cluster analysis of their sense of belonging, participation and reading and mathematical literacy performance**

| | Student category | Percentage of students | Cluster mean: Sense of belonging | Cluster mean: Participation | Cluster mean: Reading literacy | Cluster mean: Mathematical literacy |
|---|---|---|---|---|---|---|
| OECD COUNTRIES | | | | | | |
| Hungary | Well-rounded students | 45.9 | 541 | 538 | 556 | 565 |
| | Non-academic, absentee students | 11.9 | 502 | 293 | 405 | 418 |
| | Non-academic students | 42.4 | 483 | 531 | 409 | 417 |
| | All Clusters | 100.0 | 514 | 509 | 480 | 483 |
| Iceland | Well-rounded students | 23.5 | 647 | 515 | 517 | 523 |
| | Academic, disaffected students who feel isolated | 33.1 | 460 | 520 | 584 | 585 |
| | Non-academic students who feel isolated | 28.6 | 474 | 524 | 434 | 455 |
| | Non-academic, absentee students | 14.9 | 494 | 273 | 452 | 474 |
| | All Clusters | 100.0 | 514 | 483 | 507 | 514 |
| Ireland | Top students | 18.8 | 556 | 533 | 630 | 592 |
| | Engaged students | 20.0 | 633 | 521 | 504 | 480 |
| | Students feeling isolated | 31.8 | 432 | 523 | 569 | 537 |
| | Absentee students | 9.0 | 486 | 298 | 482 | 483 |
| | Non-academic students | 20.4 | 467 | 518 | 420 | 407 |
| | All Clusters | 100.0 | 508 | 503 | 527 | 503 |
| Italy | Well-rounded students | 48.7 | 492 | 520 | 557 | 527 |
| | Non-academic students who feel isolated | 12.0 | 479 | 278 | 416 | 397 |
| | Non-academic students | 39.3 | 512 | 502 | 424 | 397 |
| | All Clusters | 100.0 | 500 | 484 | 487 | 457 |
| Japan | Top students | 24.9 | 452 | 566 | 618 | 650 |
| | Engaged students | 22.3 | 580 | 569 | 540 | 572 |
| | Students feeling isolated | 32.3 | 412 | 563 | 524 | 552 |
| | Absentee students | 2.9 | 410 | 292 | 406 | 446 |
| | Non-academic students | 17.6 | 442 | 547 | 402 | 439 |
| | All Clusters | 100.0 | 465 | 555 | 522 | 557 |
| Korea | Well-rounded students | 25.5 | 563 | 565 | 558 | 588 |
| | Academic students who feel isolated | 36.6 | 417 | 561 | 564 | 598 |
| | Non-academic students who feel isolated | 30.2 | 441 | 561 | 458 | 470 |
| | Non-academic, absentee students | 7.7 | 425 | 341 | 465 | 479 |
| | All Clusters | 100.0 | 461 | 546 | 525 | 547 |
| Luxembourg | Well-rounded students | 50.7 | 547 | 542 | 514 | 510 |
| | Non-academic students who feel isolated | 7.6 | 464 | 263 | 396 | 407 |
| | Non-academic students | 41.8 | 457 | 535 | 371 | 393 |
| | All Clusters | 100.0 | 505 | 515 | 441 | 446 |
| Mexico | Top students | 18.3 | 608 | 512 | 516 | 474 |
| | Engaged students | 21.1 | 593 | 533 | 388 | 358 |
| | Students feeling isolated | 22.2 | 444 | 513 | 484 | 447 |
| | Absentee students | 13.5 | 470 | 342 | 386 | 360 |
| | Non-academic students | 24.8 | 434 | 526 | 336 | 309 |
| | All Clusters | 100.0 | 509 | 498 | 422 | 387 |
| Netherlands[1] | Well-rounded students | 24.9 | 592 | 526 | 589 | 615 |
| | Academic students who feel isolated | 33.1 | 449 | 530 | 593 | 620 |
| | Non-academic students who feel isolated | 28.3 | 487 | 520 | 453 | 483 |
| | Non-academic, absentee students | 13.6 | 483 | 313 | 481 | 497 |
| | All Clusters | 100.0 | 499 | 500 | 532 | 563 |
| New Zealand | Top students | 32.0 | 476 | 507 | 633 | 636 |
| | Engaged students | 14.6 | 668 | 488 | 538 | 546 |
| | Students who feel isolated | 28.6 | 456 | 523 | 516 | 522 |
| | Absentee students | 10.2 | 478 | 240 | 459 | 487 |
| | Non-academic students | 14.7 | 471 | 478 | 367 | 399 |
| | All Clusters | 100.0 | 498 | 479 | 529 | 537 |
| Norway | Well-rounded students | 24.5 | 636 | 529 | 519 | 505 |
| | Academic students who feel isolated | 40.2 | 468 | 529 | 581 | 567 |
| | Non-academic students who feel isolated | 27.2 | 472 | 519 | 400 | 412 |
| | Non-academic, absentee students | 8.2 | 499 | 236 | 425 | 443 |
| | All Clusters | 100.0 | 512 | 503 | 505 | 499 |

1. Response rate is too low to ensure comparability.

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Table 3.3 (continued)
**Categories of students based on a cluster analysis of their sense of belonging, participation and reading and mathematical literacy performance**

| | | Student category | Percentage of students | Cluster mean: Sense of belonging | Participation | Reading literacy | Mathematical literacy |
|---|---|---|---|---|---|---|---|
| OECD COUNTRIES | Poland | Top students | 30.3 | 442 | 538 | 572 | 564 |
| | | Engaged students | 16.4 | 583 | 527 | 504 | 489 |
| | | Students who feel isolated | 14.8 | 448 | 373 | 520 | 510 |
| | | Absentee students | 8.7 | 436 | 207 | 384 | 388 |
| | | Non-academic students | 29.8 | 419 | 513 | 395 | 386 |
| | | All Clusters | 100.0 | 461 | 477 | 479 | 470 |
| | Portugal | Well-rounded students | 20.2 | 627 | 517 | 495 | 474 |
| | | Academic students who feel isolated | 36.5 | 483 | 517 | 551 | 531 |
| | | Non-academic students who feel isolated | 34.0 | 454 | 536 | 383 | 379 |
| | | Non-academic, absentee students | 9.2 | 467 | 303 | 395 | 395 |
| | | All Clusters | 100.0 | 501 | 504 | 470 | 454 |
| | Spain | Well-rounded students | 24.2 | 601 | 514 | 514 | 491 |
| | | Academic students who feel isolated | 33.6 | 457 | 518 | 565 | 554 |
| | | Non-academic students who feel isolated | 27.5 | 464 | 493 | 414 | 396 |
| | | Non-academic, absentee students | 14.6 | 482 | 242 | 456 | 435 |
| | | All Clusters | 100.0 | 499 | 472 | 493 | 476 |
| | Sweden | Top students | 23.1 | 538 | 524 | 619 | 615 |
| | | Engaged students | 25.3 | 627 | 525 | 498 | 495 |
| | | Students who feel isolated | 24.0 | 430 | 518 | 528 | 522 |
| | | Absentee students | 10.7 | 519 | 296 | 506 | 504 |
| | | Non-academic students | 16.9 | 491 | 481 | 384 | 381 |
| | | All Clusters | 100.0 | 527 | 489 | 516 | 510 |
| | Switzerland | Top students | 23.5 | 581 | 527 | 611 | 636 |
| | | Engaged students | 23.7 | 618 | 542 | 471 | 498 |
| | | Students who feel isolated | 27.3 | 433 | 536 | 528 | 563 |
| | | Absentee students | 7.6 | 493 | 289 | 453 | 494 |
| | | Non-academic students | 18.0 | 457 | 535 | 362 | 402 |
| | | All Clusters | 100.0 | 520 | 515 | 494 | 529 |
| | United Kingdom | Top students | 23.1 | 495 | 539 | 645 | 638 |
| | | Engaged students | 18.1 | 669 | 532 | 534 | 540 |
| | | Students who feel isolated | 32.6 | 464 | 531 | 527 | 531 |
| | | Absentee students | 8.8 | 493 | 311 | 466 | 479 |
| | | Non-academic students | 17.5 | 474 | 515 | 392 | 415 |
| | | All Clusters | 100.0 | 513 | 509 | 523 | 529 |
| | United States | Top students | 30.4 | 457 | 535 | 606 | 587 |
| | | Engaged students | 19.8 | 670 | 524 | 526 | 515 |
| | | Students who feel isolated | 30.4 | 439 | 534 | 451 | 446 |
| | | Absentee students | 8.5 | 460 | 334 | 518 | 497 |
| | | Non-academic students | 10.9 | 447 | 368 | 336 | 348 |
| | | All Clusters | 100.0 | 494 | 494 | 504 | 493 |
| NON-OECD COUNTRIES | Albania | Top students | 24.3 | 458 | 544 | 463 | 508 |
| | | Engaged students | 12.5 | 615 | 531 | 350 | 389 |
| | | Disaffected students | 32.0 | 433 | 541 | 355 | 383 |
| | | Truant students | 8.8 | 429 | 311 | 331 | 372 |
| | | Non-academic students | 22.5 | 431 | 528 | 238 | 258 |
| | | All Clusters | 100.0 | 459 | 515 | 349 | 380 |
| | Argentina | Top students | 18.7 | 585 | 513 | 549 | 540 |
| | | Engaged students | 21.1 | 635 | 512 | 407 | 374 |
| | | Disaffected students | 25.7 | 455 | 504 | 463 | 442 |
| | | Truant students | 14.5 | 492 | 240 | 333 | 311 |
| | | Non-academic students | 20.0 | 445 | 512 | 302 | 277 |
| | | All Clusters | 100.0 | 518 | 471 | 418 | 388 |
| | Brazil | Top students | 25.1 | 485 | 515 | 475 | 438 |
| | | Engaged students | 20.2 | 655 | 524 | 405 | 336 |
| | | Disaffected students | 31.7 | 466 | 510 | 339 | 272 |
| | | Truant students | 11.2 | 577 | 321 | 426 | 370 |
| | | Non-academic students | 11.8 | 468 | 290 | 306 | 252 |
| | | All Clusters | 100.0 | 521 | 466 | 396 | 334 |


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Table 3.3 (continued)
**Categories of students based on a cluster analysis of their sense of belonging, participation and reading and mathematical literacy performance**

| | | | Cluster mean | | | |
|---|---|---|---|---|---|---|
| | Student category | Percentage of students | Sense of belonging | Participation | Reading literacy | Mathematical literacy |
| NON-OECD COUNTRIES | | | | | | |
| Bulgaria | Well-rounded students | 42.2 | 503 | 493 | 519 | 526 |
| | Non-academic, disaffected students | 19.6 | 460 | 230 | 374 | 376 |
| | Non-academic students | 38.2 | 464 | 500 | 372 | 368 |
| | All Clusters | 100.0 | 481 | 441 | 430 | 430 |
| Chile | Top students | 29.8 | 662 | 509 | 487 | 461 |
| | Engaged students | 20.6 | 463 | 505 | 481 | 457 |
| | Disaffected students | 17.7 | 424 | 500 | 329 | 297 |
| | Truant students | 19.7 | 488 | 251 | 336 | 321 |
| | Non-academic students | 12.2 | 596 | 514 | 377 | 348 |
| | All Clusters | 100.0 | 519 | 473 | 410 | 383 |
| Hong Kong-China | Top students | 33.4 | 442 | 566 | 605 | 644 |
| | Engaged students | 13.6 | 593 | 566 | 561 | 594 |
| | Disaffected students | 35.2 | 432 | 563 | 515 | 538 |
| | Truant students | 3.0 | 434 | 336 | 457 | 490 |
| | Non-academic students | 14.8 | 436 | 552 | 398 | 413 |
| | All Clusters | 100.0 | 458 | 557 | 525 | 560 |
| Indonesia | Well-rounded students | 44.8 | 499 | 547 | 422 | 433 |
| | Non-academic, disaffected students | 13.6 | 469 | 368 | 346 | 345 |
| | Non-academic students | 41.6 | 459 | 546 | 317 | 302 |
| | All Clusters | 100.0 | 479 | 522 | 371 | 367 |
| Israel | Well-rounded students | 43.1 | 568 | 471 | 530 | 533 |
| | Non-academic, disaffected students | 18.5 | 505 | 218 | 462 | 442 |
| | Non-academic students | 38.4 | 525 | 482 | 369 | 334 |
| | All Clusters | 100.0 | 545 | 429 | 452 | 433 |
| Latvia | Top students | 29.1 | 463 | 507 | 561 | 572 |
| | Engaged students | 16.0 | 575 | 513 | 457 | 459 |
| | Disaffected students | 28.6 | 418 | 528 | 434 | 438 |
| | Truant students | 11.4 | 450 | 283 | 414 | 444 |
| | Non-academic students | 15.0 | 437 | 462 | 309 | 324 |
| | All Clusters | 100.0 | 464 | 483 | 458 | 463 |
| Liechtenstein | Top students | 15.5 | 504 | 547 | 603 | 641 |
| | Engaged students | 37.0 | 636 | 558 | 505 | 523 |
| | Disaffected students | 26.6 | 419 | 557 | 494 | 519 |
| | Truant students | 5.9 | 486 | 284 | 431 | 471 |
| | Non-academic students | 15.2 | 467 | 525 | 348 | 373 |
| | All Clusters | 100.0 | 521 | 537 | 483 | 514 |
| FYR Macedonia | Top students | 20.1 | 541 | 525 | 491 | 507 |
| | Engaged students | 20.9 | 626 | 527 | 373 | 378 |
| | Disaffected students | 26.6 | 442 | 529 | 401 | 409 |
| | Truant students | 10.5 | 477 | 259 | 327 | 347 |
| | Non-academic students | 21.9 | 442 | 527 | 271 | 278 |
| | All Clusters | 100.0 | 503 | 499 | 372 | 379 |
| Peru | Top students | 20.4 | 504 | 509 | 453 | 439 |
| | Engaged students | 16.3 | 627 | 525 | 334 | 285 |
| | Disaffected students | 28.6 | 430 | 516 | 326 | 305 |
| | Truant students | 15.8 | 467 | 286 | 309 | 283 |
| | Non-academic students | 18.9 | 421 | 486 | 221 | 177 |
| | All Clusters | 100.0 | 480 | 473 | 327 | 292 |
| Russian Federation | Well-rounded students | 44.2 | 487 | 528 | 528 | 560 |
| | Non-academic, disaffected students | 16.3 | 463 | 277 | 434 | 467 |
| | Non-academic students | 39.5 | 465 | 514 | 390 | 395 |
| | All Clusters | 100.0 | 475 | 480 | 462 | 478 |
| Thailand | Well-rounded students | 43.3 | 503 | 536 | 501 | 506 |
| | Non-academic, disaffected students | 18.6 | 440 | 328 | 382 | 395 |
| | Non-academic students | 38.1 | 447 | 517 | 390 | 385 |
| | All Clusters | 100.0 | 469 | 489 | 431 | 432 |

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Table 4.1

**Student characteristics and family background factors associated with low sense of belonging (odds ratios)[1]**

| | | Female students | High socio-economic background[2] | Low socio-economic background[2] | Foreign-born student[3] | Single-parent family |
|---|---|---|---|---|---|---|
| OECD COUNTRIES | Australia | 0.96 | **0.83** | **1.23** | 1.14 | **1.20** |
| | Austria | 1.01 | 1.04 | **1.25** | 1.28 | 1.18 |
| | Belgium | **0.87** | 0.90 | **1.38** | **1.41** | **1.17** |
| | Canada | 0.85 | 0.79 | 1.39 | 1.59 | 1.24 |
| | Czech Republic | 0.89 | **0.83** | **1.48** | — | 1.07 |
| | Denmark | **1.27** | 0.86 | **1.24** | 1.06 | 1.18 |
| | Finland | **1.36** | 1.00 | 1.11 | — | **1.22** |
| | France | 1.03 | **0.78** | **1.23** | 0.97 | 1.15 |
| | Germany | 1.01 | **0.81** | **1.32** | **1.49** | 1.02 |
| | Greece | **0.84** | 1.02 | **1.33** | **1.39** | 1.24 |
| | Hungary | 0.91 | **0.77** | **1.55** | — | 1.18 |
| | Iceland | 1.01 | 0.85 | **1.62** | **1.59** | 1.22 |
| | Ireland | 0.97 | 1.10 | **1.23** | **2.29** | 1.15 |
| | Italy | 0.90 | 0.96 | **1.23** | — | 1.11 |
| | Japan | 0.90 | **0.86** | **1.32** | — | **1.20** |
| | Korea | **1.40** | **0.85** | **1.47** | — | 1.21 |
| | Luxembourg | 0.95 | **0.73** | **1.64** | **1.50** | **1.49** |
| | Mexico | 0.86 | **0.74** | **1.46** | **1.87** | **1.22** |
| | New Zealand | 1.04 | 0.87 | **1.36** | **1.51** | 1.13 |
| | Norway | 1.03 | **0.78** | **1.60** | **1.55** | 1.06 |
| | Poland | 0.92 | **0.80** | **1.76** | — | 1.00 |
| | Portugal | 1.05 | **0.70** | **1.84** | 1.15 | 1.11 |
| | Spain | **0.84** | 0.91 | **1.25** | — | 1.18 |
| | Sweden | **1.56** | 1.05 | **1.41** | 1.23 | 1.05 |
| | Switzerland | 1.12 | 0.91 | **1.34** | 1.37 | 1.25 |
| | United Kingdom | **0.85** | 0.95 | **1.31** | 1.20 | 1.11 |
| | United States | 0.75 | 0.71 | 1.58 | 1.63 | 1.33 |
| | *OECD average* | 0.98[sc] | **0.86**[c] | **1.38**[c] | **1.37**[c] | **1.17** |
| NON-OECD COUNTRIES | Albania | 1.02 | 0.91 | **1.22** | — | 1.03 |
| | Argentina | 0.89 | **0.53** | **1.57** | — | **1.26** |
| | Brazil | **0.77** | 0.92 | **1.20** | — | 1.13 |
| | Bulgaria | **0.75** | **0.78** | **1.65** | — | 1.15 |
| | Chile | **0.86** | **0.71** | **1.32** | — | **1.18** |
| | Hong Kong-China | 0.89 | **0.76** | **1.37** | 1.10 | **1.29** |
| | Indonesia | 0.92 | **0.68** | **1.30** | — | 0.98 |
| | Israel | **0.61** | 0.89 | 1.26 | **1.70** | 1.28 |
| | Latvia | 0.88 | **0.79** | **1.61** | **1.22** | **1.18** |
| | Liechtenstein | 0.72 | 0.75 | 1.06 | 1.89 | 1.27 |
| | FYR Macedonia | **0.78** | **0.66** | **1.42** | 1.37 | 0.89 |
| | Peru | 0.88 | **0.61** | **1.36** | — | 0.90 |
| | Russian Federation | **0.90** | **0.85** | **1.50** | 1.14 | 1.05 |
| | Thailand | **0.65** | **0.77** | **1.34** | — | 1.10 |
| | Netherlands[4] | 1.08 | 0.98 | 1.27 | 1.26 | 0.84 |

1. Odds ratios in bold text are statistically significant ($p < 0.05$). For the OECD average, odds ratios with a superscript *s* vary significantly among schools, and those with a superscript *c* vary significantly among countries.
2. Students in top and bottom national quartiles of the socio-economic status measered by International Socio-economic Index of Occupational Status (ISEI) of parents.
3. Odds ratios are not reported for countries in which less than 3% of the students are foreign-born.
4. Response rate is too low to ensure comparability.



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Table 4.2
**Student characteristics and family background factors associated with low participation (odds ratios)[1]**

| | | Female students | High socio-economic background[2] | Low socio-economic background[2] | Foreign-born student[3] | Single-parent family |
|---|---|---|---|---|---|---|
| OECD COUNTRIES | Australia | 1.10 | 1.08 | **1.27** | 1.02 | **1.55** |
| | Austria | 1.06 | 1.18 | 0.97 | 1.21 | **1.63** |
| | Belgium | 0.93 | **0.78** | **1.63** | **1.98** | **1.23** |
| | Canada | 0.98 | 0.96 | **1.24** | 0.98 | 1.29 |
| | Czech Republic | 0.96 | **0.81** | **1.27** | — | 1.18 |
| | Denmark | 1.10 | 0.91 | 1.15 | **1.32** | **1.47** |
| | Finland | 1.01 | **0.81** | 1.10 | — | 1.55 |
| | France | 0.88 | 0.91 | **1.48** | **1.51** | **1.50** |
| | Germany | 0.98 | 1.22 | **1.24** | 0.99 | **1.51** |
| | Greece | **0.67** | 0.95 | 1.07 | 1.19 | 1.11 |
| | Hungary | **0.85** | **0.81** | **1.57** | — | 1.10 |
| | Iceland | 0.98 | **0.74** | **1.52** | 1.19 | 0.95 |
| | Ireland | **0.77** | 0.85 | **1.55** | 1.33 | 1.23 |
| | Italy | **0.71** | 0.93 | 1.12 | — | 1.13 |
| | Japan | **0.70** | 1.17 | **1.70** | — | 1.41 |
| | Korea | 0.84 | 0.98 | 1.01 | — | **1.50** |
| | Luxembourg | 0.90 | 0.82 | 1.16 | **1.46** | 1.30 |
| | Mexico | **0.80** | 1.09 | **0.80** | 1.29 | **1.22** |
| | New Zealand | **1.17** | 0.88 | **1.52** | 0.94 | **1.30** |
| | Norway | 0.96 | 0.85 | **1.21** | **2.00** | **1.30** |
| | Poland | **0.75** | **1.27** | 1.00 | — | **1.29** |
| | Portugal | 0.86 | 0.99 | 0.91 | 1.13 | **1.44** |
| | Spain | **1.19** | **0.85** | **1.31** | — | **1.43** |
| | Sweden | 1.13 | **1.19** | **1.50** | 1.00 | 1.51 |
| | Switzerland | 0.98 | **1.32** | 0.94 | **1.67** | **1.44** |
| | United Kingdom | 0.89 | **0.78** | **1.74** | 1.31 | **1.56** |
| | United States | 1.16 | 0.86 | **1.61** | 0.97 | 1.30 |
| | *OECD average* | **0.93**[c] | 0.94[c] | **1.26**[c] | **1.30**[c] | **1.40** |
| NON-OECD COUNTRIES | Albania | **0.40** | 0.86 | 1.12 | — | 1.00 |
| | Argentina | 0.72 | **0.73** | **1.14** | — | **1.24** |
| | Brazil | **0.86** | **0.78** | 1.06 | — | **1.38** |
| | Bulgaria | **0.83** | 1.06 | **1.24** | — | 1.10 |
| | Chile | 0.93 | 0.93 | **1.20** | — | **1.20** |
| | Hong Kong-China | 0.87 | 1.28 | 0.99 | 1.31 | **1.67** |
| | Indonesia | **0.61** | 1.02 | 1.12 | — | 0.99 |
| | Israel | 1.11 | 0.92 | **0.76** | **0.76** | 1.19 |
| | Latvia | **0.75** | 1.07 | 1.17 | 1.17 | 1.11 |
| | Liechtenstein | **2.58** | 0.88 | 0.82 | **2.78** | 0.55 |
| | FYR Macedonia | **0.68** | **1.19** | 1.05 | 0.93 | 1.26 |
| | Peru | **0.85** | 0.93 | **1.22** | — | **1.23** |
| | Russian Federation | **0.75** | 0.99 | **1.18** | 0.98 | 1.11 |
| | Thailand | **0.50** | **0.85** | 1.02 | — | 1.07 |
| | Netherlands[4] | 0.99 | 0.97 | **1.38** | 1.22 | 1.34 |

1. Odds ratios in bold text are statistically significant ($p < 0.05$). For the OECD average, odds ratios with a superscript *s* vary significantly among schools, and those with a superscript *c* vary significantly among countries.
2. Students in top and bottom national quartiles of the socio-economic status measered by International Socio-economic Index of Occupational Status (ISEI) of parents.
3. Odds ratios are not reported for countries in which less than 3% of the students are foreign-born.
4. Response rate is too low to ensure comparability.

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Table 4.3
**Country mean on the indices of disciplinary climate, student-teacher relations and achievement press**

| | | Disciplinary climate | Student-teacher relations | Achievement press |
|---|---|---|---|---|
| OECD COUNTRIES | Australia | 4.9 | 6.7 | 5.9 |
| | Austria | 6.0 | 3.8 | 3.7 |
| | Belgium | 4.6 | 5.1 | 3.7 |
| | Canada | 4.1 | 6.1 | 6.4 |
| | Czech Republic | 5.6 | 4.3 | 3.7 |
| | Denmark | 4.6 | 6.4 | 5.2 |
| | Finland | 4.1 | 5.7 | 5.7 |
| | France | 4.3 | 4.7 | 4.6 |
| | Germany | 5.4 | 3.2 | 4.4 |
| | Greece | 2.5 | 4.1 | 3.5 |
| | Hungary | 5.3 | 5.9 | 6.4 |
| | Iceland | 5.6 | 4.8 | 7.5 |
| | Ireland | 5.6 | 5.1 | 6.8 |
| | Italy | 3.2 | 4.4 | 6.3 |
| | Japan | 7.0 | 2.6 | 0.6 |
| | Korea | 5.2 | 5.1 | 3.4 |
| | Luxembourg | 5.8 | 2.2 | 1.8 |
| | Mexico | 6.3 | 5.5 | 4.3 |
| | New Zealand | 4.6 | 6.6 | 6.8 |
| | Norway | 3.7 | 4.1 | 5.3 |
| | Poland | 6.8 | 2.1 | 6.0 |
| | Portugal | 4.7 | 6.8 | 4.7 |
| | Spain | 4.1 | 4.7 | 4.5 |
| | Sweden | 3.3 | 6.2 | 5.5 |
| | Switzerland | 6.9 | 6.1 | 4.7 |
| | United Kingdom | 5.8 | 6.6 | 7.3 |
| | United States | 5.4 | 6.3 | 6.4 |
| | *OECD average* | *5.0* | *5.0* | *5.0* |
| NON-OECD COUNTRIES | Albania | 8.9 | 4.1 | 5.5 |
| | Argentina | 3.4 | 4.7 | 2.9 |
| | Brazil | 3.2 | 7.0 | 4.9 |
| | Bulgaria | 4.8 | 4.0 | 3.9 |
| | Chile | 2.2 | 4.4 | 5.0 |
| | Hong Kong-China | 4.3 | 5.4 | 7.0 |
| | Indonesia | 6.6 | 5.5 | 3.2 |
| | Israel | 3.9 | 5.3 | 3.3 |
| | Latvia | 7.3 | 4.8 | 6.1 |
| | Liechtenstein | 7.9 | 5.1 | 4.5 |
| | FYR Macedonia | 8.3 | 4.5 | 2.7 |
| | Peru | 4.7 | 5.6 | 4.1 |
| | Russian Federation | 7.7 | 5.8 | 6.5 |
| | Thailand | 7.3 | 7.5 | 4.9 |
| | Netherlands[1] | 3.8 | 6.4 | 2.9 |

1. Response rate is too low to ensure comparability.



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*Annex*

**C**

# THE DEVELOPMENT OF THE PISA THEMATIC REPORT – A COLLABORATIVE EFFORT

## Introduction

PISA is a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests.

A Board of Participating Countries on which each country is represented determines, in the context of OECD objectives, the policy priorities for PISA and oversees adherence to these priorities during the implementation of the programme. This includes the setting of priorities for the development of indicators, for the establishment of the assessment instruments and for the reporting of the results.

Experts from participating countries also serve on working groups that are charged with linking policy objectives with the best internationally available technical expertise. By participating in these expert groups, countries ensure that: the instruments are internationally valid and take into account the cultural and educational contexts in OECD Member countries; the assessment materials have strong measurement properties; and the instruments place an emphasis on authenticity and educational validity.

Through National Project Managers, participating countries implement PISA at the national level subject to the agreed administration procedures. National Project Managers play a vital role in ensuring that the implementation of the survey is of high quality, and verify and evaluate the survey results, analyses, reports and publications.

The design and implementation of the surveys, within the framework established by the Board of Participating Countries, is the responsibility of the PISA consortium, referred to as the PISA Consortium, led by the Australian Council for Educational Research (ACER). Other partners in this consortium include the Netherlands National Institute for Educational Measurement (Citogroep), The National Institute for Educational Research in Japan (NIER), the Educational Testing Service in the United States (ETS), and WESTAT in the United States.

The OECD Secretariat has overall managerial responsibility for the programme, monitors its implementation on a day-to-day basis, acts as the secretariat for the Board of Participating Countries, builds consensus among countries and serves as the interlocutor between the Board of Participating Countries and the international consortium charged with the implementation of the activities. The OECD Secretariat also produces the indicators and analyses and prepares the international reports and publications in co-operation with the PISA consortium and in close consultation with Member countries both at the policy level (Board of Participating Countries) and at the level of implementation (National Project Managers).

The following lists the members of the various PISA bodies and the individual experts and consultants who have contributed to PISA during the first cycle.


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