

What does PISA 2012 tell about family factors in student achievement

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Outline:

- ① The question
- ② Approach and solution
- ③ Further directions



The question

Is family background related to student performance?

And if it is...

How to show this relation in a way understandable to a broad non-specialist audience?

Important factors (1/3)

Things that are at home:

- Number of books at home,
- Cultural possessions, paintings,
- Educational resources...

But...

Their view is biased by student perception!

Important factors (2/3)

Family educational / cultural / wealth status:

- Family ESCS (Economic, social and cultural status),
- Family ISEI occupational status,
- Parents education....

But...

These are artificial indexes, good for modeling but not that easy to understand for non specialist.

Important factors (3/3)

Activities at home:

- Does student play chess?
- Does student play computer games?
- Do parents and kids talk during main meal...

But,

These factors are also student individual factors.

Our approach

We are using parental occupation as a proxy, that summarizes many family related factors and is easy to understand.

In the PISA 2012 data occupations are coded with the use of International Standard Classification of Occupations classification, version 08.

In previous releases of PISA the ISCO 88 was used.

International Standard Classification of Occupations

Major groups of Occupations:

1 - Managers; 2 - Professionals; 3 - Technicians and associate professionals; 4 - Clerical support workers; 5 - Service and sales workers; 6 - Skilled agricultural, forestry and fishery workers 7 - Craft and related trades workers; 8 - Plant and machine operators, and assemblers; 9 - Elementary occupations

2xxx Professionals,

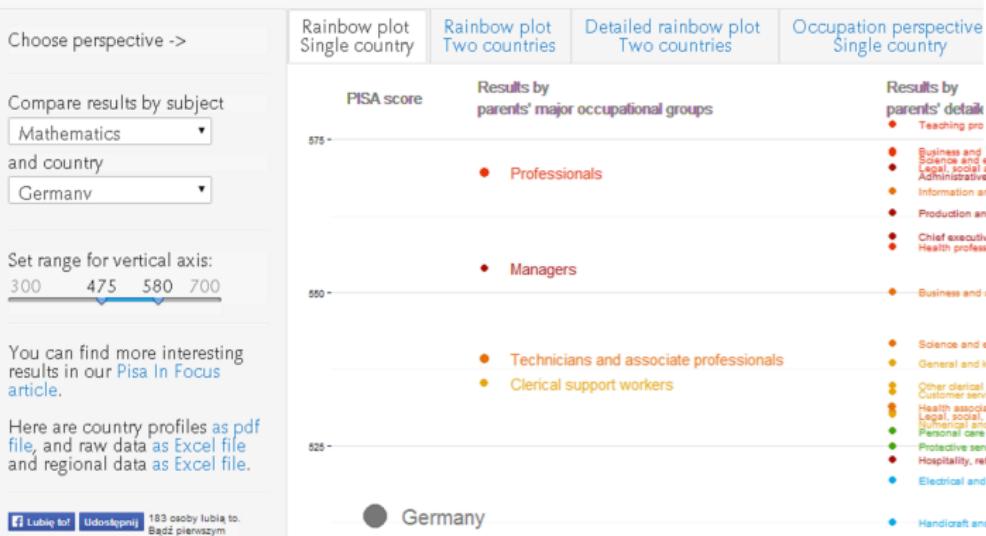
23xx Teaching professionals,

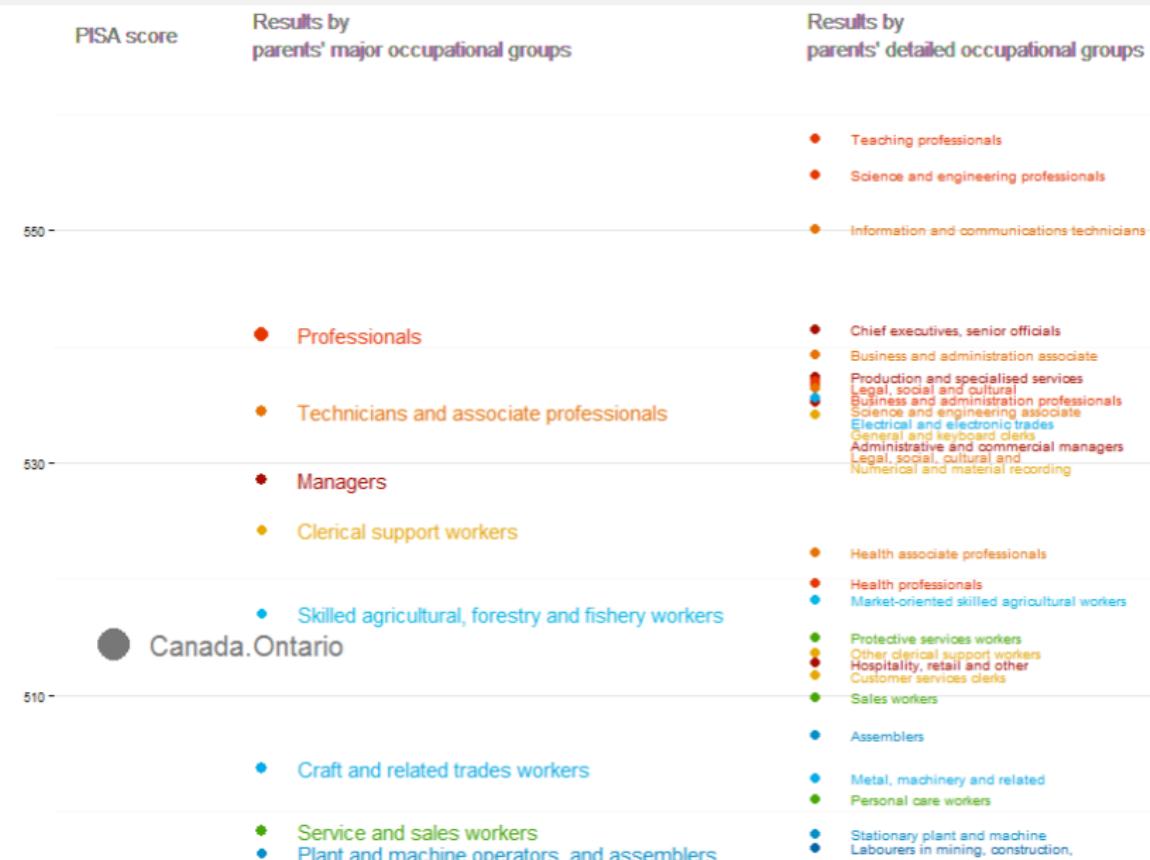
234x Primary school and early childhood teachers,

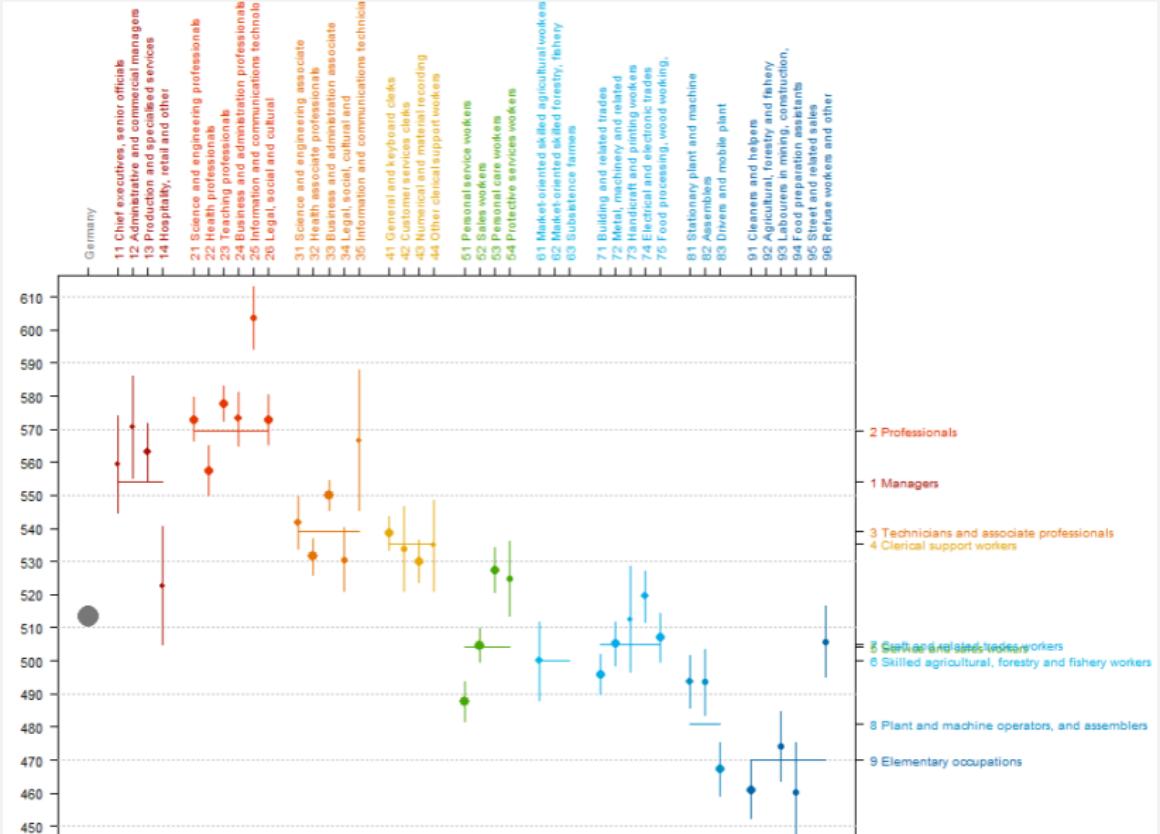
2341 Primary school teachers.

Occupations@PISA2012

How much can we infer about a student's performance in school by looking at what his or her parents do for a living? To find out more about students' parents' occupations. **Occupations@PISA2012** is a web-based application that allows you to explore the relationship between parents' occupations and their children's performance in mathematics, reading and science - in your own country and in other countries.













Open³

Open data: PISA 2012,

<http://pisa2012.acer.edu.au>,

Open analyzes, scripts are on GitHub,

<https://github.com/pbiecek/PISA2012lite>,

Open statistical engine, the R language,

<http://r-project.org>.

Further directions

- ① Most kids have two parents, should we use mother/father/min/max occupation or education?
- ② What are strong and weak sides of kids with different family background.
- ③ The endurance of kids with different family background.

Acknowledgement

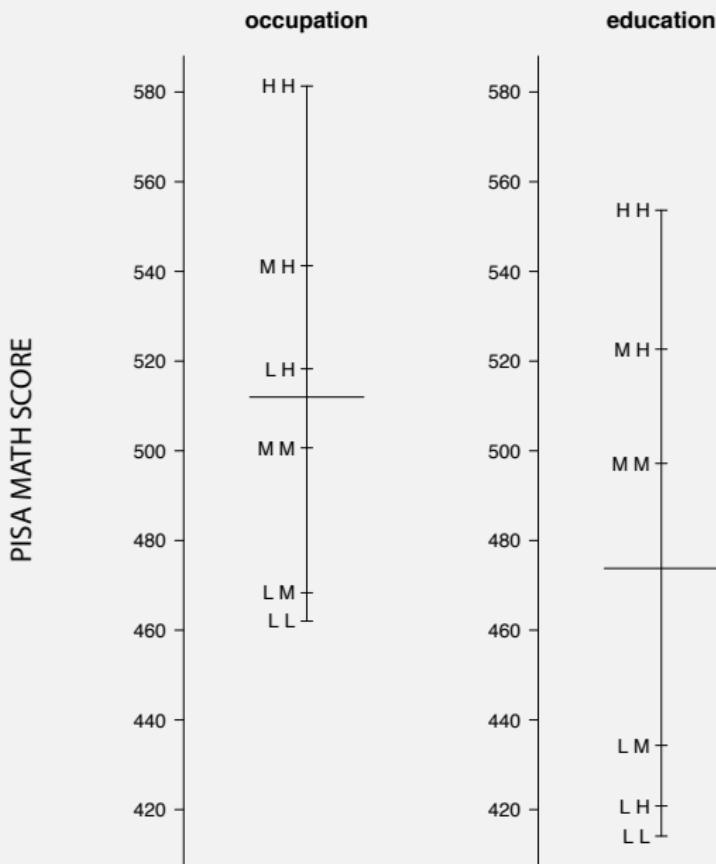
OECD TJA mentors:

Francesca Borgonovi, Tracey Burns, Pablo Zoido
and staff

Marilyn Achiron, Michael Davidson, Andreas
Schleicher

from Organisation for Economic Co-operation
and Development,

OSF Daniel Pop and Kate Linkins
from Open Society Foundations.



Red dot stands for selected country
the number on the right is
the country centile and position in the ranking

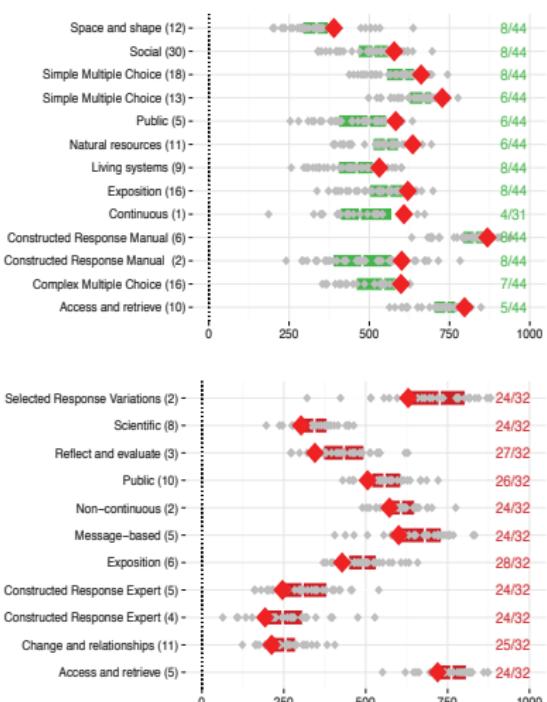
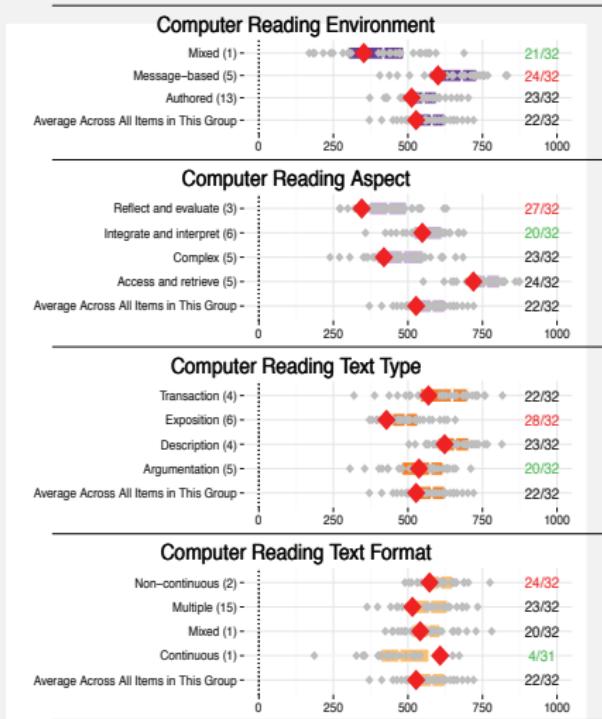
Each country is represented by a single dot
Permiles of solved items are presented, only items that match given condition



Name of the group of items
(number of items in the group)

The box shows 25th and 75 centiles
white line in the middle stands for median

Reported values are fractions x1000
(permiles)



Booklets design in different PISA studies

2000				
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	R1	R2	R4	
2	R2	R3	R5	
3	R3	R4	R6	
4	R4	R5	R7	
5	R5	R6	R1	
6	R6	R7	R2	
7	R7	R1	R3	R8
8			R8	R9
9			R9	R8

2003				
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	M1	M2	M4	
2	M2	M3	M5	
3	M3	M4	M6	
4	M4	M5		M7
5	M5	M6		
6	M6	M7		
7	M7			
8				M4
9				M5
10				M6
11			M1	M7
12			M2	
13		M1	M3	

2009				
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
1		R1	R3A	
2	R1		R4A	R7
3		R3A		
4	R3A	R4A		R2
5	R4A		R5	
6	R5	R6	R7	R3A
7	R6			R4A
8	R2			R6
9			R6	R1
10		R5		
11		R7	R2	
12	R7			
13		R2	R1	R5

2012				
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	PM5		PM6A	
2			PM7A	
3		PM6A		PM3
4	PM6A	PM7A		PM4
5	PM7A		PM1	PM5
6	PM1	PM2		PM6A
7	PM2		PM3	PM7A
8			PM4	
9		PM3	PM5	
10	PM3	PM4		PM1
11	PM4	PM5		PM2
12			PM2	
13		PM1		

