

UNIVERSITY OF OSLO

A quest for the factors associated with collaborative problem solving

Diego G. Campos
Doctoral research fellow
Centre for Educational Measurement (CEMO)





Search for objects that were not produced
through collaborative efforts

Collaborative Problem Solving

We are unsure about the extent to which students are prepared to face collaborative environments.

- Higher-level managers believed that college graduates do not have the skills needed for collaboration (AMA, 2012).
- College graduates believe they can work in a team (Schneider, 2015).



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Collaborative Problem Solving

The capacity of an individual to effectively engage in a process whereby two or more agents attempt to solve a problem by sharing their understanding and effort ... (OECD, 2017)

Social

- Participation
- Perspective taking
- Social regulation

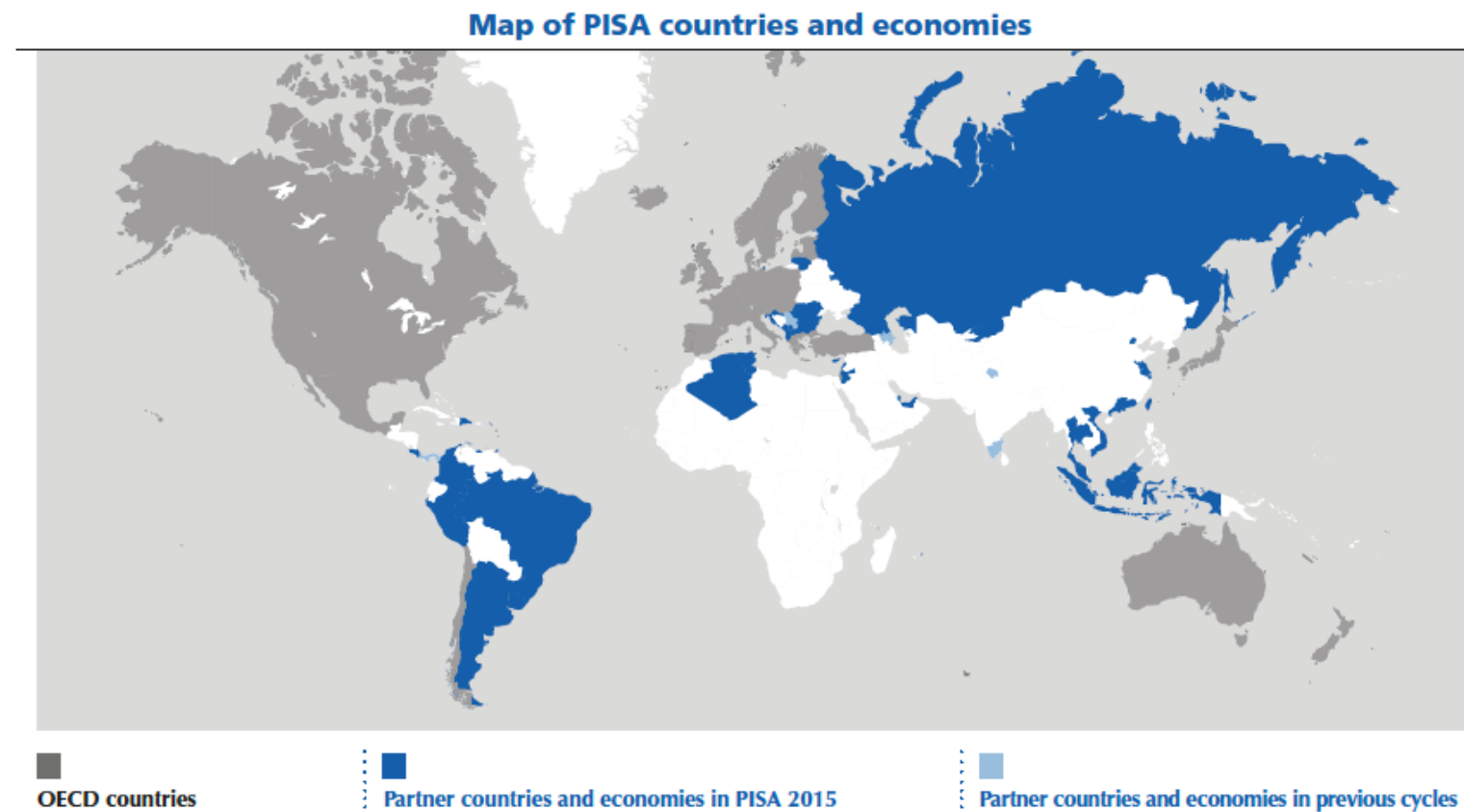
Cognitive

- Planning
- Executing
- Monitoring
- Flexibility
- Learning



CPS in Large-Scale Assessments

- Only 8% of students assessed were top performers in CPS.
- 22% of the students performed at the lowest proficiency level.



OECD, 2017

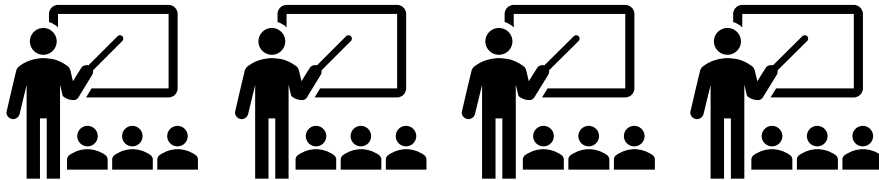
Photo by OECD, 2017



CPS in Large-Scale Assessments



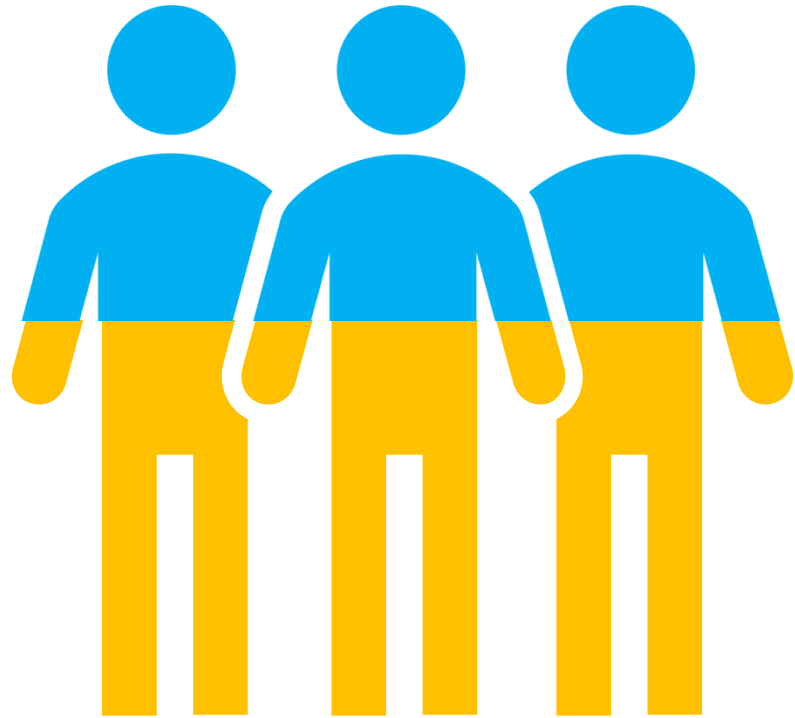
25%
9%



75%

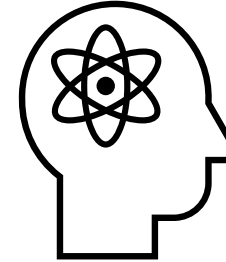


CPS in Large-Scale Assessments



38%

62%



55%

Attitudes Toward Collaboration

Altruistic interaction	Teamwork
I am a good listener.	I prefer working as part of a team to working alone.
I enjoy seeing my classmates be successful.	I find that teams make better decisions than individuals.
I take into accounts what others are interested in.	I find that teamwork raises my own efficiency.
I enjoy considering different perspectives.	I enjoy co-operating with peers.

- Students who valued more altruistic interactions had a better performance than students who did not value them.
- Students who valued teamwork tended to have lower performance than the students who did not value teamwork.



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Understanding Differences in CPS



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Attitudes Towards Collaboration



Collaborative Problem Solving



Methodology and Research Question

RQ: Are the attitudes toward collaboration scale scores comparable across the top and low achieving countries in CPS?

Method: We applied an IRT analysis to investigate the scale structure, the characteristics of the scale, and whether the items exhibit differential item functioning (DIF) across countries.



Results

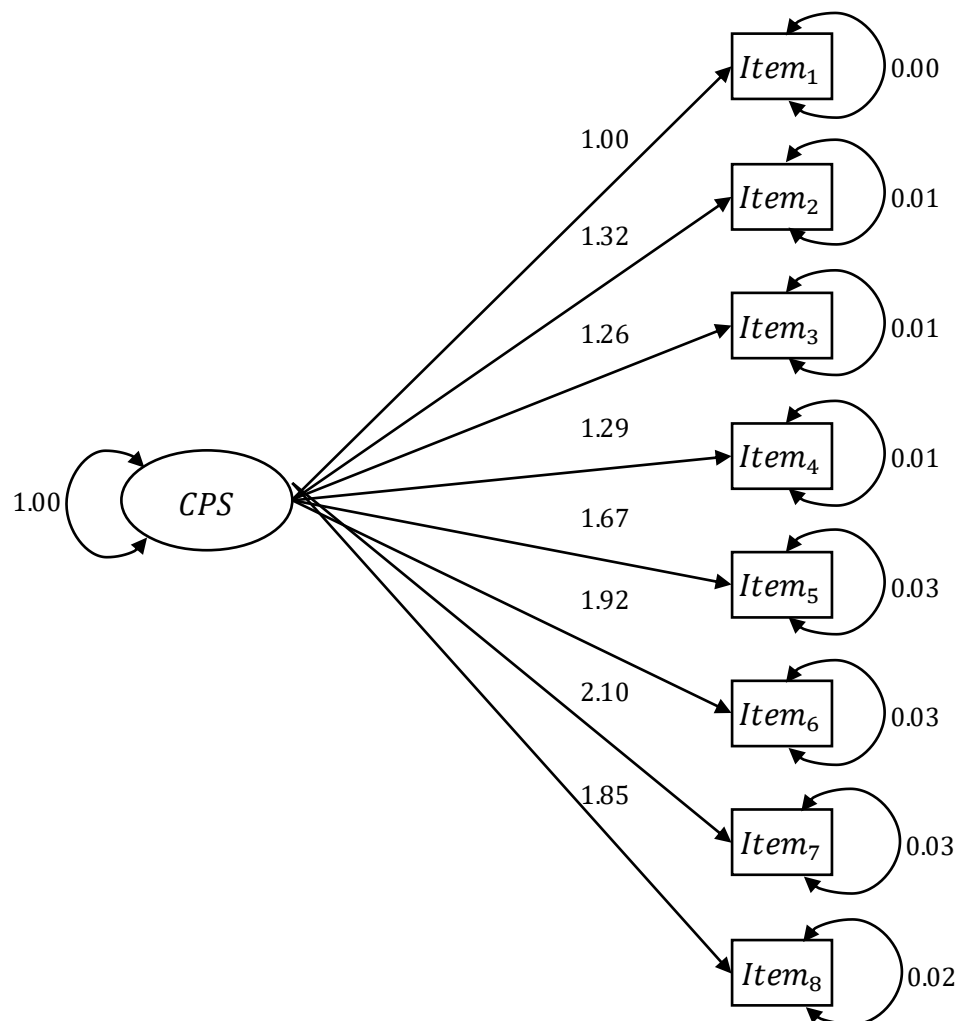
Table 1

Final sample size in PISA 2015 top and low 5% achieving countries in Collaborative Problem-Solving

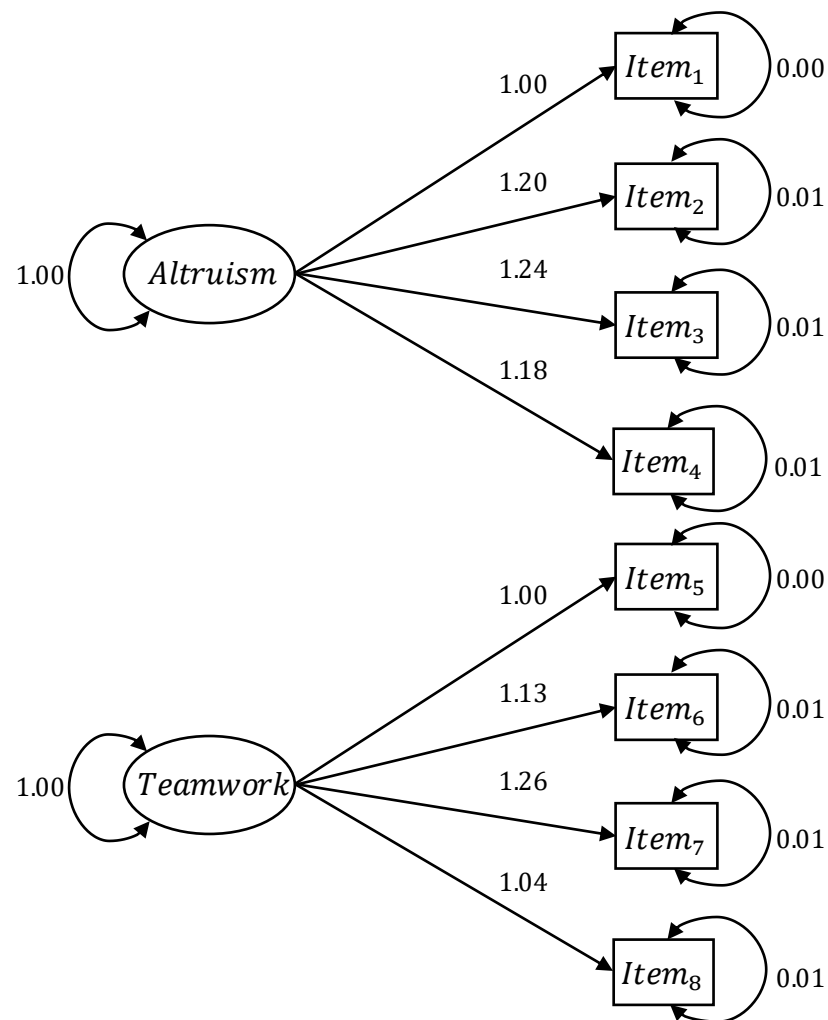
Country	n	Collaborative Problem-Solving Score
High Achieving Countries		
Singapore	6115	561.454
Japan	6647	551.675
Hong Kong	5359	540.789
Korea	5581	538.261
Canada	20058	535.391
Low Achieving Countries		
Turkey	5895	422.362
Peru	6971	417.805
Montenegro	55665	415.710
Brazil	23141	411.731
Tunisia	5375	381.594



Results



TLI = .79, RMSEA = .12, CFI = .85, AIC = 1254424, BIC = 1254573



TLI = .95, RMSEA = .05, CFI = .96, AIC = 1239728, BIC = 1239887

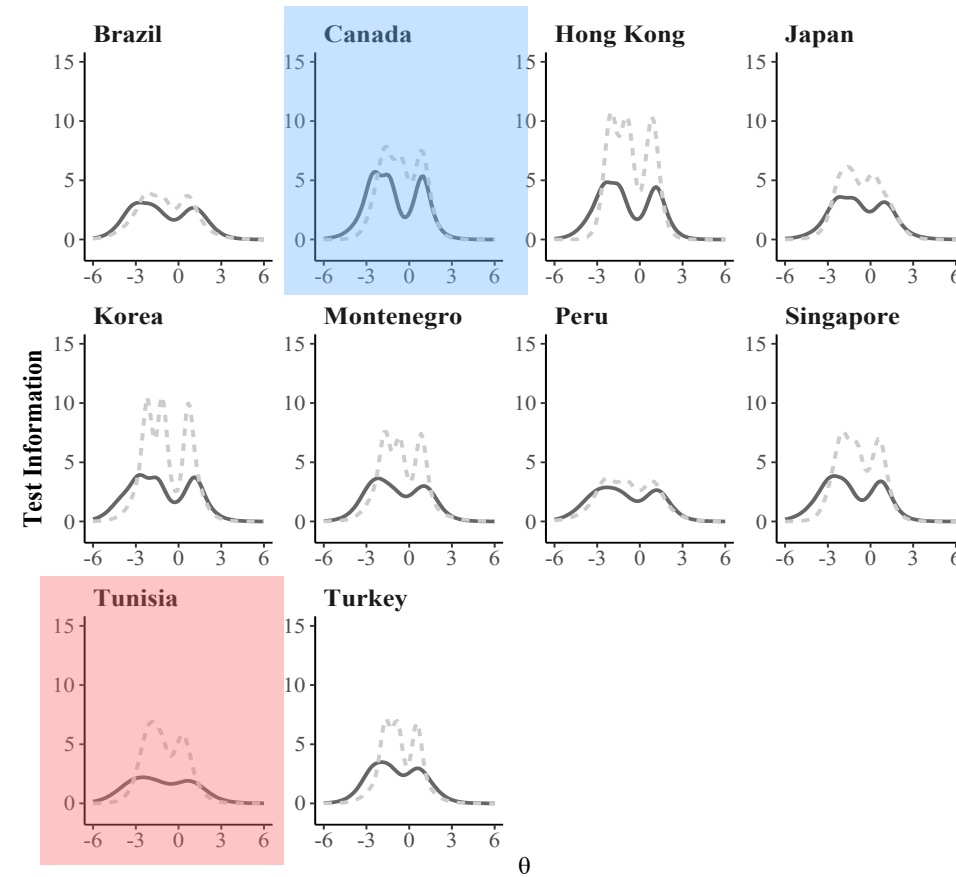
Likelihood-ratio test: $\chi^2(10) = 10890, p < .001$.



Results

Figure 1.

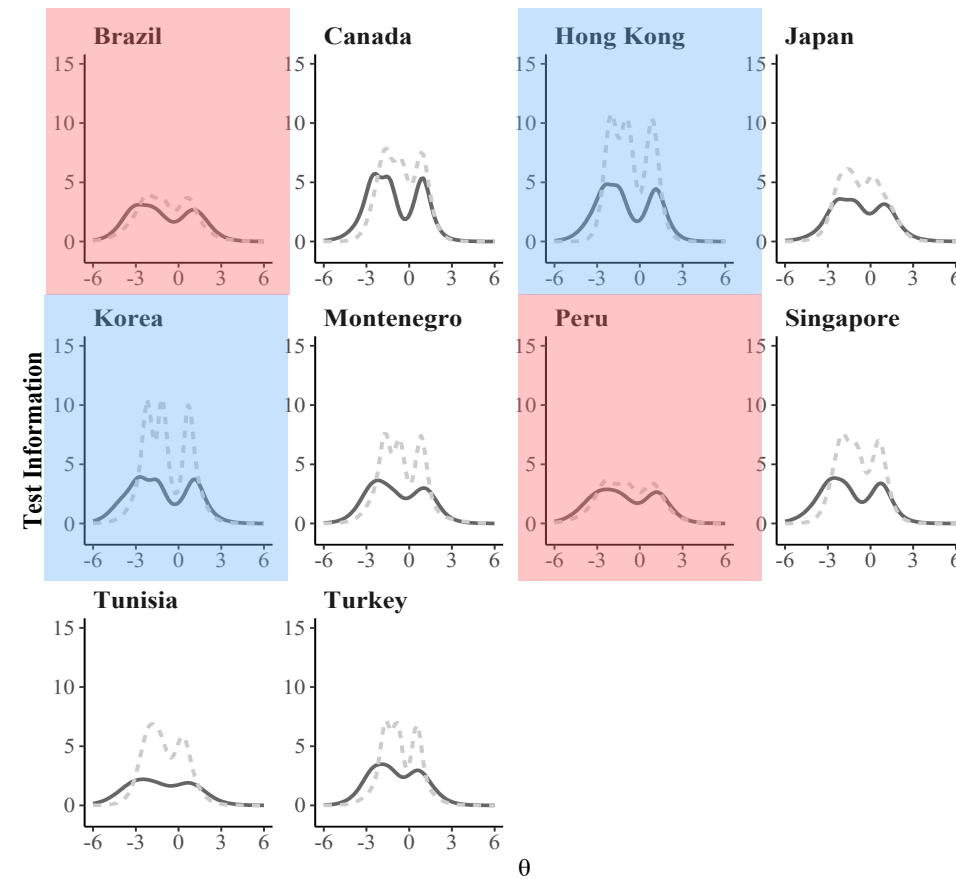
Test information function of the altruism and teamwork sub-scales.



Results

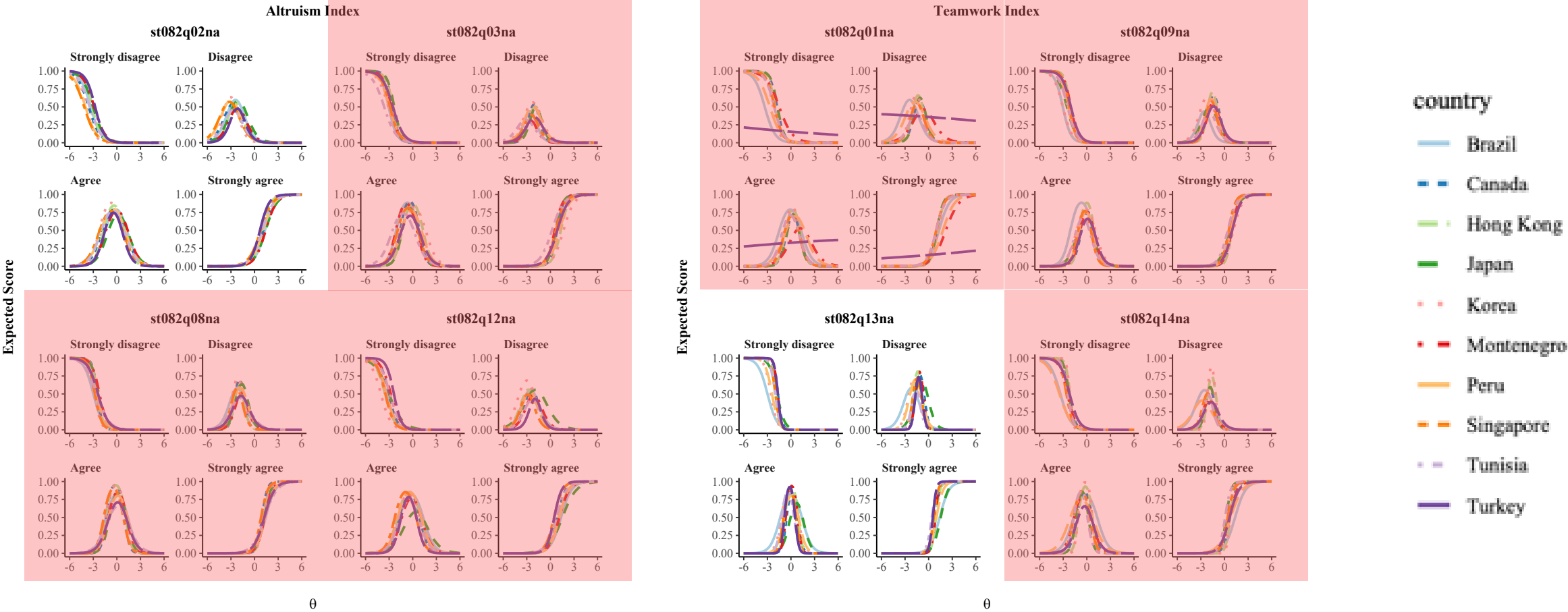
Figure 1.

Test information function of the altruism and teamwork sub-scales.



Results

Figure 3.
Item characteristic curves of the items from the altruism and teamwork sub-scales.



Conclusions

Attitudes toward collaboration is a multidimensional scale.

The attitudes toward collaboration scale is not cross-culturally comparable.

The use of the scale to make comparisons between students from different countries is not appropriate.





The End.

Twitter: [diegc_](#)
Email: diegogc@uio.no
Webpage: www.diegocampos.co

References

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Challenges in the assessment of CPS

- Construct complexity and how this influences task design in the context of generalisability.
- The use of empirical data that can provide evidence that relates to student performance in real life.
- Non-school based taught subjects.
- Cross-cultural validity of the assessments.

