Recovering Education: Using the Experiences and Learning Acquired to Build New and Better Education Systems 55
BCES Conference Books, 2023, Volume 21. Sofia: Bulgarian Comparative Education Society
ISSN 2534-8426 (online), ISSN 1314-4693 (print)
ISBN 978-619-7326-13-0 (online), ISBN 978-619-7326-14-7 (print)

Martin Boško, Hana Voňková, Ondřej Papajoanu & Angie Moore

A Comparison of Response Styles Between Different Groups of Czech and New Zealand Students Participating in PISA 2018

Abstract

International large-scale assessments, such as Programme for International Student Assessment (PISA), are a crucial source of information for education researchers and policymakers. The assessment also includes a student questionnaire, however, the data can be biased by the differences in reporting behavior between students. In this paper, we analyse differences in response styles of students in the Czech Republic and New Zealand based on data gathered in PISA 2018. The results show that Czech students use, on average, the acquiescence response style (ARS) and extreme response style (ERS) less than their counterparts in New Zealand. Contrarily, Czech students use, on average, the disacquiescence response style (DARS) more than students from New Zealand. A closer analysis according to the school type in the Czech Republic, showed that students from 4-year secondary general schools score, on average, the highest on ARS and ERS, but the lowest on DARS among all school types. The analysis in New Zealand according to the Year of study showed that students in Years 12-13 score, on average, the highest on ARS and ERS among all Year-of-study groups, the DARS values being similar across the Year-of-study groups. The mean ARS and ERS of each of the Czech school types remains below that of any of the New Zealand Year-of-study groups. For DARS, the mean score of the highest-scoring Year-of-study group in New Zealand (Years 9-10) remains below that of the lowest-scoring Czech school type (4-year secondary general school). Analysis of response styles is a crucial tool for the identification of some of the potential biases in student-reported data. Future research should take the differences in student reporting behavior into account and perhaps also employ other methodological approaches for their identification, such as the overclaiming technique.

Keywords: Czech Republic, New Zealand, PISA, student questionnaire, acquiescence response style, disacquiescence response style, extreme response style

Introduction

International large-scale assessments are a crucial source of information. They allow us to assess and compare the state of education in the world, providing valuable information to governments and policy makers, educators, researchers, as well as the general public (Bertling et al., 2016). One such assessment is the Programme for International Student Assessment (PISA) which focuses on 15-year-old students' reading, mathematics, and science literacy and is conducted triennially by the Organisation for Economic Co-operation and Development (OECD, 2019). The assessment also includes a student questionnaire collecting information on their

See on pages 298-300 how to cite the papers published in this volume.

attitudes, dispositions and beliefs, their homes, and their school and learning experiences (OECD, 2019). However, as these questionnaires heavily rely on Likert-scale items, the data can be biased by the differences in reporting behavior between students (Bertling et al., 2016). One of the approaches for the identification of these differences is the analysis of response styles (e.g., Baumgartner & Steenkamp, 2001; Buckley, 2009). The response styles analyse the tendency of a respondent to choose some response categories in Likert scale questionnaire items regardless of their content, which may reveal the differences in usage of the scale in various cultures and groups of respondents. Such analysis may include exploration of the acquiescent (the tendency to use extreme positive category, ARS), disacquiescent (the tendency to use extreme negative category, DARS), or extreme response style (the tendency to use both extreme positive and extreme negative categories, ERS; Baumgartner & Steenkamp, 2001; Buckley, 2009; Voňková et al., 2022).

The two countries under study (i.e., Czech Republic and New Zealand) were selected for the analysis to provide a comparison of response styles between two contrasting countries. The Czech Republic represents an inland, ethnically rather homogenous, post-communist country with one official non-English language (Czech). New Zealand represents an ethnically diverse island country with two official languages (English and Māori). Considering the PISA 2018 results in the Czech Republic, there were large differences in the performance of students from different school types as, for example, vocational schools with a VET (vocational education and training) certificate lag, on average, more than 100 points behind multi-year secondary general schools in each PISA discipline (Blažek et al., 2019). New Zealand then shows differences in results with regard to students' ethnicity as Māori and Pacific students score, on average, more than 50 points behind Asian and Pākehā/European students in each PISA discipline (May et al., 2019).

The aim of this paper is to compare the response styles of groups of students in the two countries using PISA 2018 student questionnaire data. The research questions are as follows:

- How do acquiescence, disacquiescence, and extreme response styles differ between the Czech and New Zealand students participating in PISA 2018?
- How do these response styles differ between Czech students from different types of schools and New Zealand students in different Years of study?

Methodology

Sample

We use data from the student questionnaire data set from the PISA 2018 study (OECD, n.d.), the main focus of which was on reading literacy. This paper uses data from 6,608 Czech students and 6,077 New Zealand students who had complete data about their school type/Year of study and response styles.

Students were grouped using a school variable. Due to the differences in education systems of both countries, students from each country were grouped based on a different school variable. The school variable chosen for Czech students was their school type, while New Zealand students were grouped based on their Year of study. The Czech sample consisted of several school types – basic schools (ISCED 2), multi-year secondary general schools and conservatoires (ISCED 2-3), 4-year secondary general schools (ISCED 3), vocational schools with Maturita exam (ISCED 3), and

vocational schools with a VET certificate (ISCED 3). Using ST001D01T for New Zealand students and the stratification variable for Czech students, we have identified:

- **Year of study of New Zealand students**: Years 9-10, Year 11, Years 12-13;
- **School type of Czech students**: basic school, 4-year secondary general schools, multi-year secondary general schools and conservatoires, vocational schools with Maturita exam, and vocational schools with a VET certificate.

Information about educational systems comes from governmental websites of individual countries.

Response styles

In this paper, three response styles will be considered. Acquiescence response style (ARS), disacquiescence response style (DARS), and extreme response style (ERS). Calculations are based on 4-point Likert-scale items found in a PISA student questionnaire with the scale *Strongly agree*, *Agree*, *Disagree*, and *Strongly disagree*. ARS, or the tendency to agree with items regardless of content, is calculated as a percentage of responses in which students chose the option *Strongly agree*. Analogically, DARS, or the tendency to disagree with items regardless of content, is a percentage of responses answered with *Strongly disagree*. ERS measure is a percentage of answers that the student responded with either *Strongly agree* or *Strongly disagree* (Buckley, 2009). Weighted mean and standard deviation calculations were made using the final student weight (W_FSTUWT).

Comparison of educational systems at primary and secondary level

In the Czech Republic, primary education (ISCED 1) concerns years 1-5 and occurs in basic schools. After five years, students may continue their lower secondary education (ISCED 2) in basic schools (years 6-9) or apply to 8-year secondary general schools for which students undergo entrance examinations. Additionally, students can also apply to 8-year conservatoires focused on music, dance, and theatre. Another possibility of transfer for basic school students is after the 7th year of basic school to a 6-year secondary general school. If students are admitted and transferred to the abovementioned schools, they typically also finish their upper secondary education (ISCED 3) at this facility. Students with finished lower secondary education may continue to ISCED 3 education in several ways. They can apply to 4-year secondary general schools, 6-year conservatoires, 4-year general field/vocational schools, or 2-year/3-year vocational schools with a VET certificate (výuční list in Czech). Education at upper secondary schools without a VET certificate is completed with a national standardised Maturita examination, which is a requirement for entry into tertiary education (MEYS, 2022).

In New Zealand, children can start school on the day they turn 5 (enrolling into Year 0 if they start in the second half of the year), meaning they do not have to wait for the start of the school year (ME NZL, 2022a). The education system is made up of 13 Year levels (ME NZL, 2022a). So-called ‘full’ primary schools cover Years 0-8, while ‘contributing’ primary schools cover Years 0-6. If students attend the latter school, they move on to intermediate school, which covers Years 7-8. After that children attend secondary school, which covers Years 9-13. Area schools and composite schools cover Years 0-13 in one school (ME NZL, 2022b). The national curriculum is not tied to Year, level (a stage of learning), or age, meaning each student progresses when they

have achieved the skills, knowledge and understating required. As a result, teachers teach students at multiple levels in their classes (ME NZL, 2022b). Students can also be taught in Kura Kaupapa Māori schools in Māori language where learning is based on Māori culture and values within a particular philosophy called Te Aho Matua (ME NZL, 2022c). These can include Years 1-8, which may be followed by Wharekura schools (Years 8-13), or they can include Years 1-13 (ME NZL, 2022c). Students unable to attend their local schools can enrol into Te Kura (The Correspondence School), which provides distance learning. Finally, Regional health schools are for students with significant health difficulties, where teachers teach students both in hospitals and at home (ME NZL, 2022c; ME NZL, 2022b). During Years 11-13, children are assessed by national standardised exams called *National Certificate of Educational Achievement* (NCEA), which they can achieve at three difficulty levels in a wide range of courses and subjects (NZQA, n.d.). NCEA is recognized by employers and it is also used for selection by tertiary institutions both in New Zealand and overseas (NZQA, n.d.).

Results

We first had a look at the mean values of response styles (ARS, DARS, ERS) in the two countries. The results are as follows:

- Czech Republic (N = 6,608): the mean ARS was 16.0% (SD = 12.64), while the mean DARS reached 11.7% (SD = 10.94). The mean ERS then reached 27.7% (SD = 19.00).
- New Zealand (N = 6,077): the mean ARS was 23.4% (SD = 15.40), the mean DARS was 9.5% (SD = 8.43), and the mean ERS reached 32.9% (SD = 19.34).

Then we also investigated how the values of response styles differ among different types of schools in the Czech Republic and among students in different Years of study in New Zealand. The results for the different types of Czech schools are as follows:

- Czech basic schools (N = 2,365): the mean ARS reached 15.4% (SD = 12.77), DARS reached 12.4% (SD = 11.72), and ERS reached 27.8% (SD = 19.76).
- 4-year secondary general schools (N = 865): the mean ARS was 19.2% (SD = 13.18), the mean DARS was 9.8% (SD = 7.55), and the mean ERS was 29.0% (SD = 17.54).
- Multi-year secondary general schools (N = 1,510): the mean ARS equaled 17.2% (SD = 12.06), the mean DARS equaled 11.7% (SD = 9.15), and the mean ERS equaled 28.8% (SD = 17.11).
- Vocational schools with Maturita exam (N = 1,290): the mean ARS equaled 16.0% (SD = 12.29), DARS equaled 10.8% (SD = 10.29), and ERS equaled 26.8% (SD = 18.37).
- Vocational schools with a VET certificate (N = 578): the mean ARS was 13.7% (SD = 12.47), the mean DARS was 12.2% (SD = 13.06), and the mean ERS was 25.9% (SD = 20.31).

The results for students in different Year of study in New Zealand are as follows:

- Years 9-10 (N = 379): the mean ARS reached 21.5% (SD = 15.13), the mean DARS reached 9.7% (SD = 8.98), and the mean ERS reached 31.2% (SD = 18.93).
- Year 11 students (N = 5,442): the mean ARS was 23.4% (SD = 15.37), the mean DARS was 9.5% (SD = 8.45), and the mean ERS was 32.9% (SD = 19.37).

- Years 12-13 students (N = 256): the mean ARS equaled 26.0% (SD = 16.05), the mean DARS equaled 9.6% (SD = 6.87), and the mean ERS equaled 35.5% (SD = 19.24).

Comparison of the countries

In their responses to Likert-scale items, students from New Zealand have, on average, higher values of ARS and ERS than their Czech counterparts (by 7.4% and by 5.2%, respectively). Czech students have, on average, a higher value of DARS than New Zealand students (by 2.2%). Moreover, the mean ARS of each of the Czech school types remains below that of any of the New Zealand Year-of-study groups – the highest-scoring Czech school type, 4-year secondary general school (19.2%), is lower than the lowest-scoring Year group 9-10 of students in New Zealand (21.5%). Similarly, for ERS, the highest-scoring Czech school type (4-year secondary general school, 29.0%) remains below the lowest-scoring Year-of-study group in New Zealand (Years 9-10, 31.2%). This is also true in reverse for DARS, where the highest-scoring Year-of-study group in New Zealand (Years 9-10, 9.7%) remains below the lowest-scoring Czech school type (4-year secondary general school, 9.8%).

Though the category of school type and Year of study is not comparable between the countries, we can see that within these country-specific categories, there are large discrepancies between students in ARS. Czech school types also differ in DARS, while New Zealand students remain fairly levelled across Years. Finally, when it comes to ERS, there is a notable difference between the Years 12-13 students and the Years 9-10 in New Zealand, while the most pronounced difference when it comes to the Czech Republic is between vocational schools with a VET certificate and both types of secondary general schools.

Conclusion

The results show that Czech students, on average, score lower on ARS and ERS, while having higher DARS compared to New Zealand students. Results from analysing the response styles of students according to their school type point towards heterogeneity among Czech students. The largest differences in response styles can be found between the 4-year secondary general schools and vocational schools with a VET certificate. When it comes to the Year of study of New Zealand students, the largest differences in ARS and ERS were found between Years 9-10 and Years 12-13 students, while Year 11 tended to be between these two groups. However, only negligible differences were found among the Year-of-study groups when it comes to the DARS values.

Analysis of response styles is a crucial tool for the identification of some of the potential biases in student-reported data. As the differences in student reporting behavior could lead researchers and policy makers to inaccurate conclusions based on such data, future research should take these differences into account and perhaps employ also other methodological approaches for reporting behavior differences identification and adjustment, e.g., the overclaiming technique. As our results show, such an analysis is fundamental not only for finding the differences in reporting behavior between different countries, but also for the identification of within-country heterogeneity in reporting behavior of students. Also, future research could also focus on an analysis of the changes in response styles in countries over time.

References

Baumgartner, H. & Steenkamp, J.-B. E. M. (2001): Response Styles in Marketing Research: A Cross-National Investigation. *Journal of Marketing Research*, 38(2), 143-156.

Bertling, J. P., Marksteiner, T. & Kyllonen, P. C. (2016): General noncognitive outcomes. In S. Kuger, E. Klieme, N. Jude & D. Kaplan (Eds.) *Assessing contexts of learning. Methodology of educational measurement and assessment* (pp. 251-281). Cham: Springer.

Blažek, R., Janotová, Z., Potužníková, E. & Basl, J. (2019): *Mezinárodní šetření PISA 2018: Národní zpráva*. Czech School Inspectorate.

Buckley, J. (2009): *Cross-national response styles in international educational assessments: Evidence from PISA 2006.* http://edsurveys.rti.org/PISA/documents/Buckley_PISAresponsestyle.pdf (Accessed 14 February 2023).

May, S., Jang-Jones, A. & McGregor, A. (2019): *PISA 2018: New Zealand summary report*. Wellington: Ministry of Education.

Ministry of Education [ME NZL] (2022a): Education in New Zealand. https://www.education.govt.nz/our-work/our-role-and-our-people/education-in-nz/ (Accessed 14 February 2023).

Ministry of Education [ME NZL] (2022b): Types of schools and year levels. https://www.education.govt.nz/school/new-zealands-network-of-schools/about/types-of-schools-and-year-levels/#Levels (Accessed 14 February 2023).

Ministry of Education [ME NZL] (2022c): Different types of primary and intermediate schools. https://parents.education.govt.nz/primary-school/schooling-in-nz/different-types-of-primary-and-intermediate-schools/ (Accessed 14 February 2023).

Ministry of Education, Youth and Sports [MEYS] (2022): Diagram of the education system of Czechia 2022/23. https://www.dzs.cz/sites/default/files/2023-01/Schema_vzdelavaciho_systemu_CR_23.pdf (Accessed 14 February 2023).

New Zealand Qualifications Authority [NZQA] (n.d.): How NCEA works. https://www.nzqa.govt.nz/ncea/understanding-ncea/how-ncea-works/ (Accessed 14 February 2023).

OECD (2019): *PISA 2018 Results (Volume I): What Students Know and Can Do*. Paris: OECD.

OECD (n.d.): *PISA 2018 Student questionnaire data file [Data set]*. https://www.oecd.org/pisa/data/2018database/ (Accessed 27 November 2022).

Voňková, H., Papajoanu, O. & Boško, M. (2022): Heterogenita ve způsobu odpovídání na dotazníkové položky u českých žáků v PISA 2012: Analýza dle kraje, typu a velikosti školy. *Studia Paedagogica*, 27(3), 127-159.

Acknowledgements

This conference contribution was made possible with the support of Czech Science Foundation's grant GA CR 21-09064S project "Heterogeneity in reporting behavior on surveys among different countries, schools and groups of students".

Mgr. Martin Boško, Charles University, Czech Republic
Assoc. Prof. Dr. Hana Voňková, Charles University, Czech Republic
Dr. Ondřej Papajoanu, Charles University, Czech Republic
Angie Moore, M.A., Charles University, Czech Republic