ANALYZING THE DIFFERENCES IN THE REPORTING OF FAMILIARITY WITH (MATHEMATICAL) ITEMS WITH FOCUS ON ASIAN COUNTRIES

ANALÝZA ROZDÍLŮ V REPORTOVÁNÍ OBEZNÁMENOSTI S (MATEMATICKÝMI) POLOŽKAMI SE ZAMĚŘENÍM NA ASIJSKÉ ZEMĚ

Hana Voňková[1], **Ondřej Papajoanu**[1], **Jo-Yu Lee**[1]

[1] Department of Education, Faculty of Education, Charles University, Prague

Abstract

In research, there has been a concern about the cross-cultural comparability of student self-reports. Researchers have found differences in the way students from different countries and world regions report their knowledge. This contribution aims to analyze the response patterns of Asian countries using the PISA 2012 overclaiming data. We show that the response pattern of Asian countries differs from that of non-Asian countries. Also, we found big differences in the patterns among Asian countries. We discuss the consequences of these differences for the comparability of student self-reports.

Keywords: *self-reports, overclaiming technique, PISA, Asian countries*

Abstrakt

V současném výzkumu se často objevuje problematika mezikulturní porovnatelnosti žákovského sebehodnocení. Byly nalezeny rozdíly v tom, jak žáci z různých zemí a světových regionů reportují své znalosti. Tento příspěvek má za cíl analyzovat způsob reportování vlastních znalostí žáky z asijských zemí na základě dat pro overclaiming z PISA 2012. Výsledky ukazují, že způsob reportování vlastních znalostí se liší mezi asijskými a neasijskými zeměmi. Velké rozdíly pak byly též nalezeny v rámci asijských zemí. Jsou diskutovány důsledky těchto rozdílů pro porovnatelnost žákovského sebehodnocení.

Klíčová slova: *sebehodnocení, overclaiming technique, PISA, asijské země*

1 Introduction

In research, there has been a concern about the cross-cultural comparability of student self-reports. Using the overclaiming technique (OCT), researchers have found differences in the way students from different countries and world regions report their knowledge (Vonkova et al., 2018). Asian countries have been paid particular attention due to their specific response patterns (e.g., He & van de Vijver, 2016). This contribution aims to analyze the response patterns of Asian countries in more detail using the PISA 2012 overclaiming data. Also, a comparison with non-Asian countries is made.

2 Theoretical background

When making cross-cultural comparisons, biases in the data can lead researchers to inaccurate conclusions (e.g., van de Vijver & Tanzer, 2004). Indeed, paradoxical results attributable to cross- cultural differences in the way respondents use rating scales have been found (He & van de Vijver, 2016). The overclaiming technique has been proposed to identify these differences. It is based on respondents reporting their familiarity with existing items (reals) from a certain field of knowledge (e.g., history) and nonexisting items (foils; Vonkova et al., 2018). Previous research has revealed low levels of reported familiarity with foils in East Asian countries like Korea and Japan (He & van de Vijver, 2016; Vonkova et al., 2018). These findings have been interpreted culturally as the Confucian value system emphasizes modesty and self-criticism (He & van de Vijver, 2016). The findings for South-East Asian countries like Indonesia and Vietnam were more varied (Vonkova et al., 2018).

3 Methods

Using the OCT, researchers can gain for each respondent information on his or her reported familiarity with reals, reported familiarity with foils, on his or her accuracy in distinguishing between reals and foils, and on his or her overall tendency to report familiarity with both reals and foils (for more, see Vonkova et al., 2018). We use the overclaiming data in the domain of mathematics for PISA 2012 participating countries. In the study, students were asked:

Thinking about mathematical concepts: how familiar are you with the following terms? They reported their familiarity with both reals (e.g., *linear equation*) and foils (e.g., *declarative fraction*) on a five-point scale ranging from (1) *never heard of it* to (5) *know it well, understand the concept.*

4 Results

Our results show that, on average, students from Asian countries report higher familiarity with reals and lower familiarity with foils than students from non-Asian countries. However, there are notable differences in response patterns among Asian countries. Students in South-East Asian countries Indonesia and Malaysia report, on average, markedly lower familiarity with reals and markedly higher familiarity with foils than students in East Asian countries like China (Shanghai) and Korea. Thus, students in Indonesia and Malaysia are less accurate in distinguishing reals and foils than students in Shanghai and Korea. In general, gender differences in reporting familiarity with foils are greater for non-Asian than Asian countries, with males reporting higher familiarity. In most Asian countries, male students report significantly higher familiarity with foils than girls. However, in Indonesia and Malaysia, girls report (nonsignificantly) higher familiarity with foils than boys.

5 Conclusion and discussion

Our findings suggest that Asian countries cannot be considered a uniform region in terms of student response patterns. While students in many Asian countries report, on average, high familiarity with reals and low familiarity with foils (see also He & van de Vijver, 2016; Vonkova et al., 2018), there are exceptions to this pattern like Indonesia and Malaysia. In these two countries, students' ability to discriminate between reals and foils is, on average, low. Also, the significant gender difference in reported familiarity with foils observed in most Asian countries was not found in these countries. Researchers should further examine the differences in response patterns not only across world regions, but also between individual countries within these regions and seek if these could be explained in terms of cultural influences. Also, the further development of methodological approaches that would allow to identify and adjust for these differences is warranted.

Acknowledgment

This study was supported by the Czech Science Foundation as the project GA ČR 21-09064S Heterogeneity in reporting behavior on surveys among different countries, schools and groups of students.

6 References

He, J., & van de Vijver, F. J. R. (2016). The motivation-achievement paradox in international educational achievement tests: Toward a better understanding. In R. B. King & A. B. I. Bernardo (Eds.), *The psychology of Asian learners: A festschrift in honor of David Watkins* (s. 253–268). Springer Science. https://doi.org/10.1007/978-981-287-576-1_16

Van de Vijver, F., & Tanzer, N. K. (2004). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology*, *54*(2), 119–135. https://doi.org/10.1016/j.erap.2003. 12. 004

Vonkova, H., Papajoanu, O., & Stipek, J. (2018). Enhancing the cross-cultural comparability of self- reports using the overclaiming technique: An analysis of accuracy and exaggeration in 64 cultures. *Journal of Cross-Cultural Psychology*, *49*(8), 1247–1268. https://doi.org/10.1177/0022022118787042