

---

## Editorial

---

### Ze Wang

Department of Educational, School and Counseling Psychology,  
University of Missouri,  
16 Hill Hall,  
Columbia, MO 65211, USA  
Email: wangze@missouri.edu

**Biographical note:** Ze Wang is an Associate Professor of Statistics, Measurement and Evaluation in Education at the University of Missouri. Her research integrates substantive theories (e.g. expectancy-value theory, self-determination theory, social comparison theory) and state-of-the-art quantitative methods to understand student learning processes and outcomes. Her research interests include statistical modelling using large-scale educational assessment data, measurement, scale development, and program evaluation.

---

Large-scale educational assessments such as the National Assessment of Educational Progress (NAEP), the Early Childhood Longitudinal Study Kindergarten Class of 1998–99 (ECLS-K), the Education Longitudinal Study of 2002 (ELS:2002), the Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS) and the Programme for International Student Assessment (PISA), have been increasingly used to address issues and to answer research questions in educational research, thanks to the quality and representativeness of the data for targeted populations. Due to their large-scale nature, these data are also frequently used to illustrate statistical and psychometric methods.

For this special issue *Large-Scale Educational Assessments*, five papers that represent different usage of large-scale educational data are selected. The first paper, by Mendoza et al. (2017), provides an overview of large-scale surveys conducted by the United States' National Center for Education Statistics (NCES) that are related to postsecondary education. They also conducted content analysis as a snapshot of how NCES data have been used in research. Based on their results, they made recommendations to researchers and to NCES regarding how to best make use of the valuable large-scale educational survey data.

The second and third papers, by Chiu (2017) and Eklöf and Knekta (2017), respectively, took advantage of multiple large-scale datasets to test substantive theories. Specifically, Chiu used the Millennium Cohort Study (MCS) data by the UK Data Service to test an extended internal/external frame of reference model; Eklöf and Knekta used the Swedish portion of the TIMSS Advanced 2008 and PISA 2012, as well as the Swedish Scholastic Assessment Test (SweSAT), and the Swedish National Tests in mathematics and the science subjects, in order to understand students' test-taking motivation and its association with test performance. It is noteworthy that both papers used data that are appropriate to examine the substantive research questions within a country. However, their findings may be generalised to other contexts when data from those contexts are available.

The fourth paper, by Finch (2017), introduces a new method - Structural Equation Modelling Trees (SEMtree) - for assessing invariance of measures across many groups, and applies existing methods and the new method to PISA 2009 data. Finch found that there was a lack of invariance of model parameters for the latent factor of reading attitude across nations, and that it was possible to group nations with equivalent factor loadings and intercepts using splitting variables for the SEMtree.

The fifth paper, by Park and Wu (2017), proposes and tests a Differential Options Functioning method. They provide a procedure to detect differential functioning of all response options under the multinomial logistic regression framework, and apply the procedure to PIRLS 2011 data.

The collection of articles in this special issue largely represents the use of large-scale educational assessments for testing substantive educational and psychological theories, and for illustrating new and innovative quantitative methodological developments. Large-scale educational assessments include both national (e.g., NAEP, ECLS-K, etc.) and international (e.g., TIMSS, PIRLS, PISA, etc.) ones. At the national level, countries, such as the USA and the UK provide online portals and repositories that allow easy access to the data and to some summary statistics. At the international level, some of the databases that were initiated by one country have become possible because of concerted effort among all the nations involved. Results from TIMSS, PIRLS and PISA are even important to shape national educational policies, and to change curricula, and instruction and teaching practices (Wagemaker, 2014). Nevertheless, among researchers, there may still be a lack of wide use of these large-scale educational assessment data. By having this special issue, I hope researchers in the USA and other countries become aware and make more use of these databases to answer research questions and to advance methodological developments.

## References

- Chiu, M. (2017) 'Extending the internal/external frame of reference model to early-year cognitive abilities for children from diverse backgrounds', *International Journal of Quantitative Research in Education*, Vol. 4, Nos. 1-2, pp.31-51.
- Eklöf, H. and Knekta, E. (2017) 'Using large-scale educational data to test motivation theories: a synthesis of findings from Swedish studies on test-taking motivation', *International Journal of Quantitative Research in Education*, Vol. 4, Nos. 1-2, pp.52-71.
- Finch, W.H. (2017) 'Structural equation modelling trees for invariance assessment', *International Journal of Quantitative Research in Education*, Vol. 4, Nos. 1-2, pp.72-93.
- Mendoza, P., Zhou, E., Abdelmalek, M.N. and Wang, Z. (2017) 'Higher education surveys from United States' National Center for Education Statistics', *International Journal of Quantitative Research in Education*, Vol. 4, Nos. 1-2, pp.3-30.
- Park, M. and Wu, A.D. (2017) 'Investigating differential options functioning using multinomial logistic regression', *International Journal of Quantitative Research in Education*, Vol. 4, Nos. 1-2, pp.94-119.
- Wagemaker, H. (2014) 'International large-scale assessments: from research to policy', in Rutkowski, L., von Davier, M. and Rutkowski, D. (Eds.) *Handbook of International Large-Scale Assessment: Background, Technical Issues, and Methods of Data Analysis*. Boca Raton, FL: Taylor & Francis, pp.11-36.