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Issues and Methodologies in Large-Scale Assessments

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Copies of this publication can be obtained from:

IERInstitute
IEA Data Processing and Research Center
Mexikoring 37
22297 Hamburg,
Germany

IERInstitute
Educational Testing Service
Mail Stop 13-E
Princeton, NJ 08541,
United States

By email: ierinstitute@iea-dpc.de
Free downloads: www.ierinstitute.org

Copyeditors: Paula Wagemaker, Editorial Services, Oturehua, Central Otago, New Zealand
with David Robitaille, Ruth R. Greenwood, and Tom Loveless
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Introduction

Dirk Hastedt (Editor)
IEA Data Processing and Research Center, Hamburg, Germany

Matthias von Davier (Editor)
Educational Testing Service, Princeton, New Jersey, United States

The IEA-ETS[1] Research Institute (IERI) undertakes activities focused on three broad areas of work: research studies related to the development and implementation of large-scale assessments of educational outcomes, professional development and training, and dissemination of research findings and information gathered through large-scale assessments. Part of IEA and ETS's collaborative work focuses on improving the science of large-scale assessments. The IERI series *Issues and Methodologies in Large-Scale Assessments* is the institute's vehicle for disseminating research findings and helping to improve understanding of the science of large-scale assessments.

This fifth volume of our periodical includes four papers and a technical note. The four papers all make use of IEA international study data—three of them use IEA Progress in Reading Literacy Study (PIRLS) data and the fourth uses IEA Trends in International Mathematics and Science (TIMSS) data. The first two papers are methodological in nature. They deal with actual issues in large-scale assessment studies. The latter two deal more with the content of these studies and what we can learn from them. Interestingly, there is also a link in terms of content between the first and the third papers because both focus on SES measures, the first more from the contextual side, and the third more from a country perspective. The technical note discusses an important analytic matter of considerable relevance for researchers, namely, sampling weights and resampling procedures.

The first paper, "Measuring Family Socioeconomic Status: An Illustration Using Data from PIRLS 2006" by Daniel H. Caro and Diego Cortés, shows how to develop an indicator of socioeconomic status (SES) in international large-scale assessments (ILSA). A good number of analyses of ILSA data make use of SES indicators, mostly in order to eliminate the effect of SES in their models and thereby achieve "pure" results that are not influenced by students' SES. For this purpose, it is essential to have a good measure of the students' SES. This paper should help researchers reflect on SES measures and develop an SES measure that is best suited to their respective analyses.

1 International Association for the Evaluation of Educational Assessment-Educational Testing Service.

"Estimating Linking Error in PIRLS" by Michael O. Martin, Ina V. S. Mullis, Pierre Foy, Bradley Brossman, and Gabrielle M. Stanco analyzes the effect of linking errors across study cycles. When the history of ILSA began, the studies were one-time assessments, but today all major ILSAs also assess trends in achievement. This development has created new challenges, such as how to quantify errors when comparing data from two different cycles. The study examines the linking error between PIRLS 2001 and PIRLS 2006, a practice that hopefully all ILSAs providing trend measures will adopt in order to ensure reliable comparisons across cycles.

"Exploring the Measurement Profiles of Socioeconomic Background Indicators and Their Differences in Reading Achievement: A Two-Level Latent Class Analysis" by Kajsa Yang Hansen and Ingrid Munck also analyses SES information. The authors, using Swedish data from PIRLS 2006, split up different components of SES and then categorized students in terms of those components. From there, they analyzed the reading achievement of the students in the different groups and drew conclusions about potential explanatory mechanisms. This paper is interesting not only in terms of presenting an application of an innovative analytical approach but also in terms of the substantive conclusions drawn. The analytical approach the authors used might inspire other researchers when conducting their analyses.

The fourth paper, "Leadership, Learning-Centered School Conditions and Mathematics Achievement: What Can the United States Learn from Top Performers on TIMSS?" by Nianbo Dong and Xiu Chen Cravens, demonstrates how ILSA can be used to contrast national data from a specified country with the data from other countries. The authors compared school-level information from TIMSS 2007 and its relationship to achievement outcome measures in the United States to corresponding data from Taipei, Korea, Singapore, Hong Kong SAR, and Japan, some of the highest achieving countries in the study. The authors found both similarities and differences in achievement across the different cultural contexts. This article shows not only the possibilities but also the limitations of ILSAs.

The last contribution, "Rescaling Sampling Weights and Selecting Mini-Samples from Large-Scale Assessment Databases," by Eugenio J. Gonzalez, explains how to deal with large databases and how to subsample students from such databases. LSA databases are getting bigger and bigger, and despite increased computing power, researchers are finding many analytic procedures a challenge, and even more so given the models used for these analyses are becoming ever more complex. Also, it is essential that researchers know how to draw samples whenever they conduct analyses which require equal contribution from subsets of the participants or when they want to test models in several subsamples. The author of this technical note not only explains the principal techniques but also provides source code for SPSS to assist researchers in their analyses.

We are extremely pleased with the selection of high-quality papers presented in this fifth issue. We hope that you will find them interesting and inspiring for your own research. We also hope that you will consider supporting this periodical by submitting your own methodological research on international large-scale assessments to IERI.

ABOUT IEA

The International Association for the Evaluation of Educational Achievement (IEA) is an independent, non-profit, international cooperative of national research institutions and governmental research agencies. Through its comparative research and assessment projects, IEA aims to:

- Provide international benchmarks that can assist policymakers to identify the comparative strengths and weaknesses of their education systems;
- Provide high-quality data that will increase policymakers' understanding of key school-based and non-school-based factors that influence teaching and learning;
- Provide high-quality data that will serve as a resource for identifying areas of concern and action, and for preparing and evaluating educational reforms;
- Develop and improve the capacity of educational systems to engage in national strategies for educational monitoring and improvement; and
- Contribute to development of the worldwide community of researchers in educational evaluation.

Additional information about IEA is available at www.iea.nl and www.iea-dpc.de.

ABOUT ETS

Educational Testing Service (ETS) is a non-profit institution whose mission is to advance quality and equity in education by providing fair and valid assessments, research, and related services for all people worldwide. In serving individuals, educational institutions, and government agencies around the world, ETS customizes solutions to meet the need for teacher professional development products and services, classroom and end-of-course assessments, and research-based teaching and learning tools. Founded in 1947, ETS today develops, administers, and scores more than 24 million tests annually in more than 180 countries, at over 9,000 locations worldwide.

Additional information about ETS is available at www.ets.org.