

**THE MEASUREMENT, EVALUATION, STATISTICS, AND ASSESSMENT
DEPARTMENT**

Invites you to Attend the Final, Public Dissertation Defense for:

Martin John Hooper

Titled:

**Applying the Pseudo-Panel Approach to International Large-Scale
Assessments:
A Methodology for Analyzing Subpopulation Trend Data**

The defense will be held on

**Tuesday, June 27th, 2017 at 10:00 am,
in
188 Beacon Street, Conf. Room 04**

Dissertation Committee:

**Dr. Ina Mullis (Chair), Dr. Henry Braun, Dr. Jan-Eric Gustafsson, Dr. Michael
Martin (Readers)**

TIMSS and PIRLS assess representative samples of students at regular intervals, measuring trends in student achievement and student contexts for learning. Because individual students are not tracked over time, analysis of international large-scale assessment data is usually conducted cross-sectionally. Gustafsson (2007) proposed examining the data longitudinally by analyzing relationships between country-level trends in background constructs and trends in student achievement. Through longitudinal analysis of international large-scale assessment data, it becomes possible to mitigate some of the confounding factors in the analysis.

This dissertation extends this country-level approach to subpopulations within countries. Adapting a pseudo-panel approach from the econometrics literature (Deaton, 1985), the proposed approach creates subpopulations by grouping students based on demographic characteristics. Following grouping, the subpopulations with the same demographic characteristics are linked across cycles and the aggregated subpopulation means are treated as panel data and analyzed through longitudinal data analysis techniques. As demonstrated herein the primary advantages of the subpopulation approach are that it allows for analysis of subgroup differences, and it captures within-country relationships in the data that are not possible to analyze at country level.

This dissertation illustrates the subpopulation approach through analysis of the relationship between early literacy activities and PIRLS reading achievement. Results from the subpopulation approach are compared with student-level and country-level cross-sectional results as well as country-level longitudinal results. In addition, multiple group analysis examines differences in regression coefficient estimates between boys and girls and across parental education subgroups, and mediation analysis examines to what extent partaking in early literacy activities can explain differences between boys and girls in PIRLS reading achievement.