***Specific Guidelines for Coordinated Paper Sessions***

*Proposals must consist of*

1. *a title of no more than 12 words,*
2. *an abstract of no more than 50 words (for inclusion in the final program),*
3. *a summary of research of no more than 800 words, and*
4. *references, tables, and figures as appropriate.*

*References, tables, and figures do not count toward the word limits.*

*The summary should include research questions, methods, and findings.*

*The Program Committee also strongly recommends that authors include the practical implications of their research (see the Evaluation and Review Criteria below).*

**TITLE**

Examining the Robustness and Comparability of PROX estimation with know item parameters.

**ABSTRACT**

OPITION 1: This study examines the robustness and comparability of a non-iterative estimation method (PROX) with more common estimation methods when item parameters are known. A simulation was conducted to manipulate the person ability distribution, item difficulty distribution, and sample size.

OPTION 2: This study investigates the effects of person ability distribution, item difficulty distribution, and sample size on the robustness and comparability of a non-iterative estimation method (PROX) with more common estimation methods when item parameters are known.

*800-word max*

**INTRODUCTION**

Iterative estimation procedures have been universally adopted for Item Response Theory and Rasch Measurement Theory software packages. These iterative methods are used to produce estimates of person ability even in situations where item difficulty is known, such as exams delivered via calibrated item banks. Under a Rasch Measurement paradigm, it may be argued that in situations where all item parameters are fixed, determining person ability is more calculation than estimation.

Cohen (1979) introduced PROX, a non-iterative method for estimating Rasch measures when data are complete and both items and persons are approximately normally distributed. A method for hand calculating PROX is shown in Wright and Stone (1979, CH 2). Although not widely applied as a stand-alone estimation method, non-iterative PROX does provide the initial estimates for Joint Maximum Likelihood Estimation in Winsteps. Linacre (1994) describes iterative PROX estimation equations for missing data. When item parameters are fixed, this iterative version of PROX becomes non-iterative.

This study examines three primary research questions:

1. How robust is non-iterative PROX to violations of the distributional assumptions for items and persons;
2. How robust is non-iterative PROX to sample size fluctuations; and
3. How do estimates produced by non-iterative PROX compare to other common estimation methods under the conditions set in the first two research questions.

**METHODS**

Simulate multiple person and item distributions as well as sample sizes.

Compare with different iterative estimation methods: JMLE, CMLE, MMLE.

**RESULTS**

**DISCUSSION**

*Practical Implications*

*Limitations*

**REFERENCES**

Cohen, L. (1979). Approximate expressions for parameter estimates in the Rasch model. *British Journal of Mathematical and Statistical Psychology*, *32*(1), 113–120. https://doi.org/10.1111/j.2044-8317.1979.tb00756.x

Linacre, J. M. (1994). PROX with missing data, or known item or person measures. *Rasch Measurement Transactions*, *8*(3), 378.

Wright, B. D., & Stone, M. H. (1979). *Best Test Design*. MESA Press.