

# IRT Modeling for Latent Variable in Complex Surveys

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## **Abstract**

Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY) is one of many surveys that use IRT to derive latent variable measurement. Like many of STC's survey, the sampling design is a multi-staged stratified one. Item response theory (IRT) offers many advantages to researchers who need to quantify children's reading and writing abilities, and for this reason, IRT methods have been adopted in Statistics Canada's National Longitudinal Survey for Children and Youth. The presentation will outline the many steps taken by Statistics Canada to apply psychometric techniques to derive appropriately measured items parameters in the construction of assessment tools and to derive relevant ability scores for children to support longitudinal analysis. This will be an opportunity to showcase some of the research efforts and findings from the last few years of the issues of psychometric testing in a complex setting of longitudinal data and surveys with complex designs. Specific empirical results based on NLSCY data will be provided, including:

1. the potential for biases due to ignoring survey weights;
2. the impact of survey design on variances of parameter estimates;
3. biases in the distribution of ability predictors, and the dependence of this bias on test length.