

Assessing Individual Change with Item Response Models

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The tradition of statistical assessment of individual change trades back at least to the 90ies of the last century. These “classical” approaches basically build on the standard error of measurement (S.E.M), which, in turn, is based on an estimation of reliability. Therefore, a simple “score difference divided by S.E.M.”-index has been termed “Reliable Change Index”, RCI. With the uprise of Item Response Theory models (IRT), the same principle has been adopted. However, the multitude of available models here allows for various ways to calculate an RCI_{IRT} . Interestingly, these variants have not been discussed in great detail, although they will likely deliver different results.

The current study explores the effect of different IRT modelling strategies have on the results in a large simulation study and a real-data application of a clinical study involving the BDI-II. The simulation study involves separate, multi-group, and multi-dimensional calibration. From the results, the third variant turns out optimal, because it takes into account the correlation of the repeated measurement. Similarly, the real-data application also revealed large differences of the various techniques.