**Deconstructing the Question of the Fit of Data to Measurement Models**

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Abstract

The fit of the data to the measurement model is a fundamental requirement of all Rasch measurement models. Without the fit of the data to the model, all of the beneficial properties of Rasch measurement do not hold. This is the source of the phrase “…. if and only if the data fit the model”. These properties include: Invariant estimation of item parameters required for equating, invariant estimation of person parameters required for CAT, and linear scales required for parametric statistical analysis of person measures, to name just a few. There are several important issues that are highlighted. First, the search for the single best item fit statistic is doomed to failure. The nature of measurement disturbances that are present in student’s responses are too complex for a single fit statistic to detect efficiently. Multiple fit statistics are needed for a comprehensive detection of measurement disturbances. Second, the issue of the Type I error rates for the various tests to detect the measurement disturbances that pose important threats is important. Third, the issue of the power of the various tests to detect the types of measurement errors that pose serious threats to the interpretation of the results. Finally, there is the issue of unweighted and weighted versions of the fit statistics. The unweighted (UT) and weighted (WT) versions of the zstd statistic in Winsteps lack the power to detect differential subpopulation performance necessary for the data to fit the Rasch model.