What's to Learn in Psychometrics?

Ben Wright

I. BASICS
A. The only theory useful to you is one you know well enough to invent and verify
B. The distinction between quantitative differences of degree and qualitative differences of kind
C. The necessity and opportunity for social science to be as quantitative as physics
D. A useful variable is a workable fiction indicating quantities of one and only one thing
E. For a measure to have meaning, its line of increase must be benchmarked by calibrated explanatory item content
F. How to construct useful measurement from ordered nominal observations

II. MEASUREMENT
A. Observations must be replicated to accumulate and focus the information they are intended to imply
B. Counts of replicating observations are the scores necessary to construct measures
C. Scores must be statistically sufficient for measurement to occur
D. But scores are not measures because:
   1. Scores are ordinal - not linear (additive)
   2. Scores are test and sample dependent - not objective
   3. Scores, on their own, cannot be validated
E. Measures, in contrast to scores, are:
   1. Additive, linear, interval
   2. Objective, invariant, generalizable
   3. Error qualified for their estimation unreliability
   4. Fit validated for their one dimensional coherence
F. When the score-to-measure function necessary to satisfy any reasonable measurement requirement is deduced, the Rasch model is found to be the necessary and sufficient result - this means that:
   1. Fit to the Rasch model is the necessary and sufficient condition for constructing measurement from data
   2. Only data which can be made to fit the Rasch model can be useful for constructing measurement

III. STATISTICS
A. Are never perfectly reliable
   1. Their inherent error must be estimated and reported
   2. Inferences about measure distributions and regressions will be mistaken unless their statistics are corrected for measurement error
B. Are never completely valid
   1. The extent of invalidity must be assessed, allowed for in estimation error and reported
   2. Improbable data signifying qualitative differences must be detected, identified, diagnosed, isolated and reported
C. Always require visualization: graphing, plotting, mapping for comprehension and communication