An Anatomy of Error

1. Theory Error [TE]
   The theory, idea, parameter is a fiction, metaphor for thinking about something which inevitably varies in the "nature" of experience but must be made singular, constant in our thoughts so that we can think about it. Do I have an exact "height"? Not at all "really". But, to the nearest half inch, I certainly have a "height" exact enough to be useful for most practical purposes.

2. Model Error [ME]
   The fictional parameter is brought into service as it works in a model for how it is useful to suppose this parameter acts to produce palpable results, useful experience. The model of what is supposed to happen is necessarily simpler than what can easily be seen as possible complications. But this second simplification is also essential for the construction of useful, inferentially reliably, knowledge. There is no thought that the model be "true" - only that it provide useful inference. Since the model is too simple to be true, it must to some extent be in error.

3. Estimation Error [EE]
   The usual standard error of estimation which follows from the stochastic algebra of the model as though the model were "true". This deduction from the model rides on the idea of random independent replications and so decreases in magnitude by root replications as in: SE = C/root(N) where C is a targeting coefficient and N is the number of replications.

4. Agent (Item) Error [AE]
   The error built into the agent of measurement, the item. If there is a specification equation [SPEQ], then its own simplifications produce a second kind of model error, SPEQME. When agents are calibrated from responses, then there is the estimation error of the empirical calibration, CALIBEE. There are also the additional errors of instrument misuse, carelessness, miskeying, miscoring, misprinting, misdirection, language obstruction, poor item design,,,,. Many of these sources of error can be reduced as they are identified by item misfit and brought under control by the application of better item design and administration.

5. Context Error [CE]
   This is the error introduced by the context, the occasion of contact between agent and object. It includes time limitation, distraction, disruption and the serving facets of judge severity and misfit, task difficulty and idiosyncrasy, time of day, seriality,,,.

6. Object Error [OE]
   The error produced by respondent confusion, misunderstanding, lack of motivation, disinterest, resentment, eccentricity,,, can be identified by person misfit, used diagnostically and its effect on measure error minimized by correction and/or deletion.

7. Predictive Error [PE]
   And now at last at the payoff of measure uncertainty, the actual variation in measures observed in the measure standard deviation (an "average" difference in the sense of the root mean square of all possible differences) of a series of random independent measures of the same object person either within a short enough time and sufficiently "independent" to avoid tangible growth/decay or corrected for visible trends and eccentricities. PE contains the cumulative impact of the above six variance components as in:

$$PE^2 = TE^2 + ME^2 + EE^2 + AE^2 + CE^2 + OE^2$$

How are these errors managed?

EE is calculated exactly from the model. Fit statistics compare the encountered errors in AE, CE and OE with EE.

The contributions of AE and OE, including the impact of CE on them, can be separated to some extent through the parameter separation of the model. The magnitudes of their contributions can be intimated from the extent to which improving the mechanics of agent application and the communication of the agent/object transaction reduces error.

Dear Friends,

Please help with this. Word choices? Symbols? Articulation? Completeness? Access?