

Some Models and Procedures for Cognitive Diagnosis Modeling

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This is a two-part presentation that focuses on the *generalized deterministic inputs, noisy “and” gate* (G-DINA) model as a general cognitive diagnosis model (CDM) framework. The first part of the presentation discusses the development and characteristics of the G-DINA model as a CDM. As a model, it is shown that the G-DINA model, which is based on the identity link function, is equivalent to other general CDMs based on alternative link functions. Moreover, several commonly encountered CDMs are shown to be constrained versions of the G-DINA model. The second part of the presentation focuses on some recent developments pertaining to the procedures within the G-DINA model framework. These procedures include a two-step approach for estimating parameters of constrained CDMs, the Wald test for comparing general and constrained CDMs, various approaches to model-data fit evaluation, several procedures for examining differential item functioning, and a few applications of the G-DINA model discrimination index (i.e., empirical Q-matrix validation, computerized adaptive testing, optimal test construction). The presentation concludes with a discussion of the implications of these developments in the practice of cognitive diagnosis modeling.

Key Words: cognitive diagnosis, assessment and evaluation, model estimation, model comparison, model-fit evaluation, computerized adaptive testing