



Wim J. van der Linden

Linear Models for Optimal Test Design

Series: Statistics for Social and Behavioral Sciences

- Can serve as a handbook for new developments to test specialists working at testing agencies as well as a text for students in classes on test theory, test construction, or applied statistics

Over my nearly forty years of teaching and conducting research in the field of psychometric methods, I have seen a number of major technical advances that respond to pressing educational and psychological measurement problems. The development of criterion-referenced assessment was the first, beginning in the late 1960s with the important work of Robert Glaser and Jim Popham, in response to the need for assessments that considered candidate performance in relation to a well-defined body of knowledge and skills rather than in relation to a norm group. The development of criterion-referenced testing methodology with a focus on decision-theoretic concepts and methods, content validity, standard-setting, and the recognition of the merits of both criterion-norm-referenced and criterion-referenced assessments has tremendously influenced current test theory and testing. The second major advance was the introduction of item response theory (IRT) and associated models and their applications to replace classical test theory (CTT) and related practices. Beginning slowly in the 1940s and 1950s with the pioneering work of Frederic Lord, Allan Birnbaum, and Georg Rasch, by the 1970s the measurement journals were full of important research studies describing new IRT models, technical advances in model parameter estimation and model fit, and research on applications of IRT models to equating, test development, the detection of potentially biased test items, and adaptive testing. The overall goal has been to improve and expand measurement practices by overcoming several shortcomings of classical test theory: dependence of test-item statistics and reliability estimates on examinee samples, dependence of examinee true score estimates on the particular choices of test items, and the limitation in CTT of modeling examinee performance at the test level rather than at the item level.

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