I

Item Response Theory

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Synonyms

Rasch modeling

Definition

Item response theory (IRT) was developed in response to observations that error terms in psychological measurement are frequently correlated with true scores. The measurement and analysis models of classical test theory assume that error terms are uncorrelated with true scores, that is, that the precision of measurement is equivalent across all levels of the construct being measured. The mathematical model is known as Rasch modeling, and typically the three-parameter Rasch model is invoked. The three parameters are the guessing parameter, the likelihood that an individual will get an item correct simply by guessing; the discrimination parameter or the probability of a correct response at a given level of difficulty; and the difficulty parameter or the level of skill in the construct where an item has 0.5 discrimination.

Current Knowledge

IRT allows an estimate of the precision of measurement for different levels of skill. IRT has facilitated the development of adaptive testing. In computerized adaptive testing, the order of presentation of items is based on the accuracy of the individual's responses to previous items. In that way, not all possible items have to be administered to all individuals in order to obtain a precise measurement. This allows for economy of time and effort for both subjects and assessors.

Cross-References

▶ Classical Test Theory
▶ Reliability

References and Readings

Forero, C. G., & Maydeu-Olivares, A. (2009). Estimation of IRT graded response models: Limited versus full information methods. *Psychological Methods, 14*, 275–299.

Reise, S. P., Ainsworth, A. T., & Haviland, M. G. (2005). Item response theory: Fundamentals, applications, and promise in psychological research. *Current Directions in Psychological Science, 14*, 95–101.