

Analyzing psychopathology data: a case for nonparametric IRT

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Abstract

Recently, several authors have introduced and discussed the advantage of the use of item response theory models (IRT) to construct personality scales and to explore the structure of personality data sets. For example, Waller, Tellegen, McDonald, and Lykken (1996) contrasted the use of IRT to principal factor analysis and Reise and Waller (in press) discussed the choice of an IRT model to analyze personality test data, that is, they compared the fit of the 2-parameter and 3-parameter logistic model (2- and 3PLM) on 15 unidimensional factor scales from the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A). Most studies apply *parametric* IRT models to investigate the quality of personality and psychopathology tests. The aim of the present study is to illustrate the usefulness of nonparametric IRT (NIRT) to construct and to analyze psychopathology and personality scales and tests. In our opinion, the use of nonparametric IRT has been underexposed in the recent personality literature (for an exception see e.g., Santor & Ramsay, 1998). We will show that these models are very suitable to explore the structure of personality data. We will argue that using nonparametric IRT models based on exploring the simple covariance structure between items and based on nonparametric regression, will lead to useful information that (1) can be interpreted very easily by practitioners, (2) avoid forcing the data into a structure they sometimes do not have, and (3) is easily obtained through the use of very user-friendly software programs. Furthermore, we will show, using empirical test data from the MMPI depression scale, how NIRT may help to avoid misleading results obtained from parametric IRT models and we will argue that nonparametric solutions are already available for problems that exist when investigating the fit of parametric IRT models.

References

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