



Title	Improving the Evaluation of Therapeutic Interventions in Multiple Sclerosis: The Role of New Psychometric Methods
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Aim

To examine the added value of new psychometric methods (Rasch measurement and Item Response Theory) over traditional psychometric approaches by comparing and contrasting their psychometric evaluations of existing sets of rating scale data.

Conclusions and results

We concentrated on Rasch measurement (RM) rather than Item Response Theory (IRT) because we believe it is the more advantageous method for health measurement from conceptual, theoretical, and practical perspectives. Our intent is to provide an authoritative document that describes the principles of RM and the practice of Rasch analysis in a clear, detailed, nontechnical form that is accurate and accessible to clinicians and researchers. There is considerable added value in using Rasch analysis rather than traditional psychometric methods in health measurement. Both RM and IRT are conceptually and theoretically superior to traditional psychometric methods. Findings from the 5 studies show that Rasch analysis is empirically superior to traditional psychometric methods for evaluating rating scales, developing rating scales, analyzing rating scale data, understanding and measuring stability and change, and understanding the health constructs we seek to quantify.

Recommendations

The arguments and demonstrations in this monograph, both theoretical and empirical, illustrate that Rasch measurement is vastly superior to traditional psychometric methods. Although we have highlighted the value of Rasch measurement in the context of only a limited number of scales for people with multiple sclerosis (MS), we feel that it has much to offer all health measurement, state-of-the-art clinical trials, and individual patients treated by clinicians.

Methods

Chapters 1 through 3 of this monograph review the literature. Chapter 1 concerns the role of rating scales and the theory and practice of traditional psychometric methods. Chapter 2 outlines the impetus behind the new psychometric methods (IRT and RM), charts their development, and explains their similarities and differences. This chapter also provides the case underpinning the reasons why the rest of the monograph focuses on RM and not on IRT. Chapter 3 describes the theory behind RM, the development of the RM model, the properties of the model, and how it works in practice. Chapters 4 through 8 present five practical head-to-head comparisons of Rasch analysis and traditional psychometric methods based on data sets produced from a variety of settings. These demonstrations focus on two scales – the Rivermead Mobility Index and the Multiple Sclerosis Impact Scale (MSIS-29) – in large samples of people with MS.

Further research/reviews required

We recommend the following future research directions: (1) other researchers and clinicians reproduce our findings in a range of clinical populations; (2) detailed head-to-head comparisons of Rasch measurement and Item Response Theory; (3) determine further sample size requirements for adequate person and item estimations; and (4) explore the application of Rasch measurement to clinical practice in areas including prioritizing problems, facilitation of communication, screening potential problems, identifying preferences, monitoring changes or responses to treatment, training new staff, and clinical audit.