Chapter 14
Measuring Perceptions of New Faculty towards Research, Service, and Teaching in Higher Education

Kelly D. Bradley
University of Kentucky, USA

Jessica D. Cunningham
Georgetown College, USA

Linda Worley
University of Kentucky, USA

Jeffery P. Bieber
University of Kentucky, USA

ABSTRACT

The New Faculty Preparation Survey was designed to measure perceptions of recently hired faculty regarding research, service, and teaching for self and institution, while considering academic preparation. A Rasch measurement model was applied to the calibration sample responses to evaluate the psychometric properties of the instrument, providing a foundation for structural modifications. Rasch results revealed sound reliability; however, item misfit existed, coupled with limited utility of the full rating scale. Studying the measurement properties of the instrument will aid in proper interpretation of the results and in the construction of an instrument that can be used by higher education institutions to better understand faculty, and potentially to enhance programmatic structuring. Accurately measuring and understanding faculty perceptions across research, service, and teaching can aid in professional development training at the university level, future faculty preparation, and general faculty satisfaction.

INTRODUCTION

When evaluating the quality of any survey instrument, reliability and validity are critical to the process. "Exemplary manuscripts… use measures that have established psychometric merit, and they provide evidence of the reliability and validity of those measures" (Smart, 2005, p. 470).This lack of consideration of psychometric attributes is problematic in the higher education literature, and even more so, on a daily basis with the collection of information utilized throughout the academic community. Collecting information regarding faculty perceptions related to research, service and teaching could be beneficial, but the necessity to collect data that is credible and has utility must

DOI: 10.4018/978-1-4666-4458-8.ch014

first be considered. This study provides a methodological framework for constructing a quality data collection tool and highlights the potential benefits of the New Faculty Preparation Survey.

The Rasch measurement model was applied to the 1997 New Faculty Preparation Survey calibration sample data to evaluate the structure and utility of the instrument, which was designed to measure perceptions of recently hired faculty regarding research, service and teaching. The study provides a foundation for accurately operationalizing, measuring, and interpreting faculty perceptions across a variable termed 'faculty load', which includes research, service, and teaching. As survey research becomes increasingly utilized in higher education decision making, it is essential that researchers set high standards for the process of survey development. Here, a healthy balance between content and measurement considerations has been met through collaboration of interested parties. Finally, this study provides a model where an audience not proficient in item response theory can still remain involved throughout this survey development process.

BACKGROUND

Rasch Model

For rating scales, a straightforward approach to item analysis, particularly for development, is the Rasch model (Wright & Masters, 1982). Item difficulty, or item endorsement in survey research, is the only independent variable considered in the Rasch model (Smith, 2004). The Rasch model assumes that an additive structure underlies the observed data, and that both participants and items can be arrayed on a continuum and that the items have equal discriminative power. Probability estimates are determined to provide the likelihood for subjects to endorse a particular item based on where the person estimate falls along the continuum relative to the item difficulty estimate. The expectation of the Rasch model is that a person endorsing a more extreme statement has a higher probability of endorsing less extreme statements (Andrich, 1988; Krueger & Finger, 2001; Santor & Ramsey, 1998; Wright & Masters, 1982).

One of the fundamental benefits of Rasch measurement, specific to Survey Research, is it calibrates scales to determine the psychometric distance between response options. Raw scores are not measures, and thus must be converted to become true interval measures. The Rasch model converts raw scores to their natural logarithm and places them along a 'ruler', in an effort to construct a measure, not simply allocate an assigned number. The model also overcomes the assumption of equal importance by controlling for both persons and items on the same metric. Bradley and Sampson (2005) summarize, stating:

Whereas the classical model produces a descriptive summary based on statistical analysis, it is limited, if not absent, in the measurement capacity. … Applications of the Rasch model allow the researcher to identify where possible misinterpretation occurs and which items do not appear to measure the construct of interest, while producing information about the structure of the rating scale and the degree to which each item contributes to the construct. Thus, it provides a mathematically sound alternative to traditional approaches to survey data analysis (p. 13).

As an additional testament to the Rasch model's strength, Curtis and Reeves (1999), Peck (2001), Waugh (1999), and Wright and Masters (1981) concur the Rasch model is the only item response theory model that adheres to the seven principles of true measurement: (1) each item should function as intended; (2) each item can be positioned on a common scale; (3) the scale should be an interval one; (4) each person can be located along the same common scale used for items; (5) the responses should form a valid response pattern for each item; (6) estimates of precision must be available for all