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Measurement models for linking latent variables and indicators: A review of human resource management research using parcels

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ABSTRACT

This paper first reviews the various measurement model options for linking latent variables to indicators that are available to human resource management (HRM) researchers. A special emphasis is placed on the option of parcels, created by combining subsets of items to form indicators. Next, a review is presented of 27 articles from the major HRM journals that have used parcels, with a focus on conceptual/theoretical and empirical issues. Recommendations for HRM researchers for improved use of parcels are also provided.

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1. Introduction

Structural equation modeling (SEM) with latent variables is a data-analytic technique that when properly conducted allows for the examination of relations proposed by theory and controls for the biasing effects of measurement error. With this analytical method, researchers are able to assess the presence, direction, and strength of relations between latent variables representing constructs, rather than between the measures of the constructs, which can be referred to as indicators. Introductions to and general reviews of the application of latent variable methods in organizational research over the past twenty years have been provided by James and James (1989), Harris and Schaubroeck (1990), Williams and James (1994), Millsap (2002), and O'Boyle and Williams (2007). These reviews indicate the increasing frequency of the application of latent variable methods in organizational research.

In order to take advantage of the capability of SEM for dealing with random and non-random measurement error, researchers must choose a strategy for linking latent variables with their indicators, and this requires considering several issues. The purpose of this paper is to review methods for linking latent variables and their indicators, to examine practices used by HRM researchers, to evaluate these practices, and then to provide a framework for guiding researchers as they build their measurement models. Our goal is to improve the understanding of different approaches to linking latent variables with indicators so as to help improve future research that uses this method.

1.1. Three methods for relating latent variables to indicators

Coffman and MacCallum (2005) review three types of aggregation available to researchers using SEM who want to control for measurement error: total disaggregation, partial disaggregation, and total aggregation with reliability correction. Put simply, researchers can either use each item from a scale as an indicator of the latent variable (total disaggregation), combine small sets of items from a scale to form indicators which are referred to as parcels (partial disaggregation), or combine all the items from the scale to form a single indicator and then use reliability information from the scale to control for random measurement error (total aggregation). Path diagrams associated with these three approaches are shown in Fig. 1. When deciding between these methods,

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