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Measurement properties of rankings and ratings

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ABSTRACT

Ratings are the dominant approach to construct measurement in the social and behavioral sciences, including the applied business disciplines. The literature documents problems with the use of ratings, but workable alternatives are few. This paper proposes the use of rankings for construct measurement. Rankings and ratings are systematically evaluated using multitrait–multimethod (MTMM) structural equations modeling. MTMM models partition the variation in measures into trait, method, and error components. The assessment presented here favors rankings for construct measurement for the brand context studied. The analysis presents a test of the brand signaling model that Erdem and Swait (1998) propose.

1. Introduction

Measurement tasks often use ratings and multiple items (measures) for each construct are developed. This is particularly the case for the measurement of attitudinal constructs, which are common in marketing research. Ratings have a number of advantages, particularly those that follow the Likert tradition (1932). Among the many practical advantages ratings are easy to construct and implement, are easy for respondents to use, are fast, and have approximately interval properties. An important theoretical rationale is that their use is consistent with domain sampling paradigm. There are also problems with their use. One is item redundancy, particularly where multiple item measures are used and unidimensionality is not properly assessed (Anderson and Gerbing, 1982).

A vast literature exists on the individual biases that can afflict the validity and reliability of ratings (see, e.g., Paulhus, 1991). A well documented one is acquiescence bias. Another is halo effects. There are some intermediate solutions to these problems, which typically involve some correction to the ratings or attempts to model general or specific method effects. A more fundamental concern is that often these biases constrain variation. Despite many improvements to practice, the literature does not specify workable alternatives to the use of ratings.

This paper explores the possibility of using rankings for construct measurement and ultimately advocates their use in favor of ratings for some applications. The general properties of rankings are established (Stevens, 1946). Rankings have great value for psychological measurement (Thurstone, 1927), because they allow for fine discriminating judgments and thus generally produce measures with greater variation. Rankings have other practical advantages. Measures based on rankings are easy to design and implement, and are generally easy for respondents to use though not as fast as ratings. A further advantage is that ranking tasks are always comparative, making the measurement task itself much more concrete. By contrast, ratings are typically non-comparative and can therefore be quite abstract. A common misperception is that rankings yield an ordinal level of measurement, therefore greatly restricting their use. However, relatively straightforward transformations of rankings yield interval and ratio levels of measurement. There are several such transformations in the literature. Threshold models are a common one in the structural equations modeling literature, which yield interval levels of measurement (Bollen, 1989).

This paper presents an evaluation of the use of rankings and ratings for construct measurement. The evaluation uses multitrait–multimethod (MTMM) structural equations models (Kenny and Kashy, 1992; Marsh and Bailey, 1991). MTMM models provide a thorough assessment of the validity and reliability of the ranking and rating measurement tasks. For both rankings and ratings, partitioning variance into trait, method, and error components is possible. The paper makes a methodological contribution. Theoretical constructs within a structural equation modeling framework use both rankings and ratings for measurement, which serves to highlight the particular advantages of rankings. This contribution is not elsewhere in the literature as past research tends to use only ratings for construct measurement. The context is an application to the Erdem and Swait (1998, 2006) model of brand signaling. This model provides an explanation of consumers' preference for brands. The model may well become a dominant model in years ahead. Hence, this evaluation offers a timely case study of an emerging marketing theory.

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2. Analytic framework

Research in the social sciences and particularly research in applied disciplines like marketing suffers from the inexact nature of psychological measurement (Cote and Buckley, 1987; Podsakoff et al., 2003). Measures may appear to be reliable but not actually measure the theoretical constructs of interest or measures may be partly a function of the measurement method used (i.e., measures may be a function of method effects). Not surprisingly, researchers have shown great interest in constructing tests that allow the assessment of method variance (Williams and Anderson, 1994). Perhaps the most popular framework is the MTMM matrix originally developed by Campbell and Fiske (1959). The literature documents criticism of their implementation of the MTMM matrix, such as its ambiguity and the use of correlations among observed variables only. Despite this criticism, the basic logic of their approach remains sound (Bagozzi and Yi, 1990). Researchers accept that construct validation requires multiple sources of measurement to allow trait and method effects to be evaluated. Following this logic and partly in response to the criticism of their implementation, several statistical approaches to the analysis of MTMM data have developed. One of the more popular approaches is the use of MTMM models in structural equations modeling (Kenny and Kashy, 1992; Marsh and Bailey, 1991). The current study applies the common MTMM specification. This approach has the advantage of partitioning variance in measured variables into trait, methods, and error components. Structural model parameters are estimated free of method and measurement error biases.

3. Brands as signals

The Erdem–Swait (E–S) model provides an elegant explanation of consumers' brand preferences. The model particularly emphasizes the importance of brand signals in explaining consumers' choice behavior (Erdem and Swait, 1998; Erdem et al., 2006). The key explanatory variable in the E–S model is brand credibility; that is, consumers' perceptions of the credibility of a brand's product positioning information.

Brand credibility directly impacts on a set of intervening variables, including consumers' perceptions of quality, consumers' information or search costs, consumers' perceptions of risk, and finally, consumers' perceptions of relative price. These intervening variables directly impact on brand consideration and purchase, which is the focal dependent variable in the E–S model. This causal chain implies that consumers' perceptions of brand credibility indirectly impact on brand choice.

The intervening variables are important because they offer traction to the explanation of how brand signals influence consumers' preferences for brands. That is, brand credibility works to establish brand preferences through reducing information asymmetries and establishing quality expectations. Fig. 1 illustrates one representation of the E–S model and its core theoretical constructs.

4. Method

This study uses data from 275 student-consumers collected in the spring semester of 2007. The students were in their first year of undergraduate business studies at a large public university. The data collection occurred in class, although the students did not receive credit for completing the paper and pencil questionnaire. The students provided information on their perceptions of and preferences for five brands in one of two categories (ten brands in total were studied). Consistent with previous tests of the E–S model, the categories studied are ones in which (1) recognition for brands in the category is generally high and (2) some variation in preferences for the brands is expected. The cellular phone and athletic shoe categories satisfy these criteria. The specific brands studied are LG, Motorola, Nokia, Samsung, and Sony-Ericsson in the cell phone category and Adidas, New Balance, Nike, Puma, and Reebok in the athletic shoe category. Pretests with students (not included in the 275 students who provided data for the main study) showed that recognition was in fact high and there was variation in consumers' preferences for the brands. For the main study, 150 students completed a survey responding to questions about cell phone brands and 125 students completed a survey of athletic shoe brands.

Two data generation processes provide measurement information on consumers' perceptions of and preferences for the brands. Following past tests of the E–S model, consumers' ratings of the brands were

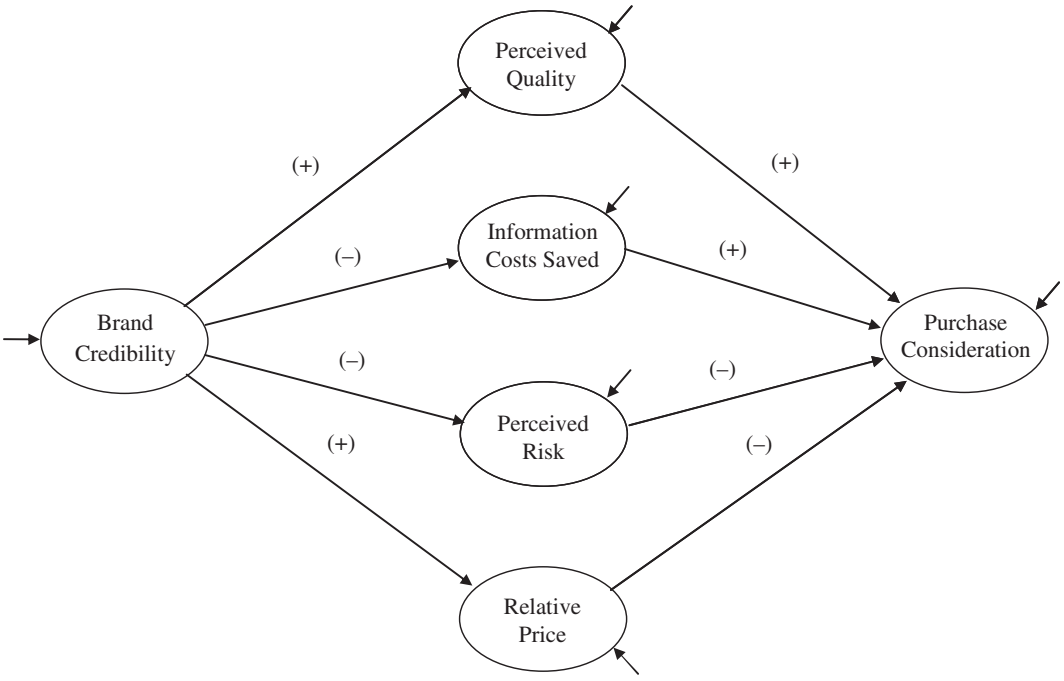

Fig. 1. The Erdem–Swait model.