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Multi-group invariance in a third-order factorial model: Attribute satisfaction measurement☆

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ABSTRACT

The definition and measurement of attribute satisfaction, AS, are important for marketing theory and marketing management. The conceptualization of AS integrates different streams of literature. Attribute satisfaction is a multidimensional and multilevel construct with three primary dimensions: the core of the service, the peripheral aspects of service quality (SQUAL), and value (VAL). Furthermore, SQUAL has three subdimensions and VAL has two. This paper estimates a confirmatory factor analytic third-order model. The model shows that the AS scale demonstrates good psychometric properties for reliability, and content, convergent and predictive validity. The paper also assesses the AS scale invariance: whether the scale has the same structure and meaning for different groups, and whether the scale can be used to study its relation with other constructs and to estimate mean differences in a valid way. In testing gender invariance, specifically, AS exhibits full configural and metric invariance and partial scalar invariance.

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1. Introduction

Customer satisfaction (CS) and customer satisfaction with specific attributes, or attribute satisfaction (AS), are different though related constructs. In particular, evidence exists that AS is an antecedent of CS (Oliver, 2009; Spreng, MacKenzie, & Olshavsky, 1996). However, other antecedents have been identified (e.g., Runyan, Sternquist, & Chung, 2010). The definition and measurement of AS are important (Szymanski & Henard, 2001). They are of special interest for managerial purposes because attributes have more diagnostic value than overall assessments of satisfaction (Lim & Chung, 2009; Mittal, Ross, & Baldasare, 1998). For example, the measurement of satisfaction at the level of specific attributes can identify problem areas in service delivery, help in segmenting customers, and help to understand how customers elaborate their evaluations of the distinct aspects that materialize as the product and the service. Yet, the structure and dimensionality of AS have not been researched.

This study integrates different streams of literature in a new and unique way to conceptualize AS: The tripartite model of satisfaction (Parasuraman, Zeithaml, & Berry, 1994), service quality (Brady & Cronin, 2001), and the value concept (Zeithaml, 1988). This paper fits a series of hierarchical models to test whether the measurement of AS has adequate construct validity (e.g., Brady & Cronin, 2001) and improves our understanding and explanation of customer judgments. For construct validation and managerial application purposes, this paper also tests for AS scale invariance. The study of invariance indicates whether the scale has the same structure and meaning for different groups that in turn implies whether the scale can be used to study its relation with other constructs and to estimate valid mean differences (Steenkamp & Baumgartner, 1998). That is, a scale must behave equivalently across groups in order to make a correct interpretation of group differences as attributable to attitudinal differences and not simply psychometric differences (Vandenberg, 2002). Gender is a common segmentation variable in diverse contexts. Different attributes can be important for distinct segments (Anderson & Mittal, 2000) and some research shows that CS varies with gender (Mittal & Kamakura, 2001), which raises the question as to whether differences at the AS level might also exist. This study extends the knowledge of CS research by presenting a unique, hierarchical, and theoretically grounded conceptualization for AS and demonstrating the good psychometric qualities of the AS scale by utilizing recent and robust techniques.

The study provides evidence that complex modeling is useful to understand marketing constructs and answers the request made by Dabholkar, Thorpe, and Rentz (1996) to apply more complex models in different contexts. The study suggests a process for the study of measurement invariance in third-order factorial models and gives the managers an AS diagnostic instrument that is managerially relevant. Therefore, this research has three main objectives: first, to present a theoretically and managerially relevant definition for AS; second, to evaluate the AS construct validity and to test for AS gender invariance by providing a better AS measurement instrument for

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marketing decisions; third, to consider whether the measurement invariance extends to a third-order factorial structure.

2. Attribute customer satisfaction construct

When customers are satisfied, any measurement will do, but when customers are dissatisfied, managers want to know attribute-level information to be able to make improvements (Huang & Sarigöllü, 2008). To this end, the definition and measurement of AS is central (e.g., Chen, Hsu, & Lin, 2010; Mittal et al., 1998; Spreng et al., 1996). The sum of each attribute of satisfaction creates a global measure, CS or, as some authors have done, calculates a mean based index (e.g., Oliver, 2009; Spreng et al., 1996). These measurements assume that the attributes weights are identical, which is not correct unless proof exists for their veracity, and the contribution of each individual attribute is lost (Szymanski & Henard, 2001). In this case, the AS structure, its components and its relations, as well as the relevance of these components cannot be identified, making a diagnosis at the attribute's CS level impossible.

In this research, the definition of AS is the result of an individual assessment of a comprehensive set of specific features of the experience from using the product or service (credit card) where the level of performance corresponds to or exceeds initial expectations. In turn, CS with the product or service is a global response that results from the experience of using the product or service to which AS contributes.

Theory development requires operational measures for abstract constructs (Peter, 1981).

AS's scale development begins with the concept domain's definition (Churchill, 1979; DeVellis, 1991; Hayes, 1998) that comprises not only the core product aspects but also additional or peripheral aspects. Further, the attributes must be as distinctive and in-depth as possible (Anderson & Mittal, 2000).

2.1. Attribute satisfaction dimensions

To identify AS dimensions, the brand or the company's offer is the set of essential and peripheral aspects. The peripheral aspects can sometimes be the more relevant for satisfaction, so they need to be explicit. Parasuraman et al. (1994) present a tripartite perspective when they say that transaction satisfaction, intended as the satisfaction with a restricted part of the consumer experience (Rust, Zahorik, & Keiningham, 1995), is a function of service quality, product quality, and price. Note that the offer's essential aspects (e.g., credit limit for a credit card) are separate from the peripheral aspects (service quality), and include price as well. Their distinctions between service quality and satisfaction, and the inclusion of the importance of value or price, is consistent with many scholars (e.g., Athanassopoulos, Gounaris, & Stathakopoulos, 2001; Fornell, Johnson, Anderson, Cha, & Bryant, 1996; Voss, Parasuraman, & Grewal, 1998). Thus, this paper conceptualizes AS along these same three dimensions: the product or the service core (CORE), the peripheral aspects (SQUAL), and value (VAL) and also establishes their corresponding specific components.

2.2. Attribute satisfaction specific components

The CORE dimension, the basic offer (Oliver, 2009), for a simple service (credit card) does not suggest any other specification: in this study, two items represent the core features that many studies and customers reference the most. However, the literature suggests that the SQUAL and VAL dimensions should have different components.

2.2.1. Service quality

In service quality research, Grönroos (1984) identifies two dimensions: technical and functional quality. In turn, these dimensions contribute to the image of the company that ultimately influences the perceptions of service quality. The SERVQUAL scale (Parasuraman, Zeithaml, & Berry, 1988) has five dimensions – reliability, responsiveness, assurance, empathy, and tangibles – and has been widely utilized and applied in different contexts. SERVQUAL has not been uniformly confirmed in several situations (e.g., Cronin & Taylor, 1992; Dabholkar et al., 1996; Durvasula, Lysonski, & Mehta, 1999). In particular, electronic service quality measurement has emerged and evolved (Akinci, Atilgan-Inan, & Aksoy, 2010).

A three-component model for service quality seems to be somewhat more robust: service product, service delivery and service environment (Rust & Oliver, 1994). This model subsumes Grönroos's (1984) functional and outcome dimensions, and Bitner's (1990) physical evidence. Brady and Cronin (2001) present an analogous hierarchical service quality scale with three primary dimensions: interaction quality, physical environment quality, and outcome quality. The dimensions that distinguish between goods and services, such as the three additional P's of the marketing mix for services (physical, people, and processes), are general dimensions with which to study attributes.

Thus, the literature seems to point to a three dimensional model for SQUAL. Accordingly, for the AS scale, SQUAL has the following components: physical aspects, process aspects, and personal interaction aspects.

2.2.2. Value

Value has different meanings. For some, value is synonymous with low prices; for others, value equals the benefits received; for still others, value is the quality received in relation to the price paid. Synthesizing these positions, Zeithaml (1988, p.14) defines value as the result of the evaluation "…based on perceptions of what is received and what is given." Other marketing scholars seem to be in consensus with Zeithaml's concept of value (e.g., Heskett, Jones, Loveman, Sasser, & Schlesinger, 1994).

However, many researchers often consider the operationalization of value as a single dimension (e.g., Fornell et al., 1996) or a single variable, which does not distinguish each of these identified factors. Therefore, Cronin, Brady, Brand, Hightower, and Shemwell (1997) define two VAL components to develop a measurement instrument with higher diagnostic power. Thus, the component price (PRI) represents what the customer gives, and the additional benefits component (ABNF) reflects what the customer receives. Athanassopoulos et al. (2001) confirm that the dimensions of satisfaction are specific to industry and country, and the factors of satisfaction might well vary with the type of product, service, or business sector. These findings reinforce the need to adapt the components to the specific context of this study.

2.3. Attribute satisfaction conceptual measurement models

Evidence exists in the literature that suggests a multidimensional and multilevel structure for AS. In their study, Dabholkar et al. (1996) make the request to apply this kind of model to different contexts, and this research fulfills that request. So, the clarification of whether AS is a global evaluation, a component based evaluation, or a unique global construct evaluation due to components is important.

Therefore, proposing and testing alternative models for measuring AS are appropriate (e.g., Lichtenstein, Netemeyer, & Burton, 1995).The models for comparison (Fig. 1) are:

M(0), the null model that has only one underlying factor, AS, for all attributes;
M(1), a first-order factorial structure where all the components (including the CORE) correlate with each other;
M(2), a second-order factorial structure where all the first-order components (including the CORE) are indicators of one second-order factor, AS; and

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