

O.R. Applications

# Assessing brand image through communalities and asymmetries in brand-to-attribute and attribute-to-brand associations

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## Abstract

Brand image is a key component of customer-based brand equity, and refers to the associations a consumer holds in memory. Such associations are often directional; one should distinguish between brand-to-attribute and attribute-to-brand associations. Information on these associations arise from two ways of collecting data, respectively: brand-by-brand evaluations of all attributes and attribute-by-attributes evaluations of all brands. In this paper, the authors present a methodological approach, namely correspondence analysis of matched matrices, to assess the communalities as well as asymmetries between brand-to-attribute and attribute-to-brand associations. This allows studying whether or not there is match in a brand's positioning (brand-to-attribute associations) and relative advantage (attribute-to-brand associations). The methodology results in perceptual maps visualizing brand image. The approach is illustrated in an empirical market research project in which two samples of consumers evaluated ten brands of deodorants and eleven attributes. The stability of the solution is examined using bootstrap resampling procedures.

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## 1. Introduction

The value of a brand lies in what consumers have experienced and learned about the brand. The resulting brand associations held in a consumer's memory constitute the brand image, and affect their behavior. Brand associations are thereby important building blocks of customer-based brand equity (Keller, 1993, 2003; Krishnan, 1996), and marketers should aim to optimize the attributes and benefits that the brand is associated with by the consumers, satisfying their core needs and wants (Keller, 2003; Park et al., 1986). Such strongly held, favorably evaluated associations that are unique to the brand and imply superiority over

other brands will be critical for a brand success (Broniarczyk and Alba, 1994; Thelen and Woodside, 1997). Hence, brand associations will have implications for many marketing mix actions, such as (re-)positioning and (re-)design of a brand (Kaul and Rao, 1995), and extending a brand to other product categories (Czellar, 2003).

Associations between brands and attributes are often directional (Anderson, 1983; Holden and Lutz, 1992; Farquhar and Herr, 1992; Krishnan, 1996): the association is from the brand to the attribute and/or the other way around. For example, the brand equity of BMW is affected by the extent to which positive features like safety and sportiness are evoked by that car brand. On the other hand, whether or not certain cues or attributes enhance brand recall in a purchase or consumption setting contributes to the equity of the brand. Insights in the communalities and asymmetries of these bi-directional associations can direct towards recommendations for brand managers.

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Holden and Lutz (1992) stated that when measuring advertising effectiveness, one has to assess effects on attributes evoked by the brand as well as on attributes that are likely to evoke the brand. Farquhar and Herr (1992) showed that the dual nature of brand associations is an essential part of determining the limits of a brand's stretch. Hence, when assessing brand image, one should consider both brand-to-attribute and attribute-to-brand associations.

Previous conceptual and empirical studies related to the description and assessment of brand image largely ignored the bi-directional nature of brand associations. Exceptions are Farquhar and Herr (1992), Holden and Lutz (1992), and Krishnan (1996), which provided conceptual foundations for studying such associations. However, existing literature does not present methodological tools adapted to the bi-directional nature of the association data.

A variety of methodologies have been proposed to assess and visualize brand images spatially on the basis of brand ratings or associations regarding a set of attributes, so-called perceptual mapping methods (see for example Dillon et al., 1985 or Shocker and Srinivasan, 1979). In this stream of literature, several studies (Jaffe and Nebenzahl, 1984; Olsen and Olsson, 2002; Teas and Wong, 1992; Wong and Teas, 2001) have demonstrated important differences for multi-attribute ratings collected through brand-by-brand judgment of all attributes versus attribute-by-attribute judgment of all brands. However, this stream of literature is specifically dealing with multi-attribute rating judgments, instead of binary associations which are widely used in positioning studies (i.e. Hoffman and Franke, 1986; Dillon et al., 2001). Furthermore, again no methodological tools are presented that account for the directional nature of the data.

Here, we aim to contribute to this stream of publications by providing a perceptual mapping procedure to assess brand image based on bi-directional associations. In particular, we present a methodological approach, correspondence analysis of matched matrices (Greenacre, 2003; Greenacre and Clavel, 2002), which provides insightful spatial representations of the communalities and asymmetries between the brand-to-attribute and attribute-to-brand associations. Further more, to examine the stability of the results obtained we modify and apply bootstrap resampling procedures as proposed by Lebart (2006) and Greenacre (2007, Chapter 25).

In this paper, we first discuss the background on brand associations within the customer-based brand equity model. Next, we discuss the potential communalities and asymmetries between attribute-to-brand and brand-to-attribute associations. We present a methodology for assessing the communalities and asymmetries and apply it in a study of brand image for deodorants. The application illustrates the insights obtained from the methodology and implications that can be derived. The bootstrap resampling is used to examine the stability of the associations previously described. Finally, we discuss general implications for research on brand image and provide directions for future research.

## 2. Customer-based brand equity

Customer-based brand equity occurs when consumers are familiar with the brand and hold favorable, strong, and unique brand associations in memory (Keller, 1993, 2003). Memory for a concept, such as a brand, consists of a network of nodes and linkages among these nodes (Anderson, 1983). The nodes represent concepts and linkages represent the relationship between the concepts. The strength of the association linking two nodes reflects the likelihood that activation of one node will activate the other (Higgins and King, 1981). A brand node can have a variety of associations linked to that node, like attributes or benefits. Customer-based brand equity implies a certain amount of brand knowledge causing differential consumer responses to marketing of the brand. Brand knowledge has two components (Keller, 1993, 2003): brand awareness and brand image.

Brand awareness is related to the strength of the brand as reflected by consumers' ability to identify the brand under different conditions (Alba and Chattopadhyay, 1985). Brand awareness is often measured by means of brand recall, which refers to the number of consumers that retrieve the brand when no cue at all or a cue like the product category or an attribute is given. Mature brands often score higher on brand recall compared to new brands (Kent and Allen, 1994), which can be attributed to longer history of media support, purchases, and consumption occasions.

Brand image can be defined as consumer perceptions about a brand as reflected by brand associations held in memory. Brand associations are informational nodes linked to the brand node in memory and contain the meaning of the brand for consumers. The favorable, strength, and uniqueness of brand associations are the dimensions of brand knowledge that play an important role in determining the differential response that makes up brand equity (Keller, 1993). The links in memory are often conceptualized as directional (Anderson, 1983), and may start or end at the brand node. Farquhar and Herr (1992) further elaborated on the dual nature of brand association and show that failure to account for the directionality and possible asymmetries can lead to incorrect conclusions.

One of the dimensions of brand image within the customer-based brand equity model is the strength of the associations between a brand and other concepts, such as attributes. The strength of an association is labelled as connectivity by Nelson et al. (1993). As our research deals with bi-directional associations, we adopt terminology by among others Ashcraft (1978), Farquhar and Herr (1992), and Loftus (1973), who used the term dominance, which combines direction and strength of an association. In particular, we use "attribute dominance" to refer to the strength of the directional association from a brand to an attribute, and "brand dominance" as the strength of the directional association from an attribute to a brand. Attribute dominance is operationalized by the number of

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