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Capturing customer judgments of product category

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ABSTRACT

Typicality refers to the extent to which natural objects exhibit the essential qualities or features representative of a group or category. People perceive the members of a product category in terms of typicality. Products with higher typicality of product category are with stronger brand associations and are learned faster than less typical ones by consumers. Viswanathan and Childers [22] introduced the direct and indirect measures methods to evaluate the gradedness of category membership at the product attribute level based on consumer perception. However, these two measures weigh each product attribute equally and lack membership of product attributes and product categories for the evaluation of product typicality. We in the present study extend the two original measures via the incorporation of the weights and preference ratings of the product attributes perceived by consumers through fuzzy synthetic analysis and evaluations to precisely probe the membership of product and category. Furthermore, the weights and ratings of product attributes were compromised to reduce membership variations between product and product category. The relevance of our advanced measures of product typicality is then illustrated with a case study of Taiwan shoes market to theoretically and empirically demonstrate its plausibility.

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1. Introduction

Typicality refers to the extent to which natural objects exhibit the essential qualities or features representative of a group or category [15]. Over the last few decades, numerous attempts have been made by scholars and practitioners in the fields of psychology and marketing to measure the effects of typicality in category and recognize the category structure. Research in cognitive psychology have demonstrated that people perceive the members of a category in terms of typicality [11,17]. Category members with higher typicality tend to be recalled and classified faster than less typical ones, and are most likely to be construed as “standard” by consumers. This implies that highly typical members of a product category exhibit more positive product attributes and are learned faster than less typical ones by consumers [11,22]. For example, consumers may have several choices when they consider buying snack food, such as popcorn, peanut, and candy. Popcorn is usually recalled by most consumers sooner than peanut or candy because it presents a higher typicality of snack food [10]. That is, popcorn acts as a dominant member of snack food and presents itself as a “standard” compared with other products.

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Before making purchasing decisions, consumers are usually inclined to summoning the typicality of product category and take a set of similar products into consideration (i.e. an evoked set), and then compare them with a well-known product image in their memory [17,20]. Accordingly, the typical products or highly similar products are easily gathered into an evoked set by consumers. The typicality of a category can be viewed and measured in three respects: (1) What product attributes govern the typicality of a category; (2) how these product attributes influence consumer preference; and (3) how the product attributes underlying typicality can be measured [2]. This information guides the association between the customer judgments of product category and the customer consensus structure. Therefore, understanding how a product is perceived by consumers, how they construe categories, how they decide whether a particular product belongs to a known category, and how they judge the typicality of product category are crucial to developing new products, extending and strengthening brand image, and positioning a product in the marketplace [21].

In evaluating multiple alternatives, human decision-making judgments are usually fuzzy and involve imprecise information processing [1]. So it is not an easy job for marketing researchers to probe consumers' perception and their decision-making processes (e.g. reasoning and evaluation). Determining the importance weight of each preference relation and to aggregate the favorites perceived by the consumers is thus an important task [25]. Fuzzy set theory is consistent with the way humans think, so it can help understand the preference information perceived and interpreted by humans [16,24]. Additionally, modeling and managing uncertainty by using linguistic information has demonstrated better explorations in computing with words across many disciplines including controls, intelligent systems, and pattern recognition [12,16].

Rosch [18] conducted experiments to portray human reasoning and consensus conditions, and indicated the usability of the principles of fuzzy set. Studies have suggested that the notion of category can be evaluated through fuzzy set theory [3,19,22]. McClosky and Glucksberg [14] revealed that categories have a fuzzy structure in which members of the categories have no clear boundary or differentiation between each other. The fuzzy set theory can appropriately capture human perception and the understanding of membership in mixed categories [13].

Usually, consumers tend to group products into categories by comparing multiple product attributes and then drawing up categorization criteria. The membership of product and category can be more precisely measured at the attribute level [22]. Viswanathan and Childers [22] discussed the concept of category as containing fuzzy sets in which products have some degrees of membership based on product attributes. They employed fuzzy set theory to measure the gradedness of a product with respect to each product attribute, and aggregated the weights of the product attributes to understand the consumer behavior of product categorization.

Product categorization is a complex multi-criteria decision-making problem. The relative weights and the preference ratings of product attribute, typicality, and product category need to be consistently evaluated. In this research, the fuzzy set theory is incorporated into a multi-criteria decision-making procedure to probe the consumer psychological activities of product categorization. An empirical case study of Taiwan shoes market is then demonstrated to show how the perceived typicality of shoe product and product categorization can be measured using the proposed methodology.

2. The original measurement of product categorization

Most proposed product attribute-based measuring methods have emphasized product evaluation rather than product categorization. Viswanathan and Childers [22] proposed the direct and indirect measuring methods to measure the gradedness of category membership at the product attribute level. These two types of measures are then fused across product attributes to derive the overall amplitude of the product category. Therefore, the basic postulate of the measures is to assess the typicality for a particular product. These two measures provide a simple and fast solution to investigate the relationship of product attribute, product, and product category. These two measures are briefly described below.

2.1. Direct measure

The direct measure method examines the relationship of product and category based on fuzzy set theory at the attribute level. The degree of membership establishes the relationship of product with the product category. The higher the degree of membership is for a product, the higher the representativeness of the product category. The direct measure is defined as follows:

$$D_j = \left[\sum_{i=1}^{M} (m_{ij})^n \Big/ M \right]^{1/n}, \tag{1}$$

where m_{ij} denotes the membership of the attribute i in the product category j for that product; M represents the number of product attributes; D_j is a degree of membership of product and category enclosed within $[0,1]$ (the closer D_j is to 1, the higher the typicality of the product in a category).

2.2. Indirect measure

The distance establishes the membership of product and category indirectly, the smaller the distance, the higher the membership of product and category. The distance between a product and a category at attribute level is measured as

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