Consumer responses to functional, aesthetic and symbolic product design in online reviews☆

Marina Candi[a],[*], Haeran Jae[b], Suzanne Makarem[b], Mayoor Mohan[b]

[a] The Reykjavik University Center for Research on Innovation and Entrepreneurship, Menntavegur 1, 101 Reykjavik, Iceland
[b] Virginia Commonwealth University School of Business, 301 W Main St, Richmond, VA 23284, USA

ARTICLE INFO

ABSTRACT

This research addresses calls to consider consumer responses to product design along three dimensions: functional, aesthetic, and symbolic design. Based on an analysis of online consumer reviews, this research sheds light on the role of all three design dimensions and reveals how each uniquely contributes to consumers' behavioral responses directly and indirectly though emotional arousal—a key mediator. Furthermore, an important distinction—rooted in consumer information processing models—is made between low-involvement and high-involvement products. The results indicate that the effectiveness of each of the three design dimensions differs depending on the level of product involvement. Taken together, the research findings highlight the importance of taking all three design dimensions into account, including the symbolic design dimension, which has received relatively little attention to date.

1. Introduction

Competitive markets demand product designs that deliver benefits that go beyond functionality by offering less tangible—yet potentially more valuable—aesthetic and symbolic benefits (Chitturi, Raghunathan, & Mahajan, 2008; Homburg, Schwemmle, & Kuehnl, 2015; Landwehr, Wentzel, & Herrmann, 2013). *Functional design* focuses on what a product is supposed to do and involves technology, functionality, and utility (Bloch, 2011). *Aesthetic design* pertains to perceptions of beauty (Leder, Belke, Oeberst, & Augustin, 2004) and how a product appeals to the senses (Liu, Li, Chen, & Balachander, 2017). *Symbolic design* involves how a product resonates with consumers' self-image, personality, or values (Seva & Helander, 2009); how it helps communicate status, gender, and social roles (Debevec & Iyer, 1986; Douglas & Isherwood, 1979; Solomon, 1983); or how it signals group membership (Belk, 1988).

Product developers have put increasing emphasis on designing for consumer experience (Candi, Beltagui, & Riedel, 2013; Liu et al., 2017), which requires a concerted focus on all three design dimensions (Homburg et al., 2015). Yet debate remains about how to best leverage the three design dimensions—especially from a consumer perspective. For example, Homburg et al. (2015) suggest that the importance of symbolic design varies depending on product type. The Marketing Science Institute (2016) identifies research examining aesthetic design

and experience design as a top priority. Likewise, Liu et al. (2017) stress the need for research that explores ideal product design strategies. Thus, both academics and practitioners clearly stand to gain from an investigation of consumers' responses to the three product design dimensions (Homburg et al., 2015; Srinivasan, Lilien, Rangaswamy, Pingitore, & Seldin, 2012).

Therefore, this research examines the relationships between the three product design dimensions and two key outcome variables: consumers' post-purchase emotional arousal and behavioral responses. This research also investigates how product involvement moderates these relationships. Existing research finds positive effects of product involvement on brand attitudes (Lutz, MacKenzie, & Belch, 1983) and purchase intentions (Bart, Stephen, & Sarvary, 2014). As such, product involvement likely influences consumers' emotional and behavioral responses to product design; however, such interactions remain underresearched.

To investigate how consumers' evaluations of functional, aesthetic, and symbolic design are related to their emotional arousal and behavioral responses and also whether and how level of product involvement moderates these relationships, this research employs a content analysis of online product reviews obtained from Amazon.com's website. The importance of online reviews is widely recognized (e.g., Zhang, Craciun, & Shin, 2010), but extant research focuses mostly on seller implications such as sales and reputation (e.g., Cervellon & Carey,

---

2014; Lee & Bradlow, 2011). Given the increasing pervasiveness of online reviews (Singh et al., 2017), examining online word-of-mouth (WOM) behaviors from a consumer perspective that focuses on the content of online reviews rather than reviewer characteristics is timely. Online reviews contain rich, unsolicited consumer-generated content (Lee & Bradlow, 2011), offering a deep understanding of consumers' emotions (Kim & Gupta, 2012) and behaviors (Moon, Park, & Seog Kim, 2014). Furthermore, unlike traditional experiments and survey-based studies with pre-determined product attributes, a content analysis of online reviews affords a stronger focus on consumers' actual perceptions by taking into account the full range of attributes mentioned (Lee & Bradlow, 2011).

This research makes several important contributions. First, it addresses calls to consider product design along three dimensions (Homburg et al., 2015), in contrast to approaches that view product design as one loosely defined concept (e.g., Bruce, Daly, & Kahn, 2007) or those that adopt a dichotomous utilitarian versus hedonic perspective (e.g., Chitturi et al., 2008). Second, this research is based on online review data linked to actual consumer purchases and obtained in an unobtrusive setting, in which genuine consumer emotions, reactions, and intentions can be observed without manipulation (Kozinets, 2002). Third, this research accounts for consumers' directly expressed emotional and behavioral responses to product design and investigates the key mediating role of emotional arousal between consumers' expressions of product design and their behavioral responses. Fourth, this research offers an important addition to product design literature by examining the moderating role of product involvement, which yields findings that are more nuanced than those of prior research (e.g., Chitturi et al., 2008; Homburg et al., 2015). Finally, this research heeds calls for consumer-based strategy studies (e.g., Dahl, 2016) by employing consumer-level data to inform firm strategies.

2. Conceptual framework and hypotheses

Homburg et al. (2015) evaluate the impact of functional, aesthetic, and symbolic design on consumer behavior and argue that these dimensions are not mutually exclusive, implying that a product can manifest all three concurrently. This argument aligns with that of Mishra, Dash, and Malhotra (2015), who suggest that design dimensions should be viewed holistically, as well as Noble and Kumar's (2010) concept of "design levers," which enable product designers to transfer value to users, which in turn influences product evaluations. Conceptualizing product design as comprising different dimensions that can influence consumer responses simultaneously, but uniquely, is a key proposition of this research.

While a number of studies examine functional design and aesthetic design—sometimes referred to as utilitarian and hedonic design, respectively (e.g., Holbrook & Hirschman, 1982)—less attention has been paid to the symbolic design dimension, likely due to the elusive nature of the symbolic dimension or because symbolic value is realized idiosyncratically (Beltagui, Candi, & Riedel, 2016). Verganti (2008) contends that symbolic design is no less important than functional design because consumers have a strong desire for meaning. Indeed, symbolic design can be the basis for consumers to experience personal values (Belk, Wallendorf, & Sherry, 1989) and derive sacred and transcendental meanings (Hirschman & LaBarbera, 1990).

The basic premise of this research is that each design dimension can uniquely influence consumers' behavioral responses. In keeping with hierarchy-of-effects models (Lavidge & Steiner, 1961), which establish causal connections among cognition, affect, and behavior (Smith & Swinyard, 1982), hypotheses that link consumers' cognitive evaluations of functional, aesthetic, and symbolic design to their affective responses and behavioral responses are developed.

2.1. Product design cognitions and behavioral responses

Product design can drive consumers' behavioral responses (Bloch, 1995; Brakus, Schmitt, & Zarantonello, 2009; Chitturi et al., 2008), which encompass a range of possible outcomes, including WOM, repurchase intentions, and other post-purchase behaviors (Enrique Bigné, Mattila, & Andreu, 2008; Santos & Boote, 2003). Consistent with studies that measure cognitions on the basis of recall of product attributes (e.g., Smith & Swinyard, 1982), the present research operationalizes product design cognitions as consumers' expressions of functional, aesthetic, and symbolic design attributes.

Functional design involves ensuring that products do what they are supposed to do in an economical, safe, and reliable manner (Bloch, 2011). Allen and Ng (1999) suggest that consumers evaluate functional design rationally on the basis of tangible attributes and that satisfaction with tangible attributes can lead to repurchase or recommendation intentions. Indeed, products that meet or exceed utilitarian expectations can enhance customer satisfaction and are positively related to behavioral responses (Chitturi et al., 2008).

H1a. Consumers' expressions of a product's functional design are positively related to their expressed behavioral responses.

Aesthetic design can be critical in influencing consumer behavior. Brakus et al. (2009) highlight the importance of consumers' sensory interactions with products, which in turn affect behaviors. Indeed, aesthetic design can grab consumer attention and influence consumer expectations (Hoegg & Alba, 2011), increase consumers' desire to acquire or interact with products (Verganti, 2009), and contribute to company outcomes such as sales growth (Auger, 2005) and profitability (Candi & Saemundsson, 2011) as well as to consumer choice behaviors (Luchs, Brower, & Chitturi, 2012).

H1b. Consumers' expressions of a product's aesthetic design are positively related to their expressed behavioral responses.

Consumers whose product purchases are influenced by symbolic design may become "active loyalists" who are committed to and passionate about the product (Muñiz & O'Guinn, 2001). Indeed, Marzocchi, Morandin, and Bergami (2013) find a strong relationship between symbolic self-identification and product commitment and loyalty. Symbolic design can motivate consumers to engage in WOM behaviors (Rosenbaum & Martin, 2012) and increase consumer engagement and recommendation behaviors (Lee, Ha, & Widdows, 2001).

H1c. Consumers' expressions of a product's symbolic design are positively related to their expressed behavioral responses.

2.2. The mediating role of emotional arousal

Research frequently uses *emotional arousal*, based on Mehrabian and Russell's (1974) framework, to explain consumers' responses to design (Havlena & Holbrook, 1986; Lee et al., 2001). Product design can have a substantial effect on consumers' emotions (Hekkert & McDonagh, 2003; Kim, Lee, & Choi, 2003). For example, Desmet and Dijkhuis (2003) find that wheelchair designs can influence how consumers feel about the product, and Kim et al. (2003) show that varying website designs can elicit different levels of emotion.

Keller (2012) posits that functional performance influences both consumer cognitions and emotions and that functional aspects should not be ignored because they are critical to how consumers evaluate products. Kervyn, Fiske, and Malone (2012) find a link between functionality and consumer emotions; similarly Norman (2004) emphasizes the importance of product intuitiveness and usability for emotional response and offers examples of products that fail to meet these objectives because of inattention to functional design.

Whereas functional design is sometimes cited as fulfilling prevention goals, aesthetic design is regarded as fulfilling promotion goals that