

Brand and Design Effects on New Product Evaluation at the Concept Stage

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Abstract

Brand equity provides a high contribution to new product evaluation in consumption situations. The present study aims at measuring the brand contribution to the evaluation of a design concept at an early stage of the new product development process. The experimental design crosses four car concepts assessed on functional and hedonic dimensions, emotions and overall liking, and the brand of a generalist car maker. Results show that at this stage the direct effect of the brand hypothesized by the anchoring effect is moderated by typicality and weak compared to the design effect. In fact, the overall brand effect is mainly mediated by emotions. Furthermore brand equity and design are working through different intermediate evaluations, functional for the brand and hedonic for the design. Finally results also emphasize that emotion is a key mediating variable between functional and hedonic evaluations and overall liking.

Keywords: Product design, New product, Brand equity, Emotion, Car, Anchoring effect, Hedonic evaluation.

1. Introduction

Involving customers in the new product development (NPD) has a positive impact on new product success (Gruner and Homburg, 2000). At early stages of NPD, when the product is not available and behavioural measures are not possible, a mock-up of the concept can be evaluated by a representative sample of the customers' target in a Concept Test (Ulrich and Eppinger, 2004). Early assessment of the concept benefits is even more important for complex products like cars, because late modifications of the concept would postpone the car launching and engender huge costs for the companies.

Emotions are important components of the consumer response (Hirschman and Holbrook, 1982). They are defined as mental state of readiness that arise from cognitive appraisals of events or thoughts that are relevant to one's well-being; emotions are accompanied by physiological processes, are expressed physically and may result in specific actions (Bagozzi, Gopinath and Nyer, 1999). Two factors among others contribute to the elicitation of emotions: the product appearance itself (Desmet et al., 2000) and the brand as emotions activate a categorical knowledge related to affect-laden experiences associated with a brand (Ruth, 2001).

One of the most important factors for the success of a new product is the contribution of the brand equity, defined as the mean of providing a differential response to marketing mix variables (Keller, 1993). However, the transfer of brand equity to the new product is not systematic and is related to both brand characteristics and congruity between concept and brand. Specifically the brand transfers its equity when its breadth is narrow and the brand-concept incongruity is moderate or when the breadth is broad and incongruity is large (Shein in and Schmitt, 1994). It is thus important to evaluate the contribution of the brand to the new product evaluation.

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The second factor is the design process which is directed to create an emotional reaction (Kreutzbauer and Malter, 2005). Several studies underline the strong correlation between product design and commercial success (Yamamoto and Lambert, 1994) and product design has become an even more decisive buy-argument in competitive business environments like automobile where cars are often similar regarding their technical definition, quality and price, (Demirbilek and Sener, 2003). Extensive research has been dedicated to the analysis of the relationships between product design and: product attractiveness (Noble and Kumar, 2010), product elicited emotions (Desmet et al., 2000), brand consideration (Bloch, 1995) and brand perception (Page and Herr, 2002).

In this context, the purpose of the paper is to analyze how the brand may impact the early evaluations of the product's benefits, elicited emotions and overall liking for several product designs. The results will show the larger contribution of emotions compared to the brand's contribution to the overall appreciation of the concepts' design.

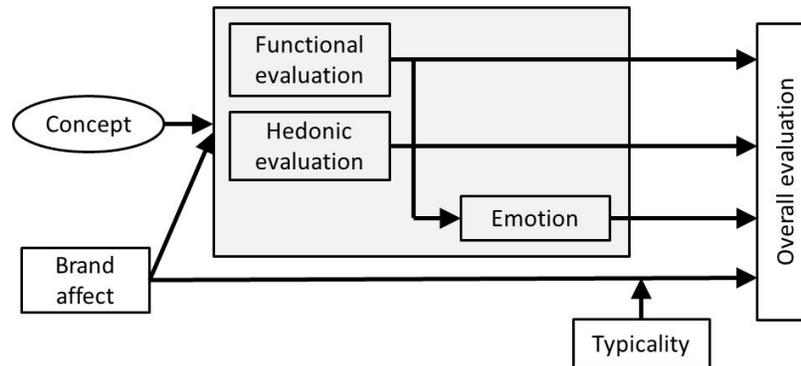
2. Conceptual Framework

To study the effect of a stimulus presenting a new product description on customer response, we use the theoretical framework of advertising effect (Holbrook and Batra, 1987). Adapted to the NPD context, this framework explains overall evaluation toward a stimulus (like-dislike) by the interaction of two components (brand and concept) and the mediating role of three evaluations (functional, hedonic and emotional).

Through brand affect, brand has a direct and indirect effect on overall product evaluation. The evaluation process starts with an anchoring stage which is an affective and categorization process. It uses information from the memory to create a first response which serves as an adaptation level. Expectancy-disconfirmation model uses congruency between the stimulus and the activated schema to evaluate the contribution of an additional cognitive effort. The second step of the evaluation is a subsequent adjustment of the anchor. This process is a cognitive evaluation of the characteristics of the concept which moves the adaptation level to the final evaluation level (Pham, Cohen, Pracejus and Hughes, 2001). The use of second step depends on cognitive capacity and motivation to process the information (Petty and Cacioppo, 1984).

During the anchoring phase, prominent semiotics cues increase accessibility to specific information which will determine the category schema used. One of the most prominent cue is the brand and research has shown that brand plays a major role during the anchoring process. The brand effect is direct and large if low involvement reduces the adjustment process (Maheswaran, Mackie and Chaiken, 1992). The effect of brand affect on evaluation is moderated by congruity between the brand and the concept (typicality): for a brand with a large breadth, the higher the typicality the lower the brand equity transfer (Sheinin and Schmitt, 1994; Odou, 2005). However, at early stages of the NPD process, no precise information is available on functional characteristics of the concept and the car design presented by roughs is a salient cue for these missing data (Bloch, 1995) and it can thus challenge the importance of the brand in the overall evaluation of a stimulus.

Functional and hedonic evaluation influence overall product evaluation through direct and indirect evaluations (Kemp and Smith, 1998). In the direct way, the product overall evaluation results from the evaluation of two types of benefits, the functional ones referring to the instrumental and practical characteristics of the product and the hedonic ones referring to the aesthetic, sensory and symbolic characteristics (Mahlke and Thüning, 2007). Consumers focus more on the functional benefits than on the hedonic benefits of a product until their minimum expectations of fulfilling utilitarian goals are met (Chitturiet al., 2007). In addition to this direct evaluation, functional and hedonic evaluations also influence overall product evaluation by an indirect route through emotions (Mahlke and Thüning, 2007). Appraisal theorists in psychology support the central role of appraisals in the formation of emotions: emotions result from the comparison of an actual state with a desired state (Lazarus, 1991). More precisely, products elicit positive emotional responses when they exceed expectations on relevant benefits (Oliver, 1997).

Figure 1: Conceptual framework

The conceptual framework is proposed in Figure 1 and the following hypotheses are tested: at early stages of the NPD process, in the context of a brand with a broad breath, (H1) Brand affect has a positive direct effect on overall evaluation; (H2) Functional, hedonic and emotion mediate concept effect (H2a) and brand effect (H2b) on overall stimulus evaluation; (H3) The concept typicality of the brand moderates the effect of the brand affect on overall evaluation, the higher the typicality the lower the brand equity transfer.

3. Methodology

A mixed experimental design is used (Brand, 2 x Concepts, 4) to measure the differential effect of the presence/absence of the brand for several concepts with decreasing typicality: each respondent evaluates four concepts (intra-subject) with or without brand identification (between subjects).

Stimuli have been selected for their great perceived differences in terms of functional and hedonic benefits (pre-test, n=30) among nine vehicles from the sport utility vehicle segment (SUV). A4 format drawings identified by letters (FA, KT, RM, TU) are presented as shown on Fig.2 in a monadic sequential way. Drawings of the side view of the vehicle allow concealing car company logo and standardizing the presentation of the cars in terms of colors and equipment (such as hubcaps) so that the perceived differences would only come from car shapes. In the branded context, the logo and brand signature of a generalist European car maker are presented in the top left part of each picture.

Figure 2: Car concepts

Typicality relative to the brand is measured for each car concept in a pre-test (n=70) as the mean of the two items proposed by Odou (2005). An Anova indicated that typicality levels are different among the concepts ($F=67.6$, $p<.01$, Bonferroni correction) with the following order for the means $FA>KT>TU>RM$.

One hundred thirty seven individuals were recruited in public places by gender (60% male) and by three age groups for unbranded context (n=47) and branded context (47 participants with a positive brand image and 43 with a negative brand image). Initial screening questions are based on car ownership and knowledge of the manipulated brand. Due to the test conditions which require short interviews, the number of items per concept has to be kept at the minimum. Two scales are measured by one item on an Osgood scale with 10 points: Brand affect (This brand is awful-perfect) and Overall stimulus evaluation for each concept (I really dislike-I really like). For the functional benefits, the hedonic benefits and the emotions a pre-tests (n=30) help selecting the most discriminant items. Participants were asked to rate their perception of the concepts on 5-points semantic differential scales. Hedonic evaluation is made of nine items ($\alpha = 0.90$). Functional evaluation is made of three items ($\alpha = 0.72$). Emotional scale is a subset of the PrEmo, which is dedicated to the measurement of product appearance elicited emotions and has been validated with cars applications (Desmet, 2005). Five positive emotions and five negative emotions (reverse coding) have been assessed on a Likert 5-points scale and an unidimensional emotion score is computed.

To ensure neutrality of the concept perception a final screening question at the end of the interview, enabled to disregard interview if the model and brand were recognized in a concept design.

4. Results

Anova results are presented in Table 1. A first model (model 1) supports the hypothesis (H1) that the brand affect influences the overall evaluation as well as the car concept. The brand and concept effect on mediating variables is supported only for functional and emotion but not for the hedonic dimension (H2 partially supported). Compared to car concept, brand affect has only a weak effect on the variables. The interaction between concept and brand affect is not significant and only age is significant as a control variable.

Table 1: ANOVA results

<i>Dependent variable</i>	Model 1				Model 2		
	Functional	Hedonic	Emotion	Overall	Emotion	Overall	
	R ²	0.402	0.571	0.472	0.478	0.579	0.731
	F	60.67	120.06	80.72	81.54	149.57	369.07
<i>Independent var.</i>	p	<.01	<.01	<.01	<.01	<.01	<.01
		F	F	F	F	F	F
Concept	F	103.83 ^a	238.19 ^a	153.68 ^a	155.25 ^a		
Brand	F	31.05 ^a	n.s.	13.6 ^a	21.12 ^a	5.19 ^b	
Age	F	7.71 ^a	n.s.	3.69 ^b	n.s.	4.04 ^a	
Functional	F					17.84 ^a	n.s.
Hedonic	F					220.89 ^a	24.58 ^a
Emotion	F						440.92 ^a
Typicality * Brand	F						5.85 ^b

a, sign <.01, b sign <.05, c sign <.10

In a second group of Anova (model 2) brand and concepts are replaced by mediating variables (functional, hedonic, emotion). Subjective variables greatly increases the percentage of variance explained for emotion and overall evaluation (R^2 from .58 to .73). Emotion is explained mainly by hedonic evaluation ($\eta^2=.171$) and much less by functional evaluation ($\eta^2=.014$) with a direct but small effect of the brand $\eta^2=.004$). Emotion plays a major role in the explanation of overall evaluation variance ($\eta^2=.218$) with an additional effect of hedonic evaluation ($\eta^2=.012$). Direct effect of functional evaluation on overall evaluation is not significant.

The hypothesis (H3) is supported as the direct effect of brand affect is significant but small ($\eta^2=.003$) and moderated by concept typicality: there is no direct effect of the brand when typicality is low.

5. Discussion, Limitations and Future Research

Four conclusions can be drawn from this study. First at an early stage of the NPD process, the brand does only play a minor role in the evaluation of the design. Surprisingly, the brand does not impact the overall evaluation by a contribution to the hedonic evaluation but by the functional evaluation. Without detailed information about product characteristics, brand name is used as a substitute and the brand equity transfer is done much more through the quality dimension than the image dimension. Second, the design of a car has a large effect on the concept overall evaluation through its influence on the hedonic appraisal which is the main determinant of the overall evaluation. This effect is coherent with former research which has shown that design plays a major role in the buying decision for a car (Kreutzbauer and Malter, 2005). Third, the results confirm that emotion is a main determinant of the overall evaluation of the car and should be systematically taken into account in the evaluation process of a new product at every stage of its development. The results confirm the Component of User Experience (CUE) model proposed by Mahlke and Thüring (2007) which assumes that emotion plays a mediating role for functional and hedonic evaluations. Furthermore, at early stages of the product development, emotion is mainly driven by hedonic evaluation. Fourth, the results only weakly support the two steps evaluation model which gave a main role to the brand to activate categorization in the first anchoring phase of an evaluation process. Even in case of a light involvement, without any physical contact with the product, the schema activated by the brand cue is not the main determinant of the adaptation level and design has a stronger effect at an early stage of the NPD. This result is coherent with former research that establishes the effect of design in facilitating categorization and in structuring beliefs on product and brands (Bloch, 1995).

Several limitations exist related to the choice of the stimuli: the brand is a generalist car maker with a medium awareness on the French market and the brand impact at the concept evaluation stage could be higher with a higher awareness. Besides, both functional and hedonic mediation of the brand impact on overall assessment could have significant effects for specialist car makers who are recognized for their technical superiority and attractive designs. Interaction effects could also arise from the choice of the product segment: at the moment, Sport Utility Vehicle are requested not only for their functional characteristics (off-road performances for instance) but also their fashionable appearance. Interactions between hedonic appraisal, functional appraisal and emotional responses could be different in sedan cars.

We underlined that product functional characteristics may be difficult to apprehend on pictures. Hedonic appraisal could also be biased by size perception effect of the car. As representative mock-ups of the concept are not available at the early stages of the new product development, some evaluate the relevance of virtual prototypes, digital mock-ups and immersive technologies to improve consumer testing (Bangcuyo et al., 2015). Future research should explore the connections between product design dimensions assessment and product presentation. Finally, measures of emotions can also be challenged as measures are not yet stabilized (Meiselman, 2015).

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