Food Quality and Preference 39 (2015) 209–220

Contents lists available at ScienceDirect

Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Multimodal packaging design: How human motivations moderate the success of a multimodal stimulation

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ARTICLE INFO

Article history:
Received 13 December 2011
Received in revised form 2 July 2014
Accepted 18 July 2014
Available online 27 July 2014

Keywords:
Multimodal
Package design
Motivation
Need states
Congruence
Moderating effects

ABSTRACT

This study aims at better understanding the effect of a multimodal stimulation on liking. So far, most product design and product presentation related research on multimodal stimulation focused on congruence of stimuli intensity or message congruence only. Next to a multimodal stimulation, the product's ability to activate human motivations/need states can positively influence product liking, too. By taking these insights into consideration, the survey was designed to investigate the effect of a need state congruent stimulation on liking moderated by the target group's need states. For this purpose, an experiment was carried out in which 360 respondents evaluated face lotion packages. The stimuli combination followed a factorial design, including the sensory modalities optics, haptics, acoustics and olfaction. One half of the stimuli were designed to activate the need for affiliation, the other half to address the need for achievement – both basic motivations to use face lotion. For both need states a moderating effect can be observed, i.e. best results can be stated for need state congruent stimulations that were rated by respondents with a high specific need state.

Introduction

In the past years, systematically implemented, multimodal stimulations in product, packaging and point of sale design has experienced increased attention (Kroeber-Riel, Weinberg, & Gröppel-Klein, 2009; Michon & Chebat, 2005; Salzmann, 2007). A multimodal approach was mostly implemented in order to emotionally address the consumer, to stimulate purchase behaviour and to differentiate from competition (Hehn, 2007; Kilian & Brexendorf, 2005; Schwarz, 1988). Generally speaking it can be assumed that a multimodal product and packaging design boosts better differentiation to competition because the product can stand out on several sensory modalities (Kilian, 2007). Moreover, products that address multiple modalities are processed more intensely in different parts of the human brain. Hence, perception is more diverse and comprehensive which supports better brand awareness and loyalty (Bihler, 2007; Clegg, 2006; Engelkamp & Denis, 1990).

Studies investigating the effectiveness of multimodal stimulations with regard to packaging design and product presentation hardly exist. So far, mostly the interactive impact of colours, background music, and ambient odour in point of sale context has been analysed (among others Cheng, Wub, & Yenc, 2009; Mattila & Wirtz, 2001; Michon & Chebat, 2004, 2005; Salzmann, 2007; Sharma & Stafford, 2000; Spangenberg, Grohmann, & Sprott, 2004). Key learning is that the congruence of intensity of included stimuli moderates the impact on purchase related factors, meaning that best results were observed when the intensity of all implemented sensory stimuli were either high or low (Michon & Chebat, 2004, 2005).

Research in the field of applied psychology and neuroscience has shown that human behaviour is strongly moderated by human need states/motivations (Bischof, 1985, 1993; Felser, 2001; Kenning, 2008; Kroeber-Riel et al., 2009; Reiss, 2002, 2004; Strahan, Spencer, & Zanna, 2002). Assuming a moderating effect of human motivations on product perception and evaluation it consequently can be postulated that stimuli do not only have to be congruent with regard to their intensity but also with regard to the need state they are to activate. Based on this thinking model, in this study it was postulated that stimuli do not only have to be congruent with regard to intensity but also with regard to the need state they are to activate. Therefore, different face lotion packages – including the sensory modalities optics (colour and style elements) and haptics (surface texture of the material) – were developed that in combination with their presentation (acoustic: background music and olfaction: ambient odour) resulted in a

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http://dx.doi.org/10.1016/j.foodqual.2014.07.014
0950-3293/

Table 1
The effect of need state congruency and consumers' need states on product liking.

Research hypothesis	Consumers with high respective need state	Consumers with low respective need state
Need state congruent multimodal stimulation	High product liking	Low product liking
Need state incongruent multimodal stimulation	Low product liking	Low product liking

multimodal stimulation that was in different degrees able to activate one of two need states that are relevant in the face lotion market.[1] Overall, it was expected that a need state congruent multimodal stimulation is better liked by consumers with a high respective need state than by those with a low need state and that a need state congruent stimulation will result in a higher overall liking by respondents with a high need than an incongruent stimulation (see Table 1).

To give the reader a better understanding on the theoretical background of the study that was carried out to test the impact of a need state congruent multimodal stimulation, more background information on human need states, their impact on human behaviour and their interaction with a multimodal stimulation will be given.

Theoretical background

Using motivations to explain behaviour

The objective of motivation psychology is to explain the elicitation of behaviour and behaviour modification with respect to its direction and intensity, meaning the analysis of goal formation which steers human behaviour either on a conscious (explicit) or a subconscious (implicit) level (Kroeber-Riel et al., 2009; Thomae, 1999). Motives can trigger behaviour: the address of motives can result in positive emotions because e.g. endogenous opiates are released (Spitzer, 2007). These positive emotions thus enforce a specific behaviour; negative emotions that are the result of negative experiences in such a situation diminish the specific behaviour (Puca & Langens, 2008). Is a product to be bought in the end, it has to address the target group's motives/need states which can be satisfied by the product's purchase.

When studying literature about need states, three basic need states seem to be especially helpful for explaining human behaviour. Although they are often named differently they basically refer to three need systems called: security, arousal and autonomy (Bischof, 1985, 1993). Accordingly human beings have the basic need for affiliation, care, stability and security (subsystem security), for autonomy, performance, achievement, suppression, control, power, dominance and freedom (subsystem autonomy) and for exploration, stimulation variety, play and sensation seeking (subsystem arousal). The system autonomy refers to the so far well established need for achievement (McClelland, 1967, 1987; Murray, 2008; Schmalt, 2005) and need for power (*n* Power) (McClelland & Burnham, 1995; McClelland, Davidson, & Floor, 1980; Murray, 2008; Veroff, Wilcox, & Atkinson, 1953; Winter, 1988;). The subsystem security has as regards content big overlaps with the system introduced by Panksepp called "care/nurturance" (Panksepp, 1998) and the need for affiliation (Murray, 2008; Heyns, Veroff, & Atkinson, 1992; McClelland, 1987). The subsystem arousal can also be found in the field of motivational psychology where it is called need for sensation seeking (Hebb, 1955; Zuckerman, Buchsbaum, & Murphy, 1980; Zuckerman, Eysneck, & Eysneck, 1978) or novelty seeking (Bardo, Donohew, & Harrington, 1996; Harlow, Blazek, & McClearn, 1956). A differential psychologist would call it openness – one factor of the Big 5 (Costa & McCrae, 1995; McCrae & Costa, 1991; McCrae & John, 1992). The need state sensation seeking reflects the need for sociability, for novel stimulation and play (Zuckerman et al., 1980) (see Fig. 1).

The need for achievement next to the need for affiliation will be used in this survey to better explain moderating factors in a multimodal stimulation. They have already been extensively used to explain and predict human behaviour. The need for achievement that was originally described by the pioneering work of McClelland, Atkinson, Clark, and Lowell (1953) has especially been used to explain and predict performance related behaviour (Elliot & McGregor, 1999) like e.g. performing in a task at college (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), success in business (McClelland & Boyatzis, 1982; McClelland & Burnham, 1995; Winter, 2010) or entrepreneurial status (Zhao & Seibert, 2006). Furthermore, McClelland and Liberman (1949) could demonstrate in a survey that people with a high need for achievement could recognise positive achievement words faster than participants with a medium or low need. The need for achievement does not only influence perceptual processes; effects on behaviour were reported, too: e.g. McClelland et al. (1953) and Atkinson (1958) state that males with a high need for achievement have a better memory for incomplete tasks, are more active at college, and are more resistant to social pressure. Moreover, the need for achievement was also used to explain consumer behaviour like a clear preference for purchasing quality men's store brands for men's suits (Gardner, 1972). A mediating effect between the need for affiliation and involvement for greeting cards could be shown by Schmidt and Hanson Frieze (1997). Atkinson and Edward (1956) could show a moderating effect of the need for affiliation on perceptual processes: in their study respondents with a high need for affiliation recognized significantly more often faces (operationalizing the need for affiliation) than those low in need for affiliation. Like the need for achievement also the need for affiliation's effect on managerial success was analyzed. In this case, respondents low in need for affiliation were significantly more associated with managerial success (McClelland & Boyatzis, 1982). McAdams and Constantian (1983) also report that high levels in need for affiliation clearly correlate with conversations, letter writing, and close interpersonal relations/interactions.

The score of each individual in adulthood for each specific need state is relatively stable. Still, behaviour is also highly influenced by situational and mood effects meaning that even a person with a high need for affiliation wants to be on his own once in a while. Different need states can also be in rivalry with each other. The individual will then go for the alternative (e.g. product) that best satisfies the strongest need (need showing the biggest deficit) (Kroeber-Riel et al., 2009).

How do Human Motivations and Multimodal Stimulation Come Together?

Consumer need states are helpful for better understanding the effect of a multimodal stimulation: you can design the point of sale or the product itself in such a way that you activate needs of your target group which will result in positive emotions that will have a positive impact on the subsequent product perception (Cacioppo & Gardner, 1999). Since sensory processing is mostly implicit and thus only requires little or no attention (Kroeber-Riel et al., 2009), needs can be activated without having to overcome the threshold of consciousness of the consumers which is especially

[1] With the help of 10 in-depth interviews two important need states could be identified that influence the purchase behaviour of face lotion. These need states are the need for affiliation and the need for achievement (McClelland, 1967, 1987).