



Consumer context-specific sensory acceptance tests: Effects of a cognitive warm-up on affective product discrimination



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ABSTRACT

For simple hedonic ratings, product range effects often limit the reliability and accuracy of consumer affective discriminations among multiple products. In the present study, a cognitive warm-up (CWU) procedure was applied to consumer acceptance tests in order to stabilize consumers' evaluative criteria by evoking their personal evaluation context. The effects of such procedure on the robustness of the affective product discriminations were investigated using two sets of comparison experiments, each using a related samples design. Consumers with equivalent sensory preference profile for skin lotions were screened and divided into High Reflection Thinkers (HRT) and Low Reflection Thinkers (LRT) using the Cognitive Reflection Test. They were then randomly, but evenly assigned to either a treatment (Group I) or a control (Group II) group, in which hedonic rating was performed either with or without the preceding CWU procedure, thus forming four sub-groups (treatment group-HRT, treatment group-LRT, control group-HRT, and control group-LRT subjects). For each sub-group, discriminability between the two chosen products in terms of d' value was compared across the two experimental conditions consisting of different product ranges. The results indicated that only in the control group-LRT subjects, the two conditions displayed different product discrimination. It suggests that for LRT subjects who are assumed to be more intuitive and thus might be more vulnerable to such product range effects, the CWU had a stabilizing effect on the evaluative criteria, resulting in more robust product discrimination.

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1. Introduction

Knowing whether consumers can notice differences between products, and how such differences change their acceptance is very important for the fast moving consumer goods (FMCG) industry. This understanding allows companies to make well-informed decisions for many business objectives, such as cost saving, harmonization, flexible manufacturing, etc. In order to make good quality decisions, we need consumer test methods that can accurately quantify differences in consumer affective responses to product sensory properties; for this, many direct rating and indirect comparative scaling methods have been studied and compared (Hein, Jaeger, Carr, & Delahunty, 2008; Jaeger & Cardello, 2009; Lawless, Sinopoli, & Chapman, 2010; Lim, 2011; Schifferstein, 2012). Amongst the many methods available, hedonic rating is commonly

used to measure consumer affective discriminability between multiple products or between a standard product and new prototypes. In the conventional application of hedonic rating, it has long been assumed that the higher the momentary hedonic rating of the sensory experience, the stronger the acceptance of the sensory properties. For this reason, the concepts of hedonic value vs. acceptability are often considered to be interchangeable, and thus, in some of the literatures, 'hedonic testing' is often called 'acceptance testing'. But, the concepts of hedonic value and acceptability are indeed different, i.e. the acceptance implies an implicit threshold above which a product is accepted and therefore, it is conceptually different from simple hedonic value. Typically, with hedonic ratings, no conceptual anchor for evaluation is provided to the consumers, and therefore, it is likely that consumer responses are based on the relative momentary appreciations or arousal potential of the products in the test set, rather than a genuine acceptance of these products. As a result, product range effects may limit the reliability and accuracy of the consumer measurement, reducing the predictability of the results.

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During product use/consumption, consumers judge products based on sensory properties which they might associate with a particular benefit they seek. Therefore, depending on the conceptual benefit and the specific context of product usage, a given product might yield different acceptance results. When using hedonic rating in the absence of a natural consumption context, one may thus expect the consumer evaluative criterion to be more liberal (or flexible), with a larger number of possible product properties meeting the requirements for acceptance, and thus leading to higher hedonic scores for a larger number of products. On the contrary, when an evaluative criterion is specified according to a consumer-relevant situation, a more limited number of products may be considered acceptable. This does not necessarily mean that hedonic scores obtained from a controlled-situation would be always higher than those obtained from a consumer-relevant situation. It means that during the evaluation process, if a consumer evaluates a certain product using a flexible criterion, which is not his/her internal evaluative criterion, the hedonic scores obtained might have no external validity because the evaluative criterion used for the real situation was not applied. In this paper, we refer to 'acceptance' as the degree of liking under a specified personalized consumer context. This is different from hedonic rating which relates to liking in the absence of context.

Considering the fast technological developments and heavy competition in the FMCG industry, a key business question is how to position and optimize sensory properties to reinforce product benefits. Therefore, improving the accuracy of product acceptance and affective discriminability measures requires emphasizing not only the use of an optimal scaling approach but also other methodological aspects to ensure ecological validity of the results, such as how best to incorporate the consumer context into the measurement method (Köster, 2003). More recently, Meiselman (2013) emphasized that the test methods incorporating consumer context and more representative consumer measures need to be standardized in order to increase the ecological validity.

In the literature on measuring sensory acceptance, two different approaches have been adopted to induce consumer context: physical contextualization and cognitive contextualization. Although much research has focused on modifying the physical environment to simulate the real consumption/usage situation (King, Meiselman, Hottenstein, Work, & Cronk, 2007; King, Weber, Meiselman, & Lv, 2004; Petit & Sieffermann, 2007; Sester et al., 2013), this approach is expensive and time consuming. While context is often referred to as the physical environment such as real consumption/usage situation, we argue that capturing the consumer context appropriately involves incorporating the expectations and associations related to the product and associated consumption/usage aspects (Lyman, 1989). Therefore, evoking a consumer context cognitively might be an alternative approach to modifying the physical environment (Astrom, Gilbert, Mojet, Köster, & Wendin, 2011; Delarue & Boutrolle, 2010; Hein, Hamid, Jaeger, & Delahunty, 2010, 2012).

Hein et al. (2010) used written scenarios to evoke consumer contexts cognitively. In their study, an independent samples design was used, and differences in hedonic ratings between the treatment and control groups were compared to demonstrate the effects of such a method. It was found that the treatment group showed better affective discrimination between the products than the control group. When comparing the two different conditions (treatment vs. control), an independent samples design is often adopted to prevent carry-over effects as in Hein et al.'s study because a related samples design has the problem of such carry-over effects, where the first test condition influences the other. The independent samples design is also advantageous to lower the chances for the subjects to suffer from boredom of a long series of tests because they perform only a single condition. If the degree

of hedonic for a particular product is the main interest under investigation, the independent samples design is more generally accepted design. However, independent samples designs have the drawback when used in the methodological comparison experiment in that the observed effects might result from the differences between the groups, which is hard to control for with hedonics. Further, if the two groups differ in terms of hedonic score patterns across products, it is difficult to determine which group has provided more valid results. In other words, higher affective discrimination does not necessarily mean more valid results. Higher discrimination between products can be explained by an experimental artifact called hidden "demand characteristics" of direct scaling (Köster, 2003); people tend to feel that they have to discriminate the presented products regardless of their actual liking for them. This means that hedonic ratings of similar products can result in a significant difference in scores, even if the hedonic difference is not important enough to lead to the actual preference of one product over the other in a real consumption setting (Nichols & Maner, 2008). Thus, when an independent samples design is used to test the effects of cognitive context on hedonic test results, an additional element needs to be incorporated into the design. In the present study, we designed two sets of comparison experiments, each using a related samples design to test the robustness of the results of affective product discriminations. Boutrolle, Arranz, Rogeaux, and Delarue (2005) introduced the concept of robustness to validate their research on consumer test methodology, and defined it as "a measure of the method's capability to remain unaffected by small, but deliberate variations in method parameters". In their study, the robustness was measured by testing the stability of the results after decreasing the sample size, compared to the original data set.

In the field of food acceptance and choice, various consumer context factors have been reported. Rozin and Tuorila (1993), and Rozin (1996) described environmental/cultural factors, personal factors, and socio-cultural aspects as a range of contexts that can influence eating and food choice. Meiselman (2002) identified key factors important to the food consumption context which were shown to impact food acceptance by King et al. (2004, 2007). However, such factors defined in the food context might not directly apply to other product categories such as personal care products. A means to evoke a proper cognitive frame fitted to the evaluation of the personal care product categories thus needed to be designed in conjunction with our acceptance test.

For cosmetics products, such as skin care or makeup products, a consumer has individual needs; depending on such needs, the benefits which she is seeking might differ. Often, the type of benefits sought is one of the key variables which explain market segmentation. Therefore, we thought that by reminding each consumer of the benefit she is seeking when buying or using a product, the evaluative criterion which she normally uses can be induced. In skin care/household and personal care industries, home use tests (HUT) are often used in which a natural consumption context is there, however, and industries are trying to allow for some test to be done in central location test (CLT) setting in order to speed up innovation and reduce cost, even in skin care/household and personal care industries. While not all HUT can be omitted, if some early CLT tests can be more predictive, the number of HUT required would be reduced. Thus, in this study, we hypothesized that when a consumer context is appropriately applied to a sensory acceptance test by using imagined usage situations and remembered positive experiences, the measurements would be more stable across experimental sessions. For this, a pre-test interview of the consumer, focused on her individual product usage context, and which will be referred to as the cognitive warm-up procedure (CWU), was designed and applied prior to the hedonic rating. The assumption is that such a CWU procedure would allow consumers

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