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# Projective mapping based on choice or preference: An affective approach to projective mapping

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ABSTRACT

This work explores a new affective approach to projective mapping, based on consumers' choices or preferences. Two sessions, one week apart, were performed with the same consumers, using whole bread as a case study. Overall liking ratings (OL) were gathered in blind conditions and samples were also profiled by a trained panel using generic descriptive analysis. Three projective mapping tests were performed in different scenarios. Consumers' categorization and product descriptions were explored when consumers based their positioning on the products' similarities and differences (analytical approach, "classic napping") both in blind and informed conditions, and when consumers were focusing on their preference or choice (affective approach). The affective approach to projective mapping successfully revealed consumers' drivers of liking and choice from a holistic perspective, where consumers summarized their main drivers for categorizing products as they would do when choosing in real life situations, based on their preferences.

## 1. Introduction

Projective mapping (also known as Napping®) followed by a descriptive step has been extensively used with consumers in the last years as an alternative tool for the description of products and packs. It is considered a holistic approach to product profiling, closer to what happens in a choice event when compared to classic descriptive or attribute-based techniques (Valentin, Chollet, Lelièvre, & Abdi, 2012; Varela & Ares, 2012). Built on the perception of similarities and differences, it encourages the generation of a global representation of the products, which is usually hindered when consumers are directly asked about multiple particular attributes. Holistic methods enable to identify the main attributes that account for the differences among the samples without forcing consumers to focus on specific characteristics (Varela & Ares, 2012). In addition, projective methods make it possible to capture more spontaneous responses than other, more directive, techniques (Guerrero et al., 2010). The projective mapping (PM) task can involve the perception of similarities and differences from an intrinsic (sensory) perspective, from an extrinsic (pack, labelling, etc.) perspective, or from both (Carrillo, Varela, & Fiszman, 2012a), generally considering product objective characteristics for categorization rather than liking as the main parameter. Despite this, consumers often use hedonics or benefit-related terms together with the product and pack descriptive characteristics. This can be used to relate product characteristics to marketable features and consumer preferences (Ares & Varela, 2014) and is an approach that has been applied successfully to explore sensory and non-sensory stimuli, such as the influence of packaging information – e.g. nutritional and health claims – on consumer perception (Carrillo et al., 2012a; Carrillo, Varela, & Fiszman, 2012b; Miraballes, Fiszman, Gámbaro, & Varela, 2014; Varela, Antúnez, Silva Cadena, Giménez, & Ares, 2014).

When optimizing food products, the general practice has been to ask consumers about liking; the sensory properties would be characterized in parallel by a trained panel, in a preference mapping type of exercise (van Kleef, van Trijp, & Luning, 2006). However, trained assessors may describe the product differently, so sensory characterization based on consumers' direct input may have greater external validity (Ares & Varela, 2014). In this sense, overall liking (OL) has been gathered jointly with PM data in some studies in order to draw conclusions on drivers of liking (Ares, Deliza, Barreiro, Giménez, & Gámbaro, 2010; Torri et al., 2013) and to better understand the changes in hedonic response in different mapping scenarios (Carrillo et al., 2012b). In a study by Ares, Varela, Rado, and Giménez (2011), after doing a PM with real samples of powdered orange juice consumers were asked about their ideal product to be mapped. The results were similar to those of external preference mapping. Withers et al. (2014) have used taxonomic sorting, a holistic method also based on sample categorization, to generate diagnostic sensory data directly from target consumers by external preference mapping. Generally, hedonic descriptions or OL have been considered as supplementary variables in PM data.

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From a different perspective, King, Cliff, and Hall (1998) compared PM to a "structured PM" to map snack bars, where they used labelled axes in the PM space: the x-axis was defined as "liking" (low - high) and the y-axis as "usage" (treat - meal replacement). They found the proposed method less discriminating than PM, but only 24 consumers participated in this study. To our knowledge, there have been no other approaches to PM from an affective perspective, with liking or preference explicitly driving sample categorization.

Consumers in affective tests act in an integrative fashion, basing themselves on global sensory and non-sensory stimulation from the product – in contrast to the analytical testing frame of mind in descriptive testing (Jaeger, 2006; Lawless & Heymann, 2010). More concretely, since consumers are integrated and organized wholes, as highlighted by Maslow (1954), in real buying and eating situations they take a certain number of attributes (sensory and non-sensory) into account when performing food choices or declaring their preference (Asioli et al., 2017). Thus, consumers would cognitively focus on products differently when describing as opposed to stating their preference or choice. With this background, it is of great interest to study how consumers approach the PM task when preference or choice is used as a criterion.

The objective of this study was to explore a new affective approach to projective mapping, with bread as case study, basing product categorization on consumers' choice or preference, and to compare it to the classic preference mapping procedure. This approach might provide information that is more realistic for product developers and marketers during the product development process and market launch.

## 2. Materials and methods

### 2.1. Samples

Eight commercial wholegrain, pan-loaf breads were used in the study, bought in supermarkets in the region immediately south of Oslo (Norway). Products differed in terms of brands, prices, mix of grains used and percentage of wholegrain (Table 1).

### 2.2. Descriptive analysis with a trained panel

A trained panel of nine assessors at Nofima Mat (Ås, Norway) performed a sensory descriptive analysis according to a quantitative descriptive analysis inspired by QDA® with modifications, as described by Lawless and Heymann (2010) as generic descriptive analysis. The assessors were tested, selected and trained according to ISO standards (ISO, 1993) and the sensory laboratory used followed the ISO standards (ISO, 1988). Nofima's panel is a highly trained and very stable panel; the assessors are solely hired as tasters, with a part-time job; some of them have > 20 years' experience. The panel performance is assessed frequently, and checked for every project. The specific attribute list for the bread was developed in a one hour pre-trial session using two extreme bread samples. After a pre-trial session, the attributes and definitions were agreed upon by the assessors: they were all able to discriminate among samples, exhibited repeatability, and reached agreement with other members of the group. The assessors agreed upon 25 attributes describing the bread samples: odour intensity, hue, colour intensity, whiteness, pore size (crumb), amount of seeds/fibres (crust), roughness, elasticity, strength, crumbling, cohesiveness (using the finger), acidic taste, sweetness, saltiness, bitterness, yeast flavour, grain flavour, nut/seed flavour, roasted flavour, rancid flavour, hardness, juiciness, roughness/coarseness, chewiness and stickiness. All attributes were evaluated on unstructured line scales with labelled endpoints going from "no intensity" to "high intensity". In a pre-test session, the assessors were calibrated on samples that were considered the most different on the selected attributes typical for the breads to be tested. Samples were served in transparent Ziploc® bags labelled with three-digit numbers. Tap water was available for palate cleansing. Two replicates were performed for each bread sample. All samples and replicates were served in randomized order following a balanced block experimental design.

### 2.3. Consumer tests

Two sessions, one week apart, were held with the same group of participants and the same eight samples at Nofima Mat (Ås, Norway). In the first session, consumers performed two "classic" PM tests: blind PM (tasting blind samples) and informed PM (tasting together with the pack). In the second session, consumers first rated blind overall liking followed by a PM task based on choice or preference in informed conditions (tasting together with the pack). In both sessions, new samples with new codes were delivered for the two tests; consumers had a minimum of 15 min' break between tests.

#### 2.3.1. Consumers' sample

The consumers included in the study (n = 50) were recruited from Nofima's consumer database and were frequent consumers of wholemeal bread (more than twice per week). The participants were between 34 and 64 years old (43 years on average). Each session lasted around one hour (Fig. 1).

#### 2.3.2. Session 1 – classic PM, blind and informed

All participants were instructed in the use of the PM technique with a descriptive step. The basics of the technique were explained to the participants through an example employing geometric shapes with different colours and patterns, without any reference to bread. After the explanation of the technique, the participants received an A2 sheet of paper to allocate the samples. Samples were allocated according to the principle that samples with similar characteristics should be placed close to each other, while different samples should be placed further

**Table 1**
Bread samples included in the research.

| Sample | Type of bread | Half-coarse 25–50% whole grain | Coarse 50–75% whole grain | Extra coarse 75–100% whole grain | Keyhole label | Claims |
|---|---|---|---|---|---|---|
| B1 | Wholegrain | x | | | | Balance. Protein rich, less carbohydrates, "smart-carbo", high fibre, beneficial fats, stable blood sugar |
| B2 | Dinkle wholegrain | | x | | x | |
| B3 | Wholegrain | | x | | x | |
| B4 | Wholegrain with oats | | | x | x | |
| B5 | Wholegrain with oats and rye | | | x | x | Sport bread. Gold recipe. The taste of success is unbeatable |
| B6 | Oats | | | x | x | High fibre |
| B7 | Rye | | | x | x | Healthy and well, good for the body. Long lasting satiety, health & taste winner. High fibre |
| B8 | Barley | | | x | x | B-glucans, lower cholesterol, long lasting satiety, Norwegian grain |