Comparison of the consumers’ expected and actual perception of food investigated by Napping
A case study with Béarnaise sauce

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ISBN: 978-91-7290-325-8
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Abstract

In the present work we investigate the consumers’ expected perception of food, using packages of béarnaise sauce, with the preference of the actual product. Further we compare the results of the consumer panel with the outcome of an analytical sensory panel. The ambition was also to use innovative techniques to get additional insights of the consumers’ perception of food. Global Napping was performed with a consumer panel on the expected preference and partial Napping was conducted for evaluating the perception of the actual products. Results were complemented with preference tests and rankings, as well as the connection of the product to a package. An analytical sensory panel performed partial Napping of the products. In addition new and simple method of Napping data evaluation is presented. The results showed a mismatch between the perception of the package and the actual product. Different groups, here named as “emotional” and “rational”, perceived products in diverse ways. The consumer panel was a highly inhomogeneous group of individuals, whereby the sensory analytical panel had high agreement. Consumers, who used to buy a certain product could not necessarily distinguish this product, neither did they rate this product as their first choice.

Keywords
Sensory analysis, Napping, Partial Napping, Global Napping, Consumer perception, Consumer research, Projective mapping

Introduction

It is of great interest for food manufacturers, as well as researchers, how consumers perceive food, how they make decisions and how this influences their choice of food. In a traditional way of analysis, consumers are given products and asked for their preferences using different kind of grades, for instance a scale. Further, it is common that no conclusions can be drawn of what motivation consumers had for making their decision, how products differed and what characteristic was most important for each individual (Köster, 2003, 2009). Principally a restricted frame is given of how the products have to be evaluated (Lawless & Heumann, 2010). Previous investigations on the buying behavior of consumers showed that the emotions of a person influenced their choice of food (Leigh Gibson, 2006; Thomson, Crocker, & Marketo, 2010). But also external influences, such as the partner or in particular their children play a major role in this manner (Binkley & Golub, 2011; Frostling-Henningsson, 2008; Gram, 2010). Thus, there is a demand for innovative methods, which account this background. One method was recently introduced by Pagès (2005), called Napping. Assessors position products on a paper according to their similarities and differences with small or big distances on the paper. The individual persons are free in their choice, according to what characteristics products are placed. The word napping derives from the French word “nappe” which means tablecloth, referring to the paper sheet used to place the products. Different to projective mapping by Risvik et al. (1994), the tablecloths do not contain any line scales or thought to be two-dimensional. Napping was introduced for its simple and fast way to characterize products, but mainly because it is said to represent the perception of the assessors in a pure and pristine way, which is crucial for the determination of the consumers’ perception of food (Dehlholm, Brockhoff, Meinert, Aaslyng, & Bredie, 2012). Moreover consumers are not trained in the description of
Recently Napping has been used in combination with Ultra-flash profiling (UFP) (Albert, Varela, Salvador, Hough, & Fiszman, 2011; Ares, Deliza, Barreiro, Giménez, & Gámbaro, 2010; Carrillo, Varela, & Fiszman, 2012; Dehlholm et al., 2012; Moussaoui & Varela, 2010; Perrin et al., 2008), where assessors describe the products shortly in their own words to determine what criterion was important to them. Napping can be divided into two types: global Napping and partial Napping. The first type is non-restricted, so as the judges are completely free in their choice of distinction; in partial Napping several tablecloths are used with the restriction of an attribute for each paper, for instance the appearance of a product. The evaluation of Napping data is commonly done with Multiple-Factor analysis (Pagès & Husson, 2001) or Generalized procrustes analysis (Gower, 1975). However, if not already introduced, these methods can be time consuming to perform, they involve restricted software or else they require the knowledge of a programing language. Consumers, in particular, require a method giving consideration to each person to take their individuality into account. For this reasons another evaluation method is needed, which makes Napping simple to evaluate using commonly used and free accessible software, without usage of a programming language, but at the same time give respect to each individual. Earlier Napping studies were made, for instance, on white wine (Pagès, 2005), fish products (Albert et al., 2011), enriched and reduced-calorie sweet biscuits (Carrillo et al., 2012), liver pâté (Dehlholm et al., 2012), hot beverages (Moussaoui & Varela, 2010) and beers (Abdi & Valentin, 2007). Within the literature research of this work, no investigation was found that studied Napping with béarnaise sauce. In Sweden béarnaise sauce represents the biggest sector of sauces (Nielsen) and is therefore very habitual in its use. In addition sensory variation is apparent when comparing different sauces in appearance, as well as smell, taste and texture. Furthermore differences between different manufacturing technologies could be examined. To quantify the consumers’ expectations and the actual perception of a product Napping data could be complemented with hedonic investigations of the expected and the actual perception of food product, as well as with rankings of the products. The aim of this work was to compare the consumers’ expected and actual perception of food products. Further objectives where to investigate:

- The importance of sensory variation for consumers
- Consumer’s ability to sense the difference between products manufactured in different ways
- Individual differences

In this study we conducted global Napping of the expected perception, using six béarnaise sauce packages, and partial Napping of the actual products with naïve consumers. The sauces were made according to different ways of production. Consumers were divided into two groups, here named “rational” and “emotional”. Napping was complemented with preference tests, rankings and tests of the connection between product and package. An analytical sensory panel performed partial Napping of the actual products. Further a new method for evaluation of the resulting Napping data was introduced. Focus group interviews were conducted, however, the results are not included here. We hypothesized that the expected preference differs from the actual perception of the product, caused by the package, although, consumers can determine sensory variation and different ways of production. Above that we expected the consumers to be a rather inhomogeneous group of individuals in contrast to the analytical sensory panel.
Methods

Products: six béarnaise sauces

The products, with different manufacturing techniques, were the béarnaise sauces of Blå Band (P1) and Knorr (P2) as sauces that had to be prepared using a powder base, and as ready-made sauces the products of Jensen (P3), Knorr (P4), Lallerstedt (P5), and Rydbergs (P6, P6rep) were used. The powder based sauces P1 and P2 were prepared according to their package descriptions, with a maximum of two bags at once, the ready-made sauces P3 to P6 were heated and served randomly at eating temperature of 68 °C. An overview of the samples is shown in Table 1.

Table 1 Overview of the six béarnaise sauces regarding brand, manufacturing technology, packaging and picture of the product

<table>
<thead>
<tr>
<th>Product</th>
<th>Brand</th>
<th>Manufacturing technology</th>
<th>Packaging</th>
<th>Picture of the product</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Blå Band</td>
<td>Powder base</td>
<td>Cardboard containing bags</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Knorr</td>
<td>Powder base</td>
<td>Cardboard containing bags</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>Jensen</td>
<td>Ready-made</td>
<td>Squared plastic bottle, reclosable</td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>Knorr</td>
<td>Ready-made</td>
<td>Tetra pak</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td>Lallerstedt</td>
<td>Ready-made</td>
<td>Round shaped plastic container, reclosable</td>
<td></td>
</tr>
<tr>
<td>P6, P6rep</td>
<td>Rydbergs</td>
<td>Ready-made</td>
<td>Sealed plastic bag, standing</td>
<td></td>
</tr>
</tbody>
</table>

Two panels – one consumer and one analytical sensory panel

A naïve consumer panel of 15 persons, 8 female and 7 male, with children living at home was recruited. Assessors were selected by their liking and buying behavior of béarnaise sauce, as well as their anticipated emotional and rational personality. In a pre-questionnaire the chosen persons stated that:

- they eat béarnaise sauce once or more times a month
- they purchase their food either themselves or together with their partner
- they like béarnaise sauce

The age of the persons ranged between 29 and 54 years. They had 1 to 4 children living at home with the age ranging from 7 months to 21 years. The test person was either the only adult in the household or had another adult living with them. If an assessor fully agreed to the statement: “I always take a shopping list when purchasing food” and: “If there is a shopping list, I only buy the products on the list” they were divided into a group, here called “rational” (8 persons) and in case of a divergence, they were divided into another group, here “emotional” (7 persons).

An analytical sensory panel consisted of 8 selected assessors, screened according to ISO 8586-1 (1993) and recruited from SIK’s pool of panelists, experienced in sensory evaluation.

**Experimental design**

According to the reality when choosing food in a supermarket, consumers were first asked to judge the empty packages and thereafter they were given the products itself. The packages were investigated by global Napping by the consumers, followed by the expected preference and a ranking of the packages. In a second phase the products itself were evaluated by partial Napping with the attributes “appearance”, “smell/taste” and “texture”. The consumers were subsequently asked for their preference followed by a ranking of the products. Finally in a third phase the assessors were asked to connect the tested products to the given packages. The analytical sensory panel conducted partial Napping in the same manner as the consumers with the products. Each group was given a short introduction of Napping and the schedule directly before the tests. In Fig. 1 the arrangement and the type of the performances are shown.

![Experimental design for consumers and the analytical sensory panel](image-url)
Global and partial Napping

Napping was performed based on the description of Pagès (2005) and further developed by Dehlholm et al. (2012). Global Napping was done on the packages only. Small images were given to the assessors; in addition they had an empty package of each sample standing on their table. The images were placed on an A3 paper sheet (tablecloth) according to their similarities or dissimilarities. Packages that consumers perceived as similar were placed close to each other and packages very different from each other were placed with big distance on the paper. Each consumer was free to choose their own criteria for grouping the products. Napping was coupled with UFP, where assessors describe the product in their own words. In practice they wrote some descriptive words next to the products on the Napping tablecloth. Partial Napping was done with the products, served at 68 °C. For each characteristic (appearance, smell/taste, and texture) a separate paper was used, i.e. each person was given three tablecloths. Samples were identified by colored stickers, which were placed on the paper by the judges.

Preference and ranking

After the global Napping of the packages, the consumers were asked to judge the expected preference of the package on a nine-point hedonic scale (Lawless & Heymann, 2010), ranging from “extremely bad” to “extremely good”. Thereafter they ranked the samples from place one to place six, whereby the first place stood for the most appreciated product. In addition consumers were asked to motivate the first and last placements. Subsequently to the Napping of the actual sauces, they were asked on a nine-point hedonic scale, from “extremely good” to “extremely bad”, how much each product was appreciated. Thereby it was not known which of the packages belonged to which product. The same ranking as for the packages was also done with the actual products, with the difference that P6 was used as a replicate (P6rep), so as the consumers evaluated seven samples. Finally consumers connected the tested products to the packages they assumed it belonged to.

Data collection and statistical analysis

To evaluate the Napping tablecloths, the x and y co-ordinates of each product on each paper were measured with the origin in the bottom left corner. Since every person was free in their choice of how the directions on the paper were defined, the co-ordinates of a product could not be compared directly with another person; instead the relation of products on one tablecloth was compared to other persons’ tablecloths. Therefore the Euclidean distances (Abdi, 2007) of the products on each paper were calculated out of the co-ordinates using the Pythagorean theorem:

\[ d_{ij} = \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \]  

(1)

where \( x \) is the value of the x co-ordinate in cm, \( y \) the y co-ordinate and the subscripts \( i \) and \( j \) stand for the products. In practice the consumers used their paper very differently, so as some used the whole space and some only a small part. Thus, the distances for each person and each tablecloth were normalized:

\[ D_{ij} = \frac{d_{ij}}{d_{ij}^{\text{max}}} \]  

(2)
where \( 0 \leq D_{ij} \leq 1 \). In that way each assessor was given equal weight, no matter if he or she used the whole tablecloth or only a small part of it. Thus, the two dimensions x and y were reduced to one dimension. The normalized distances were imported in the freeware PanelCheck (V1.4.0, 2010) and principal component analysis (PCA) plots were extracted to determine which products are grouping.

The characteristic words used in UFP were collected. Similar meanings of words were grouped and the occurrence was counted. In accordance to Perrin et al. (2008) words with a quantitative addition, such as “very” or “little”, were ignored since each occurrence was counted with either 1 or 0. For each consumer and product all available descriptions were evaluated, i.e. UFP on the Napping tablecloth, as well as descriptions in the complementary tests. As the sensory panel conducted only partial Napping together with UFP on the tablecloth, for this group descriptors were only taken from this data.

The results of the preferences and rankings were evaluated with FIZZ calculations 2.46 B. An analysis of variance was performed of the preferences; the rankings were evaluated with the Friedman-Test. Significances were considered as \( p < 0.05 \). To get a relation of the expected and the actual perception of the product, the preference and the ranking of the package were subtracted from the preference and ranking of the product for each single person. In that way it was possible to eliminate personal differences, and in addition get a value if a person over- or underestimated the product when seeing only the package. The resulting values were likewise evaluated with FIZZ calculations 2.46 B.

**Results**

**Package – the expected perception of consumers**

**Napping**

On the tablecloths it was apparent how consumers arranged the packages and thus, how they perceived it. Words mentioned very often were: ready-made/chilled, prepare/dry/powder, size/big, plastic, brand, stackable/storage/space, reclosable/closable, edged, paper or color, see Fig. 2.
In Fig. 3a the PCA plot of how consumers placed the packages on the tablecloth is shown. Apparent is that both of the powder based sauces, P1 and P2, are very close to each other, marked with a circle. Thus, most consumers perceived those packages as quite similar. The ready-made sauces P6, P5 and P3 are on the other side of principal component 1 (PC1). The explained variance of PC2 is with 17.3 % relatively low, accordingly the vertical distance is not equally big. Consumers ordered the samples also by their material. The sample P4 was a tetra pack and hence a mix between cardboard and plastic, it ended up in the middle – between P6, P5 and P3 on one side, which are plastic packages, and P2 and P1 made of cardboard on the other side. As mean value the distance between the latter two was lowest with 8.1 cm followed by P3 and P5 with 11.5 cm. The biggest difference in the mean value was between P5 and P1 with 24.1 cm, which therefore were perceived as most different packages.
Fig. 3 Napping PCA of a) the packages by the consumers; b) the actual products by the consumers including appearance, smell/taste and texture; c) the actual products by the analytical sensory panel including appearance, smell/taste and texture. Circled are P1 and P2, which are sauces, made from powder base and P6 and P6rep, which are replicate sauces. The principal components, shown in the graphs, explain a higher variance for the analytical sensory panel, indicating that this group was more homogeneous compared with the consumer panel.

Preference and ranking of the package and expected content

In the rating of the expected preference, consumers answered very differently. They avoided using the extremes like “extremely good” or “extremely bad”. There was no significant difference within the consumers, neither when looking at the groups “emotional” or “rational” separately, in contrast to the ranking of the packages. Consumers ranked the package of P5 highest (low number), followed by P6, P3, P1, P2 and P4. However, only the first and the last sample differed significantly. The standard deviations were relatively high. As explanation when choosing P5 as the first place, consumers wrote: “easy to open”, “looks more modern” or “known brand”. Only two of the 15 assessors chose P4 as their sixth place. As a reason, they stated: “does not look appealing” and “the content is not visible”. Most persons chose P3 as their last place with the explanation that it is difficult to get all sauce out. When looking at the different groups of consumers, there were significant differences in the “emotional” group (between P5 and P2), but not in the “rational” group.

Product – the actual perception

Consumer

The blind tests of the products showed very different preferences of the actual products, compared with the expected preference. The PCA of the attributes appearance, smell/taste and texture of the consumers is shown in Fig. 3b. The illustrated explained variance PC1 and PC2 is 61.2 %. As it includes all three attributes together and shows
the mean of three tablecloths per person, the explanation is lower than for the expected preferences, seen in Fig. 3a. The replicate samples P6 and P6rep are grouping with the smallest of all mean distances with 8.7 cm and normalized 0.30. Also both of the powder based sauces P1 and P2 are grouping. They had a mean distance of 9.3 cm on the tablecloths. The other ready-made sauces are located on the other side of the chart and differ mostly in PC2. Highest differences were calculated between P5 and P4 with a mean value of 18.7 cm and between P3 and P2 with equal mean value. The normalized distances showed the same tendency. In the single attributes, like the appearance, results were slightly different. The maximum normalized distance in the mean values was the texture between P4 and P5 with 0.74 while the minimum was 0.18 in appearance between P1 and P2.

Whereas there were no significant differences when consumers rated the expected content of the packages, as soon as they got to taste the products, they also used the extremes like “extremely good” or “extremely bad”, which led to a significant difference. The powder based sauces P1 and also P2 had an average score of 6.5 and were rated as best of all products. The ready-made sauces P3 and P4 were given the lowest rates with 2.7 and 4.1 mean points. They differed significantly from the first two sauces, P1 and P2. The ranking from 1 to 7 resulted in the same order and showed, as well, high significance ($p < 0.0001$). Persons who stated before the test that they usually buy a certain product did not always rate this product with the best score. Out of 15, there was only one who found the sauce he usually buys “extremely good” (9 points), one person even stated that the sauce was “bad” (4 points). In average consumers rated the sauce they usually buy as “good” with 7.0 points, in the ranking it resulted in place 2.4. In addition consumers did not necessarily recognize the product they usually buy. The guesses were correct to 40% when consumers were asked to connect the tested sauce to a package. Out of all products 34% of the guesses were correct, whereas 67% were connected to the right type of sauce in terms of manufacturing technique.

**Analytical sensory panel**

In Fig. 3c the PCA of all attributes together, of the analytical sensory panel is shown. The explained variance of the first two principal components is with 75.0% far higher compared with 61.2% of the consumer panel. The replicate samples P6 and P6rep are very close to each other. Mean distance, regarding all attributes, of the two samples was 5.1 cm and normalized 0.17. Compared with the distance of the same samples of the consumer panel (8.7 cm; normalized: 0.30), the value is very low. Next lowest are the distances between P2 and P4 along with P1 and P4, with mean distances of 11.8 resp. 12.1 cm. The largest mean difference was between P3 and P5, which was 23.9 cm and normalized 0.75. Thus, the range between 5.1 and 23.9 cm is much higher compared with the resp. range of the consumer panel. The maximum normalized distance, regarding the single attributes, was the texture between P3 and P5 with 0.93, while the lowest value was 0.10 in the texture between P6 and P6rep. For the consumer panel the maximum and minimum mean value, when looking at the single attributes, was 0.74 and 0.18. To visualize the differences in individuality, Fig. 4 shows the accordance of the consumer panel (Fig. 4a), and the analytical sensory panel (Fig. 4b) in the case of smell and taste with P5 as an example. Assessors outside the inner circle are significant; small grey dots indicate the positions of the persons for the other products. The assessors of the analytical sensory panel are grouping outside the circle, meaning that they are significant, contrary to the assessors of the consumer panel, who preliminary are inside the circle. As the grey dots indicate, this constellation was similar for the other samples.
Comparison of the expected and the actual perception

The comparison of the preferences of the expected content and the product resulted in values of −4 to +7 (theoretically possible −8 to +8) with an overall mean value of 1.4, i.e. the products itself were, in average, slightly higher rated than the expected content of the packages, see Fig. 5. Negative values, i.e. low rating of the expected content and high rating of the product, indicate that the consumer underestimated the product when seeing only the package and vice versa. The package with lowest score was P2 with a mean value of −0.5 followed by P1 with −0.2. Both of them were powder sauces with a package of cardboard. The most overestimated package was P3 with a mean value of 3.7 and P5 with 2.3, both were plastic packages in different shapes. They differed significantly from the powder based sauces P2 and P1. The samples P6 and P4 were situated in the middle, although with positive mean values. The comparison of the rankings resulted in the same order of samples. Nevertheless, the ranking of the products included seven places instead of six, caused by the replicate sample P6rep. Therefore the values could not directly be compared with the results of the preferences. When looking at the groups, significances were detected in the “emotional” group regarding the calculated difference in preference of the expected content and the actual product, as well as the calculated difference in the ranking of the package and the actual product. Most underestimated package in relation to the content for the “emotional” group was P2 followed by P1, which differed significantly to the most overestimated packages P3 and P5. The “rational” group, however, did not result in significant differences in both of the calculated differences, see also Fig. 5.

Fig. 4 Accordance of a) the consumers and b) the analytical sensory panel in case of texture on P6
Fig. 5 Difference values of the expected preference subtracted by the preference of the actual product: all consumers in comparison with the groups "rational" and "emotional"; no significance of the “rational” group, whereas all together and the “emotional” group showed significant differences.

Discussion

By the words, which the consumers wrote on their tablecloths and the Napping results of the packages, it can be seen that assessor’s preliminary divided béarnaise sauce into their manufacturing techniques. The reason behind might be that it affects them directly, as it determines the effort they have to make at home and the time they have to spend to prepare the product. Additionally, when being in a supermarket, the decision if ready-made or powder sauce, has to be made before actually taking the product, since the products are positioned in different places, either chilled or ambient. Thereafter consumers seem to make the choice of the brand, unless they are always buying the same type and brand.

The consumer, in average, did not have a strong opinion about the expected content of the packages, however if he was asked for the packages itself, consumers tended to like more packages made of plastic rather than simple looking packages of cardboard. Nevertheless, the relatively high standard deviations indicate, that each person had a very individual view on the packages. The sample P4, the tetra pak, was least appreciated or in other words, the assessors neither liked, nor disliked the package since only two persons chose it as their sixth place. Possible explanation can be that the product itself was not visible, in contrast to the other ready-made sauces. To position it on the last place might also be more an indication that a person does not like the package, nonetheless it seemed more as the other packages drew more attention than the tetra pak, hence assessors put it mostly on one of the rear places without really disliking it.

Other authors found that the mood, when purchasing food, influences consumers’ choice and eating behavior (Adriaanse, Vinkers, De Ridder, Hox, & De Wit, 2011; Leigh Gibson, 2006). Since the "rational" group did not show significant differences in the ranking of the packages, the conclusion can be drawn that a more rational thinking person is less influenced by the package itself. On the other hand, higher number of persons can result in higher significances. Since the groups had seven resp. eight persons, this fact could also have influenced the significance. However, also the calculated difference between the expected and the actual perception of the product
shows this tendency. Although the “rational” group did not show big differences, the “emotional” group was more influenced by the package in relation to the product. Therefore it can be said that a more rational person makes rather even-tempered choices compared with a more emotional thinking person (Zajonc & Markus, 1982).

Partial Napping of the product showed that the majority of the consumers could sense that P6 and P6rep were very similar. This can be seen as an indication that the consumers are able to tell differences in the products. Also the sauces made from powder base were grouping, which indicates that most persons perceived this way of production different to ready-made. However, the range, from minimum to maximum, of the mean normalized distances is fairly small, showing that the consumers had a very individual view on the characteristics of the sauces and perceived them in different ways. Also the low explained variance of the PCA plots compared with the analytical sensory panel, demonstrate this. Regarding the analytical sensory panel, this range of mean values was quite big, which shows that this panel was a very homogeneous group, only looking at the specific characteristic without emotional interpretations. Moreover the consumers showed that the content matters more to them compared with the packages as they used a wider scale when they evaluated their preference of the products. It also resulted in a very high significance, showing that consumers can distinguish the products without the packages. Two third of the consumers could recognize if the sauce they tested was a ready-made sauce or if it was prepared with a powder base. Though, the panel was limited to persons who like béarnaise sauce and buy it regularly. Taking other persons into account might result in different conclusions. Persons, who usually buy a certain product, did not necessarily recognize this product. Neither did they think this product was the best out of all the products they have tested. Thus, the choices they make in the supermarket turn out to be more a habit than a preference (D. Cohen & Farley, 2007; J. B. Cohen & Areni, 1991; Rook & Gardner, 1993; Scholderer & Trondsen, 2008; Zajonc & Markus, 1982). They might buy a certain product, because they know that it tastes good to them, without knowing, that another product might taste better. On the other side, since this study was made with consumers living with their children, not only the tested panelists themselves decide what they buy, also the partner and especially the children have a big influence on the buying behavior of those persons (Binkley & Golub, 2011; Frostling-Henningsson, 2008; Gram, 2010). In this study we assumed that the consumers evaluated their own preferences, as it did not influence their families. Also convenience could have had an impact on the decision, but since the consumers, in this study, preferred sauces made from powder base, this should not have had an effect.

When each persons expected preference is compared with their preference of the product, it can be said that the packages of sauces with powder base, made out of cardboard, were underestimated. That means that the consumers had low expectations of the product when they saw the package, but were thereafter impressed by the taste. One possible explanation could be that they are used to the taste and texture of powder based sauces, since the majority of the consumer panel stated, that they usually buy one type of powder based béarnaise sauces.

The presented way of evaluating Napping data by calculating the distances, normalizing it and monitoring the outcome with PanelCheck led to reasonable results. Personal differences in placing the products are eliminated and the results can be presented in a demonstrative way. This makes Napping a better accessible, as well as affordable method to conduct, supporting a higher number of applications.
Conclusions

In the present work we compared and described the consumers’ expected versus actual perception of béarnaise sauce. As we hypothesized, the perception of the two differed greatly. Cardboard packages with a powder base were underestimated in relation to their content, whereas plastic packages with ready-made sauces drew positive attention only in the appearance of the package, contrary to the perception of the actual product. Further it seemed as more rational thinking partly prevents the disposition of over- or underestimating a product only by packaging exposure. The consumer panel represented an inhomogeneous group with very individual view on the packages resp. the expected content, as well as the perception of the actual product. However, differences in the products were clearly identified by consumers. Nevertheless consumers actually preferred another product over what they have been used to buy, showing that their buying behavior is more a habit than a preference (D. Cohen & Farley, 2007; J. B. Cohen & Areni, 1991; Rook & Gardner, 1993; Scholderer & Trondsen, 2008; Zajonc & Markus, 1982). The analytical sensory panel was a group of high agreement and homogeneity, which underlined the individuality of each consumer.

Acknowledgements

This study has been part of the cross-disciplinary food research program Tvärlivs and has further been financed by Formas, Vinnova, Abba Seafood, Arla Foods, Campbell Soup, Fazer, Findus and Pågen.
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