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The effect of emotions on purchase behaviour towards novel foods. An application of Means–End chain methodology

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ABSTRACT
This study performs an *a priori* segmentation of shoppers based on their emotions with respect to two novel food items, one functional the other conventional. Both food types appear to evoke positive emotions in a majority segment of consumers and negative emotions in a minority segment. An analysis of the purchase decision structures of these segments using means–end chain methodology reveals the importance of hedonistic and nutritional qualities in food consumption decisions. In addition, brand emerges as a key factor in the purchase choices of satisfied consumers while quality search and control are key issues for concerned shoppers.

1. Introduction

The high level of dynamism and competition that characterises agri-food markets has forced food companies to be more accurate in identifying the preferences of their customers as well as in describing the consumer choice process. Furthermore, this new competitive environment has compelled companies to innovate and develop new food products in order to satisfy the needs and desires of markets and to improve the competitive position of companies (Baregheh *et al*., 2009; Naidoo, 2010).

Today, consumers are increasingly variable and less predictable due to significant lifestyle and demographic changes, cultural exchanges and high communication levels (Capitanio *et al*., 2009; Fortuin and Omta, 2009; Kühne *et al*., 2010). Therefore, acquiring better knowledge of what consumers want, of how their needs change and how to immediately address these changes, that is, becoming marketing oriented, is not only a success factor for agri-food companies but a survival one also (Costa *et al*., 2004). Successful innovation is based on understanding consumers and the characteristics and benefits they pursue in the products they buy and consume, as well as the aspects of their own personality that they project through these products.

A large body of literature has analysed the effect of standard socioeconomic, consumption frequency, and cultural variables, etc. in consumer behaviour (Sapp and Korsching, 2004; Sparke and Menrad, 2009; Michon *et al*., 2010; Piqueras-Fiszman and Jaeger, 2014). However, most studies point out that personal characteristics have little effect on innovation adoption (Urala and Lähteenmäki, 2007; Bellows *et al*., 2010). More recently, however, attention appears to have turned towards factors of a more psychological nature, such as eating-related emotions, which play an additional role in explaining variation in food-choice behaviour (*Kuesten et al., 2014*; Spinelli *et al*., 2014; Gutjar *et al*., 2015). Shiv and Fedorikhin (2002) note the relative importance of emotions on decision making is a function of a series of factors, which include subjects' cognitive abilities and self-control.

It is not easy to determine exactly how emotions influence food consumption, or to explain individual variability. The broad consensus, however, is that variability is partly due to the different motives governing consumers' choices.

Evers *et al.* (2010) report on the process by which emotions influence eating behaviour is examined within the context of 'emotional eating' and that this may introduce some type of additional influence on the food choice process. Thus, all these studies coincide in identifying the interaction of emotions in rational behaviour, a phenomenon that has also been widely studied in relation to its influence on brand perception and communication effectiveness (Pawle and Cooper, 2006; Cardello *et al.*, 2012; Dalenberg *et al.*, 2014).

Overall, there is a growing consensus on the fact that, along with hedonistic aspects and sociodemographic characteristics, emotional responses play an important role in terms of the acceptance of market products' acceptance (Narchi *et al.*, 2007; King *et al.*; 2010; Kuesten *et al.*, 2014; Mojet *et al.*, 2015). Using Mojet's model (2001), Köster (2009) finds emotions to be among the factors influencing food choice. This shows that emotions are a precedent of cognitive behaviour. This is related to the need to shift from the traditional perspective (Lancaster, 1996), which took into account only the physical characteristics of a product, to a broader one which includes an analysis of the personal issues and emotions felt by buyers. Consumers generally tend to choose food items they perceive as emotionally close to them (*Porcherot et al., 2010*; Jiang *et al.*, 2014). In this way it will be possible to identify which attributes, benefits, emotions and values are taken into account by consumers when it comes to innovation as in general the success of a new product will depend on the degree to which it provides benefits sought by consumers and on how it fits with the life values they pursue. In methodological terms, this approach, which relates values with benefits and attributes, can make use of means–end chain (MEC) theory, which establishes relations between the characteristics or specifications of a product, the benefits they symbolise, and the values consumers seek through them (Reynolds and Gutman, 1984; Ter Hofstede *et al.*, 1998; Olson and Reynolds, 2001).

Our particular interest lies in the way emotions influence consumer behaviour towards innovative food products. When a consumer selects an item from this category, the degree of novelty determines *a priori* that the consumers' behaviour will depend less on experience, the determinant factor in more traditional food choice processes. Fischer and De Vries (2008) note the effect of feelings on foods that carry a certain level of perceived risk, such as novel foods. Laros and Steenkamp (2004) also use GM foods to illustrate the role of emotions in consumers' acceptance of new food technologies, by comparing six types of emotions and four food categories. Townsend *et al.* (2004) also analyse the impact of feelings in biotechnology, relating it to perceived risk associated with technological changes. Another interesting study is Chandy *et al.* (2001), which shows that emotions have a stronger influence on the acceptance of novel food items when the target market is already used to this kind of product.

This study aims to add further elements to the debate on this topic. Specifically, it uses means-end chain as a cognitive analysis theory to examine the preference structures of novel food purchasers, previously segmented according to their perceived emotions with respect to this type of product. The objective is to contribute to the literature relating emotions to consumption and, by means of the selected methodology, determine whether choice structures vary as a function of perceived emotions in order to identify the product attributes and the benefits considered in each case, as in general the success of a new product depends on the degree to which it provides benefits sought by the consumer.

The study proceeds as follows. The next section presents the theoretical framework for the analysis of the determinants of the phenomena that concern us. Section 3 describes the methodology. Section 4 presents the results and Section 5 summarises the conclusions and indicates the limitations of our research.

2. Theoretical framework

2.1 Analysis of emotions and consumer behaviour

The term emotion is used to refer to a preparatory mindset resulting from cognitive patterns learned from events or thoughts, usually accompanied by a psychological process and manifested physically (gestures, postures, etc.). It may give rise to specific actions to express an emotion, depending on its nature and its meaning for the individual (Lazarus, 1991; Oatley, 1992; Bagozzi *et al.*, 1999).

The study of emotions has very often been limited and hampered by the ambiguity of two inter-related issues: emotional structure and emotional content (Bagozzi *et al.*, 1999; Laros and Steenkamp, 2005). With respect to the structure of emotions, some researchers examine them as a whole (Izard, 1977), while others use a specific hierarchical structure in which specific emotions are particular cases of a more general emotion (Shaver *et al.*, 1987; Storm and Storm, 1987). Regarding emotional content, there is ongoing debate. Some researchers claim that it would be more effective to view it from a broader, global perspective (Laros and Steenkamp, 2005) while others consider that each emotion should have its own estimators (Roseman *et al.*, 1996; Smith and Lazarus, 1993).

Other important features of emotions are the fact that they are personal (the same products evoke different emotions in different individuals), temporal (an individual may experience different emotions towards a product at different times) and mixed (a subject may sometimes experience more than one emotion at the same time) (Maheswaru and Shavitt, 2000; Scarabis *et al.*, 2006).

The extent to which food items arouse emotions is currently the subject of much interest (Gutjar *et al.,* 2015). This area of research is supported by recent studies which show that emotional profiles related to food items work better to differentiate consumer behaviour when compared to socio-demographic or hedonic parameters alone (Desmet and Schifterstein, 2008; Köster, 2009; King *et al.*, 2010; Ng *et al.*, 2013a, 2013b; Gutjar *et al.*, 2014; *Kuesten et al., 2014*; Spinelli *et al.*, 2014; Chen and Gao, 2016).

In this regard, Macht (2008) reviews the range of eating-related emotions examined by various authors, and proposes a set of alternative models to explain this kind of behaviour. According to Macht, emotions can affect food choice, suppress eating, increase food intake in general or stimulate the intake of certain types of food, all depending on individual eating habits, motivations to eat, and cognitive factors.

A series of aspects such as product presentation, packaging, name, flavour, etc. can evoke different emotions which vary in intensity and type (Cardello *et al.*, 2012; Ng *et al.*, 2013b; Spinelli *et al.*, 2014). This means that studying emotions caused by food bestows added value on those analyses of consumer behaviour which take into account other aspects (hedonic and demographic characteristics) and better explains and predicts actual purchase behaviour (Gutjar *et al.*, 2015).

The individual variability of perceived emotions suggests their use as a basis for market segmentation, and supports the viability of including emotional benefits among consumer classification criteria. The results in various studies confirm that measuring the emotions evoked by food provides more information in terms of market segmentation and allows products to be differentiated in a more effective way (Cardello *et al.*, 2012; Jaeger *et al.*, 2013; King *et al.*, 2013; Ng *et al.*, 2013a, 2013b).

We will use this theory as the basis for this study in which we propose market segmentation based on consumers' perceived emotions and focus on the emotions triggered by the consumption of two food products with a novel element; one is a functional food, the other a convenience one.

2.2 Means–end chain methodology (MEC)

The means–end chain is the cognitive structure that links the consumer's knowledge of products to his personal knowledge of certain consequences and values, as demonstrated in a series of studies of different markets. It was Gutman (1982) who first applied it in the field of marketing and consumer

research; Ter Hofstede *et al.*, 1998; Zanoli and Naspetti, 2002; De Boer and McCarthy, 2003; Fotopoulos *et al.*, 2003; Leppard *et al.*, 2004; Russell *et al.*, 2004 are also worth highlighting.

The main premise of MEC analysis is that consumers learn to select the products that possess the attributes that allow them to achieve their desired ends (Reynolds and Gutman, 1984; Ter Hofstede *et al.*, 1998; Walker and Olson, 1991; Grunert and Valli, 2001; Olson and Reynolds 2001; Fotopoulos *et al.*, 2003; Costa *et al.*, 2004). Means–end chain theory suggests that the consumer organises product knowledge hierarchically by levels of abstraction (Howard, 1977; Young and Feigin, 1975; Gutman, 1982; Reynolds *et al.*, 1995). The stronger and more direct the personal link, the higher the level of abstraction in the decision (Olson and Reynolds, 1983).

In the analysis of mental images, it is possible to subdivide each basic level of abstraction into distinct categories. In this respect, Walker and Olson (1991) propose a six-level MEC. The three lower levels (concrete attributes, abstract attributes and functional consequences) constitute the consumers' product knowledge, while the three upper levels (psycho-social consequences, instrumental values and terminal values) comprise their self-knowledge. This sequence has been analysed in various studies using different product categories (Miele and Parisi, 2000; De Boer and McCarthy, 2003; Flight *et al.*, 2003; Costa *et al.*, 2004).

Using this methodology can help us better understand the structure of consumers' decision making *vis-à-vis* food as it analyses products' characteristics and also consumers' personal aspects.

3. Methodology

3.1 Choice of product and data collection process

As already stated, in recent years the agri-food sector has shown an outstanding level of innovativeness that has led to the development of a large number of new food items: organic, functional, genetically modified, convenience, etc. (*Huh and Kim, 2008*; Capitanio *et al.*, 2009). To conduct the survey required to fulfil our research objectives, we selected two novel food items: a functional food, specifically a pro-biotic drink and a convenience food (a heat-and-serve bean dish). The reason for this choice of products is that they represent two of the best-known and most widely consumed novel food categories in Spain.

The required data were collected by means of a four-part personal survey targeting household food shoppers, which was conducted in Navarre, Spain, in 2014. In part one, consumers answered questions about the frequency with which they consumed novel foods and asked to name the attributes they take into consideration when buying them. In part two, they were asked to indicate their level of agreement with various statements in order to elicit their attitudes towards novel foods. Part three was the application of the means–end-chain method to probe the cognitive processes of the respondents by means of laddering interviews. Their socio-demographic data were collected in part four.

The study used a convenience sample (Gutman, 1982) of purchasers and consumers of functional foods and convenience foods. Vannoppen *et al.* (1999) approve the use of convenience samples in laddering procedures, given the complexity of the technique and the fact that respondents' familiarity with the product enables them to express more ideas about it. In this case, the sample comprised 70 household food purchasers who agreed to a personal interview after being contacted by e-mail. An e-mail was sent to the whole community (students, teachers and administrative and service staff) of a university in the north of Spain. This e-mail stated that everyone could participate as long as they were household food purchasers. The sample is representative of the population of the Navarre region of the north of Spain in terms of age and gender. Furthermore, the fact that it includes people from different areas and functions of the university means that it covers various socio-economic levels of society.

We explained the contents of the different parts of the questionnaire and the procedure to complete the survey to all those who answered our call in group sessions of seven to 10 people each.

Special emphasis was placed on the Association Pattern Technique and an example of the means–end chain relationship was provided to ensure a fuller understanding of the process.

Given its complexity and length, each participant answered the survey at home. Each interview took between 40 and 60 minutes.

The size of this sample is in line with that used in the majority of previous surveys found in our review of the literature using this technique.

3.2 Segmentation

Following the reasoning outlined above, food market segmentation is usually based on variables relating to consumer behaviour, geographical factors, lifestyles, consumption occasions, etc. However, although perceived emotions have been shown to influence choice, they have rarely been used as market segmentation criteria. The aim of the first stage in this study was to determine whether there are appreciable differences between consumers in terms of the degree to which they use perceived emotional benefits to differentiate between products. Previous research on this issue has focused mainly on perceived risk analysis and food disorders (Fischer and De Vries, 2008; Laros and Steenkamp, 2004 and Townsend et al., 2004, among others). This analysis of perceived emotions therefore uses the Richins scale of emotions (1997) later used by Laros and Steenkamp (2004, 2005) in the context of food consumption.

3.3 The laddering interview

Means–end chains are usually elicited by means of a qualitative interviewing technique known as laddering. Laddering interviews are personal interviews aimed at revealing the attribute–consequence–value associations made by consumers with respect to a particular product. We selected the attributes for the attribute–consequence and value–consequence matrices from the reviewed literature and in consultation with experts through a pilot survey. This resulted in a set of 13 attributes for the functional product and 12 for the convenience product (Table 1). In the same way, drawing on the reviewed literature on the MEC and laddering analysis, especially as applied to functional and convenience foods, and using what we considered to be the most relevant functional and psychological consequences, we identified a total of 23 and 22 consequences associated by consumers with the consumption of these products. To conclude, we used the list of values (LOV) proposed by Kahle et al. (1986), which incorporated nine new consumption-related instrumental and terminal personal values (Table 1).

The present study used hard laddering because, as noted by Russell et al. (2004), it is easier, as the interview is shorter and the respondent feels less pressure (Botschen and Thelen 1998). The specific technique chosen for this part of the questionnaire was the 'Association Pattern Technique', better known as APT, proposed by Gutman (1982) and considered appropriate for use with samples of more than 50 individuals (Gutman and Alden, 1985). This technique uses two separate matrices: an attribute–consequence matrix and a value–consequence matrix.

One of the main issues to be considered when working with hierarchical value maps (HVM) is the determination of the cut-off point, which marks the number of linkages to be allowed on the map (Leppard et al., 2004). Most of the various cut-off determination methods put forward in previous research (Pieters et al., 1995) agree that a good cut-off point is one that leads to a solution providing the maximum amount of information together with the optimum degree of readability (Audenaert and Steenkamp, 1997; Reynolds and Gutman, 2001).

The method adopted to determine the cut-off point in our case was top-down ranking, originally proposed by Leppard et al. (2004). This method rests on the premise that all participants in a survey will not necessarily make the same number of links between two levels of abstraction. Usually, larger numbers of links are more common at lower levels of abstraction than at higher levels. Therefore, it may not be appropriate to use the same cut-off point when the number of links varies between

Table 1. Identification and classification of attributes, consequences and values used in the study

Attributes			Consequences		Values	
Concrete attributes	• Price (A1) • Flavor (A2) • Brand (A3) • Information on label (A5) • Packaging (A6) • Ease of consumption/ Easy to prepare (A7) * • _____/ Texture (A11) • ____/Geographical origin (A12)	Functional consequences	• It is a health food (C1) • It is nutritious (C3) • Good value for money (C5) • I am well-informed (C7) • Easy to purchase (C9) • Helps control my weight/It is easy and quick to prepare (C12) • Makes life easier (C14) • Liked by the whole family (C15) • The brand is familiar (C17) • It saves me time (C19) • Keeps my cholesterol down (C22)	Instrumental values	• Provides fun, pleasure and enjoyment (V2) • Enhances my quality of life and security (V4) • Provides excitement (V6) • I am more successful (V9)
Abstract attributes	• Nutritional value (A4) • Quality (A8) • Manufacturer's guarantee (A9) • Health benefit effect (A10) • Calcium content / ____ (A11) • Low in cholesterol/ _____ (A12) • Probiotic effect/ ____ (A13)	Psychological consequences	• Good eating habits (C2) • Appetizing (C4) • No health risk (C6) • I'm consuming a quality product (C8) • Brings back memories (C10) • Enhances the family diet (C11) • Status symbol (C13) • I feel I'm doing the right thing (C16) • I enjoy the nice taste/It is authentic (C18) • Protects my health and that of my family/I find it traditional and familiar (C20) • Provides happiness and satisfaction/It leaves me with more free time (C21) • Covers my nutritional needs (C23)	End values	• Gives me a sense of social belonging (V1) • Enhances my relationship with others (V3) • Makes me feel fulfilled and responsible (V5) • Makes me feel respected by others (V7) • Enhances my peace of mind and self-respect (V8)

Notes: * (a/b) a. Denotes an attribute or consequence considered only in relation to the functional food.
b. Denotes an attribute or consequence considered only in relation to the convenience food.

different levels of abstraction. The strategy underlying this method fixes the cut-off point according to a concept known as the importance link. The most important link is the one most often repeated. This approach gives different HVMs for different orderings. The advantage of this method is that it allows one to observe how the most important links between different levels of abstraction levels gradually emerge, while also allowing for the comparison of groups with the same cut-off point. Furthermore, this cut-off level captures a reasonable amount of the initial data shown in the final variance of the model.

MECANALYST PLUS 1.0.8. software was used in the data analysis, the main results of which are presented below.

4. Results and discussion

4.1 Segmentation based on perceived emotions

Starting from the Richins scale of emotions, we conducted a series of factorial and confirmatory factor analyses to condense the information into a smaller number of factors and test whether specific emotions can be grouped into single factors as suggested in the literature. The scale was filtered by means of a pre-test because some of the emotions not considered by any of the respondents were removed from the analysis to enhance scale reliability. This process left eight emotions for consideration, ranging from optimism and joy to worry and discontent.

The analysis provided two factors for each test product jointly explaining 64.63 per cent and 68.24 per cent of the variance. Table 2 shows the standardised coefficients for each item in the corresponding factor and reliability scores of each factor, where both Cronbach's alpha and the goodness of fit indices of the models showed acceptable values.[1] The first factor that emerges for the functional food is "positive emotions" as felt at the moment of consumption. It is characterised by optimism, joy, contentment, excitement and peace. The second, "negative emotions", involves discontent, surprise and worry. The convenience food produces similar results, although, in this case, "surprise" is included in "positive emotions".

These results allow us to conclude that the emotions evoked by consumption in the functional and convenience food markets are of a mixed nature, that is, several emotions can be experienced simultaneously and, furthermore, that these emotions fall into more general categories, in the sense suggested by Laros and Steenkamp (2005).

The factor scores of each respondent were then used in a segmentation process using the K-Means clustering technique. This gave two segments for each product type, as shown in

Table 2. Confirmatory factor analysis of the emotions felt towards the consumption of a functional food and a convenience food

		Mean	Standard deviation	λ	α	Goodness of fit indices
Functional						
Factor 1	Peace	1.5942	0.84573	0.459	**0.867**	$\chi^2 = 17.755$
	Contentment	2.4203	1.19319	0.887		($p = 0.539$)
	Optimism	2.5217	1.27889	0.939		CFI = 1.00
	Joy	2.1884	1.20386	0.819		GFI = 0.94
	Excitement	1.5652	1.03580	0.608		AGFI = 0.89
Factor 2	Discontent	1.3623	0.76641	0.533	**0.569**	RMSEA = 0.000
	Worry	1.3333	0.70014	0.138		
	Surprise	1.5652	1.07756	0.998		
Convenience						
Factor 1	Peace	1.3607	0.85699	0.458	**0.900**	$\chi^2 = 15.567$
	Contentment	2.0492	1.23053	0.889		($p = 0.555$)
	Optimism	1.9016	1.17905	0.937		CFI = 1.00
	Joy	1.7590	1.10248	0.817		GFI = 0.95
	Excitement	1.4262	0.90294	0.613		AGFI = 0.89
	Discontent	1.5246	1.01006	0.554		RMSEA = 0.000
Factor 2	Worry	1.5246	1.04254	0.581	**0.740**	
	Surprise	1.4426	0.74217	0.438		

Table 3. Segmentation based on respondents' emotions towards the functional food

	Concerned 31.88%	Satisfied 68.12%	Statistical test of differences	
			Value	Sig.
Factor 1 Positive emotions	0.152	−0.071	0.744	0.391
Factor 2 Negative emotions ***	1.187	−0.555	135.830	0.000
Consumes the functional food ***	70.9%	86.4%	0.008	0.016

Table 4. Segmentation based on respondents' emotions towards the convenience food

	Concerned 13.11%	Satisfied 86.89%	Statistical test of differences	
			Value	Sig.
Factor 1 Contentment	-0.093	0.014	0.079	0.779
Factor 2 Worry ***	2.051	-0.309	107.598	0.000
Consumes the convenience food**	62.5%	90.6%	0.028	0.062

Tables 3 and 4. Two segments show clearly distinct perceived emotional benefits, and one of the pre-determined factors significantly discriminates between the two segments.

In both food products, the first segment presents the lower level of consumption and the higher level of negative emotions towards both functional and convenience foods. For this reason, we call them the "concerned" segment. The second segment in both cases shows the higher level of consumption and the fewest negative emotions towards these products, and will be labelled henceforth as the "satisfied" segment. Thus, we are able to conclude that there are two clearly differentiated segments with respect to perceived emotions.

These results are in line with those of Gutjar *et al.* (2015), Bhumiratana *et al.* (2014) and Ng *et al.* (2013a), who showed that food choice based on sensory properties only predicted more poorly than those cases when emotions were studied on their own or when both aspects were combined. They found that positive emotions seemed to indicate the actual food choice and increased consumption.

In the same vein, there seems to be a positive relationship between positive emotions and consumers who are creative or innovative in nature (Fredrickson, 2003). Positive emotions such as love, peace, optimism, pride, relief, joy and excitement give rise to openness of mind and thus have a positive effect on a subject's innovative nature (Amabile *et al.*, 2005).

4.2 Hierarchical value maps (HVM)

For each group we present the level 7 HVM, that is, the map showing all the attribute–consequence and consequence–value linkages at or above the seventh highest level of frequency. The cut-off point was established using the method recommended by Leppard *et al.* (2004) which, as shown in Table 5, gives a different cut-off point for every level of abstraction and group of respondents, and allows comparison between maps.

It is clear that the cut-off point differs across maps and across the types of linkages established. Thus, the cut-off points for the attribute–consequence linkages made by the "concerned" and "satisfied" segments for the functional food are 22 and 43, respectively, and 8 and 46, respectively, for the convenience food. The cut-off points for the consequence–value links are 21 and 40 for the functional food and 8 and 44 for the convenience food. The values, in almost all cases, exceed 35 per cent, thus falling within the limits established by most of the previous research.

In Figures 1 and 2 the HVM (hierarchical value maps) for each segment are shown, at a cut-off level of 7 for the functional food, and Figures 3 and 4 show the HVM for the convenience food. The percentage beside the components (attribute, consequence or value) of the chains represented on the maps indicates the percentage of respondents who established that linkage.

Table 5. Cut-off levels at the 7 levels of abstraction and percentage of total cases

| | | Functional food | | | | Convenience food | | | |
| | | Concerned | | Satisfied | | Concerned | | Satisfied | |
		Cut-off	%	Cut-off	%	Cut-off	%	Cut-off	%
Level 1	AC[a]	22	100	43	91.5	8	100	46	86.8
	CV[b]	21	95.4	40	85.1	8	100	44	83.0
Level 2	AC	20	90.9	39	82.9	7	87.5	43	81.1
	CV	18	81.8	38	78.7	7	87.5	40	75.5
Level 3	AC	19	86.4	36	76.6	6	75.0	42	79.2
	CV	16	72.7	37	74.5	6	75.0	39	73.6
Level 4	AC	18	81.8	35	74.5	5	62.5	41	77.4
	CV	15	68.2	35	74.5	5	62.5	36	67.9
Level 5	AC	16	72.7	34	72.3	4	50.0	39	73.6
	CV	14	63.6	33	70.2	4	50.0	31	58.5
Level 6	AC	14	63.6	32	68.1	3	37.5	37	69.8
	CV	13	59.1	32	68.1	3	37.5	27	50.1
Level 7	AC	13	59.1	31	65.9	2	25.0	36	67.9
	CV	12	54.5	31	65.9	2	25.0	25	47.1

Notes: [a]Attribute–Consequence; [b]Consequence–Value.

An initial partial analysis of the results for the attributes reveals some interesting similarities between segments. As far as the concrete attributes of the two products are concerned, both segments take into consideration factors such as "flavour", "price", "label information" and "ease of preparation", all of which relate to the organoleptic characteristics, price, information and convenience of the product. As authors such as Grunert *et al.* (2003) have pointed out, sensory attributes, especially appearance and flavour, have always been key factors affecting consumers when it comes to rating food products. In terms of label information, previous research suggests that the availability of
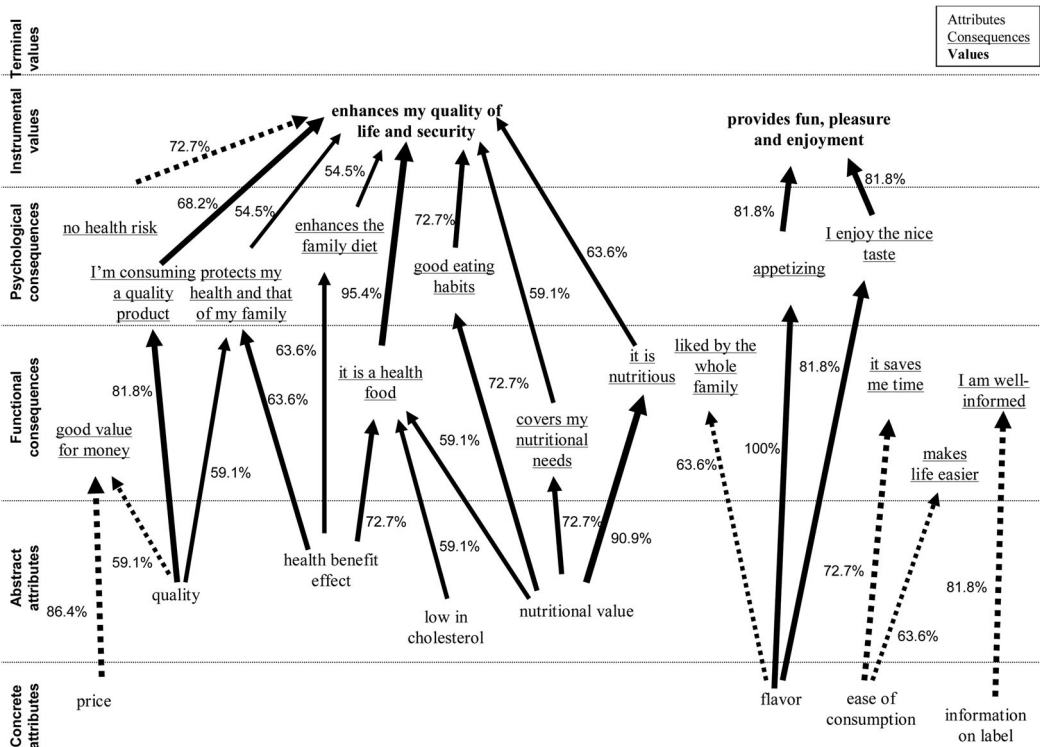

Figure 1. Hierarchical value map of the "concerned" segment for the functional food (level 7)
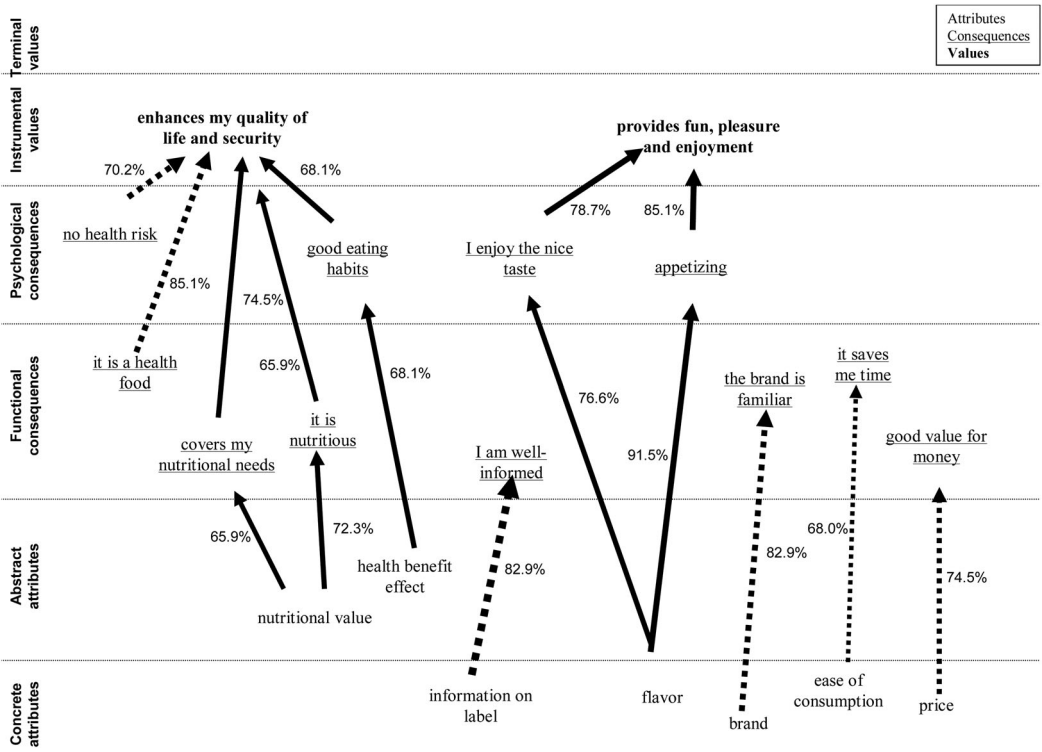
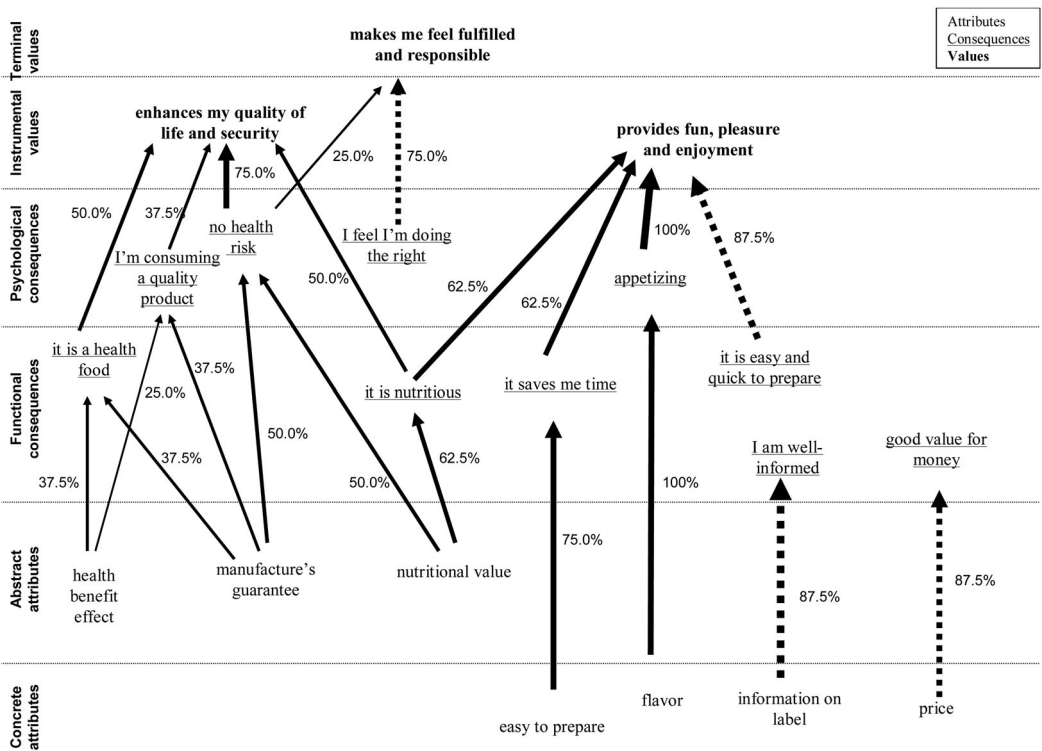**Figure 2.** Hierarchical value map of the "satisfied" segment for the functional food (level 7)

Figure 3. Hierarchical value map of the "concerned" segment for the convenience food (level 7)
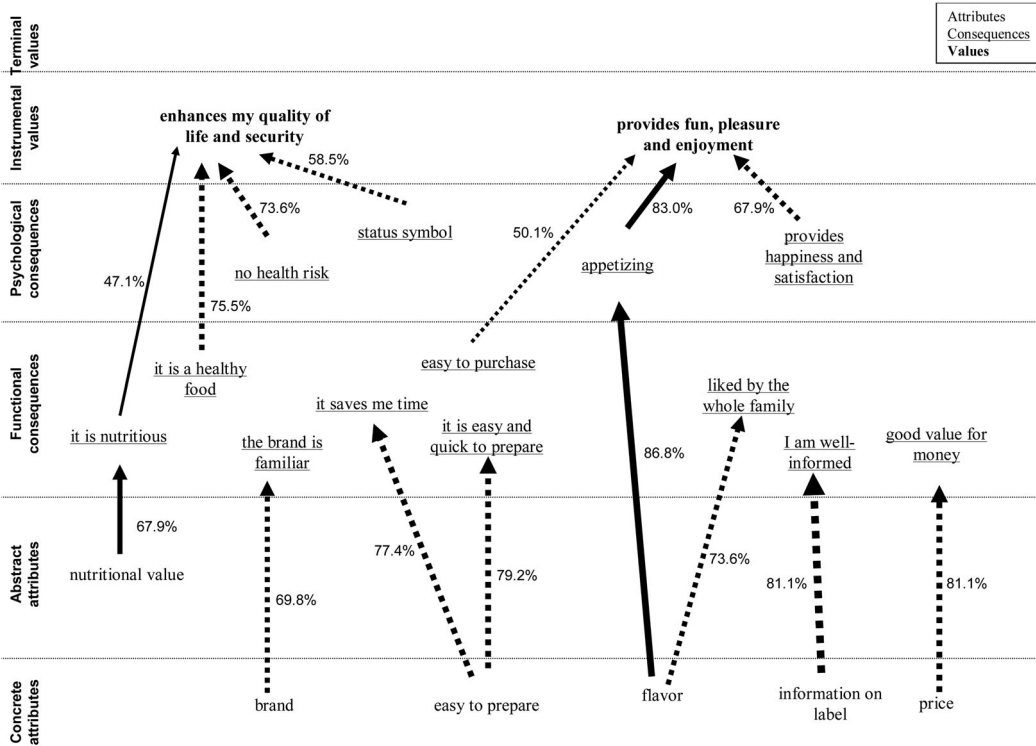
Figure 4. Hierarchical value map of the "satisfied" segment for the convenience food (level 7)

information increases subjects' willingness to try a food product (Cardello and Sawyer, 1992; Pelchat and Pliner, 1995). It seems to be particularly useful to highlight the convenience aspect of products and its contribution to making consumers' lives easier, an aspect that was already brought to our attention by Weststrate *et al.* (2002) and Pferdekämper (2003).

With respect to the abstract attributes, both segments coincide in evaluating both test products as foods that they chose for their "nutritional value" which sums up the basic notion of what makes up the initial interest in a food item. One of the main distinguishing points between segments is the importance that "satisfied" consumers attach to brand in both food products. This is probably because higher consumption levels result in greater familiarity with the product, enabling customers to identify brand as a key factor in product differentiation. In both products, the important attributes for the "concerned" segment include "quality", the potential "health benefit effect" and the "manu-facturer's guarantee". This result is consistent with classical economic theory, which points out that brand tend to reduce consumers' risk perception in relation to a product (Grunert, 2005).

It is useful to be able to identify the negative emotions associated with certain product attributes since this information can suggest ways of orienting marketing strategies to reduce consumers' per-ceived risk (Im *et al.*, 2003; Schifferstein *et al.*, 2013).

Notably, both groups surveyed for each product show an interest in the functional consequences, that the product is "good value for money", is "a healthy food", is "nutritious" and generally "leaves more free time" and "makes life easier". Similarities in the perceived psychological consequences are that both products provide satisfaction ("it is exciting and enjoyable to eat") and safety, since they "carry no health risk". However, there are differences between segments as well. The "concerned" consumers value the fact that this food enables them to "protect their own health and that of their families", "consume a quality product" and "feel they are doing the right thing". Thus, "con-cerned" consumers accept these novel food products for the benefits they provide for the rest of

the family and for the peace of mind that comes from doing the right thing. Both these motivational factors are worth the consideration of producers and distributors who wish to encourage and promote the consumption of these products among lower consumption groups. Thus, the kinds of emotions associated with high perceived risk are also revealed by the respondents' search for stricter quality control factors. This finding corroborates those in Wansink *et al*. (2003), who note that products causing fewer positive emotions are less consumed and make consumers more uncertain in terms of the assurance provided by a product.

All the consumer segments analysed attach importance to the "enhances my quality of life and security" and "provides me with fun, pleasure and enjoyment" instrumental values. The only hierarchical value map to include a terminal value is that of the "concerned" segment in their valuation of the convenience food. The terminal value in question is the "sense of fulfilment and accomplishment of duty" they obtain from including this type of food in their diet. Therefore, their need to feel they are doing the right thing is an inhibiting factor among consumers reluctant to consume convenience foods. Renewed efforts to communicate the quality of these products will be required to remove this kind of barrier.

These initial results allowed us to perform a more detailed analysis later in the study, when we sought to build on these results to improve our understanding of how consumers form their attribute–consequence–value chains. The resulting ladders reveal that two linkages are common to all segments. The first and most important links the concrete attribute "flavour" with the consequence "it is appetising and enjoyable to eat" and the instrumental value "provides fun, pleasure and enjoyment". This suggests that one of the values sought by both groups through the consumption of these novel food products is the enjoyment of eating them, an association that is hardly surprising in the agri-food market. Another common link is the one between the "nutritional value" abstract attribute, the "it is nutritious" consequence, and the "enhances my quality of life and security" instrumental value, all of which suggest concern for the nutritional characteristics and quality of the product complementing hedonistic preferences. In this regard, different empirical applications have shown that consumers perceive a product to be safe when it brings health benefits and thus enhances their quality of life (Flake and Patterson, 1999; Piggott and Marsh, 2004; Van Rijswijk and Frewer, 2008).

Another significant finding is the presence of two ladders that appear only on the HVMs of the "concerned" segments for both products. They both show that this consumer segment links the "health benefit effect" and "nutritional value" attributes to the "it is a healthy food" and "carries no health risk" consequences and thence to the "enhances my quality of life and security" value. Thus, for consumers who have more reservations regarding the consumption of these novel food products, the potential consequences for their health are a major source of concern and they seek tangible means to reduce the perceived risk.

Also worth noting is the link made by the "concerned" segment in both food products connecting the "quality", "the health benefit effect" and "nutritional value" attributes with the "I am consuming a quality product", "protects my family's health and my own", "ensures my family is properly nourished" and "it is a health food" consequences, all of which lead to the "enhances my quality of life and security" instrumental value. This again shows the higher importance attached to health issues in the purchase choices of the more reluctant consumers of this type of food product, which is a point to be taken into consideration by suppliers, since it could otherwise hamper the development of these market sectors.

As noted throughout this analysis of the components and ladders that appear in the HVMs of the two consumer segments for both of the products considered, the "concerned" segments appear to display a more complex cognitive structure.

4.3 Comparing degrees of abstraction

The above results appear to suggest not only a certain level of abstraction in the functional and convenience food markets, but also variation in respondents' cognitive structures in relation to

Table 6. Complete ladders for each food group

Attributes	Consequences	Values	Functional food		Convenience food	
			Concerned	Satisfied	Concerned	Satisfied
Concrete	Functional	Instrumental	–	–	1	–
		Terminal	–	–	–	–
	Psychological	Instrumental	2	2	1	1
		Terminal	–	–	–	–
Abstract	Functional	Instrumental	5	2	4	1
		Terminal	–	–	–	–
	Psychological	Instrumental	5	1	4	1
		Terminal	–	–	1	–

Table 7. Average number of attributes, consequences and values for each product category and consumer segment

	Functional food			Convenience food		
	F	Concerned	Satisfied	F	Concerned	Satisfied
Concrete attributes	0.302	5.70	5.59	0.444	7.87	8.24
Abstract attributes	0.002	6.22	6.21	3.367*	3.00	2.43
Functional consequences	0.430	10.04	9.72	3.372*	8.00	6.45
Psychological consequences	7.739***	10.86	9.00	4.070**	12.62	9.77
Instrumental values	0.553	3.17	3.00	0.106	3.25	3.13
Terminal values	8.221***	3.77	2.59	3.775*	3.87	2.61

Note: *** $P < 0.01$.

their perceived emotions at the time of consumption. Table 6 summarises the complete ladders of each group in terms of the attributes, consequences and values used in their formation. The main difference is in the number of complete ladders describing linkages between abstract attributes, functional and psychological consequences and instrumental values. In both products, the "concerned" segment produces more complete ladders of this kind than the "satisfied" segment. Another important point is that the only group to reach the highest degree of abstraction is the "concerned" segment in relation to the convenience food. This suggests that because of the variation in their perceived emotions "concerned" consumers use more personal values in the choice process than "satisfied" consumers and thus reach a higher degree of abstraction.

By probing further into the degree of abstraction in this market sector Table 7 summarises the average numbers of attributes, consequences and values of each type used by each segment. As seen in the testing of the market segmentation hypotheses, significant differences emerge in two of the six levels considered (concrete and abstract attributes; functional and psychological consequences; instrumental and terminal values) with respect to the functional food and in four with respect to the convenience food. In relation to the convenience food, the "concerned" consumers used more abstract attributes (3.00 versus 2.43) and mention more functional consequences (8.00 versus 6.45) than the "satisfied" consumers. They also mention more psychological consequences (10.86 versus 9.00 for the functional food, and 12.62 versus 9.77 for the convenience food) and significantly more terminal values (3.771 versus 2.59 and 3.87 versus 2.61, respectively) than the "satisfied" consumers with respect to both products. This suggests that those consumers whose emotions indicate reticence towards novel food items reach a higher degree of abstraction, tending towards the highest level mentioned in the theory proposed by Walker and Olson (1991). This is apparent in their more frequent allusions to terminal values, which complete the means–end chain. In other words, when it comes to the purchase decision for these food innovations, the more reluctant consumers, having previously expressed concern or negative emotions towards these products, relate more of their personal values with the product attributes, thus reaching a higher level of abstraction.

5. Conclusions

Various studies have demonstrated the role of consumers' perceived emotions with respect to food consumption. The influence of this factor adds a further degree of complexity to the decision-making process, the evidence having shown that perceptions vary with motivational processes, market characteristics, etc. There is also a certain level of consensus that consumers feel both positive and negative emotions, and one or the other will dominate, depending on the type of consumption choice being faced (Gutjar *et al.*, 2015; Bhumiratana *et al.*, 2014; Ng *et al.*, 2013a). The existing research in the food context has focused more on the emotions involved in eating disorders and less on emotions related to the consumption of new products. The purpose of this study was to add some elements to the debate surrounding the second of these issues by testing the choice structures of predefined consumer segments characterised by their perceived emotions towards novel foods, in order to detect variations in terms of preferred attributes, desired benefits and the personal values involved. The results show that both of the products used in the survey, a functional food and a convenience food, arouse both positive and negative emotions, and that positive emotions (or satisfaction) prevail over negative emotions (or concern). Our initial conclusion, therefore, is that emotions are a discriminatory variable for purchase behaviour. Therefore, following authors such as Cardello *et al.* (2012), Jaeger *et al.* (2013) and King *et al.* (2013), the use of the emotions evoked by food products may be a more efficient consumer segmentation criterion than traditional variables. Furthermore, the use of this classification variable may be valid in relation to products for which classic segmentation fails to work.

Secondly, the results show that the most influential attributes in the purchase process for both products are those relating to the hedonistic and nutritional aspects of food consumption. In general, all consumers, regardless of the emotions they feel, adopt these food products for their hedonistic attributes (enjoyment or pleasure factors) and their nutritional value, which was already identified by Teratanavat and Hooker (2006) as one of the key determinants of purchase choice in relation to food products. "Satisfied" consumers seek brands, while the decisive factors for "concerned" consumers, who have a greater sense of perceived risk, are safety and quality control. This result is consistent with classical economic theory, which assigns brand and labels the role of reducing consumer-perceived risk in the purchase process, and signaling the position of the product (Erdem and Swait, 1998; Grunert, 2005).

When it comes to desired consequences or benefits, factors relating to the improvement or enjoyment derived from the consumption of both products play a prominent role for both segments, but health and quality controls emerge as the key issues for the "concerned" consumer. The ladders obtained provide further indication of the linkages between hedonistic and nutritional aspects in the "satisfied" consumers' choice structures and a greater need for food safety and quality controls in those of the "concerned" segment. These results confirm the suitability of using means–end chain theory as food product choice is affected both by product characteristics and by the benefits they provide and consumers' personal values.

A final, key finding of this study is that consumers whose emotions reveal a higher level of concern have a more complex purchase-decision structure, incorporating a larger number of abstract attributes, psychological consequences and terminal values. It will therefore be more challenging to design effective communication strategies to reach this segment.

The main implication of this study resides in the greater level of knowledge it provides regarding consumer behaviour and the process of decision making when it comes to adopting new food products. This could help firms to better position their products in the market.

The main limitations of this study could be overcome in future research by extending the analysis to other products and markets and by using alternative means to measure or categorise emotions. This would facilitate comparison with results obtained through other methods. In other words, the use of more complex behaviour models and the inclusion of more variables and higher relationship levels would be an interesting direction for further analysis of these initial findings.

Note

1. The results for factorial analysis were similar.

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