Cross-cultural conceptualization of the words *Traditional* and *Innovation* in a food context by means of sorting task and hedonic evaluation

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ABSTRACT

Traditional food products (TFPs) are an important element of human culture, identity and heritage. However, their production still relies on traditional manufacturing practices, often with low competitiveness, efficiency and R&D investment. The introduction of innovations could help producers to increase the market share of TFP, although some innovations could have a negative impact on their traditional character and image.

The objective of this study was to understand the meaning of the concepts "Traditional" and "Innovation" in a cross-cultural context by means of a sorting task.

The study was done in four regions of four European countries (Belgium, France, Norway and Spain). A total of 476 participants performed a sorting task with 13 different key words written on cards (one word per card), including the words "Traditional" and "Innovation". An additional affective evaluation was carried out by each participant by assessing how they perceived each key word in a food context.

The sorting task proved to be an efficient method to conceptualize the words "Traditional" and "Innovation" from a consumer perspective. The affective test complemented the sorting task and helped to better understand the groups obtained. A noticeable incompatibility between the two concepts, "Traditional" and "Innovation" was detected as well as the relative unhealthy character of some traditional food products. The information provided in this study may help producers of TFP to improve the image of this category of foods and to implement potentially successful innovations in the European traditional food sector.

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1. Introduction

Innovation is widely accepted as one of the keys to being successful. However, companies can innovate and still fail if markets are not ready or willing to accept the innovation. According to Stevens and Burley (1997) approximately 3000 new ideas must be generated to have one commercial success. The acceptance or rejection of innovations can be regarded as the result of a complex decision-making process which involves an assessment of the perceived risks/benefits associated with the innovation and with the existing alternatives (Henson, 1995).

In general, the acceptance of an innovation depends on the innovation itself as well as on the carrier product to which it is applied, especially in the food domain (Guerrero et al., 2009). As stated by Moskowitz and Hartmann (2008), the food industry has

a rather slow-moving nature, given that it is not subject to the innovation pressure that other sectors are subjected to. This is particularly accentuated in traditional food products (TFPs) because consumers perceive traditional foods as having a strong distinctive character linked to the cultural heritage (Guerrero et al., 2009, 2010; Trichopoulou, Soukara, & Vasilopoulou, 2007), thus being perceived as something to preserve intact for future generations. This may obviously be contradictory to the idea of innovation.

The traditional food sector in the European Union (EU) consists mainly of Small or Medium-sized Enterprises (SMEs) (Molnar, Gellynck, Vanhonacker, Gagalyuk, & Verbeke, 2011), representing more than 99% of the companies and about 60% of the employment in the European food and drink industry (CIAA, 2006). Additionally, TFP are an important element of European culture, identity and heritage, thus contributing to the development and sustainability of rural areas and increasing the variety of food choice for consumers. However, the production of traditional food still relies on traditional manufacturing practices, often with low competitiveness

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and poor efficiency (Fito & Toldra, 2006), and usually with low internal investment in research and development (R&D) (Kühne, Vanhonacker, Gellynck, & Verbeke, 2010). Traditional food producers have been recommended to extend their skills in modern production techniques, management and marketing, as well as in promoting the aspects of their products related to nutritional and health issues (European Communities, 2007). In order to maintain and even increase their market share, TFP need to be improved by introducing innovations that fulfill the European consumers' demand for better TFP from different perspectives, including for example health, safety, taste and convenience characteristics (Cayot, 2007). The actual challenge is knowing whether such food innovations will or will not modify the perceived traditional character and image of these products, which could have a negative impact on one of their main competitive advantages, notably their character and image related to tradition, authenticity and heritage.

One of the most appropriated initial approaches for predicting and understanding the potential applicability of an innovation in TFP is to know the meaning that these concepts have in the consumers' minds and their possible incompatibility. Among different options, a sorting task is a user-friendly and straightforward procedure for assessing the perceived similarity/dissimilarity among a set of products or concepts, and it is less tedious and time-consuming than other equivalent methods (Abdi, Valentin, Chollet, & Chrea, 2007). A sorting task is based on categorization which is a natural cognitive process that does not imply any sort of quantification (Lelièvre, Chollet, Abdi, & Valentin, 2008). Categorization, defined as a mental representation used to classify entities, is one of the constituents of the cognitive processes involved in concept formation, but not unique. In fact, concepts seem to depend on multiple functions which interact to affect conceptual structure and processing (Solomon, Medin, & Lynch, 1999). In this sense, the combination of different complementary approaches to categorization (sorting task) might improve the insight and knowledge regarding the concepts examined.

A sorting task is especially useful to obtain perceptual maps with untrained participants, and is therefore of great interest when dealing with naive consumers (Cartier et al., 2006; Faye et al., 2004; Lawless, Sheng, & Knoops, 1995; MacRae, Howgate, & Geelhoed, 1990; Qannari, Cariou, Teillet, & Schlich, 2010). However, the implementation of a sorting task entails particular challenges too. The different identified perceived dimensions might have a clear meaning only for those individuals involved in the study, thus it is necessary to obtain further information from them to better interpret the perceptive space obtained (Faye et al., 2004). In this sense, quite often, after a sorting process, participants are also asked to describe each group made with words. This description can then be projected into the same perceptual map. However, especially when dealing with abstract concepts, this descriptive task may be difficult to perform. According to Prabhu (1987) working with concepts is always more complex than working with the names of objects or actions. In addition, some problems can arise when trying to analyze the vocabulary used to describe the different groups of concepts by untrained participants due to the number of terms to process, high inter-individual variability or lack of precision of the terms used (Lelièvre et al., 2008).

It is important to bear in mind that categorization is a complex process that involves at least two distinct types of processing: integration (finding a relationship that meaningfully links two concepts together, e.g. cow and milk) and comparison (grouping two concepts based on their similarities and differences, e.g. horse and zebra) (Wisniewski, 1996). According to Salomon et al. (1999), concepts cannot be studied through categorization alone; consequently and in order to better understand the group formation of the different products or concepts in a sorting task some additional measures should be included. For example, Abdi et al.

(2007) used the hedonic score and the alcoholic content of different beers to gain knowledge about the differences detected among samples in a sorting experiment. Affective evaluation for the different products or concepts might be another valuable tool to better understand qualitative results (Roininen, Arvola, & Lähteenmäki, 2006) including sorting task.

The overall objective of this study was to gain knowledge about the conceptualization of the words "Traditional" and "Innovation" in a food context by consumers from different European regions, by means of a sorting task, in order to assess their potential incompatibility. In addition, and to better interpret the perceptual maps obtained, the usefulness of a hedonic evaluation was also examined. This approach allowed quantitatively testing the qualitative definition previously obtained for the concept of "Innovation" (Guerrero et al., 2009) and checking the robustness of the concept of "Traditional" reported by Guerrero et al. (2010), through applying a less rational technique such as sorting task. A direct comparison of the two concepts, traditional and innovation, was also envisaged.

2. Materials and methods

2.1. Participants

The study was carried out in four different regions of four European countries: Flanders in Belgium, Burgundy (Dijon) in France, the counties of Akershus and Østfold in Norway and Catalonia in Spain. Participants were selected within each area or region using a convenient intentional and reasoned sampling with predetermined quota (Pedret, Sanier, García, & Morell, 2003). This sampling method is recommended during exploratory research activities since it allows a gross estimate of the results at a relatively low cost (Pla, 1999). Convenience sampling is frequently used in behavioral science research (Gravetter & Forzano, 2008).

A total of 476 participants were recruited from previous databases and/or through different advertising systems. Participants did not have any relationship with the research centre/university where the test was carried out. The first criterion for selecting the participants was their involvement in decisions regarding food shopping and food preparation at home. Only consumers who stated involvement in these two activities were included. Secondly, the different quotas for selecting participants were age (a minimum of 15% of participants in each decade from 20 to 60 years old) and gender (a minimum of 25% of individuals of each gender within each age group). Next to age and gender as quota control criteria, additional information about education level and number of children was recorded for each participant. Table 1 shows the distribution of the recruited participants per quota and region. In each country, all participants lived in the same geographical area or region. At the recruitment stage, participants were not informed on the specific objective of the study. No mention was made of the words "Traditional" or "Innovation" when recruiting them.

2.2. Procedure

Thirteen different key words were selected as stimuli for this study: traditional, innovation, childhood, natural, ready-to-eat meals, change, good for your health, tasty, variety, quality, origin, food habits and technology. The key words were selected by open discussion of the researchers involved in this activity and based on the results of 12 focus group discussions carried out previously. The selected words were those linked to the different dimensions obtained in these focus groups for both concepts (four dimensions for "Traditional" namely habit/natural, origin/locality, processing/elaboration and sensory properties; and five dimensions for "Innovation" specifically novelty/change, variety, processing/technol-

Table 1
Socio-demographic characteristics of the participants recruited.

Socio-demographic variable		European region			
		Flanders (Belgium)	Burgundy (France)	Akershus and Østfold (Norway)	Catalonia (Spain)
Gender (%)	Men	55.4[a]	47.6[ab]	38.2[ab]	35.3[b]
	Women	44.6[b]	52.4[ab]	61.8[ab]	64.7[a]
Age group (%)	20–30	26.4	26.2	23.5	27.3
	31–40	18.2	24.3	19.6	26.0
	41–50	23.1	24.3	35.3	22.0
	51–60	32.2	25.2	21.6	24.7
Education (%)	Primary school	9.9[ab]	3.9[b]	3.9[b]	13.3[a]
	Secondary school	22.3[b]	36.9[ab]	33.3[ab]	38.0[a]
	Higher education	67.8	59.2	62.7	48.7
Number of children	0	38.0	36.9	32.4	46.0
	1	19.0[a]	12.6[a]	3.9[b]	21.3[a]
	2	28.9	35.9	30.4	26.7
	3 or more	14.0[b]	14.6[b]	33.3[a]	6.0[b]
	N	121	103	102	150

Percentages in the same row with different letters differ significantly (Chi-square test, $p < 0.05$).

ogy, origin/ethnicity and convenience) and among the most frequent words mentioned in them (Guerrero et al., 2009). Key words were submitted to a back-translation process (Brislin, 1970; Maneesriwongul & Dixon, 2004) into each of the national languages (Table 2). According to Hair, Black, Babin, and Anderson (2010), for stable solutions of data analysis in a sorting task it is necessary to have more than four times as many objects as dimensions desired. Consequently, and in order to avoid an inflated estimation of fit, the minimum number of objects (key words) to sort for a two dimensional solution should be nine.

The key words were written on cards (one word per card) and were given to the participants all together (the 13 cards) in different orders according to a balanced design (Macfie, Bratchell, Greenhoff, & Vallis, 1989). Each participant had to group the 13 cards provided into mutually exclusive groups based on perceived similarity. They were told to group the 13 words into no fewer than two groups and into no more than 12 groups. The literal instructions given to participants were: "*Please read all these words and then try to group them based on similarity, this is similar words in the same group. The only limitations to do it are that you have to make a minimum of two groups and a maximum of 12 and one word can only belong to one group. If you want, you also can make a group with just one word. Remember that you have to make the different groups*

thinking in a context of foods". This ensured that at least two groups were created and avoided the trivial response, i.e. one word per group (Popper & Heymann, 1996).

In order to better understand and interpret the groups obtained, an additional affective test was carried out by each participant by assessing, on a structured 7-point interval scale, how they perceived each key word in a food context. The scale ranged from "Extremely unpleasant" to "Extremely pleasant". The affective test was done after a short break (2–3 min) once the sorting task was completed, and each participant assessed the 13 key words in the same order as used for the sorting task.

2.3. Data analysis

The existence of statistical differences in the socio-demographic profile between the different European regions was checked by means of a Chi-square test. The same statistical procedure was applied in order to analyze the differences observed in the number of key word groups generated per participant within each socio-demographic group.

A contingency table was created based on the frequency that each pair of words was grouped together. The similarity matrix obtained (higher value indicated that the words were grouped together more frequently) was analyzed by means of a non-metric (ordinal) Multidimensional Scaling Analysis (MDS) (Faye et al., 2006). MDS is a multivariate technique that displays the data contained in a similarity or dissimilarity matrix on a map. The overall deformation made from the original data when it was summarized in two or more dimensions was measured by the Kruskal Stress value. Different criteria exist for deciding what level of stress is acceptable. Based on the original study of Kruskal (1964), a stress below 0.05 indicates a good fit and a stress above 0.20 represents a poor fit. In any case, it is often the researcher's experience with MDS and common sense that determine whether the fit level is acceptable or not. Normally higher stress values can be useful as well in order to interpret general patterns and tendencies, although drawing conclusions at a higher level of detail when this occurs is not recommended. In general larger dissimilarities or longer distances tend to be more accurate than shorter distances, so larger patterns are still visible even when stress is high.

In order to detect the existence of different sorting patterns among participants for the two terms of interest ("Traditional" and "Innovation") depending on the region of origin, gender and age, a simple correspondence analysis was performed. This analysis was done over two different contingency tables, one for the word "Traditional" and the other for the word "Innovation", including the region of origin as active variable and gender and age group (one group per age decade, see Table 1) as supplementary variables. Each cell in this table represented the frequency that

Table 2
Key words selected in the different languages after the back-translation process.

Key Word (English)	Dutch	French	Norwegian	Spanish
Traditional	Traditioneel	Traditionnel	Tradisjonell	Tradicional
Innovation	Innovatie	Innovation	Nyskapning	Innovación
Childhood	Kindertijd	Enfance	Barndom	Infancia
Natural	Natuurlijk	Naturel	Naturlig	Natural
Ready to eat meals	Kant-en-klaar maaltijden	Prêt à l'emploi/Facile à utiliser	Ferdigmat	Platos preparados
Change	Verandering	Changement	Forandring	Cambio
Good for your health	Goed voor de gezondheid	Bon pour votre santé	Sunn	Saludable
Tasty	Smaakvol	Qui a du goût	Smakfull	Sabroso
Variety	Variatie	Variété	Variasjon	Variedad
Quality	Kwaliteit	Qualité	Kvalitet	Calidad
Origin	Herkomst	Origine	Opprinnelse	Origen
Food habits	Eetgewoonten	Habitudes alimentaires	Matvaner	Hábitos alimenticios
Technology	Technologie	Technologie	Teknologi	Tecnología

one of the remaining 12 key words was grouped together with the word "Traditional" or "Innovation".

The results obtained from the affective measurement were analyzed by means of analysis of variance, thus adding region, gender, age group, education level, number of children and their double interactions as fixed factors. Participants were included in the analysis as a random effect. In addition, a cluster analysis (Ward method) was performed to detect the presence of different segments of individuals with similar response patterns based only on the affective score given for the two words of interest ("Traditional" and "Innovation"). An individual MDS (non-metric) was also performed for each cluster obtained. In order to characterize the different clusters, a multinomial logistic regression analysis ("Logit" model) was performed including the cluster as dependent variable and all socio-demographic information about participants as explanatory variables.

All the analyses were carried out by means of two statistical software packages, namely SAS V. 9.2 (SAS, 2008) and XLSTAT 2010 (Addinsoft, France).

3. Results and discussion

Statistical differences between regions were observed for gender, education and number of children in the household (Table 1). Anyhow, and although these differences might have had a slight impact on the results obtained, the recruitment criteria per quotas were accomplished in all cases. It is worthwhile to mention that, as it will be demonstrated later on in this paper, the effect of these socio-demographic variables was very small and almost negligible.

3.1. Sorting test: overall results

The maximum number of key word groups created per participant in the whole sample ($n = 476$) was 9 and the minimum 2, with an average value of 4.2 (standard deviation of 1.3). Table 3 shows the average number of groups generated for each socio-demographic variable. This number was significantly higher for Norway compared to France and Spain. It is worthwhile to remark how those regions with a higher experience with TFP created a lower number of groups.

Some significant differences ($p < 0.05$) were also detected regarding the number of groups (in percentage) produced within each socio-demographic variable analyzed (Table 3). These differences, although significant, are minor and difficult to interpret in most cases.

The first two dimensions of the Multidimensional Scaling (MDS) analysis for the four regions (Belgium, France, Norway and Spain) as pooled data are shown in Fig. 1. Kruskal Stress was 0.074 indicating a good fit and low deformation of the original data set (Kruskal, 1964).

Overall the concept of "Traditional" was mainly related to the word "Origin". Food origin represents an important extrinsic value in food choices and preferences (Guerrero, 2001; Kuznesof, Tregear, & Moxey, 1997; Verbeke & Roosen, 2009) and in some cases it may even have a similar role as a brand name (Filser, 1994). Origin is especially relevant for TFP, since a noticeable part of them are linked to a specific geographical area by means of Protected Designations of Origin (PDO) or Protected Geographical Indications (PGI), especially in southern Europe. According to Giraud (1998), local products outside their area of influence, outside their locality, region or country are perceived as regular products, thus losing all or an important part of the additional values and feelings that may be conferred on consumers in their original place of manufacturing and/or distribution. Similarly, TFP outside their original place of influence tend to lose some of their affective and emotive characteristics. An Italian Parmesano cheese or a Spanish Serrano ham can be perceived as TFP in different places all over the world, but only consumers who have emotional links with the product or its region of origin will perceive all the dimensions that the concept of traditional has (Guerrero et al., 2010). These emotional links are expected to be more intense for those consumers living in the area, region or country where the product is manufactured or produced. Therefore, it is not surprising that both words, traditional and origin had strong associations in the consumers' minds. The importance of the origin as a key element when defining TFP was also pointed out by Guerrero et al. (2009) and Vanhonacker et al. (2010) for consumers in the same European countries, plus Italy and Poland.

The word "Childhood" was also frequently related to the concept of traditional. The most important influence in human development is the cultural setting within which children grow up (Weisner, 2001). According to Smith and Ansell (2009), childhood is conceptualized as socially constructed, historically and culturally specific rather than reflecting any biologically essentialist reality. The concept of childhood comprizes an important part of our learning process, thus also including food habits. In fact most food habits and preferences are acquired at the earliest phases of human

Table 3
Average number of groups generated and distribution of participants (%) for each number of groups created within each socio-demographic variable.

Socio-demographic variable		Mean value	Percentage of consumers							
			2 Groups	3 Groups	4 Groups	5 Groups	6 Groups	7 Groups	8 Groups	9 Groups
European region	Flanders (Belgium)	4.17[ab]	5.5[ab]	20.2[ab]	39.4	24.8	6.4[ab]	3.7	0.0	0.0
	Burgundy (France)	4.11[b]	8.7[ab]	28.2[a]	27.2	19.4	13.6[ab]	1.9	1.0	0.0
	Akershus and Østfold (Norway)	4.66[a]	2.0[b]	14.3[b]	34.7	24.5	16.3[a]	6.1	1.0	1.0
	Catalonia (Spain)	3.94[b]	11.5[a]	28.4[a]	31.1	18.2	6.1[b]	4.1	0.7	0.0
Gender	Men	4.13	7.9	22.3	35.1	20.8	10.9	3.0	0.0	0.0
	Women	4.23	7.0	24.2	31.3	21.9	9.4	4.7	1.2	0.4
Age group	20–30	4.41	6.5	19.5	26.8	26.0	15.4[a]	5.7	0.0	0.0
	31–40	4.10	8.6	29.5	26.7	20.0	10.5[ab]	2.9	1.9	0.0
	41–50	4.08	6.3	24.1	40.2	17.9	8.0[ab]	3.6	0.0	0.0
	51–60	4.13	8.5	21.2	38.1	21.2	5.9[b]	3.4	0.8	0.8
Education	Primary school	4.43	5.0	22.5	25.0	32.5	7.5	5.0[ab]	0.0	2.5
	Secondary school	4.21	9.5	20.9	33.1	21.6	6.8	6.8[a]	1.4	0.0
	Higher education	4.14	6.7	24.8	34.1	19.6	12.2	2.2[b]	0.4	0.0
Number of children	0	4.28	8.4	21.3	27.5[b]	24.2	14.6[a]	3.4[ab]	0.0	0.6
	1	4.25	8.5	21.1	31.0[ab]	25.4	5.6[b]	7.0[b]	1.4	0.0
	2	4.00	8.0	26.8	37.0[ab]	18.1	7.2[b]	1.4[a]	1.4	0.0
	3 or more	4.25	2.8	23.9	40.8[a]	16.9	8.5[ab]	7.0[b]	0.0	0.0

Values and percentages in the same column within a socio-demographic variable with different letters differ significantly (Chi-square test, $p < 0.05$).
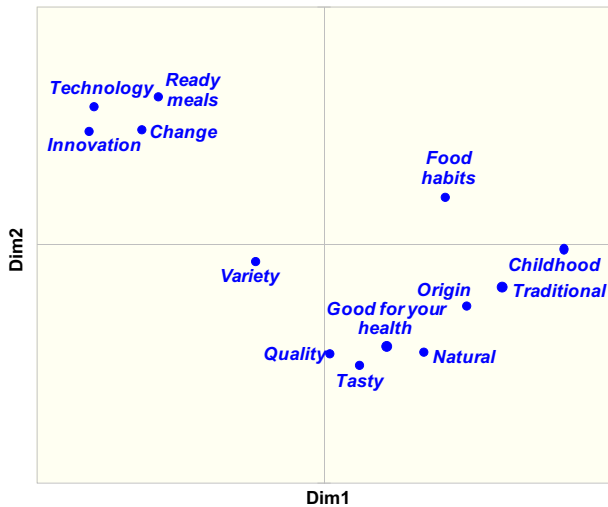
Fig. 1. Multidimensional scaling for the pooled sample of participants ($n = 476$) (Kruskal Stress = 0.074).

development (Nicklaus, Boggio, Chabanet, & Issanchou, 2004). In the present study, the word "Childhood" may also have a temporal connotation, linked to something that has been used or consumed from the beginning of our lifes and that belongs to our gastronomic heritage. Culture, habit and heritage are three key pillars of the concept of TFP (Guerrero et al., 2009) and all three seem to be covered by the concept of childhood.

"Food habits" is also close to the words "Traditional" and "Childhood" (Fig. 1).The relationship between food habits and traditional foods has been pointed out by several studies (Béhar, 1976; Guerrero et al., 2010; Trichopoulou et al., 2007). In fact, and according to Béhar (1976) food habits and beliefs are transmitted from generation to generation, thus being an essential element of our gastronomic heritage. Habit is one of the main constituents of food-related behavior, influences preferences and also seems to shape the concept of traditional foods. Habit is more than a frequency of occurrence; it is a mental construct involving automaticity and automatic responses to cues, which is characterized by low consciousness, low control and mental efficiency (Verplanken, 2006). Without habits, choices and behavior would require consciousness, thinking and rational actions. Why do people eat a specific traditional dish on Christmas? Normally they do not think about it, they simply buy the product and consume it because this is what they normally do. This repeated unconscious behavior may constitute the basis for building up part of the concept of "Traditional" in consumers' minds. Therefore, an important part of food-related traditions might be linked to habit dependent behaviors.

It is worthwhile mentioning that the concepts "Quality", "Tasty", "Natural" and "Good for your health" appeared together in the MDS space. More than 40% of the participants put at least two of these words into the same group. Contrary to what was expected, these words were not very close to the term "Traditional". Trichopoulou et al. (2007) stated that a TFP may have specific healthy properties. However, Guerrero et al. (2010) in a free word association study for the concept of "traditional food" in the same European countries, plus Italy and Poland, observed the existence of some negative health associations with traditional foods, such as "Unhealthy" or "Heavy/copious". Pieniak, Verbeke, Vanhonacker, Guerrero, and Hersleth (2009) also found an overall negative association between health as a motive for food choice and traditional food consumption in a cross-sectional sample of European consumers, especially in France. Some traditional foods and dishes

may have a high content in energy, fat, sugar and/or cholesterol, for example. These nutrients did not constitute a concern for past generations, when food was rather limited and lifestyles differed from today's way of living, but nowadays they can represent a negative health issue in modern societies characterized by lower physical activity and higher access to energy-dense foods. Normally, natural foods are perceived as being both nutritious and safe and frequently associated with a positive impact on human health (Rozin, Spranca, Krieger, Neuhaus, Surillo et al., 2004). Consequently, healthy and natural concepts were grouped together by 62.6% of the participants and, as expected, very close to the term "Quality" as well. The word "Tasty" was also located near these three concepts, probably more because of its relationship with the words "Natural" and "Quality" than with the word "Good for your health", since healthy foods tend to be perceived as less tasty by consumers than the homologous unhealthy version (Raghunathan, Hoyer, & Walker, 2006). In a similar vein, Verbeke (2006) reported that functional foods, which were positioned and perceived as more healthy than conventional foods, were often associated with inevitable compromising on taste.

TFP have been related to a higher variety in diet (Guerrero et al., 2009; Jordana, 2000), but innovations are also associated with higher product diversification (Guerrero et al. 2009; Moskowitz & Hartmann, 2008; Rosenkranz, 2003). Accordingly, the concept of "Variety" was located in-between these two concepts in the MDS space (Fig. 1). People's tendency to regularly vary the food choices they make, as an intrinsic human need, has been reported by several authors (Kim & Drolet, 2003; Lähteenmäki & van Trijp, 1995; Ratner, Kahn, & Kahneman 1999), and both, innovations and TFP seem to be perceived as providing higher variety, thus partially contributing to satisfy this people's need. In this sense, variety represents an important nexus between the two concepts that might help producers to increase the acceptance of innovations in TFP if used appropriately.

Overall, the results reported in this paper corroborate the robustness of the traditional food concept, since similar results were always observed irrespectively of the selected technique: a qualitative rational approach (Guerrero et al., 2009), a projective technique (Guerrero et al., 2010) or a conceptualization process as used in the present study.

The terms "Innovation", "Technology", "Ready meals" and "Change" were sorted together. More than 42% of the participants put at least two of these words into the same group. For most European consumers, thinking about innovation means thinking in terms of technology and technological issues, and consequently in new products and changes, thus confirming quantitatively some of the qualitative results previously reported. In fact, two of the main dimensions that emerged around the concept of innovation from the European consumers' perspective were technology and change, (Guerrero et al., 2009). Some other more technical definitions for the term "Innovation" also include the words "Technology" and "Change" as basic elements (Carayannis, González, & Wetter, 2003). Change is a relevant feature that deserves some consideration, since the resistance offered by consumers to an innovation can be explained, to some extent, by personal aversion to changes that the innovation may introduce at different levels (purchasing, eating behavior, usage patterns, norms, habits and traditions) (Kleijnen, Lee, & Wetzels, 2009). Consequently, changes introduced by any innovation in a TFP can be the main factor that explains its success or failure on the market. According to Aarts and Dijksterhuis (2000) the majority of people act on a routine basis in food-related contexts, and apparently, this routine may be disturbed by the changes introduced when a product or process is innovated. This is especially relevant in foods, given that the food industry is less prone to innovation pressure than other sectors such as electronics, automobiles or financial services (Moskowitz

& Hartmann, 2008). The slow-moving nature of the food industry has a propensity to be even more severe in TFP.

The concepts "Traditional" and "Innovation" were among those with the highest dissimilarity values in the first two dimension of the MDS map, therefore showing the apparent incompatibility between these two words in the consumer's mind. Only 20 participants from the total sample of 476 (4.2%) sorted them into the same group. The conservatism in food habits (Rozin & Vollmecke, 1986) and the expected damage to the traditional image that innovations may generate can explain, in part, why consumers are not pushing hard for changes in the traditional food sector. Interestingly, innovations and changes seem to be accepted in technology, probably because they are perceived as a passageway to progress and development, but appear to be rejected in traditional cultural and gastronomic-related contexts, perhaps because TFP are perceived as something to preserve and protect for subsequent generations. The weak association between "Traditional" and "Innovation" seems to quantitatively confirm the apparent incompatibility between these two concepts observed by Guerrero et al. (2009) from a qualitative perspective.

3.2. Sorting test: effect of a priori segmentation (region, age and gender)

Europe cannot be regarded as a homogeneous food culture. In fact noticeable differences exist not only at a national level but also at a more regional/local level in terms of food preferences, habits, food-related behavior, and attitudes (Askegaard & Madsen, 1998; Guàrdia, Aguiar, Claret, Arnau, & Guerrero, 2010). This variability is even greater when dealing with TFP and traditional cuisine that rely on the maximum use of locally available natural resources (Jordana, 2000). In Figs. 2 and 3, respectively, simple correspondence analysis shows the main differences in the "Traditional" and "Innovation" concepts between regions, age groups and gender. As expected, in both cases some differences between regions were observed.

For the word "Traditional", French and Spanish consumers showed similar profiles: compared to the northern European regions, traditional foods were more frequently linked to origin, natural character and sensory properties ("Tasty"). This association was different to that of the Norwegian consumers, who positioned "Traditional" closer to the words "Childhood" and "Food habits". Norwegian participants were especially different from the other nationalities regarding the concepts of "Tasty", "Variety" and "Good for your health". Belgian consumers were characterized by presenting the most favorable attitude towards innovations and changes in traditional foods. In any case, it is important to remark that this statistical technique highlights the main differences between regions (Greenacre and Belsius,1994), which means that although Belgian consumers were the participants who were more open to innovations in TFP, the vast majority of them behaved as described in the previous section (overall results). These divergences between countries can be partially explained by the range of foods traditionally produced in southern versus northern European countries (Jordana, 2000), the differences in the number of collective quality marks (PDO, PGI and TSG) (Becker, 2009; EU, 2010) and even by the structure of the food industry (greater market share of SMEs in southern European countries). According to Trichopoulou et al. (2007), although the disparities in food choices between the northern and southern European populations are progressively narrowing, in the case of traditional foods a clear north/south gradient seems still evident.

Regarding age groups, the youngest consumers (20–40 years old) focussed more on naturalness, healthiness, sensory properties and origin of TFP than the older consumer groups (41–60 years old), who were more focused on ready meals, changes and child-
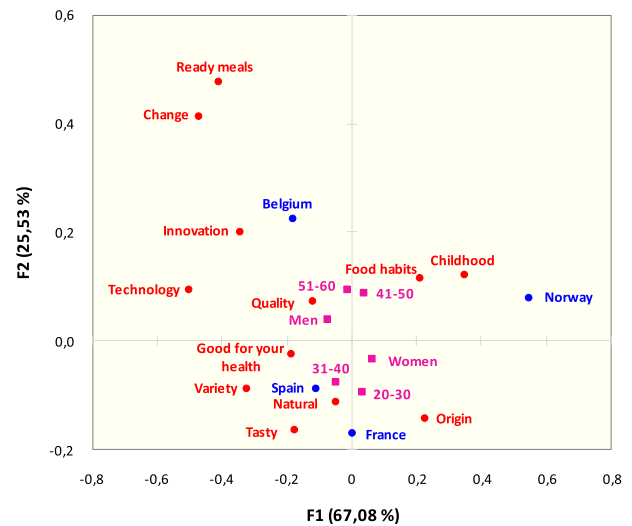

Fig. 2. First two dimensions of the simple correspondence analysis performed for the word "Traditional".
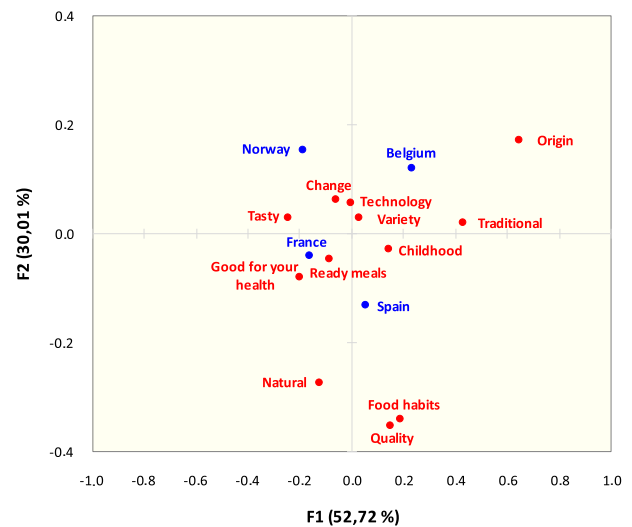

Fig. 3. First two dimensions of the simple correspondence analysis performed for the word "Innovation".

hood. Gender differences were rather minor. Women were located closer to the youngest participants while men were placed closer to the oldest group of consumers. These differences, although small, provide a subtle portrait of our society. For instance personal values evolve when people get older and seemingly irrelevant issues during youth, such as family roots, childhood or habits (which all relate to some kind of nostalgia) starts to gain importance with age (Weinert & Sherrod, 1986).

A clear distinction between northern and southern European countries was observed as well for the concept of "Innovation" (Fig. 3). French and Spanish consumers sorted the words "Good for your health", "Natural" and "Ready meals" with "Innovation" more frequently than northern European consumers. The first group of consumers probably thought in terms of health oriented innovations such as salt, fat and sugar reduction and/or enriched or functional foods. Norwegian consumers were characterized by having the lowest frequencies of association of the word "Innovation" with terms such as "Childhood", "Traditional" and "Food habits" and the highest frequency with the word "Tasty". Hence, it

Table 4
Mean values and standard deviation for each key word obtained in the affective test for the whole sample of participants ($n = 476$).

Key word	Mean value[1,2]	Std. dev.	Coefficient of variation (%)
Quality	6.6[a]	0.71	10.8
Tasty	6.5[a]	0.84	12.9
Good for your health	6.5[a]	0.80	12.4
Natural	6.4[ab]	0.83	13.0
Variety	6.2[bc]	0.94	15.3
Childhood	5.9[cd]	1.18	19.9
Traditional	5.8[de]	1.01	17.4
Origin	5.6[e]	1.09	19.3
Change	5.4[f]	1.25	23.2
Food habits	5.3[f]	1.32	24.8
Innovation	5.3[f]	1.20	22.5
Technology	4.9[g]	1.38	28.2
Ready meals	3.9[h]	1.56	40.2

[1] Mean values with different superscript differ significantly ($p < 0.05$).
[2] Values ranging from 1 (Extremely unpleasant) to 7 (Extremely pleasant).

seems that Norwegian consumers related innovations more often with the innovative cuisine and/or molecular gastronomy (seeking sensory innovations) than the other nationalities involved in the present study. Belgian participants seemed to be the consumers who were more open to the introduction of innovations in TFP.

Overall, these results tend to show again, the apparent incompatibility between the concepts "Traditional" and "Innovation" and the high diversity in food related issues, even in relatively homogenous countries such as those belonging to Europe. No relevant differences were observed for the concept of "Innovation" depending on the age group or on the gender of the participants and, for this reason, these variables were not included in Fig. 3.

3.3. Affective measurements

Mean affective scores for the 13 different key words assessed are shown in Table 4 as well as the results of the overall pairwise comparison among them (Tukey's HSD Post Hoc Test). The interval scale used in this study ranged from 1 to 7, and consequently values over four indicate a positive affective score and values below four a negative perception. The words "Quality", "Tasty" and "Good for your health" obtained the highest average scores, while "Ready meals" and "Technology" received the lowest affective values. The word "Traditional", with a mean affective score of 5.8, ranked exactly in the middle of the ordered list of words, which indicates

that its perception, although positive, could be improved considerably. The less positive image for the concept "Traditional" compared to other words such as "Natural" or "Tasty" could be explained by the negative impact on health that some consumers seem to perceive from TFP (Guerrero et al., 2010; Pieniak et al., 2009). It is worthwhile mentioning the case of the concepts "Technology" and "Ready meals". In both cases, the discrepancy between participants was higher than for the other concepts (the highest coefficients of variation), especially for "Ready meals". In most cases, these two concepts were evaluated very positively or very negatively depending on the participant. For instance, 21.0% of the participants scored the word "Ready meals" with values 1 or 2 versus 16.3% of them who gave scores of 6 or 7; for other words such as "Quality" 94.1% of the participants selected values of 6 or 7 on the interval scale. This result underlines the necessity to recognize the existence and identity of different segments of consumers with different affective perceptions for some of these words, especially for those of interest ("Traditional" and "Innovation").

Regarding the *a priori* segmentation some differences were detected depending on the region and the socio-demographic profile. The most relevant differences were those based on the region of participants' origin. Fig. 4 shows the affective profile per region and key word. Belgian consumers mainly differed in the significant low score given to the word "Ready meals". According to Geeroms, Verbeke, and Van Kenhove (2008), consumers in Belgium have a rather negative attitude toward ready meals in general. For French participants, the highest detected difference was for the affective score of "Food habits". Renaud and Lorgeril (1992) stated that the level of saturated fats in the French diet was higher than the international health recommendations, despite the well-know "French-paradox". Furthermore, Srinivasan, Irz, and Shankar (2006), strongly recommended a substantial diminution of animal fats, especially those coming from meat and dairy products, and an increase in fruits and vegetables in the French diet. Based on this evidence, it seems that French consumers would be aware of their unhealthy food habits, which in turn might explain their overall negative association between health as a motive for food choice and the traditional food consumption reported by Pieniak et al. (2009). Regarding Norwegian consumers, no relevant difference was observed compared to the other nationalities. Finally, Spanish consumers were more satisfied with their own food habits, probably as a result of the media coverage on the goodness of the Mediterranean diet. Indeed, most Spaniards identified themselves with this type of diet and lifestyle. This fact contrasts with some studies that point out the Spaniards progressive abandonment of
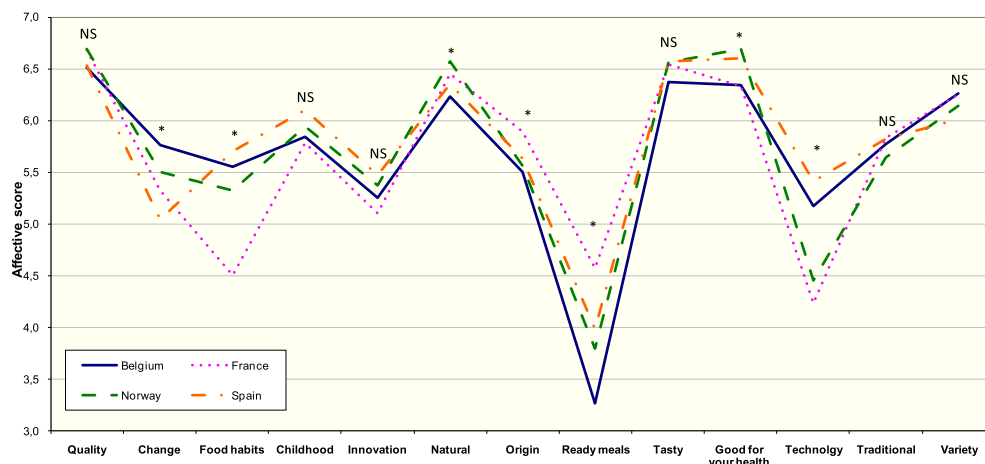
Fig. 4. Affective mean values (1 = extremely unpleasant; 7 = extremely pleasant) for each key word per region (country) and significance of the differences between regions (NS: not significant; *$p < 0.05$).

Table 5
Mean affective values and label for each cluster obtained.

| Concept	Cluster		
	1 "Traditional"	2 "Tolerant"	3 "Innovative"
Traditional	6.1	6.3	4.4
Innovation	4.2	6.3	5.7
N	184	171	121
Percentage (%)	38.7	35.9	25.4

the Mediterranean diet (Lairon, Vincent, & Defoort, 2006) and the important distance observed between the actual and the ideal diet according to the World Health Organization (Srinivasan et al., 2006). Participants from this European region also gave the highest score for the word "Technology", differing from French and Norwegian consumers, and the lowest affective score for the word "Change". This apparent contradiction – given that normally technological advances imply changes (Carayannis et al., 2003) – may be explained by the context/product consumers were thinking about when scoring the different key words, even if they were told to think in terms of food products.

3.4. Ex post segmentation using affective measurements

The *ex post* segmentation carried out by means of a cluster analysis (Ward method) using the affective scores for the concepts of "Traditional" and "Innovation" as segmentation variables allowed the identification of three clusters of consumers (Table 5). The first and largest cluster ($n = 184$) consisted of consumers who gave a high affective score for the word "Traditional" and a relative low score for the concept of "Innovation", consequently this first cluster was labeled as "Traditional". In cluster 2, named as "Tolerant", participants ($n = 171$) scored both words similarly. Consumers in the third cluster ($n = 121$) were those who provided the lowest affective mean score for the word "Traditional" and a relative high score for the word "Innovation", accordingly this cluster was labeled as "Innovative".

The Multidimensional Scaling (MDS) performed for each cluster (Fig. 5) showed similar patterns for the three segments of consumers detected. The three spaces obtained were comparable to the overall results previously presented (for the whole sample). In general, affective and cognitive components do not necessarily have to go in the same direction. In fact, and in order to measure consumer attitude both components have to be quantified separately (Axelson & Brinberg, 1989). Accordingly, in the present study and in the three clusters, participants conceptually perceived the words "Traditional" and "Innovation" in the same way (cognitive assessment). However, the hedonic assessment was notably different in each of them. Generally speaking, and irrespectively of being *pro* innovations or *anti* innovations (expressed as affective values), it seems evident that the conceptual incompatibility between "Traditional" and "Innovation" is extensively accepted.

The results of a logistic regression performed in order to characterize the different clusters depending on the available sociodemographic information of the participants showed no significant differences in any case (McFadden's $R^2 = 0.035$, overall predictor significance using the Wald Chi-square test = 0.080 – not significant –; Wald P-value for all the socio-demographic variables higher than 0.20; only 46.2% of observations correctly classified in their respective cluster in the confusion matrix). This indicates that typical socio-demographic variables fall short in profiling traditional versus innovation oriented consumer segments in a food context. The cluster analysis indicates an affective incompatibility between
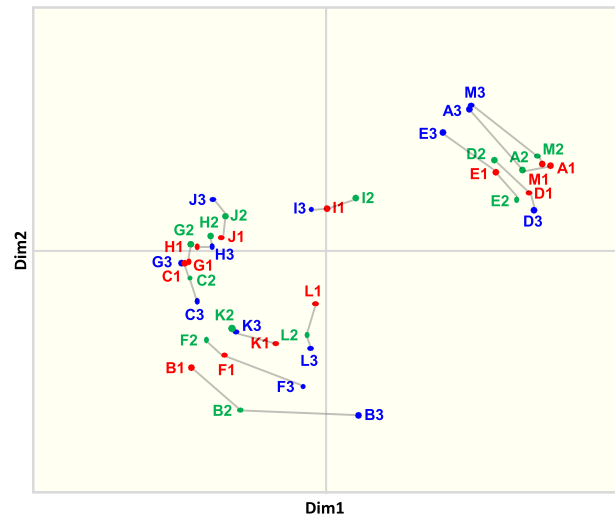
Fig. 5. Multidimensional scaling for each affective cluster (Nos. 1–3). A = Innovation, B = Childhood, C = Natural, D = Ready meals, E = Change, F = Traditional, G = Good for your health, H = Tasty, I = Variety, J = Quality, K = Origin, L = Food habits and M = Technology (Average Kruskal Stress = 0.077).

the concepts of "Traditional" and "Innovation" for 64.1% of the participants (cluster 1 and 3) in agreement to what was observed in the sorting task results. No relevant differences, although some were significant ($p < 0.05$), were observed for the remaining 11 key words between clusters (results not shown).

4. Conclusions

The sorting task proved to be an efficient method to conceptualize the words "Traditional" and "Innovation" in a food context from a consumers' perspective. In general, the affective test complemented the sorting task and helped to better understand why some concepts were or were not grouped together such as "Traditional" and "Good for your health" or "Traditional", "Childhood" and "Origin". The results obtained in the present study enhance those previously reported by Guerrero et al. (2009) and (2010) when using other qualitative techniques with participants from the same European regions, plus Italy and Poland. Based on this finding, it seems that the combination of different qualitative techniques, although providing similar results, allows the detection of some peculiarities that help to improve the understanding of the topic under investigation. In this sense, a noticeable incompatibility between the two concepts, "Traditional" and "Innovation", was detected using the sorting task as well as some relevant aspects such as the relative unhealthy character of TFP.

The information provided in this paper may help policy makers and producers of TFP to improve the image of this category of foods. The mean value of the affective score for the "Traditional" concept was lower than might be expected, which leaves room for further improvement. This can be realized for instance by enhancing the nutritional value or improving the nutrient profile of TFP, e.g. reducing salt, saturated fat or sugar content. At the same time the insights from this study might offer valuable clues in order to implement and communicate about potentially successful innovations in the European traditional food sector by exploiting aspects such as the potential increase in the variety of choices, stressing the national/local origin of TFP, exploring the opportunities of new distribution channels, improving the products' shelf-life and their nutritional value.

Acknowledgements

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