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An Analysis of the Decision Structure for Food Innovation on the Basis of Consumer Age

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Abstract

Food innovations have high failure rates. One reason is due to not understanding what motivates consumers' product selections. This study analyzes consumer decision making strategies according to age ranges and their preferences for novel food products. Utilizing the means-end chain theory, our results show age is not a factor in consumption decisions with familiar products. However, the structure becomes more complex in the case of novel food items, especially among young consumers.

Keywords: novel foods, age, means-end chain, laddering, coffee

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Introduction

The food market has high levels of competition and saturation, which requires companies to keep developing new strategies in order to improve, sustain their market share, or even survive (Baregheh et al. 2009, Naidoo 2010). One strategy used to gain the competitive advantage is product innovation aimed at satisfying consumers' needs, and targeting niche markets with specific needs. While product innovation is important in terms of business strategy and growth, success rates for newly launched products are relatively low, with failure rates between 40 - 90% (Gourville 2006, Gresham et al. 2006). This is often caused by a failure to understand consumers, a lack of market orientation from the businesses, and by consumer neophobia[1].

Consumers are becoming more variable and less predictable for many reasons due to significant changes in lifestyles, demographics, cultural exchanges and high communication levels. (Imram 1999, Capitanio et al. 2009, Fortuin and Omta 2009, Kühne et al. 2010). In view of this, better knowledge of what consumers want, their changing needs, and how these changes can be immediately addressed through market orientation, becomes not only a key to success but a key to survival for agro-food industries (Costa et al. 2004). Innovation success is a combination of understanding consumers, the features and benefits they are looking for in the products they purchase and consume—and the aspects of their own personalities they project through product usage.

Means-end chain (MEC) theory allows us to establish relationships between the features or specifications considered in a given product, with the benefits they symbolize, and the personal values consumers are striving to personify through them. Thus, this approach gives us an idea of the aspects consumers consider when it comes to buying a given product. This means that understanding consumers' adoption process and cognitive structure can help improve positioning and launch strategies related to food innovations. Consumer-behavior research on innovation has focused on the analysis of the mental, behavior and demographic traits associated with willingness to adopt novel products. Some studies relate adoption of novel products to consumers' personal traits (Dickerson and Gentry 1983, Michon et al. 2010). The variables normally include: income, age, family-group size, education level, etc. Although some studies show that the effect of demographic variables tend to be mild, generally, there is consensus that consumers who innovate tend to have higher income and education levels, are young, have higher social mobility, prone to making risky decisions, and have higher opinion leadership (Dickerson and Gentry 1983, Gatignon and Robertson 1991, Rogers 1995, Im et al. 2003).

The age variable generally appears in marketing literature dealing with market segmentation and consumer behavior. The specific phase in the cycle of life that people are going through accounts for the general structure of certain consumer choices (Grande 1993), which means that companies cannot work in the same way for all age segments if they want to succeed at getting consumers to adopt new goods and services. Life-span Developmental Theory argues that

[1] The reluctance to try unfamiliar foods or dislike for the flavor of unfamiliar foods is called food neophobia (Pelchat and Pliner 1995; Pliner 1994; Pliner and Loewen 1997).

personal values change normatively with age (Robinson, 2013) and that the objectives pursued in products consequently change with age too (Heckhausen et al. 2010). There is a broad-based consensus in the literature on the fact that age has an adverse effect over consumers' innovation drive. Younger consumers tend to be more innovative (Rogers 2003) and older consumers are more reluctant to innovate (Leek et al. 2001, Tellis et al. 2009).

Age generally affects innovation; young people are less risk-averse (Assael 1987). This trend is seen in the ecological food market (Tsakiridou et al. 2008, Bartels and Reinders 2010), the functional food market (Leek et al. 2001, Krystallis et al. 2010) and the ethnic food market (Pelchat and Pliner 1995, Xu et al. 2004).

Lunsford and Burnett (1992) considered a series of potential barriers to the adoption of novel products among older consumers and suggested there are a number of incompatibility limitations with these products. Psychologically, older consumers often fail to see clear benefits, resonate with a brand image or a product that is inconsistent with the older consumers' self-image. Our study attempts to analyze consumers' decision strategies according to their age and in relation to a novel food product in order to determine differentiating elements. This knowledge will help us identify the key elements for each age group and establish guidelines leading to improved rates of novel food product adoption. Although the age factor in relation to the adoption of novel food products has been widely analyzed, there are currently no studies establishing differences in decision structure according to age using means-end chain theory. That is to say, there are no studies analyzing the extent to which the desired specifications in a product, the benefits pursued and the personal values in play vary according to consumers' age when a novel food product is bought; and this is the differentiating element in our study.

Means-end chain theory, the theoretical basis of our research is presented in the next section. Section 3 explains the methodology used and Section 4 presents the primary results. Finally, the main conclusions and implications are presented, as well as the limitations of the study.

Theoretical Framework

Means-End Chain (MEC)

Gutman (1982) introduced means-end chain (MEC) theory into the field of marketing and consumer research, as a way of explaining the relationship between consumer knowledge and consumer behavior. MEC is a cognitive structure that links consumers' knowledge of products to their knowledge of certain consequences and values connected with those products (Ter Hofstede et al. 1998).

The main premise of MEC is that consumers learn to select those products that feature the attributes that allow them to achieve their desired ends (Reynolds and Gutman 1984, Ter Hofstede et al. 1998, Walker and Olson 1991, Olson and Reynolds 2001). MEC theory assumes that people base their purchase choices not on the products themselves but on the benefits to be gained from their consumption. A means-end chain begins with a product, service or performance attribute and establishes a sequence of links with personal values through the consumer's perceptions from which the consequences or benefits are derived.

Means-end chain theory suggests that product knowledge in consumers is hierarchically organized by level of abstraction (Young and Feigin 1975; Gutman 1982). The higher the level of abstraction, the stronger and more direct the relationship with the person (Olson and Reynolds 1983). In the analysis of mental images, each basic level of abstraction can be subdivided into distinct categories of abstraction. In this respect, Walker and Olson (1991) propose a six-level MEC. The three lower levels (concrete attributes, abstract attributes and functional consequences) form the consumer's product knowledge, while the three upper levels (psychosocial consequences, instrumental values and terminal values) comprise the consumer's self-knowledge. *Concrete attributes* are those properties or characteristics of the product, service or performance that may be desired or pursued by consumers. *Abstract attributes* are those that cannot be checked prior to consumption of the product and must therefore be inferred from internal or external cues. *Functional consequences* are the tangible benefits that consumers derive from product or service attributes as a direct result of consumption. *Psychosocial consequences* are benefits of a more personal, social and less tangible nature. *Instrumental values* represent desirable modes of behavior for the attainment of desirable end-states, and finally, *terminal values* represent desirable end-states. Having presented our theoretical framework, we will focus our attention in the next section on the methodology used in this research.

In relation to age and the use of the means-end chain, life-span developmental theory claims that personal values vary with age and therefore the objectives and benefits pursued in products change throughout life (Robinson 2013; Heckhausen et al. 2010). A further theory which confirms the aforementioned is the one proposed by Erikson (1980); young people aim to establish successful relationships. Thus, they value and prioritize autonomy, improvement and new experiences (Arnett 2000). Adults focus more on family so their pursued values and objectives focus on the people around them. As age increases, people are more concerned with maintaining traditions and are reluctant to change (Robinson 2013). These theories confirm that attributes-consequences-values and relationships can change with age. Furthermore, a number of MEC studies have analyzed variations according to age group. Roininen et al (2004) analyze the fruit and vegetables consumption habits of two different age groups in Finland and the UK. Flight et al. (2003) studied the perception of attributes, consequences and values of red meat consumption of middle-age and early old-age people. The text now includes a limitation regarding the issue of potential differences in the level of involvement and behavior between young people and adults.

Methodology

Product Choice

Two products were selected to determine the role played by consumers' ages in the acceptance of food innovations and the potential differences in decision structure when consumers of different ages are presented with a novel food product. We chose a traditional product as the control product (coffee) and a novel coffee-derived product (Nespresso type coffee capsules). Given that coffee consumers are increasingly more demanding and care more for quality and presentation, coffee capsules offer them the opportunity to enjoy different types of specialized establishment grade coffee in their homes without needing to spend large sums of money on

coffee makers or cafés (Resa 2011). In other words, capsules make consumers feel like coffee experts and cosmopolitan consumers etc., which are intangible values associated with consumption of the new product. These two products were chosen bearing in mind that coffee - both in its traditional and innovative formats - is a popular and widely consumed product among the Spanish population. According to data from the Spanish Ministerio de Agricultura, Alimentación y Medio Ambiente (MARM) [Ministry of Agriculture, Food and the Environment], 82% of the population drink brewed coffee. The proposed innovation (coffee capsules) was launched in 2004-2005[2], and its penetration in the Spanish market has tripled over the last two years to reach over 1.5 million regular consumers (8% of the total coffee consumption volume). This product is expected to amount to 20% of total coffee sales in the next five years (MARM 2011).

Laddering Interviews

The usual method used to obtain means-end chains is a qualitative interviewing technique known as laddering. Laddering interviews are personal, individual, in-depth, semi-structured interviews aimed at revealing the attribute-consequence-value associations made by consumers with respect to a particular product. Laddering interviews comprise a three-stage process. In the first stage, the researcher identifies the relevant attributes of the test product. In the second stage, subjects are invited through a series of questions of the type 'Why is that important to you?' to explain why the attributes chosen in the first stage are relevant in terms of their associated consequences and values. In the third stage, the associations or linkages are used to form an implication matrix from which to generate a hierarchical value map (HVM) (Nielsen et al. 1998, Ter Hofstede et al. 1998).

One of the key issues to be considered when constructing a HVM is the choice of cut-off level, as only associations above this level will be mapped (Leppard et al. 2004). The method adopted to determine the cut-off point in our case is known as 'top-down ranking', originally proposed by Leppard et al. (2004). This method is based 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 different levels of abstraction. The strategy underlining 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. Using this approach, one obtains different HVMs for different orderings. HVM1 represents the 'most important' or 'best' linkages, in the sense that any other choice of cut-off value or values must produce a HVM based on smaller and thus less strongly associated linkages between levels of abstraction. HVM1 is also the least complicated and most easily interpreted of all possible HVMs as it has the least number of elements displayed. Similarly, a HVM2 is constructed by repeating the above process but defining the relevant cut-off levels at the second largest cell entry at each level of abstraction. Thus, additional linkages are created by using a less stringent requirement (second highest vs. first highest) which results in a more complex HVM. Continuing in this way, choosing successively smaller cell entries in the manner described above, a sequence of HVMs can be created. The advantage of this method

[2]Coffee capsules were launched in 1986. In Spain, however, it is a novel food product as it entered Spanish market much later (Nesspreso 2012).

is that it allows one to observe how the most important links between different levels of abstraction gradually emerge, while also allowing for the comparison of groups with the same cut-off point. That is to say, the same level may have different cut-off points between the groups but this allows us to know which elements (attributes, consequences and values) are relevant at each level and whether they are similar or different for the different groups established. Furthermore, this cut-off level captures a reasonable amount of the initial data shown in the final variance of the model.

Data Collection

The data to achieve our objectives was collected by means of a personal survey carried out in Navarra in March-April, 2011. The three-section survey target was household food buyers. The first section comprised questions related to consumption frequency for novel food products and their valued qualities when it comes to purchasing them. The second part of the questionnaire focused on applying the methodology in order to find out the respondents' means-end chains (laddering interview). Finally, the third part was related to the respondents' socio-demographic characteristics and lifestyles.

This study uses hard laddering[3] because, as noted by Russell et al. (2004), the technique is easier to apply, as the interview is shorter and the respondent feels less pressure (Botschen and Hemetsberger 1998). The present study uses hard laddering, because, as noted by Russell et al. (2004), it yields higher levels of abstraction than soft laddering while conserving the richness and complexity of the data[4]. The specific technique chosen for this part of the questionnaire was the 'Association Pattern Technique' (APT), which was introduced by Ter Hofstede et al. (1998) and is generally approved for use with samples of more than 50 individuals (Russell et al. 2004). This method comprises two independent matrices: an Attribute–Consequence (AC) matrix and a Consequence–Value (CV) matrix; respondents have to establish relationships between these elements.

The attributes selected for the attribute-consequence and value-consequence matrices were drawn from the reviewed literature and consultation with experts (academic staff at the *Universidad Pública de Navarra*) and through a pilot survey carried on people there. This produced a set of 13 attributes for coffee (Table 1). In the same way, we extracted what we considered to be the 21 most relevant functional and psychological consequences associated with the consumption of coffee. Finally, we used the list of values (LOV) proposed by Kahle (1985), which incorporated nine new consumption-related instrumental and terminal personal values (Table 1).

[3]There are two types of laddering: hard and soft (Grunert and Grunert, 1995; Botschen and Thelen, 1998). Hard laddering includes all those techniques in which subjects are required in a structured interview to generate or verify associations between elements on individual ladders in sequences showing increasing levels of abstraction. Soft laddering respects the respondent's natural flow of discourse throughout the interview and the attribute–consequence–value linkages have to be reconstructed afterwards.

[4]Therefore, Costa et al. (2004) recommend the use of hard laddering for samples of more than 50 respondents, which strengthens the rationale for our adoption of this type of laddering.

Table 1. Identification and Classification of Attributes, Consequences and Values Selected for the Analyzed Product.

Attributes	Consequences	Values
Concrete Attributes ▪ Price ▪ Taste ▪ Aroma ▪ Brand ▪ Label information ▪ Package ▪ Geographic origin ▪ Type of coffee	*Functional Consequences* ▪ Appetizing and enjoyable to drink ▪ It is a healthy food ▪ Good value for money ▪ I'm well informed ▪ Easy to purchase ▪ Appeals to all the family ▪ Makes life easier ▪ It is familiar ▪ It saves me time ▪ My concentration is better and I feel more awake ▪ It make me nervous ▪ It helps me relax and rest	*Instrumental Value* ▪ Provides fun, pleasure and enjoyment ▪ Enhances my quality of life and security ▪ Gives me an emotional boost ▪ Makes me feel more successful
Abstract Attributes ▪ Quality ▪ Ease of preparation ▪ Familiarity ▪ Beneficial health effect ▪ Caffeine content	*Psychological Consequences* ▪ I'm consuming a quality product ▪ Good eating habits ▪ Provides me happiness and satisfaction ▪ Brings back memories ▪ Gives me a sense of cultural identification ▪ No health risk ▪ Status symbol ▪ I feel I'm doing right ▪ Makes me feel more cosmopolitan	*Terminal Values* ▪ Gives me a sense of social belonging ▪ Improves my relationships with others ▪ Gives me a sense of self-fulfillment and accomplishment ▪ Makes me feel more respected by others ▪ Gives me peace of mind, dignity and self-respect

The study used a convenience sample of coffee purchasers and consumers. Vannopen et al. (1999), approve the use of convenience samples in laddering procedures, given the complexity of the process and the fact that respondents are familiar with the product and therefore capable of expressing more ideas on the subject. In this case the final sample consisted of 98 people in charge of buying household food who responded to a personal invitation sent by e-mail to *Universidad Pública de Navarra* staff (academics, non-academic staff and students).This size of sample is in line with the majority of the past surveys using this technique found in the review of the literature. The characteristics of the sample and of the population of Navarre are shown below in Table 2.

Table 2. Characteristics of the Sample and the Population of Navarre (Spanish region).

	Coffee Sample	Spanish Region Navarre
Gender		
Male	28.03%	49.77%
Female	71.97%	50.23%
Average age	40.03	40.50
Size of household	3.06	2.90
Level of Education		
Elementary	—	18.67%
Intermediate	17.99%	52.24%
Higher	82.10%	29.09%

Source. National Statistics Institute (INE Spain) (2007) and authors' own calculations

It shows that the biggest difference is the higher percentage of participants with higher education in the two samples analyzed, because the surveys were conducted in the university.

The table also shows a higher number of women in the sample; this is probably due to the fact that the survey was responded to by people in charge of household purchases and there are still a higher number of women in charge of this chore. Even though the sample could be considered biased in terms of its educational level, other elements, such as household composition, age and gender, these are similar to those found in the population of Navarre as a whole. The sample has representativeness problems in terms of the interviewees' education level. Furthermore, it was impossible to interview people over 65 years of age given that the survey was carried out in a working environment and the difficulty older people may have when it comes to answering laddering interviews. Interviewing was conducted in groups of approximately 10 subjects who were given an explanation of the questionnaire content, its component parts and instructions for completion and then they completed the survey in their homes. Special emphasis was placed on explaining the laddering technique and an example was given of the MEC relationship to ensure a fuller understanding of the process. The duration of the interview ranged between 40 and 60 min. Mecanalyst Plus 1.0.8. software was used to construct ladders for all the sample respondents. The main findings from the data analysis are presented below.

Results

Segment Characterization

In order to find out whether consumers' decision structures with regard to food innovation vary according to age, the sample was segmented based on this variable. Two age groups were established: 18-35 year old interviewees (the "young" group) and 36-65 year old interviewees (the "adult" group).

Table 3 shows the socio-demographic characteristics and lifestyles of the two groups determined a priori as well as the corresponding statistics in order to determine significant differences between these two segments. The young group constitutes almost 39% of the sample, the adult group being the biggest segment (61%). In terms of socio-demographic characteristics, differences can be seen in family size; the adult group has bigger family sizes (a logical result given the family life cycle stage each of the groups is going through). Differences are also observed in terms of lifestyles; the adult group tends to be more participative in NGOs and more concerned about health related matters (medical check-ups, eating additive-free food and reducing stress), which is consistent with results found by other authors (Rimal 2001).

Table 4 shows consumption frequency for the products analyzed (traditional coffee and coffee capsules) for both age segments. Consumption levels for traditional coffee are very high; 80% of the population consumes this product regularly. In the case of coffee capsules, the consumption frequency is much lower, which is consistent with the literature related to the dissemination and adoption of innovations. In this case consumption frequency differences are significant and consumption levels are clearly higher in the young segment. This is consistent with the literature related to adoption of innovations, which holds that innovations have higher acceptance levels among young consumers (Leek et al. 2001, Tellis et al. 2009).

Table 3. Socio-Demographic Characteristics and Lifestyles by Respondents' Ages.

	Young	**Adults**	**Snedecor's F**	**Sig.**
	38.8%	**61.2%**	2.831	0.096
Household Size *	2.72	3.19		
Life Styles				
I reduce salt intake	3.18	3.11	0.066	0.798
I am a vegetarian	1.41	1.65	1.157	0.285
I exercise regularly	3.54	3.21	1.179	0.280
I try to avoid industrial products	2.87	3.28	1.954	0.165
I regularly eat fruit and vegetables	4.09	4.33	1.290	0.259
I eat red meat in moderation	3.39	3.46	0.063	0.802
I am member of a wildlife conservation association	1.06	1.20	0.968	0.328
I try to eat additive-free food	2.40	2.89	2.839	0.095*
I have regular health check-ups	2.46	3.27	5.963	0.016**
I try to reduce stress	2.62	3.19	5.122	0.026**
I participate in NGOs	1.68	2.50	6.076	0.016**
I see a dentist regularly	3.28	3.71	2.135	0.147
I try to lead an organized, methodical life	3.43	3.49	0.054	0.817
I try to balance work and private life	3.75	3.99	1.120	0.293
I read food products' labels	3.54	3.95	2.653	0.107
	Young	**Adults**	**Chi-square test**	**Sig.**
Gender			0.123	0.726
Male	25.8%	29.3%		
Female	74.2%	70.7%		
Level of Education			0.020	0.808
Secondary	23.2%	25.9%		
Higher	76.8%	74.1%		

***, **, * show the existence of significant differences between groups for 1%, 5%, 10% maximum error level respectively.

Table 4. Coffee Consumption by Respondents' Age.

		Young 38.8%	**Adults 61.2%**	**Chi-square**	**Sig.**
Coffee	Do not consume	—	6.3%	2.322	0.313
	Occasional consumption	18.2%	14.3%		
	Regular consumption	81.8%	79.4%		
Coffee capsules	Do not consume	37.6%	58.7%	5.730	0.038**
	Occasional consumption	37.3%	19.0%		
	Regular consumption	25.2%	22.3%		

***, **, * show the existence of significant differences between groups for 1%, 5%, 10% maximum error level respectively.

Cut-Off Point of Hierarchical Value Maps (HVM)

Having obtained the socio-demographic profile of each group and following the construction of the hierarchical value maps, it was necessary to determine the cut-off point of the HVMs. All the maps constructed were level 6 maps; that is, they show all the attribute-consequence and consequence-value linkages at and above the frequency of the one ranked sixth in importance. The cut-off point obtained following the methodology proposed by Leppard et al. (2004) is different for each level of abstraction and group of respondents, as shown in Table 5, while allowing for comparison between maps. Almost all of these linkages are made by over 50.0% of the group in each case, thus satisfying the minimum requirement suggested by the majority of authors.

Table 5. Cut-Off Points for the 6 Levels of Abstraction and Total Percentage of Cases.

	Coffee				Coffee Capsules			
	Young		Adults		Young		Adults	
	CP	%	CP	%	CP	%	CP	%
Level 1 AC	37	97.3	60	100	31	81.5	54	86.6
CV	34	89.5	56	93.3	30	78.9	54	86.6
Level 2 AC	33	86.8	51	85.0	27	71.0	50	83.3
CV	32	84.2	41	68.3	26	68.4	49	81.7
Level 3 AC	31	81.5	49	81.7	25	65.8	48	80.0
CV	31	81.6	38	63.3	25	65.8	46	76.6
Level 4 AC	29	76.3	47	78.3	24	63.2	45	75.0
CV	30	78.9	37	61.6	23	60.5	42	70.0
Level 5 AC	28	73.7	44	73.3	22	57.9	43	71.6
CV	28	73.7	35	58.3	21	55.2	39	65.0
Level 6 AC	27	71.0	42	70.0	21	55.2	40	66.7
CV	26	68.4	34	56.6	19	50.0	36	60.0

Effect of Exposure to Innovation by Consumers' Ages

This section presents the HVM results for traditional coffee and coffee capsules both for the young and the adult groups. This will allow us to determine whether or not consumers' cognitive structures vary when exposed to a novel food product (coffee capsules). Figures 1 and 2 show the hierarchical value maps for both segments in relation to traditional coffee. Figures 3 and 4 show the results for coffee capsules. Each element (attribute, consequence or value) in the chain appears on the maps alongside the percentage of respondents who mentioned that linkage.

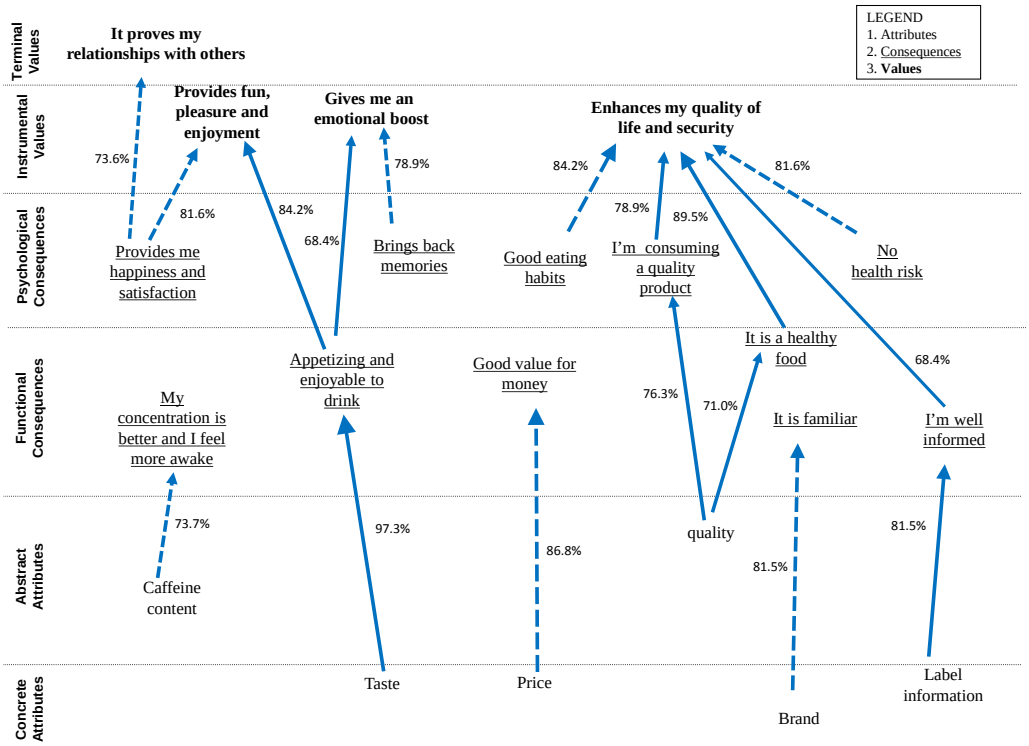

Figure 1. Level 6 Hierarchical Value Map for the Young Group and Traditional Coffee

Figures 1 and 2 show that the HVMs for the young and adult segments in the case of traditional coffee are quite similar in terms of attributes, consequences and values considered. The most significant differences are related to the "caffeine content" attribute in the case of the young group and the "aroma" attribute for adults. With regard to consequences, only one difference was observed, "being more concentrated and awake", which was valued by the young group; the same happened with the terminal value "improves my relationship with others".

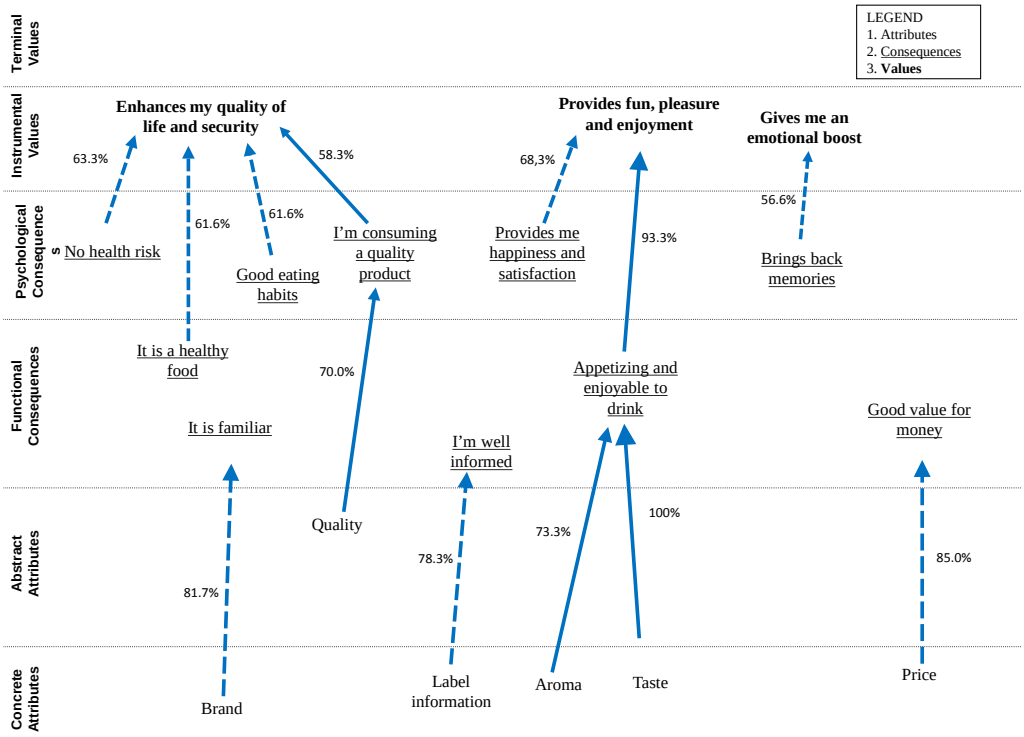

Figure 2. Level 6 Hierarchical Value Map for the Adult Group and Traditional Coffee

Figures 3 and 4, which show coffee capsules HVMs for the young and the adult segments respectively, indicate at a glance more complexity in the novel food product maps than in the traditional coffee ones for each of the two segments considered. A more detailed analysis of the HVMs for the young segment shows differences in the additional consideration of the concrete attributes "price" and "packaging" and the abstract attributes "familiarity" and " product preparation" in the case of coffee capsules. In terms of consequences, those related to the convenience and user-friendliness of coffee capsules ("make my life easier", "they save me time) are noteworthy as well as those which give consumers a sense of being "more cosmopolitan" and "having higher status". It is worth mentioning that "no risk perception" does not appear on the coffee capsules map, which implies that consumers somehow perceive that they are riskier than traditional coffee. In terms of values, a higher number of values for the novel food product are observed in the young segment, values related to "being more successful", "a sense of social belonging" and "having peace of mind, dignity and self-respect".

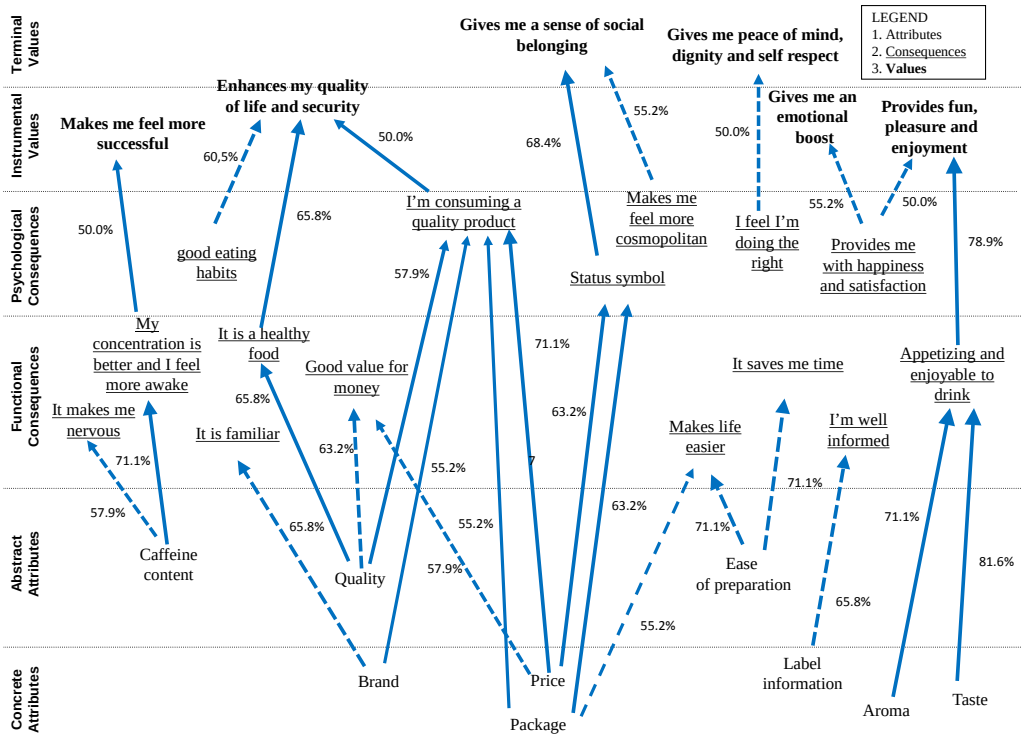

Figure 3. Level 6 Hierarchical Value Map for the Young Group and Coffee Capsules

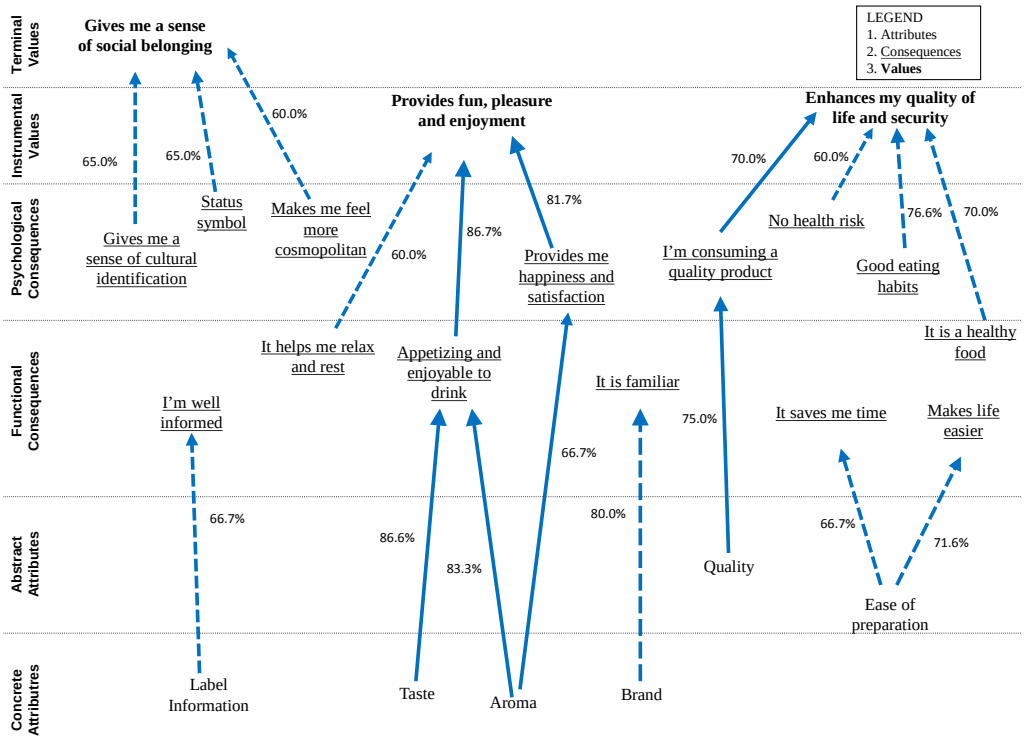

Figure 4. Level 6 Hierarchical Value Map for the Adult Group and Coffee Capsules.

In the case of adult consumers, the maps differ in one specific attribute, "price" which only appears in the traditional coffee HVM, and in "ease of preparation" as an abstract attribute in the case of coffee capsules. With regard to benefits or consequences, perceptions of regular coffee as a "good value for money" product and as a product that "brings back memories" are noteworthy. In the case of capsules, consumers identify a higher number of consequences, some of them related to the fact that this innovation "makes consumers' lives' easier" and to the fact that they perceive themselves as more cosmopolitan people when they consume it.

These results seem to indicate that in the case of a regularly consumed product consumers' cognitive structures are similar regardless of their age. When presented with a novel food product, consumers' cognitive structure becomes more complex. These differences are more patent in the young group.

Effect of Age on Decision Structure in Food Innovation

Once the fact that there actually exist differences in the cognitive structure when consumers are exposed to food innovation has been determined, we need to find out whether or not the decision structure related to the novel product differs according to the age of the consumers. To this end the HVM for young and adult consumers in coffee capsules are compared (Figures 3 and 4).

The initial analysis of the results obtained in relation to attributes reveals some interesting similarities between the two groups studied. Both segments are interested in concrete attributes such as "taste", "brand", "aroma" and "label information" i.e. mostly product organoleptic aspects, brand and information. As authors such as Grunert et al. (2003) have pointed out, sensory attributes, especially appearance and taste, have always been among the key factors influencing consumers when rating food products. In the case of abstract attributes, both groups perceive coffee capsules as a "quality" and "easy to prepare" product. In terms of differences in attributes, two concrete attributes are mentioned only by the young group: "price" and "packaging". The same happens with two abstract attributes: "caffeine content" and "product familiarity". These results show higher interest in packaging and caffeine content on the part of young consumers.

When the consequences or benefits mentioned by both groups are analyzed in more depth, functional consequences related to pleasure ("it's appetizing and enjoyable to drink") as well as those related to convenience ("it makes my life easier", "it saves me time") and being informed ("I'm well informed") are the ones which stand out. Similarities also emerge in terms of psychological consequences, specifically in those referring to consuming a quality product and having good eating habits as well as perception of higher status and cosmopolitanism when consuming coffee capsules. It should be noted that adults consume this product when they consider "it does not pose a risk to human health" while young consumers "feel they do the right thing", which shows that consumption of a novel food product is associated with the perception of being presented with a risk-free product. Differences were found in the usefulness interviewees attribute to this novel product; the young segment use coffee to improve their concentration and feel more awake while the adult segment consumes it to relax and rest. Besides, the young segment mentions "good value for money". The young group also mentions a higher number of values. Both segments agree on instrumental values such as "I have good

quality of life and safety, "it provides fun, pleasure and enjoyment" and the terminal value "gives me a sense of social belonging". The young segment, however, is able to convey a higher number of values in the map and they indicate that coffee capsules consumption gives them an emotional boost, makes them more successful and feel they have "peace of mind, dignity and self-respect".

These initial findings could be analysed in more detail in a second stage of the analysis in order to gain a deeper understanding of how purchasers' means-end chains are formed. The ladders observed show three relationships common to both segments. The first two refer to the "taste" and "aroma" of coffee capsules which are related to the consequence "it's appetizing and enjoyable to drink" and the value "it provides fun, pleasure and enjoyment".

This suggests that one of the values that all groups pursue through the consumption of foods is the enjoyment of eating them, an association that it is hardly surprising to observe in food consumption research. Another common pattern in the groups is the chain linking the abstract attributes "quality" with the consequence "I am consuming a quality product" and the instrumental value "enhances my quality of life and security", all of these concepts being related to the quality of the product.

Certain differences in terms of consumers' age are observable given that the young segment is able to convey many more complete ladders. For instance, three ladders associating "brand", "packaging" and "price" of the product with consumption of a quality product that provides them with good quality of life and safety are observed. Besides, the young group associates "price" and "packaging" with a "status symbol" and this in turns makes them perceive a sense of social belonging. Finally, the caffeine content of the novel food product is associated with better concentration and being more awake, which leads to being more successful.

From the analysis of the various elements and ladders shown on the hierarchical value maps of these consumer segments, it appears that the more complex cognitive structure underlying the decision making process with respect to innovations is that of the young group, the one which shows higher consumption of the new product.

Given that young and adult consumers presented consumption frequencies significantly different in relation to coffee capsules (Table 4), frequent coffee capsules consumers' HVMs for both age ranges were analyzed in order to find out whether these results were derived from age or from consumption frequency. Figures 5 and 6 show the HVMs obtained for young and adult regular coffee capsules consumers. The results show that even though there are some minor differences, the map structures remains similar to the one obtained for the groups in general when consumption frequency is not taken into account. The HVM for the young group is still considerably more complex than that of adults consuming this innovation, regardless of consumption frequency. These results seem to indicate that differences derive from age and not from consumption frequency.

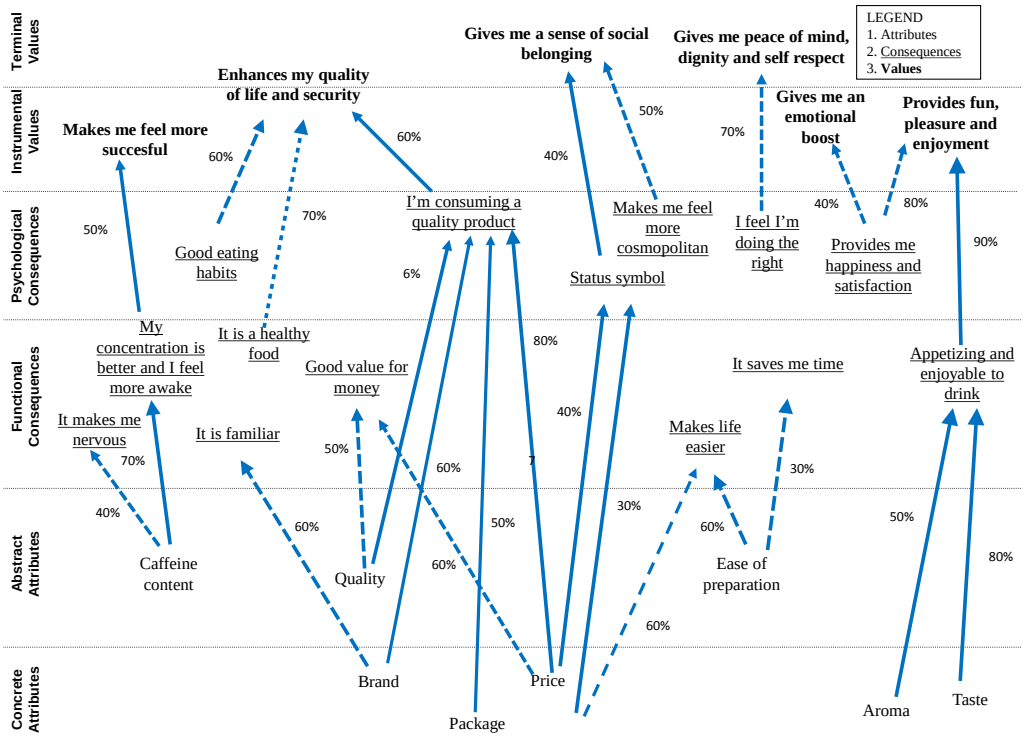

Figure 5. Level 6 Hierarchical Value Map for the Young Group and Coffee Capsules (Regular consumption).

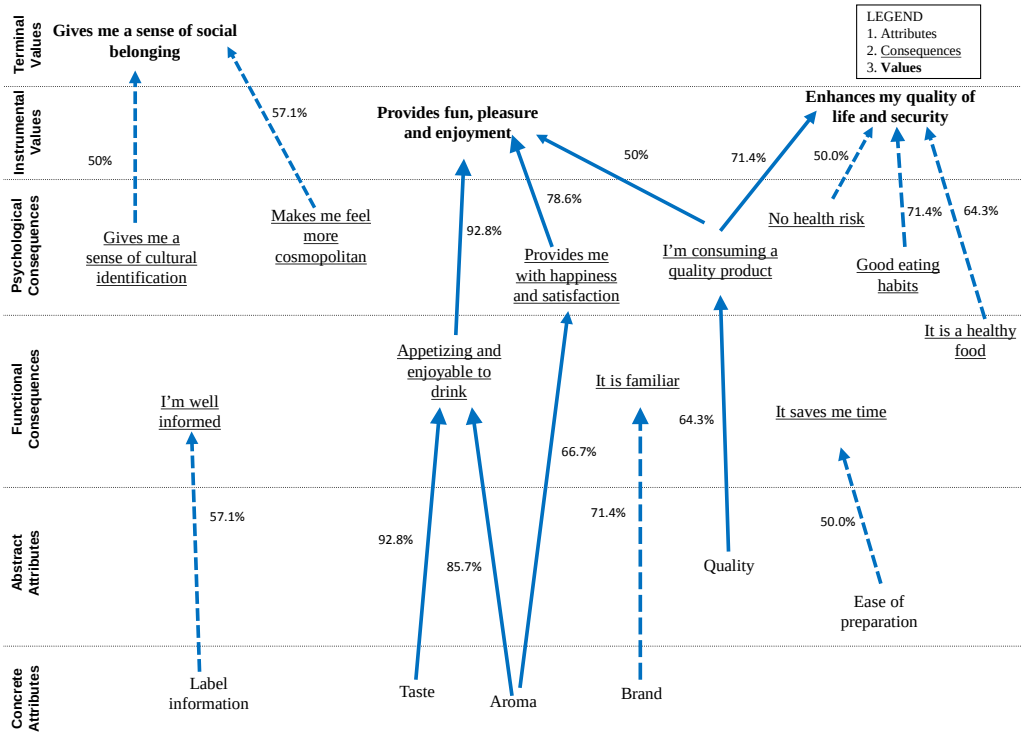

Figure 6. Level 6 Hierarchical Value Map for the Adult Group and Coffee Capsules (Regular consumption).

Degree of Abstraction Comparison

Results seem to suggest variations in the respondents' cognitive structure as a function of exposure to innovations and according to their age. Table 6 summarizes the complete ladders formed by each group in terms of the attributes, consequences and values involved. In general, the innovative product shows a higher degree of abstraction and more complex maps. Besides, this complexity becomes more patent with the young segment. Assuming that the degree of abstraction increases as the cognitive structure is more heavily dominated by abstract attributes, psychological consequences and terminal values than by concrete attributes, functional consequences and instrumental values, this higher degree of abstraction indicates that young consumers include more personal associations in the purchase process than adult consumers.

Table 6. Complete Ladders for Each Group and Product Analyzed.

			Coffee		Coffee Capsules	
Attributes	**Consequences**	**Values**	**Young**	**Adult**	**Young**	**Adults**
Concrete	Functional	Instrumental	3	2	2	2
		Terminal	—	—	—	—
	Psychological	Instrumental	—	—	3	1
		Terminal	—	—	2	—
Abstract	Functional	Instrumental	1	—	2	—
		Terminal	—	—	—	—
	Psychological	Instrumental	1	—	1	1
		Terminal	—	—	—	—

Conclusions

In recent years, market globalization and higher levels of competition have placed the food industry under ever greater pressure. Added to this, consumers are becoming more and more demanding and are more aware of what to look for in food products: quality, food safety, healthier products, etc. This reality has forced producers and processors to develop new products to meet these new demands in order to achieve a competitive market position. Despite the efforts on the part of the agro-food industry, the failure rate for novel food products is very high. This is due to various reasons, but it is mainly connected to a lack of understanding of consumers. In societies where nutritional needs are covered, the success of a given product in the market is related to acquiring knowledge about consumers, finding out what they look for in a product and what personality traits they project through the food products they purchase and consume. Consumers tend to put up barriers to novel products when they fail to find clear benefits in them or when they do no match their self-image.

Traditionally, consumer behavior oriented research on innovations has focused on demographic traits associated with willingness to adopt novel products. One of the variables generally considered is consumers' age, given that studies show that young consumers tend to be the more innovative ones. Our study attempted to analyze decision structures in consumers within different age ranges in relation to novel food products in order to determine potential differences. This knowledge will help identify the key elements for each age range to try and improve novel food adoption rates. These issues were explored in an application based on means-end chain theory, enabling us to map attribute-consequence-value linkages obtained through laddering

interviews with two consumer segments (young and adult consumers) and two products, traditional coffee (control product) and coffee capsules (food innovation).

The results show in the first place that young consumers have higher food innovation consumption levels, which is consistent with the results in most of the literature, which show that young consumers rank higher when it comes to adopting novel products.

Moreover, the hierarchical value maps allow us to conclude that consumers' cognitive structures are similar regardless of age when they are presented with a traditional product. However, this structure becomes more complex when they are presented with a novel food product in both age ranges. In other words, the decision structure related to novel food products projects a higher number of aspects connected to consumers' personalities through the products' attributes. Likewise, when adult and young consumers' decision structures for novel food products are compared, we find that complexity is much more patent for young consumers. In brief, young consumers of the novel product analyzed perceive more benefits in the novel food through its attributes and that said attributes reflect to a greater extent their personality.

Regardless of age, consumers adopt the novel product for hedonic reasons (taste, aroma and pleasure), due to ease of use (a key aspect for the market success of this product) and also because it makes them feel more trendy (more cosmopolitan) and gives them certain social status. Product search and experience attributes such as label information, brand, taste and ease of use are key factors. However, product belief attributes such as product quality are also noteworthy. This indicates that choice is not completely based on tangible product aspects; intangible or belief elements also play a role, which become more relevant when consumers are faced with the novel food product. The results in the study provide knowledge on the tangible and intangible elements which define the choice structures of the different consumer groups, which is knowledge of the consumer that goes beyond sociodemographic characteristics. And this knowledge facilitates the design of promotion strategies, which can be based on the links between product attributes and the values mentioned by consumers. Furthermore, the age of consumers is determinant in terms of certain benefits pursued in the novel food product analyzed; young consumers look for success through caffeine content, which allows them to improve their concentration while adult consumers aim at relaxation and rest. Finally, a further differentiating element is that young consumers attribute more importance to the products' image and packaging, brand and price, all of them perceived as quality and social status symbols. These factors are worth taking into consideration when it comes to designing marketing strategies aimed at boosting consumption among consumers of different ages.

Finally, we should mention some limitations of this study. In the first place, the sample used has representativeness problems in relation to the education level of interviewees (higher than that of the population of Navarra) and to the impossibility of interviewing people over 65 years of age. Second, it would have been interesting to introduce more variables in the preferences analysis, such as psychometric variables, which have not been taken into account in this study. Third, the study is focused on one product and we were unable to generalize the findings to other novel foods or the food market in general. A further limitation is that the level of involvement with the product is likely to be different according to different age groups and therefore behavior in relation to the product may vary. It would be therefore useful to corroborate the results by extending the scope of the research to other geographical areas, other food innovations or larger consumer samples.

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