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Post Hoc Tourist Segmentation with Conjoint and Cluster Analysis

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Abstract: In the present work, the authors want to illustrate the advantages of the combined use of the Conjoint Analysis and the Cluster Analysis in market segmentation. The benefits are easily understandable since the Conjoint Analysis allows researchers to know the structure of the consumer's preferences and the Cluster Analysis allows grouping those consumers by their preferences. So, with the enormous diversification that characterizes tourism, it doesn't make sense segmenting market with *a priori* procedures. It's preferable to carry out a *post hoc* segmentation in order to know more detailed and relevant information like tourists preferences (estimated with the Conjoint Analysis). This procedure creates a competitive advantage. Hence, segmenting markets based on the preferences of consumers allows researchers and professionals to better evaluate which the real preferences are (by clusters) and to better develop marketing strategies that better suit the consumers' preferences.

Key Words: Market Segmentation; Conjoint Analysis; Clusters Analysis; Tourist Preferences.

Resumen: En el presente trabajo los autores pretenden ilustrar las ventajas del uso combinado del Análisis Conjunto y del Análisis de Conglomerados, en la segmentación del mercado turístico. Los beneficios son fácilmente entendidos, una vez que el Análisis Conjunto permite a los investigadores conocer la estructura de las preferencias de los consumidores y el Análisis de Conglomerados los agrupa en segmentos, a partir de las preferencias de éstos. Habida cuenta de la enorme complejidad y diversificación que está adquiriendo el mercado turístico en nuestros días, carece de sentido adoptar estrategias de segmentación *a priori*, basadas únicamente en variables clásicas de corte sociodemográfico, cuya capacidad explicativa ha demostrado ser muy limitada. En su lugar, optar por procedimientos de segmentación *post hoc*, donde se incluya información más elaborada, como pueden ser las preferencias de los consumidores turistas (estimadas a partir de procedimientos estadísticos avanzados como el Análisis Conjunto), se convierte en una ventaja competitiva. La segmentación basada en las preferencias permite a investigadores y gestores disponer de un conocimiento más preciso del mercado y desarrollar estrategias de Marketing adecuadas a cada uno de los segmentos de interés.

Palabras Clave: Segmentación de mercados, Análisis conjunto, Análisis de conglomerados, Preferencias de los turistas.

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Introduction

Effectively, tourism is one of the most important sectors of the international economy. The UNWTO's *Tourism 2020 Vision* forecasts that international arrivals are expected to reach nearly 1.6 billion by the year 2020. Of these worldwide arrivals in 2020, 1.2 billion will be intraregional and 378 million will be long-haul travellers. The total tourist arrivals by region shows that by 2020 the top three receiving regions will be Europe (717 million tourists), East Asia and the Pacific (397 million) and the Americas (282 million), followed by Africa, the Middle East and South Asia (table 1).

	Base Year	Forecasts		Market Share (%)		Average Annual Growth Rate (%)
	1995	2010	2020			
	(Million)			1995	2020	1995-2020
World	565	1006	1561	100	100	4.1
Africa	20	47	77	3.6	5.0	5.5
Americas	110	190	282	19.3	18.1	3.8
East Asia and the Pacific	81	195	397	14.4	25.4	6.5
Europe	336	527	717	59.8	45.9	3.1
Middle East	14	36	69	2.2	4.4	6.7
South Asia	4	11	19	0.7	1.2	6.2

Table 1. Tourist arrivals, market share and average growth rate

However, since mid-2008 we assisted to a rapid slowdown of international tourism growth (for the reason that oil's price has increased a lot).

So, this is a very important point that countries and the private sector related with tourism activity must be aware of and they must take initiatives to be stronger to face new difficult times that are coming, ("one of the biggest crisis").

In this context, Portugal is one of the top 20 international countries in terms of tourist arrivals (concretely about 11.5 millions). Tourism is a vital sector of the Portuguese economy, representing about 11% of national GDP and 10% of the national employment. This way, all efforts must be done to maximize the profitability of the resources and the investments made.

A very important point is that about 80% of Europeans live in urban areas and they want to come back to the "field life" as a form of recreation and leisure occupation. So, if we think that the Iberian Peninsula has 80% of the biodiversity of the European Union, Portugal (with particularity Northern of Portugal) should seriously focus on this eco-tourism. Therefore, all the investments made from the national government and from the private investments should be strategically done to safeguard the quality and the diversity of the biological life in these regions, in order to capture the maximum of tourists (incomes) as possible (INE, 2008).

In regions like the Interior of Portugal, where the economy doesn't reach the most desired levels, the tourist activity has increased but not in a satisfactory way. Thus, each tourism product that is strategically oriented represents a crucial factor to achieve a sustainable economic growth for those regions. This way, attributes like the quality of the environment can be improved. The Ecotourism represents more than 10% of the market and it's currently the sector of the Portuguese tourism that must increases.

In fact, it's not illusory the enormous importance that tourism has on the social and economic prosperity of a country, concretely in the case of Portugal. Factors such as the creation of jobs, directly and indirectly (in hotels, restaurants, etc.) have a direct and a significant impact on the GDP and on the brand image of a country, at a national and international level. In the context of an increasing globalization and international competition, tourism is a paramount sector and it's a strategic sector of growth for a country (certainly is in the case of Portugal).

Therefore, it's very important to develop this sector and all the researches should be conducted with consistent methods and consistent goals, to carry out an ambitious plan in Portugal and in the others strategic countries for the Portuguese tourism. As a result, Portugal should take advantage of its tourism potential strategically, to

maximize the profitability.

In this context, Portugal must fallow the marketing strategies of Spain and France (international leaders in terms of tourism revenues). Such countries have one common factor: they guide themselves by a strong marketing approach in the management of their tourism resources. And the recent history confirms that those countries (France and Spain) are the most competitive in the world. This phenomenon can be explained by several factors, such as: a) a huge professionalization of all sectors related with tourism; b) the marketing and the sales of this sector (travel agents) are carefully structured; c) the strategy of management is very well coordinated because: i) the promotion is very weighted; ii) the offer is adjusted to the consumers' needs and preferences; iii) and a structured strategy for the consumers' loyalty through marketing campaigns (e.g.: in strategic locations - fairs).

Based on the assumption that all processes that are part of Tourism Marketing (described above) have in their essence to meet the needs and the preferences of tourists, it's essential to know which the structures of the tourist preferences are. This allows segmenting market into clusters that share homogenous preferences.

Santesmases (1999, p.214) states that segmenting markets is the "process of dividing the market into homogeneous groups in order to carry out a marketing strategy to each one, allowing to satisfy more effectively their needs and to achieve the commercial objectives of the company. "

According to the same author (Santesmases, 1999), segmenting markets presents several advantages, such as finding markets that are not saturated, i.e., where there are still business opportunities; it allows to set priorities; it facilitates the analysis of competition, providing information about who are the direct competitors and allows companies to offer products/services that best suit specific needs of each segment.

Nowadays, market researchers analyse products and services as a set of characteristics or attributes and these products tend to be configured according to the consumers' needs and preferences. So, it's important to know which the assessment of those attributes is and to know in which way each attribute and level of attribute contribute to elect a certain product. Therefore, Conjoint Analysis is very useful to analyze the consumers' preferences (Wittink & Cattin, 1989; Wittink, Vriens & Burhenne, 1994).

As it's currently known, it's not possible to please everyone's needs, so it's inevitable segmenting markets. Hence, business organizations need to group consumers into segments, to satisfy their needs and to increase their level of satisfaction. Therefore, the better is the segmentation the better will be the adjustment of the products to the consumers' preferences.

Until today, there are just a few empirical researches in tourism with real methodological basis. Spain, and more specifically Galicia, has been consolidating in recent years a strong marketing approach for the management of tourism resources, being a good example to follow by other countries.

In this context, Conjoint Analysis is a methodology that has its origins in the Psychology and in Marketing. The works of Luce and Tukey (1964) are the first references and, later, Wilkie & Pessemier (1973) started to talk about multi-attribute models, as a way to analyze and understand the preferences of the consumers (Varela & Braña, 1996; Picón & Varela, 2000; Braña, Rial & Varela, 2001; Picón, Braña & Varela, 2002; Picón, Varela & Braña, 2006; Ramírez, 2008).

Like this, the multi-attribute models explain the way that consumers former their preferences (for products or services). So, preferences are created by the consumers' perception and the main goal of the Conjoint Analysis is to estimate the value of each characteristic or levels of attribute that defines a product. With these values, it's possible to know which the characteristics of the consumers' behaviours are. And the compensatory models (Fishbein & Ajzen, 1975) are linked to the multi-attribute models and the various levels of attributes can compensate each other. It's

possible to find very different products with very similar global utilities or preference because the different levels of attribute of a product act together in the consumers' mind and perception.

A classic segmentation (*a priori* segmentation) groups consumers that share the same socio-demographic characteristics (age, gender, etc). But, in reality, it doesn't group the consumers by the similarity of their preferences. It's almost about describing the consumers by their socio-demographic profile.

But a *post segmentation* that combines Conjoint Analysis and Cluster Analysis brings important benefits (Picón, 2000). More specifically, Conjoint Analysis allows professionals to know the structure of the consumers' preferences and, therefore, it's possible to group those consumers into segments by their similarity of preferences (Picón, 2004; Picón & Varela, 2004; Varela, Picón & Braña, 2004).

This way, it would be possible to proceed to an integral segmentation, i.e., a segmentation based on the consumers' preferences information and on their socio-demographic profile. To each group resultant it will be associated a different kind of destination (preference).

Traditionally, there are two basic ways of segmenting markets (Green, Carroll & Carmone, 1977; Wind, 1978): a) *a priori* Segmentation: in this kind of segmentation, the number of segments (groups) as well as its description is established before the study is carried out. The professionals choose from the beginning some basis to start the study, for example, the use of a product, the main benefit searched, needs, loyalty to a brand, etc, and then, they (professionals) assign consumers into groups; b) a *post hoc* segmentation: when the consumers' characteristics or their reactions to a new product are not known, it's better to realize a *post hoc* segmentation. This way, the number of groups, the number of subjects in each cluster and its description are known just after the analysis is made. The resultant groups are constituted by consumers with more homogeneity between their preferences and there is more heterogeneity in the preferences of the groups than in *a priori* segmentation.

Objectives

The major objective of the current article is to illustrate the importance and the benefits of the combined application of the Conjoint Analysis and the Cluster Analysis. This allows professionals to identify groups of tourists with particular needs and preferences. This way, a segmentation based on the consumers' preferences allows researchers and professionals to know more precisely the market and to develop Marketing strategies more appropriate to each group.

Methodology

A total of 300 young (96 males and 204 females) were interviewed, with ages from 18 to 35 years old (mean = 23.53; standard deviation = 4.595), residents in the Oporto city. It was explained to all the subjects that the task should be made with the utmost concentration and seriousness.

Attributes and levels' Selection

ATTRIBUTES	LEVELS
Weather	Sun Cold or Snow Rain
Cultural Offer	High Low
Kind of Destination	Beach Nature or Mountain City
Leisure Offer and Night Fun	High Low
Price	Until 300€ 300€ - 600€ 600€ - 1000€ > 1000€
Time of Permanency	2-3 Days (Weekend) 1 Week 2 Weeks

Table 2. Attributes and attributes' levels used

The present work is part of a larger study (the main aim was to know the tourist preferences of young people from Northern Portugal). The attributes and levels of attribute selected were based on two elements: a) the existent bibliography

(Goodrich, 1978; Muller, 1995; Baloglu & McCleary, 1999; Gallarza, Gil & Calderón, 2002; Picón & Varela, 2000; Varela, Picón & Braña, 2004; Rodríguez & Molina, 2007; Rial, Varela & García, 2008); b) and it was made a previous pilot study with a sample of 100 students to know which the most important attributes were. The elected attributes were: Weather, Cultural Offer, Kind of Destination, Leisure Offer and Night Fun, Price and Time of Permanency.

Stimuli

To achieve the Conjoint Analysis we selected this six attributes of tourism destination, with different levels for each (3x4x2x2x4x3). From the 576 possible combinations, we used an orthogonal fractional factorial design, being selected 16 of them, which were eventually used in the data collection (with an *Orthoplan* procedure of the SPSS software). We built 16 cards, each one representing one of the sixteen combinations of the levels of attribute.

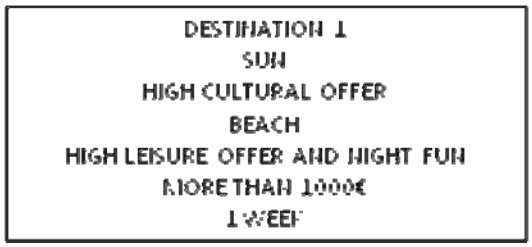

Figure 1. An example of a card.

Procedure

It was asked to the subjects that in the first minutes they should analyse every cards and, then, they should sort those cards based on their preferences. This procedure is called *Full Profile*, with *Simulated Stimuli* and sort cards (*Sequence*).

Data Analysis

Data was collected from 300 subjects (300 x 16), and it was analysed with the Conjoint Algorithm and a Clustering Algorithm.

Results

Model fit is very high, so we can conclude that validity of the results is high (Pearson's R=0.999; Kendall tau=0.967).

By the application of the Conjoint Analysis to the entire sample, we can state that the most important attribute is Weather, with 31.5% of importance, followed by the attribute Cultural Offer, with an importance of 22.9%. In third place, in terms of importance, is the attribute Leisure Offer and Night Fun (16.6%); in fourth place comes the attribute Time of Permanency with an importance of 12.59%. In fifth and penultimate place comes the attribute Kind of Destination, with an importance of 15.57%. And in sixth place comes the attribute Price, with an importance of 3.76%. These results can be observed on figure 2.

In terms of part-worths of the levels of attribute, the results show that in the attribute Weather, the preferred level is *Sun* with a part-worth of 1.79; the level Cold or Snow has a part-worth of (-1.017) and the level Tepid or Humid has a part-worth of (-0.78). About the attribute Cultural Offer, it's possible to say that the preferred level is an High Offer with a part-worth of 1.023, and the opposite offer (Low) has a part-worth of (-1.023). In the attribute Kind of Destination, the preferred level is Beach, with a part-worth of 0.634. In the attribute Leisure Offer and Night Fun, the level High Offer presents a part-worth of 0.743. The preferred level of the attribute Price is

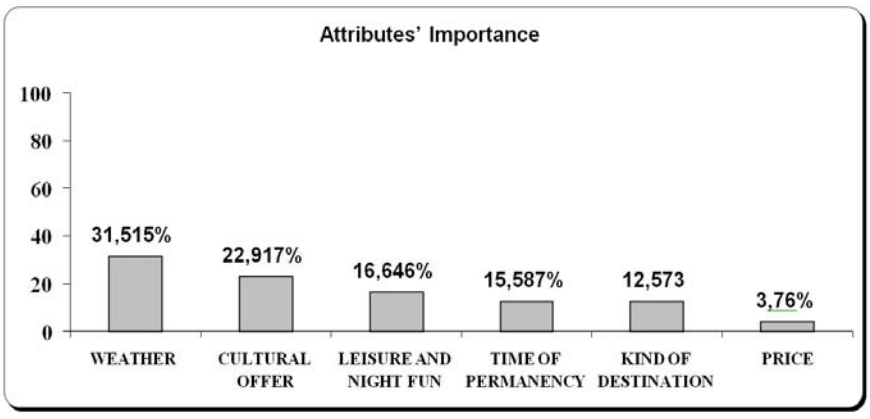

Figure 2. Attributes' Importance

Until 300€ with a part-worth of 0.189. And for the attribute Time of Permanency, the preferred level is 2 Weeks with a part-worth of 0.436. These results can be observed in figure 3.

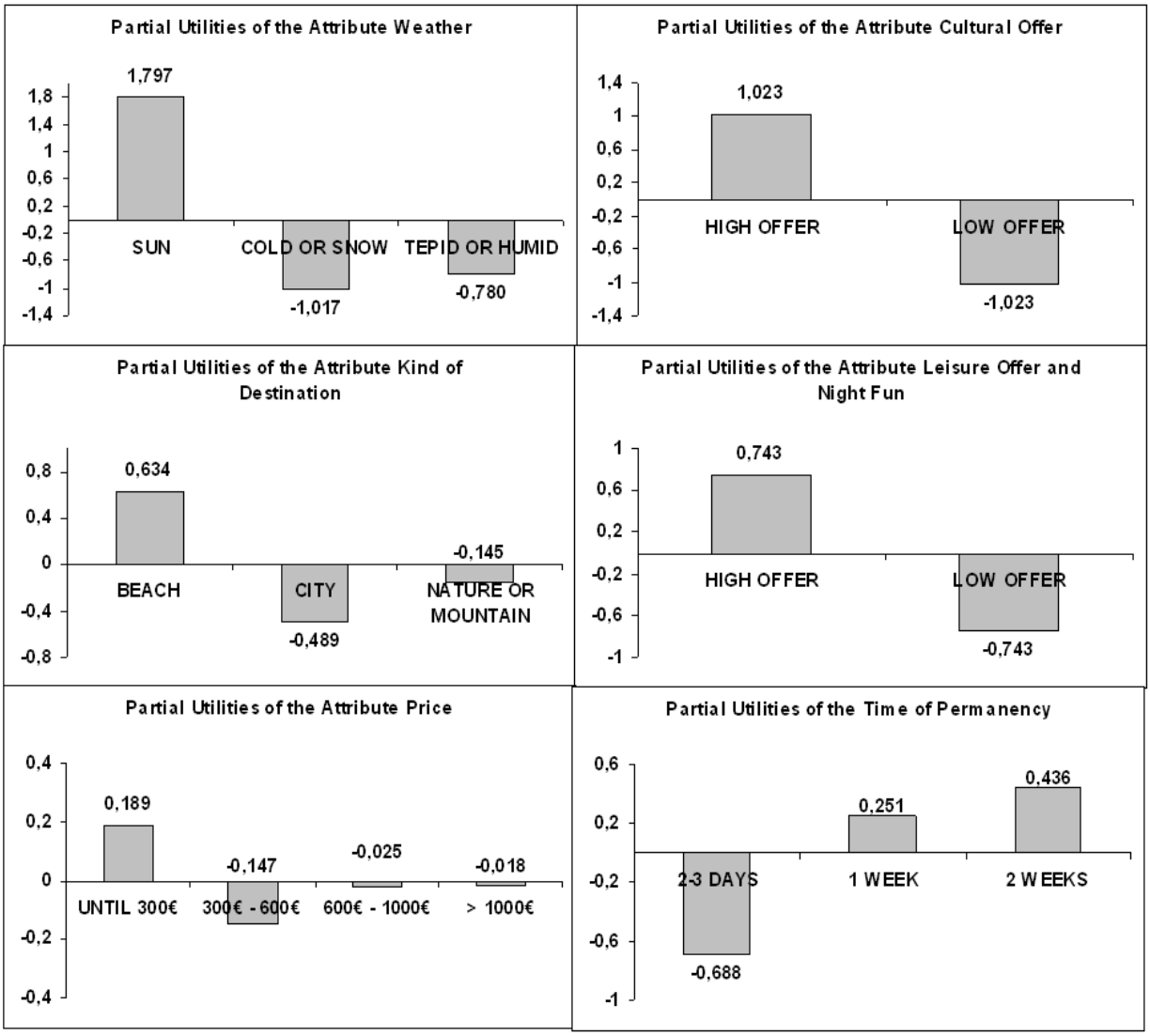

Figure 3. Levels of attributes and correspondent part-worth

Sun
High Cultural Offer
Beach
High Leisure Offer and Night Fun
Until 300€
2 Weeks

Figure 4. Ideal destination (of the entire sample).

Conjoint Analysis allows researchers to know which the ideal destination is. This is made by summing all the part-worths of the preferred levels and the value of the *constant*. And this ideal destination would be:

So, if we sum all part-worths and the value of the constant, we have:

1.797 + 1.023 + 0.634 + 0.743 + 0.184 + 0.436 + 8.064 = 12.881

So, the global importance of this ideal destination would be 12.881.

So, some advantages of using the Conjoint Analysis were illustrated. But, the real advantage of those results is that they can be used by the Cluster Analysis (as input). It allows researchers segmenting markets based on the similarity of the structure of preferences (of tourists). Subsequently, using both methodologies we obtained five clusters (figure 5).

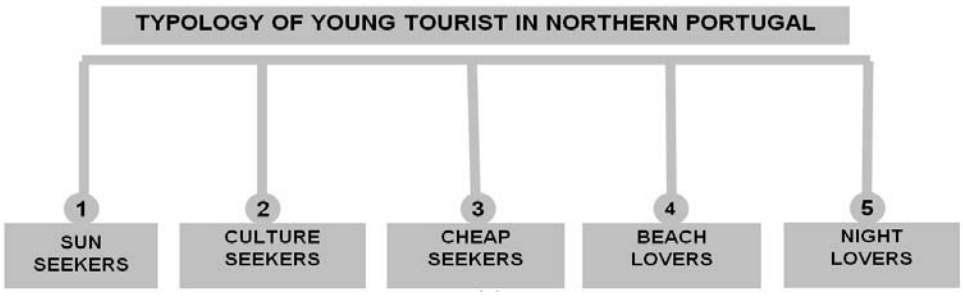

Figure 5. Typology of young tourist in orthern Portugal with clusters.

Group 1: Sun Seekers (24%)

This group is characterised by an preference for Weather with an importance of 58.1%, being the favourite level *Sun* with a utility (u) of 4.58;

Group 2: Culture Seekers (24%)

This one is characterised by a large preference for Culture Offer with an importance of 56.04%, being the preferred level *High cultural offer* (u = 2.94);

Group 3: Cheap Seekers (13%)

They are a group that gives huge importance to the Price paid by a tourist travel; the importance of the attribute *Price* is 52.32%, being the preferred price *Until 300€* (u = 1.91);

Cluster 4: Beach Lovers (16%)

These subjects are characterised by a large preference for Kind of Destination with an importance of 45.87%, being the favourite level *Beach* (u = 1.90);

Cluster 5: Night Lovers (22%)

These ones are characterised by a large preference for Night Fun with an importance of 28.92% and for a long time on holidays with an importance of 29.09%.

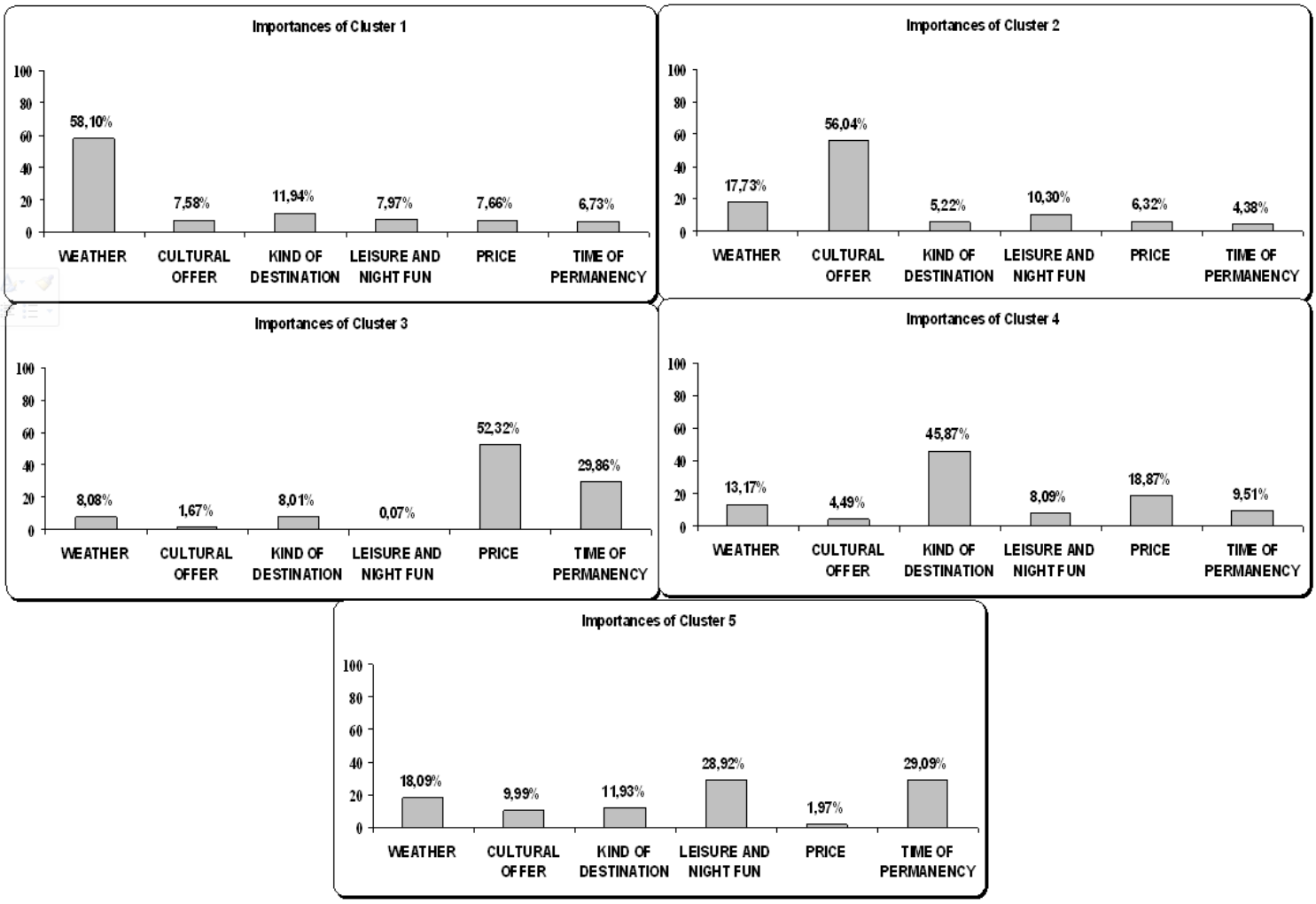

Figure 6. Attributes' importance by clusters

So, knowing the real preferences of each cluster, it's possible, for example, to design or promote destinations that suit the particular preferences of each cluster. For instance, to Group 1 (*Sun Seekers*) it would be appropriate to promote a tourist destination where the Weather is very often *Sunny;* to Group 5 (*Night Lovers)* it would be more appropriated to promote a tourist destination mentioning that it has many pubs, discotheques and bars, i.e., the night life offer would be very complete.

Through these results (table 3), it's possible to state that all the part-worths of the levels of attribute are very different in every cluster. That is, the subjects have been assigned into clusters, presenting part-worths significantly different between them. These results allow validating the advantages of the current application of the Cluster Analysis since what differentiates the subjects of those five clusters is their preferences and not their socio-demographic characteristics. This is one of the reasons why it's advisable to carry out a *post hoc* segmentation based on the consumers' preferences (Picón & Varela, 2000).

Through table 4, it's possible to state that clusters present a socio-demographic very similar composition, except for gender. This way, the preferences of young tourist of Northern Portugal can't be explained based simply on socio-demographic characteristics because there isn't a concrete socio-demographic profile. Subjects have been assigned into clusters not because of sharing socio-demographic characteristics, but because they share tourism preferences.

	Cluster		Error		F	Sig.
	Quadratic Mean	df	Quadratic Mean	df	Quadratic Mean	df
SUN	189,378	4	1,582	295	119,725	,000
COLD-SNOW	65,804	4	2,935	295	22,418	,000
TEPID-HÚMID	52,365	4	2,843	295	18,419	,000
HIGH CULTURAL OFFER	91,381	4	,972	295	94,011	,000
LOW CULTURAL OFFER	91,381	4	,972	295	94,011	,000
BEACH	38,743	4	1,849	295	20,958	,000
CITY	103,842	4	1,836	295	56,558	,000
NATURE-MOUNTAIN	37,299	4	2,168	295	17,205	,000
HIGH LEISURE OFFER AND NIGHT OFFER	30,396	4	1,139	295	26,684	,000
LOW LEISURE OFFER AND NIGHT OFFER	30,396	4	1,139	295	26,684	,000
UNTIL 300€	35,531	4	2,516	295	14,124	,000
BETWEEN 300€ AND 600€	33,705	4	2,024	295	16,652	,000
BETWEEN 600€ AND 1000€	6,349	4	2,595	295	2,446	,047
MORE THAN 1000€	87,454	4	2,468	295	35,436	,000
2-3 DAYS (WEEKEND)	38,084	4	1,948	295	19,551	,000
ONE WEEK	20,344	4	1,638	295	12,421	,000
TWO WEEKS	60,221	4	2,004	295	30,051	,000

Table 3. ANOVA with the levels of attributes by clusters

		Clusters
Gender	Chi-square	13,234
	df	4
	Sig.	,010
Occupation	Chi-square	1,487
	df	4
	Sig.	,829
Incomings	Chi-square	14,769
	df	20
	Sig.	,789
Civil status	Chi-square	5,331
	df	8
	Sig.	,722
Age	Chi-square	10,542
	df	8
	Sig.	,229

Table 4. Pearson's Chi-square values

Conclusions

Tourism is a key sector of growth in some countries (such is the case of Portugal). It has an enormous weight on the Gross Domestic Product (about 10%) and it generates about 10% of the national employment. In the current and competitive environment, managing tourism resources of a country under a marketing approach is very important and it's a key to success. Factors like the enormous competitiveness and dynamism of the tourism sector, the appearance of new destinations, the enormous globalization and the international crisis affect negatively the most part of tourist destinations. So, new adjustments must be realized in order to remain competitive. This way, it's necessary to invest in a "Research and Development" strategy as it's invested in quality of hotels and restaurants and in national and international fairs. To invest in Market Research is very important and it becomes by itself a sustainable platform for tourism.

In this context, professionals must be aware of the outset of the consumers' preferences, needs, habits and lifestyles that are more and more heterogeneous, which generates a tremendous diversification of supply. As such, focusing on methodologies that allow optimizing the management of tourism resources is an added value.

USA, Spain and France are the most competitive countries in the world and they share a competitive advantage when it comes to analyzing the preferences of tourists: the use of Conjoint Analysis to know the real structure of preferences of tourists (Varela, Rial & García. 2003). In this way, they can design new strategies that better suit tourists' preferences. This worldwide competitiveness led to a tremendous diversification of the supply of products and services, that's because it's so important to know the consumers' preferences.

So, from a methodological point of view the present article illustrates the enormous potential that the combined use of the Conjoint Analysis and the Cluster Analysis has in the management of tourism resources. It shows that the preferences in this sector are more complex than it might be expected. More precisely, it has been possible to identify up to five different segments (in a seemingly homogeneous population such as the young residents in Northern Portugal), each segment with a peculiar structure of preferences. The characterization of each group can bring more guide lines to market researchers in the case of the *post hoc* segmentation than in the case of an *a priori* segmentation. So, being able to know accurately the preferences of tourists, segmenting market properly allows marketing researchers to identify heterogeneous groups and develop products that suit the preferences of each group (Picón, Varela & Lévy, 2004). This is an essential strategy for the tourism management.

Finally, it would be interesting to have a more representative sample in order to know more precisely which the tourist's preferences are. And it would be interesting to carry out a Brand Image Analysis and Positioning. This way, it would be possible to know which attributes/characteristics are related with the tourist destinations of Portugal and to know which marketing strategies should be created to suit the diversity of the national and international tourists' preferences.

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