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EVALUATION OF HOTEL QUALITY ATTRIBUTE IMPORTANCE THROUGH FUZZY CORRELATION COEFFICIENT

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Abstract. An indirect method of calculation of the importance of attributes as the fuzzy correlation between the performance of attributes and the overall satisfaction was proposed in a recent paper. We apply the method to the results of a survey with respect to the quality of hotel services in Oradea (Romania). Different representations of the answers as triangular fuzzy numbers, as well as distinct analyzes to compare the hierarchies of the attributes with respect to the experience with the hotel and the motivation of the travel are considered.

Keywords: triangular fuzzy number, correlation coefficient, importance of attributes, performance of attributes, hotel services, hierarchy of attributes.

JEL Classification: Z33, C02, C44.

Introduction

Since the human thinking is subjective and ambiguous, the fuzzy numbers are often preferred instead to crisp numbers for modeling in decision making, engineering, science, economy, social sciences and other areas (see e.g. Ban 2011; Ban, A. I., Ban, O. I. 2012; Ban *et al.* 2015a; Chien, Tsai 2000; Chu, Lin 2009; Deng 2008; Stanojević *et al.* 2015; Wei 2011; Wei *et al.* 2012, 2013; Wu *et al.* 2004; Yeh, Kuo 2003; Zhao *et al.* 2013). A very good example is the Likert scale, used throughout surveys that are applied. The responses are usually transformed according to the binary logic and the differences between the successive categories are equal even if initially they are not crisp. For example, the set of possible answers {"strongly disagree", "disagree", "fair", "agree", "strongly agree"} is transformed into

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5-point Likert scale {1; 2; 3; 4; 5} even if in this way a quantity of information is lost. That is why it would be more appropriate a modeling of the answers by fuzzy numbers.

The determination of the importance of attributes, as an essential step in many methods related with the decision theory, can be made by direct or indirect methods. Indirect methods were elaborated (see, e.g., Ban *et al.* 2015a; Deng 2007; Feng *et al.* 2014; Hair *et al.* 1995; Hancock, Klockars 1991; Matzler *et al.* 2003; Mount, Sciarini 1999; Mount 2005) due to the fact that direct methods have significant disadvantages (see, e.g., Abalo *et al.* 2007; Bacon 2003; Deng, Pei 2009). The input data are often considered as fuzzy numbers such that new methods were proposed. As examples, in Ban *et al.* (2015a) and Ban *et al.* (2015b) methods of calculation based on the fuzzy correlation coefficient between the performance of attributes and the overall customer satisfaction were given.

In this paper we apply the method proposed in Ban *et al.* (2015b) to calculate the importance of attributes in the cases of four 4-star hotels in Oradea, with over 50 rooms and located in high traffic areas. In June 2012, 125 questionnaires were applied to the guests (Romanian and foreign) of these hotels, for measuring the degree of satisfaction regarding the services received, the evaluation of service quality in terms of performance in order to achieve a classification of quality attributes according to the model proposed by Kano (see Ban, Meșter 2014). The data collection instrument was the questionnaire with Likert scale questions to assess the performance of hotel services from the perspective of 21 attributes and to measure the global satisfaction. The results obtained were represented as triangular fuzzy numbers, to shape the subjectivity and ambiguity of human thought. The importance of the attributes was calculated by correlating the overall satisfaction with the perceived performance of each attribute in part, represented by triangular fuzzy numbers, the proposed method being that recently proposed in Ban *et al.* (2015b).

Our main aim is to evaluate the impact of research variables on the hierarchy of attributes by importance. Based on the recent literature, the following hypotheses are considered in our study:

H1: Due to the small inter-item variation of responses (all respondents give positive values) any drastic penalization of responses which do not represent the maximum on the linguistic scale lead to significant changes in the hierarchy of the importance of attributes.

H2: Previous visits and knowledge about the destination play an important role in influencing individual perceptions.

H3: The radical different reasons (e.g. business and leisure) assume different expectations and therefore involve different hierarchies of attributes.

1. Fuzzy numbers and operations

We recall that (see Zadeh 1965) a fuzzy set A (fuzzy subset of X is defined as a mapping $A{:}X \to [0,1]$, where $A(x)$ is the membership degree of x to the fuzzy set A.

The fuzzy numbers generalize the real numbers and they are fuzzy subsets of the real line with some additional properties (see, e.g., Diamond, Kloeden (1994) or Dubois, Prade

(1978)). In practice fuzzy numbers with simple membership functions are preferred. A triangular fuzzy number (see, e.g., Hong 2006) $\Delta = (a, \alpha, \beta)$ is defined by the membership function:

$$D(x) = \begin{cases} 1 - \frac{a}{\alpha} + \frac{1}{\alpha}x, \ \textit{if}\ a - \alpha \le x \le a, \\ 1 + \frac{a}{\beta} - \frac{1}{\beta}x, \ \textit{if}\ a \le x \le a + \beta, \\ 0, \qquad \text{otherwise.} \end{cases}$$

The expected value of a fuzzy number, *EV*, was introduced in Chanas (2001) and Dubois, Prade (1987). For a triangular fuzzy number $\Delta = (a, \alpha, \beta)$ the general formula becomes:

$$EV(\Delta) = a + \frac{\beta - \alpha}{4}.$$

In Ban, Coroianu (2015) it was proved that the expected value is a simple and effective ranking index on fuzzy numbers, therefore on triangular fuzzy numbers too. Namely, for two triangular fuzzy numbers Δ and Δ' we define:

$$\Delta \prec \Delta' \text{ if and only if } EV(\Delta) < EV(\Delta'), \tag{1}$$

$$\Delta \sim \Delta' \text{ if and only if } EV(\Delta) = EV(\Delta'), \tag{2}$$

$$\Delta \preceq \Delta' \text{ if and only if } EV(\Delta) \le EV(\Delta'). \tag{3}$$

It is well-known that the Zadeh extension principle based on a triangular norm extends an arithmetical operation on reals to an arithmetical operation on fuzzy numbers (see Hong 2006; Zadeh 1978). If we choose the weakest triangular norm then the operations have some advantages: the calculation is drastically simplified, the fuzziness of the output data is small, the addition and multiplication preserve the shape of fuzzy numbers, in particular of triangular fuzzy numbers, etc. (Hong 2001, 2002).

Below we summarize the arithmetic operations on triangular fuzzy numbers, based on the weakest triangular norm.

Let $\Delta = (a, \alpha, \beta)$ and $\Delta' = (b, \gamma, \delta)$ be two triangular fuzzy numbers and $\lambda \in \mathbb{R}, \lambda > 0$ we have (see Hong 2006, 2001):

$$(a,\alpha,\beta) + (b,\gamma,\delta) = (a+b, \max(\alpha,\gamma), \max(\beta,\delta)), \tag{4}$$

$$(a,\alpha,\beta) - (b,\gamma,\delta) = (a-b, \max(\alpha,\delta), \max(\beta,\gamma)), \tag{5}$$

$$\lambda \cdot (a,\alpha,\beta) = (\lambda a, \alpha, \beta), \tag{6}$$

$$(a,\alpha,\beta)\cdot(b,\gamma,\delta) = \begin{cases} (ab, \max(\alpha b, \gamma a), \max(\beta b, \delta a)), & \text{if } a,b \ge 0, \\ (ab, -\max(\alpha b, \gamma a), -\max(\beta b, \delta a)), & \text{if } a,b \le 0, \\ (ab, \max(\alpha b, -\delta a), \max(\beta b, -\gamma a)), & \text{if } a \le 0, b \ge 0, \\ (ab, \max(\gamma a, -\beta b), \max(\delta a, -\alpha b)), & \text{if } a \ge 0, b \le 0. \end{cases} \tag{7}$$

$$\sqrt{(a,\alpha,\beta)} = \left(\sqrt{a}, \frac{\alpha}{\sqrt{a}}, \frac{\beta}{\sqrt{a}}\right), \text{ for every } a > 0. \tag{8}$$

$$\frac{(a,\alpha,\beta)}{(b,\gamma,\delta)} = \begin{cases} \left(\frac{a}{b}, \max\left(\frac{\alpha}{b}, \frac{a\delta}{b(b+\delta)}\right), \max\left(\frac{\beta}{b}, \frac{a\gamma}{b(b-\gamma)}\right)\right), & \text{if } a>0, b>0, b-\gamma>0, \\ \left(\frac{a}{b}, \max\left(-\frac{\beta}{b}, -\frac{a\gamma}{b(b-\gamma)}\right), \max\left(-\frac{\alpha}{b}, -\frac{a\delta}{b(b+\delta)}\right)\right), & \text{if } a<0, b<0, b+\delta<0, \\ \left(0, \frac{\alpha}{b}, \frac{\beta}{b}\right), & \text{if } a=0, b>0, b-\gamma>0, \\ \left(0, -\frac{\beta}{b}, -\frac{\alpha}{b}\right), & \text{if } a=0, b<0, b+\delta<0, \\ \left(\frac{a}{b}, \max\left(-\frac{\beta}{b}, \frac{a\delta}{b(b+\delta)}\right), \max\left(-\frac{\alpha}{b}, \frac{a\gamma}{b(b-\gamma)}\right)\right), & \text{if } a>0, b<0, b+\delta<0, \\ \left(\frac{a}{b}, \max\left(\frac{\alpha}{b}, -\frac{a\gamma}{b(b-\gamma)}\right), \max\left(\frac{\beta}{b}, -\frac{a\delta}{b(b+\delta)}\right)\right), & \text{if } a<0, b>0, b-\gamma>0. \end{cases} \tag{9}$$

2. Importance of attributes by correlation method under the weakest triangular norm based fuzzy arithmetic

As in Ban *et al.* (2015b), let us consider n attributes of a service, $A_1, \ldots, A_n$, and m customers, consumers of that service, $C_1, \ldots, C_m$. We denote by X_{ij} the performance of the attribute A_j, $j \in \{1, \ldots, n\}$ in the opinion of the customer C_i, $i \in \{1, \ldots, m\}$, by X_i the overall level of satisfaction in the opinion of the customer C_i, $i \in \{1, \ldots, m\}$ and by W_{ij} the importance of the attribute A_j, $j \in \{1, \ldots, n\}$ in the opinion of the customer C_i, $i \in \{1, \ldots, m\}$. The importance of the attribute A_j, denoted by W_j, can be given by a direct method, aggregating the values W_{ij}, $i \in \{1, \ldots, m\}$, $j \in \{1, \ldots, n\}$. For example, if the arithmetic mean is used, then:

$$W_j = \frac{1}{m}\sum_{i=1}^{m} W_{ij}.$$

The method can be extended to the fuzzy case in an obvious way by considering the arithmetical operations in (4) and (6). Nevertheless, this method has significant disadvantages (see, e.g., Abalo *et al.* 2007; Bacon 2003; Deng, Pei 2009).

The correlation coefficient between the performance perceived for each attribute and the overall satisfaction is already accepted as a successful indirect method to determine the importance of the attributes in the crisp case (see Deng 2007; Mount, Sciarini 1999; Mount 2005). Based on the classical definition of the correlation coefficient of two variables (see e.g. Snedecor, Cochran 1967) we obtain that the importance of the attribute A_j, $j \in \{1, \ldots, n\}$, is given as the correlation coefficient between $(X_{1j}, \ldots, X_{mj})$ and $(X_1, \ldots, X_m)$, therefore:

$$W_j = \frac{\sum_{i=1}^{m}\left(X_{ij} - X_j^M\right)\left(X_i - X^M\right)}{\sqrt{\sum_{i=1}^{m}\left(X_{ij} - X_j^M\right)^2 \sum_{i=1}^{m}\left(X_i - X^M\right)^2}},$$

where $X_j^M = \frac{1}{m}\sum_{i=1}^{m} X_{ij}$ and $X^M = \frac{1}{m}\sum_{i=1}^{m} X_i$ The correlation coefficient for two variables expressed by fuzzy numbers was introduced in Liu, Kao (2002). Following the idea in the crisp case we can find the fuzzy importance of attributes as the correlation coefficient between the performance of attributes and the overall satisfaction, all the data being fuzzy numbers (see Ban *et al.* 2015a).

If the fuzzy number $\tilde{X}_{ij}, i \in \{1,\ldots,m\}$, $j \in \{1, \ldots, n\}$, denotes the performance of the attribute A_j, $j \in \{1, \ldots, n\}$, in the opinion of the customer C_i, $i \in \{1, \ldots, m\}$ and the fuzzy number $\tilde{X}_i, i \in \{1,\ldots,m\}$, denotes the overall satisfaction in the opinion of the customer C_i, $i \in \{1, \ldots, m\}$ then we can formally define the fuzzy importance of the attribute A_j, $j \in \{1, \ldots, n\}$, as

$$\widetilde{W}_j = \frac{\sum_{i=1}^{m}\left(\tilde{X}_{ij} - \tilde{X}_j^M\right)\cdot\left(\tilde{X}_i - \tilde{X}^M\right)}{\sqrt{\sum_{i=1}^{m}\left(\tilde{X}_{ij} - \tilde{X}_j^M\right)^2 \sum_{i=1}^{m}\left(\tilde{X}_i - \tilde{X}^M\right)^2}}, \quad (10)$$

where:

$$\tilde{X}_j^M = \frac{1}{m}\sum_{i=1}^{m} \tilde{X}_{ij} \quad (11)$$

and

$$\tilde{X}^M = \frac{1}{m}\sum_{i=1}^{m} \tilde{X}_i. \quad (12)$$

In Ban *et al.* (2015b) $\tilde{X}_{ij}$ and $\tilde{X}_i, i \in \{1,\ldots,m\}$, $j \in \{1, \ldots, n\}$ are considered as triangular fuzzy numbers and the arithmetical operations are given by (4)–(9) such that an analytical result for the fuzzy importance of an attribute is obtained. An algorithm for calculating the importance of the attributes in the triangular fuzzy case was elaborated in Ban *et al.* (2015b) too. Moreover, the fuzzy numbers obtained from (10)–(12) are ordered by the method described in (1)–(3).

3. Study of the hotel services in Oradea

In this section we apply the method already proposed in Ban *et al.* (2015b) and summarized in the previous section to the study of the quality of hotel services. The same survey as in Ban *et al.* (2015a, 2015b) is considered, but the study is more detailed.

Although widely used, the Likert scale has several disadvantages (see Dolnicar 2007; Hancock, Klockars 1991; Preston, Colman 2000; Watson 1992), among these being the concentration of responses only at the top of the scale, thus not making a clear and useful enough distinction among the possible answers. This is why we propose a comparative analysis of the hierarchy of quality attributes according to their importance, in two distinct situations: when using the responses on a classic five-steps symmetrical Likert scale and when using an asymmetrical Likert scale, which penalizes drastically the answers that are not in the positive extremity, to counteract the disadvantages described above and to force the differentiation. The responses are represented by triangular fuzzy numbers and then the method in Ban *et al.* (2015b) is applied to obtain values of the importance of attributes, given also by triangular fuzzy numbers. A real number to represent the importance of each attribute and, therefore, a hierarchy of attributes for both approaches are provided.

On the other hand, there have been distinct analyzes, based also on the methods given in Ban *et al.* (2015b), to compare the hierarchies of the attributes for those who are for the first time at a certain hotel and for those who are not accommodated for the first time at the hotel. Also, based on the same type of approach, we obtained results related to the motivation of the travel, being considered the most important categories: business and pleasure.

During two weeks in June 2012 a number of 125 questionnaires was applied to customers of four 4-stars hotels from Oradea, Romania. For the establishment of the attributes the SERVQUAL scale was considered. The complete list of attributes was included in Table 1.

Table 1. List of attributes

1	The room facilities are appropriate
2	The room is clean enough
3	The hotel has sufficient restaurant facilities
4	The staff has an appropriate and professional look
5	The location of the hotel is suitable
6	The staff provide correct information to guests
7	The staff is able to offer services in a short period of time
8	The staff is able to resolve guests' problems
9	The staff is able to provide information in a short time
10	The availability of staff
11	Clients complaints are resolved quickly
12	Different payment facilities are available
13	The safety of the installations in the hotel
14	Service professionalism
15	Service customization
16	Friendliness of staff
17	Proper opening hours of hotel's facilities
18	The hotel has entertaining facilities
19	Big variety and proper quality of meals
20	Internet connection is available
21	Aesthetics of rooms and of the hotel

We obtained the value of the α-Cronbach coefficient (0:827) as being a satisfactory one (see Ban, Meşter 2014) for the validity of the questionnaire. The performance of attributes and the overall customer satisfaction (OCS) measured on a five Likert scale {*Very poor (VP), Poor (P), Medium (M), Good (G), Very good (VG)*} for all hotels and separately for each hotel are summarized in Table 2.

3.1. Symmetric case versus drastic case

Usually, the distinguishability between *VG* and *G* is the same as between *VP* and *P*, between *G* and *F* is the same as between *P* and *F*, therefore a symmetric case is considered. We can attach the triangular fuzzy numbers to linguistic variables as they are indicated in Table 3.

Table 2. Performance of attributes

		Attribute																					
Hotel		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	29	21	OCS
	VP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P	2	1	1	2	3	2	0	2	2	2	3	2	1	2	1	2	2	4	2	2	0	0
All	M	8	9	10	5	15	11	13	13	13	10	10	13	9	10	16	14	12	13	10	15	10	9
	G	43	33	49	46	49	35	29	41	53	42	46	35	43	48	57	42	49	42	61	39	29	45
	VG	72	82	65	72	58	77	83	69	57	71	66	75	72	65	51	67	62	66	52	69	86	71
	VP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Hotel 1	M	1	1	3	0	1	1	4	3	2	1	4	2	2	1	3	1	1	1	2	5	0	1
	G	7	0	16	7	13	3	5	5	11	6	9	13	10	8	17	2	15	13	25	8	6	6
	VG	31	38	20	32	25	35	30	31	26	32	26	24	27	30	19	36	23	25	12	24	33	32
	VP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel 2	M	0	1	0	0	2	0	0	1	1	1	0	1	0	0	1	1	0	0	1	0	0	1
	G	1	1	3	6	7	2	3	3	4	2	4	2	2	3	6	3	5	3	2	2	1	2
	VG	20	19	18	15	12	19	18	17	16	18	17	18	19	18	14	17	16	18	18	19	20	18
	VP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P	2	1	1	2	3	2	0	2	2	2	3	2	1	2	1	2	2	4	2	0	0	0
Hotel 3	M	7	7	7	5	7	9	8	9	9	8	4	8	6	8	10	9	8	10	5	8	6	4
	G	14	18	11	13	11	12	12	11	15	13	16	6	14	12	15	17	9	9	15	13	14	21
	VG	6	3	10	9	8	6	9	7	3	6	6	13	8	7	3	1	10	6	7	8	9	4
	VP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel 4	M	0	0	0	0	5	1	1	0	1	0	2	2	1	1	2	3	3	2	2	2	4	3
	G	21	14	19	20	18	18	9	22	23	21	17	14	17	25	19	20	20	17	19	16	8	16
	VG	15	22	17	16	13	17	26	14	12	15	17	20	18	10	15	13	13	17	15	18	24	17

On the other hand, to the question on the importance attributed to the quality characteristics, all respondents gave positive values, very high and very close, suggesting that the characteristics have great and almost similar importance. This small inter-item variation is a known problem of direct research (see Bacon 2003; Deng, Pei 2009). We can try to counteract this trend by drastically penalizing any response that does not represent the maximum on the linguistic scale considered. We modify the combination of Table 3 and we suggest the representation by triangular fuzzy numbers of the linguistic variables as in Table 4.

Table 3. Linguistic variables-symmetric case

Performance/OCS	Triangular fuzzy number
Very poor (VP)	(1, 1, 1)
Poor (P)	(3, 2, 1)
Medium (M)	(5, 2, 2)
Good (G)	(7, 1, 2)
Very good (VG)	(9, 1, 1)

Table 4. Linguistic variables-drastic case

OSC/Performance	Triangular fuzzy number
Very poor (VP)	(0, 0, 1)
Poor (P)	(1, 1, 1)
Medium (M)	(2, 1, 1)
Good (G)	(4, 1, 1)
Very good (VG)	(9, 1, 1)

We apply the method described in Section 2 to the data in Table 2 for all hotels and separately for each hotel, in the symmetric case and in the drastic case. We obtain the fuzzy importance of attributes in Tables 5–9. We give the importance of attributes expressed by real numbers after defuzzification with the expected value in the same tables.

Taking into account the real values of the importance of attributes and the ranking defined by (1)–(3) in Table 10 we give the decreasing orders of the importance of attributes for all hotels and separately for each hotel in the symmetric and drastic case.

Table 5. Fuzzy importance and crisp importance of attributes – All hotels

All hotels	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
1	(0.30, 0.05, 0.05)	0.301	(0.27, 0.01, 0.01)	0.270
2	(0.42, 0.05, 0.05)	0.420	(0.43, 0.01, 0.01)	0.433
3	(0.35, 0.03, 0.03)	0.355	(0.31, 0.01, 0.01)	0.309
4	(0.42, 0.03, 0.03)	0.425	(0.32, 0.01, 0.01)	0.315
5	(0.36, 0.02, 0.02)	0.358	(0.29, 0.00, 0.00)	0.287
6	(0.41, 0.03, 0.03)	0.410	(0.39, 0.01, 0.01)	0.387
7	(0.19, 0.03, 0.03)	0.194	(0.20, 0.01, 0.01)	0.203
8	(0.42, 0.03, 0.03)	0.417	(0.38, 0.00, 0.00)	0.376
9	(0.44, 0.04, 0.04)	0.444	(0.44, 0.01, 0.01)	0.442
10	(0.39, 0.03, 0.03)	0.390	(0.33, 0.01, 0.01)	0.330
11	(0.31, 0.04, 0.04)	0.315	(0.34, 0.01, 0.01)	0.342
12	(0.18, 0.03, 0.03)	0.175	(0.16, 0.00, 0.00)	0.158
13	(0.24, 0.03, 0.03)	0.244	(0.25, 0.01, 0.01)	0.245
14	(0.37, 0.03, 0.03)	0.374	(0.37, 0.01, 0.01)	0.370
15	(0.21, 0.03, 0.03)	0.210	(0.21, 0.01, 0.01)	0.215
16	(0.37, 0.03, 0.03)	0.370	(0.40, 0.00, 0.00)	0.402
17	(0.34, 0.03, 0.03)	0.339	(0.33, 0.00, 0.00)	0.333
18	(0.32, 0.04, 0.04)	0.316	(0.31, 0.01, 0.01)	0.311
19	(0.17, 0.04, 0.04)	0.171	(0.15, 0.01, 0.01)	0.151
20	(0.10, 0.04, 0.04)	0.104	(0.16, 0.01, 0.01)	0.161
21	(0.25, 0.03, 0.03)	0.248	(0.25, 0.01, 0.01)	0.255

Comparing the hierarchy of attributes obtained by considering a symmetrical scale with the hierarchy of the attributes resulted by considering a drastic scale, we note the following: of the 21 attributes considered, 8 are positioned the same in the two cases, in the last 8 positions. This may suggest that less important attributes are constant and maintain their position regardless of the constraints applied on the answers. At the other extreme, on the top 5 positions are 4 features that retain their position, suggesting that the highly important considered attributes remain so no matter the constraints applied on responses. We should note however that the attributes considered important which retain their position are less in number (half) than those not important which retain their position. Surprisingly, at the first three hotels the situation is similar as a whole. The exception is Hotel 4 where the ratio is reversed, meaning there are more important considered attributes that retain their position than those considered unimportant which retain their position. The conclusion would be that the scale is not that important as suggested (see Hancock, Klockars 1991).

Table 6. Fuzzy importance and crisp importance of attributes – Hotel 1

Hotel 1	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
1	(–0.21, 0.21, 0.21)	–0.214	(–0.23, 0.04, 0.04)	–0.233
2	(–0.07, 0.34, 0.34)	–0.072	(–0.08, 0.08, 0.08)	–0.075
3	(0.39, 0.13, 0.13)	0.393	(0.29, 0.02, 0.02)	0.292
4	(0.23, 0.12, 0.12)	0.226	(0.17, 0.03, 0.03)	0.175
5	(0.10, 0.17, 0.17)	0.095	(0.08, 0.03, 0.03)	0.084
6	(–0.14, 0.26, 0.26)	–0.141	(–0.15, 0.05, 0.05)	–0.154
7	(–0.06, 0.15, 0.15)	–0.056	(0.00, 0.03, 0.03)	–0.001
8	(0.16, 0.17, 0.17)	0.162	(0.22, 0.03, 0.03)	0.219
9	(0.18, 0.15, 0.15)	0.183	(0.22, 0.03, 0.03)	0.220
10	(–0.08, 0.21, 0.21)	–0.077	(–0.06, 0.04, 0.04)	–0.062
11	(0.29, 0.13, 0.13)	0.290	(0.35, 0.02, 0.02)	0.351
12	(–0.14, 0.17, 0.17)	–0.140	(–0.12, 0.03, 0.03)	–0.120
13	(–0.18, 0.17, 0.17)	–0.180	(–0.18, 0.03, 0.03)	–0.179
14	(0.11, 0.20, 0.20)	0.107	(0.17, 0.03, 0.03)	0.171
15	(–0.24, 0.16, 0.16)	–0.239	(–0.23, 0.03, 0.03)	–0.234
16	(–0.12, 0.28, 0.28)	–0.120	(–0.13, 0.05, 0.05)	–0.132
17	(0.05, 0.18, 0.18)	0.052	(0.11, 0.03, 0.03)	0.109
18	(0.10, 0.19, 0.19)	0.095	(0.16, 0.03, 0.03)	0.159
19	(0.11, 0.13, 0.13)	0.108	(0.07, 0.02, 0.02)	0.068
20	(–0.24, 0.15, 0.15)	–0.243	(–0.25, 0.02, 0.02)	–0.252
21	(–0.19, 0.14, 0.28)	–0.154	(–0.20, 0.04, 0.04)	–0.197

Table 7. Fuzzy importance and crisp importance of attributes – Hotel 2

Hotel 2	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
1	(0.81, 0.43, 0.43)	0.810	(0.69, 0.11, 0.17)	0.701
2	(0.70, 0.37, 0.48)	0.728	(0.52, 0.08, 0.08)	0.519
3	(0.66, 0.23, 0.35)	0.691	(0.65, 0.06, 0.06)	0.647
4	(0.39, 0.15, 0.21)	0.406	(0.37, 0.04, 0.04)	0.374
5	(0.27, 0.21, 0.21)	0.274	(0.26, 0.04, 0.04)	0.261
6	(0.20, 0.29, 0.59)	0.275	(0.27, 0.10, 0.10)	0.272
7	(0.39, 0.23, 0.23)	0.389	(0.31, 0.06, 0.06)	0.309
8	(0.55, 0.32, 0.32)	0.552	(0.34, 0.06, 0.06)	0.336
9	(0.50, 0.30, 0.30)	0.498	(0.28, 0.06, 0.06)	0.275
10	(0.62, 0.35, 0.35)	0.618	(0.41, 0.07, 0.07)	0.413
11	(0.30, 0.20, 0.20)	0.301	(0.23, 0.05, 0.05)	0.226
12	(0.43, 0.35, 0.35)	0.427	(0.54, 0.07, 0.07)	0.542
13	(0.20, 0.29, 0.59)	0.275	(0.27, 0.10, 0.10)	0.272
14	(0.39, 0.25, 0.49)	0.451	(0.51, 0.08, 0.08)	0.511
15	(0.24, 0.27, 0.27)	0.245	(0.28, 0.05, 0.05)	0.281
16	(0.55, 0.15, 0.29)	0.589	(0.56, 0.05, 0.05)	0.563
17	(0.01, 0.20, 0.41)	0.061	(0.05, 0.07, 0.07)	0.053
18	(0.39, 0.23, 0.23)	0.389	(0.31, 0.06, 0.06)	0.309
19	(0.62, 0.35, 0.35)	0.618	(0.41, 0.07, 0.07)	0.413
20	(0.53, 0.29, 0.53)	0.584	(0.43, 0.07, 0.07)	0.433
21	(–0.09, 0.43, 0.81)	0.011	(–0.09, 0.14, 0.14)	–0.090

Table 8. Fuzzy importance and crisp importance of attributes – Hotel 3

Hotel 3	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
1	(0.16, 0.14, 0.14)	0.158	(0.07, 0.03, 0.03)	0.067
2	(0.20, 0.18, 0.18)	0.198	(0.20, 0.05, 0.05)	0.205
3	(0.39, 0.08, 0.08)	0.386	(0.37, 0.03, 0.03)	0.369
4	(0.45, 0.08, 0.08)	0.452	(0.05, 0.03, 0.03)	0.050
5	(0.41, 0.08, 0.08)	0.415	(0.17, 0.03, 0.03)	0.170
6	(0.23, 0.10, 0.10)	0.230	(0.01, 0.03, 0.03)	0.010
7	(0.09, 0.09, 0.09)	0.086	(0.01, 0.03, 0.03)	0.006
8	(0.30, 0.09, 0.09)	0.296	(0.15, 0.03, 0.03)	0.155
9	(0.09, 0.14, 0.14)	0.087	(–0.06, 0.04, 0.04)	–0.061
10	(0.31, 0.09, 0.09)	0.310	(0.12, 0.03, 0.03)	0.119
11	(0.00, 0.14, 0.14)	0.000	(0.23, 0.05, 0.05)	0.226

End of Table 8

Hotel 3	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
12	(0.00, 0.07, 0.07)	0.000	(0.54, 0.07, 0.07)	0.542
13	(0.25, 0.08, 0.08)	0.250	(0.27, 0.10, 0.10)	0.272
14	(0.23, 0.09, 0.09)	0.225	(0.51, 0.08, 0.08)	0.511
15	(0.09, 0.12, 0.12)	0.094	(0.28, 0.05, 0.05)	0.281
16	(0.00, 0.14, 0.14)	0.000	(0.56, 0.05, 0.05)	0.563
17	(0.28, 0.07, 0.07)	0.278	(0.05, 0.07, 0.07)	0.053
18	(0.07, 0.11, 0.11)	0.068	(0.31, 0.06, 0.06)	0.309
19	(–0.16, 0.15, 0.15)	–0.159	(0.41, 0.07, 0.07)	0.413
20	(0.09, 0.09, 0.09)	0.088	(0.43, 0.07, 0.07)	0.433
21	(0.37, 0.09, 0.09)	0.369	(–0.09, 0.14, 0.14)	–0.090

Table 9. Fuzzy importance and crisp importance of attributes – Hotel 4

Hotel 4	Symmetric		Drastic	
Attribute	Fuzzy imp.	Crisp imp.	Fuzzy imp.	Crisp imp.
1	(–0.16, 0.06, 0.12)	–0.147	(–0.21, 0.02, 0.02)	–0.206
2	(–0.05, 0.06, 0.12)	–0.034	(–0.05, 0.02, 0.02)	–0.048
3	(–0.14, 0.06, 0.12)	–0.126	(–0.13, 0.02, 0.02)	–0.130
4	(–0.02, 0.06, 0.12)	–0.004	(–0.04, 0.02, 0.02)	–0.044
5	(0.06, 0.09, 0.09)	0.058	(0.07, 0.02, 0.02)	0.070
6	(0.22, 0.05, 0.05)	0.221	(0.17, 0.01, 0.01)	0.171
7	(–0.15, 0.14, 0.14)	–0.145	(–0.16, 0.02, 0.02)	–0.157
8	(0.05, 0.05, 0.05)	0.050	(–0.02, 0.01, 0.01)	–0.015
9	(0.31, 0.06, 0.06)	0.314	(0.31, 0.01, 0.01)	0.309
10	(–0.07, 0.06, 0.12)	–0.058	(–0.10, 0.02, 0.02)	–0.102
11	(0.09, 0.10, 0.10)	0.086	(0.11, 0.02, 0.02)	0.106
12	(0.00, 0.11, 0.11)	0.000	(0.04, 0.02, 0.02)	0.036
13	(–0.05, 0.11, 0.11)	–0.048	(–0.05, 0.02, 0.02)	–0.052
14	(–0.04, 0.12, 0.12)	–0.044	(–0.07, 0.02, 0.02)	–0.069
15	(0.00, 0.10, 0.10)	–0.004	(0.00, 0.02, 0.02)	–0.003
16	(–0.06, 0.10, 0.10)	–0.064	(–0.10, 0.02, 0.02)	–0.097
17	(0.22, 0.10, 0.10)	0.224	(0.30, 0.02, 0.02)	0.300
18	(–0.06, 0.10, 0.10)	–0.061	(–0.03, 0.02, 0.02)	–0.030
19	(–0.08, 0.10, 0.10)	–0.079	(–0.04, 0.02, 0.02)	–0.043
20	(–0.09, 0.11, 0.11)	–0.089	(–0.07, 0.02, 0.02)	–0.073
21	(–0.18, 0.10, 0.10)	–0.177	(–0.12, 0.02, 0.02)	–0.116

Table 10. Decreasing ordering of the importance of attributes

All hotels		Hotel 1		Hotel 2		Hotel 3		Hotel 4	
Sym.	Dr	Sym.	Dr	Sym.	Dr	Sym.	Dr	Sym.	Dr
9	9	3	11	1	1	4	3	9	9
4	2	11	3	2	3	5	21	17	17
2	16	4	9	3	16	3	13	6	6
8	6	9	8	10	12	21	2	11	11
6	8	8	4	19	2	10	17	5	5
10	14	19	14	16	14	8	5	8	12
14	11	14	18	20	20	17	20	12	15
16	17	18	17	8	19	13	8	15	8
5	10	5	5	9	10	6	15	4	18
3	4	17	19	14	4	14	10	2	19
17	18	7	7	12	8	2	14	14	4
18	3	2	10	4	7	1	1	13	2
11	5	10	2	18	18	15	4	10	13
1	1	16	12	7	15	20	6	18	14
21	21	12	16	11	9	9	7	16	20
13	13	6	6	13	6	7	16	19	16
15	15	21	13	6	13	18	18	20	10
7	7	13	21	5	5	11	9	3	21
12	20	1	1	15	11	16	12	7	3
19	12	15	15	17	17	12	11	1	7
20	19	20	20	21	21	19	19	21	1

Analyzing data on each hotel, we see that both approaches – symmetrical and drastic, in over half of the situations there are negative values. According to Ban *et al.* (2015a, 2015b), this may suggest an indirect relationship between the overall satisfaction and the perceived performance of attributes and a concentration of these attributes above a certain level does not lead to an increase in satisfaction but to its decrease. The position of the attribute "the hotel has sufficient catering facilities" is interesting, an attribute which is considered very important in all cases less than two (symmetrical and drastically) belonging to Hotel 4.

3.2. Segmented ordering of the importance of attributes

The method summarized in Section 2 can be fructified in many directions. As example, in the present section we consider the division of the customers (respondents to the survey) according with certain criteria, apply the method and interpret the results.

3.2.1. Experience with the hotel

One of the question in the survey is related with the experience of the respondents: "Are you the first time at this hotel?", two answers ("yes" and "no") being possible. The results obtained by applying the proposed method are synthesized in Table 11 for all hotels and

Table 11. Fuzzy importance and crisp importance of attributes related with the experience – All hotels

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
6	(0.56, 0.04, 0.04)	0.563	16	(0.42, 0.07, 0.07)	0.424
4	(0.54, 0.05, 0.05)	0.544	2	(0.37, 0.11, 0.11)	0.370
9	(0.54, 0.07, 0.07)	0.537	10	(0.32, 0.07, 0.07)	0.319
14	(0.54, 0.04, 0.04)	0.537	9	(0.31, 0.06, 0.06)	0.306
3	(0.51, 0.04, 0.04)	0.511	8	(0.30, 0.06, 0.06)	0.304
8	(0.51, 0.04, 0.04)	0.510	5	(0.30, 0.05, 0.05)	0.296
2	(0.46, 0.05, 0.05)	0.455	18	(0.29, 0.08, 0.08)	0.295
11	(0.45, 0.05, 0.05)	0.450	4	(0.22, 0.08, 0.08)	0.220
21	(0.43, 0.05, 0.05)	0.427	17	(0.20, 0.07, 0.07)	0.204
1	(0.43, 0.05, 0.05)	0.425	6	(0.19, 0.07, 0.07)	0.192
17	(0.42, 0.04, 0.04)	0.417	11	(0.16, 0.09, 0.09)	0.162
10	(0.42, 0.04, 0.04)	0.416	14	(0.13, 0.07, 0.07)	0.126
5	(0.39, 0.04, 0.04)	0.394	3	(0.13, 0.07, 0.07)	0.126
13	(0.38, 0.05, 0.05)	0.377	13	(0.12, 0.07, 0.07)	0.116
18	(0.36, 0.04, 0.04)	0.365	1	(0.08, 0.12, 0.12)	0.082
7	(0.35, 0.06, 0.06)	0.351	19	(0.07, 0.10, 0.10)	0.070
15	(0.33, 0.05, 0.05)	0.325	15	(0.06, 0.05, 0.05)	0.062
16	(0.32, 0.04, 0.04)	0.316	21	(0.05, 0.07, 0.07)	0.053
20	(0.30, 0.05, 0.05)	0.300	7	(0.05, 0.06, 0.06)	0.046
12	(0.28, 0.04, 0.04)	0.283	12	(0.04, 0.06, 0.06)	0.043
19	(0.25, 0.05, 0.05)	0.254	20	(–0.04, 0.08, 0.08)	–0.039

in Tables 12–15 for each hotel, the rating of importance by triangular fuzzy numbers in Table 3 being considered.

The familiarity with a destination, given by the physical closeness, previous visits and knowledge about the destination play an important role in influencing individual perceptions about a destination (see Chi 2012; Hu, Ritchie 1993; Weaver *et al.* 2007), an aspect which may apply also to the previous experience with a museum (see Gil, Ritchie 2009) or a hotel. According to Alegre and Cladera (2006), the repetition of the visit has a limited impact on the overall satisfaction, therefore we should not see significant differences in the hierarchy of attributes.

The analysis of data overall and on each hotel shows hierarchies of the importance of attributes considerably changed, depending on the existence of a previous visit or not (see Table 16).

An interesting situation is held by the attributes "internet connection is available" and less "the staff is able to resolve the guests' problems" which in 8 of the 10 cases has approximately the same position regardless of a previous visit or not. The only exception is made by hotel 4. These results confirm the validity of the proposed method, reinforcing the general perception of the constant importance that the internet connection has.

3.2.2. Motivation

One of the question in the survey is related with the main reason of the travel: "What is the main reason why you are in this hotel?", seven answers being possible, but the most respondents were in categories M1 – "business" and M2 – "leisure". In the sequel we consider only the answers corresponding to these categories. The results obtained by applying the method in Section 2 to all hotels are synthesized in Table 17, the rating of importance by triangular fuzzy numbers in Table 3 being considered.

The relationship between satisfaction and the motivation of travel has been previously studied (see Meng *et al.* 2008), highlighting some notable distinctions between the business and leisure travel (see Kashyap, Bojanic 2000). In our study also, the hierarchy of the attributes by importance having as the respondent's motivation the business is radically different compared to the hierarchy of the attributes by importance having as the respondent's motivation the entertainment. In the case of tourism of business reasons, the first places are occupied by the following attributes: "the staff has an appropriate and professional look", "the room is clean enough", "the staff is able to provide information in a short time", while in the case of tourism motivated by entertainment on the top are the "friendliness of staff", "the safety of the installation of the hotel" and "the location of the hotel is suitable". The results are not surprising, they reflect the requirements of different categories of consumers and finding them in this study aligns the tourist behavior in Oradea with that of the tourists from other countries, similar results being obtained for business tourists in other studies (see Gundersen *et al.* 1996; Mccleary 1993). At the same time, the information processing method used is validated.

Table 12. Fuzzy importance and crisp importance of attributes related with the experience – Hotel 1

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
9	(0.67, 0.19, 0.31)	0.704	18	(0.33, 0.16, 0.33)	0.368
3	(0.67, 0.23, 0.31)	0.694	11	(0.27, 0.14, 0.25)	0.296
14	(0.56, 0.23, 0.47)	0.617	8	(0.16, 0.16, 0.29)	0.192
4	(0.56, 0.22, 0.28)	0.573	17	(0.08, 0.19, 0.32)	0.114
8	(0.44, 0.27, 0.55)	0.507	3	(0.06, 0.19, 0.31)	0.085
11	(0.46, 0.14, 0.21)	0.474	5	(−0.03, 0.20, 0.36)	0.014
7	(0.28, 0.23, 0.47)	0.338	2	(−0.08, 0.30, 0.60)	−0.003
19	(0.31, 0.13, 0.14)	0.317	9	(−0.07, 0.17, 0.30)	−0.041
5	(0.23, 0.14, 0.15)	0.232	12	(−0.10, 0.17, 0.29)	−0.067
17	(0.17, 0.21, 0.42)	0.221	16	(−0.13, 0.24, 0.49)	−0.072
13	(0.11, 0.29, 0.55)	0.175	19	(−0.09, 0.22, 0.31)	−0.074
10	(0.11, 0.29, 0.55)	0.175	6	(−0.16, 0.23, 0.45)	−0.101

End of Table 12

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
18	(0.00, 0.23, 0.47)	0.058	1	(–0.18, 0.21, 0.42)	–0.129
15	(–0.07, 0.19, 0.37)	–0.028	10	(–0.18, 0.21, 0.42)	–0.129
20	(–0.08, 0.21, 0.42)	–0.032	4	(–0.17, 0.15, 0.30)	–0.132
12	(–0.16, 0.20, 0.40)	–0.109	14	(–0.20, 0.20, 0.40)	–0.156
2	(–0.14, 1.44, 1.44)	–0.144	7	(–0.21, 0.15, 0.26)	–0.178
16	(–0.14, 1.44, 1.44)	–0.144	21	(–0.22, 0.13, 0.25)	–0.186
6	(–0.14, 1.44, 1.44)	–0.144	13	(–0.29, 0.17, 0.29)	–0.262
21	(–0.14, 1.44, 1.44)	–0.144	20	(–0.31, 0.15, 0.27)	–0.278
1	(–0.28, 0.23, 0.47)	–0.221	15	(–0.37, 0.18, 0.24)	–0.351

Table 13. Fuzzy importance and crisp importance of attributes related with the experience – Hotel 2

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
14	(1.00, 1.00, 1.00)	1.000	1	(0.89, 0.47, 0.47)	0.886
16	(–0.11, 0.50, 1.00)	0.014	2	(0.76, 0.41, 0.54)	0.791
11	(–0.11, 0.50, 1.00)	0.014	10	(0.76, 0.41, 0.54)	0.791
4	(–0.11, 0.50, 1.00)	0.014	19	(0.76, 0.41, 0.54)	0.791
10	(–0.11, 0.50, 1.00)	0.014	3	(0.72, 0.24, 0.51)	0.789
18	(–0.11, 0.50, 1.00)	0.014	16	(0.67, 0.20, 0.47)	0.736
8	(–0.11, 0.50, 1.00)	0.014	9	(0.67, 0.38, 0.47)	0.691
19	(–0.11, 0.50, 1.00)	0.014	8	(0.67, 0.38, 0.47)	0.691
15	(–0.17, 0.38, 0.75)	–0.073	18	(0.56, 0.31, 0.56)	0.617
9	(–0.17, 0.38, 0.75)	–0.073	20	(0.56, 0.31, 0.56)	0.617
12	(–0.11, 1.05, 1.05)	–0.105	4	(0.48, 0.16, 0.34)	0.529
13	(–0.11, 1.05, 1.05)	–0.105	12	(0.44, 0.38, 0.38)	0.438
7	(–0.11, 1.05, 1.05)	–0.105	7	(0.39, 0.24, 0.28)	0.400
2	(–0.11, 1.05, 1.05)	–0.105	11	(0.39, 0.24, 0.28)	0.400
3	(–0.11, 1.05, 1.05)	–0.105	5	(0.36, 0.25, 0.25)	0.358
1	(–0.11, 1.05, 1.05)	–0.105	15	(0.31, 0.33, 0.33)	0.307
6	(–0.11, 1.05, 1.05)	–0.105	17	(0.17, 0.33, 0.66)	0.256
20	(–0.11, 1.05, 1.05)	–0.105	14	(0.17, 0.33, 0.66)	0.256
21	(–0.11, 1.05, 1.05)	–0.105	6	(0.17, 0.33, 0.66)	0.256
5	(–0.22, 0.33, 0.65)	–0.136	13	(0.17, 0.33, 0.66)	0.256
17	(–0.22, 0.33, 0.65)	–0.136	21	(–0.14, 0.47, 0.89)	–0.035

Table 14. Fuzzy importance and crisp importance of attributes related with the experience – Hotel 3

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
2	(0.64, 0.21, 0.21)	0.638	5	(0.43, 0.24, 0.25)	0.430
3	(0.59, 0.14, 0.16)	0.598	21	(0.16, 0.24, 0.24)	0.160
4	(0.59, 0.16, 0.16)	0.595	4	(0.16, 0.24, 0.24)	0.156
1	(0.51, 0.21, 0.21)	0.509	16	(0.05, 0.66, 0.66)	0.047
21	(0.46, 0.18, 0.18)	0.465	15	(0.02, 0.28, 0.28)	0.020
14	(0.45, 0.16, 0.16)	0.453	8	(0.00, 0.21, 0.21)	0.000
6	(0.44, 0.20, 0.20)	0.440	10	(0.00, 0.29, 0.29)	0.000
8	(0.44, 0.20, 0.20)	0.440	13	(0.00, 0.26, 0.26)	0.000
7	(0.42, 0.14, 0.14)	0.417	17	(–0.03, 0.24, 0.24)	–0.032
10	(0.41, 0.16, 0.16)	0.411	3	(–0.05, 0.29, 0.29)	–0.054
17	(0.41, 0.19, 0.19)	0.409	18	(–0.07, 0.23, 0.23)	–0.069
13	(0.39, 0.26, 0.26)	0.390	6	(–0.21, 0.24, 0.24)	–0.205
5	(0.39, 0.17, 0.17)	0.387	14	(–0.21, 0.22, 0.22)	–0.207
20	(0.28, 0.14, 0.14)	0.281	20	(–0.24, 0.28, 0.28)	–0.243
11	(0.28, 0.22, 0.22)	0.278	9	(–0.24, 0.28, 0.28)	–0.243
18	(0.22, 0.22, 0.22)	0.225	11	(–0.34, 0.34, 0.34)	–0.338
9	(0.21, 0.22, 0.22)	0.205	19	(–0.38, 0.38, 0.38)	–0.377
12	(0.19, 0.19, 0.19)	0.190	2	(–0.45, 0.45, 0.45)	–0.453
15	(0.08, 0.24, 0.24)	0.080	1	(–0.45, 0.45, 0.45)	–0.454
19	(–0.01, 0.26, 0.26)	–0.009	12	(–0.45, 0.26, 0.25)	–0.456
16	(–0.10, 0.25, 0.25)	–0.101	7	(–0.48, 0.28, 0.26)	–0.483

Table 15. Fuzzy importance and crisp importance of attributes related with the experience – Hotel 4

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
6	(0.51, 0.10, 0.10)	0.508	17	(0.24, 0.14, 0.27)	0.270
9	(0.40, 0.12, 0.12)	0.397	9	(0.24, 0.13, 0.13)	0.236
8	(0.22, 0.10, 0.10)	0.215	2	(0.09, 0.14, 0.18)	0.103
17	(0.20, 0.15, 0.15)	0.204	11	(0.05, 0.10, 0.10)	0.046
4	(0.17, 0.10, 0.19)	0.190	5	(0.02, 0.12, 0.20)	0.038
14	(0.10, 0.18, 0.18)	0.102	16	(0.04, 0.13, 0.13)	0.035
15	(0.10, 0.16, 0.16)	0.098	12	(–0.06, 0.14, 0.28)	–0.023
11	(0.10, 0.16, 0.16)	0.098	13	(–0.07, 0.14, 0.14)	–0.070
5	(0.09, 0.15, 0.15)	0.087	15	(–0.16, 0.14, 0.27)	–0.131
12	(0.06, 0.16, 0.16)	0.064	6	(–0.15, 0.10, 0.10)	–0.149
18	(0.06, 0.16, 0.16)	0.058	7	(–0.17, 0.14, 0.18)	–0.156

End of Table 15

"Yes"			"No"		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
20	(0.02, 0.16, 0.16)	0.017	10	(–0.17, 0.13, 0.14)	–0.166
3	(–0.02, 0.10, 0.19)	0.000	8	(–0.20, 0.16, 0.16)	–0.203
1	(–0.03, 0.10, 0.20)	–0.008	19	(–0.24, 0.15, 0.30)	–0.203
13	(–0.02, 0.16, 0.16)	–0.019	18	(–0.25, 0.14, 0.28)	–0.220
19	(–0.04, 0.18, 0.18)	–0.036	21	(–0.26, 0.10, 0.19)	–0.233
21	(–0.07, 0.12, 0.22)	–0.045	20	(–0.31, 0.14, 0.14)	–0.310
10	(–0.09, 0.12, 0.22)	–0.071	4	(–0.31, 0.14, 0.14)	–0.310
7	(–0.14, 0.21, 0.21)	–0.141	3	(–0.31, 0.14, 0.14)	–0.310
2	(–0.17, 0.10, 0.19)	–0.145	14	(–0.35, 0.18, 0.18)	–0.350
16	(–0.15, 0.15, 0.15)	–0.149	1	(–0.42, 0.13, 0.13)	–0.417

Table 16. Decreasing ordering of the importance of attributes related with the experience

All hotels		Hotel 1		Hotel 2		Hotel 3		Hotel 4	
"Yes"	"No"	"Yes"	"No"	"Yes"	"No"	"Yes"	"No"	"Yes"	"No"
6	16	9	18	14	1	2	16	6	17
4	2	3	11	2	2	3	5	9	9
9	10	14	8	3	10	4	21	8	2
14	9	4	17	6	19	1	4	17	11
3	8	8	3	7	3	21	15	4	5
8	5	11	5	12	16	14	8	14	16
2	18	7	2	13	9	6	10	15	12
11	4	19	9	1	8	8	13	11	13
21	17	5	12	20	18	7	17	5	15
1	6	17	16	21	20	10	3	12	6
17	11	13	19	8	4	17	18	18	7
10	14	10	6	19	12	13	6	20	10
5	3	18	1	16	11	5	14	3	8
13	13	6	10	18	7	20	20	1	19
18	1	2	4	10	5	11	9	13	18
7	19	16	14	11	15	18	11	19	21
15	15	21	7	4	17	9	19	21	20
16	21	15	21	15	14	12	2	10	4
20	7	20	13	9	6	15	12	7	3
12	12	12	20	5	13	19	1	2	14
19	20	1	15	17	21	16	7	16	1

Table 17. Fuzzy importance and crisp importance of attributes related with the motivation – All hotels

M1			M2		
Attribute	Fuzzy importance	Importance	Attribute	Fuzzy importance	Importance
4	(0.56, 0.06, 0.07)	0.562	16	(0.69, 0.29, 0.69)	0.794
2	(0.53, 0.06, 0.06)	0.533	13	(0.53, 0.26, 0.53)	0.595
9	(0.50, 0.05, 0.05)	0.496	5	(0.53, 0.26, 0.53)	0.595
1	(0.49, 0.06, 0.06)	0.495	20	(0.50, 0.25, 0.50)	0.563
6	(0.48, 0.05, 0.05)	0.479	21	(0.41, 0.28, 0.55)	0.477
5	(0.47, 0.04, 0.04)	0.473	18	(0.37, 0.24, 0.48)	0.428
10	(0.46, 0.05, 0.05)	0.463	17	(0.29, 0.25, 0.49)	0.353
8	(0.45, 0.05, 0.05)	0.445	4	(0.29, 0.29, 0.29)	0.291
14	(0.42, 0.06, 0.06)	0.420	6	(0.26, 0.39, 0.43)	0.269
16	(0.37, 0.05, 0.05)	0.372	15	(0.20, 0.25, 0.40)	0.238
3	(0.32, 0.05, 0.05)	0.318	14	(0.16, 0.32, 0.40)	0.178
18	(0.32, 0.05, 0.05)	0.317	9	(0.06, 0.29, 0.55)	0.124
11	(0.29, 0.05, 0.05)	0.288	3	(0.06, 0.29, 0.55)	0.124
17	(0.26, 0.05, 0.05)	0.263	10	(0.06, 0.29, 0.55)	0.124
21	(0.25, 0.07, 0.07)	0.246	2	(0.00, 0.32, 0.65)	0.081
19	(0.21, 0.06, 0.06)	0.214	11	(0.00, 0.32, 0.65)	0.081
12	(0.18, 0.05, 0.05)	0.185	7	(–0.19, 0.33, 0.66)	–0.106
15	(0.16, 0.05, 0.05)	0.163	1	(–0.26, 0.32, 0.65)	–0.178
7	(0.15, 0.05, 0.05)	0.151	8	(–0.26, 0.26, 0.43)	–0.215
13	(0.11, 0.05, 0.05)	0.107	19	(–0.30, 0.31, 0.63)	–0.224
20	(–0.05, 0.07, 0.07)	–0.045	12	(–0.35, 0.35, 0.52)	–0.303

Conclusions

With respect to the hypotheses H1–H3 in Introduction we can formulate the following conclusions:

H1: The differences between the hierarchy of attributes obtained considering a symmetrical scale and the hierarchy of the attributes resulted considering a drastic scale is not that important as it is suggested in the literature, therefore the hypothesis is not confirmed.

H2: The hypothesis is confirmed, that is the analysis of data overall and on each hotel shows hierarchies of the importance of attributes considerably changed, depending on the existence of a previous visit or not.

H3: The hierarchy of the attributes by importance having as the respondent's motivation the business is radically different compared to the hierarchy of the attributes by importance having as the respondent's motivation the entertainment, therefore the hypothesis is confirmed.

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