The Opportunity of Indirect Determination of the Importance of the Attributes of the Tourist Product in Evaluating the Consumer’s Satisfaction

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Abstract. This paper’s purpose was to test the hypothesis of replacing the direct measure of the importance of attributes within IPA, with indirect mathematical methods. We used two methods appropriate for multivariate ordinal scales, the Spearman coefficient and the entropy calculus. Due to the significant differences between the results obtained directly and the results obtained indirectly, there occurs the need for other mathematical methods.

Keywords: satisfaction, attribute, Importance-Performance Analysis (IPA), indirect methods

1. Introduction

The first studies on the consumer satisfaction belong to Cardozo [1] and Anderson [2]. In their attempt to define the concept of consumer satisfaction they were followed by: Oliver [3]; Tse and Wilton [4]; Peterson and Wilson [5]; Yi [6]; Oliver [7]; Giese and Cote [8]. The ideas issued in the definitions of the consumer satisfaction have several common aspects: the consumer satisfaction is seen as a result, as an emotional and cognitive reaction resulting from a psychological process; it is seen as a result of all the activities during the acquisition and consumerism and/or post acquisition or post consumerism and it is the result of a comparison between a standard (expectations) and the consumed product [4].

The models developed so far Millan and Esteban [10] connect the expectations, the perception on the performance, the differences between these two and the level of unconfirmed expectations. It is interesting that the studies [9] are referring to showed that the increase of the acceptance of the expectations’ invalidation could be an explanation for the adjustment of the consumers’ satisfaction. Carman [10] makes the difference between expectations and the frequency of product or service usage.

The IPA is based on the idea that the satisfaction is the result of the preferences for a product, as a result of the evaluation of its performances. The IPA scale is based on the assumption that the satisfaction is influenced by the importance of the attributes and the perceived performance of the attributes. [11]

2. The Research Of The Consumer Satisfaction By Multivariate Ordinal Scales

The marketing researchers underline the compulsoriness of the multi-attributive or multidimensional measurement of the product studied. [9] It is very well spread the practice of using multivariate ordinal scales and especially of the Likert scale in the marketing researches in tourism, the so called “industrial standard” [14]; [12]; [13].

Watson [15] identified a problem connected to the use of the Likert scale, supported by numerous empirical studies, that is a conventional result, without firm positioning is obtained.

The dimension of the scales is a very much debated and challenged subject. The preoccupations are directed to the indication of the relation between the type of scale used and the validity of the responses, and the conclusions themselves are contradictory, too. If Preston and Colman [16] state that there is no relation

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between the type of scale used and the validity of the responses, Hancock and Klockars [17] claim that the
validity of responses vary according to the type of scale and they support the utility of the 7-point scale.

The cultural context highly influences the position of the subjects in the responses with the scale, either it
is the Likert scale or another type. Watson and Cheung [18] noticed differences in the response style of those
questioned according to their country of origin. In other words, they opt for certain positions on the scale,
more extremist or moderate according to cultural determinants. The idea is shared by van Herk, Poortinga
and Verhallen [19] too, who state that different response style manifest in the EU countries.

Empirical studies show the option for a position in the Likert scale in the average or superior area while
the binary questions, the negative positioning is more often encountered [20]; [21]; [22].

The IPA, very often used in the marketing researches, has lost its efficiency due also to the difficulty to
realistically determine then importance of the evaluation criteria, of the product’s characteristics from the
consumer’s perspective.

The recording of the importance of the researched product’s attributes in the same survey with the
analysis of the product’s performance with regard to these attributes is more and more criticized and it
started to be abandoned. Taking into consideration the problems mentioned above, we suggest the separation
of the research concerning the importance of the attributes from the research concerning the perception of the
recorded performance. On the other hand, the separation in time of these studies modifies the environment
conditions and may lead to inconclusive results. Actually, the importance associated to the attributes during
the evaluation of a product or services from the point of view of the respective attributes is what really
matters.

The solution would be the elimination of the battery of questions concerning the importance of the
attributes and the keeping of that regarding the recording of the performance. It is considered that the
importance of the items can be directly inferred through mathematical methods. [17]

The hypothesis that we are launching is that of the increase of the efficiency of the studies made by
eliminating the battery of questions regarding the importance of the attributes and the use of certain
appropriate mathematical methods which should allow the inference of the importance of the attributes from
the respondents’ perspective.

3. **Methodology**

During March-April, 2010 a survey was conducted among the population of Oradea, Romania [20]. The
sample was composed of a total of 1,060 people, sampling method chosen was the stratification method
(margin of error of 3%). The segmentation criterion used was age. The respondents were persons who
received accommodation services in Romania at least once since 2007 till 2010.

Research goal was to investigate the level of Oradea inhabitants satisfaction, with the quality of tourism
services and the performance of service staff. The research instrument was a questionnaire with 21 questions,
plus some questions related to socio-demographic aspects.

The respondents were investigated on three dimension of tourist services quality, respectively: the
material base (equipments), staff training and staff behavior. The results reflect that out of the three
dimensions of service quality the utmost importance is given to staff conduct, which is also evaluated at the
lowest level in terms of performance.

There were 19 attributes chosen for tourism staff, in correspondence with SERVQUAL, for which it was
done the analysis of the importance given by respondents and the analysis of the perceived performance of
the staff from Romania. A scale with five steps was used in this research, from "unimportant" to "very
important".

The results show that a great importance is given to all attributes. Situated on the first places, with values
over 4.5 are attributes of Staff Kindness (Courtesy) and Responsibility, Communication and Timeliness. In
assessing the performance it was observed a decrease for all attributes. The best values, although all were
average level, were obtained for **Physical Appearance** and **Staff Communication**.
Before the two sets of questions for the recording of the attributes regarding the evaluation of the tourism staff and its perceived performance there has been addressed a question regarding the satisfaction global evaluation concerning the tourism staff in Romania.

The results obtained indicated a hierarchy of the attributes from the point of view of the importance and a hierarchy of the attributes from the point of view of the perceived performance with regard to the tourism staff in Romania. Table 1

Observations regarding the results obtained:
- the scores obtained for the importance given to attributes is situated on the superior part of the Likert scale, all between 4.00 and 5.00, with a single exception situated between 3.00 and 4.00. Practically, all the attributes are appreciated as being important, the inter-item differentiation being insignificant and, due to this, useless.
- the scores obtained for performance follow the same trek as those for importance, with the mention that they are placed on a lower level, that is between 3.00 and 4.00, with an exception between 2.00 and 3.00.

4. Mathematical Method

Taking into consideration the problems induced by the direct recording of the attributes’ importance we intend to test to what extent the direct recording could be replaced (with an acceptable error rate) by the indirect determination, through mathematical methods of the attributes’ importance.

We started from the empirical study presented above which, apart the global evaluation of the satisfaction with regard to the tourism staff’s performance in Romania has surprised and the importance given to the staff’s evaluation attributes (19 items) and the perception regarding the extent to which the tourism staff comply with these attributes. We have followed the comparison of the attributes’ importance directly determined, through the responses given by those questioned, with the results of indirect determination of the attributes; importance through mathematical methods. The direct importance given to attributes was determined by making the arithmetical average of the responses as they appear in Table 1, column 1.

Excluding the direct responses referring to the attributes’ importance, we have tried by two mathematical methods to indirectly determine this, by checking the correlation between the perceived performance and the global satisfaction. We start from the hypothesis that the determination of the percentage of attributes in the global satisfaction will lead us to hierarchy them in accordance to the importance given by the consumers.

Mathematical methods used in correspondence with the type of scale used in the survey applied, that is multivariate ordinal scales and these are: the calculus of entropy and the calculus of the Spearman coefficient (through SPSS).

We assume that respondents are “m”, and number of attributes is “n”.

The indirect method to calculate the importance $w_j$ of $A_j$ attribute, where $j \in \{1,\ldots,n\}$ by calculus of entropy asking for value determination of $p_{ij}$, $i \in \{1,\ldots,m\}$.

Step 1:

$$p_{ij} = \frac{x_{ij}}{(x_{1j} + \ldots + x_{mj})}, \quad i \in \{1,\ldots,m\}$$

where $x_{ij}, i \in \{1,\ldots,m\}, j \in \{1,\ldots,n\}$ is the level of $i$ respondent satisfaction relate to $j$ attribute.

Step 2:

$$e_j = \frac{1}{1nm}(p_{1j}1np_{1j} + \ldots + p_{mj}1np_{mj})$$

Step 3:

$$w_j = (1-e_j)/(n-(e_1+\ldots+e_n))$$

Relate with the 1060 peoples responses at the questionnaires with 19 attributes, used methods described at (1)-(3) we obtain the hierarchy presented in Table 1.

The Spearman coefficient is calculated using the formula:

$$S = \frac{1-(6\sum d^2)}{n(n^2-1)}$$

where:
- $x$- independent factor, that 19 attributes;
y-dependent factor, global evaluation;
\[ d \] – difference between the ranks according to variable x (r_x) and according to variable y (r_y);
\[ n \] – number of elements of the units, number of responses;

The calculus of the Spearman coefficient has led to positive values, indicating the presence of a direct connection with different intensities for the attributes taken into consideration Table 1, column 3.

5. Interpretations

The analysis of the opportunity to replace the indirect method of determining the importance of the attributes characterizing a tourist product or service for a concrete case has shown the following:

- the individual importance given to the attributes characterizing the performance of the tourism staff, obtained from the entropy calculus based on the use of the evaluation of the tourism staff’s performance is substantially different from the data obtained through direct research;
- the individual importance given to the attributes characterizing the tourism staff’s performance, obtained after applying the Spearman coefficient in order to evaluate the tourism staff’s performance from the perspective of some given attributes and the evaluation of the global satisfaction regarding the staff’s performance is substantially different from the data obtained through direct research;
- the analysis of the attributes’ hierarchies according to the criterion of importance, indirectly obtained through mathematical methods is positioning on the first positions criteria like “Enthusiasm” and “Communication” which, in the direct research occupy different positions. In the direct research, the “Communication” is among the first three attributes considered important, as it is in the indirect research through the Spearman coefficient. Instead, the “Enthusiasm” through the two indirect methods is on the situated on the first four positions is on the last but one position in the direct research. We ask ourselves whether it is convenient to cancel the utility of the indirect methods or their more detailed research is necessary. There might be unconscious attributes as important but appreciated as such when it is about a concrete situation;
- the “Kindness” attribute, positioned on the first place in the direct research is on the third place in that through the Spearman coefficient and on the fifth position through the entropy calculus. No matter the method used, will a strong attribute find the way to the first positions in the hierarchy? The need for a relation with the tourism contact staff, marked by kindness was found in other studies [23], which encourages the idea that there is a latent, unsatisfied need of the Romanian consumer. In the regime before 1989, “the service provider was the master and not the consumer”.

<table>
<thead>
<tr>
<th>Attributes according to their importance in the survey</th>
<th>Attributes according to their importance determined through entropy calculus (x10^-2)</th>
<th>Attributes according to the importance inferred through the Spearman coefficient (x10^-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q8.16 Kindness</td>
<td>4.62 Q8.12</td>
<td>9.0814 Q8.8 0.141**</td>
</tr>
<tr>
<td>Q8.17 Responsibility</td>
<td>4.58 Q8.10</td>
<td>5.6693 Q8.9 0.137**</td>
</tr>
<tr>
<td>Q8.8 Communication</td>
<td>4.53 Q8.13</td>
<td>5.6593 Q8.16 0.134**</td>
</tr>
<tr>
<td>Q8.3 Promptitude</td>
<td>4.53 Q8.1</td>
<td>5.4893 Q8.12 0.133**</td>
</tr>
<tr>
<td>Q8.10 Responsiveness to problems</td>
<td>4.5 Q8.16</td>
<td>5.3768 Q8.17 0.133**</td>
</tr>
<tr>
<td>Q8.11 Conscientiously</td>
<td>4.46 Q8.11</td>
<td>5.3018 Q8.18 0.133**</td>
</tr>
<tr>
<td>Q8.7 Ability to solve problems</td>
<td>4.46 Q8.19</td>
<td>5.2943 Q8.6 0.131**</td>
</tr>
<tr>
<td>Q8.2 Attention</td>
<td>4.46 Q8.17</td>
<td>5.2493 Q8.19 0.128**</td>
</tr>
<tr>
<td>Q8.5 Availability</td>
<td>4.45 Q8.15</td>
<td>5.2193 Q8.11 0.127**</td>
</tr>
<tr>
<td>Q8.9 Oral Expression</td>
<td>4.45 Q.8.18</td>
<td>5.1969 Q8.10 0.121**</td>
</tr>
<tr>
<td>Q8.6 Physical Appearance</td>
<td>4.43 Q8.9</td>
<td>5.1144 Q8.4 0.117**</td>
</tr>
<tr>
<td>Q8.18 Sociability</td>
<td>4.42 Q8.3</td>
<td>5.1144 Q8.5 0.113**</td>
</tr>
<tr>
<td>Q8.14 Skills</td>
<td>4.41 Q8.4</td>
<td>4.8319 Q8.1 0.111 **</td>
</tr>
<tr>
<td>Q8.19 Self-control</td>
<td>4.4 Q8.8</td>
<td>4.8369 Q.8.15 0.108**</td>
</tr>
<tr>
<td>Q8.4 Professional knowledge</td>
<td>4.58 Q8.5</td>
<td>4.7594 Q8.3 0.098**</td>
</tr>
<tr>
<td>Q8.13 Flexibility</td>
<td>4.26 Q8.7</td>
<td>4.6869 Q8.7 0.098**</td>
</tr>
</tbody>
</table>
Note: Correlation is significant at the .01 level (2-tailed).

6. Conclusions

Considering the weak correspondence among the results obtained directly and the results obtained through mathematical methods, we can state the following:

- we can explain the results obtained through the non-identification of the mathematical methods suitable for the concrete situation analyzed, a conclusion which supports though the idea of the existence of some more appropriate methods than others for each analysis;
- another possible explanation could reside in the cultural determinants of the respondents who make possible the existence of a discrepancy in the overall judgment of a performance and in the analysis of a performance according to attributes; The performance of the labor conscriptions, according to the attributes considered, has an average between 3.00 and 4.00 on the Likert scale, while in the overall evaluation, 90% of the respondents appreciate that the staff’s labor conscription “needs improvements”, “it is poor” or “very poor”.
- there is the need to test other mathematical methods too to indirectly determine the importance of the evaluation attributes of a touristic performance (or in another field of services) like fuzzy methods;
- there is the need to apply the mathematical methods used in this paper in the results obtained by surveying a target group with other cultural determinants.

7. References


