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The Importance of Apple attributes: a Comparison of Self-explicated and Conjoint Analysis Results

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Abstract— the goal of this article was to determine the importance of apple attributes using two research techniques – self-explicated procedure and conjoint analysis. Research was conducted on a sample of 426 consumers of apples in Zagreb, Croatia. The results of self-explicated and conjoint analysis procedures revealed differences in ranking of apple attributes regarding their importance. It is demonstrated that conjoint analysis gives more detailed results and that it is not influenced by respondents' tendency to give socially acceptable answers. The results of conjoint analysis also give more information for the producers of apples who can use them to create a product that matches consumers' wishes.

Keywords— apple, conjoint analysis, self-explicated method

I. INTRODUCTION

One of the most important aspects of consumer research is determining the structure of consumer preferences for different products. In this way producers can offer a product that can satisfy the needs of consumers which is the basic goal of marketing concept of doing business.

Every product is specific and has its own set of characteristics and attributes that give consumers certain satisfaction and utility. There are different techniques used to determine consumer preferences. Among the most frequently used research techniques are the self-explicated approach and conjoint analysis.

Self-explicated approach is a composite model of determining consumer preferences in which consumer is asked to assess the importance of product attributes, usually on a Likert-type scale [1]. Importance ratings given for each product attribute are then summed into a total rating of product utility. Besides self-explicated method, other composite models

include value expectancy model and linear compensatory attitude model [2].

Conjoint analysis is a decomposite model of determining consumer preferences. It is based on the assumption that all products are composed of attributes which may have two or more levels. Respondents are usually presented with different combinations of product attributes and attribute levels and asked to rank or rate them. Conjoint analysis is a procedure where each attribute level is assigned a value called part-worth that indicates the relative importance of that particular level to respondents. Total importance for an attribute is derived by calculating the range of part-worths across the levels of that particular attribute. When all part-worths for different combinations of attribute levels are summed, total value of the product to consumers is found [3].

The goal of this paper is to determine the importance of apple attributes using two techniques – self-explicated procedure and conjoint analysis.

II. METHODOLOGY AND RESEARCH PROCEDURE

The target population were all citizens of Zagreb who buy apples in supermarkets. A *face to face* survey was conducted on a sample of 426 apple buyers in three Zagreb supermarkets (Konzum, Mercator and Kaufland).

The research was conducted in supermarkets whose selection was based on expert estimate.

Three supermarkets were chosen that belong to different trade chains and whose offer of apples differs in quality, assortment, prices and the way apples are displayed in the shop.

The selection of respondents in supermarkets was random. Every second consumer who bought apples was included in the sample, provided that he/she agreed to participate in the research. Respondents received a symbolic gift (apple juice) for their participation.

In order to conduct the research, a structured questionnaire was used, with several groups of questions: demographic characteristics, characteristics of buying behaviour, the importance of different attributes in buying apples and the importance of information in buying fruit.

Besides the questions mentioned above, conjoint task was also a part of the questionnaire. Based on the data from previous research, five attributes of apples were chosen to be included in the conjoint task. These attributes are taste, colour, method of production, origin and price. Each attribute had two levels, with the exception of price, which had three levels. All attributes and their levels are shown in Table 1.

Table 1 Attributes and levels used in conjoint analysis

Attributes	Levels
TASTE	<ul style="list-style-type: none"> • mostly sweet • mostly sour
COLOUR	<ul style="list-style-type: none"> • mostly red • mostly green
METHOD OF PRODUCTION	<ul style="list-style-type: none"> • conventional usage of plant protection products • reduced usage of plant protection products
ORIGIN	<ul style="list-style-type: none"> • Croatian • imported
PRICE	<ul style="list-style-type: none"> • 6 kn/kg • 9 kn/kg • 12 kn/kg

Source: Own research

The data collection method used in this research is full-profile method, where participants are required to evaluate a set of stimuli representing

alternative combinations of all five attributes (hypothetical products).

Using the orthogonal array experimental design, from all the possible combinations of attributes and levels, 8 combinations were chosen as stimuli to be used in this research, plus two hold-out stimuli (used to assess the validity of the results). Table 2 shows an example of a stimulus card.

Table 2 An example of a stimulus card

<p><u>APPLE A</u> mostly sour mostly red conventional usage of plant protection products Croatian origin 12 kn/kg</p>	<p>Very low preference 1 2 3 4 5</p>	<p>Very high preference 6 7</p>
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The respondents' task was to rate each stimulus on a 7-point Likert scale, where 1 indicates very low and 7 indicates very high preference for the product described.

In the self-explicated method, respondents were simply asked to rate the importance of apple attributes on a five-point Likert scale, where 1 indicates that the attribute is completely unimportant and 5 indicates that the attribute is very important.

The generation of experimental stimuli and all analyses were performed using SPSS statistical software (Version 13.0, 2004, SPSS Inc, Chicago, IL).

III. RESULTS AND DISCUSSION

The results of self-explicated method were calculated by computing mean scores for each attribute. Table 3 shows mean values of attributes' perceived importance as reported by participants.

Table 3 Perceived importance of apple attributes - self – explicated method

Attributes	Mean	Std. Deviation
TASTE	4,76	0,541
COLOUR	3,80	1,165
METHOD OF PRODUCTION	4,35	1,022
ORIGIN	4,22	1,111
PRICE	3,82	1,109

Source: Own research

The results show that the most important apple attribute is the taste, followed by method of production and origin of the product. Price and colour of the apple are rated as less important attributes. It is interesting to compare these results with the results of conjoint analysis, shown in Table 4.

Table 4 Perceived importance of apple attributes - conjoint analysis

Attributes	Averaged importance (%)	Utility of attribute levels
TASTE	24,19	Mostly sweet (-0,1072)
		mostly sour (0,1072)
COLOUR	17,98	mostly red (0,0647)
		mostly green (-0,0647)
METHOD OF PRODUCTION	13,53	conventional usage of plant protection products (0,0273)
		reduced usage of plant protection products (-0,0273)
ORIGIN	20,94	Croatian (0,4099)
		Imported (-0,4099)
PRICE	23,36	6 kn/kg (-0,0323)
		9 kn/kg (-0,0646)
		12 kn/kg (-0,0969)

Source: Own research

In the case of conjoint analysis results, taste is also the most important apple attribute, but the second most important attribute is the price of the product which was ranked fourth in the self-explicated method. Moreover, the method of production, which was rated as very important in the self-explicated method, is the least important attribute according to the results of conjoint analysis.

These results can be explained by respondents' general tendency to provide socially acceptable answers as it is described in methodological literature in social sciences [4]. When asked directly (self-explicated method) about the importance of money, it is usually not socially desirable to express high price sensitivity or it is uncomfortable for some respondents to express money concerns as it may reveal their social status.

On the other hand, it is socially acceptable to express concern for the environment and safe food by stating preference for reduced usage of chemical plant protection products.

That is why method of production is highly ranked in self-explicit method results as the second most important attribute of apples.

However, when consumer preferences are calculated in an indirect way, through conjoint analysis procedure, where giving acceptable answers is not an option, price becomes a very important attribute and method of production falls down to being the least important.

These findings are consistent with previous research [3], [5] where it was also found that conjoint analysis provides more accurate results than self-explicated method. Conjoint analysis also provides information that can't be elicited from surveys because it gives insight into consumers' preferences for attribute levels. This can help producers to create products that closely fit consumers' demands and in this way they can be more successful in the market.

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