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Product attributes and preferences
A study of product attribute preferences of consumers and preference stability

Doctoral theses

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1. JUSTIFICATION OF THE TOPIC CHOICE

In recent decades, the number of product attributes has multiplied for a great number of products in consumer markets and a wide variety of product variations is available to consumers making it more difficult for them to make a choice. Many times a customer no longer has to consider product variations within only one product category, as often there is an overlap of categories. Today, a microwave oven is not just for reheating, but also for cooking, baking, grilling, or even defrosting food. Mobile phones are not only used to make a call but also to take photos, listen to music or access the Internet, and soon we will even be able to use them for payment. My doctoral dissertation focuses on exploring the problems related to preferences in connection with complex products and analyzes how consumer preferences can be measured.

In recent decades, a number of factors have led to the emergence of complex products. The development of the information and communication technology has changed how companies operate and spurred changes in the economy which have been unprecedented since the industrial revolution (Szabó, Hámori, 2006). The spread of mass products created through standardization has made a number of products now widely accessible although they were previously available to a narrow layer of society. With the strategy of differentiation, a wide variety of products has been created. One way of product differentiation is to add new functionality to the existing basic functions, i.e. to add new attributes, features. Today, the number of features for certain products has increased to such an extent that a consumer is almost unable to consider all features when making a decision. Not only do manufacturers and retailers want to know if a consumer purchases a particular product, but also what features encourage them to choose a specific brand or a product version within a given brand. Therefore, the manufacturer aims to use a combination of features to make the product that can best satisfy the needs of consumers – or the special needs of a group of consumers. One way to do this is customization to satisfy consumer needs on a segment level as well as to take into consideration individual preferences within a segment. As a result, the notion of mass customized products was created (Davis, 1989). Almost all the characteristics of such products make it possible to satisfy individual needs in a cost-effective manner. The emergence of mass customization is primarily due to the fact that information technology has enabled us to customize products at a lower cost. Mass customization became the best option for companies when it became possible to keep both marginal and fixed costs low (Cox-Alm
Thus, the emergence of complex products was largely enabled by the strategy of mass customization.

*The timeliness and relevance of the topic to be examined is underpinned by several factors.* In recent decades, an increasing number of researchers of economic psychology, primarily, have supported the idea that consumer preferences are not stable, but are created as a result of the task and the context during the decision-making process (Bettman, Luce, Payne, 1998). This is most likely to occur in a decision-making context where a consumer needs to *make a complex or new decision* (Bettman, 1979). This is partly in connection with the theory of bounded rationality (Simon, 1955). An important statement of this theory is that decision-makers have a limited capability to process information. Herbert Simon's theory (1982) suggests that consumers possess utilities on the attributes level as well but due to their limited capacity to process information they use or recall only a certain subset of attributes during the decision-making process. In addition, consumers sometimes look for a satisfactory decision rather than an optimal one (in terms of maximum utility) when making a choice. Based on the different decision-making tasks or contexts, consumers “activate” different subsets, and therefore we many times can observe preference reversal or instability. Simonson (2008) and Kivetz et al. (2008) found that there are more stable and less stable preferences, which are based on inherent preference or disposition. Consequently, a major direction for future research will be to identify the preferences that are construed as the decision is made and those what are based on inherent preference or disposition. Kivetz et al (2008) emphasize that stable attributes identified in a decision problem are not necessarily inherent preferences. They may be stable only because they have been construed in the same context.

The increased complexity of products poses new challenges to researchers in the exploration of consumer preferences. This is partly due to the fact that the methods used earlier to explore consumer preferences related to product attributes – including conjoint analysis or the self-explicated method – can hardly or not be used to explore preferences related to complex products. For this reason, in recent years, focus shifted to the improvement of these methods to make them suitable to explore preferences related to a large number of complex product attributes and/or products with complex features (Netzer, Srinivasan, 2011, Park et al., 2008; Scholz et al, 2008).

These studies primarily concentrate on resolving technical problems caused by complexity, to make them capable of handling a large number of attributes. The methods, however, *eliminated the other phenomenon triggered by complexity, namely the instability of*
consumer preferences. In my doctoral dissertation, particular attention is paid to the study of factors affecting the stability of consumer preferences.

The two approaches mentioned above, conjoint analysis and the self-explicated method, are based on the basic assumption of the classical utility theory that consumers have stable and coherent preferences. Many studies conducted in the past decades on economic psychology have confirmed that consumer preferences are not stable. This was demonstrated primarily by preference reversal. Research showed that the stability of preferences is influenced by a number of factors, such as the context (Tversky, Kahneman, 1980), the goals (Bettman, Payne & Luce, 1998), and the experience (Hoeffler, Ariely, 1999). In my dissertation, I consider it important to examine how the findings of economic psychology concerning preference stability and the nature of preferences can be applied and integrated into the measurement of consumer attribute preferences.

2. RESEARCH OBJECTIVES AND HYPOTHESES

In my dissertation I tried to link the approaches of two disciplines. I approached the problem of measuring product attribute preferences from a new perspective, from economic psychology and the related idea of preference instability. I examine the problem of measuring the preferences related to product attributes from a marketing research perspective as well and focus on new challenges raised in connection with the complexity of products.

The figure below shows the theoretical model developed based on the available literature. As products became more complex, the number of attributes and variants increased which, partly owing to the limited capacity of decision makers to process information, makes it difficult for the consumers to fully evaluate every alternative. When weighing alternatives, the development of preferences is affected by what decision-making strategy a consumer chooses. Consumers do not always “consider” all possible attributes and characteristics in the evaluation and a number of factors (effort, goals, time constraints, etc.) can influence what set of attributes are involved in the decision-making process. However, the perception and stability of preferences is always dependent on the context in which a decision-maker has to express his or her preferences. The consumer’s individual characteristics, product-related attitudes and the characteristics of the decision will also affect the stated preferences.
Taking the above model as a starting point, my doctoral dissertation aims to examine the stability of consumers’ product attribute preferences: on the one hand, I look into whether there are any significant differences in the stability of consumer preferences on a product attribute level, and on the other, I wish to explore what factors influence stability in terms of attributes and features. I measure stability in an experiment integrated into a longitudinal study along the same context.

In the first group of our research hypotheses, we examined whether there is a significant difference between the stability of the attributes and the stability of the preference types (primary preference, secondary preference, and non-preference). The hypotheses related to this question are as follows:

**Hypothesis 1:** There is a significant difference between the stability of different attributes.

**Hypothesis 1.1.** There is a significant difference between the total preference stability of different attributes.

**Hypothesis 1.2.** There is a significant difference between the stability of the different types preference attributes (primary preference, secondary preference and non-preference).

**Hypothesis 1.3.** There is a significant difference in the number and type of attributes mentioned in the spontaneous and the aided phase.

The other group of the hypotheses examined what factors influence the individual differences in the stability of these attributes. We divided the factors into four categories.

*Source: edited by the author*
to examine the stability of preferences: based on the criteria linked to the decision, the task, the product and the respondent’s personality.

**Hypothesis 2: Some decision-related factors (proximity of the decision, importance of the decision) positively influence the preference stability of the individual attributes.**

**Hypothesis 2.1** The preferences concerning the product attributes of those who are closer in time to a real decision are more stable than the preferences of those for who this decision is currently not relevant. Thus, the proximity of the decision positively influences the preference stability of the individual attributes.

**Hypothesis 2.2.** The importance of the decision positively influences the preference stability of the individual attributes.

**Hypothesis 3: Some factors related to a specific product (presumed informedness, degree of involvement, brand loyalty) positively influence the preference stability of the individual attributes.**

**Hypothesis 3.1** The preferences of respondents who declare themselves more informed are more stable than the preferences of those who are less informed. Thus, presumed informedness positively influences the preference stability of the individual attributes.

**Hypothesis 3.2** The preferences of respondents who are more involved with a product are more stable than the preferences of those who are less involved. Thus, the degree of involvement positively influences the preference stability of the individual attributes.

**Hypothesis 3.3** Brand loyalty positively influences the stability of brand preferences.

**Hypothesis 4: Some factors related to a consumer’s personality (risk avoidance, willingness to pay) positively influence the preference stability of the individual attributes.**

**Hypothesis 4.1** The preferences of respondents who have a risk-avoiding attitude during a purchase are more stable than the preferences of those who like taking risks. Thus, risk avoidance positively influences the preference stability of the individual attributes.
Hypothesis 4.2 The preferences of those who demonstrate a higher willingness to pay during a purchase are more stable than the preferences of those who would spend less on a particular product. Thus, willingness to pay positively influences the preference stability of the individual attributes.

Hypothesis 5: The perceived ease of the task (the identification of preferences) positively influences the preference stability of the individual attributes.

Hypothesis 5.1 The preferences of those respondents who felt it easier to fill in the questionnaire are more stable than the preferences of those who found it difficult to complete the questionnaire. Thus, the subjective perception of the ease of the task positively influences the preference stability of the individual attributes.

Hypothesis 6: Consumers primarily have instable preferences with the attributes of more complex products.

3. STRUCTURE OF THESIS AND THE METHODS APPLIED

To answer the above questions, my dissertation is divided into two major parts. The first bigger part (Chapters 2.1, 2.2 and 2.3) presents the theoretical background of the processed and researched topic, and the second part discusses three consecutive and complementary primary studies and their findings.

In the first part of the theoretical overview, I discuss the approaches related to products and product attributes. First, I describe the different types of attributes based on literature and then I introduce the notion of a complex product and the reasons for its emergence.

In the second theoretical subchapter I discussed in detail the different concepts and the interpretation of utility and preferences, and then I examine the factors affecting consumer preferences. I look into the effect of context, the task, experience, and values on preferences based on literature. I touch on the problems of preference stability, the different related approaches and views in literature.

The third subchapter of the literature overview presents the basic methods used for measuring the preferences related to product attributes and then it deals with the problems and approaches arising due to complexity. Finally, the newly arisen or not fully solved problems are outlined.
After presenting the theoretical framework (*see chapter 3*), I present the theoretical model of the series of primary research, the research questions and hypotheses that have arisen. Here I describe the methodology of the three consecutive surveys. *Chapter four* discusses the findings of the series of primary research where I examine the problems entailed with measuring consumer preferences and preference stability. Finally, I evaluate the hypotheses and formulate the theses of the dissertation based on my conclusions.

Figure 1. Factors affecting the stability of preferences

3.1 *Research methodology*

For this dissertation, three consecutive and complementary studies were conducted to explore the system of consumer preferences and examine the stability of attribute preferences (Figure 2).
In the first two studies, we chose the mobile phone as research object, as it seemed ideal for our research from several aspects:

- it is a complex product with a large number of attributes
- the people involved in the research (students) possess such a product and have experience with it.

For the third study, we chose a totally different, “average” product: yogurt.

For both products, we conducted qualitative research in the first step to assess consumer preferences and perceptions in connection with the product. In the second research phase, we used the experience gained in the in-depth interviews to develop the questionnaire for quantitative research.

For all three studies, we used convenience sampling. The respondents in the sample were college and university students aged 18-23.

We conducted our survey in two phases within our quantitative research using personal interviews with a standardized questionnaire. In the two phases, we asked respondents the questions relating to product attribute preferences two times with one week’s interval. This
was to ensure that in addition to consumer preferences we could also examine the stability of preferences.

After the descriptive statistical analyses, we analyzed the stability of attribute preference and the effect of influencing factors using a t-test (paired t-test and ANOVA). In the analysis, we pointed out the relationship between the attributes using multidimensional scaling.

The research was designed to measure the stability of consumer preferences related to product attributes. The approaches presented in the theoretical part show that currently there is no single position among researchers in economic psychology on the nature of consumer preferences. On the one hand, the number of criteria examined in the exploration of the factors affecting the development of preferences increased and although approaches have been put forward to take into account and group these criteria, still no commonly accepted point of view exists in literature. On the other hand, there is also no common position on how preference stability should be judged (Bettman, Luce, Payne 1998, Simonson 2008 and Kivetz, Netzer and Schrift; 2008, Bond, Carlson, Keeny, 2008), Warren, MCGraw, van Boven, 2011).

The starting point for the research concept was the preference concept formulated by economic psychologists claiming that consumer preferences are context-dependent and often developed/construed when a question is asked / a decision is made. It is the starting point for classic empirical research methods (conjoint analysis and the self-explicated method), aimed at identifying consumer preferences, that preferences are stable and that the researcher is responsible for exploring them using an appropriate method. Since the above mentioned methods do not take into account the possible instability of preferences, our research was aimed to identify preferences and examine stability in a longitudinal study. Naturally, we are aware, and this is also confirmed by the previously discussed theoretical foundations, that it is a rather complex (if not impossible) task to fully explore consumer preferences, therefore we have tried to set the goal to examine a narrower set of problems. Hence, the research objective is to examine which product attributes/characteristics seem to be more stable and which less stable within the same context rather than to examine stable and instable attribute preferences in general. It was important to assume the same context because, as shown by many studies in the listed literature, a change in the context may change the preferences of the consumers.

In recent years, several studies were conducted in marketing using repeated measure/repeated choice within the same context. Some of them looked at what marketing
research tools can be used to make the responses more stable (Dolnicar, Rossiter, 2008), or what proportion of aggregate data is reliable (Rungie, 2005, Dall’Olmo Riley et al. 1997).

Nevertheless, we consider it important to examine the stability of these preferences, especially with regard to how the information on attribute stability can be used in marketing, and whether we can say any more about consumer preferences than without this information.

The other objective is to examine what factors influence the stability of consumer preferences.

We have chosen two methods to measure consumer preferences: on the one hand, the analysis of spontaneous responses (see research no. 1) and on the other a pre-compiled list of attributes (aided response) (research no. 1, 2 and 3). When the list was compiled, the attributes and characteristics of specific products were explored partly by gathering the attributes of products available in the Hungarian market and partly through in-depth interviews.

The preferences were examined in a complex manner by each product attribute to see with what attributes the consumer has primary preference, secondary preference or non-preference. The individual preferences were characterized for consumers as follows:

- **primary preference** – “I would choose this one, above all”
- **secondary preference** – “I might consider this one as well”
- **non-preference** – “I wouldn’t choose this one at all”

The respondents were given the opportunity to highlight the attributes that are unknown to them, as with complex products there may be a number of attributes that a respondent did not know before. They may not have established preferences.

To measure stability, respondents were asked to fill in two questionnaires: the first one was a longer version, whereas in the second one they had to answer again certain questions related to attribute preference. The time elapsed between two measurements ranged from one week to one month. In the two interviews, the respondents had to answer questions on preferences two times.

The same context means that we tried to arrange all circumstances so that they are possibly identical at the time of the two measurements: on the one hand, they completed the questionnaire on the same day of the week, at the same time of the day in the same environment, on the other, the questions on attribute preference examined were identical as well.

The goal outlined to the respondents was the same: If you had to choose a new product, what attributes should it have?
In addition, it was also important to examine whether there are any factors that influence the stability of a given attribute. Based on several factors identified in literature, we examined the relationships.

4. MAJOR FINDINGS OF THE DISSERTATION

Below I present my theses based on the objective of the dissertation, the hypotheses made and the findings of primary research.

**Thesis 1:** The stability of preferences related to various product attributes is different; there are attributes for which consumer preferences are more stable and others for which they have less stable preferences.

Thesis 1 is in connection with hypothesis H1.1 which was examined in all three surveys. In the first study, we examined attribute-level stability for spontaneously mentioned mobile phone features and found that there is a significant difference between the attributes spontaneously mentioned in the two phases. In the second and third research, we measured preference stability for mobile phones and yogurt using a previously compiled (aided) list. In both cases, we found attributes that were more stable or less stable than the average.

**Thesis 2:** The preferences identified in spontaneous and aided responses differ significantly from one another in terms of the number and type of the preferred attributes.

Thesis 2 is in connection with hypothesis H1.3 which was examined in the first research. Research by Bond et al. investigated the decisive criteria of decision makers and found that decision makers are only partially able to spontaneously reveal their preferences, and that there is a significant difference between the attributes explored spontaneously and with the list used in aided measurement. In our research, we applied their method to product attribute preferences. Our findings support our hypotheses in which we assumed, based on the findings of Bond et al. (2008), that we would find a significant difference between the type and number of attributes mentioned in spontaneous and aided responses.

**Thesis 3:** Thus the distance in time of the decision significantly influences the preference stability of the individual attributes.

We experienced the effect of decision proximity on the stability of attribute preferences with two attributes. Those who bought their phone within a year, had significantly
more stable preferences with respect to business and multimedia attributes than those who bought their phone earlier.

**Thesis 4: Product-dependent factors (informedness, degree of involvement, brand loyalty) significantly influence the preference stability of the individual attributes.**

We examined the effect of product-related factors on the stability of product attribute preferences in the second research (H3.2, H3.3, H3.4). Based on the findings, we can say that those who feel more informed about mobile phones have significantly more stable preferences with regard to camera options, basic, multimedia and business attributes. As for the degree of involvement, we found that in terms of brand and business attributes those respondents who were more involved with the product had more stable preferences. Therefore, this hypothesis is considered accepted. Also, we found a significant relationship between brand loyalty and the stability of brand preferences. Consequently, those who would choose the same brand of mobile phone as their current one, have significantly more stable brand preferences than those who would switch to another brand.

**Thesis 5: The perceived ease of the task significantly influences the preference stability of product attributes.**

Thesis 5 is in connection with hypothesis H2.7 which was tested in the second research. Based on the results we can say that with almost all attributes those who found it easier to fill in the questionnaire, had more stable preferences, and for the **business attribute** this difference was significant.

**Thesis 6: Consumers do not primarily have instable preferences with the attributes of more complex products, as attribute preferences may be more instable with a less complex product as well.**

Our research does not confirm that consumer preferences are unstable in terms of preferences for complex products. We found a significant difference in the stability of attribute preferences with not only the mobile phone but also with an average product such as yogurt. This suggests that attribute complexity rather than product complexity can be decisive.

**Thesis 7: Methods used in marketing research for measuring attribute preferences, such as the self-explicated method and conjoint analysis, do not examine the**
stability of preferences. In addition to the preferences stated by a consumer, their stability provides new insights to understand consumer behaviour.

The findings indicate that there are differences in the stability of consumers’ product attribute preferences. We observed significant differences in the stability of products with similar average preference. This shows that it is worthwhile to examine preference stability, as we can gain new information on the behaviour and preferences of consumers.

From a theoretical point of view, I consider it a valuable result to give an overview of the theory, the definitions and the uncertainty surrounding the interpretation of preference and preference stability. The approach of economic psychology that is different from the one applied in classical economics has enriched the literature of economics with a number of new findings. However, even among economic psychologists, no consensus exists about the nature of preferences. To systematize these approaches and reveal contradictions, it is important to set up a theoretical model.

Applying the findings of economic psychology regarding preferences and their stability in marketing research / empirical research methodology is a new approach. In the measurement of product attribute preferences, the methods of marketing research are based on the classical economic approach. Therefore, I consider it important to integrate the findings of the approaches relying on economic psychology into the methods of marketing research. Although I had neither the intention, nor the possibility to entirely implement this in my dissertation, I hope that my research will be a useful basis for other researchers interested in this topic.

The findings of the quantitative research suggest that there is a significant difference between the stability of specific product attributes and the preference stability of the attributes. This was confirmed by the results of all three surveys.

Another new result was to point out that the preferences found in spontaneous and aided responses differ significantly from one another in terms of the number and type of preferred attributes.

Similarly, many factors affecting the stability of preferences influence attribute-level preference stability. For the mobile phone, informedness and the proximity of the decision affected the stability of individual attribute preferences the most. Those who consider themselves more informed have more stable preferences in terms of the brand, or business, basic and multimedia attributes. Those who bought their phone within a year, have more stable preferences with respect to business and multimedia attributes. In contrast, this group
has less stable preferences for the style attribute than those who bought their phone earlier. In the case of yogurt, we found no significant influencing factor. This may partly be due to the fact that we examined fewer influencing factors.

Methods used in marketing research for measuring attribute preferences, such as the self-explicated method and conjoint analysis, do not examine the stability of preferences. Another new result was to point out that in addition to the preferences stated by a consumer, their stability provides new insights to understand consumer behaviour.

REFERENCES


PUBLICATIONS RELATED TO THE DISSERTATION

Books and book chapters (English)


Books and book chapters (Hungarian)


Articles and journals (English)


Articles and journals (Hungarian)


Conference proceedings (International Conference, English)


Conference proceedings (Hungarian)


Other publications

Books and book chapters (Hungarian)


Conference proceedings (International Conference, English)


Conference proceedings (Hungarian)
