Ph.D Program in Management and Business Administration

THESES OF DOCTORAL DISSERTATION

Krisztina Rita Dörnyei

Analysis of Consumer Information Search Behaviour on Food Packaging

Ph.D Dissertation

Supervisor:

András Bauer, Ph.D
associate professor

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Department of Marketing

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I. Research Background and Significance of the Topic

I.1. Objectives and Importance of the Topic

Our endeavour has been to look at consumers' information seeking behaviour, i.e. how and why consumers seek information from external sources before their purchase decisions.

The aim of the research is threefold. First, an **academic goal**, is to better understand consumer information search behaviour with the help of a literature review, preliminary studies and primary research. Second, there are a number of factors, which have been known to affect information search as borne out by earlier studies, but which have not been researched in depth in connection with information search, or the research was carried out using old-fashioned methodology, or it came to controversial conclusions. This thesis wishes to establish the exact impact which these factors, listed below, have on information search:

- product category
- assortment depth
- number of product attributes
- involvement
- prior knowledge and experience
- demographic factors.

The **practical aim** of the research is an understanding of labelling on packaging through the eyes of consumers, making it possible for corporate managers to plan packaging more easily and position products more accurately. Based on interviews with industry experts we can say that the informative function is dwarfed by design in practice in corporate decision-making despite being essential for informing consumers at points of sale. After completing this research we will be able to perfect the informative function of packaging and give practical advice on how to create effective product packaging.

The research also has a **social-welfare goal** insofar as it helps understand consumers' information seeking behaviour. Creating the necessary legislation for informing consumers and promoting access to product information is a task of the state. Consequently, the knowledge of consumers' information seeking behaviour is an essential precondition for legislators. Through a better understanding of behaviour patterns it becomes possible to make decisions about compulsory and voluntary information items and draw up recommendations.

I.2. Research Background

The antecedent of a purchase decision is information search, which is of key importance for marketing science from both a practical and a scientific point of view (Bettman, 1979). And although it has been the subject of studies since the 1920s, (Copeland, 1923), it has not lost it significance, on the contrary, it is a hotter issue than ever due to the free movement of goods, the ever faster turnover and larger merchandise, the large amount of information provided by the Internet and media and the changing trends of consumer behaviour (Guo, 2001). Consumers make their decision before purchase based on information from internal sources (stored in memory) and external sources (advertisements, in-store information, friends, experts) (Bauer, Berács, 2006). When purchasing food labels on packaging is an extensively used source of external information (Dörnyei, 2010), as they display a description of the product's attributes. Labelling is a source of information and apart from being useful for consumers, its presence is an obligation stipulated by law. A proactive corporate behaviour requires the conscious design of the informative function of packaging as it is the basis of consumers' purchase decisions

To structure the literature on information seeking, we used Stiegler's (1961) information search paradigm, suggesting that information search has four dimensions: 'why', 'when', 'what' and 'where'. The responses to these questions form the basis of measuring and comparing information search activities. In our view there is a fifth dimension to be included, i.e. the dimension of 'why', which we also used when summarising the literature.

A number of theories have been created to explain the whys of consumer information search. The most popular ones are the economics of information approach, information seeking cost theory, prospect theory, the psychological model of information processing, Elaboration Likelihood Model and characteristics theory. According to the latter, instead of looking at a product's usefulness directly, consumers look at the usefulness of a product's characteristics. Four types of information are to be distinguished when we talk about information seeking: search, experience, credence attributes and Potemkin information. Caswel and Mojduszka (1996) argue that labelling transforms experience and credence attributes into search attributes thus consumers are able to compare different products at points of sale and base their decisions on that comparison.

The literature has extensively studied the factors influencing information search, or, as they are referred to more commonly, the antecedents of information search. Seven such antecedents are to be listed (Beatty, Smith, 1978; Guo, 2001): marketing environment, situational variables, product importance, knowledge and experience, individual differences, conflicts and conflict resolution strategies and cost of search. The authors described how each

of these factors influences information search. In this thesis three groups of factors affecting information search have been examined in detail, i.e. involvement, prior knowledge and marketing environment: their effects on information search has been controversially or little researched in literature.

Food industry is thought to be a good example for studying information search, as consumers tend to pay more and more attention to what type of food they purchase. Food purchase is an activity resulting from biological, social and cultural processes related to self-preservation, influenced by biological, psychological, sociological, anthropological, demographical and economic factors. Food consumption patterns and explanations vary, which may arise from cultural differences. Foods belong to either of two groups, cognitive or emotional products (Cleays, Swinnen, Abbeele, 1995; Lehota, 2001). While with emotional products consumers rely little on information search, with cognitive products it is the opposite, information search is more extensive. In countries where living standards are higher, the need for health preservation, health consciousness and the increase in the demand for quality food has resulted in more massive information seeking. Research in this field (carried out with public, scientific and private cooperation) does not only give an account of how consumer behaviour has changed but has also been giving increasingly better quality and fuller range of information since the 1970s to consumers. Due to its specific nature, several models have been created on how nutrition and food attributes information is processed, whereby information search is explained in terms of different factors which relying on the earlier results of the applied discipline.

The source of information search is labelling on packaging. Oftentimes, packaging is the first and only marketing tool consumers encounter before a purchase, therefore it is considered to be the most important communication tool instead of advertisements (Behaegel, 1991; Peters, 1994). Marketing literature, although starting to recognise its relevance, has relatively few theoretical works in the field of packaging. Early studies focused on the general features, roles and communication roles of packaging design along with how it affects brands but seem to entirely neglect its informative function. Consumers, nevertheless, do not only want to purchase a product but obtain information about it, whose means is labelling. The definition of information content found on packaging, i.e. labelling is the following: *a communicative tool between producer/distributor and consumer, including all compulsory and voluntary information content on or next to the product packaging, of which a brand name and symbol, descriptive or grade information can be distinguished*.

Even though from the point of view of information search it is hard to study labelling on its own, independently from other sources of information, due to its growing significance it should still be studied in its own right. Numerous studies examine the role and effect of labelling during purchases, giving summaries of factors affecting label reading from an

academic (Drichoutis et al., 2006; Baltas, 2001), or from an organisational aspect (EdComps, 2007; Harper et al., 2007). They all agree on the increasing importance of labelling. Although counter-opinions exist (Skuras, Dimara, 2005), it is a generally held view that labelling affects perception, preferences, anticipations and after trying a product, evaluation. Along with that, individual characteristics of consumers (demography, product knowledge, product awareness, trust, scepticism, motivation, state of health), situational factors (time available, attention and interest) and form and content of information (length, potential for misinterpretation, comparability with other products) also affect label use (Wansink, Sonka, Hasler, 2004).

I.3. Pilot Studies

Three preliminary studies were conducted with the aim of giving a foundation to the theoretical model, and testing and pre-examining a few elements of the empirical research. The first preliminary study is a qualitative analysis carried out using an exploratory methodology, followed by a quantitative questionnaire survey and thirdly, a questionnaire scale testing (*Figure 1*).

	QUALITATIVE STUDY	QUANTITATIVE STUDY	SCALE TESTING
METHODOLY	Netnography	Self-report study	Self-report study
SUBJECTS	Online sources (blogs, chat rooms, forums)	630 undergraduate students	255 undergraduate students
TIME OF THE RESEARCH	June 2010	May 2009	May 2010
AIM OF THE RESEARCH	How do consumers use food labels?	How do consumers use food labels? What are the latent motives behind label use?	Which involvement and subjective knowledge scale is adequate for further research?
SOFTWARE USED	Nvivo 7	SPSS 17	SPSS 17
METHOD OF ANALYSIS	Text analysis	Variance analysis, multidimensional scaling, Cluster analysis	Faktoranalysis, variance analysis, scale testing

1. figure – Summary of pilot studies
Source: edited by the author

Based on the three preliminary studies (netnography, self-administered questionnaire and scale testing) we can conclude that labelling is needed, consumers use it both during their point of sale information search and home product use.

Through the use of the method of **netnography** we aimed at exploring the general use of labelling on packaging and related consumer behaviours. The results of the exploratory

research are limited due to both the nature of the method and its application: the outcome reflects the opinion of an active online population. Also, the results do not make the exact values of behaviours and patterns identified clear, and fail to show how often and with which consumers these patterns surface.

We aimed at quantifying qualitative results using a **self-administered online questionnaire**. Our results suggest that respondents confirm their need for labelling and that they use them while choosing food. In conclusion of our research we argue that labelling is an important factor in the purchase decision. Not every consumer reads labelling though, label use is also characterised by demographic and situational factors. Types of labelling differ in terms of their usage frequency and strong relationship was found between label use and gender, organic food consumption and vegetarianism. Product category is an important factor of label use, for consumers will look for different amount of information in different product categories. Consumers may be categorised by the type of information they want when purchasing a product as label types have varying relevance for them. Our research reveals that functional properties connected to health have higher priority for respondents than brand. In addition, origin (mainly if it is from Hungary) and the sell-by date are of interest out of compulsory label contents. If an expression is not familiar or advertised enough, consumers do not regard it important and ignore it when making their purchase decision.

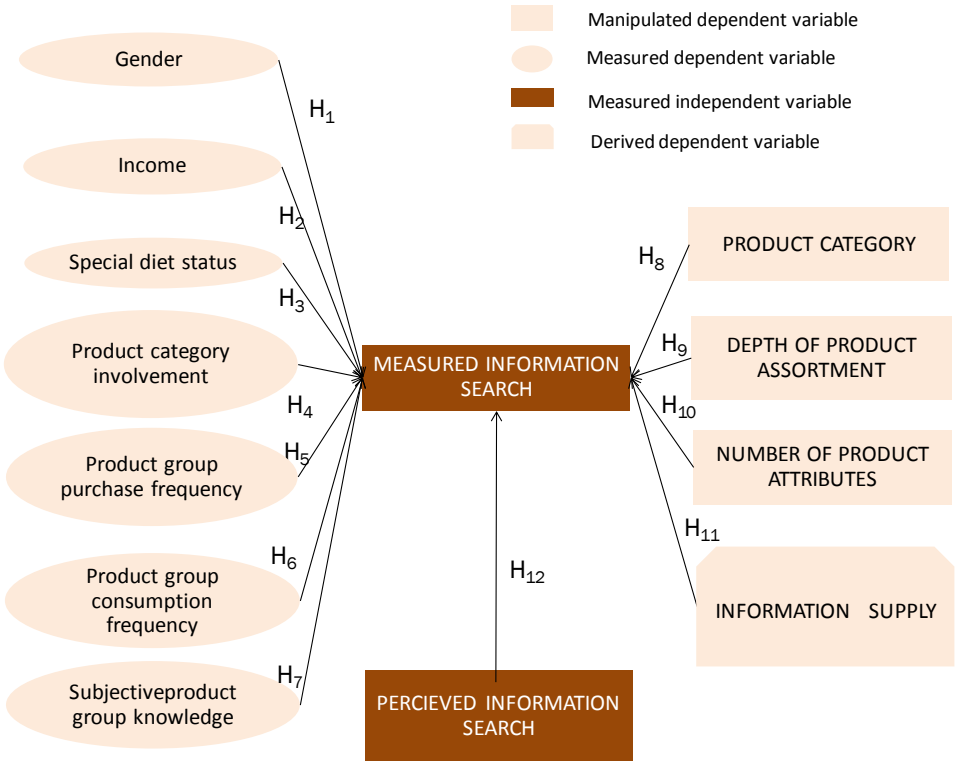
A **new classification of labelling** has been introduced as a result of multidimensional scaling, which means a redefinition resulting from a consumer questionnaire. It is useful since consumers do not make their decision affected by compulsory components or descriptive or grading properties but are influenced some other, latent dimensions. Three such latent dimensions have been discovered. First, prior knowledge, which is needed to interpret information. Second, involvement (which may be self-interest or public interest) also affects label use. Third, trust in labelling also influences the way labels are used. Another finding of our research is the grouping of labels resulting from cluster analysis. This classification includes so far little emphasised but increasingly searched factors by consumers such as nutrient information, functional, technological and ethical information as well as classic information types (on shape and brand). These are homogenous groups which can be described in terms of the three dimensions.

Finally, the **scales** of the two antecedents identified in the literature and in the preliminary research, i.e. the constructs of prior knowledge and involvement were **tested** in Hungarian, with Hungarian participants. Both scales were defined as unidimensional and have three items.

II. Applied Methods

Our endeavour has been to look at consumers' information seeking behaviour, i.e. how and why consumers seek information from external sources before their purchase decisions. Added to that, we also examine what factors affect the amount of information search, since information search is intertwined with the decision making process, they are difficult to investigate on their own, it is therefore important to examine these affecting factors, too. The choice of these factors is based on the recommendations of the relevant literature (Guo, 2001) and the conclusions of our preliminary studies.

II.1. Theoretical Model



2. figure – Measurement model
Source: edited by the author

In the theoretical model which is about the relationship between information search and its antecedents, information search is a dependent variable while information supply (the number of product attributes, assortment depth), product category, individual differences and prior knowledge are independent variables. The dependent variable is one we wish to measure and which is assumed to be influenced by independent variables, having a causal effect on the dependent variable, i.e. information search. Research hypotheses mainly concern the relationship of the dependent and independent variables, the relationship of antecedents and

information search. Finally, the differences between measured and assumed information search are analysed. Based on the theoretical model, the hypotheses to be examined are discussed below (*Figure 2).*

II.2. Methodology: experiment

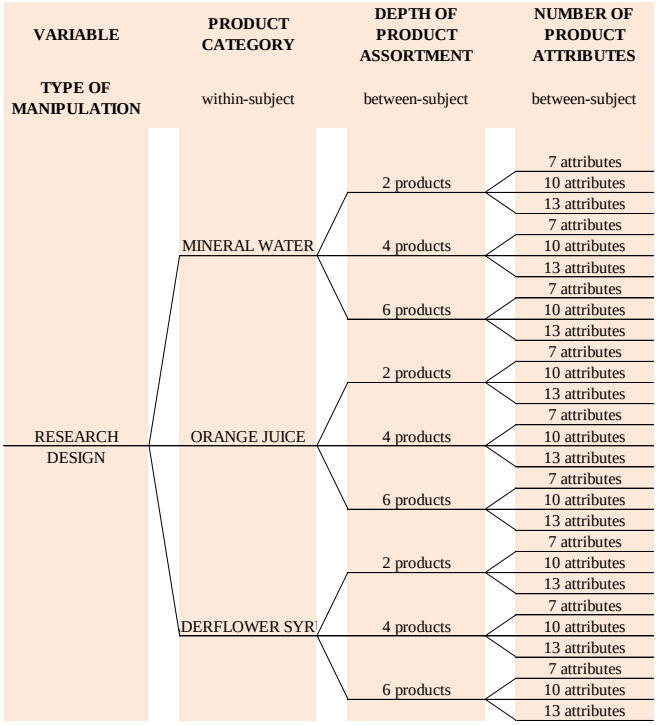
In literature several methods have been used for studying external information seeking. These included questionnaires (Baltas, 2001) to explore label use, qualitative methodology, for example focus groups (Wright, 1997), laboratory experiment, for example eye tracking (Rawson, Janes, Jordan, 2008) and point of sale observation and research (Russo et al., 1986; Cliath, 2007).

The methodology selected for this study is the **multivariate computer administered laboratory experiment**. The experiment is a research strategy in which independent variables whose effect we wish observe are systematically varied while other factors are kept at the same level (Keppel, 1991), which seems to be the appropriate method for examining the associations of the hypotheses. The laboratory experiment takes place under monitored conditions therefore variables are highly controllable and distracting conditions can be filtered out, ensuring high internal reliability to results. Its disadvantage is that it becomes hard to generalise to a multitude of situations in life from one artificial situation, which jeopardises external reliability but it can be minimised through the right execution of the experiment. A multivariate experiment is applied here as we want to examine the effect of several independent variables. On a computerised surface with the help of experimental methodology using software, participants can search the surface similar to an online store for information about products. Obviously, in an experiment store environment and packaging cannot be perfectly imitated, but we argue that this software based solution imitating online purchase situations is appropriate for measuring information search if participants are familiar with the online environment resembling an actual store even if it is virtual.

Using this method enables us to record the entire information search process, to identify search patterns and specialities, to observe and measure required product attributes and time spent with the help of this computer software. In this way information seeking behaviour patterns become comparable and we will be able to get new information in connection with point of sale information search. This is the methodology with which information search can be documented to its most accurate and light can be shed on tendencies which have not yet been identified in literature.

The research consisted of three parts. In the first part participants filled in a 20-question questionnaire aiming at measuring descriptive and measured independent variables. After that a pilot test was carried out, then respondents were asked to actually test products, where they were to select a product within the three product categories offered. They were provided with the opportunity to look for any information necessary for their decisions. Thus we were able to accurately document the product attributes subjects wanted to know about a certain product. Information search, the dependent variable of the experiment, was measured by a click count and the exact duration of information search.

In the experiment subjects were divided into groups based on independent variables. Measurements were carried out *between subjects* along with repeated measurements *within subjects*. This resulted in a 3x3x3 **mixed research design** (*Figure 3*). 9 research groups were identified based on the 3 variable levels of the two independent variables manipulated between participants. In the experiment to rule out any other influences, all participants, product categories and product attributes were randomly assigned to groups and products were shown randomly to rule out possible distortions arising from order.



3. figure – Mixed research design
Source: edited by the author

III. Results of the Empirical Study

Three larger groups of hypotheses were defined in the research. We looked at the correlation between antecedents (individual differences, involvement, prior knowledge and marketing

environment) and information search size; we assumed a functional relation between information supply and information search, and finally we compared two methods of measuring information search.

III.1. How do individual differences affect information search?

First the influence of **gender** was examined from among individual differences. Similarly to most studies (Mueller, 1991; Guthrie et al., 1995; Nagya, 1997; Govindasamy, Italia, 1999), we assumed that women look for more information before their food purchase decisions both in terms of the amount of information search and its duration.

H_{1a}: Before making their food purchase decisions, female consumers look for information longer than male consumers.
H_{1b}: Before making their food purchase decisions, female consumers look for more product attributes than male consumers.

The hypothesis was examined using GLM across the averages of the two groups' information search. Women typically spend significantly more time on information search ($p<0.05$), but they do not look for more information on average, **therefore hypothesis H_{1a} is accepted while hypothesis H_{1b} is rejected.**

The two genders look for similar amounts of information, but women are thought to read the information more thoroughly and spend more time on understanding and processing it. Besides, although no hypothesis was drawn up in this respect but it complements the interpretation of results, the information seeking behaviour of the two genders differ in terms of the type of information sought: women look for the place of origin product attribute more.

The other individual difference was **financial situation**, whose influence on information search was investigated. We saw contradictory results in literature: there were exploratory studies concluding there to be either a positive (Piedra, Schupp, Montgomery, 1996; Wang, Fletcher, Carley, 1995) or a negative (Drichoutis, Lazaridis, Nayga, 2005; Schupp, Gillespie, Reed, 1998) correlation between the two factors so the examination of this relationship seemed reasonable enough.

H_{2a}: Before making their food purchase decisions, consumers of higher income look for information longer.
H_{2b}: Before making their food purchase decisions, consumers of higher income look for more product attributes.

GLM was used again to compare the averages of the categorical variable across the groups, on the basis of which it is concluded that financial situation affects both the duration of information search ($p<0.1$) and the amount of information searched ($p<0.1$). An inverted U shape relationship was revealed between the two variables: consumers with an average financial situation look for more information while those of either good or dire financial situation look for less information, **therefore both hypothesis H_{2a} and hypothesis H_{2b} are accepted.**

The reason behind it is that those in a worse financial situation tend to be more price sensitive and other information than price is not really relevant for making their decisions. Those, however, in a good or very good financial situation do not require a lot of information since they can afford to purchase whatever products taking relatively few risks: they are not forced into compromises due to their income. In contrast to them, consumers with an average income can afford a certain degree of freedom in their choices whose risk will then be higher than that of high income consumers. Financial situation also showed a significant relationship with looking for information on price as a product attribute: those in a better financial situation did not look for this product attribute.

The third important individual difference is following a **special diet**, which has been confirmed in literature several times (Bender, Derby, 1992; Drichoutis, Lazaridis, Nayga, 2005; Nayga, Lipinski, Savur, 1998; Schupp, Gillespie, Reed, 1998). In this research medical, slimming, cleansing, vegetarian and organic diets were asked about using categorical variables (Govindasamy, Italia, 1999; Dörnyei, 2008). It was assumed that those following a particular diet, or consuming more organic food, or being vegetarians will look for more information.

H_{3a}: Before making their food purchase decisions, consumers following a special diet look for information longer than those not following any special diets.
H_{3b}: Before making their food purchase decisions, consumers following a special diet look for more product attributes than those not following any special diets.

The hypothesis was examined using GLM across the information search averages of the groups, both in terms of the number of product attributes looked for and the duration of information search. When comparing the averages of nutrition related variables, vegetarianism was the only one where we discovered a significant difference concerning the size of information search ($p<0.1$). Partially vegetarians looked for more information, **therefore hypothesis H_{3a} is rejected while hypothesis H_{3b} is accepted.**

Although the category ‘partially vegetarians’ may sound unusual, it was included in the research as a reaction to feedback from earlier studies. Partially vegetarian consumers supposedly eat only certain types of meat (e.g. chicken breast) and often only on special occasions. These self-imposed rules force them to lead a conscious lifestyle and require continuous attention from them, as a result of which they will look for more information. Partially vegetarians typically paid more attention to attributes such as place of origin and ingredients out of product attributes examined here than non vegetarians.

III.2. How does product category involvement affect information search?

The relationship between **involvement** and information search is an extensively studied area in literature (Durvasula, Akhter, 1990), with a growing relevance in the case of food product category (Lehota, 2001; Verbecke, Vackier, 2003; Beharrel, Denision, 1995; Bell, Marshall, 2002; Drichoutis, Lazaridis, Nayga, 2007), therefore their correlation was also investigated in this research. It was assumed that consumers of high involvement levels will look for more information, since being involved in the topic of food means more sophistication when selecting a product, therefore more emphasis will be put on information search before choosing the right food.

> ***H_{4a}: Before making their food purchase decisions, consumers with a high level of product category involvement look for information longer.***
> ***H_{4b}: Before making their food purchase decisions, consumers with a high level of product category involvement look for more product attributes.***

The hypothesis was examined using GLM based on the indicator generated from the aggregate value of the involvement scale both in terms of the number of product attributes looked for and search duration. Results showed that consumers of high or medium levels of involvement look for more information on average (but not for a longer time) than consumers of low involvement levels ($p<0.001$), **therefore hypothesis H_{4a} is rejected while hypothesis H_{4b} is accepted.**

The research confirmed the hypothesis that involvement and information search have a positive correlation and that those who show involvement in a product group want to know it more thoroughly, and a method for this is a more intensive information search activity.

III.3. How does prior knowledge affect information search?

More experience, partly a result of higher purchase frequency of a product category, is said to be in literature in a positive correlation with information search. Major grocery shoppers responsible for the meals of others in the household will be more likely to read labelling information (Drichoutis, Lazaridis, Nayga, 2005). But if they are more likely to attend to it and information search is ongoing then our assumption was that those who go shopping more frequently will look for less information and for a shorter time during an average shopping occasion, for they are already familiar with the products and their attributes.

> ***H_{5a}: Before making their food purchase decisions, consumers purchasing a certain product category more frequently will look for information for a shorter time.***
> ***H_{5b}: Before making their food purchase decisions, consumers purchasing a certain product category more frequently will look for less product attributes.***

The hypothesis was examined using GLM across the information search averages of the groups, both in terms of the number of product attributes looked for and the duration of information search. Our results show that purchase frequency significantly ($p<0.05$) correlated with the size of information search but did not correlate with its duration. Those who never go shopping looked for more information than those who do, **therefore hypothesis H_{5a} is rejected while hypothesis H_{5b} is accepted.**

Those who never go shopping wanted to obtain information about many more product attributes than those who always go shopping alone for their households. Frequent shoppers know the products on the market and do need to stop and read product information all over again during each time. They have also developed a taste for their favourite brands which they know and stick to. The fact that the duration of information search did not show a significant difference may spring from other factors, for example processing information or impatience, which influence the duration of information search more.

Another type of experiential knowledge is **consumption frequency**. Similarly to purchasing experience, we assumed that there is a negative correlation between consumption frequency and information search. Insofar as consumers consume a certain product frequently, they are already in possession of sufficient knowledge to feel familiar with it and do not have to look for a lot of information during purchase, therefore we assumed a negative relationship between these two factors.

> ***H_{6a}: Before making their food purchase decisions, those who consume a certain product category more frequently will look for information for a shorter time.***

H_{6b}: Before making their food purchase decisions, those who consume a certain product category more frequently will look for less product attributes.

We examined the hypothesis using GLM on the basis of the information search activities of those consuming the product category frequently but identified no significant differences either in terms of the number of product attributes looked for or the duration of information search. **Therefore both hypothesis H_{6a} and hypothesis H_{6b} are rejected.**

From the point of view of information search, purchasing a product and consuming a product seem to differ. Consumption does not necessarily mean having to look for information about a product because consumption follows the purchase decision process, when information is not needed. Information search is an antecedent of the purchase decision process and it is relevant when making the purchase decision but seems irrelevant for confirming consumption.

Raju, Lonial, and Mangold (1995) assumed there to be a positive monochronistic relationship between **perceived knowledge** and information search but have not identified it. We also assumed a correlation (a negative one) between the two theoretical constructs, meaning that those with high perceived knowledge will make do with less information search since they are confident enough, consequently, they will make less effort during information search and look for a less amount of information and will do so for a shorter time.

H_{7a}: Before making their food purchase decisions, consumers of higher perceived product group knowledge will look for information for a shorter time.
H_{7b}: Before making their food purchase decisions, consumers of higher perceived product group knowledge will look for less product attributes.

The hypothesis was examined using GLM based on the aggregate values of the scale both in terms of the number of product attributes looked for and the length of search time. Our results show that consumers of high and low perceived product group knowledge look for less information on average than those with a medium level of perceived knowledge ($p<0.1$), **therefore hypothesis H_{7a} is rejected while hypothesis H_{7b} is accepted.**

Those with a low level of perceived knowledge did not look for information. Those with a high level of perceived knowledge did not look for information, either, since they admittedly know ‘everything’ and their benefit does not increase if they make more search effort. Those with a medium level of perceived knowledge do not feel informed enough and therefore acquire more information.

III.4. How does product category affect information search?

Since literature argues that the relationship between **product category** and information search has not been studied extensively enough (Beatty, Smith, 1978; Guo, 2001), and our preliminary study confirmed influence of product category we thought it important to examine their relationship. We assumed that information search will differ by product category both in terms of the length of search time and the type of information looked for. In order to be able to confirm this difference we investigated the size of information search within the food product category across products of similar product categories, able to satisfy the same consumer needs and substitute one another.

> ***H_{8a}: Before making their food purchase decisions, consumers look for information about substitute products which can satisfy the same consumer need for various lengths of time.***
> ***H_{8b}: Before making their food purchase decisions, consumers look for various numbers of product attributes about substitute products which can satisfy the same consumer need.***

The hypothesis was examined using GLM repeated measures across the information search averages of groups both in terms of the number of product attributes looked for and the length of search duration. Our results show that there are significant differences of the size of information search across product categories in terms of the duration of information search ($p<0.1$), **therefore hypothesis H_{8a} is accepted while hypothesis H_{8b} is rejected.**

Significantly the most information was searched about orange juice and was done so for the longest time. Participants searched information for the second longest time about elderflower syrup while they were the least interested in mineral water. This confirms that information search size differs across product categories. In addition, although no hypothesis was drawn up relating to it but it complements the interpretation of results, differences were experienced in terms of the product attributes looked for. In the case of orange juice price, brand and ingredients, in the case of mineral water brand, producer and price and in the case of elderflower syrup ingredients, price and brand were relevant factors (in these respective orders).

III.5. How does information supply affect information search?

Even though information oversupply has been found to affect purchase decisions negatively (Malhotra, 1982), or not to provide any extra advantages (Jacoby, 1977), we assumed that this is not true for the size of information search. The more information consumers are faced, the longer time they will spend on information search. We assumed that the increase of assortment depth will lead to consumers looking for more information and for a longer time.

H_{9a}: Before making their food purchase decisions, consumers look for information longer if product assortment is deeper.
H_{9b}: Before making their food purchase decisions, consumers look for more product attributes if product assortment is deeper.

The hypothesis was examined with the help of GLM across the information search averages of the manipulated group both in terms of the number of product attributes looked for and search duration. Our results show that the increase in the number of product attributes lead to a significant increase in both the duration of information search and size of information search ($p<0.05$), **therefore both hypothesis H_{9a} and hypothesis H_{9b} are accepted.**

It must additionally be noted that the rate of increase decreases: looking at information supply weighted information search, information search size (length and size) decrease per unit. Product assortment, nevertheless, was confirmed to be one of the most important information search antecedents: it significantly influenced information search whether we looked the information search duration or the number of product attributes looked for.

Similarly to assortment, we also assumed that there is a positive correlation between the **number of product attributes** and information search as it is also an indicator of information supply. Consequently, if a product is described by few product attributes, there is no need for lengthy information search as opposed to more complicated products defined by more numerous attributes.

H_{10a}: Before making their food purchase decisions, consumers look for information longer if the number of product attributes is higher.
H_{10b}: Before making their food purchase decisions, consumers look for more product attributes if the number of product attributes is higher.

The hypothesis was examined with the help of GLM across the information search averages of the manipulated group both in terms of the number of product attributes looked for and search duration. There was no significant difference found in the information seeking behaviour of consumers in terms of the number of product attributes; group averages were identical, **therefore both hypothesis H_{10a} and hypothesis H_{10b} are rejected.**

In addition, although no hypothesis was drawn up relating to it but it complements the interpretation of results, when studying how product attributes affect information search, a significant difference was identified between information search and the number of product attributes in the cases of ingredients and place of origin. When the number of product attributes increased, the likelihood of viewing that particular attribute decreased, as opposed to for instance price and brand where no significant correlation was found. To sum up, although the correlation is not confirmed for the entire information search process, there are some product attributes whose search is influenced by the number of attributes. The fact that brand and price are always viewed independently of product attribute number explains the lack of correlation, but these two product attributes accounted for half of the total search size.

Also, it is assumed that there is a positive, continuous, functional relation between **information supply** (defined as the product of the number of product attributes and product supply) and information search. The more information a consumer is faced, the greater the amount of information search and the longer search time will be.

H_{11a}: Before making a food purchase decision, there is a positive functional correlation between the duration of information search and information supply.
H_{11b}: Before making a food purchase decision, there is a positive functional correlation between the number of product attributes looked for during information search and information supply.

The hypothesis was examined using regression, and as a result a logarithmic relation was identified between the length of general information search and information supply. The line of best fit was chosen on the basis of the explanatory power of the model (R^2), the significance level of the test function and our subjective decision as a researcher. R^2 indicated a strong correlation; information supply predicts the duration of information search in 74% and its size in 64%, ***therefore both hypothesis H_{11a} and hypothesis H_{11b} are accepted.***

The size of information search increases to a less extent if information supply is increased. As the size of information available is increased (either through including more products, or more complex products described with more attributes) consumers will, on the whole, make more effort to find out about a product but their effort will still be less per unit. Each further product attribute (information unit) will contribute to the sense of benefit for the consumer to a lesser degree. As it is explained in literature every consumer has a maximum benefit of information search which we can approach through increasing the information supply.

III.6. Do perceived and actual information search differ?

Literature measured information search using several methods. Two types of information search are to be distinguished. Perceived information search defines information size based on what consumers admit to, its methods include questionnaires (Baltas, 2001) and focus groups (Wright, 1997), while measured information search, e.g. through laboratory research (Rawson, Janes, Jordan, 2008) and in-store observation (Russo et al., 1986; Cliath, 2007) bases its conclusions on the observation of consumers' real action. The review of literature suggests that there is a difference between perceived and measured information search: self-administered methods and questionnaires consistently overestimate the results of in-store observation methods (Russo et al., 1986). Consequently, it was also assumed here that a significant difference would be identified between perceived and measured information search favouring the value of the perceived one.

H_{12}: Perceived information search size based on consumers' self-assessment aimed at measuring consumers' information search before making their food purchase decisions, indicating the number of product attributes used in making the decision, consistently overestimates the numbers of product attributes viewed during information search measured with the research methodology.

The hypothesis was examined using a one-item paired sample t-test across the perceived and measured values of several product attributes. Our results show that there is a significant difference between perceived and measured information search in 9 cases. The difference was not significant in 3 cases out of the 12 pairs compared, i.e. the averages of perceived and measured information search were identical. Perceived information search was higher in 6 cases. Since perceived information search overestimated measured information search in half of the cases, **hypothesis H_{12} is accepted.**

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