THE LEVEL OF SHELVES AND SPACE SOLUTION AS ONE OF THE KEY FACTORS FOR CONSUMER ATTENTION

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Abstract

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This paper is focused on consumer attention to the positioning of 5 product categories (packaged vegetables, dairy food, packaged fish, packaged meat and frozen food) in store bays and shelves. The results compare consumer attention to different levels of shelves. A different space solution – the SpaceGrid II system – was also used in the chosen bays. In these bays, the data indicate a distinct increase of consumer attention. The data were obtained through the eye-tracking device SMI RED 250 (n = 22). Particular attention was given to consumer perception by analysing AOI (areas of interest). The research was carried out during September 2015 in the Eye-Tracking Laboratory at Mendel University in Brno. The objective of the research was to identify attention in different levels of shelves and differences in perception between two types of shelves (classic and SpaceGrid). The results imply that the shelf level significantly influences the variability of attention of all product categories except for vegetables. The influence of the type of shelves was proven for meat and fish. The article also offers detailed information about the behaviour of participants who were surveyed in the framework of in depth interviews.

Keywords: consumer attention; space solution; eye-tracking; point of purchase; SpaceGrid, DISPLAY of merchandise

INTRODUCTION

20 million – that is the average number of seconds spent by buyers in a shop or in a shopping centre in one week. Buyers spend 80% on average of their time moving within a shop while space filled by commercial communication, including product packaging, is only used by 70% on average (Sorensen, 2009).

There is very little time for attracting customer attention in a shop and thus also little time for influencing the buying decision (Kardes, 2011).

It is therefore apparent that in-store communication is gaining in importance. At the same time, the demand for the sophistication of shelf arrangements is increasing. To achieve the optimization of this arrangement, it is then necessary to carry out the measurement of customer behaviour in a shop, in order to optimize

the behaviour of these customers through the arrangement of shelves (Egol, 2008). Increasing the effectiveness of all in-store communication and including new modern technologies and multimedia is a current trend.

In his article, Chandon *et al.* (2009) states that the basic factors influencing the attention of customers in in-store communication are the number of facings of the brand, a vertical position in the display, a horizontal position on the shelf and the price of goods. He also states that these factors of in-store communication are necessary for the activation of memories of out-store communication (e.g. advertisement). He also states that products located vertically as well as horizontally in the middle gain the greatest attention. From the research of Chandon *et al.* (2009), it clearly follows that the number of shelf facings strongly

influences the visual attention of participants as well as the size of the display. The importance of the vertical position is, according to this author, also important. The difference between the location on the top shelf and the bottom location is significant.

Thus, there is still an opportunity for traders to improve customer attention, their interest and finally also the saleability of the displayed products. However, for the successful growth of one's own shop, retailers have to create the type of shopping environment, that visitors will want to visit again and again. In order to achieve it, a retailer has to, among other things, know who their customers are, understand their buying behaviour and listen to them (Reyhle, Prescott, 2014).

According to the latest Shopper Engagement Study ČR 2015, as many as 87 % of Czechs realize their buying decisions once at the place of sale. In addition, 59 % of purchases are also completely unplanned. This means that the shopping area and its individual elements have a very significant influence on Czechs. The most intuitively purchased impulsive products include spices, salty snacks, dressings and biscuits. Furthermore, through the influence of price promotion and displaying a substitution product, Czechs most often substitute brands of laundry detergents, biscuits and chocolates (PHD, 2015).

After getting a customer closer to a shelf, we further distinguish four vertical shelf zones. They can be a key factor in the decision-making on which product a customer chooses from the offer in the end (Ebster, Garaus, 2011).

The stretch level – above 6 ft., represents one of the least valuable zones. Shelves in this zone usually gain relatively little customer attention. Some modern shops refrain from this zone, nevertheless, it is still largely used. Lighter weight products are located on shorter shelves (Ebster, Garaus, 2011).

Eye level – 4 – 5 ft., represents the zone with the greatest customer attention. It is a place where products with the highest profit should be placed. Products in this zone can gain the better attention of customers by 35 % (Ebster, Garaus, 2011).

Touch level – 3 – 4 ft. represents the area of the central part of a consumer's body. It is a zone, which gains higher attention than the stretch and stoop level, however, less than the eye-level. Products with a higher profit are also located in this zone (Ebster, Garaus, 2011).

Stoop level – below 3 ft., represents a non-popular area, which does not gain too much customer attention. Consumers do not like to bend down to this zone. Products with a low profit or heavy products are usually placed there (Ebster, Garaus, 2011).

Thus, when creating a product offer, it is necessary to consider which and how many products will be displayed on a particular shelf (Hübner, 2012). From the point of view of in-store communication, therefore, it is the goal of each trader to organize and distribute the sales assortment as best as possible in order to generate the most profit, all with regard to the limited space of trade (Murray *et al.*, 2010; Lim *et al.* 2004).

The method of searching for a specific product within a classic shelf arrangement is the same for the majority of consumers. A customer first scans a specific shelf horizontally and subsequently starts to scan it and search vertically. An exception is differently designed shelves, where products can be suspended or arranged into vertical blocks. Here, the searching process is reversed (Ebster, Garaus, 2011).

Consumers buy products and commodities primarily when needed. A change in the shelf space, like a price change, can lead to a small reaction in a change in the planned purchase. In this context, impulsive and unplanned purchases are directly determined by marketing activities at the point of sale (Desmet and Renaudin, 1998).

In the case of routine purchases, it is necessary to make more of an effort in order to gain the attention of consumers. They, however, realize their purchase according to an ingrained "formula", they buy their preferred brands and do not pay greater attention to a purchase. In order to gain their attention, it is then necessary to use some significant elements, e.g. to attract through packaging, a display or to influence the consumer in another way. In the case of displays being used, it is then more effective to employ more unusual shapes for gaining attention than are employed in other displays. A higher quantity of displays tends to be ignored by consumers (Young, 2014).

Drexler and Souček (2016) claimed that creatively designed and distinct packaging placed on a shelf could strongly attract a consumer's attention, causing him/her to purchase the item. This type of package is especially preferred if there are no special offers in the category and could also attract strong consumer attention in case a product is outside of the preferred brand.

Other research shows that some parts of packages are also important for consumer attention and their decision-making process. For example, in the case of milk products, the research of Ježovičová *et al.*, 2016 shows that less respondents were interested in examining the nutritional value than the ingredients. The most sought out and most important information on the packaging of milk is the fat content and it needs to be easily found on the product packaging. This is also confirmed by Souček (et al., 2015). According to his study, the crucial nutrition parameter of milk is the fat content. The information regarding the fat level is significant for consumer attention. In the case of dairy products, the name of the milk and the brand of milk are also important for customer attention.

According to Vysekalová (2011, p. 64), consumer behaviour identified within one category of trade or products is not possible to take as dogma and to generalize results for a whole segment of products. It is better to instead get inspired by the discovered

results in different categories. A qualitative strategy of attracting consumers does not have to be based only on creativity. Using bright pink packaging on a product can certainly attract a lot of attention, but that won't necessarily lead to the sale of the product (Sorenson, 2009).

MATERIALS AND METHODS

The main research issue and the objective of this article is to assess consumer attention across the various categories of food displayed in the shop. The main criteria for comparing the attention is vertical positioning in each shelf level. Another research prerequisite is to assess the impact of a different display on consumer attention – whether or not it may be affected, and across different categories of food. To supplement the knowledge about selected food categories, the last research question is to assess the consumer perceptions of these categories.

The research was realized in September 2015 at the specialized eye-tracking laboratory at the Department of Marketing and Trade at the Faculty of Business and Economics of Mendel University in Brno. For research, the stationary SMI Red 250 device was used. For the simulation of a real customer purchase, each stimulus was (a shelf with products) projected by a projector on the wall. The participants stayed at a distance of 3 meters from the wall and 0.5 m from the device. There were 50 stimuli (shelf pictures) from Tesco.

There were 22 participants. Each participant was chosen randomly. Participants were asked to look at a picture of a shelf and try to behave as if in a real situation.

Shelves were divided according to departments into 4 groups – packaged vegetables (7 shelves), dairy food (12 shelves), packaged fish (7 shelves; in this category, close bays with self-produce products are also included), packaged meat (12 shelves) and frozen food (12 shelves). After each department, an in-depth interview with the participants was performed. Questions during the interview were focused on the opinions and purchasing preferences of participants.

The analysis of attention was conducted using the BeGaze program. For each stimulus, AOI (areas of interest) were specified as individual shelves (layers) of every module. From the AOI outputs, the Dwell-time values that define the total duration of attention to a specific stimulus were further used. An example of AOI analysis is shown in Fig. 1.

In the selected modules (6 modules), in most departments (vegetables – 3; meat – 1; frozen – 1; fish – 1), classic shelf systems were replaced with a different space solution, the SpaceGrid II from the company Eden Europe. Products in these modules are, through the SpaceGrid system, permanently located in the front position.

1: *AOI analysis – space solution with the SpaceGrid system*

Therefore, the module visually looks constantly completed and tidy. One of the analysis objectives was to identify the change of attention in cases when goods were located in the SpaceGrid system.

In order to analyse the influence of the shelf level on consumer attention, a multifactor analysis of variance MANOVA (in this specific case two-factor) was used. The only exception was the category of dairy food, where the SpaceGrid system was not used and attention was tested only for individual levels of shelves.

The tested assumption was that individual levels gain a different amount of attention. Through the testing criterion F, the differences of the average between individual groups, which were created based on factors consisting of individual vertical levels of shelves and types of shelves, were evaluated. The levels of shelves as the first factor were coded into the base shelf – 0 up until the last level, e.g. shelf level 6 – 6. The type of shelf (classic x SpaceGrid) was coded 1 and 0. Dairy products, where a basic analysis of variance was carried out, constituted an exception in testing. For evaluation, the p-value was used. All the tests were evaluated on the level of importance $\alpha = 0.05$.

Levene's homogeneity test was carried out before measuring. The SPSS program was used for the realization of analysis.

RESULTS

### Influence of shelf levels on consumer attention

The analysis of attention dwell time in individual shelf levels in the classic shelf systems of an everyday department clearly shows an increasing level of attention in bottom base shelves (space level 0) toward eye-level and a subsequent downturn of this attention above this level. In this respect, an exception is the classic display of packaged vegetables. Vegetables are, in comparison to other categories, displayed in a shelf system directly in

crates. The eye-level of the shelf here reported the lowest dwell time. The shares of attention of individual levels in classic shelf systems are shown in Fig. 2.
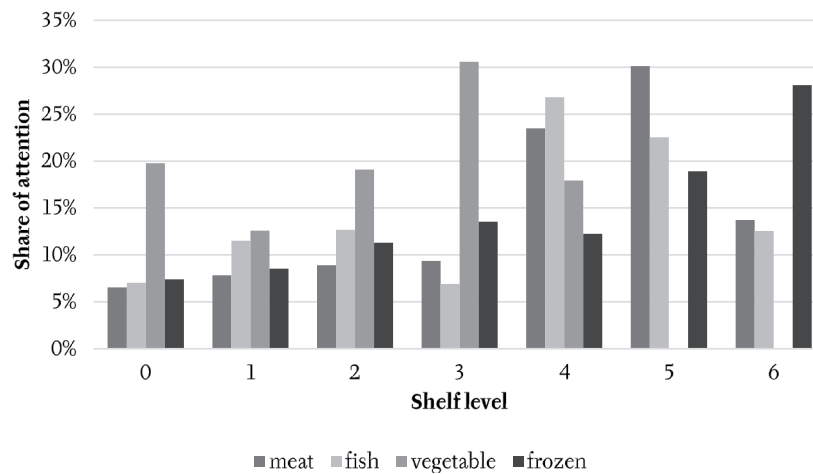
Influence of a different space solution on consumer attention

The analysis of the attention of modules with a different space solution using the SpaceGrid system shows certain differences compared to the regular shelf display of products. In comparison to regular display, a shelf level was added in some of the departments. The principle of increasing attention toward the hot zone stays similar in the categories of meat and fish. Moreover, consumer attention starts to act according to this principle in the vegetable department. The base shelf, which receives a higher level of attention, represents an exception. It is possible to explain this fact by using classic crates in the base shelf as well as in shelves with the SpaceGrid solution, which therefore looks differently than the rest of the shelves. In the case of frozen products, it is then possible to observe almost an increasing trend of attention from the base shelf towards the upper shelves. The average measured dwell time in a different space solution is shown in Fig. 3.

The essential importance and difference in the case of using a different space solution lies in the significant growth of consumer attention in comparison to a classic shelf display. It is demonstrated primarily in categories of packaged meat and fish. In the case of meat, it is possible to observe an increase of attention in the eye-level area by 924.5 ms. In the case of fish, there was an attention increase in the eye-level area by 750 ms. In the eye-level of vegetables, we can observe an increase of dwell-time by 165.4 ms. In the case of the eye-level of frozen products, it is by 372.8 ms. Nevertheless, there is a slight decline of attention in these categories in the other shelf levels. However, it is possible to explain it by a completely different trend of distribution of attention compared to
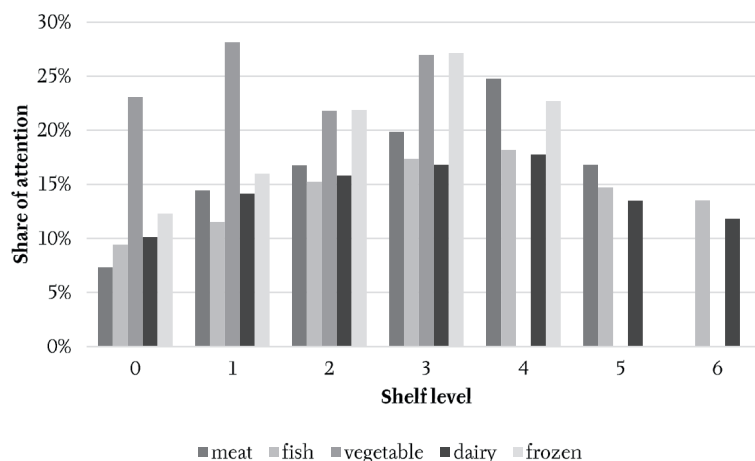
2: *Share of attention in the shelf levels of a classic space solution.*

3: *Share of attention in the shelf levels of a different space solution with the SpaceGrid system.*

a classic shelf display. An increase or decrease of attention in using a different space solution compared to the classic one is shown in Tab. II.

In order to prove the influence of individual shelf levels and types of shelf, an analysis of data was realized with the help of univariate ANOVA. Firstly, the homogeneity of data was evaluated by Levene's Test of Equality of Error Variances. The results imply that for all sets of data, the homogeneity of data was proven (in all the cases α > p-value), which enables the usage of variance analysis.

Aunivariate analysis of variance evaluated the influence of two factors on the variability of attention of participants, which is measured by dwell time (attention in a delimited segment of a picture). The factors delimited in this analysis were the shelf level and the type of shelf (standard or SpaceGrid). As was already stated, all tests were carried out on the level of importance α = 0.05. The overview of results of the variability analysis is shown in Tab. II. In the case of dairy products, SpaceGrid shelves were not used and therefore only the influence of the level of the shelf is evaluated.

The results imply that the shelf level has an influence on variability in all cases except for shelves with vegetables. In this case, the arrangement of goods into crates plays an important role as it is stated in the previous results. From the previous

comparison and the results of the variability analysis, it is possible to conclude that the individual shelf levels have a different level of attention, while the greatest attention is held by the level closest to the eyes. Through eye tracking, which is already used in practice, the assumption was confirmed.

While the influence of the shelf level was proven, the influence of shelf types was not. Evidence of the influence of the shelf type is possible to be found only in fish products and meat. As Tab. II implies, in other cases the p-value was higher than the level of significance α = 0.05. Thus, the results are conclusive only for shelves with meat and fish and it is possible to state that for these types of food, attention is influenced by the shelf type. Interaction between the shelf level and the shelf type is also conclusive in the case of fish and meat. It implies that the shelf type and also the level of the allocation of goods influence the attention of participants. The shelf level has an influence on attention in the case of frozen products, although the space solution does not. However, this fact can be explained by the allocation of products in closed freezing equipment. Although this equipment is glazed and in a certain way it limits the impact of the display design of products on consumer attention – a different display is not so apparent for consumers here. It is stated that a different

I: *Change of average dwell time in the usage of a different space solution.*

Shelf level	Meat		Fish		Vegetable		Frozen	
	absolute difference	relative difference	absolute difference	relative difference	absolute difference	relative difference	absolute difference	relative difference
0	121.3	76.42%	51.4	17.54%	−89.9	−11.17%	3.5	2.48%
1	22.4	7.15%	205.8	57.51%	−526.5	−53.62%	−16.8	−9.06%
2	18	4.95%	148.8	31.44%	−69.7	−9.16%	−30.6	−12.10%
3	−29.3	−6.82%	−200.4	−37.16%	165.4	17.58%	−47.4	−15.08%
4	468.7	87.38%	750	132.91%	649	100.00%	−21.7	−8.26%
5	924.5	254.04%	647.4	141.59%			372.8	100.00%
6	587	100.00%	195.3	46.49%			553.6	100.00%

II: *Summary of Univariate ANOVA results*

Type of food	Significance			
	model	shelf level	type of shelf	interaction
dairy	0.0000	0.0000	x	x
fish	0.0000	0.0000	0.0000	0.0010
frozen	0.0000	0.0020	0.2680	0.9840
meat	0.0000	0.0000	0.0160	0.0180
vegetables	0.0210	0.1060	0.0890	0.0450

space solution has, in most cases, an influence on the attention of consumers in a positive meaning – it increases consumer attention. This fact is most significant precisely in the hot zones.

Perception of a consumer

After observing every category of food, the task of participants was to evaluate specific displays and comment on their attitudes to individual products or alternatively buying decision. In the case of packaged meat, participants most often expressed a positive attitude to individual products. However, they primarily expressed a favouritism for products marked as poultry or Czech meat. Poultry is very popular among participants because they often connect it with a lower price and relative health benefits in comparison to other types of meat. In case of meat products designated as being of a Czech origin, respondents were attracted precisely by this declaration of origin. During the buying decision, respondents would prefer meat of Czech origin, however they are often influenced by other factors.

Respondents also very positively evaluated a different design of the space solution for premium meat. Their most frequent opinion was that thanks to this solution, the products give off a premium or fresh impression. This display would be so interesting for some of them, that they would look at some premium products and probably even buy them.

Fish products did not arouse much interest. This category also included semi-finished goods, spreads and other products partially containing fish. The greatest attention was paid directly to packaged fish. Respondents, who usually like to buy fish or have a positive relationship to it, paid the most attention to this category. Most of the respondents than perceived a difference between the classic and different space solution of the display, while in most cases, they evaluated a different display more positively.

In this category respondents indicated the marking of shelves "for a healthy life style" and "make your own spread" as negative. The content of shelves does not correspond with the declared fact and thus it is even comical according to the respondents. Therefore, they did not even want to pay greater attention to these shelves.

In the case of packaged vegetables, an atypical solution gained an important part of consumer attention. Respondents evaluated significant difference in "playing with the colours" of products. Respondents evaluated it as creative and very interesting. Atypical display even gained more attention than shelf display in the leading position of the category. However, the disadvantage of this category of packaged vegetables was the certain obscurity of some products. A majority of products within the stimulus were created by packaged salads. They were evaluated by a greater part of respondents (especially by men) as not very attractive goods. Most often, respondents would either not buy anything or they would choose from some of the displayed salads.

In the category of dairy products, respondents especially negatively evaluated empty spaces between products. Empty spaces were the most visible in this category. Participants evaluated the display as common and classic and not very interesting. This comment was mostly directed toward modules containing only milk itself. The module that contained exclusively milk of one brand and in one design was completely uninteresting for respondents.

In the category of dairy products, a module with products with an ending use-by-date, was also included. This module was interesting mostly in a negative context for participants. According to a majority of participants, they usually try to avoid this shelf. However, they by and large do not rule out the possibility that if they found themselves close to it and at the same time here wasn't a high quantity of other customers, they would look at the products on the shelf. Then they would choose a discounted product that they planned to consume the same day.

From other products in the category of dairy products, consumers would most often choose some acidophil milk located in the head shelf and containing a discount display. At the same time, they would also carry out a regular purchase in this department including milk, yogurts or butter. The department of dairy products is one which is regularly visited by a majority of respondents.

The last department of frozen products is not very interesting for a majority of respondents. They personally did not notice a more significant difference between the classic and innovative design of the shelves. From the offered products, they would more often choose either frozen pizza or exceptionally the ice cream Tesco Finest. Respondents who were sufficiently warned about

the different design of the shelf display would, in a majority of cases, notice that this display was used for the premium frozen products Tesco Finest. Then, the respondents commented that this display has a luxurious effect in connection with the brand. However, it does not cause a higher level of attention of respondents.

CONCLUSION

The research survey confirmed the influence of the shelf levels on consumer attention. Thus, it is possible to confirm the assumption of Chandon (2009) that one of the factors influencing attention is the vertical level of facing.

As mentioned by Ebster and Garaus (2011), the highest consumer attention is paid to the eye-level and touch level areas. The research also implies that the stretch level gains slightly more attention than the stoop level. The tendency of increasing attention from the base shelf is obvious in a majority of categories. The department of packaged vegetables was shown as an exception. Products in this department are usually placed in crates which represents a different type of display by itself. The influence of the shelf level on consumer attention was not proven only in this department.

A different space solution through the SpaceGrid system, which ensures the display of products in front positions, showed an increase of average consumer's attention in a majority of the shelf levels. This increase can be observed most significantly in the eye-level area in packaged meat with an increase of the time of average attention by 254%. An exception is primarily the category of frozen products, where the average attention was decreasing. This fact is, however, compensated for by an increase in the quantity of shelf levels. The department of packaged vegetables is similar.

The influence of the space solution on consumer attention was demonstrably proven in the category of packaged meat and fish. In frozen products, the influence of a different space solution was not confirmed. However, consumer attention here is also influenced by different factors, from which it is first necessary to consider the placement of products in closed fridges.

The perception of individual research categories of food is relatively positive among consumers. Dairy products are a commonly purchased food with a majority of consumers. In this category, consumers negatively perceive especially empty places and the display of only one brand within a module. Acidophil milk products are especially popular.

Consumers designated the shelf with products with an ending use-by-date as not very attractive. They only show interest in them if there is a product they want to consume immediately.

In meat products, consumers expressed a positive perception especially in the category of poultry and Czech meat. Poultry is interesting for consumers from the price point of view and because of the perceived positive health benefits. They also very positively evaluated the display of premium meat where a different space solution was used.

All modules with a different space solution within all categories (except for dairy products where it was not used) were always evaluated positively by consumers. This display mostly made an impression of an exclusive offer. In connection to the increase of consumer attention, on which there is a significant influence of the space solution in the category of meat and fish, it is possible to recommend this solution for the support of consumer attention in the chosen products.

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