

PERCEPTION OF LOCAL FOOD LABELLING BY GENERATION Z: AN EYE-TRACKING EXPERIMENT

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ABSTRACT

The subject of this research is to reveal the customer's approach towards local food in general and to explore the impact of its labelling on consumer perceptions. The main objective is to find out if an eco-label, a local-label or a bio-label has an impact on consumer behaviour. The following methods were used during the research: eye-tracking technology, in-depth interviews, the A/B testing method, the non-parametric Mann-Whitney test and the non-parametric Kruskal-Wallis test for testing hypotheses. Data were collected from the eye-tracking device in December 2015 and additionally revised for higher validation. In total, the observation contains 121 respondents (63 participants in the reference group – A, and 58 participants in the control group – B). Participants are defined as being from generation Z. It is assumed that the presence of the label on a product has an effect on consumer behaviour. The experiment itself took place at the eye-tracking laboratory of the Faculty of Business and Economics at Mendel University in Brno.

KEY WORDS

consumer behaviour, eye-tracking, local products, labelling

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1 INTRODUCTION

1.1 Local Food

Whereas the Czech Ministry of Agriculture clearly defines the term “local food”, no standards exist defining it in the United States. The US market is characterised by one of the

biggest demands for alternative food (organic and regional food) among countries. This is the main reason why we mention some data in our study. According to the Czech Ministry of Agriculture, a local food product is one produced in certain region and made from ingredients

grown in the same region. A local product in the United States has to be grown within the country or neighbouring countries, or within a state (U.S. Department of Agriculture, 2012; Ministerstvo zemědělství ČR, 2016).

Recently, the demand for local (and organic) products has continued to rise as consumers are increasingly interested in a healthy lifestyle. As proof of this, data from 2012 can be referenced. Almost 2 billion Czech crowns were spent on local and organic food in the retail market in the Czech Republic, representing an annual increase of 6.7% (FiBL and IFOAM, 2016). But it is not just a question of the one country. According to National Geographic and GlobeScan (2014), there has been growth in the interest of people in local and organic food in 12 countries since 2012.

A desire to live a healthier lifestyle is not the only factor that has been driving consumers to include local products into their daily menu; there is also a demand for a diverse range of quality food products that consumers are taking into account. Furthermore, it seems that people are taking methods of production and food processing more seriously than ever before (Moudrý and Prugar, 2002).

Purchasing local products has become inseparably associated with responsible consumption, which has an ethical and social background (De Pelsmacker et al., 2005; Harrison et al., 2005).

As already mentioned, there is less supplier exploitation due to the existence of local food, food without chemicals and additives, reduced amounts of packaging, and other positives that local food consumption benefits from (McEachern et al., 2010).

Apart from food quality and the impact on the environment leading consumers to buy local products, there are also other reasonable factors motivating them to do so. According to the COI (2007), these include for instance supporting local farmers and local business, cutting down on pollution and reducing the purchase power of supermarket chains. On the other hand, according to Lithuanian research people do not believe that buying environmentally-friendly products can make a difference to the environment (Kavaliauskė et al., 2013).

Aside from this the Institute of Grocery Distribution (IGD) reported (2005) that many people still do not know of the impact and benefits from buying local products. A lack of awareness of local production, an ignorance of the positives of having a healthy lifestyle and supporting the local environment and business are considered to be the main boundaries preventing potential consumers from buying local food.

1.2 Labelling of Organic Products

According to recent studies, eco-labelling is a significant factor that occurs in promoting sustainable consumption patterns (Horne, 2009). Agenda 21, in connection with the Earth Summit in Rio in 1992, recognised the value of placing local labels as an indisputable factor in promoting the consumption of products that have an obvious positive impact on local environment (Goethe Institution, 2006).

As a great deal of scientific, political and social debate, supported by the mass media, spread the importance of focusing on reducing global warming and “saving” the global climate in general, interest in the value of eco-labelling can be seen as a hope for achieving greater participation in purchasing eco-friendly products by the general public (Horne, 2009).

Research recently conducted around the world has proven the importance of labelling, and resulted in a clear finding. Placing labels (eco, local and bio) definitely plays certain role in marketing communications aimed at consumers with a sense for a sustainable environment and eco-friendly production. Therefore placing labels should be included when influencing the eco-friendly consumer purchase intentions. (Chow et al., 2003; Grankvist et al., 2007; Horne, 2009; Dočekalová and Straková, 2011).

According to Atkinson and Rosenthal (2014) the presence of the eco-label on the product makes the product appear more trustworthy, but it does not lead a consumer to the purchase by itself. Other factors are needed, such as price and taste. The influence on the purchase is indirect. On the other hand, the eco-label's effect, as determined by Sörqvist et al. (2015),

can have a direct influence on the purchase of the product. For some samples (mostly fruit) it was found that respondents were more willing to buy a product with an eco-label because they thought it tasted better.

An assumption was formulated following from the mentioned information that the presence of a label on a product has an impact on

consumer behaviour. From this two hypotheses were formulated. Hypothesis #1: There is not a relationship between the presence of the label and percentage Dwell Time of the brand and hypothesis #2: There is not a relationship between the attitude of the respondents to regional products and percentage Dwell Time [%] of the label.

2 METHODOLOGY AND DATA

Two research methods were used to gain trustworthy data. In the first part of the research, the eye-tracking technology was used and in the second part, in-depth interviews with all participants were conducted.

The SMI RED 250 eye-tracker was used in this research and the SMI Experiment Centre software helped us in designing the experiment. SMI BeGaze software and the SPSS programme were additionally used for the analysis, export and appraisal of the collected data. For the experiment a remote eye-tracker was used – it was affixed to the bottom edge of a monitor which had a diagonal size of 22" with a 16:10 aspect ratio. The respondent's viewing distance was about 60 cm.

The research was conducted in December, 2015 and involved 121 respondents (63 participants in the reference group and 58 participants in the control group). The original number was higher, but some respondents had to be eliminated. The reason for this was different eye-handicaps which disrupted the accuracy of the measurements. The age of the respondents was 18–26, making them part of generation Z.

The experiment was designed as an A/B test, where one group of the respondents (group A or the reference group) was shown the modified stimulus and the second group (group B or the control group) the original version. The reference group saw an experiment with chosen labels on products and the control group saw products without labels. The aim was to show the influence of the label on consumers. Original labels were added in the Zoner Callisto graphics programme.

The process of working with eye-tracking technology has its specific features. At the beginning of experiment the researcher has to instruct a participant how to behave during the trial. It is very important for validity of the data. For example the participant cannot look away from the monitor, shake his/her head violently or make similar movements.

When respondents had completed the first part of the research, an in-depth interview could begin. The aim of the second part of the research was to support data from the eye-tracker and fully understand the thinking of the participants. Questions were related to the participant's consumer behaviour and to the factors that have a particular influence on them during the purchase of the mentioned products and their relationship to local labels on products.

In-depth interviews lasted around 15–20 minutes each and the questions were thoroughly prepared in advance. These questions were given to the respondents to answer during interviews and the answers were written down on prepared sheets. As a precaution against the loss of the papers or overhearing of the answers, all the interviews were recorded on a voice recorder.

2.1 Eye-tracking

Eye-tracking technology is actively used as part of the neuromarketing methods for analysing customer behaviour. It is based on the tracking of a respondent's pupils during the presentation of various stimuli. Tracking allows us to get closer to consumer behaviour with objective



Fig. 1: Gherkins – differences between the reference and control groups, Regionální potravina.
Source: Znojmia (2016), Ministerstvo zemědělství ČR (2011)

data uninfluenced by consumers. As a result, in combination with other neuromarketing methods, it is possible to gain a more complex view of the consumer's psychological processes (Zurawicki, 2010).

Conversely, some restrictions that have to be taken into account when concluding research based on eye-tracking technology are also worth mentioning. On the one hand, we are able to discover the level of label visibility and perceive whether consumers pay attention to certain elements on the internet or on the shelf. Nevertheless not all of this information depicts the actual relationship between the consumer and element in question precisely. Due to this information about eye-tracking technology, an additional research method should be included (Turpault, 2014).

2.2 Products Tested

Eight products were tested during the experiment: apple juice, cream, gherkins, flour, a children's snack (Hamánek), mead, paprika and yogurt.

The chosen products were photographed and the label of the regional product was added. The primary aim of the research was to find out if labels have some influence on consumer behaviour. Fig. 1 shows the original package of the tested product (left) and the edited one

(right). In this case, the local label: Regional Food (Regionální potravina) was used and it was placed next to the description of the product (see Fig. 1 right).

2.3 Statistical Testing

Because the output from the eye-tracker differs from a normal distribution, non-parametric tests were used – the Mann-Whitney *U* test for hypothesis #1 and the Kruskal-Wallis test for hypothesis #2.

Some authors say that a non-parametric test has less explanatory power than the parametric ones. The other option is to normalise the data and use a parametric test, such as the *t*-test. But for the purpose of this paper non-parametric tests were used. For hypothesis #1 the Mann-Whitney *U* test was chosen, as the equivalent of the parametric *t*-test. Hypothesis #1 was formulated to find the differences between the reference and control groups. One issue was that the number of participants was not same across the groups. The Mann-Whitney *U* test was used because of the comparison of two different groups and the possibility to use it for data without an assumed normal distribution. The null hypothesis is that distribution of the independent variable is same across categories. The significance level of the alpha is 0.05. As a result, if the significance level is

lower than 0.05, than we can say that there are differences between the groups (reference and control group), as was assumed (Field, 2009).

For hypothesis #2 the Kruskal-Wallis test was used. In this case the objective was not to find differences between control and reference groups, but to find differences between four smaller groups in the reference group according to their attitude to the eco, bio and local-labels. As in hypothesis #1 the groups have different numbers of respondents. The groups were ranked from 1 to 4 depending on their attitude to the mentioned labels:

- ‘I believe them, they present quality and eco-friendly production’ = 4;
- ‘I perceive them, they play an important role when I am deciding in the shop’ = 3;
- ‘I do not have an opinion on them, I have neutral attitude’ = 2;
- ‘They have negative influence on me, they dissuade me from purchasing’ = 1.

If the significance level is lower than 0.05, there are differences between the groups from 1 to 4 in the reference group (Field, 2009).

3 RESULTS

Two hypotheses were formulated for statistical testing. To verify the relationship between the presence of the label (Regional Food) and the time (Dwell Time [%]) of observation of the brand of the product hypothesis #1 was used.

Hypothesis #1: There is not a relationship between the presence of the label and the percentage Dwell Time of the brand.

Percentage Dwell Time was used because all participants had the chance to watch the picture for as long as they wanted. The hypothesis was tested for every product individually. The non-parametric Mann-Whitney *U* test was chosen for testing. The confirmation of the null hypothesis in this case means that the Dwell Time [%] of the brand is the same in the reference and control groups and the presence of the label has no effect on the dwell time of the brand.

Hypothesis #1 retained for all researched products. Cream was the closest to significance level with the value 0.084, followed by mead with a value 0.230. The rest of the products did not event get close. According to these results we can say that consumers do not become more interested in the brand of the product just because of the Regional Food label placed on it. The biggest disagreement with the hypothesis was measured in flour with a value 0.864.

Within the experiment the respondents were asked to rank their attitude toward products with Regional Food labelling. To verify the

existence of a relationship between the attitude to regional products and attention to this label *Hypothesis #2* was formulated: *There is not a relationship between the attitude of respondents to regional products and percentage Dwell Time [%] of the label.*

Tab. 1: Results of testing hypothesis #1 (from SPSS)

Name of product	Mann-Whitney <i>U</i> test	Conclusion
Apple juice	0.468	The null hypothesis is retained.
Cream	0.084	The null hypothesis is retained.
Gherkins	0.725	The null hypothesis is retained.
Flour	0.864	The null hypothesis is retained.
Hamánek	0.564	The null hypothesis is retained.
Mead	0.230	The null hypothesis is retained.
Paprika	0.593	The null hypothesis is retained.
Yogurt	0.267	The null hypothesis is retained.

Tab. 2: Results of testing hypothesis #2 (from SPSS)

Name of product	Kruskal-Wallis test	Conclusion
Apple juice	0.440	The null hypothesis is retained.
Cream	0.969	The null hypothesis is retained.
Gherkins	0.133	The null hypothesis is retained.
Flour	0.673	The null hypothesis is retained.
Hamánek	0.373	The null hypothesis is retained.
Mead	0.469	The null hypothesis is retained.
Paprika	0.136	The null hypothesis is retained.
Yogurt	0.029	The null hypothesis is rejected.



Fig. 2: Heatmaps of paprika – differences between the reference and control groups (output from SMI BeGaze)

In this case the non-parametric Kruskal-Wallis test was chosen. The verification of the null hypothesis for this test means that the Dwell Time [%] of the label is the same in the reference and control groups and the respondent's attitude to regional food labelling has no effect on it.

The null hypothesis was rejected only in the case of the yogurt stimulus, as you can see from Tab. 2. There we can say that participants who care about the origin of the products did watch the label longer than those who do not recognise the mentioned labels on products. For the rest of the products, the null hypothesis is retained. Participants who perceive eco-labels as being better did not focus on labels on the chosen products any longer than those who do not.

Within the experiment, heatmaps of eye movement were also revisited. The heatmap shows places on the product that participants looked at most.

The difference between the tested groups is apparent in Fig. 2. The control group (on the right) without the label spent more time on the description of the product and on the brand. The reference group (on the left) placed their focus more on the stimulus including the added label.

Within this paper only the results of heatmaps for the paprika stimulus are provided, but the results are valid for all the tested products.

4 CONCLUSION

Eye-tracking technology brings us a relatively new interesting way of looking at consumers' habits when purchasing.

It was found during the research in all cases that the presence of the mentioned labels on products has no influence on the Dwell Time [%] of the brand. Respondents showed no greater interest in the brand of the products just because of the presence of the label, as was first

thought. There are probably other factors that should be taken into account.

On the other hand, participants who have a positive relationship to labels of origin are focusing more on these labels on a package of the yogurt than on other products which were tested. This could be a consequence of the difference in the attractiveness of the label in comparison with the rest of the products.

There are probably differences between labels on different types of food or different colours of package. The yogurt was the most successful from this selection. The labels on other products were not so attractive for respondents.

The results from heat maps show that participants did notice the labels, but in the final result it has only a small or zero effect on their behaviour as consumers.

There is a chance that the measurement was distorted by the age of the respondents (18–26). Participants at this age are not economically active in all cases, so the selection between

variants of products can be made by their parents. This could be an impulse to continue in the experiment with different age categories.

We can find a very similar conclusion in other research also realised with help of eye-tracking technology. According to a study focused on perception of wine labels (Mokřý et al., 2016) the presence of a sticker or awards had a greater degree of observation than the other monitored attributes. Furthermore, the presence of an award/sticker also, as in our study, did not automatically translate into a better perception or nor lead to higher Dwell Time.

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