

## INFLUENCE OF PACKAGING ATTRIBUTES ON PERCEPTION OF JUICE: EYE-TRACKING STUDY

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### ABSTRACT

Today, consumers are increasingly aware of the impact that the fast and stressful way of life has on their health. They focus not only on physical activity, but also on a diet filled with fruits and vegetables. As a result, they often choose a tasty alternative which is one of the main sources of vitamins and nutrients - fruit juices. However, these products are often labeled as drinks with high amounts of sugar. Therefore, it is very important for these drinks to be perceived by the consumers as healthy and tasty, which is one of the most important features of their packages. Their goal is to appeal to customers, catch their attention and make them buy the product. One of the most convenient methods to study how packages appeal to customers is the eye-tracking method. The aim of this article is to find out how different attributes of packages can influence customers' perception of the juice. The research was carried out in a form of eye-tracking experiment (A/B testing), which involved 38 participants at the age from 20 to 29 (generation Y). Results showed that lower color saturation significantly reduces the attention of individual packages and also reduces the influence of craving the juice as opposed to brighter colors. The importance of information on the back side was also confirmed, since moving the information from back to the front side did not show any significant decrease of the back side's attention span. Last but not least, it has been found out that the image type used on the orange juice package holds importance too, since photography of oranges led to a higher craving of the juice in comparison to the illustration of oranges. However, it was not proven that photographs of oranges held a higher attention span compared to the illustrations. The article contains demonstrable proof of individual package attributes' influence on how generation Y consumers perceive the juice.

**Keywords:** consumer; attribute; juice; eye-tracking; package

### INTRODUCTION

In recent years, the consumers' attention is focusing on a healthy lifestyle, which is also related to a healthy diet. There is a permanent trend among global and state institutions which recommend higher consumption of fruit and vegetable due to positive effects on the organism. This is one of the reasons why the vast majority of consumers perceive juices as beneficial for health (Nicoli, 2012). Their popularity confirms the fact that while in the past, they were created as a result of the overproduction of fresh fruit, nowadays the fruit (mostly citrus and apples) is in many areas grown specifically for juicing (Robertson, 2009). Fruit juices contain mainly vitamins and minerals but also saccharides prevailing in the solid component. Even though the fruit contains only a small amount of proteins and fats, there are higher concentrations of iron, calcium, and vitamins B and C (Ashurst, 2016).

The area of drinks, and more specifically juices, belongs to a group of products that are bought impulsively (habitually) by consumers (Mruk-Tomczak, Jerzyk and

Wawrzynkiewicz, 2019). This means that during the decision process, they create little to no conscious effort, they don't search for information beforehand and as a result, they're often tempted to buy impulsively (Solomon, 2009). The product's packaging design plays a crucial role in this form of shopping (Cahyorini and Rusfian, 2012; Hubert et al., 2013; Waheed, Khan and Ahmad, 2018).

In recent years, there have been countless researches about the influence on the decision making of consumers during shopping for groceries. One of the researched attributes was the shape and overall package design. According to Burgess (2016), the shape of a specific product package is very important for the consumer, since people are visually driven beings and therefore the color and overall package design have a much bigger influence on expectations and consequential experience of the consumer compared to holding the product itself in their hands as such. Nowadays, there is a lot of research carried out on the so called "crossmodal correspondence". It stands for cross sense associations, e.g. between letter shapes and taste (Velasco

et al., 2014), package shape and perceived health safety (Fenko, Lotterman and Galetzka, 2016; Ooijen et al., 2017), smell and shape (Hanson-Vaux, Crisinel and Spence, 2012), etc. where consumers imagine a certain taste, smell and so on based on a certain shape. The importance of packaging colors has also been proven within impulsive shopping (Bone and France, 2001). The research focused on color harmony (Wei et al., 2014; Hurley et al., 2017), color hues (Ampuero and Vila, 2006), but also the influence of colors on product's taste itself (Piqueras-Fizman and Spence, 2011; Karnal et al., 2016; Rompay, Deterink and Fenko, 2016). Within the products, consumers are now also focusing on the health side of the products, and therefore the impact of the information on the perception of the health acceptance of the product is being examined increasingly. On that account, the subject of the research was, for example, the presentation of health claims on the packages (Liem, Aydin and Zandstra, 2012; Sütterlin and Siegrist, 2015), the presentation of nutrition claims (Talati et al., 2017) or the impact of images on the packaging on consumer's perception (Mizutani et al., 2010).

It is necessary to realize that these researches are not only a mere theory, but it is indeed possible to implement gained conclusions in practice. As one of the examples may serve the redesign of the orange juice package of one of the world's largest fruit juice processors, Tropicana. When changing the package of Tropicana's pure orange juice, the typical feature of the juice packaging - an orange with a straw - was removed. This has made it impossible for consumers to find this particular feature, which means that they cannot identify the new package and, of course, do not buy it. The new juice packaging resembled a private brand. The change in the company's packaging resulted in a significant drop in sales by 20% between December 2008 and February 2009, which is an estimated loss of 27.3 million dollars. The redesign of the new packaging cost Tropicana about 35 million dollars and is considered to be the most important event in the beverage industry (Lee, Gao and Brown, 2010).

Many other researches have been, are and will continue to be conducted within the design of packages, to reveal some links between packaging attributes and consumer's perception. The goal of this study is to test certain assumptions of the impact of packaging on the perception of Y-generation consumers in the field of fruit juices by using eye-tracking technology and thereby also contributing to further progress in this field of research.

### Scientific hypothesis

*H<sub>0</sub>: Color saturation of juice package has no impact on the package's attention span.*

This hypothesis is based on the assumption that the higher the package color saturation is, the higher level of attractiveness and expectations for its consumers it has (Velasco and Spence, 2018).

*H<sub>0</sub>: Additional information on the front side of the juice package has no impact on the inspection duration of the back side of the juice package.*

This hypothesis is formulated based on the general assumption that the consumers will spend less time looking at the back side of the juice package after moving the information from the back side to the front side.

*H<sub>0</sub>: Type of package image has no impact on the length of observation of the juice package.*

This hypothesis includes the assumption that consumers prefer photography of a certain object over its illustration (Kovač et al., 2019), therefore they should spend more time looking at the package with photography compared to the package with an illustration.

### MATERIAL AND METHODOLOGY

The research consisted of two parts, where the first part was eye-tracking research and the second part was an in-depth interview. The research was held from the 14th to 18th of October 2019 in eye-tracking laboratory ETLab of the department of economics at Mendel University in Brno. The respondents applied for this research via Google Docs application shared through social media Facebook. Requirements for participation in the research were age between 20 to 30 years and consumption of fruit juices. 38 respondents have participated in the research, during which none of the respondents experienced loss of signal or incorrect calibration, which could significantly influence the eye-tracking research. Half of the participants were in the age between 20 to 24, the other half belonged to the age group between 25 to 29. The average age of the participants was 24.53 years. 58% of the respondents consisted of women (22) and the remaining 42% of men (16). The largest representation consisted of Slovak nationality (25), which is roughly 65%. The second largest representation was one of Czech nationality (12), which is roughly 33%. One of the participants was of Ukrainian nationality and has been living in the Czech Republic for the last 5 years and speaks fluent Czech. Table 1 shows the estimated monthly juice consumption in liters among individual respondents.

**Table 1** Estimated monthly juice consumption in liters among individual respondents.

<b>1 – 2 L</b>	15 respondents	39.47%
<b>2 – 5 L</b>	16 respondents	42.10%
<b>5 – 7 L</b>	6 respondents	15.80%
<b>7 – 10 L</b>	1 respondent	2.63%
<b>More than 10 L</b>	0 respondent	0%

The research was in a form of experiment and A/B testing, where 19 respondents in group A were presented with one variant of stimuli, and the other 19 respondents in group B were presented with another variant of stimuli with variations. This research used a static eye-tracker SMI RED 250 produced by SensoMotoric Instruments GmbH (hereinafter referred to as SMI), which was placed under screen's monitor with resolution 1680×1050 px. Eye-tracking reading was carried out on a frequency of 120 Hz. The software used for eye-tracking research was Experiment center SMI, as well as SMI iView X, which was used to control the eye-tracking. First, a 5-point calibration was performed, followed by validation, which provided information about the deviation from the calibration point. For this thesis, a maximum deviation of 0.5 degrees was determined on both the x-axis and y-axis. Calibration and validation were performed multiple times while choosing the best value. The eye-tracking research consisted of several blocks. At the beginning of each block, instructions were given, after which the respondents continued by pressing the spacebar on a keyboard. After

each task description (before displaying each stimulus), a so-called "fixation cross" was displayed for 800 ms. The goal of this cross was to direct the participant's eyes to the center of the screen, therefore allowing each stimulus to be viewed from the same place. All stimuli (juices) were displayed in the background with RGB color: 192, 192, 192. Respondents answered a specific question each time an image was displayed. Respondents could view each stimulus indefinitely and press the spacebar to continue to the next image. After the eye-tracking research, an in-depth interview took place, where the participants were asked several questions regarding the eye-tracking, as well as general questions about the consumption of juices.

For the processing of the eye-tracking research data, SMI BeGaze software was used to create individual areas of interest (AOI). These were the individual parts of the packaging that, in certain cases, differed in groups A and B and were the subjects of research. These areas of interest contained metrics also known as key performance indicators (KPIs). These KPIs may for example indicate how many participants viewed each element, in which order and with how many repetitions. Based on the data, heat maps were also created, where red indicates the areas with the most attention, while blue indicates the least attention.

The hypotheses were tested using paired *t*-test and Mann-Whitney test using IBM SPSS Statistics 25 statistical software.

**Stimuli**

The research used pictures of fruit juice packages of foreign brands, but also of juice brands sold in Czech and Slovak markets (Figure 1). In the case of the first hypothesis, which concerns the effect of the color saturation, the color saturation of each alternative was reduced by 50%. In the second stimulus, the information from the back side of the juices was added to the front side of the juices in a form of leaves that fitted the entire package design better. In the case of the third hypothesis, packages with illustrations of oranges were created in addition to the juices with images of real oranges. The effect of the image type was observed in the case of the packages, where the image was a small part of the package, as well as in the case where it created a larger part of the package. All graphic edits were done with Adobe Photoshop CC2018 software.

**RESULTS AND DISCUSSION**

The first stimulus consisted of a selection of 4 juices, 2 of which were colored normally and the remaining two had their color saturation reduced by 50%. Based on the data of individual metric, it has been recorded that the color saturation had an impact on the number of returns to a certain juice. The largest difference has been recorded in juice brand Tropicana, where the respondents looked back 3 times at the version with lower color saturation, while the normally colored version caught their attention more than 5 times. In case of juices Minute Maid and Tropicana, the most observed area of interest was the brand, while for the remaining two juices Del Monte and Dimes it was the flavor labeled 100%.



Figure 1 Variants of stimuli used for A/B test.

**Table 2** Average dwell time of selected AOIs of juices from the first part of eye-tracking research.

		Normal saturation	Lower saturation
Del Monte	Brand	4.1%	4.9%
	Picture	5.9%	4.3%
	Flavor + 100%	9.3%	5.0%
Minute Maid	Brand	20.0%	13.1%
	Picture	5.7%	4.6%
	Flavor + 100%	3.1%	1.8%
Tropicana	Brand	10.4%	7.4%
	Picture	6.0%	2.5%
	Flavor + 100%	3.1%	2.0%
Dimes	Brand	4.2%	1.7%
	Picture	4.9%	4.1%
	Flavor + 100%	5.9%	6.6%

Table 2 shows the average dwell time in the percentage of selected areas of interest at lower and higher color intensities. Based on these numbers we're able to conclude that higher saturation positively impacts the attention paid to the selected areas of interest. This impact of saturation has been statistically tested with the first hypothesis, which has been observed individually at each juice. Table 5 shows that the *p*-value of tests is lower than the significance value  $\alpha = 0.05$  in three out of four tests, therefore the null hypothesis is rejected and the alternative hypothesis is accepted instead. Therefore, it can be concluded that most of the offered juices showed a statistically significant effect of color saturation on the specific juice's attention. In the case of the juice Del Monte where the null hypothesis of the nonexistence of color saturation impact on dwell time was not rejected, Table 5 shows higher average dwell time in the case of higher color saturation. We are therefore able to observe the positive impact of color saturation in this juice, even though it has not been confirmed as statistically significant. **Kovač et. al (2019)** also observed the same impact of brighter colors during his research, which confirmed that brighter colors are more attractive to consumers. Brighter colors not only impacted the dwell time of consumers but also their selection of the juice. During the eye-tracking research, they were asked to choose one of the four juices they fancied the most. Within group A, it was very clear since 18 respondents (95%) chose juice Minute Maid, while 1 respondent (5%) chose juice brand Dimes. Both brands had fully colored packaging. Group B was less clear. Juice Minute Maid was fancied the most by 4 participants (21%) despite the lowered color brightness in packaging. The remaining participants would choose juices with higher package color saturation, more specifically 5 (26%) would choose Del Monte and 10 respondents (53%) would choose juice Tropicana. We can conclude that the packaging colors are being subconsciously perceived by consumers who may be influenced by more saturated colors in the form of fancying the juice more. This fact has also been clarified in a study by **Wei et al. (2014)** who explains that saturated colors create a new expectation of a fresh fruit product in consumers. Juice package with bright colors may create an impression of a freshly squeezed juice. The higher presence of orange color on juice packages Tropicana and Minute Maid may have caused higher dwell time with these brands. **Wei et al. (2014)** and **Ježovičová, Turčinková and Drexler (2016)** state that it is appropriate to use a color in

the background of the juice package that corresponds to the fruit from which the juice is prepared. **Schloss and Palmer (2010)** found in their research that the evaluation of color preferences and harmony was highest for colors that have the most similar hues. This could also have resulted in a successful selection of these juices by the respondents. The mentioned fact may have also contributed to the choosing of these juices by the respondents. On the other hand, **Hurley et al. (2017)** did not confirm the significance of color harmony on package preference in his study. He stated that designers have creative freedom in package design and are not required to follow this rule.

In the second part, we researched whether an edit of the front side of juice packaging can impact the reviewing process of the juice by the respondent. Two Czech juice brands Hello and Relax in tetrapack package were chosen as the stimuli. The front sides of the packages were edited with additional information from the back sides in the form of texts placed in leaves. In the case of the juice Hello, the added information were "z koncentrátu" (from concentrate) and "Vyrobeno v České republice" (Made in Czech Republic). In case of the juice Relax, the added information was "100% obsah ovocné složky" (100% fruit content), "Žádné konzervační látky ani barviva" (No preservatives, no artificial colors) and "Vyrobené z koncentrátu" (Made from concentrate). The choice of this information was made regarding the study results by **Gadioli et al. (2013)**, **Mohebalian, Cernusca and Aguilar (2012)** and **Romano, Rosenthal and Deliza (2015)**.

Based on the heat maps in Figure 2, it is clear that the graphic edit of the front side of the packaging drew significant attention from the respondents. Figure 2 also shows that attention paid to additional information increased at the expense of the sign "100% pomeranč" (100% orange) and the image of an orange. The most viewed part of the front side was leaves with information (37.5%), while with the original package without any edits it was the brand name (21.9%). Great attention while viewing the front side of the package was also paid to juice flavor along with the 100% sign, which the respondents in



**Figure 2** Heat maps of tested variants juice Hello with and without additional informations.

group A paid attention to for about 16% of viewing time, while in group B they spent about a quarter of it.

However, the method of viewing the back side of the juices was the same in both variants. In both groups, participants spent more than 50% of the time reading the juice composition in the Czech and Slovak languages. Only 2% of viewing time was spent on each of the other areas of interest such as producer, volume, producer's website label, etc.

Similar to the Hello juice, the Relax brand can be seen in Figure 3, where we can observe the attention of the respondents with accompanied information on the front side. With the front page without additional information, the areas of greatest attention are flavor along with 100% (46.3%), brand (24.9%) and orange image (14.4%). In case of the front page with information, the flavor along with 100% (30.3%) and brand (19.7%) are also the main areas of interest but are followed by "no preservatives or artificial colors" (14.3%) and "100% fruit content" (9.5%). Only then follows the orange picture (4.6%). The label "made from concentrate" received less than 3% attention. This lesser attention could also be due to the position of this label, as it was found out that consumers prefer the upper part of the package (Juravle et al., 2015; Rebollar et al., 2015).

Even in the case of the back of the Relax Juice, the most observed part was the juice composition, at which participants spent up to 40% of their time. However, there were two other areas of interest in this juice, where the participants spent a certain amount of time. Those are the nutritional values, that group A respondents went through for about a quarter of the time, while in group B the participants spent a little less time there (only about 15%). The respondents' attention was also drawn to the graphic element located in the center of the package, which spoke of shaking the juice before opening. Participants in group A spent 13.9% of the time and group B spent 11.6% of the time in this area of interest.

In this case of the eye-tracking research, we tested the assumption that when placing additional information from



Figure 3 Heat maps of tested variants juice Relax with and without additional informations.

the back of the juice package to the front, the respondents spend less time looking at the back of the juice package. The hypothesis was tested for both juices, but in neither case the *p*-value of the tests did fall below the significance level of 5% (Table 5) and therefore the null hypothesis cannot be rejected. Thus, there is no statistically significant difference between the time of observation of the back side for additional information on the front side of the juice. With Relax juice, the *p*-value (0.0597) is relatively close to the rejection of the null hypothesis. This is also shown by the average back side viewing time, which is significantly lower if the front page information is added, although this has not been confirmed statistically. From Table 5, it can also be noted that the average back side viewing time is even longer in the case of Hello juice if there is additional information on the front side in comparison to its absence. This could also be due to the number of information added to the front, which was higher in the case of Relax, but specific information could also have an impact. Indeed, Relax juice had information about vitamin C on the front and according to Gadioli et al. (2013), this information is very important for young people and students. Therefore, along with additional information, the front of Relax juice could have had a more meaningful value than Hello juice.

However, these incentives have confirmed the importance of the back juice packaging, which is significant for consumers. This was also confirmed in an in-depth interview where up to 32 (84%) of respondents said they always or frequently read the back of juice containers while the remaining 6 (16%) do not read this information.

Recent packages of fruit juices in this research have been examined for the perception of different types of presented oranges. For each pair of juices, the respondents were to choose the one that makes them fancy orange juice the most.

For the first stimulus, juice 365 Everyday Value, it is clear from the heat maps (see Figure 4) that respondents were primarily driven by orange images during the decision process. This is also confirmed by the authors Simmonds and Spence (2017), who confirms that food images can evoke hunger or craving for food in the consumers' minds. The average percentage values of dwell time for individual areas of interest are shown in Table 3, which shows that the participants spent most of their time looking at pictures of oranges on the juice packaging. They spent up to 30% of their total viewing time by looking at orange images.



Figure 4 Heat maps of tested variants juice 365 Everyday Value with photo and illustration of oranges.

**Table 3** Average dwell time of selected AOIs of juice 365 everyday value.

	Photo of oranges	Illustration of oranges
Opening system	1.35%	1.45%
Brand	8.45%	7.40%
Flavor + 100%	11.10%	9.25%
Picture	15.10%	16.10%
Additional information	2.40%	2.00%

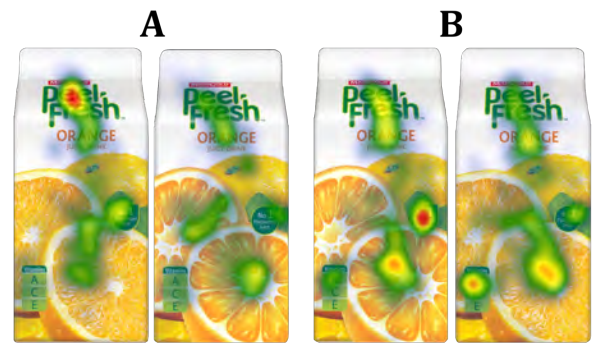
In both groups, although the oranges in the form of illustrations were viewed longer, the difference was only 1%. The second most viewed part of the package was the 100% composition label along with the flavor, which is also confirmed by the heat map on which the area is colored as well. Juice brand viewing ranked third. The respondents paid the least attention to the uppermost part of the package (opening system) as well as the lowermost part of the package, where the volume and health claims were stated.

In the second stimulus, the package also differed in the form of oranges (graphic/real), but in this case the oranges covered a larger package area than the 365 Everyday Value juice. With the Peel Fresh juice, however, it is not possible to speak of a clear way of monitoring the juice package as it was with the first stimulus. From Figure 5 it can be stated that in this juice, the participants checked the package from top to bottom, which was due to a relatively small number of elements on the package. Table 4 shows the average percentage times of viewing specific areas of interest in Peel Fresh juice. In the case of both juices, the respondents spent about 50% of their total viewing time looking at oranges. With the brand, the average was about 13% of the viewing time. When comparing the juice packages (Figure 5), it is shown that some attention is also paid to the vitamin elements and the "No. 1 Pasteurised Juice" label. This could be because when comparing the appearance of oranges, the respondents looked from one package to another with the aforementioned elements, and therefore the respondents' eyes were focused on them for a certain amount of time.

Table 5 also shows the results of the last third tested the hypothesis, which examined the assumption that the photographs of oranges placed on the package will draw the

**Table 5** Results of tested hypothesis.

Hypothesis	Brand of juice	Variant	Average dwell time	Test	p-value	Test result
1	Del Monte	Normal saturation	22.61%	Independent samples Mann-Whitney	0.084930	H <sub>0</sub>
		Lower saturation	16.39%			accepted
	Minute Maid	Normal saturation	35.95%	Independent samples t-test	0.002242	H <sub>1</sub>
		Lower saturation	24.15%			accepted
	Tropicana	Normal saturation	24.16%	Independent samples Mann-Whitney	0.009766	H <sub>1</sub>
		Lower saturation	14.84%			accepted
Dimes	Normal saturation	20.05%	Independent samples t-test	0.032048	H <sub>1</sub>	
	Lower saturation	15.24%			accepted	
2	Relax	Without information	15651.64 ms	Independent samples Mann-Whitney	0.059692	H <sub>0</sub>
		With information	9446.30 ms			accepted
	Hello	Without information	9815.09 ms	Independent samples Mann-Whitney	0.511257	H <sub>0</sub>
		With information	12071.76 ms			accepted
3	Peel Fresh	Photo	43.79%	Independent samples t-test	0.134955	H <sub>0</sub>
		Illustration	40.80%			accepted
	365 Everyday Value	Photo	43.77%	Independent samples t-test	0.343758	H <sub>0</sub>
		Illustration	41.81%			accepted



**Figure 5** Heat maps of tested variants juice Peel Fresh with photo and illustration of oranges.

respondents' attention more than the illustrated oranges. However, the *p*-values of both tests did not reject the null hypothesis, thereby confirming an alternative hypothesis that suggests statistical insignificance of the image type for attention to packages. However, Table 5 shows that higher average attention was recorded in both cases of juices with a genuine depiction of orange.

Although the type of image did not have a significant effect on the length of attention, it affected fancying the orange juice. The respondents' answers about evoking the biggest appetite for juice when choosing from two versions of 365 Everyday Value juice packages clearly say that respondents prefer photographs of oranges over illustrations.

Up to 35 out of 38 respondents (92%) chose the real orange option, while only 3 participants (8%) had a greater appetite for juice when looking at the graphic version. A similar result can be observed with Peel Fresh juice.

Up to 33 participants (87%) fancied a juice package with real oranges more, while 5 respondents (13%) fancied a package with a graphic version of oranges. These results

**Table 4** Average dwell time of selected AOIs of juice Peel Fresh.

	Photo of oranges	Illustration of oranges
Brand	7.30%	5.50%
Flavor	3.85%	3.85%
Picture	24.45%	25.00%

are in line with the results of other studies that have shown that food product photography gives consumers feel of a healthier and more natural product (Kovač et al., 2019; Smith, Barratt and Sørensen, 2015; Abrams, Evans and Duff, 2015; Pensasitorn, 2015).

This study has shown interesting results in the graphic design of juice packages, but it can also provide resources for further research. Research of the form of the fruit's presentation on the juice package proves to be suitable. The way of fruit processing has already been studied by Machiels and Karnal (2016), but it would also be useful to find out what type of fruit serving produces the greatest appetite for juice (sliced, whole...).

A certain extent of limitation of this study can be seen in the unequal distribution of men and women, as the majority of the sample were women. This could have had an impact on the overall data obtained. Indeed, in some studies (Orquin and Scholderer, 2011; Abdi Sargezeh, Tavakoli and Daliri, 2019; Sammaknejad et al., 2017), it has been confirmed that there are certain differences in the monitoring of men and women. The weak point of this study could also be the low number of respondents. The limitations of this study can also be seen when creating heat maps. The heat maps were created separately for Group A and Group B with each group containing 19 participants. However, Pernice and Nielsen (2009) recommend a minimum of 30 respondents for the creation of heat maps. Therefore, the resulting heat maps shown above may be slightly distorted.

## CONCLUSION

The eye-tracking research has shown that color saturation of the fruit juice package has a significant impact on the attention of Y-generation consumers since the  $p$ -value in three out of four tests of color saturation of the juice package was lower than  $\alpha = 0.05$ . The lesser attention paid to the juice as the result of a lower saturation effect has been confirmed in up to three out of four juices. This claim is also reinforced by the fact that the vast majority of respondents chose the package with the highest color saturation as the packaging which evoked the highest appetite for orange juice. Adding information to the front side of the juice packages did not significantly reduce the viewing time of the back of the juice packages. Therefore, the importance of reading information on the back sides of juice packages, which is sometimes or occasionally read by up to 85% of the respondents, has been confirmed. The respondents spent most of their time reading the juice composition while viewing the back side. In the case of an image type, its impact on respondents' observation time was not confirmed. It however did have an impact on fancying the orange juice, as up to 90% of respondents evoked the appetite by looking at the images of real oranges. It has also been found out that when deciding on the induction of appetite, the long-term focus was on fruit images on the juice package.

## REFERENCES

Abdi Sargezeh, B., Tavakoli, N., Daliri, M. R. 2019. Gender-based eye movement differences in passive indoor picture viewing: An eye-tracking study. *Physiology & Behavior*, vol. 206, p. 43-50. <https://doi.org/10.1016/j.physbeh.2019.03.023>

Abrams, K. M., Evans, C., Duff, B. R. 2015. Ignorance is bliss. How parents of preschool children make sense of front-of-package visuals and claims on food. *Appetite*, vol. 87, p. 20-29. <https://doi.org/10.1016/j.appet.2014.12.100>

Ampuero, O., Vila, N. 2006. Consumer perceptions of product packaging. *Journal of consumer marketing*, vol. 23, n. 2, p. 100-112. <https://doi.org/10.1108/07363760610655032>

Ashurst, P. R. 2016. *Chemistry and Technology of Soft Drinks and Fruit Juices*. Hoboken, NJ : John Wiley & Sons, p. 424. ISBN 9781118634967. <https://doi.org/10.1002/9781118634943>

Bone, P. F. France, K. R. 2001. Package Graphics and Consumer Product Beliefs. *Journal of Business and Psychology*, vol. 15, no. 3, p. 467-489. <https://doi.org/10.1023/A:1007826818206>

Burgess, P. 2016. *Integrating the Packaging and Product Experience in Food and Beverages: A Road-Map to Consumer Satisfaction*. CAMBRIDGE, UK : Woodhead Publishing, p. 220. ISBN 978-0-08-100356-5

Cahyorini, A., Rusfian, E. Z. 2012. The effect of packaging design on impulsive buying. *Bisnis & Birokrasi Journal*, vol. 18, p. 11-21.

Fenko, A., Lotterman, H., Galetzka, M. 2016. What's in a name? The effects of sound symbolism and package shape on consumer responses to food products. *Food quality and preference*, vol. 51, p. 100-108. <https://doi.org/10.1016/j.foodqual.2016.02.021>

Gadioli, I. L., Pineli, L. D. L. O., Rodrigues, J. D. S. Q., Campos, A. B., Gerolim, I. Q., Chiarello, M. D. 2013. Evaluation of Packing Attributes of Orange Juice on Consumers' Intention to Purchase by Conjoint Analysis and Consumer Attitudes Expectation. *Journal of Sensory Studies*, vol. 28, no.1, p. 57-65. <https://doi.org/10.1111/joss.12023>

Hanson-Vaux, G., Crisinel, A. S., Spence, C. 2012. Smelling shapes: Crossmodal correspondences between odors and shapes. *Chemical senses*, vol. 38, no. 2, p. 161-166. <https://doi.org/10.1093/chemse/bjs087>

Hubert, M., Hubert, M., Florack, A., Linzmajer, M., Kenning, P. 2013. Neural correlates of impulsive buying tendencies during perception of product packaging. *Psychology & Marketing*, vol. 30, no. 10, p. 861-873. <https://doi.org/10.1002/mar.20651>

Hurley, R. A., Randall, R., O'Hara, L., Tonkin, C., Rice, J. C. 2017. Color harmonies in packaging. *Color Research & Application*, vol. 42, p. 50-59. <https://doi.org/10.1016/j.foodqual.2016.04.014>

Ježovičová, I., Turčinková, J., Drexler, D. 2016. The influence of package attributes on consumer perception at the market with healthy food. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, vol. 64, no. 6, p. 1919-1926. <https://doi.org/10.11118/actaun201664061919>

Juravle, G., Velasco, C., Salgado-Montejo, A., Spence, C. 2015. The hand grasps the center, while the eyes saccade to the top of novel objects. *Frontiers in psychology*, vol. 6, p. 1-9. <https://doi.org/10.3389/fpsyg.2015.00633>

Karnal, N., Machiels, C. J., Orth, U. R., Mai, R. 2016. Healthy by design, but only when in focus: Communicating non-verbal health cues through symbolic meaning in packaging. *Food Quality and Preference*, vol. 52, p. 106-119. <https://doi.org/10.1016/j.foodqual.2016.04.004>

Kovač, A., Kovačević, D., Bota, J., Brozović, M. 2019. Consumers' preferences for visual elements on chocolate packaging. *Journal of Graphic Engineering and Design*, vol. 10, no. 1, p. 13-18. <https://doi.org/10.24867/JGED-2019-1-013>

Lee, J. Y., Gao, Z., Brown, M. G. 2010. A study of the impact of package changes on orange juice demand. *Journal of*

- Retailing and Consumer Services*, vol. 17, no. 6, p. 487-491. <https://doi.org/10.1016/j.jretconser.2010.08.003>
- Liem, D. G., Aydin, N. T., Zandstra, E. H. 2012. Effects of health labels on expected and actual taste perception of soup. *Food Quality and Preference*, vol. 25, no. 2, p. 192-197. <https://doi.org/10.1016/j.foodqual.2012.02.015>
- Machiels, C. J., Karnal, N. 2016. See how tasty it is? Effects of symbolic cues on product evaluation and taste. *Food Quality and Preference*, vol. 52, p. 195-202. <https://doi.org/10.1016/j.foodqual.2016.04.014>
- Mizutani, N., Okamoto, M., Yamaguchi, Y., Kusakabe, Y., Dan, I., Yamanaka, T. 2010. Package images modulate flavor perception for orange juice. *Food quality and preference*, vol. 21, no. 7, p. 867-872. <https://doi.org/10.1016/j.foodqual.2010.05.010>
- Mohebalian, P. M., Cernusca, M. M., Aguilar, F. X. 2012. Discovering niche markets for elderberry juice in the United States. *HortTechnology*, vol. 22, no. 4, p. 556-566. <https://doi.org/10.21273/HORTTECH.22.4.556>
- Mruk-Tomczak, D., Jerzyk, E., Wawrzynkiewicz, N. 2019. Consumer Engagement and the Perception of Packaging Information. *Olsztyn Economic*, vol. 14, no. 2, p. 195-207. <http://doi.org/10.31648/oiej.3971>
- Nicoli, M. C. 2012. *Shelf Life Assessment of Food*. Boca Raton, FL : CRC Press, p. 316. ISBN-13 978-1-4398-4603-2
- Ooijen, I., Franssen, M. L., Verlegh, P. W., Smit, E. G. 2017. Signalling product healthiness through symbolic package cues: Effects of package shape and goal congruence on consumer behaviour. *Appetite*, vol. 109, p. 73-82. <https://doi.org/10.1016/j.appet.2016.11.021>
- Orquin, J., Scholderer, J. 2011. Attention to health cues on product packages. *Journal of Eyetracking, Visual Cognition and Emotion*, vol. 1, no. 1, p. 59-63. Available at: <http://hdl.handle.net/10437/2311>.
- Pensator, W. 2015. The use of images in graphic design on packaging of food and beverages. *Journal of Economics, Business and Management*, vol. 3, no. 12, p. 1159-1163. <https://doi.org/10.7763/JOEBM.2015.V3.351>
- Pernice, K., Nielsen, J. 2009. *How to Conduct Eyetracking Studies*. USA: Nielsen Norman Group, p. 158. Available at: [https://media.nngroup.com/media/reports/free/How\\_to\\_Conduct\\_Eyetracking\\_Studies.pdf](https://media.nngroup.com/media/reports/free/How_to_Conduct_Eyetracking_Studies.pdf).
- Piqueras-Fiszman, B., Spence, C. 2011. Crossmodal correspondences in product packaging. Assessing color-flavor correspondences for potato chips (crisps). *Appetite*, vol. 57, no. 3, p. 753-757. <https://doi.org/10.1016/j.appet.2011.07.012>
- Rebollar, R., Lidón, I., Martín, J., Puebla, M. 2015. The identification of viewing patterns of chocolate snack packages using eye-tracking techniques. *Food quality and preference*, vol. 39, p. 251-258. <https://doi.org/10.1016/j.foodqual.2014.08.002>
- Robertson, G. L. 2009. *Food Packaging and Shelf Life: A Practical Guide*. Boca Raton, FL: CRC Press, p. 404. ISBN-13: 978-1-4200-7845-9
- Romano, K. R., Rosenthal, A., Deliza, R. 2015. How do Brazilian consumers perceive a non-traditional and innovative fruit juice? An approach looking at the packaging. *Food Research International*, vol. 74, p. 123-130. <https://doi.org/10.1016/j.foodres.2015.04.033>
- Rompay, T. J., Deterink, F., Fenko, A. 2016. Healthy package, healthy product? Effects of packaging design as a function of purchase setting. *Food quality and preference*, vol. 53, p. 84-89. <https://doi.org/10.1016/j.foodqual.2016.06.001>
- Sammaknejad, N., Pouretamad, H., Eslahchi, C., Salahirad, A., Alinejad, A. 2017. Gender classification based on eye movements: A processing effect during passive face viewing. *Advances in Cognitive Psychology*, vol. 13, no. 3, p. 232-240. <https://doi.org/10.5709/acp-0223-1>
- Schloss, K. B., Palmer, S. E. 2010. Aesthetic response to color combinations: preference, harmony, and similarity. *Attention, Perception, & Psychophysics*, vol. 73, no. 2, p. 551-571. <https://doi.org/10.3758/s13414-010-0027-0>
- Simmonds, G., Spence, C. 2017. Thinking inside the box: How seeing products on, or through, the packaging influences consumer perceptions and purchase behaviour. *Food Quality and Preference*, vol. 62, p. 340-351. <https://doi.org/10.1016/j.foodqual.2016.11.010>
- Smith, V., Barratt, D., Sørensen, H. S. 2015. Do natural pictures mean natural tastes? Assessing visual semantics experimentally. *Cognitive Semiotics*, vol. 8, no. 1, p. 53-86. <https://doi.org/10.1515/cogsem-2015-0001>
- Solomon, M. R. 2009. *Marketing: Real People, Real Decisions*. 5<sup>ed</sup> ed. Harlow, UK: Pearson Education, p. 589. ISBN 978-0-273-70880-3
- Sütterlin, B., Siegrist, M. 2015. Simply adding the word "fruit" makes sugar healthier: The misleading effect of symbolic information on the perceived healthiness of food. *Appetite*, vol. 95, p. 252-261. <https://doi.org/10.1016/j.appet.2015.07.011>
- Talati, Z., Norman, R., Pettigrew, S., Neal, B., Kelly, B., Dixon, H., Ball, K., Miller, C., Shilton, T. 2017. The impact of interpretive and reductive front-of-pack labels on food choice and willingness to pay. *International Journal of Behavioral Nutrition and Physical Activity*, vol. 14, p. 171. <https://doi.org/10.1186/s12966-017-0628-2>
- Velasco, C., Salgado-Montejo, A., Marmolejo-Ramos, F., Spence, C. 2014. Predictive packaging design: Tasting shapes, typefaces, names, and sounds. *Food Quality and Preference*, vol. 34, p. 88-95. <https://doi.org/10.1016/j.foodqual.2013.12.005>
- Velasco, C., Spence, C. 2018. *Multisensory Packaging: Designing New Product Experiences*. Cham, GERMANY : Springer Berlin Heidelberg, p. 378. ISBN 978-3-319-94976-5.
- Waheed, S., Khan, M. M., Ahmad, N. 2018. Product Packaging and Consumer Purchase Intentions. *Market Forces College of Management Sciences*, vol. 13, no. 2, p. 97-114.
- Wei, S. T., Ou, L. C., Luo, M. R., Hutchings, J. B. 2014. Package Design: Colour Harmony and Consumer Expectations. *International Journal of Design*, vol. 8, no.1, p. 109-126.

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