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## BEHAVIORAL ECONOMY APPLICATIONS IN LIFESTYLE FOOD E-COMMERCE

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### Abstract

This article examines the application of behavioral economics principles, focusing on the impact of selected psychological factors influencing consumer decision making processes. It explores the impact of various behavioral tools and theories on online food purchases and their implications for marketing strategies. The article discusses core behavioral economics concepts like bounded rationality, heuristics, and cognitive biases, contrasting them with traditional economic models. It emphasizes the growing importance of behavioral economics in e-commerce, where consumer behavior is influenced by factors beyond rational thinking. Primary data were collected by an online questionnaire survey of 255 consumers with prior online shopping experience. The questionnaire investigates factors influencing Slovak consumers with an active lifestyle and interest in health and nutrition when purchasing food online. The key findings revealed that “free delivery” and “discounted prices” are the most influential promotional offers, while social proof, especially “customer reviews”, is the strongest motivator. Purchase triggers are primarily “running low on supplies” and “costs reduction”, varying slightly across age and gender. Moreover, younger consumers prefer “receiving a newsletter” and “website registration”, while older consumers favour “product samples”.

*Keywords: Behavioral Economics, Lifestyle Food E-Commerce, Consumer Behavior*

**JEL Classification: D91, M31, L81**

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## Introduction and theoretical background

Behavioral economics is a field that focuses on studying how psychological factors influence individuals' economic decision-making. In recent years, it has become an important part of consumer behavior analysis, especially in e-commerce, where purchasing decisions are not only the result of rational thinking but also cognitive biases and emotional influences. This article focuses on the applications of behavioral economics in the online food sales sector, particularly in the lifestyle area, where consumer behavior is influenced by various marketing tools and factors. The goal of the article is to explore which behavioral tools and theories influence consumers' decisions when purchasing food online and what impact they have on marketing strategies in this area.

### Behavioral economics fundamentals

Behavioral economics draws from multiple disciplines, including psychology, sociology, and cognitive science, to enhance the standard economic model by incorporating the underlying psychology of human behavior (Thaler, 2016). This approach challenges the traditional assumption of rational decision-making, recognizing that individuals often exhibit systematic deviations from the ideals of utility maximization (Saha, 2020). One key aspect of behavioral economics is the concept of bounded rationality, introduced by Herbert Simon, which suggests that individuals have limited cognitive resources and are unable to fully process all the available information when making decisions. This can lead to the use of heuristics, or mental shortcuts, which can sometimes result in biases and suboptimal choices. Historically, the foundations of behavioral economics can be traced back to the seminal works of influential thinkers such as Adam Smith, who recognized the role of psychological factors, such as loss aversion and self-control, in economic decision-making (Thaler, 2016). However, it was not until the 1980s that the modern version of behavioral economics emerged, challenging the traditional assumption of perfectly rational economic agents (Thaler, 2016). Scholars within this field have sought to address the limitations of the standard economic model by exploring the ways in which cognitive biases, emotions, and social influences shape the decision-making process (Camerer, 1999).

### Behavioral Economics in E-Commerce

Rapid technology development, and the strict restriction in activities due to pandemic situations have caused the increase of online shopping trends (Joseph & Balqiah, 2022). A growing number of time-constrained consumers are embracing the convenience of online shopping. This includes 24/7 availability, the ability to shop from home, competitive pricing, access to global markets, and the flexibility to use any internet-enabled device (Khosrow-Pour, 2015). In the context of e-commerce, psychological and cognitive factors can have a significant impact on the purchasing decisions of consumers. For example, factors such as loss aversion, overconfidence, and self-control can influence the way consumers navigate the online shopping process, leading to behaviors like shopping cart abandonment or impulsive purchasing. Researchers have explored various frameworks and theories to understand the motivational and affective factors that underlie consumer behavior in the e-commerce setting. These include considering the sequential processes involved in

online shopping, the organization and research of products within the shopping cart, and the role of emotional and cognitive processing in shaping the overall shopping experience (Bell et al., 2020). In the rapidly evolving landscape of e-commerce, the interplay between consumer behavior and economic decision-making has become a captivating area of study. Behavioral economics, a field that integrates insights from psychology and economics, has emerged as a powerful lens through which to understand the complex factors that shape online purchasing decisions. The foundational work of scholars highlighted the significance of psychological factors, such as loss aversion and overconfidence, in economic behavior (Thaler, 2016). However, it was not until the 1980s that the modern field of behavioral economics gained traction, challenging the traditional assumptions of the neoclassical model (Thaler, 2016). As the digital realm has become increasingly central to consumer experiences, researchers have turned their attention to the ways in which psychological and social factors influence online purchasing behavior (Cetină et al., 2012).

The rise of e-commerce in the food industry has ushered in a new era of consumer behavior that warrants careful examination through the lens of behavioral economics. As consumers become increasingly accustomed to the convenience and personalization offered by online platforms, e-commerce businesses in the lifestyle food sector must adapt their strategies to cater to the evolving preferences and decision-making processes of their target audience (Dijksterhuis et al., 2005; Nazarov, 2020). Hence a primary objective of each enterprise should be to meet and even exceed the requirements of their customers, what allows them to build a long-term relationship between them and their customers (Knop, 2019).

### Behavioral Tools in E-Commerce

One key aspect of behavioral economics in the e-commerce context is the role of cognitive biases and heuristics. Individuals often rely on mental shortcuts and rules of thumb when making decisions, which can lead to systematic deviations from the rational, utility-maximizing behavior assumed by the classical economic theory. For instance, the “anchoring effect” can cause consumers to be disproportionately influenced by the initial price they encounter, making them reluctant to deviate from that anchor point, even if subsequent options present a better value (Saha, 2020). The field of behavioral economics has shed light on the profound influence that social factors can have on individual decision-making processes, particularly when it comes to consumer behavior. One such social phenomenon that has garnered significant attention is the concept of social proof, which describes how people often look at the actions and opinions of others as a guide for their own behavior, especially in situations involving uncertainty or ambiguity (Salihu Ibrahim, 2023). In the context of online shopping, the impact of social proof can be particularly pronounced, as consumers are often faced with a vast array of product options and limited physical interaction with the items they are considering purchasing. In the absence of the ability to physically examine products or receive recommendations from sales representatives, online shoppers frequently turn to the experiences and opinions of other consumers, as expressed through online reviews and ratings, to help inform their purchasing decisions. Research has suggested that the presence of positive online reviews and high ratings can significantly increase the likelihood of a consumer making a purchase, as these forms of social proof provide a sense of reassurance and confidence in the quality and reliability of a product or service. Conversely, negative

online reviews and low ratings can have the opposite effect, serving to deter potential customers and eroding their trust in the brand or product (Putri et al., 2022). In addition to social proof, recommendation systems are crucial for managing the overwhelming amount of information that are available today to combat the news fatigue of consumers (Fernandes et al., 2024). Personalized newsletters offer readers control over their content consumption. They create relationships with companies and increase brand loyalty. Despite predictions, newsletters are experiencing continuous popularity and serve as a valuable tool for subscriber acquisition. Subscribers receive various offers, such as discounts or advantages, which are many times not available through any other channels. Moreover, this helps companies to easily create and use databases for segmentation. (Molinillo et al., 2021). Businesses also use many pricing tools to influence customer purchasing behavior and increase sales by shaping the perception of prices and product value. The most used ones are attractive prices comparable to different suppliers, discounts or often even no delivery costs (Abbad et al., 2011; Anvari & Norouzi, 2016). This leads to a mutually beneficial situation, where costumers reduce costs and time by no need for additional measures. Last-Mile Delivery describes the final and one of the most important and sensitive phases of the purchasing process - the shipping of products (Lazarević & Dobrodolac, 2020). Some e-commerce companies deliver orders by themselves, while others contract a third party (Švadlenka et al., 2023). One of the common issues is collaboration with external business partners, because the quality of their services also influence future customer purchasing behavior.

The rise of e-commerce has transformed the landscape of consumer behavior, ushering in a new era where businesses must navigate the complex interplay between technology, psychology, and consumer decision-making. Understanding the factors that influence online consumer behavior has become a crucial area of research for companies operating in the digital marketplace (Svobodová & Rajchlová, 2020; Vengatesh & Archana, 2023). One of the key factors shaping online consumer behavior is the impact of digital marketing strategies. Online companies must be proactive in developing unique selling propositions and conducting A/B testing to gauge the effectiveness of their digital tools (Nazarov, 2020). The slightest changes to a website, link, or any other digital element can have unpredictable results, underscoring the importance of a well-designed and user-friendly online platform (Nazarov, 2020). Moreover, the emergence of e-commerce has led to the modification of traditional factors that influence consumer behavior. Research suggests that the online shopping experience can trigger changes in mental processes, leading to shifts in consumer attitudes, beliefs, and perceptions towards products and brands (Cetină et al., 2012). Psychological and social factors, such as social status, fashion, and reference groups, have become increasingly relevant in the digital landscape, as they shape the decision-making process of online consumers (Cetină et al., 2012). Therefore, e-commerce businesses must consider these behavioral factors when crafting their strategies to remain competitive in the evolving online marketplace.

## Material and methods

The results of primary data collection can contribute to identifying factors that influence consumer decision-making when shopping in e-commerce. The following variables were selected for the research: gender, age category, preferences for online shopping, the impact of discounted purchases and promotions on customer decisions, preferred delivery and payment methods, interest in registering on websites

and subscribing to newsletters, preferences for product sorting, the use of filters when purchasing muesli bars, the selection of cost-effective products, and interest in product samples at a fraction of the price. The research also tested hypotheses aimed at identifying differences in respondent preferences based on gender, age, and shopping habits.

The data collection process took place continuously from January 2023 to March 2023. The target sample included all consumers who had prior experience with shopping through e-shops. The sampling method used was convenience sampling. Our respondents completed questionnaires via Google Forms. The survey questions were tailored to a specific e-commerce store of a Slovak lifestyle food manufacturer. Methodologically, we focused on addressing respondents' psychological barriers to completing content- and technology-intensive questionnaires. Based on this, we designed an optimal questionnaire with a reasonable number of questions, ensuring simplicity. When formulating the questionnaire items, we emphasized their mutual coherence. Pilot testing was conducted on a small sample of respondents to gather feedback on the clarity of the questionnaire. After minor adjustments, the final version consisted of 2 sociodemographic and 17 specialized questions related to the research problem.

A total of 255 respondents participated in the survey, with the majority being women (75%), while men accounted for 25%. In terms of age structure, the largest group consisted of respondents under 25 years of age, comprising 58% of the sample. The second-largest group included individuals aged 26–35, representing 20% of respondents. Those aged 36–45 accounted for 10%, while the smallest group, respondents over 45 years old, made up 12%. Regarding respondents' online shopping behavior, 93% reported that they regularly shop online. The frequency of online shopping varied among respondents – approximately two-thirds shop online occasionally, about once or twice a month, 19% shop frequently, at least once a week, and 14% use online shopping exclusively during sales. These results highlight the importance of e-shops and their marketing strategies tailored to the preferences of individual customer segments. The structure of the sample is illustrated in Table 1.

Table 1 *Structure of the sample selection*

Survey item	Answers	absolute numbers	relative numbers
gender	male	71	27,84%
	female	184	72,16%
age	12 - 18	22	8,63%
	19 - 25	125	49,02%
	26 - 45	79	30,98%
	46 - 64	17	6,67%
	65 and more	12	4,71%
shopping experience in an e-shop	yes	238	93,33%
	no, i don't plan to try it	10	3,92%
	no, i plan to try it	7	2,75%

<b>regularity of purchases in the e-shop</b>	always	8	3,14%
	often	46	18,04%
	only when there are discounts	33	12,94%
	rarely	151	59,22%
	without an answer	17	6,67%

*Source: Own processing based on data from the survey*

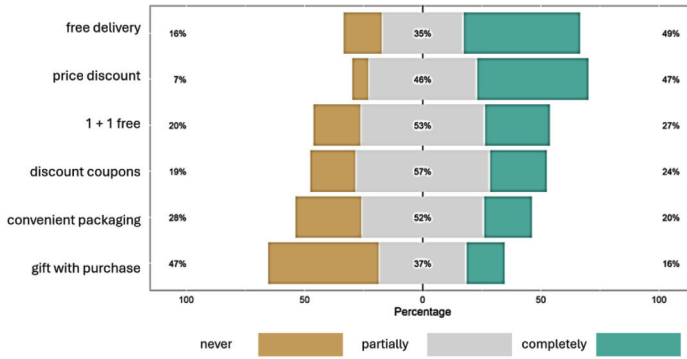
The dataset from the questionnaire survey was evaluated using appropriate statistical tests. The statistical analysis was performed using SPSS 22 and R. The validity of the stated hypotheses is assessed using suitable statistical tests based on the calculated p-values, which represent the probability of making an error if the null hypothesis is rejected. The significance level for all tests was set at 5%.

We use a comparative analysis of three statistical techniques commonly employed in such cases - Friedman's test, the Sign test with Bonferroni correction, and Binary logistic regression. Friedman's test is a non-parametric alternative to repeated-measures ANOVA, designed to identify differences among multiple methods or conditions across repeated measurements. It is particularly advantageous when the assumptions of parametric tests, such as normality and homogeneity of variance, are violated. The test operates by ranking observations within each block (e.g., subject or unit) and comparing the average ranks across the groups or conditions. The Sign test with Bonferroni correction is another non-parametric method for comparing two or more groups or conditions. Unlike Friedman's test, the Sign test does not involve ranking data but instead evaluates the frequency of positive and negative differences between paired observations. To control the error rate when conducting multiple comparisons, the Bonferroni correction adjusts the p-values (Pereira et al., 2015). We use the Plackett-Luce model to examine preferences for different delivery methods. The Plackett-Luce model can handle more than two alternatives, making it well-suited for analyzing preferences among a wider range of delivery options. The model estimates a set of "worth" parameters that represent the relative preference for each delivery method, with the most preferred option having the highest worth parameter (Turner et al., 2020).

## Results and discussion

Online stores usually use various types of special offers; hence respondents were asked to rate six of them using a three-point ordinal scale. Figure number 1 shows that "free delivery" has the greatest impact on respondents (completely influencing 49%), along with a "discounted price" (completely influencing 47%). On the contrary, the least important for consumers was "the fact whether they receive some kind of gift when the value of purchased goods exceed a set value". The Friedman test was used to test whether there is a statistical difference in the degree of influence for each of the purchase incentive options. The null hypothesis was rejected ( $\chi^2(5) = 200$ ;  $p < 0.001$ ); therefore, we have confirmed that there is a difference between variables, with a small effect ( $W = 0.17$ ). The Sign test with Bonferroni correction showed that "free delivery" and a "discounted price" had the greatest impact and do not differ from each other. The statistically lowest impact was confirmed for "a gift with purchases over a certain amount". In addition, the "buy one, get one free" promotion had a statistically greater impact than "discounted product bundles" ( $p = 0.004$ ).

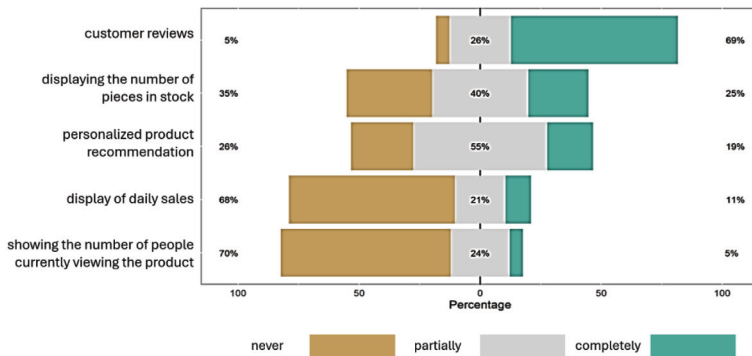
Figure 1 Influence of purchase incentive options



Source: Own processing based on data from the survey

Social proof can be considered as the most powerful practice of e-shops, since “reviews from other customers” influenced 69% of respondents “completely” (Figure number 2). The factors “displaying the number of items sold that day” and “the number of people currently viewing the product” motivated only 11% and 5%, respectively. A Friedman test was used to test the hypothesis of the equal motivational effects of these factors, and it was rejected ( $\chi^2(4) = 426$ ;  $p < 0.001$ ), with a medium effect ( $W=0.48$ ). A post-hoc test with Bonferroni correction was used to compare all pairs of factors. “Customer reviews” were statistically the strongest motivational factor, while “displaying the number of items sold that day” and “the number of people currently viewing the product” are statistically the least motivating. The remaining two factors (“products recommended directly to the shopping person” and “the number of products in stock”) do not differ statistically from each other ( $p=0.668$ ).

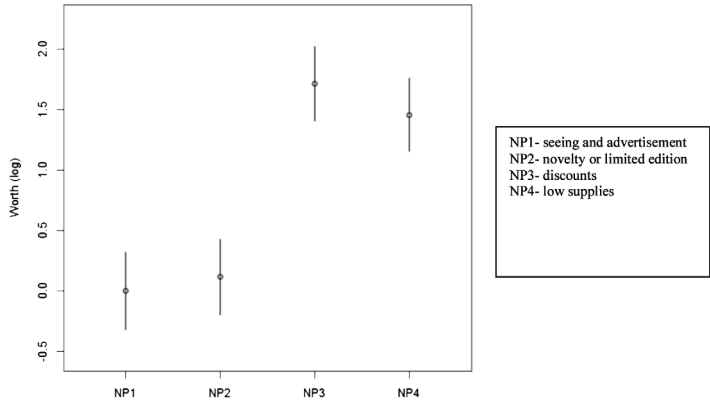
Figure 2 Impact of social proof factors on respondent's decision-making process



Source: Own processing based on data from the survey

When analyzing customer purchasing behavior, we used “seeing an advertisement” (NP1) as a reference category. Four situations can be divided into two equally sized groups (Figure number 3). Respondents were the most frequently motivated to make a purchase when “there are discounts” (NP3) or when “their supplies are running low” (NP4). These two situations did not differ statistically. On the other hand, “seeing an advertisement” (NP1) and “a new product” (NP2) were significantly less important than the aforementioned two categories.

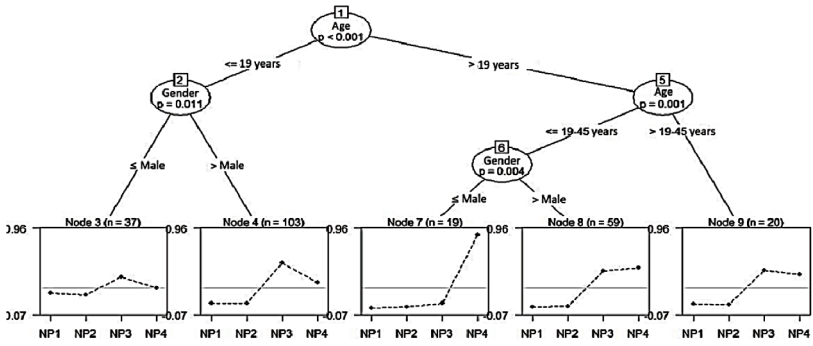
Figure 3 Strength of motivational parameters



Source: Own processing based on data from the survey

However, this preference was not maintained if the gender and age of respondents were taken in to account and these variables created five differently behaving groups (Figure number 4).

Figure 4 Strength of motivational parameters with age and gender taken into account



Source: Own processing based on data from the survey



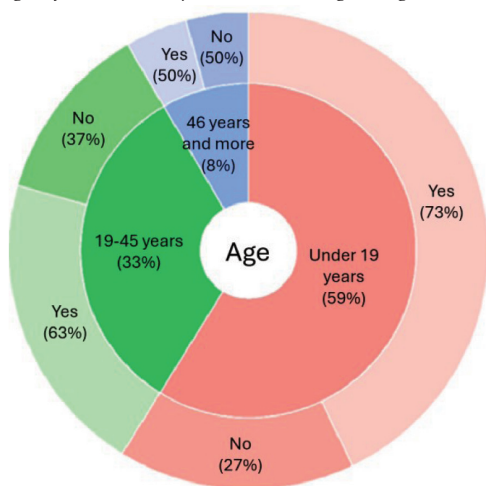
The largest group (43%) consisted of 110 women under the age of 19, for whom “discounts” and “running out of stock” were the dominant reasons for online shopping. Women aged from 19 to 45, as the second largest cohort (25%), were driven mainly by “discounts” and “running out of stock”. The third largest group (men under 19 years old) were motivated by all factors equally, with a slight dominance of “purchasing due to discounts”. “Running out of stock” was clearly the most common reason for making a purchase for men under 45. This reason was the most important for the last group, with a relatively small share (8%), of consumers over the age of 45, as well. Therefore, we can conclude that almost all created groups were driven primarily by feeling the lack from insufficient supplies and not by not marketing stimuli promoting products as a novelty, limited edition or for discounted price.

In the next part of the questionnaire, respondents were asked about their attitude to giving consent to receiving newsletters. A positive attitude was marked by a third of respondents (33%). The greatest interest in this service was among younger generations, since more than a third of respondents (36%) under the age of 19 used it on regular basis. Among respondents in the age category “from 19 to 45 years old” the interest was at the level of 27%, and in the oldest age category 30% declared interest.

The question concerning the website registration option was answered positively by more than two thirds of respondents (68%). The greatest interest (Figure number 5) in this service was among younger respondents, i.e. in the category “up to 19 years of age”, where almost three quarters of them (73%) used it. Among respondents in the age category “from 19 to 45 years”, the interest was at the level of 63%. Advantages of this service were used only by a half of the oldest respondents.

Furthermore, 69% of respondents expressed a willingness to order a sample of selected products with their order. The greatest interest (80%) was detected in the oldest age category. The youngest respondents “up to 19 years of age” would appreciate a sample of product in 70% of cases and the lowest interest (65%) was observed in the middle/age category.

Figure 5 Strength of motivational parameters with age and gender taken into account



Source: Own processing based on data from the survey

**Binary logistic regression** was used to determine the relation between respondent's age and answering the following questions:

- *newsletter subscription*
  - increasing the age category by one level resulted in a 19 % chance of decrease in the likelihood of subscribing for a newsletter, but this decrease was not statistically significant ( $p=0.575$ ),
- *registration option on the website*
  - increasing the age category by one level resulted in a 50 % chance of a decreasing interest in registering on websites. This decrease was statistically significant ( $p=0.042$ ).
- *willingness to order a sample of selected products*
  - increasing the age category by one level resulted in a 50 % chance of an increase in the odds of ordering a sample, but this increase was not statistically significant ( $p=0.351$ ).

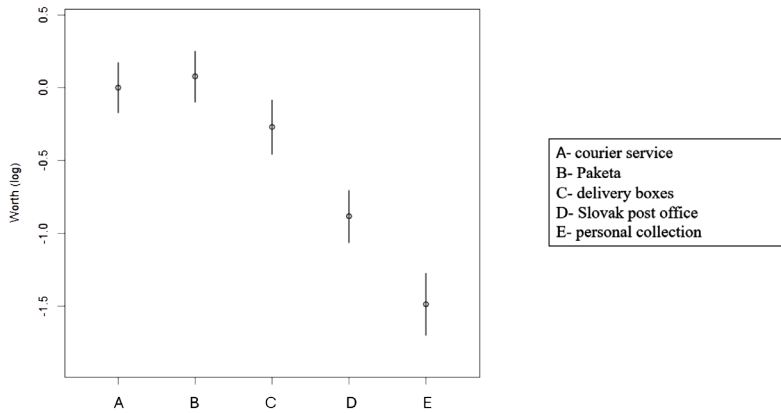
When shopping, respondents mostly (70%) preferred high quality, but they were also looking for the lowest possible price. 20% of respondents focused primarily on the quality of products and 10% were likely to make a purchase with the lowest possible costs. It turns out that the preference for high quality over low price increased with age.

As for the question related to assessing price and quality a multinomial regression model was used, where the results showed that increasing the age category by one level caused:

- a 9% decrease ( $p=0.918$ ) in the chance of choosing the product based on the fact, that it is limited edition in comparison with the product with reduced price,
- a 48% decrease ( $p=0.524$ ) in the chance of choosing the product based on the fact that it is a newly introduced product in comparison with the product with reduced price,
- a 62% decrease ( $p=0.380$ ) in the chance of choosing the product based on the lowest price in comparison with the product with reduced price.

Customers usually remember the end of an experience most vividly. That is why e-shops try to make the last stage of delivery as pleasant as possible for customers. They provide tailor-made delivery options, to suit all segments, such as courier delivery, delivery points by Packeta, delivery boxes open 24/7, post offices or personal pickup at selected stores. The last question analyzed the preferences regarding these delivery methods. The Plackett-Luce model was used to test the strength of preference (Figure 6) for individual methods of delivery. Delivering by courier service was used as the reference item. This answer and delivery points by Packeta were the most preferred options by respondents. The third most frequent answer was "delivery boxes" and the least used were delivery by the Slovak post office and personal collection at stores.

Figure 6 Strength of delivery options

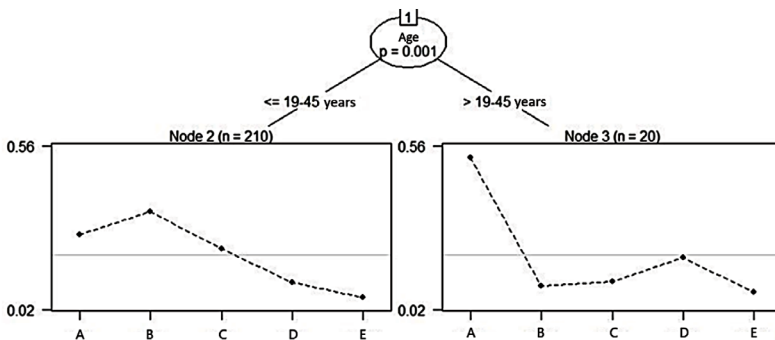


Source: Own processing based on data from the survey

Furthermore, the effect of the respondents' gender and age had also been analyzed. Results (Figure 7) show that a statistically significant factor is only the age of respondents when choosing a delivery option. Two groups with different preferences were identified:

- respondents under 45 years of age with a preference of delivery via Packeta delivery points,
- respondents older than 45 years of age with a preference for courier delivery.

Figure 7 Strength of delivery options with age taken into account



Source: Own processing based on data from the survey

## Conclusion

In conclusion, this study revealed key insights into online consumer behavior. Promotional offers like free delivery and discounted prices exerted the strongest influence on purchasing decisions, while on the other hand, gifts with purchases had the lowest impact. Social proof, particularly in the form of customer reviews, emerged as the most powerful motivator, significantly outweighing factors like displaying the number of items sold or how many people are currently viewing the same product. Purchase triggers were primarily driven by perceived scarcity ("running low on supplies") and discounts, although these preferences varied slightly across age and gender. While younger consumers showed greater interest in newsletters and website registration, older consumers were more inclined to ordering product samples. However, the relationship between age and newsletter subscriptions or sample orders was not statistically significant. Only the link between age and website registration was statistically proven, with older respondents less likely to register. These findings offer valuable information for online retailers to tailor their promotional strategies, website design, and marketing efforts to effectively target different consumer segments and optimize sales. The research is limited by the method used to construct the sample and its focus on a specific online store. Due to the sampling method, the findings may not be universally applicable to all e-commerce platforms, as consumer behavior can vary across different retailers. Additionally, by concentrating on a particular e-shop, the study's conclusions might be influenced by the unique marketing strategies and consumer dynamics of that platform, which could limit the generalizability of the results to other online food retailers. These constraints should be taken into account when interpreting the findings and applying them in broader contexts.

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