Changes in Online Shopping Behavior in the Czech Republic During the COVID-19 Crisis

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Abstract

The development of the online environment resulted in the formation of the behavior of all subjects in the online and offline market. This paper responds to current changes that significantly shape the whole society. Therefore, this paper aims to identify changes in online shopping before and during the COVID-19 crisis. The paper is based on primary research in the form of a questionnaire survey among a selected group of respondents that assess the determinants influencing their online shopping decisions before and during the ongoing COVID-19 crisis. The research showed that the COVID-19 crisis was reflected in changes in respondents' online shopping behavior. Less than a third of respondents declared that they did not change their online shopping behavior during the COVID-19 crisis. The research showed that the frequency of online purchases had increased significantly (more than three times), as well as the percentage volume of goods purchased online. It can also be assessed that the COVID-19 crisis has an impact on future online shopping, and more than 40% of respondents do plan to shop online more after the COVID-19 crisis than during the crisis. However, the relationship between generational cohorts and changes in online shopping behavior before and during the COVID-19 crisis has been demonstrated. Online retailers should be prepared for these changes and should take these changes into account when designing and implementing their e-strategy and thus increase their competitiveness in e-commerce.

1. INTRODUCTION

Online shopping behavior has been the subject of research in recent years, but understanding it is difficult because major actors, such as consumers and businesses and their behavior, have changed (Loketkrawee & Bhatiasevi, 2018). The E-commerce environment changes the shopping behavior not only in the case of online shoppers and formulates their new habits (Makwana et

al., 2017). Thanks to advanced times and technological advances, consumer behavior in the purchasing decision-making process has changed rapidly over the years (Prashant, 2009; Richard et al., 2010, Martín & Camarero, 2009; Pereira et al. 2016; Svatošová, 2020). With the advent of the COVID-19 crisis from March 2020 in Europe (WHO, 2020; WHO, 2021), it was possible to observe changes in the socioeconomic behavior of society due to the external and extraordinary circumstances (lockdown of most retail stone shops, social distancing, restrictions in socializing, traveling, other governmental measures to eliminate the epidemic risk, etc.). This situation caused by the COVID-19 crisis lasts for many months; therefore, the questions and businesses need to change their existing strategies and thus maintain their current competitiveness not only in e-commerce. The hypotheses emerge if these changes in the behavior of the global population are temporary or permanent and how businesses must change existing strategies in line with this change. Therefore, this paper focuses on the current knowledge dealing with the impact of COVID-19 on shopping behavior with specification on the online shopping behavior as the world was forced to reconsider their daily routine habits into the online environment.

The issue of the impact of the COVID-19 crisis on changes in online shopping behavior has so far been given minimum space (APEK, 2021; Laroche et al., 2005; Hao et al., 2020; Alaimo et al., 2020; Kurtisi & Alver, 2021; Moon et al., 2021; Alheimer, 2022). Therefore, this paper primarily aims to fill this research gap for the Czech Republic as the main research representing online shopping behavior within Central and Eastern Europe. Afterward, the results of the primary study will be used for the implementation of research in other European countries with their subsequent comparison. The main research questions are formulated to fulfill the main objectives of the research survey: (1) Is there any relationship between online shopping behavior before and during the COVID-19 crisis and selected generational cohorts? (2) How does online shopping behavior differ before and during the economic and health crisis caused by the new type of coronavirus COVID-19? (3) Did the COVID-19 crisis influence the importance of determinants of online shopping behavior?

2. THEORETICAL BACKGROUND

This paper summarizes the minor relevant secondary research focused on the issue of general and online shopping behavior before and during the COVID-19 crisis in the context of e-commerce competitiveness.

Online/offline shopping behavior before the COVID-19 crisis

With the development of information and communication technologies, the channels through which offline retailers can sell their products to consumers are expanding. Many offline retailers are trying to enter the e-commerce market through online stores, which retailers can easily compile at low prices in order to advertise and sell products online (Huseynov & Yildirim, 2016). E-commerce plays an important role in the world economy, and its scope is growing (Roca et al., 2009). Nowadays, businesses in e-commerce that desire to stay competitive in the long run must adapt their e-commerce strategy to the online shopping habits of their customers (Martín & Camarero, 2009; Pereira et al., 2016). Retail sales in e-commerce account for 12.8% of total retail sales (APEK, 2021) and 16.2% in 2020. This share rises every year, and the Czech Republic

has caught up with other countries. Moreover, the use of the Internet, and, in particular, online shopping, is still growing here. E-commerce brings particular positives and negatives to traders (Svobodová & Rajchlová, 2020). Hallikainen & Laukkanen (2018) state that the reluctance to shop online may also be associated with an individual's personality, as buyers show different levels of trust in e-commerce. Choshin & Ghaffari (2017) also indicated that the key success factor in e-commerce competitiveness is customer satisfaction, including customer trust, personal data security, purchase security, and easy access to information.

Online/offline shopping behavior during the COVID-19 crisis

The current situation after the first wave and the beginning of the second wave of the COVID-19 pandemic in Europe has forced many consumers to rethink their established shopping habits or even learn new ones (Sheth, 2020). For example, due to the extraordinary measures to eliminate pandemic risk, many consumers we forced to do online shopping, home delivery, or cashless payments, which they have never considered before (Pantano et al., 2020). It is necessary for retail managers to observe changes in consumer shopping behavior and lifestyles to understand what adjustments in strategies they have to implement (Verma & Gustafsson, 2020; Eger et al., 2021). According to Laato et al. (2020), due to the recent COVID-19 pandemic, the reality of the business environment has changed drastically. There is no exception for online shopping businesses due to customers altered purchasing behavior. Anti-epidemic assurances and calls to leave the house only in the most urgent cases have brought many orders to be delivered to end-users, resulting in the growth of this business in the tens of percent (Eger et al., 2021). In the early stage of the COVID-19 crisis, Shamim et al. (2020) confirmed that people were afraid to shop at stone shops and kept social distancing, and pursued health safety practices in general. During the COVID-19 crisis, Taha et al. (2021) confirmed that interest in online shopping increased significantly and the contactless shopping process made e-commerce the first choice for people when shopping. For instance, Chang & Meyerhoefer (2020) argued that a variety of products such as frozen food and fresh vegetables had been sold online more than in previous years. Roggeveen & Sethuraman (2020) indicated that the requirement of emergency medical supplies and hygiene products has also been found to be highly popular on online shopping platforms because buyers have positive purchasing attention due to their concern for safety during the pandemic. Eger et al. (2021) demonstrated significant differences as well as similarities in consumer behavior between generations. This research supports and expands generation cohort theory concerning changes in consumer behavior during the COVID-19 pandemic from a Central European perspective. Nevertheless, only a few studies are focused on the issue of online shopping behavior during the COVID-19 crisis. For instance, Moon et al. (2021) analyzed the characteristics of consumers who have used offline shopping channels during the pandemic. In addition, participants were asked how often they will use online and offline shopping channels after society stabilizes from COVID-19 to analyze what determinants will be used to select either online or offline shopping channels after the pandemic. Alhaimer (2022) investigated the risk factors that altered online shopping behavior in Kuwait during the COVID-19 crisis and revealed that risk susceptibility, risk severity, and risk of formal penalties positively affect consumers' online buying attitudes. In the new era of retail, many consumers have moved from offline retail channels to safe and convenient online channels (Laroche et al., 2005; Lee & Lee, 2020). Another study (Kurtisi &

Alver, 2021) explored the online shopping behavioral changes in Sweden during the COVID-19 crisis. They revealed that COVID-19 caused online shopping increment during the pandemic. Still, participants' intentions do not show a sign that their online shopping behavior changes would be affected by the changes of COVID-19 when the pandemic ends.

According to APEK (2021), Czechs spent CZK 196 billion on the Internet in 2020, which is 26% more than in the previous year. The COVID-19 crisis has changed the behavior of Czech customers in the online space–from a temporary transition to contactless payments to a tendency to trust larger and trustworthy e-shops when shopping. During the closing of retail, new e-shops were created as a new sales channel, often as a supplement to the stone shop. The jumper of the year was the segment of books, movies and games (+ 47%), food (+ 45%), and sports (+ 43%). Compared to the past, customers started buying daily consumer goods, such as food and drugstore goods, but, for example, medicines were also in great demand. In these categories, APEK (2021) saw great potential for growth in the future, as they are increasingly available to residents outside large cities. The development of online sales is also helped by an ever-widening range of delivery methods, including the very popular personal collection. Other investigations (Hao et al., 2020; Alaimo et al., 2020; Jensen et al., 2021) focused only on the segment of food in online shopping behavior. All studies confirmed significantly increased interest in online food shopping for the many reasons (lockdown, social distancing, elimination of pandemic risk, fear appeal, etc.) caused by the COVD-19 crisis. The results of these studies also highlight that people having familiarity with buying food online and have a higher educational level and consider online food channels easy to use appear more satisfied with the food online shopping experience. Jensen et al. (2021) revealed 20% of online shoppers shopped online for the first time during the COVID-19 crisis, and most respondents do plan to shop food online after the COVID-19 crisis. However, another comprehensive view of online shopping behavior during the COVID-19 crisis is lacking.

3. RESEARCH OBJECTIVE, METHODOLOGY, AND DATA

Research objectives and methods

The main research objective is to identify changes in online shopping behavior before and during the economic and health crisis caused by the new type of coronavirus COVID-19. Afterward, the first partial objective is to identify determinants that affect online shopping behavior in the Czech online environment before and during the economic and health crisis caused by a new type of coronavirus COVID-19. The second partial objective is to evaluate the relationship between online shopping behavior before and during the COVID-19 crisis selected generational cohorts. The main research method of the research survey is the method of personal questioning carried out in the form of quantitative research. A questionnaire survey is the main technique of data collection of the research survey. The online format of distribution of questionnaires (using the Survio form by e-mails, social media, own websites) was chosen regarding the pandemic coronavirus risk at the time of implementation (June to August 2021) and respecting the quota selection of respondents (Table 1). In general, respondents have been selected using random selection and the technique of snowball effect. The online questionnaire calculated the number

of respondents divided by generational cohorts: when the needed number of respondents in a given age category was received, this category was in questionnaire closed.

Research sample and data collection

The respondents for the survey, conducted through a questionnaire, are residents of the Czech Republic; thus, as the author has been studying the Czech online environment for a long time and is well oriented in it, the respondents were chosen specifically. According to the CSO (2020), there were 10,553,700 inhabitants in the Czech Republic, which served as the basic dataset for the research. According to Raosoft (2021), the representativeness of the data is ensured in a sample of 385 respondents, at a confidence interval of 95% and 5% of the allowable error. In this survey, respondents were categorized according to their year of birth into the following generational cohorts (see Table 1), based on the definition of previous research (Eger et al., 2021; McKinney et al., 2004; Parment, 2013; Marjanen et al., 2019; Chaney et al., 2017). Table 1 presents the expected number of respondents to the questionnaire survey, which was calculated based on data from the CSO (2020), using quota selection, where the age of consumers was selected as a quota character. The next column shows the actual number of respondents who participated in the online questionnaire survey. A total of 424 participants participated in the questionnaire survey filled in the submitted online questionnaire. Therefore, the representativeness of the data for the Czech Republic is ensured. Nevertheless, the results cannot be generalized for the worldwide population. Moreover, these results could be used for the further comparison of other countries, at least from Central and Eastern Europe. However, at the time of this research survey, similar comparative studies had not been carried out in Europe.

Tab. 1– Comparison of the expected and actual number of respondents. Source: own research

Age cohorts (categories) of the research survey	Age ranges of age category	Population by age category	Percentage of population by age category	Expected number of respondents	Actual number of respondents
W: War generation (until 1945)	76 +	751,945	7.08%	27	30
B: Baby boomers (1946–1967)	54–75	2,684,753	25.47%	98	108
H: Husák's children, the so-called generation X (1968–1982)	39–53	2,469,482	23.35%	90	99
M: Millennials, the so-called Generation Y (1983–1997)	24–38	2,079,359	19.81%	76	84
O: Online generation, the so-called generation Z (1998–2010)	23 and less	2,568,171	24.29%	94	103
Summary		10,533,700	100 %	385	424

Research hypotheses and statistical methods verification

To fulfill the main and partial objectives of this paper, the following research hypotheses are determined:

MH1: Online shopping behavior before and during the COVID-19 crisis is independent of generational cohorts. An essential component to understanding shopping behavior is marketing segmentation (McKinney et al., 2004). Parment (2013) indicates that a useful segmentation approach is based on generational cohort because of the relative homogeneity within generations and, at the same time, of the heterogeneity across generations. Marjanen et al. (2019) state that generational cohort memberships share similar values that affect attitudes, preferences, as well as shopping habits and behavior. Similarly, Chaney et al. (2017) argue that generational cohorts' experiences, beliefs, core values, attitudes, and preferences shape their behaviors. The orientation on the research from the perspective of generational cohorts is the subject of relevant research activities (Eger et al., 2021; Alaimo et al., 2020; Williams & Page, 2011; Krbová, 2016; Jackson et al., 2011). Therefore, the research survey of this paper is focused on the selected generational cohorts (Table 1).

MH2: There are no differences between online shopping behavior before and during the COVID-19 crisis. The main key area of the research survey focuses on the differences in online shopping behavior before and during the COVID-19 crisis. At least, some minor research has already been dedicated to this issue (Moon et al., 2021; Kurstisi & Alver, 2021; Eger et al., 2021; Alaimo et al., 2020; Romeo-Arroyo et al., 2020; Pantano et al., 2020; Sheth, 2020; Verma & Gustafsson, 2020). The results of the identified secondary research are the subject of the theoretical background of this paper and served as the inspiration for the structuring and identifying the main intent of the primary research survey.

MH3: The importance of determinants of online shopping behavior during the COVID-19 crisis has not been changed. This hypothesis derives from the previous research activities focusing on the importance of identified determinants of online shopping behavior (Moon et al., 2021; Kurtisi & Alver, 2021; APEK, 2021; CSO, 2020; Prashant, 2009; Richard et al., 2010; Chenxu et al., 2017; Villa et al., 2018; Svatošová, 2020). These determinants include the following: (1) security of electronic commerce, (2) offering of payment options on the Internet, (3) method and speed of delivery of goods, (4) e-shop web design (e-shop user interface), (5) intensity of interactive communication with the customer, (6) credibility of the e-shop, (7) e-shop certification, (8) online visualization and product description on the e-shop, (9) added value to online shopping (customer service), (10) references and e-shop discussions, (11) references and product discussions, (12) multichannel sales (online store together with the stone shop), (13) lower price of products or services, (14) unlimited purchase time, and (15) a wider range of assortment. This hypothesis verification aims to identify if the COVID-19 crisis impacted changing the importance of these identified determinants by a selected group of respondents.

Furthermore, a total of 23 partial hypotheses (PH1–PH21) are stated to reject or not reject the main research hypotheses (for summary details about partial hypotheses verification, see Table 2). Hypothesis verification is performed at the significance level $\alpha = 0.05$. The rejection or non-rejection of the verified hypothesis is decided based on a comparison of p-values, the minimum significance level for which the null hypothesis can be rejected, and the significance levels α. The Shapiro–Wilk test confirmed that the selection does not come from a normal probability distribution at the significance level $\alpha = 0.05$ because $p \leq \alpha$. Since normality is not met, parametric statistical methods cannot be used. The following tests are selected for hypothesis testing:

Pearson Chi-square test (independent test) using the pivot tables, Kruskal–Wallis test (ANOVA), Friedman test (ANOVA), and Wilcoxon paired test. "The limitations of nonparametric tests are as follows: the conclusions of these methods are less reliable than the conclusions of parametric methods; confidence intervals are usually larger, the set level of significance is usually observed with too much margin, and tests have less force. Hypothesis verification is performed using the software Statistica"

4. RESULTS

The research survey was conducted from June to August 2021, that is, the period when the epidemic was declining in most countries. However, whether the global pandemic is indeed in decline and has been brought under control is not entirely clear at this time, as new mutations of the virus are emerging that may prolong the pandemic. For this reason, the research focuses only on experience with online shopping behavior in the pre-crisis period (before March 2020) and during the COVID-19 crisis (March 2020 to June 2021). Figure 1 shows that most respondents (30.66%) were shopping online more often during the COVID-19 crisis than before. The second biggest group of respondents (28.07%) were online purchasing without any meaningful change before and during the crisis. The results showed that online shopping behavior before and during the COVID-19 crisis had been changed and almost one-third of respondents shopped online more often during the COVID-19 crisis than before.
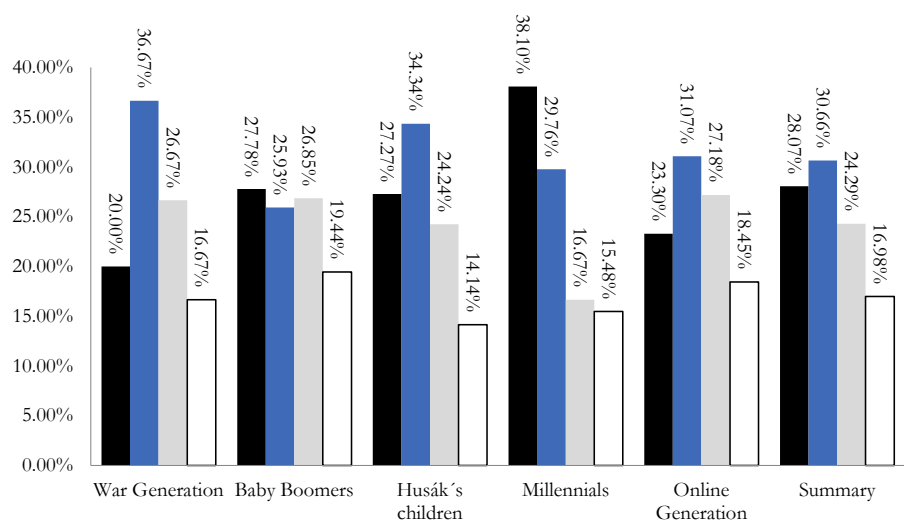

Fig. 1 – Changes in online shopping behavior before and during the COVID-19 crisis by generational cohorts. Source: own research

The other research question was dedicated to the consequences of the COVID-19 crisis on online shopping after the crisis in the future. Figure 2 shows the relative values divided by generational cohorts.
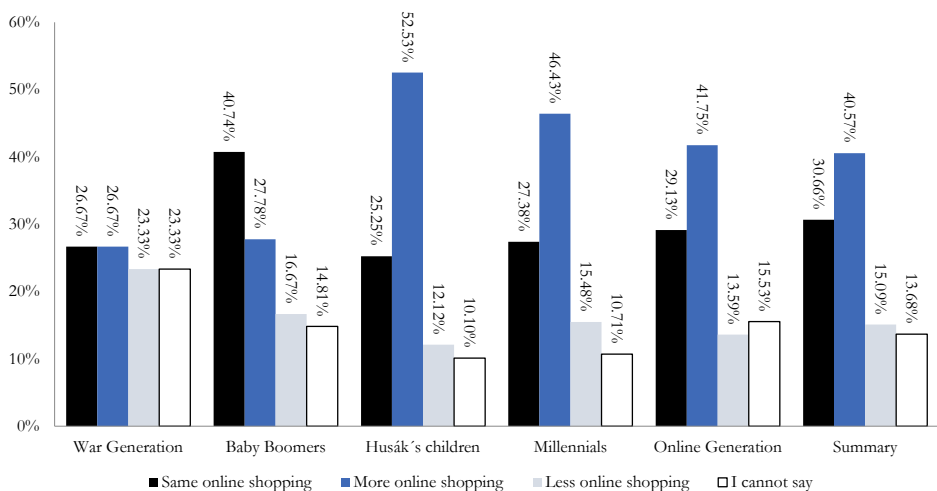
Fig. 2 – Consequences of the COVID-19 crisis on online shopping in the future (after the crisis) by generational cohorts. Source: own research

The results show that most of the respondents (40.57%) do plan to shop online more even after the COVID-19 crisis and the second biggest group of respondents (30.66%) do plan to shop online the same way as during the COVID-19 crisis. The second biggest group of respondents (28.07%) was online shopping without any meaningful change before and during the crisis. On the other hand, surprisingly, 27.18% of respondents were shopping online less often during the crisis than before. Only 15.09% of respondents do plan to shop less than during the COVID-19 crisis. Therefore, the COVID-19 crisis has an impact on future online shopping, where more than 40% of respondents do plan to shop online more after the COVID-19 crisis than during the crisis. Similar proportional results were obtained in all generational categories except the baby boomers' generation in which most respondents (40.74%) do plan to shop online the same way as during the COVID-19 crisis.

The research survey also explored the differences in the frequency of online purchases before and during the COVID-19 crisis. The frequency of online purchases during the COVID-19 crisis has increased rapidly, that is, 5–8 online purchases per month have increased 2.37 times during the COVID-19 crisis and even more than 9 purchases per month have been realized 3 times more often than before the COVID-19 crisis. On the other hand, 0–1 online purchase per month has decreased almost 5 times during the COVID-19 crisis in favor of more frequent online purchases. It can be concluded that the COVID-19 crisis has an impact on the increasing frequency of online purchases. The research was also dedicated to the changes in percentage volume of online purchases before and during the COVID-19 crisis. The most frequent percentage volume of online purchases is between 21% and 40% before and during the COVID-19 crisis (25.94% before and 33.96% during the COVID-19 crisis). Nevertheless, it can be concluded that the percentage volume of online purchases was larger during the COVID-19 crisis than before. The other part was focused on the whole volume of spending on online purchases before and during

the COVID-19 crisis. The largest volume of spending on online purchases is between CZK 3,000 and CZK 7,000 before and during the COVID-19 crisis (37.03% before and 38.68% during the COVID-19 crisis), that is, spending on online purchases has increased by 1.65% during the COVID-19 crisis.

Another important part dealt with the frequency of purchased assortments of online goods and services before and during the COVID-19 crisis. Respondents at each item (details shown in Figure 3) rated the frequency of purchased goods or services on the scale of 1–5 (very often, 5; often, 4; less often, 3; rarely, 2; not at all, 1). Figure 3 shows the average evaluation of the frequency of individual assortments of purchased goods and services before and during the COVID-19 crisis. On average, most the purchased online assortments of goods and services have been bought more frequently during the COVID-19 crisis, except the assortment of cosmetics and fashion. On the other hand, the frequency of online shopping has increased in the case of drugs and pharmaceuticals, food, children's assortment, pet supplies, and entertainment (as a logical consequence of lockdown).
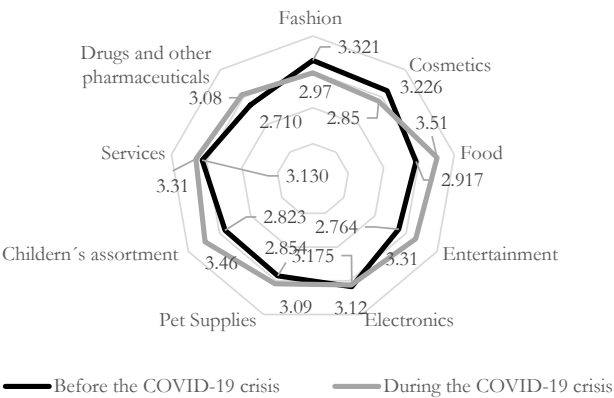

Fig. 3 – The average frequency of purchased assortments of online goods and services before and during the COVID-19 crisis. Source: own research

The other part of the research survey dealt with the importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis. Respondents at each factor (price, quality, warranty, brand, reviews, and origin of goods) rated the importance of affecting the online assortment selection before and during the COVID-19 crisis on the scale of 1–5 (definitely yes, 5; rather yes, 4; neutral attitude (neither yes nor no), 3; rather no, 2; definitely, not at all, 1.). Figure 4 shows the average evaluation of the importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis.
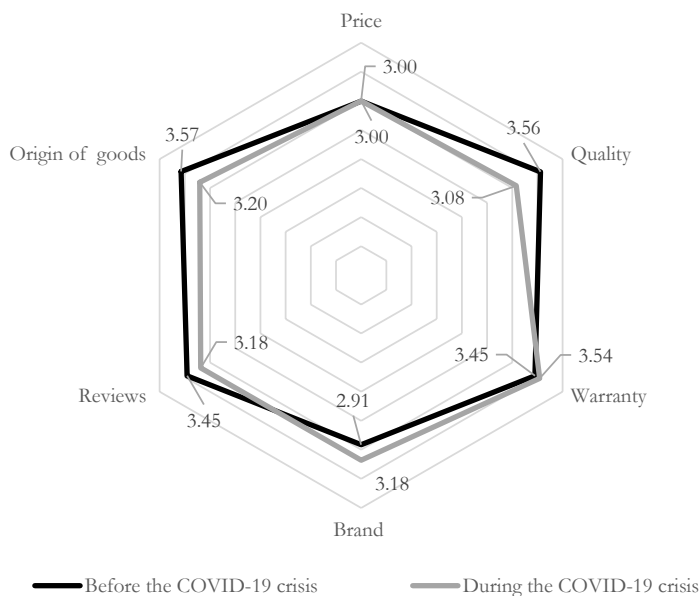
Fig. 4 – The average importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis. Source: own research

The research survey also explored the order of preference to shop online before buying in a stone shop (i.e., comfort, no stone shop, shop far way, good from abroad, saving time, financial savings, a wider range of goods, and elimination of pandemic risks) before and during the COVID-19 crisis. The order of importance (preference) was performed from 1 to 8 (1, least important; 8, most important). Figure 5 shows the average evaluation of the order of preference to shop online before buying in a stone shop before and during the COVID-19 crisis. On average, the most meaningful change in preference before and during the COVID-19 crisis is the elimination of pandemic risk, no stone shop (due to the lockdown of most the retail stone shops during the COVID-19 crisis), and the possibility to buy goods from abroad (i.e., expanding online shopping opportunities or discovering more online shopping opportunities during the crisis).
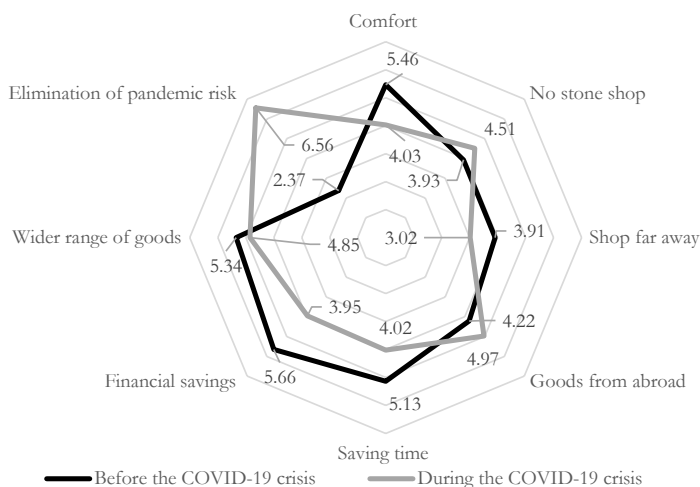
Fig. 5 – The average order of importance of the reasons for buying online before and during the COVID-19 crisis.
Source: own research

The last key area of the research survey dealt with the importance of determinants of online shopping behavior before and during the COVID-19 crisis. These determinants have been identified based on the previous research activities (Svatošová, 2020). The importance of these determinants has been evaluated on a scale of 1–5 (1, the least important; 5, the most important). Figure 6 identifies the average values of the importance of determinants of online shopping behavior before and during the COVID-19 crisis.
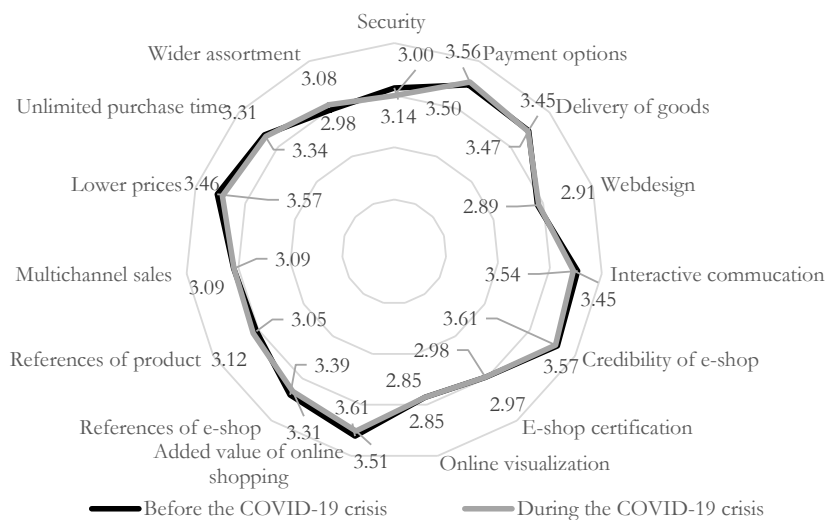

Fig. 6 – The average values of the importance of determinants of online shopping behavior before and during the COVID-19 crisis. Source: own research

Tab. 2 – Summary of the partial research hypotheses. Source: own research

	Partial hypothesis	Partial hypothesis verification	Conclusion of hypothesis verifying
MH1:	Online shopping behavior before and during the COVID-19 crisis is independent of generational cohorts		Rejected
PH1:	Changes in online shopping behavior before and during the COVID-19 crisis are independent of generational cohorts.	X^2 p = 0.616021	Not rejected
PH2:	Consequences of the COVID-19 crisis online shopping in the future are independent of generational cohorts.	X^2 p = 0.047350	Rejected
PH3:	Frequency of online purchases before the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.937817	Not rejected
PH4:	Frequency of online purchases during the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.005537	Rejected
PH5:	Percentage volume of online purchases before the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.108841	Not rejected
PH6:	Percentage volume of online purchases during the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.77833	Not rejected
PH7:	Volume of spending on online purchases before the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.279650	Not rejected
PH8:	Volume of spending on online purchases during the COVID-19 crisis is independent of generational cohorts.	X^2 p = 0.342757	Not rejected
PH9:	Frequency of purchased assortments of online goods and services before the COVID-19 crisis is not affected by generational cohorts.	KW Some indicators p < α Rejection of hypothesis: electronics, pet supplies, drugs, and pharmaceuticals	Rejected
PH10:	Frequency of purchased assortments of online goods and services during the COVID-19 crisis is not affected by generational cohorts.	KW all p > α	Not rejected
PH11:	Importance of selected factors affecting the online assortment selection before the COVID-19 crisis is not affected by generational cohorts.	KW all p > α	Not rejected
PH12:	Importance of selected factors affecting the online assortment selection during the COVID-19 crisis is not affected by generational cohorts.	KW Some indicators p < α Rejection of hypothesis: quality, origin of goods	Rejected

MH2:	There are no differences between online shopping behavior before and during the COVID-19 crisis.		Rejected
PH13:	Frequency of online purchases before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W p = 0.0000	Rejected
PH14:	Volume of spending on online purchases before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W p = 0.135279	Not rejected
PH15:	Percentage volume of online purchases before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W p = 0.002111	Rejected
PH16:	Frequency of purchased assortments of online goods and services before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W Some indicators p < α	Rejected
PH17:	Importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W Some indicators p < α	Rejected
MH3:	The importance of determinants of online shopping behavior during the COVID-19 crisis has not been changed.		Not rejected
PH18:	Preference to shop online before buying in a stone shop before the COVID-19 crisis is equally important, i.e., all distribution functions are equal.	F p < α, i.e., p = 0.0000	Rejected
PH19:	Preference to shop online before buying in a stone shop during the COVID-19 crisis is equally important, i.e., all distribution functions are equal.	F p < α, i.e., p = 0.0000	Rejected
PH20:	Preferences to shop online before buying in a stone shop before and during the COVID-19 crisis are not different, that is, the distribution functions of both selections are identical.	W all p < α	Rejected
PH21:	Importance of determinants of online shopping behavior before and during the COVID-19 crisis is not different, i.e., the distribution functions of both selections are identical.	W all p > α	Not rejected

Note: X² - Pearson Chi-square test; KW - Kruskal–Wallis test; W - Wilcoxon paired test; F - Friedman test

5. DISCUSSION

The research survey was dedicated to the ongoing topic of online shopping behaviors that gained

increasing importance during the economic and health crisis caused by COVID-19. The main research questions were formulated to fulfill the main objectives of the research survey of this paper and are the subject of the other discussion.

1) Is there any relationship between online shopping behavior before and during the COVID-19 crisis and selected generational cohorts? The research survey clearly identified the relationship between the selected generational cohorts and the observed aspects of online shopping behavior, that is, consequences of COVID-19 crisis online shopping in the future, frequency of online purchases during the COVID-19 crisis, frequency of purchased assortments of online goods and services before the COVID-19 crisis, and importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis. In case of consequences of online shopping after the COVID-19 crisis, most categories of generational cohorts do plan to shop more after the COVID-19 crisis or do plan to shop the same way as during the COVID-19 crisis. The only exception is the baby boomer generation, in which the answer of the same online shopping after the COVID-19 prevails. The different behavior of baby boomers also confirmed the other secondary research (Eger et al., 2021; Jackson et al., 2011). When considering the frequency of online purchases, the most evident increase was recorded in the case of the online generation, Husák's children, and Millennials. The frequency of online shopping in the case of war generation and baby boomers has also increased, but the number of monthly online purchases was less frequent. Generational cohorts consist of individuals who share major events in history that impact personality behavior, including consumer behavior (Marjanen et al., 2019). This fact supports the generational approach and claims by Parment (2013) that studying the shopping behavior of generational cohorts could be very beneficial. In the consumer context, generational identity significantly influences purchase patterns and shopping behavior (Williams & Page, 2011; Parment, 2013; Eger et al., 2021). The most similar research realized in the Czech Republic (Eger et al., 2021) focusing on the consumer behavior during the COVID-19 crisis also confirmed the relationship between the generational cohorts and changes in consumer behavior during the COVID-19 crisis (especially the baby boomer generation has indicated a significant difference from the other generational cohorts). The relationship between the selected group of age categories and changes in online shopping behavior also confirmed the research realized in the Czech Republic (CSO, 2020, APEK, 2021). Differences in the behavior of generational cohorts in general also confirmed other theories and studies (Eger et al., 2021; Alaimo et al., 2020; Williams & Page, 2011; Krbová, 2016; Jackson et al., 2011). The research confirmed that Generation Z and Generation Y increased their frequency and volume of online shopping during the COVID-19 crisis. They naturally moved in the online environment even before the crisis, as confirmed by the previous studies (Eger et al., 2021; Krbová, 2016). The increase in the baby boomer generation was also indicated but to a lesser extent than the other generations, as also confirmed by further research (Eger et al., 2021; CSO, 2020; APEK, 2021; Krbová, 2016; Alaimo et al., 2020; Williams & Page, 2011).

2) How does online shopping behavior differ before and during the economic and health crisis caused by the new type of coronavirus, COVID-19? The differences have been determined in the following aspects: the frequency of online shopping behavior during the COVID-19 has significantly increased, the frequency of purchased assortments of online goods

and services has increased almost three times more often than before the COVID-19 crisis, and the percentage volume of online purchases was larger (by 1.65%) during the COVID-19 crisis than before. On the other hand, the volume of spending on online purchases before and during the COVID-19 crisis is not significantly different. Furthermore, the frequency of purchased assortments of online goods and services before and during the COVID-19 crisis is different, that is, most the purchased online assortments of goods and services have been bought more frequently during the COVID-19 crisis. This is except the assortment of cosmetics and fashion and the importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis, which is different. The difference has been identified for the following factors: brand, reviews, and origin of goods. It can be concluded that the COVID-19 crisis has an impact on future online shopping, where more than 40% of respondents do plan to shop online more after the COVID-19 crisis than during the crisis. Taha et al. (2021) confirmed the dramatic increase in online shopping. Jensen et al. (2021) also revealed that most respondents do plan to shop food online after the COVID-19 crisis. Nevertheless, Kurstisi & Alver (2021) did not confirm these results as they indicated that the respondents would return to the ordinary online shopping habits as before the COVID-19 crisis. On the other hand, Eger et al. (2021), Alaimo et al. (2020), Moon et al. (2021), and Chang & Meyerhoefer (2020) confirmed that their respondents would shop online more frequently after the COVID-19 crisis; however, their studies were limited to the food assortment offline or online. Finally, it can be concluded that online shopping behavior before and during the COVID-19 crisis has been changed, and almost one-third of respondents shop online more often during the COVID-19 crisis than before. The secondary research that served as the inspiration for structuring the primary research of this paper (Moon et al., 2021; Kurstisi & Alver, 2021; Eger et al., 2021; Alaimo et al., 2020; Romeo-Arroyo et al., 2020; Pantano et al., 2020; Sheth, 2020; Verma & Gustafsson, 2020) also identified differences in online shopping behavior before and during the COVID-19 crisis. In general, it also confirmed the main results of the primary research survey, that is, increased frequency of online shopping, increased percentage volume of online purchases, changes, and long-term consequences of the COVID-19 crisis on online shopping behavior, and increased online purchases in specific forms of assortment (drugstore, pharmaceuticals, electronics, hygienic and disinfectant preparations, etc.). Roggeveen & Sethuraman (2020) also confirmed a dramatic increase in online sales of drugstore pharmaceuticals and hygienic and disinfectant preparations during the COVD-19 crisis. Pantano et al. (2020) also indicated increasing volumes and frequency in online shopping during the COVID-19 crisis that were mainly caused by external circumstances (lockdown, social distancing, restrictions in socializing, traveling, etc.). Laato et al. (2020) also confirmed more intense online shopping and, in general, unusual shopping during the early stage of the COVID-19 crisis that was mainly caused by total lockdown and fear appeal; nevertheless, their study was more focused on general consumer behavior in Finland, and the increase in online shopping was not numerically expressed. The survey also revealed that the most frequent motivation to shop online during the COVID-19 crisis was eliminating pandemic risk and the absence of stop shops in the surroundings. Shamim et al. (2020) also confirmed that people kept health safety practices, especially during the early stage of the COVID-19 crisis, and changed their shopping behavior.

3) Did COVID-19 crisis influence the importance of determinants of online shopping behavior? The research originally assumed the importance of the monitored determinants of online shopping behavior during the COVID-19 crisis would change (15 determinants were defined based on previous research activities) (Moon et al., 2021; Kurtisi & Alver, 2021; Prashant, 2009; Richard et al., 2010; Chenxu et al., 2017; Villa et al., 2018; Svatošová, 2020). However, the results of the research did not confirm this assumption. Similar conclusions were reached by the following research (APEK, 2021, CSO, 2020) that found out that the changes in selected determinants of online behavior during the COVID-19 are not permanent (especially using the payment methods and forms of delivery). The research also explored the importance of selected factors affecting the online assortment selection before and during the COVID-19 crisis. These changes were defined for the following factors: brand, review, and origin of goods. No difference was defined for the following factors: price and warranty. Similar conclusions were indicated in the case of the following research (Eger et al., 2021, Moon et al., 2021; Kurtisi & Alver, 2021), which confirmed the increasing importance of brand, reputation, and quality of goods and services during the COVID-19 crisis. Alhaimer (2022) also indicated that financial risk, product risk, or non-delivery risk are not significant factors for changing online shopping behavior during the COVID-19 crisis.

6. CONCLUSION

The research clearly showed that the COVID-19 crisis was reflected in changes in respondents' online shopping behavior. Less than a third of respondents declared that they did not change their online shopping behavior during the COVID-19 crisis. By contrast, more than a third of respondents shopped online during the COVID-19 crisis than before. The research has shown that the frequency of online purchases has increased significantly (more than three times), and more than 40% of respondents do plan to shop online more after the COVID-19 crisis than during the crisis. The most important reason for changing online shopping behavior during the COVID-19 crisis is the elimination of pandemic risk, the absence of a stone shop, and the possibility to buy goods from abroad. It can be evaluated that the COVID-19 crisis has accelerated changes not only in the field of e-commerce and online shopping behavior, which shape the online environment and the behavior of all participants. The research confirmed that online shoppers had high demands on the quality of services provided when shopping online, and these demands did not change during the COVID-19 crisis. Online retailers should be prepared for these changes and take them into account when designing and implementing their e-strategy.

The main benefits of the research survey are as follows: the paper has provided a comprehensive view of online shopping behavior not only during the ongoing economic and health crisis caused by the new type of coronavirus, COVID-19. At the same time, it evaluated changes in online shopping behavior in the Czech online environment during the COVID-19 crisis. It evaluated that these changes in online shopping behavior affect e-commerce even after the COVID-19 crisis concerning selected generational cohorts. Another benefit of the paper is the identification of the determinants of online shopping behavior and evaluating their significance before and during the ongoing COVID-19 crisis. The results of this study could be applicable for e-commerce businesses when designing and implementing e-commerce strategy and thus

for increasing e-commerce competitiveness. During the COVID-19 crisis, the e-commerce strategy of businesses had to be adapted to the changing online shopping behavior. The results of this study indicated that these changes could also be expected after the COVID-19 crisis. When e-commerce businesses implicate the outputs of this study to their e-commerce strategy implementation (e.g., changing target group of online shoppers; increasing the volume of baby boomer generation; increasing online sales of selected categories, especially food, drugstore, and pharmaceuticals; increasing trust and popularity in online shopping in general; changing motives in online shopping; reducing health risk; buying goods from abroad due to the absence of stone shops in the surroundings; increasing expenses for online shopping, and increasing demands of online shoppers for the quality of online services associated with online shopping), they can consider current factors forming the online environment. They can maintain or increase their e-commerce competitiveness in the long run. The results of the primary research could also serve as the inspiration for other studies focusing on online shopping behavior not only during the COVID-19 crisis.

It is also necessary to acknowledge the unforgettable limitations of this research. The research survey focused only on Czech respondents, although the representativeness of the data was ensured. It is likely that the results may differ when focusing on another group of respondents, for example, in other regions of the European Union. Therefore, further research is recommended to focus on other regions and other groups of respondents. Another important limitation is the implementation of a research survey at the time of the lingering COVID-19 crisis, when the long-term economic, health and social consequences of this crisis were not fully determined. Therefore, it is difficult to predict the long-term consequences of the COVID-19 crisis in online shopping behavior during this period. Further research will focus on changes in the field of online shopping behavior in the next period (after the end of the COVID-19 crisis). It will compare these results with other EU regions in Central and Eastern Europe. The research also specifically focused only on selected aspects of online shopping behavior. The broader context of this issue (e.g., the impulsivity of online shopping, the impact of social media on online shopping during the COVID-19 crisis, the influence of other external and internal factors on online shopping, etc.) was not considered in this research. Despite these limitations, the paper provided one of the first comprehensive researches in online shopping behavior not only during the ongoing COVID-19 crisis and thus provided a basis for further research activities in the researched area. The results provide the potential for further research that can be used by online retailers, marketers, and traders to create and implement their e-strategy and thus increase their competitiveness in e-commerce.

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