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THE INFLUENCE OF MEDIA ON IMPULSIVE BUYING IN THE ERA OF THE COVID-19 PANDEMIC

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Abstract. *Purpose* – With the appearance of COVID-19, epidemiological measures were implemented which significantly changed the customer behaviour. Media became an important source of information. The fear phenomena in the lockdown era compelled consumers to buy impulsively. Therefore, this paper determines the changes in consumer behaviour in the era of the pandemic and the influence of media on consumer's impulsive buying during lockdown.

Research methodology – The research was carried out with a questionnaire (N = 298). The descriptive, multivariate, and correlation analysis, and the t-test were used to process primary data to confirm changes in consumer behaviour.

Findings – The research results show that impulsive buying does exist during a lockdown and is influenced by media. Such indicators give a clear direction for creating marketing campaigns in future crises.

Research limitations – The research sample was random so, to prove hypothesis H2, the database of the intensity of buying in lockdown needed to be filtered out so only impulsive buyers could be selected (n = 89).

Practical implications – The findings could help in the creation of future marketing campaigns in crises.

Originality / Value – This research gives a new look at consumer behaviour in crises, the intensity of fear influence, and the influence of media on consumer behaviour.

Keywords: consumer behaviour, impulsive buying, media, COVID-19 pandemic.

JEL Classification: M31.

Introduction

Changes in the environment drastically affect buying habits, directly influencing consumer decisions and behaviour. This is why consumer behaviour has been the focus of researchers for a very long time (Kesić, 2006), and the significance of such research has even more intensified in the era of the COVID-19 pandemic when substantial changes. With the beginning of 2020 and the appearance of the COVID-19 pandemic, significant changes in consumer

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behaviour were also noticed (Xiao et al., 2020). Epidemiological measures were intended to reduce physical contact between people and introduce a higher degree of hygiene and disinfection. This is why from 19th March 2020, the lockdown was put into place in the Republic of Croatia, which meant that most types of jobs were prohibited (or they were done from home). In addition, unnecessary movements and public gatherings were also forbidden, including travelling which was only possible with travel permits issued by the local Headquarters of Civil Protection. The aforementioned measures lasted until 11th May 2020, after which they were slightly alleviated.

All of the above had drastically changed consumer behaviour, which was under the influence of societal factors in the newly emerged situation. It was paramount to avoid shopping unless absolutely necessary, so consumers started to plan the dates when they went shopping, which became rarer, but quantity-wise they bought more products and mostly impulsively. Impulsive buying emerged because of different factors, such as the fear of missing out on certain products, fear of shortages, societal influence, and the influence of social media (Islam et al., 2021; Jurčić, 2017).

It is important to emphasize that because of the relevance of the topic it was not possible to rely on earlier equivalent research, so the theory is based on behavioural analyses in past pandemics (Spanish flu etc.) and on the Nielsen research conducted in March and April 2020 on consumer behaviour in Croatia during the COVID-19 pandemic (Nielsen, 2020). Since this topic is relatively unexplored, this empirical research analyses the consumer behaviour during the COVID-19 crisis with an emphasis on the intensity of impulsive buying in the first lockdown period, as well as further down the line of the pandemic, and determine which factors had led to this situation (Hua & Shaw, 2020). The expected scientific contribution mainly entails identifying the key factors of impulsive buying, all to predict future patterns of consumer behaviour in similar crises. Therefore, this paper has the goal of answering whether consumers did actually buy impulsively and whether the media were the cause of this. Considering the goal of the research, the following hypotheses are put forward:

Hypothesis 1. Consumers were buying impulsively at the beginning of the COVID-19 crisis.

Hypothesis 2. The media had an intensive influence on impulsive buying during the COVID-19 crisis.

The empirical research was carried out on the results of the primary survey on a sample of 298 respondents.

1. Literature review

Consumer behaviour is focused on how people decide and manage their resources when buying products. Or, in other words, what, when, where, what incites them, and how often do individuals buy certain products, and use what they bought (Schiffman & Kanuk, 2004). Therefore, to be successful on the market, marketing experts need answers to all of the above questions, meaning they need to gather all available information on consumer behaviour (Solomon, 2017). "Consumer behaviour is a study of individuals, groups, or organisations, and all the activities which involve buying, using, and disposing of goods and services. It involves the consumers' emotional and mental reactions and their behaviour before and after

the aforementioned activities" (Kardes et al., 2014, according to Matohanca, 2018, p. 2). The literature most often mentions three crucial activities studied by consumer behaviour: buying, consumption and the activities after buying something. In addition, marketing experts also evaluate the reactions of consumers to all of these activities. The reactions of consumers can be emotional, mental and behavioural (Kardes et al., 2014).

"In modern business, there is an ever-increasing need to establish marketing strategies in the business planning phase" (Ribić & Pleša Puljić, 2020, p. 160), but to discover marketing tactics that lead to an increase in sales, one has to be familiar with the psychology of human beings. The main goal of all of these types is to provoke the consumer to buy a product they initially had no plans of buying (Kotler et al., 2014). Unfortunately, "most consumers are not aware to what extent they are victims of company strategies" (Kotler et al., 2014, according to Blažević Bognar et al., 2017, p. 592).

1.1. Consumer behaviour

Consumer behaviour distinguishes between two types of purchases: routine and impulsive (Kesić, 2006). The routine consumer behaviour mainly involves the consumer making a decision based on their knowledge of the product, or finding further information about the product, but they will not take "more time than required, nor will this influence the direction of their decision" (Soče Kraljević et al., 2016, p. 28). One mainly focuses on the person's previous experience with the actual product or service (Čičić et al., 2009). On the other hand, impulsive buying is characterised by unplanned purchases, which are happen at the spur of the moment, or in other words, the consumers make their purchasing decision without any preparation. Therefore, impulsive buying can be defined as an emergence of a sudden, strong, and irresistible need to buy something as an unplanned purchase, or as a feeling that a purchase is urgent, or as an urge which cannot be resisted by the individual (Barbić & Lučić, 2018, according to Živković 2020, p. 2).

1.2. Impulsive buying behaviour

Impulsive buying behaviour is defined as behaviour that necessarily relies on instant gratification, or in other words, satisfying a strong urge to buy something (Mihić & Kursan, 2010). Impulsive buying is frequently connected with the feeling of anxiety, and the results are low levels of self-control. A lack of self-control in consumers, especially if it is caused by stress, intensifies significantly the impulsiveness of purchases. It is important to mention that when people lack self-control they are more susceptible to environmental stimuli which further contributes to impulsive buying. Rook and Hock (1985) highlight five crucial characteristics of impulsive buying which is manifested in spontaneous desire for doing something without control, psychological conflicts and reduction of cognitive evaluation involving irrational spending. Likewise, indicators for this type of purchases are emotions such as joy, fear, love, sexuality, hope, fantasy, etc. The rational thought process is present to a much lesser degree, and affective activities are emphasized (Živković, 2020). The classical phases of making purchasing decisions do not exist in impulsive buying, considering that the purchase happens immediately after the need is established. The phases which involve seeking information and

alternatives are under the influence of external and internal factors. "External factors could be the marketing activities of companies, and the internal factor is the individual's personality" (Ban, 2018, p. 10).

1.3. Previous research on consumer behaviour during the COVID-19 pandemic

The beginning of 2020 marked the appearance of the COVID-19 virus which had started suddenly spreading worldwide. To combat the virus, world governments implemented different epidemiological measures which affected all aspects of life. Most countries started implementing lockdowns to prevent physical contact between people, which caused changes in consumer behaviour (INSEAD, 2020). The Nielsen Agency carried out a survey (during March and April 2020) on consumer behaviour in Croatia during the COVID-19 pandemic and determined six phases in customer behaviour (Nielsen, 2020).

The first and second phases which began at the end of February were characterised by proactive and reactionary purchasing, with an emphasis on health. After the appearance of the COVID-19 virus, an increase in the purchasing of canned foods, pasta, flour, and rice was noticed in Croatia compared to the previous year. The third phase involved preparing supplies, which occurred between 9th and 15th March 2020. Retail chains detected an average increase of 65% in the purchase of food and toiletries compared to the same period of the previous year. In the abovementioned week in Croatia, a record increase of purchasing was noted for the following top three food products: flour (+410%), rice (+303%), bakery products (yeast, baking powder, pudding +221%), while the top three toiletries were soaps (+232%), toilet paper (+162%), toilet cleaners (+165%) (Nielsen, 2020). In the same period shortly before the lockdown, according to global surveys, the most commonly bought products were also food products rich in carbohydrates, canned food, disinfectants, and even toilet paper (Martin-Neuninger & Ruby, 2020). This phase was marked by fewer shopping trips, but an excessive amount of products in the cart. It can be concluded that a specific purchasing pattern of one or more consumers can encourage the rest of the population to behave identically. This is what exactly happened during the pandemic, where a vast majority of consumers followed the purchasing patterns of their peers, whether they were shopping offline or online (Kim & Su, 2020). "We can observe that the largest influence on an individual's behaviour have been reference groups" (Kesić, 2006, p. 102). Images of long lines at cash registers in supermarkets and empty shelves for certain products had been seen worldwide through media, causing the rest of consumers to rush to shops to buy supplies (Iyer et al., 2020; Addo et al., 2020). Oberst et al. (2017) claim that biased behaviour begins in the part of the brain responsible for impulsive decisions (Kaur & Sharma, 2020), which is also responsible for emotions, and which was during the pandemic under the substantial influence of 24-hour media reporting (Crabbe, 2020; Addo et al., 2020).

Based on previous research (Nielsen, 2020; Kaur & Sharma, 2020), a research gap on impulsive buying in the COVID-19 period in the Croatia was observed. Hypothesis H1 was created from the mentioned research problem.

1.4. The role of media during the pandemic

The role of media during the pandemic was considerable, especially when it comes to influencing the development of negative emotions, spreading fabricated news and fear. The spread of the COVID-19 pandemic led to more time spent at home, which caused longer periods spent consuming media content. Social media have become the primary source of information for most people (Addo et al., 2020), despite contributing a lot of disinformation (Zhang et al., 2019). The research that had been carried out have confirmed that there is a positive correlation of the influence of media on consumer behaviour (Kalaitzandonakes et al., 2004). Also, survival psychology indicates that people change their behaviour due to crises (Forbes, 2017). This leads to the emergence of phenomena such as panic buying, herd mentality, supply hoarding, and impulsive buying. This type of buying is influenced by the individuals' perception of the health crisis, fear caused by negative emotions, changes in consumer behaviour due to the need to alleviate anxiety and take control, social-psychological (Yuen et al., 2020) and societal factors (Li et al., 2020; Wang et al., 2020). Consumers make decisions more easily once they see the experiences of their acquaintances, unknown people, or even influencers, whose adverts consumers consider to be reliable and convincing, especially when it comes to a very popular influencer (Blažević Bognar et al., 2019). Impulsive buying occurs when consumers experience an intensive impulse to buy something right away (Parsad, 2020), where the purchasing decision is not part of a deep thought process (Suryaningsih, 2020; Zafar et al., 2019), but rather is under the influence of emotions, or in other words, people buy products that make them feel good or have some emotional value (Husnain et al., 2016, according to Iriani et al., 2021). Impulsive buying is characterised by unplanned purchases which are based on irrational thought, (Chan et al., 2017, according to Iriani et al., 2021) and which can be induced by external stimuli such as economic conditions, personality, time, place etc. (Wu et al., 2016, according to Iriani et al., 2021) but also the phenomena of fear in the lockdown which had prompted consumers to buy without thinking (Wiranata & Hananto, 2020; Kim, 2020; Addo et al., 2020).

The fourth phase, marked by preparation for life in quarantine, came just before the complete lockdown which began in the Republic of Croatia on 19th March 2020, where problems in the supply chain started to appear, leading to empty shelves. Despite the government efforts to warn against irrational behaviour, most people started panic buying (Turkalj, 2021). Impulsive buying of essential and non-essential products had suddenly increased (Crabbe, 2020). This type of buying was characterised by a disproportional purchasing of disinfectants, toilet paper, hygiene items, protective masks (Turkalj, 2021), flour and yeast. Many shops could not satisfy all the consumer needs, which lead to a short term breakdown in the supply chain, and all of the above resulted in even greater panic among consumers (Kim & Su, 2020; Rajan et al., 2020), which again resulted in more panic and impulsive buying (Kim, 2020).

This type of consumer behaviour, including impulsive and panic buying, can even further deepen scarcity (Zafar et al., 2019; Bergel & Brock, 2019). Fear overpowers the capacity for rational thought (Witte & Allen, 2000), and this is why some surveys have already suggested that fear is an important mediator in impulsive buying (Iyer et al., 2020; Addo et al., 2020; Przybylski et al., 2013). To alleviate fear and uncertainty, consumers started hoarding supplies

to gain a feeling of safety and preparedness (Mathes et al., 2017). The above is confirmed by Loxton et al. (2020) who claim that the behaviour of consumers during the pandemic, where they consumed essential products, reflects the satisfaction criteria of the lower-level needs of Maslow's hierarchy. Consequently, consumers were relentless in satisfying lower-level needs until the crisis was over. During the aforementioned state of the market, consumers started looking for alternative channels for obtaining supplies, whereby they mostly used Internet shopping and products from local manufacturers.

Based on previous research (Kim & Su, 2020; Iyer et al., 2020; Addo et al., 2020), a research gap was observed on the influence of the media on impulsive buying in the period of COVID-19. Hypothesis H2 was created from the mentioned research problem.

The fifth phase- limited living, was marked by a growth in online shopping, which became dependant on high delivery standards, while the sixth phase- life in the new normal, entailed consumers returning to formal buying habits but with a focus on newly adopted hygiene habits (Nielsen, 2020).

2. Research methodology

The overview of the literature unquestionably shows that the era of the COVID-19 pandemic has led to certain changes in consumers' buying habits. The largest number of surveys discuss panic and impulsive buying that had been influenced by the feeling of fear and information from the media. Previous studies indicate that perceived excitement leads to a purchasing decision (Malhotra, 2010; Sneath et al., 2009). For example, Wu et al. (2020) have discoverd that scarcity is positively correlated with perceived excitement which affects impulsive buying. The research that was conducted during the beginning of the COVID-19 crisis also indicates that fear and panic caused by scarcity has raised customer stress, i.e. has caused high levels of excitement which affected impulsive and obsessive buying (Islam et al., 2021). Therefore, this paper has the goal of answering whether consumers did actually buy impulsively and whether the media were the cause of this. Considering the goal of the research, the following hypotheses are put forward:

Hypothesis 1. Consumers were buying impulsively at the beginning of the COVID-19 crisis.

Due to the great uncertainty of the situation, consumers were encouraged to continuously search for information and spend their cognitive resources which frequently leads to information overload (Farooq et al., 2020; Hua & Shaw, 2020), i.e. negative emotions are continuously stimulated (Moors et al., 2013). Previous studies have indicated that information anxiety could be stimulated by a perceived information overload (Hwang et al., 2019), which leads to impulsive buying (Liu et al., 2019; Yi, 2012). Xiao et al. (2020) conducted a study during the beginning of the COVID-19 pandemic and have determined that the uncertainty of the situation has led to information overload and information anxiety which consequently has caused impulsive buying. Therefore, the following hypothesis is put forward:

Hypothesis 2. The media had an intensive influence on impulsive buying during the COVID-19 crisis.

The empirical research was carried out on the results of the primary survey. The survey was carried out on a sample of 298. The main survey tool was a questionnaire that consisted of closed multiple-choice questions, where the Likert scale was used with five levels of intensity. The first part of the questionnaire contained general information about the purpose of the survey, and also the anonymity of the questionnaire was emphasised in this part. The first set of questions involved the social-demographic characteristics of the respondents. The second, third, and fourth set of questions examined with the Likert scale whether consumers were buying impulsively before the pandemic, just before the pandemic, and after the lockdown. The fifth set of questions examined which factors had influenced impulsive buying in the lockdown, while the last set of questions examined which information sources had been used by consumers. The survey was carried out over the Internet during June and July 2021.

The descriptive statistical analysis, multi-variant statistical analysis (multiple regression method), correlation analysis and the t-test were used in primary data analysis to determine the direction and strength of the correlation between the observed variables and to confirm the differences in behaviour. The descriptive analysis was carried out to create profiles of the buyers and analyse their behaviour before, after and during the lockdown. To prove H1, the differences in behaviour in these three periods were tested with the t-test.

To analyse H2, a sample of consumers who acted impulsively (n = 89) in lockdown was derived (with the help of the descriptive analysis) from the general sample. The goal was to analyse which factors affected this behaviour and to determine the strength of the correlation between consumers and the factors that affected this behaviour. Next, the correlation analysis determined the direction and strength of the connection between the information sources that the user used during the lockdown and the impulsiveness of their purchases. This was done to determine the influence of media on impulsive buying. The multi-variant regression demonstrates the intensity of the influence of each factor on impulsive buying.

In addition to the data analysis method which was carried out in the Excel programme package, the method used for presenting results is done in the form of tables and graphs. Descriptive statistics were performed on all variables to describe the observed differences clearly, and when it comes to differential statistics, the level of statistical significance was determined to be 5% ($p < 0.05$).

To evaluate the formulated hypothesis, the dominant method used was the correlation method which measured the inter-dependency of observed variables in the conceptual model. In this paper, this correlation was used to determine the direction, intensity and significance of the analysed connections.

2.1. Sociodemographic indicators

This survey used a sample size of N = 298. The survey sample was random and the structure of the survey sample is presented in Table 1.

Table 1. Sociodemographic characteristics of respondents (source: prepared by authors)

Sample characteristics, $N = 298$	%
Gender	
Female	76.85
Male	23.15
Age	
15–18	8.39
19–25	38.59
26–40	37.25
41–60	12.75
61 and more	3.02
Qualifications	
Lower expertise	2.35
Medium expertise	27.85
Higher expertise	48.32
High expertise	21.48

Note: N – number of participants, *%* – percentage of participants.

The main limitation of the survey was the random survey sample, which would mean the survey sample contained a population that did not have a pronounced impulsiveness in their purchases, which might have made the sample inadequate. Therefore, to prove hypothesis H1, the entire survey sample was used to prove that there was a change in behaviour of the entire population before, during and after the lockdown. However, to prove H2, the database needed to be filtered out according to the intensity of buying during the lockdown, meaning that certain consumers were selected who stated that during lockdown they bought essential products (masks, flower and yeast, toilet paper, and disinfectants) despite having already supplies, indicating they behaved impulsively during the lockdown. This sample contained 89 respondents. Below is a graphical overview that shows the intensity of purchases of products in the era of the COVID-19 pandemic.

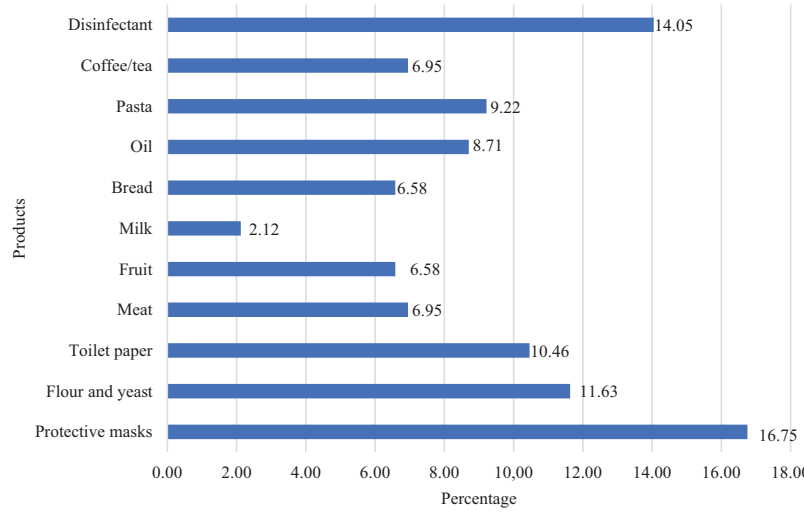

Figure 1. Products that were bought immediately before the lockdown which began on 1.4.2020. (source: prepared by the authors)

From the Figure 1 it can be seen that consumers exhibited the highest demand for protective masks (16.75%), disinfectants (14.05%), flour and yeast (11.63%) and toilet paper (10.46%), which coincides with the already previously mentioned surveys (Martin-Neuninger & Ruby, 2020). It is important to mention that the beginning of the lockdown was the time when the craze for these products had begun in shopping malls, which caused shortages of these products on shelves, and fear in buyers they would not be able to buy these products. This situation influenced impulsive buying, which is why the part of the sample which emphasised they had bought all four of the mentioned products can be considered a population that was impulsively buying due to the fear of scarcity.

3. Survey results and discussion

The survey's primary intention was to give insight into the opinions of consumers and their buying habits during the lockdown, and the differences in their behaviour before and after the lockdown. Therefore, the following hypothesis was put forward:

Hypothesis 1. Consumers were buying impulsively at the beginning of the COVID-19 crisis.

To prove the hypothesis, factors which characterise impulsive buying (unplanned purchases, lack of rational thought, not postponing shopping, and in the event of a crisis, hoarding supplies) were analysed, and these factors were presented to respondents in the form of statements to which they could express their agreement or disagreement with a Likert scale (from 1 to 5). Respondents had to express their agreement for the identical statements 3 times, for the period before, during, and after the lockdown. To determine user behaviour, the statements were summarised into one indicator (named consumer behaviour) which was compared to identical indicators with a t-test, but in different periods (before, during, and after lockdown).

Table 2. Results of the t-test for the period before (<2020), during (2020), and after the lockdown (>2020) (source: prepared by authors)

t-Test: Paired Two Sample for Means

	Variable <2020	Variable 2020	Variable 2020	Variable >2020	Variable <2020	Variable >2020
Mean	3.166107383	2.833053691	2.833053691	3.194630872	3.166107383	3.194630872
Variance	0.547231261	0.463407142	0.463407142	0.522597338	0.547231261	0.522597338
Observations	298	298	298	298	298	298
Pearson Correlation	0.300551849		0.176575735		0.322225659	
Hypothesized Mean Difference	0		0		0	
df	297		297		297	
t Stat	6.833220856		–6.925863224		–0.578207553	
P(T<=t) one-tail	2.35415E-11		1.34359E-11		0.281781077	
t Critical one-tail	1.650000301		1.650000301		1.650000301	
P(T<=t) two-tail	4.7083E-11		2.68718E-11		0.563562154	
t Critical two-tail	1.967983525		1.967983525		1.967983525	

From the Table 2 it can be clearly seen that there is a statistically significant difference in consumer behaviour before and during lockdown (in April 2020), which is proven with the t-test ($t(298) = 2.35415E\text{-}11$, $p < 0.05$). This issue is also confirmed by previous research Nielsen (2020) and Kaur and Sharma (2020). A significant contribution of this research lies in comparing behavioural changes during and after lockdown. In addition, there is a statistically significant difference during the lockdown and after ($t(298) = 1.34359E\text{-}11$, $p < 0.05$), but slightly less pronounced than in the previous comparison. The results indicate that there was a significant change in behaviour during the lockdown, which is confirmed by the fact that there was not a statistically significant difference between the before and after lockdown indicators for consumer behaviour ($t(298) = 0.281781077$, $p > 0.05$).

The indicators confirm hypothesis *H1: Consumers were buying impulsively at the beginning of the COVID-19 crisis,* as well as indicating that impulsiveness decreased after lockdown, meaning that behaviour returned to its pre-lockdown level. All of the above points to the fact that the amount of information and level of fear during lockdown had a drastic impact on changes in consumer behaviour and had intensified impulsive buying, which will be analysed further in the paper.

Considering that the factors of impulsive buying are: unplanned purchases, lack of rational thought, not postponing shopping, and in the event of a crisis hoarding supplies, these factors were also analysed in this survey. The factors are shown on the Figure 2, where consumers could express their agreement/disagreement for all three periods. It is evident that consumers had been planning their purchases before the pandemic, but in lockdown, planning became considerably rarer, and after the lockdown, it became more common. They were questioning their purchasing decisions before and after the lockdown, while during lockdown they were not questioning their decisions but were making them impulsively. Moreover,

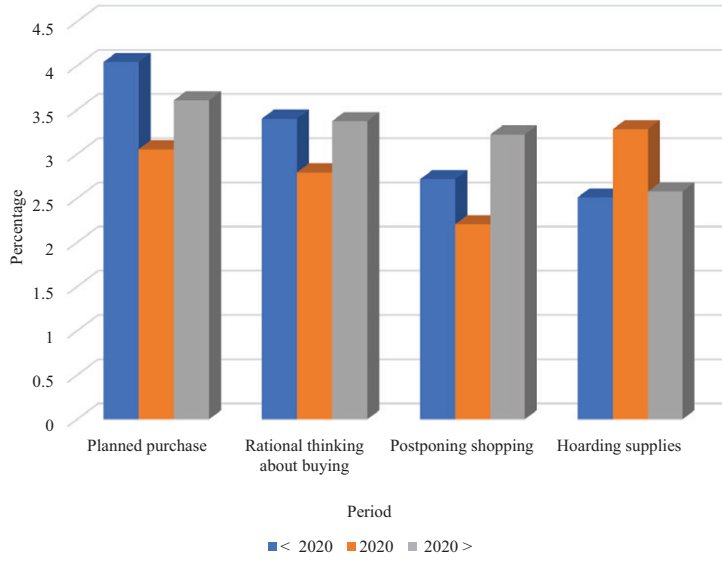

Figure 2. Changes in consumer behavior and in the impulsiveness of purchases in the period before, during and after lockdown (source: prepared by authors)

another important determinant of impulsive buying is postponing shopping until the prices are discounted. It is without a doubt that the respondents of this survey were not postponing their shopping during the lockdown, as they were known to do before and after. In the end, they were hoarding certain products in large quantities, while they had not been exhibiting this behavioural pattern before and after the lockdown. All of the above confirms once more that consumers had undoubtedly changed their behavioural patterns during the lockdown and that they were buying impulsively (which also analysed Iyer et al., 2020), therefore hypothesis *H1: Consumers were buying impulsively at the beginning of the COVID-19 crisis* can be accepted fully.

Something key for further analysis is to determine which factors had contributed to these type of purchases, or in other words, which factors had affected purchases will be analysed using the multi-variant regression further below. For this analysis, a sample of consumers who behaved impulsively during lockdown (n = 89) was selected (using the descriptive analysis method) from the total sample. The goal was to analyse which factors had affected their behaviour and to determine the strength of the correlation between consumer behaviour and the factors which had affected their behaviour. The multi-variant regression demonstrates the intensity of influences of each of these factors on impulsive buying.

From the Table 3 it can be seen how users react substantially to the fear of missing products on shelves, to the present (empty shelves), as well as to the future (closed borders,

Table 3. Results of multi-variant regression (source: prepared by authors)

SUMMARY OUTPUT								
Regression statistics								
Multiple R	0.84261							
R Square	0.709992							
Adjusted R Square	0.696182							
Standard Error	0.396563							
Observations	89							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	4	32.34053	8.085133	51.41179	8.13E-22			
Residual	84	13.21003	0.157262					
Total	88	45.55056						
	Coefficients	Standard error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	–0.5812	0.3759	–1.5462	0.1258	–1.3286	0.1663	–1.3286	0.1663
Lockdown	0.3633	0.0978	3.7149	0.0004	0.1688	0.5578	0.1688	0.5578
People's recommendations	0.1052	0.0969	1.0849	0.2810	–0.0876	0.2980	–0.0876	0.2980
Empty shelves	0.2077	0.1037	2.0032	0.0484	0.0015	0.4139	0.0015	0.4139
Economic breakdown	0.4163	0.0984	4.2304	0.0001	0.2206	0.6119	0.2206	0.6119

hindered market trading, and economic breakdown), and to a new potential lockdown. To be more concrete, the intensity of impulsive buying will increase by 0.4163, with a significance level of 5%, if the fear of a potential long-term shortage of products due to closed borders, hindered market trading, and economic breakdown increases by one point, with the rest of the variables remaining unchanged. With this, it can be determined that potential shortages of products in the future have the most intensive influence on impulsive buying in the COVID-19 pandemic era. It is also important to mention the influence of the lockdown on impulsive buying. Namely, if the fear of lockdown grows by one point, with the rest of the variables remaining unchanged, then the intensity of impulsive buying will increase by 0.3633, with a significance level of 5%. And in the end, if the fear of empty shelves grows by one point, with the rest of the variables remaining unchanged, then the intensity of impulsive buying will increase by 0.2077, with a significance level of 5%

Furthermore, the results of the group F test (F = 8.13E-22) indicate that the regression model is meaningful with a significance level of 5%. The value of the multiple correlation coefficient (R = 0.84261) indicates that there is a strong connection between impulsive buying as the dependent variable and independent variables. The 71% variance of impulsive buying on the observed 89 respondents was interpreted using the above values. Accordingly, it can be stated that the regression analysis has confirmed the strong connection between the components which cause fear in users during the COVID-19 pandemic and impulsive buying.

Consequently, it is necessary to determine whether media influenced consumer behaviour during the pandemic and to determine the strength of the correlation between consumer behaviour and factors that had influenced it. The intensity of the influence of each factor on impulsive buying is presented using the multi-variant regression method. The direction and strength of the connection between the information sources the user used during the lockdown and the impulsiveness of their purchases was determined using correlation analysis, intending to determine the influence of media on impulsive buying, i.e. to test the hypothesis

Hypothesis 2. The media had an intensive influence on impulsive buying during the COVID-19 crisis.

The regression analysis of the influence of information sources on impulsive buying is given below.

From the Table 4, it can be seen that users react significantly to information received from media (this is also confirmed by previous research by Kaur and Sharma (2020), Kim and Su (2020), Addo et al. (2020)), but they also gather information from their families.

To put it more concretely, if the amount of information received from Headquarters of Civil Protection is increased by one point with the rest of the variables remaining unchanged, the intensity of impulsive buying will increase by 0.4476, with a significance level of 5%, with which it can be determined that Headquarters of Civil Protection had the most intensive influence on impulsive buying during the COVID-19 pandemic. It is also important to mention the influence of TV news on impulsive buying. Namely, if we increase the amount of information about COVID-19 from TV news by one point, with the rest of the variables remaining unchanged, the intensity of impulsive buying will increase by 0.2517, with a significance level of 5%. It is interesting to note that the influence of information gathered from Facebook is significant, so if the intensity is increased by one point, the intensity of impulsive buying will increase by 0.1921, with a significance level of 5%.

Table 4. Results of multi-variant regression (source: prepared by authors)

SUMMARY OUTPUT								
Regression statistics								
Multiple R	0.8056911							
R Square	0.6491381							
Adjusted R Square	0.6188167							
Standard Error	0.4441938							
Observations	89							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	7	29.5686	4.2240864	21.40858	4.633E-16			
Residual	81	15.98196	0.1973081					
Total	88	45.55056						
	Coefficients	Standard error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	–2.4506	0.5941	–4.1249	0.0001	–3.6326	–1.2685	–3.6326	–1.2685
Facebook	0.1921	0.1223	1.5705	0.1202	–0.0513	0.4356	–0.0513	0.4356
TV news	0.2517	0.0796	3.1602	0.0022	0.0932	0.4101	0.0932	0.4101
Friends	0.0740	0.0871	0.8496	0.3981	–0.0993	0.2472	–0.0993	0.2472
Family	0.2743	0.1062	2.5831	0.0116	0.0630	0.4857	0.0630	0.4857
Headquarters	0.4476	0.1325	3.3793	0.0011	0.1841	0.7112	0.1841	0.7112
Newspaper	0.1640	0.0901	1.8199	0.0725	–0.0153	0.3433	–0.0153	0.3433
Radio	0.0989	0.0708	1.3977	0.1660	–0.0419	0.2397	–0.0419	0.2397

Furthermore, the results of the group F test indicate that the regression model is meaningful with a significance level of 5%. The value of the multiple correlation coefficient (R = 0.8056911) means there is a strong connection between impulsive buying as the dependant variable and the information sources. The test is valid since the 65% variance of impulsive buying of the observed 89 respondents was interpreted using these aforementioned factors, hence it can be stated the regression analysis has confirmed the strong connection between the above-mentioned information sources of users during the COVID-19 pandemic and impulsive buying, with especially strong connections between media and impulsive buying, which confirms hypothesis H2.

In order to even further confirm the thesis that media influences impulsive buying, a correlation matrix was made which consisted of information sources during the pandemic and indicators of impulsive buying in users. The results are shown below.

The correlation matrix shows the strength and direction of the connection between individual variables. According to the Table 5, it is interesting to note that a negative correlation was not observed in any analysis. This is why it can be stated that the information

Table 5. Results of correlation matrix (source: prepared by authors)

	Impulsive buying	Facebook	TV news	Peers	Family	Headquarters	Newspaper	Radio
Impulsive buying	1							
Facebook	0.5275	1						
TV news	0.4684	0.2861	1					
Peers	0.5212	0.5703	0.4123	1				
Family	0.4760	0.4279	0.0538	0.3780	1			
Headquarters	0.6590	0.3492	0.3019	0.3636	0.3989	1		
Newspaper	0.5440	0.4371	0.2564	0.3771	0.2511	0.4860	1	
Radio	0.4504	0.2039	0.1902	0.2522	0.1344	0.5161	0.4294	1

sources and the information gathered had a positive influence on impulsive buying. The strongest connection was discovered in the information from Headquarters of Civil Protection (0.6590), which confirms that, during the lockdown, Headquarters of Civil Protection had the largest influence on the attitudes and behaviour of consumers. A medium-strong connection was found between impulsive shopping and the information that was gathered from peers (0.5212) and family (0.4760) so it can be stated that, besides media, information also came from those sources that had also influenced consumer behaviour. It is important to mention that a strong positive connection was found between impulsive buying and information gathered from newspapers (0.5440), Facebook (0.5275), TV news (0.4684) and radio (0.4504), which indicates that media influenced impulsive buying, which once again confirms hypothesis *H2: The media had an intensive influence on impulsive buying during the COVID-19 crisis.*

Conclusions

Epidemiological measures were implemented to supress physical contact between people which disturbed the market. The obtained information (either from media or surrounding individuals) instilled even more fear in individuals. All of the above had influenced significant changes in behaviour during the lockdown, which this research proved with hypothesis H1.

Impulsive buying emerged because of fear of missing out on certain products and of scarcity. Surrounding individuals and society, in general, had a strong influence on this behaviour, yet this survey shows that media had the strongest influence of them all. The survey has indicated that the most influential information on impulsive buying had come from Headquarters of Civil Protection, which were transmitted by the media, and there was also a strong connection between impulsive buying and news from TV, newspapers, radio, and Facebook, which confirmed hypothesis H2.

The empirical research proved there had existed a significant intensity of impulsive buying during the first lockdown, as well as further along the pandemic, and that media had had a significant influence on this behaviour. Therefore, indicators from this survey can help in

identifying the key factors of impulsive buying, with the goal of predicting future consumer behavioural patterns in similar crises.

This research had a couple of limitations. Firstly, due to the limited financial resources, the gathered data only encompassed the Republic of Croatia. In subsequent surveys on this topic, it would be worthwhile to involve more respondents, and to compare data to data from other countries, as well as data from previous crises, to gain a clearer picture of consumer behaviour in times of crises/ pandemics and the influence of media on it. Secondly, the data was collected online with a survey due to still existing epidemiological measures. This leaves more space for other studies, which can be conducted with other methods. Finally, this research was conducted on a random population sample, so to prove hypothesis 2, the database had to filtered out according to the buying intensity, so that only impulsive buyers could be analysed (n = 89).

It would also be important to analyse the population that has gone through some previous crisis periods, in which there was a shortage or fear of a lack of tested products (such as war, smallpox, Spanish flu...) and analyse the impact of previous experience on the impulsiveness of buying today, but also potentially in future periods. From the above analysis, the behaviour of users in the following crisis periods could be assumed.

The practical implication of this paper is mainly related to governments, consumers and media providers. Firstly, in similar crises it will be necessary for governments to find a system which will disprove false information spread by media, so that information anxiety is mitigated on time. Secondly, a higher media and information literacy is necessary for consumers to overcome potential information anxiety and thus mitigate unnecessary impulsive buying. Thirdly, it is paramount to continuously raise awareness of the responsibility of media providers, whereby only with professionalism and social responsibility can consumer anxiety be mitigated.

References

Addo, P. C., Jiaming, F., Kulbo, N. B., & Liangqiang, L. (2020). COVID-19: Fear appeal favoring purchase behavior towards personal protective equipment. *The Service Industries Journal*, *40*(7–8), 471–490. https://doi.org/10.1080/02642069.2020.1751823

Ban, K. (2018). *Influence of external factors on impulsive buying.* Faculty of Economics, University of Split, Split.

Barbić, D., & Lučić, A. (2018). *Financial literacy and responsible spending in everyday life*. Narodne novine.

Bergel, M., & Brock, C. (2019). Visitors' loyalty and price perceptions: The role of customer engagement. *Service Industries Journal*, *39*(7–8), 575–589. https://doi.org/10.1080/02642069.2019.1579798

Blažević Bognar, Z., Pleša Puljić, N., & Kadežabek, D. (2019). Impact of influencer marketing on consumer behaviour. In G. Dukic, J. Clifford, & D. Atkinson (Eds.), *42nd International Scientific Conference on Economic and Social Development* (pp. 301–309). London.

Blažević Bognar, Z., Pleša Puljić, N., & Lacko, T. (2017). The impact of the psychological price on consumer's behavior. In D. Cingula, M. Przygoda, & K. Detelj (Eds.), *23rd International Scientific Conference on Economic and Social Development* (pp. 589–597). Madrid, Spain.

Chan, T. K. H., Cheung, C. M. K., & Lee, Z. W. Y. (2017). The state of online impulse-buying research: A literature analysis. *Information and Management*, *54*(2), 221–239. https://doi.org/10.1016/j.im.2016.06.001

Čičić, M., Husić, M., & Kukić, S. (2009). *Ponašanje potrošača* [Consumer behavior]. Faculty of Economics, University of Mostar, SUTON d.o.o.

Crabbe, M. (2020, March 9). *Research your way out of a crisis: Covid-19's effect on consumer behaviour*. Mintel Blog. https://www.mintel.com/blog/consumer-market-news/research-your-way-out-of-a-crisis-covid-19s-effect-on-consumer-behaviour

Farooq, A., Laato, S., & Akam, I. (2020). Impact of online information on self-isolation intention during the COVID-19 pandemic: Crosssectional study. *Journal of Medical Internet Research*, *22*(5), e19128. https://doi.org/10.2196/19128

Forbes, S. L. (2017). Post-disaster consumption: analysis from the 2011 Christchurch earthquake. *The International Review of Retail, Distribution and Consumer Research*, *27*, 28–42. https://doi.org/10.1080/09593969.2016.1247010

Hua, J., & Shaw, R. (2020). Corona virus (COVID-19) "Infodemic" and emerging issues through a data Lens: The case of China. *International Journal of Environmental Research and Public Health*, *17*, 2309. https://doi.org/10.3390/ijerph17072309

Husnain, M., Qureshi, I., Fatima, T., & Akhtar, W. (2016). The impact of electronic word-of-mouth on online impulse buying behavior: The moderating role of big 5 personality traits. *Journal of Accounting & Marketing*, *5*(4), 190–209. https://doi.org/10.4172/2168-9601.1000190

Hwang, M. Y., Hong, J, C., Tai, K, H., Chen, J, T., & Gouldthorp, T. (2019). *The relationship between the online social anxiety, perceived information overload and fatigue, and job engagement of civil servant LINE users*. Government Information Quarterly, 101423. https://doi.org/10.1016/j.giq.2019.101423

INSEAD. (2020). *The Psychology behind coronavirus panic buying*. Retrieved March 29, 2020, from https://knowledge.insead.edu/node/13451/pdf

Iriani, S. S., Nuswantara, D. A., & Kartika, A. D. (2021). The impact of government regulations on consumers behaviour during the COVID-19 pandemic: A case study in Indonesia. *The Jorunal of Asian Finance, Economics and Business*, *8*(4), 939–948. https://www.koreascience.or.kr/article/JAKO202109554061581.page

Islam, D. T., Pitafi, D. H., Wang, D. Y., Aryaa, D. V., Mubarik, D. S., Akhater, D. N., & Xiaobei, D. L. (2021). Panic buying in the COVID-19 pandemic: A multi-country examination. *Journal of Retailing and Consumer Services*. https://doi.org/10.1016/j.jretconser.2020.102357

Iyer, G. R., Blut, M., Xiao, S. H., & Grewal, D. (2020). Impulse buying: a meta-analytic review. *Journal of the Academy of Marketing Science*, *48*(3), 384–404. https://doi.org/10.1007/s11747-019-00670-w

Jurčić, D. (2017). Theoretical settings about media – definitions, functions, influence. *Mostariensia: Journal of Social Sciences and Humanities*, *21*(1), 127–136. https://hrcak.srce.hr/190208

Kalaitzandonakes, N., Marks, L. A., & Vickner, S. S. (2004). Media coverage of biotech foods and influence on consumer choice. *American Journal of Agricultural Economics*, *86*(5), 1238–1246. https://doi.org/10.1111/j.0002-9092.2004.00671.x

Kardes, F., Cronley, M., & Cline, T. (2014). *Consumer Behavior*. Cengage Learning.

Kaur, R., & Sharma, B. (2020). Impulsive buying behavior for essential goods: Covid-19. *Journal of Critical Reviews*, *7*(8), 3126–3135. http://www.jcreview.com/fulltext/197-1595738107.pdf

Kesić, T. (2006). *Consumer behavior*. Opinio, Zagreb.

Kim, B. (2020). Effects of social grooming on incivility in COVID-19. *Cyberpsychology, Behavior, and Social Networking*, *23*(8), 519–525. https://doi.org/10.1089/cyber.2020.0201

Kim, S. W., & Su, K. P. (2020). Using psychoneuroimmunity against COVID-19. *Brain, Behavior, and Immunity*, *87*, 4–5. https://doi.org/10.1016/j.bbi.2020.03.025

Kotler, P., Keller, K. L., & Martinović, M. (2014). *Marketing management*. MATE d.o.o.

Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of COVID-19 epidemic declaration on psychological consequences: A study on active Weibo users. *International Journal of Environmental Research and Public Health*, *17*, 2032. https://doi.org/10.3390/ijerph17062032

Liu, P., He, J., & Li, A. (2019). Upward social comparison on social network sites and impulse buying: A moderated mediation model Curr Psychol of negative affect and rumination. *Computers in Human Behavior*, *96*, 133–140. https://doi.org/10.1016/j.chb.2019.02.003

Loxton, M., Truskett, R., Scarf, B., Sindone, L., Baldry, G., & Zhao, Y. (2020). Consumer behaviour during crises: Preliminary research on how coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the media in influencing behaviour. *Journal of Risk and Financial Management*, *13*(8), 166. https://doi.org/10.3390/jrfm13080166

Malhotra, D. (2010). The desire to win: The effects of competitive arousal on motivation and behavior. *Organizational Behavior and Human Decision Processes*, *111*, 139–146. https://doi.org/10.1016/j.obhdp.2009.11.005

Martin-Neuninger, R., & Ruby, M. B. (2020). What does food retail research tell us about the implications of Coronavirus (COVID-19) for grocery purchasing habits? *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01448

Mathes, B., Oglesby, M., Short, N., Portero, A., Raines, A., & Schmidt, N. (2017). An examination of the role of intolerance of distress and uncertainty in hoarding symptoms. *Comprehensive Psychiatry*, *72*, 121–129. https://doi.org/10.1016/j.comppsych.2016.10.007

Matohanca, M. (2018). *The use of psychological prices in marketing*. Juraj Dobrila University of Pula.

Mihić, M., & Kursan, I. (2010). Influence of demographic and individual factors on impulsive buying. *Market*, *22*(1), 7–28. https://hrcak.srce.hr/62108

Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art nad future development. *Emotion Review*, *2*, 119–124. https://doi.org/10.1177/1754073912468165

Nielsen. (2020). Covid-19 article. https://www.nielsen.com/?s=covid+19+&market=us&language=en

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of Fear of missing out. *Journal of Adolescence*, *55*, 51–60. https://doi.org/10.1016/j.adolescence.2016.12.008

Parsad, C. (2020). Comparing between product-specific and general impulse buying tendency: Does shoppers' personality influence their impulse buying tendency? *Asian Academy of Management Journal*, *24*(2), 41–61. https://doi.org/10.21315/aamj2019.24.2.3

Przybylski, A. K., Murayama, K., De Haan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of Fear of missing out. *Computers in Human Behavior*, *29*(4), 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014

Rajan, D., Koch, K., Rohrer, K., Bajnoczki, C., Socha, A., Voss, M., Nicod, M., Ridde, V., & Koonin, J. (2020). Governance of the Covid-19 response: A call for more inclusive and transparent decision-making. *BMJ Global Health*, *5*, 002655. https://doi.org/10.1136/bmjgh-2020-002655

Ribić, D., & Pleša Puljić, N. (2020). *Basics of entrepreneurship.* Školska knjiga, Zagreb.

Rook, D., & Hoch, S. (1985). Consuming impulses. *Advances in Consumer Research*, *12*, 23–27. https://doi.org/10.1086/208514

Schiffman, L. G., & Kanuk, L. L. (2004). *Consumer behavior* (8 ed.). Prentice Hall.

Sneath, J. Z., Lacey, R., & Kennett-Hensel, P. A. (2009). Coping with a natural disaster: Losses, emotions, and impulsive and compulsive buying. *Marketing Letters*, *20*, 45–60. https://doi.org/10.1007/s11002-008-9049-y

Soče Kraljević, S., Galić, S., & Vidačak, Z. (2016). Exploring the impact of demographic factors on impulsive buying. *Proceedings of the Faculty of Economics, University of Mostar*, *22*, 26–48. https://hrcak.srce.hr/203898

Solomon, M. R. (2017). *Consumer behavior: Buying, having, and being* (global ed.). Pearson Higher Ed.

Suryaningsih, I. B. (2020). Hedonic shopping mediation on impulse buying determinants. *Journal of Management and Business*, *19*(1), 1–13. https://doi.org/10.24123/jmb.v19i1.426

Turkalj, D. (2021). The effects of the pandemic crisis on the use of the media and the assessment of its importance in everyday life. *CroDiM: International Journal of Marketing Science*, *4*(1), 121–130. https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=370298

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*, 1729. https://doi.org/10.3390/ijerph17051729

Wiranata, A. T., & Hananto, A. (2020). Do website quality, fashion consciousness, and sales promotion increase impulse buying behavior of e-commerce buyers? *Indonesian Journal of Business and Entrepreneurship*, *6*(1), 74. https://doi.org/10.17358/ijbe.6.1.74

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior: the official publication of the Society for Public Health Education*. *27*, 591–615. https://doi.org/10.1177/109019810002700506

Wu, I. L., Chen, K. W., & Chiu, M. L. (2016). Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users. *International Journal of Information Management*, *36*(3), 110–115. https://doi.org/10.1016/j.ijinfomgt.2015.11.015

Wu, Y., Xin, L., Li, D., Yu, J., & Guo, J. (2020). How does scarcity promotion lead to impulse purchase in the online market? A field experiment. *Information and Management*, *58*(1), 103283. https://doi.org/10.1016/j.im.2020.103283

Xiao, H., Zhang, Z., & Zhang, L. (2020). A diary study of impulsive buying during the COVID-19 pandemic. *Current Psychology*. https://doi.org/10.1007/s12144-020-01220-2

Yi, S. (2012). Shame-proneness as a risk factor of compulsive buying. *Journal of Consume Policy*, *35*(3), 393–410. https://doi.org/10.1007/s10603-012-9194-9

Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The psychological causes of panic buying following a health crisis. *International Journal of Environmental Research and Public Health*, *17*(10), 3513. https://doi.org/10.3390/ijerph17103513

Zafar, A. U., Qiu, J., Li, Y., Wang, J., & Shahzad, M. (2019). The impact of social media celebrities' posts and contextual interactions on impulse buying in social commerce. *Computers in Human Behavior*, 115. https://doi.org/10.1016/j.chb.2019.106178

Zhang, M., Qin, F., Wang, G. A., & Luo, C. (2019). The impact of live video streaming on online purchase intention. *Service Industries Journal*, *40*(9–10), 656–681. https://doi.org/10.1080/02642069.2019.1576642

Živković, M. (2020). *Quantitative study of the impact of coronavirus on impulsive buying.* Faculty of Economics in Zagreb. https://repozitorij.unizg.hr/islandora/object/efzg:6185/datastream/PDF