The moderating effect of social media use in impulsive buying of personal protective equipments during the COVID-19 pandemic

Hanifah Putri Elisa*, Mahendra Fakhr and Mahir Pradana

Abstract: The global economy, public health, and markets are now being greatly affected by the spread of COVID-19. Indonesia is one of the countries affected. These effects cause fear, panic, and anxiety for many people. When the lockdown was applied, panic buying becomes common during the COVID-19 pandemic. Therefore, it is essential to investigate consumer purchasing behavior during COVID-19 to understand the phenomenon better and provide management insights to policymakers and marketers. This research utilized the scarcity model theory and the Stimuli-Organism-Response (SOR) model. We investigated how creating external stimuli such as scarcity affects perceived value among people in panic situations, which in turn affects impulsive buying behavior. Finally, 320 valid data points were collected using online surveys, and SmartPLS was used for data analysis. Our results show that scarcity significantly increases impulse buying. In addition, our results show that social media use moderates the relationship between scarcity messages and impulsive buying, while perceived value mediates the relationship between scarcity and impulsive buying in Indonesia. The study provides more information about consumers’ impulsive buying, considering the scarcity of health supplement products during pandemics. Marketers and the Indonesian government can take action to mitigate their impact and help maintain security during pandemics.

Subjects: Marketing Research; Consumer Behaviour; Media & Communications; Research methods; Global Health; Health Education and Promotion

ABOUT THE AUTHOR
Hanifah Putri Elisa
As the first author, my research interest is about social use of marketing. With my colleagues, we have presented a study related to psychological impact of COVID-19 pandemic on consumer behaviour at Industrial Engineering and Operation Management Conference 2022. I wrote this article with my supervisors, Mahendra Fakhr and Mahir Pradana. They have published several articles in reputable journals, such as Current Issues in Tourism, Local Environment, and Technology Analysis and Strategic Management.

PUBLIC INTEREST STATEMENT
The COVID-19 pandemic has caused not only socio-economic effects, but also social problems seen by a significant shift in consumer behavior. During the lockdown, panic buying becomes common pandemic. Therefore, it is essential to conduct a study related to consumer purchasing behavior to understand the phenomenon better and provide management insights to policymakers and marketers. This article is a report from our research investigating impulsive buying with scarcity model theory and the Stimuli-Organism-Response (SOR).

The topic is essential to discuss psychological and marketing phenomena which are the effects of the COVID-19 pandemics. We provide the article with detailed tables and make the results more understandable for the readers.
Keywords: Scarcity; impulse buying; perceived value; social media use

1. Introduction
COVID-19 is one of the most serious challenges that government and businesses have faced in the last century (Hall et al., 2020). COVID-19 brings many psychological, social, and occupational changes such as rising unemployment, reduced savings, fear and prolonged stress, uncertainty in the future, and physical and mental health problems (Caroline & Isham, 2020). As a result of this pandemic, the Indonesian government took precautions to prevent the spread of the virus by imposing lockdowns and implementing social distancing, but the number of infected people is still growing. From 24 October 2021, the number of tested positive for COVID-19 increased by 623 patients (Nuryanti, 2021). This fact proves that the coronavirus spreads rapidly and affects daily life activities. This situation caused a very high level of panic among the public. In particular, there was no unique drug that was clinically tested to treat COVID-19 (Zhang et al., 2021). In addition, the ongoing panic surrounding the COVID-19 phenomenon makes the general public buy or store items directly related to the prevention of COVID-19, such as face masks, disinfectants, hand sanitizers, and health supplements.

Similarly, high-stress consumers are likely to make impulsive buying (Widiyarti, 2020). People make impulsive buying when they already have large quantities of goods, resulting in a scarcity of face masks, hand sanitizers, disinfectants, and other health products (Huang & Zhao, 2020). Moreover, some Indonesians believe that a series of foods and drinks can kill and prevent COVID-19, so milk and vitamins are everywhere hunted by the public (Radiordk, 2021). In addition, news about the high number of positive cases of COVID-19 that continues to increase every day makes people more afraid (Amalia, 2021). The community will do their best efforts to purchase any products preventing the virus from entering the body (Watson & Popescu, 2021). Therefore, it is not surprising that milk, vitamins, or health supplements that are considered to strengthen the body’s resistance to the virus are invaded massively by the community, resulting in scarcity (Amalia, 2021).

According to Verplanken and Herabadi (2001), impulsive buying are divided into two aspects, namely cognitive aspects and affective aspects. The cognitive aspect is the lack of consideration and planning in the purchases made. Affective aspects include emotional impulses and feelings of pleasure and joy after making an unplanned purchase, but after that, suddenly arise feelings or desires to buy repeatedly or compulsively, uncontrollably, satisfaction, disappointment, and regret having spent money to fulfill his desires. The COVID-19 pandemic can cause a variety of negative emotions, one of which is anxiety (Julianti, 2020). According to Supriyanto (2020) anxiety will affect people’s activities while shopping or making purchases. Therefore, it is essential to observe consumers’ impulsive buying behavior during pandemics to better understand the phenomenon and provide insight to policymakers and marketers. The research falls under the guidelines of scarcity model theory and the S-O-R perceived value, which leads to consumers’ impulsive and compulsive purchases. The study took place in Indonesia. At the beginning of 2021, internet users in Indonesia reached 202.6 million. Compared to Indonesia’s total population of 274.9 million, the penetration rate of Indonesian internet users is 73.7% (Riyanto, 2021). The most popular internet activity among Indonesian internet users is social media. Currently, as many as 170 million Indonesians are active users of social media (Riyanto, 2021). Social media has become a significant force in the social media user aspect of life (Pop et al., 2021). In fact, as millions of people follow government regulations to stay at home, the reliance on social media is increasing drastically (Birut & Lązaroii, 2021). Therefore, people today rely on social media to find and share information about pandemics (Islam, Pitafi et al., 2021). Of course, news about health products needed at this time of pandemic has flooded social media platforms such as Facebook, Twitter, YouTube, and Instagram. The phenomenon of scarcity can increase the perceived value of consumers’ impulse buying. The study also looked at the role of social media in the impulsive behavior of buyers in this pandemic period. By integrating the SOR model, the proposed model illustrates
that scarcity positively affects perceived value, which in turn affects impulse buying. Therefore, the aim of the study is to determine the impact of scarcity on customers’ impulse buying, with perceived value acting as a moderator. This study aims to integrate relevant constructs from scarcity theory, and S-O-R models to develop various ways to explain the effect of scarcity on consumers’ impulse buying; to determine the effect of scarcity on impulse buying by examining mediating means such as perceived value; to examine the relationship between scarcity and perceived value; to determine the moderating effect of social media use on the relationship between scarcity and impulse buying; and to examine the relationship between perceived value and impulse buying.

Overall, the study is expected to provide new insight into the extent to which scarcity affects impulse buying, help governments better deal with the COVID-19 pandemic, and reduce anxiety and impulsive purchases caused by social media use during the COVID-19 pandemic.

The study is structured as follows: after introduction, we present literature review to help structuring the research model. Here, the conceptual framework and the hypotheses of the study are presented. Afterward, section 3 present the methods used in this study. Section 4 presents the empirical results and are followed by the discussion in section 5. The last section of this study will present the conclusion and future research directions.

2. Literature reviews

2.1. Scarcity model
Essentially, scarcity results from an imbalance between supply and demand, leading to competition for resources (Kristofferson et al., 2017). In marketing, scarcity is defined as an item that is available in limited quantities and times (Chen et al., 2021). If the product is only available in limited quantities and times, consumers feel worried if they do not get the product on time and have to compete with other consumers. As a result, consumers feel that the product is worth buying now (Jang et al., 2015). In addition, many factors can cause scarcity, such as increased demand, production delays, limited production, to capacity constraints (Li et al., 2021). The study focused on limited health supplement products due to large demand. The study used a scarcity model developed by W.-Y. Wu et al. (2011) which discusses how scarcity affects buying interest through consumer value perception. It is related to the S-O-R model in which the organism (O) responds to cues such as perceived values (Jiyong & Lennon, 2013). This study aims to identify how scarcity affects impulse buying. Therefore, the scarcity model is suitable for this study.

2.2. The S-O-R model
Many consumer behavior researchers have supported and applied the SOR model. (Islam et al., 2018; Liu et al., 2016). The SOR model describes various aspects of the environment acting as stimuli (S), affecting a person's internal state and acting as an organism (O), ultimately driving their response (R; Mehrabian & Russell, 1977). The SOR model is suitable for researching compulsive purchase behavior during the COVID-19 epidemic because it theoretically and empirically verifies that environmental stimuli elements impact individuals’ cognitive and emotional states, which in turn influence consumer behavior (Islam et al., 2018; Liu et al., 2016). In this study, the SOR model was used to describe the relationship between external stimuli, organism state, and certain responses. Scarcity of health supplement products refers to stimuli and the various ways or mechanisms of mediation (perceived value) generated in an organism, while impulse buying represents its response.

2.3. Scarcity on impulsive buying
An impulsive buying is a sudden action that differs from a planned purchase (Ahn et al., 2020; Jones et al., 2003; Li & Jing, 2012), and it is made without careful consideration of its long-term consequences (Moon et al., 2017; Pradhan, 2016). Impulsive buying can also be interpreted as irrational habits (Zhang et al., 2021). In the opposite case, scarcity can be explained as a consumer...
who recognizes the limited availability of benefits of an item (Lynn, 1989). Researchers have previously supported restrictions on purchases as an instructive signal to consumers (Aggarwal et al., 2011; Lynn, 1992). There are two types of scarcity messages that are often used, namely, limited products and limited time (Akram et al., 2018). When a product is limited and rare, consumers will want it again, so limited product availability will create positive value in the minds of consumers (Akram et al., 2018). Given the competitive environment, scarcity positively influences impulsive buying behavior, therefore the following hypothesis is proposed.

H1: Scarcity positively and significantly affects the impulsive buying behavior of health supplement products in Indonesia

2.4. Scarcity on perceived value

Scarcity is defined as a purposeful limitation on demand, discounts, timing, and other comparable purchase circumstances for a product (Islam, Pitafi et al., 2021). According to Jang et al. (2015) scarcity is frequently communicated to consumers through marketing campaigns, which convey the impression that purchasing a certain product is restricted. Marketers effectively use scarcity approaches to promote and sell existing supplies in limited quantities (Ku et al., 2012). Yi Wu et al. (2020) argue that in conditions of high quantity scarcity, the perception of individual competition with others also increases. The more consumers spend on rare products, the more they consider the product to be of value (W.-Y. Wu et al., 2011). This research shows that scarcity affects the perceived value of consumers. Therefore, hypotheses 2 are proposed.

H2: Scarcity positively and significantly affects the perception value of health supplement products in Indonesia

2.5. Perceived value on impulsive buying

Previous research on COVID-19 found that Chinese consumers’ perceived value and impulsive buying are based on the theory of cognitive affective personality systems (Xiao et al., 2020). In addition, it also explains that perceived value results in impulsive behavior in Chinese consumers (Zhang et al., 2021). However, the study is based on the scarcity model, the S-O-R model, and the relationship between perceived values and impulsive buying in the context of COVID-19 in Indonesia. Therefore, hypotheses 3 are proposed.

H3: Perceived value positively and significantly affects impulsive buying of health supplement products in Indonesia

2.6. Scarcity and perceived value on impulsive buying

In the COVID-19 period, people were frantically looking for limited quantities of food and hygiene products, which are typical conditions of scarcity of limited quantities (Islam, Pitafi et al., 2021). Impulse buying can be influenced by perceptions as much as genuine competition among buyers. According to Beatty and Ferrell (1998) consumers with high impulsivity tend to have low self-control. When confronted with stimulation from their environment, a person with a high level of impulsivity is more likely to have an affection reaction (Youn & Faber, 2000). According Yi Wu et al. (2020) that in the situation of high scarcity, an individual’s perceived competitiveness with others grows significantly, resulting in a high level of perceived value. Consumers’ emotional arousal is influenced by scarcity, according to these studies. Previous study revealed that scarcity in terms of both time and quantity is positively related to Chinese students’ perceived value in the online context, which promotes their impulsive buying (Yi Wu et al., 2020). Therefore, hypotheses 4 are proposed.
H4: Perceived value mediates the relationship between scarcity and impulsive buying of health supplement products in Indonesia

2.7. Scarcity and social media use on impulsive buying
The exponential growth of social media and high smartphone penetration, enable billions of people to share and post any experience on social media (Facebook, Instagram, etc.; Islam, et al., 2021; Parsons et al., 2014; Prentice et al., 2020). Any business research have demonstrated that using social media influences customers’ decision-making processes and drives them to modify their preferences (Barger et al., 2016). Furthermore, during the COVID-19 epidemic, social media allowed internet users to rapidly share and get information, as well as create and maintain connections (Rydell & Kucera, 2021). It’s no surprise that in this exceptional scenario, the use of social media has skyrocketed (Islam, et al., 2021). Millions of posts about COVID-19 are posted daily on social media, such as photos and videos showing empty shelves as well as other impulsive and compulsive purchases that increase panic and anxiety among users (Islam, et al., 2021). The dissemination of such information can affect consumers and the buying patterns of Indonesian people. Impulse buying on a large scale emphasize finding comfort from the virus outbreak that is being experienced (Hopkins & Potcovaru, 2021; Smith & Mochova, 2021). Typically, consumers who make impulse buying do so to find items that make them feel comfortable (Arifiani & Gunawan, 2020). Therefore, Hypothesis 5 was proposed.

H5: Social media use moderates the impact of scarcity on impulsive buying of health supplement products in Indonesia.

Our conceptual framework is visually represented by figure 1.

3. Methods

3.1. The development of the research instrument
We did an in-depth literature assessment of related past research on scarcity, perceived value, impulsive buying, and social media use while building study tools. From here, we take some relevant research instruments. As presented in Table 1, 16 research items have been adapted from several appropriate sources in the context of this study, namely W.-Y. Wu et al. (2011) for scarcity construction; Zhang et al. (2021) for the construction of perceived value; (Ahmed et al., 2020) for the construction of social media use; and Ho and Lim (2018) for impulsive buying construction. The construction of the study was scored using a five point Likert type scale (1 = strongly disagree and 5 = strongly agree). Furthermore, because the intended respondents were Indonesians, the final study item was first translated into Indonesian. In addition, we define
our current definition of study constructs in Table 1 to offer a clear grasp of what constructs we measure.

3.2. Sampling
The population in this study was customers with a minimum age of 17 years from various regions in Indonesia who had purchasing experience with several health supplement products such as vitamins, milk, and others. We anticipate that consumers with such experiences may analyze the influence of scarcity on health supplement goods in impulsive buying and sell them to targeted customers using social media and the value of others by establishing specific criteria. We were unable to locate sources or references for the exact number of populations required to compute the minimum sample size. Therefore, we consider the recommendations put forward by Hair et al. (2010), the appropriate sample size for the study should be about 5 to 10 times the number of indicators used in the study. There are 16 indicators for items or indicators used in this study. The data for the study was collected in the form of questionnaires. In total, about 320 respondents were contacted via social media (such as Line, Instagram, and Whatsapp) to fill out a questionnaire survey. Data collected through survey questionnaires is analyzed using Smart PLS and SEM (Structural Equation Model) software. For complete information estimation method using Smart PLS software, This is because SEM is one of the most popular methods among marketing researchers for evaluating new theoretical models with several complex social structures (Wang et al., 2018), and PLS-SEM is a tool for more detailed statistical analysis. It is appropriate for estimating complex models with numerous constructions (Zhang et al., 2021). The complexity of the current model has 1 variable as moderator and 1 variable as mediator, for a total of 4 variables, making this study suitable for using PLS-SEM. Data analysis and interpretation of the results will be discussed in the next.

3.3. Statistical analysis technique
The current study used the PLS-SEM method and SmartPLS software. The key advantage of utilizing PLS-SEM is that it is more flexible and has a higher statistical strength (Hair et al., 2011). The statistical analysis utilizing PLS-SEM then proceeds to two stages: assessment of the measurement model and evaluation of the structural model (Hair et al., 2019). Table 2 also shows the processes for completing PLS-SEM analysis as well as the rules of thumb for each unit of analysis.
4. Results
During the data collection period, 350 respondents filled out survey forms. But of the 350 items of data collected, only 320 data items can be categorized as acceptable data sets after outlier inspection procedures. Table 3 presents an overview of the respondents involved.

4.1. Measurement model evaluation
After analyzing the respondent’s profile, the next step is to process the data to determine the relationship between each variable and get the results of this study. However, before determining the relationship between variables, the data must meet the criteria of validity and reliability in the
evaluation of the measurement model. As shown in Table 2, the reliability and validity of each concept are assessed during the evaluation of measurement models. Regarding construct reliability, the focus is on indicator loading values that reflect indicator reliability values and composite reliability, which demonstrates the reliability and internal consistency of the construct.

Referring to Table 4, the values of all loading indicators for each construct meet the expected value, which is greater than 0.7, except for SC4 (0.579). But Hair, Matthews, et al. (2017) assert that although some indicators may have values below the minimum limit of 0.70, Because the composite reliability of each construct is acceptable, they can still be maintained for further analysis. As in Table 4, the Composite Reliability value of each construct is 0.907 (IB); 0.880 (PV); 0.818 (SC); and 0.843 (SM), which also exceeds the minimum limit value of 0.70 (Hair et al., 2019). In other words, the research construct’s reliability is well-established. Meanwhile, another focus is on investigating convergent and discriminant validity in response to the construct validity issue. Convergent validity values are seen in AVE (Average Variance Extract) scores, where the AVE value of each construct is 0.663 (IB); 0.647 (PV); 0.533 (SC); and 0.642 (SM). In other words, the convergent validity value of each construct exceeds the minimum limit value of 0.50 (Hair et al., 2019). Likewise, construct discriminant validity refers to the Heterotrait-Monotrait correlation ratio (HTMT), where the HTMT value for each correlation must be below 0.85 (Hair et al., 2019; Henseler et al., 2014). Then, based on Table 5, it can be concluded that HTMT values are widely accepted, which at the same time shows a high level of discriminant validity. Thus, it may be determined that all of the data fits the measurement model’s criteria. So that it is considered valid and reliable.

4.2. Structural model evaluation
After the assessment results on a satisfactory measurement model, the next step is to assess the structural model (Hair, Matthews et al., 2017). Each hypothesis is associated with a causal relationship in a structural model, while a path coefficient is usually used to evaluate the hypothetical relationship of a structural model (Hair, Hult et al., 2017). In general, the value t determines the statistical significance of the coefficient (Hair, Matthews et al., 2017; Urbach & Ahlemann, 2010). The critical values commonly used in two-sided testing are t-value 1.65 (significance level = 10%), t-value 1.96 (significance level = 5%) and t-value 2.57 (significance level = 1%); Hair, Matthews et al., 2017). In this study, a hypothesis would be supported if the hypothesis’s t value (relationship between variables) was greater than the cut-off value of 1.96. In comparison, a hypothesis would be rejected if the hypothesis’s t value (relationship between variables) was lower than the cut-off value of 1.96. For example, as presented in Figure 2 and Table 6, it can be observed that SC+IB obtained a research significance value of 1.993 > 1.96, the significance level is 0.017 < 0.05, and the path coefficient value is a positive 0.200, which indicates the direction of the relationship between scarcity and impulsive buying is positive and significant. Thus, this study states that scarcity affects impulse buying, which is accepted. Positive relationships show that the more scarcity increases, the higher the tendency of individuals to engage in impulsive buying. Meanwhile, a significant scarcity relationship to impulsive buying means that it can be generalized to the entire population, where the sample in this study is a population of health supplement product users. For this reason, it is important to pay attention to the extent of the scarcity of health supplement products.

SC+PV obtained a significant value of research that is t-value of 3.689 > 1.96, the significance level of 0.000 < 0.05 and path coefficients value is positive 0.339, which indicates the direction of the relationship between scarcity to perceived value is positive and significant. Thus, this study states that scarcity affects the perceived value received. Positive relationships show that the more scarcity increases, the higher the perceived value in health supplement products. Meanwhile, a significant scarcity relationship to perceived value means that it can be generalized to the entire population, where the sample in this study is a population of health supplement product users.
PV→IB obtained a research significance value of 1.984 > 1.96, a significance level of 0.048 < 0.05, and a path coefficients value of 0.205 which indicates that the relationship between perceived value to impulsive buying is positive and significant. Thus, this study states that perceived value affects impulsive buying is accepted. Furthermore, the positive relationship shows that the more perceived value in health supplement products, the higher the tendency of individuals to do impulsive buying on health supplement products. Meanwhile, a significant perceived value relationship with impulsive buying means that it can be generalized in the entire population where the sample in this study is a population of health supplement products users.

Moderating Effect 1→IB obtained a research significance value of 2.087 > 1.96, significance level 0.037 < 0.05, and path coefficients values are positive 0.164 which indicates the direction of the relationship between Moderating Effect 1 to impulsive buying is positive and significant. Thus, the study states that Moderating Effect 1 affects impulsive buying is accepted. Positive relationships show that the increasing use of social media as Moderating Effect 1, the higher the tendency of individuals

Table 4. The summary of the measurement model evaluation

| Variables          | Indicator/Items | Reliability Test | Validity Test |
|--------------------|----------------|-----------------|---------------|
|                    | Indicator       | Loadings        | Cronbach's   | Composite | Convergent | Discriminant |
|                    | Items           | Alpha           | Reliability  | Validity  | Validity   | Validity     |
| Impulsive Buying (IB) | IB1             | 0.793           | 0.872        | 0.907     | 0.663      | Valid        |
|                    | IB2             | 0.883           |              |           |            |             |
|                    | IB3             | 0.851           |              |           |            |             |
|                    | IB4             | 0.800           |              |           |            |             |
|                    | IB5             | 0.737           |              |           |            |             |
| Perceived Value (PV) | PV1             | 0.781           | 0.818        | 0.880     | 0.647      | Valid        |
|                    | PV2             | 0.812           |              |           |            |             |
|                    | PV3             | 0.826           |              |           |            |             |
|                    | PV4             | 0.799           |              |           |            |             |
| Scarcity (SC)      | SC1             | 0.774           |              |           |            |             |
|                    | SC2             | 0.783           | 0.731        | 0.818     | 0.533      | Valid        |
|                    | SC3             | 0.766           |              |           |            |             |
|                    | SC4             | 0.579           |              |           |            |             |
| Social Media Use (SM) | SM1            | 0.803           | 0.723        | 0.843     | 0.642      | Valid        |
|                    | SM2             | 0.787           |              |           |            |             |
|                    | SM3             | 0.813           |              |           |            |             |

Figure 2. The output of the structural model evaluation.

PV→IB obtained a research significance value of 1.984 > 1.96, a significance level of 0.048 < 0.05, and a path coefficients value of 0.205 which indicates that the relationship between perceived value to impulsive buying is positive and significant. Thus, this study states that perceived value affects impulsive buying is accepted. Furthermore, the positive relationship shows that the more perceived value in health supplement products, the higher the tendency of individuals to do impulsive buying on health supplement products. Meanwhile, a significant perceived value relationship with impulsive buying means that it can be generalized in the entire population where the sample in this study is a population of health supplement products users.
Table 5. The summary of the discriminant validity test (HTMT)

|                     | Impulsive Buying | Perceived Value | Scarcity | Social Media Use |
|---------------------|------------------|-----------------|----------|------------------|
| Impulsive Buying    | 0.814            |                 |          |                  |
| Perceived Value     | 0.455            | 0.804           |          |                  |
| Scarcity            | 0.395            | 0.339           | 0.730    |                  |
| Social Media Use    | 0.587            | 0.384           | 0.400    | 0.801            |

to do impulsive buying on health supplement products. Meanwhile, the significant Moderating Effect 1 relationship with impulsive buying means that it can be generalized in the entire population where the sample in this study is a population of health supplement products users.

In addition, the table above shows the mediation effect of perceived value, it shows the indirect influence of SC→PV→IB obtained the value of the significance of the study was t-value of 1.671 < 1.96, the significance level of 0.095 > 0.05, and the value of path coefficients was positive at 0.069 which indicates scarcity against impulsive buying through perceived value is positive but not significant. This demonstrates that the effect of mediation on perceived value has an effect on impulsive buying of health supplement products, but it is not significant. Then, researchers evaluate variance scores on dependent variables, described by all independent variables, with reference to $R^2$ values. Based on Figure 2, the $R^2$ values of perceived value (PV), and impulse buying (IB) are 0.12 and 0.45, respectively.

In short, the $R^2$ values of all research-dependent constructs are categorized as weak to moderate (Hair et al., 2019). In other words, scarcity can reduce perceived value (PV) levels by as much as 12 percent. Scarcity, perceived value, and social media use all have a 45 percent influence on impulse buying (IB). Another criterion for assessing structural models is $f^2$ (effect size). This analysis is important for evaluating how eliminating certain independent variables affects the $R^2$ value of the dependent variable (Hair et al., 2019). As can be seen in Table 7, the extent of the effect of all the constructed relationships in this study had a small effect.

5. Discussion

Under the theoretical parameters of scarcity models and SOR models, this study attempts to investigate the factors underpinning impulsive buying behavior during the unusual COVID-19 epidemic. Overall, we discovered that COVID-19 panic caused a fear of a shortage of health supplement products among Indonesian consumers and eventually led to impulsive buying behavior. These results support scarcity theory empirically and are consistent with previous research, that scarcity has a positive and significant relationship with impulse buying (Zhang et al., 2021).

External stimuli (scarcity) had a substantial and beneficial effect on perceived value during COVID-19, according to our findings. That is, the more consumers fear or panic about a lack of goods to shop for, the higher the perceived value of health supplement products will be. These results support with previous research, that in conditions of high quantity scarcity, the perception of individual competition with others also increases (Yi Wu et al., 2020), and S-O-R model are consistent with previous research, that environmental cues impact an individual’s emotions, which can influence behavior (Ya-ling & Li, 2018).

Furthermore, the findings of this study reveal that during the COVID-19 epidemic in Indonesia, consumers with a strong perception of value are more likely to buy impulsively. This research adds to our knowledge of impulsive buying. Previous research on COVID-19 found that Chinese consumers’ perceived value and impulsive buying are based on the theory of cognitive affective personality systems (Xiao et al., 2020).
Table 6: The summary of the relationship testing

| Hypotheses       | Relationship Path Coefficient | Sample Mean | Standard Deviation | t-values | p-Values | Significance |
|------------------|-------------------------------|-------------|--------------------|----------|----------|--------------|
| H1               | Scarcity→Impulsive Buying     | 0.200       | 0.207              | 1.993    | 0.047    | Yes          |
| H2               | Scarcity→Perceived Value      | 0.339       | 0.361              | 3.689    | 0.000    | Yes          |
| H3               | Perceived Value→Impulsive Buying | 0.205           | 0.196              | 1.984    | 0.048    | Yes          |
| H4               | Scarcity→Perceived Value→Impulsive Buying | 0.069 | 0.070 | 0.041 | 0.095 | Not |
| H5               | Moderating Effect→Impulsive Buying | 0.164 | 0.171 | 2.087 | 0.037 | Yes |
Several studies have explored the underlying mechanisms of stimulus to behavior switching. The study examined pathways that affect stimuli to perceived values and behavioral outcomes based on the S-O-R model. As expected, we found that perceived levels of value are a determinant of impulsive buying behavior, which supports S-O-R and enriches research on impulse buying. Most customers engage in impulsive buying to ease psychological stress and anxiety during times of crisis (Rydell & Suller, 2021). The results of this study provide an interesting record of how the scarcity of impulsive buying through perceived value has a positive but insignificant effect, this contradicts previous research such as Yi Wu et al. (2020) argue that scarcity in terms of both time and quantity is positively related to Chinese students’ perceived value in the online context, which promotes their impulsive buying. It should be noted that the possible cause of this result according to Kusmaharani and Halim (2020) is due to the principle of benefits on perceived value and goal-oriented and efficiency-oriented millennials, of which most of this research is millennials, as well as the impulsive level of respondents who show strong control behavior.

During the COVID-19 outbreak, the government ordered millions of Indonesians to return to their homes. The usage of the internet and social media has skyrocketed in this exceptional situation. During quarantine, people utilize social media to keep up with news and information, as well as preserve ties with family and friends. Data shows an increase of about 10% in internet use during the pandemic in Indonesia (KOMINFO, 2020). An essential finding of the study is that during the COVID-19 pandemic, excessive social media use moderated the impact of scarcity on the purchase of impulsive health supplement products in Indonesia. This result is supported by previous research showing that excessive use of social media influences consumer buying behavior and psychological outcomes (Liu et al., 2016; Luqman et al., 2020). The current study’s findings reliable backup this statement and provide evidence in the context of COVID-19. We found that during COVID-19, excessive social media usage exacerbated the direct effect of scarcity messaging on impulsive buying customers in Indonesia, based on data from our research. One possible reason is that people who use social media excessively are often faced with high volumes of news about stockpiling products related to the prevention of COVID-19, which is not yet clear about the truth about COVID-19. These findings are in agreement with previous research, which suggested that the desire to buy impulsively was accompanied by an intention to buy impulsively and had a substantial influence on impulsive buying (Huang, 2016). This study provides a deeper understanding of impulse buying by examining the perceived value effect on the relationship between scarcity and impulse buying.

6. Conclusions

6.1. Theoretical implications
Theoretically, this study adds to the marketing literature in a number of ways. First and foremost, as far as we are concerned, this study is a scholarly research on the impulsive buying behavior of Indonesian consumers during the COVID-19 epidemic. The current study builds on the impulsive buying research conducted during the COVID-19 crisis using the SOR model principles and scarcity model. Furthermore, most previous studies that looked into the effects of scarcity and perceived value on consumer behavior used promotional scarcity messages as stimuli to manipulate the environment. Second, the COVID-19 pandemic is a global disaster that has affected billions of

| Construct Relationship | $f^2$ (Effect Size) Score | Effect |
|------------------------|---------------------------|--------|
| Moderating Effect 1→IB | 0.052                     | Small  |
| PV→IB                 | 0.060                     | Small  |
| SC→IB                 | 0.053                     | Small  |
| SC→PV                 | 0.130                     | Small  |
people. We did this research in Indonesia in the hopes of being able to generalize it and gain a comprehensive knowledge of impulsive buying during COVID-19. Third, the SOR and scarcity models offer a solid theoretical explanation for the influence of scarcity messages on perceived value and consumer behavior. In addition, in this study, we added essential moderators, including excessive use of social media, because many studies show that social media use influences consumer behavior (Lee et al., 2012; Nash et al., 2019). There was a significant increase in internet and social media use when billions of people were required to stay active at home during the epidemic. In this unique context, our study continues to look at the important role that social media plays in eliciting cognitive and emotional reactions in people, which are linked to consumer buying behavior. The results showed that excessive use of social media played a role in strengthening the relationship between scarcity messages and consumers’ impulsive buying in Indonesia. The results suggest that increased consumer panic during COVID 19 increases the effects of scarcity messaging as an external stimulus on impulsive and compulsive buying. Therefore, this study provides new evidence for the argument that the panic consumers experience during natural disasters has a significant impact on impulsive buying behavior. Thus, the study builds on scientific research on SOR and scarcity models.

6.2. Managerial contributions
The results of this study have contributions for marketing managers, policymakers and non-governmental organizations. First, our findings imply that scarcity is positively resulting in impulsive buying. As a result, governments and the media may be effective in informing and reassuring the public that they do not need to be concerned about food scarcity, particularly when it comes to health supplement products. Social media, television, print media, and radio campaigns will all be successful. The core message should be constant and focused at assuaging unfounded customer concerns. Similar ads may be undertaken by grocery stores and supermarkets, alerting customers with a comforting message and demonstrating that health supplement products will always be available swiftly and on time.

Second, the results showed that emotions are important (i.e., perceived value) during impulse buying during pandemics. Therefore, some action can be taken to regain control of personal emotions, effectively changing panic buying behavior. This fact is a natural response for people who fear perceived deprivation and competition.

Third, COVID-19 provides significant supply chain management challenges. In normal time. Supply chain systems are efficiently designed and operated with timely production and inventory to reduce the costs of manufacturers, distributors, and retailers. However, in the COVID-19 condition, this system is beset by a demand-supply imbalance. Many companies and factories were forced to close as a result of the worldwide lockdowns, and the manufacturer’s output capacities dropped.

On the other hand, consumer demand for functional products such as groceries, toiletries, masks, and hand sanitizers surges rapidly, causing shelves to empty in stores. In addition, during the pandemic, making other changes, such as retailers’ ability to move more businesses online, may be an effective way to reduce the negative impact of COVID-19. For example, during this pandemic, many people turn to the Internet to buy for groceries. After a pandemic, consumer behavior that was adopted temporally might become permanent. For long-term success, retail outlets must provide a safe consumer experience and combine online and offline operations.

Fourth, in this study, social media was significant in moderating the relationship between scarcity messaging and impulsive buying. During the COVID-19 pandemic, social media use jumped dramatically. People rely more on social media for information, connections, and communication than before the pandemic. In some ways, social media amplifies panic buying during pandemics because people are constantly bombarded with images and video footage of others
scrambling for products that are thought to prevent virus transmission (such as hand sanitizers, masks, and vitamins) and panic buying that has negative consequences such as panic buying in the community. Social media, on the other hand, may be utilized to provide a soothing message. Policymakers and marketers, in particular, can collaborate with celebrities or digital influencers to spread a positive message to the broader public via social media.

Fifth, panic buying behavior during the Covid-19 epidemic causes consumers to stockpile disease-prevention items and race for basic household essentials despite no signs of looming scarcity. The importance of social media in spreading the word about panic buying cannot be overstated. The study focused mostly on panic buying and impulsive buying behavior. Panic buying makes supermarkets and merchants money right away, but they should be mindful of the short- and long-term effects of inventory shortages, as well as the unanticipated drop in sales and income that comes with them.

6.3. Limitation
In terms of the study’s limitations, 320 validity questionnaires were collected in Indonesia, but the process has limitations in time. Therefore, the response cannot represent all the opinions of Indonesian consumers because Indonesia has a vast population. Second, in this study, data collection was done through online survey methods because of the current pandemic conditions and because Indonesia has a vast population, making the questionnaire suitable for this study. Third, in the SOR model, “organisms” represent both affective and cognitive. However, the study focused only on perceived value as a mediator. Fourth, the study solely evaluated scarcity messages as antecedents of perceived value, leading to impulsive buying behavior.

6.4. Future research perspectives
In the context of COVID-19, researchers may opt to explore scarcity and impulsive purchasing behavior in other industries or items that are becoming rare owing to consumer panic purchases. Finally, while the sample size is big enough to provide relevant results, it may be increased, presumably by include other areas of Indonesia to give a broader comparative analysis throughout Indonesia. This finding may be considered as part of a larger Indonesian comparative research. Furthermore, because of the diversity of COVID-19 conditions and cultures in various nations, comparative research between countries or times within the same country are possible. Future research may incorporate new structures linked to the consequences of scarcity in order to increase the model's completeness and explanatory strength. Future research may also consider other vital variables that may influence behavioral outcomes. Given COVID-19’s strong infectivity, health-related components such as safety protocols may be important.

References
Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity Messages. Journal of Advertising, 40(3), 19–30. https://doi.org/10.2753/JOA0091-3367400302
Ahmed, R. R., Streimikiene, D., Rolle, J.-A., & Duc, P. A. (2020). The COVID-19 pandemic and the antecedents for the impulse buying behaviour of US citizens. Journal of Competitiveness, 12(3), 5–27. https://doi.org/10.7441/joc.2020.03.01
Ahn, J., Lee, S. L., & Kwon, J. (2020). Impulsive buying in hospitality and tourism journals. Annals of Tourism Research, 92(1), 102764. https://doi.org/10.1016/j.annals.2019.102764
Akram, U., Hui, P., Khan, M. K., Yan, C., & Akram, Z. (2018). Factors affecting online impulse buying: evidence from Chinese social commerce environment. Sustainability, 10(2), 352. https://doi.org/10.3390/su10020352
Amalia, Y., 2021. Merdeka.Com. Merdeka. Retrieved: https://www.merdeka.com/periwakan/langkunya-susu
Elisa et al., Cogent Social Sciences (2022), 8: 2062094
https://doi.org/10.1080/23311886.2022.2062094

COVID-19 outbreak in China: A web-based cross-sectional survey. Psychiatry Research, 288(1), 112954. https://doi.org/10.1016/j.psychres.2020.112954

Islam, T., Ahn, T., Arba, Y., Wang, Y., Akhtar, N., Mubarak, S., & Xiaobo, L. (2021). Panic buying in the COVID-19 pandemic: A multi-country examination. Journal of Retailing and Consumer Services, 59(March), 102357. https://doi.org/10.1016/j.jretconserv.2020.102357

Islam, T., Sheikh, Z., Hameed, Z., Khan, I. U., & Azam, R. I. (2018). Social comparison, materialism, and compulsive buying based on stimulus-response-model: A comparative study among adolescents and young adults. Young Consumers, 19(1), 19–37. https://doi.org/10.1108/YC-07-2017-00713

Jong, W., Ko, Y. J., Morris, J. D., & Chang, Y. (2015). Scarcity message effects on consumption behavior: limited edition product considerations. Psychology & Marketing, 32(10), 989–1001. https://doi.org/10.1002/mar.20836

Jiyoung, K., & Lennon, S. J. J. (2013). Effects of reputation and website quality on online consumers’ emotion, perceived risk and purchase intention. Journal of Research in Interactive, 7(1), 33–56. https://doi.org/10.11701/1750593111311

Jones, M. A., Reynolds, K. E., Weun, S., & Beaty, S. E. (2003). The product-specific nature of impulse buying tendency. Journal of Business Research, 56(7), 505–511. https://doi.org/10.1016/S0148-2963(01)00250-8

Julianti, A. (2020). Kecemasan dan pembelian impulsif pada saat pandemi Covid-19. UG JURNAL, 14(12), 1–9. https://www.egjournal.ungarum.ac.id/index.php/ugjournal/article/viewFile/3648/2118

KOMINFO, 2020. Berita Kominfo. Retrieved: https://kominfo.go.id/content/detail/26060/tejadi-pergeseran-penggunaan-internet-selama-masa-pandemi/liberta_satker

Kristofferson, K., McFerran, B., Morales, A., & Dahi, D. (2017). The dark side of scarcity promotions: how exposure to limited-quantity promotions can induce aggression. Consumer Research, 43(5), 683–706. https://doi.org/10.1086/692316

Ku, H.-H., Kuo, C.-C., & Kuo, T.-W. (2012). The effect of scarcity on the purchase intentions of prevention and promotion motivated consumers. Psychology & Marketing, 29(8), 541-548. https://doi.org/10.1002/mar.20541

Kusmaharani, A. S., & Halim, R. E. (2020). Social influence and online impulse buying of Indonesian indie cosmetic products. S. Jurnal Ilmiah Manajemen, 10(2), 237–248. https://doi.org/10.22441/mix.2020.v10i2.007

Lee, W., Xiong, L., & Hu, C. (2012). The effect of Facebook users’ arousal and valence on intention to go to the festival: applying an extension of the technology acceptance model. International Journal of Hospitality Management, 31(3), 819-827. https://doi.org/10.1016/j.ijhm.2011.09.018

Li, Y. L., & Jing, F. J. (2012). Post-impulsive buying behavior satisfaction based on the analysis of impulsive buying predisposing factors. Chinese Journal of Management, 9(3), 437–443.

Li, C., Wang, Y., Lv, X., & Li, H. (2021). To buy or not to buy? The effect of time scarcity and travel experience on tourists’ impulse buying. Annals of Tourism Research, 86(January), 103083. https://doi.org/10.1016/j.annals.2020.103083

Liu, H., Chu, H., Huang, Q., & Chen, X. (2016). Enhancing the flow experience of consumers in China through interpersonal interaction in social commerce. Computers in Human Behavior, 58(May), 306–314. https://doi.org/10.1016/j.chb.2016.01.012
Luqman, A., Massood, A., Weng, Q., Ali, A., & Rasheed, M. I. (2020). Linking excessive sns use, technological friction, strain, and discontinuance: the moderating role of guilt. Information Systems Management, 37(2), 94–112. https://doi.org/10.1080/10580530.2020.1732527

Lynn, M. (1989). Scarcity effects on desirability: Mediated by assumed expensesness? Journal of Economic Psychology, 10(2), 257–274. https://doi.org/10.1016/0167-4870(89)90023-8

Lynn, M. (1992). Scarcity’s enhancement of desirability: the role of naive economic theories. Basic and Applied Social Psychology, 13(1), 67–78. https://doi.org/10.1207/s15324934basp1301_6

Mehrabian, A., & Russell, J. A. (1977). Evidence for a three-factor theory of emotions. Journal of Research in Personality, 11(3), 273–294. https://doi.org/10.1016/0022-1031(77)90037-X

Moon, M. A., Farooq, A., & Kiaran, M. (2017). Social shopping motivations of impulsive and compulsive buying behaviors. UW Journal of Management Sciences, 1(1), 15–27. https://uwjmns.org.uk/Downloads/v1/S1/issue1/101012.pdf

Nash, K., Johansson, A., & Yogeaswaran, K. (2019). Social media approval reduces emotional arousal for people high in narcissism: electrophysiological evidence. Frontiers in Human Neuroscience, 13(292), 13. https://doi.org/10.3389/fnhum.2019.00292

Nuryanti, 2021. TribunNews. Tribun. Retrieved: https://www.tribunnews.com/corona/2021/10/24/breaking-news-update-corona-indonesia-24-oktober-2021-tambah-623-kasus-total-4240019-positif

Parsons, A. G., Ballantine, P. W., Ali, A., & Grey, H. (2014). Deal is on! Why people buy from daily deal websites. Journal of Retailing and Consumer Services, 21(1), 37–42. https://doi.org/10.1016/j.jretconserv.2013.07.003

Pop, R.-A., Sǎplăcan, Z., Dobia, D.-C., & Alt, M.-A. (2021). The impact of social media influencers on travel decisions: The Role of trust in consumer decision journey. Current Issues in Tourism, 25(5), 823–843. https://doi.org/10.1080/13683500.2021.1895729

Pradhan, V. (2016). Study on Impulsive Buying Behavior among Consumers in Supermarket in Kathmandu Valley. Journal of Business and Social Sciences Research, 1(2), 215–233. https://doi.org/10.3126/jbssr.v1i2.20926

Prebice, C., Chen, J., & Stantic, B. (2020). Timed intervention in COVID-19 and panic buying. Journal of Retailing and Consumer Services, 57(November), 102203. https://doi.org/10.1016/j.jretconserv.2020.102203

Rodiorid, 2021. Berita Nasional. Radio RDK. Retrieved: http://rdr.fikdom.unj.ac.id/index.php/2021/07/07/covid-19-melanjk-mandarakat-dilanda-panic-buying-susu-beruang/

Riyanto, G. (2021, February 23). Jumlah pengguna internet Indonesia 2021 tembus 202 Juta. Kompas.Com. Kompas. https://teknokompas.com/read/2021/02/23/1610057/jumlah-pengguna-internet-indonesia-2021-tembus-202-juta

Rydel, L., & Kucera, J. (2021). Cognitive attitudes, behavioral choices, and purchasing habits during the COVID-19 Pandemic. Journal of Self-Governance and Management Economics, 9(4), 35–47. https://doi.org/10.22381/jsmene9420213

Rydel, L., & Suller, P. (2021). Underlying values that motivate behavioral intentions and purchase decisions: lessons from the COVID-19 pandemic. Analysis and Metaphysics, 20(20), 116–129. https://doi.org/10.22381/am20202218

Smith, A., & Mochova, V. (2021). Consumer tastes, sentiments, attitudes, and behaviors Related to COVID-19. Analysis and Metaphysics, 20(20), 145–158. https://doi.org/10.22381/am20202110

Supriyanto, Y., 2020. Bisnis.Com. Bisnis. Retrieved: https://lifestyle.bisnis.com/read/20200331/220/1220509/kecemasan-virus-corona-meningkatkan-belanja-online

Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. Journal of Information Technology Theory and Application, 11(2), 5–40. http://ejournals.unibayreuth.de/eprinter/8000

Verplanken, B., & Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. European Journal of Personality, 15 (1_suppl), 571–583. https://doi.org/10.1002/per.423

Wang, S., Wang, J., Li, J., Wang, J., & Liang, L. (2018). Policy implications for promoting the adoption of electric vehicles: Do consumer’s knowledge, perceived risk and financial incentive policy matter? Transportation Research Part A: Policy and Practice, 117(November), 58–69. https://doi.org/10.1016/J.TRA.2018.08.014

Watson, R., & Popescu, G. H. (2021). Will the COVID-19 pandemic lead to Long-Term consumer perceptions, behavioral intentions, and acquisition decisions? Economics, Management, and Financial Markets, 16 (4), 70–83. https://doi.org/10.22381/emfm16420215

Widyatari, Y., 2020. Tempo.Co. Tempo. Retrieved: https://gaya.tempo.co/read/1327098/belanja-impulsif-pelarisan-dari-kecemasan-pada-covid-19/fullview?ok

Wu, Y.-Y., Lu, H.-Y., Wu, Y.-Y., & Fu, C.-S. (2011). The effects of product scarcity and consumers’ need for uniqueness on purchase intention. International Journal of Consumer Studies, 36(3), 263–274. https://doi.org/10.1111/j.1470-6431.2011.01000.x

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 & Management, 58(1), 1–10. https://doi.org/10.1016/j.im.2020.103283

Xiao, X., Zhu, X., Fu, S., Hu, Y., Li, X., & Xiao, J. (2020). Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. Journal of Affective Disorders, 274(September), 405–410. https://doi.org/10.1016/j.jad.2020.05.081

Yo-ling, W., & Li, E. (2018). Marketing mix, customer value, and customer loyalty in social commerce. Internet Research, 28(1), 74–104. https://doi.org/10.1108/IR-08-2016-0250

Youn, S., & Faber, R. J. (2000). Impulse buying: Its relation to personality traits and cues. Advances in Consumer Research, 27(1), 179–185. https://www.acrwebsite. org/volumes/1838/volumes/v27/NA-27/full

Zhang, J., Jiang, N., Turner, J. J., & Sharif, S. P. (2021). The impact of scarcity of medical protective products on Chinese consumers’ impulsive purchasing during the COVID-19 epidemic in China. Sustainability, 13(17), 9749. https://doi.org/10.3390/su1317974917
