Panic Buying: Modeling What Drives it and How it Deteriorates Emotional Well-being

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This study develops a panic buying model that explains its driving forces and adverse consequences. The data were collected from 415 U.S. nationwide consumers during the outbreak of the current pandemic and analyzed through structural equation modeling. Results indicated that although social learning through traditional media did not significantly affect consumers' fearfulness toward product shortage or panic buying, social learning through social media exerts significant effects on both. The results also provide empirical evidence that consumers' panic buying can trigger them to experience more negative emotions, which proves why such abnormal buying behaviors are an essential matter to be addressed.

Keywords: emotional well-being; pandemic; panic buying; product shortage; social learning; social media

INTRODUCTION

The World Health Organization officially announced the novel coronavirus (COVID-19) as a global pandemic on March 11, 2020 (World Health Organization, 2020). Responding to the sudden outbreak of COVID-19, many people have been required to be in quarantine, keep social distancing, and avoid public gatherings (Anderson et al., 2020). Despite developing and distributing vaccines to curb the virus, it is still challenging for everyone across the globe to end destructive waves of the pandemic (WHO, 2020). In addition, the new variant of coronavirus, named Delta virus, has become more prevalent nationally and internationally, upping the stakes in the fight to contain the pandemic once more (Santhanam, 2021).

Consumers' unusual purchasing behavior during the pandemic has been observable, especially during the initial stages of COVID-19 (Li et al., 2021). For instance, people stockpiled food and necessities during the pandemic to help them temporarily relieve their anxieties (Leung et al., 2021). The stockpiling is called panic buying, which is an action of purchasing an unusually large amount.
of a certain product (Zheng et al., 2020). Because the pandemic still seems to be erratic, it is crucial to continue exploring how consumers have been responding to COVID-19 and its new variant.

Panic buying may not be entirely a new phenomenon as it has occurred during different types of disaster-related situations, like severe acute respiratory syndrome (SARS; Hall et al., 2020). However, facing the escalation of the current pandemic, panic buying became an extremely important manifestation of consumers’ responses to the uncertainty (Prentice et al., 2021). Pandemic-related panic buying is a salient issue because it may cause distress for people, increase the risk of infection, and heighten public anxiety (Taylor, 2021). In addition, panic buying impacts vulnerable groups of consumers who are in greater need of resources that become hard to access (Wesseler, 2020). On top of deleterious implications to individual consumers, panic buying also adversely impacts the balance in the supply and demand chain (Zheng et al., 2020). Specifically, the cascading effects can include supply chain disturbances, freight capacity dynamics problems, and production capabilities of industries (Chua et al., 2021).

Furthermore, consumer stockpiling behaviors can affect retailers’ decisions, such as order allocation or decisions about pricing and volume flexibility (Yoon et al., 2017). Concerns for temporary product shortage could be the culprit and potential factor that triggers consumers’ engagement in such undesirable behavior (Bentall et al., 2020).

Then, what makes consumers engage in panic buying when it may be undesirable for individuals as well as businesses? Although harmful consequences of panic buying have been studied, empirical studies directly examining the antecedents or causes of panic buying are scarce (Yuen et al., 2020). Thus, this study aims to better understand particular mechanisms underlying panic buying, offering a more comprehensive model of panic buying that illustrates both antecedents and consequences. The particular mechanism being considered is grounded in social learning theory and protection motivation theory. To identify key factors that drive panic buying during the pandemic, we particularly highlight the role of consumers learning about other people’s behaviors through traditional media and social media in the mechanism. Furthermore, this study examines whether consumers’ engagement in panic buying results in negative emotion.

The specific purpose of this study is to develop a panic buying model that explains: (a) initial factors that drive panic buying, which includes social learning through traditional media vs. social media, (b) the role of fearfulness toward product shortage in panic buying, and (c) the effects of panic buying on negative emotion. Understanding panic buying is important for individual consumers to enhance their awareness of forces that unconsciously direct them toward a detrimental consumption. In addition, media and retail practitioners can better understand the consequences of customers’ exposure to different types of media, fearfulness toward product shortage, and consumption behavior in a crisis situation so that they can improve their communication or inventory strategies during any other crises that will inevitably come beyond this current pandemic.
LITERATURE REVIEW AND MODEL DEVELOPMENT

Theoretical Framework

The primary theories on which this study is based are social learning theory and protection motivation theory. According to social learning theory, people tend to imitate one another through observational learning and modeling (Bandura, 1977). The beliefs of a larger group of people a person interacts with can heavily influence buying preferences and behaviors; thus, the social learning theory supports the panic buying model in this study. Van Bavel et al. (2020) indicated that learning from the media about other people stockpiling can provoke consumers’ desires of mimicking that behavior. People were unfamiliar with the pandemic in the beginning, so the information they obtained through the media potentially impacted the early insights toward the crisis situation, and consequently, prompted them to change their attitudes and behavioral intentions. Because the internet, a tool that contains both risks and benefits of use, has become a main access for people to learn information (Williams & Merten, 2011), we use social learning theory to examine whether learning how others consume through traditional media and social media provokes consumers to engage in panic buying.

In particular, we seek to understand whether traditional media or social media is more inclined to affect consumers’ desire of engaging in panic buying. For this study, traditional media is classified as traditional media, including such news reporting agencies as television, radio, and the newspaper (Arafat et al., 2020), whereas social media refers to a digital platform that connects individuals’ personal opinions, reactions, and interactions in virtual networks, such as Facebook, Instagram, and Twitter (Xu et al., 2020). We see elucidating which media source for social learning exerts more influence on panic buying as essential for the generation of more in-depth theoretical and practical implications.

To address another aspect of panic buying, we draw theoretical insight from Rogers’ (1975) protection motivation theory. Panic buying is stemmed from both human cognition and emotion. In this regard, this unusual buying behavior depends on the balance between perceived risks and benefits given a crisis situation (Billore & Anisimova, 2021). In other words, when consumers are confronted with uncontrollable situations, they are likely to engage in panic buying as a coping mechanism, which is a natural behavioral response to the perceived risk, which explains why protection motivation theory can support construing the changes in consumer behaviors during the pandemic. Similarly, Sheu and Kuo (2020) found that stockpiling behavior during a disaster can be a form of self-protection behavior or planned behavior to minimize risk. Maddux and Rogers (1983) found that fear can impact consumers’ purchase intentions to reduce their perceived risks. Coupling protection motivation theory with those findings from the literature, it is plausible that when consumers perceive an uncontrollable or life-threatening situation, they will experience the fear of uncertainties, which increases impulsiveness to foster panic buying. Therefore, we integrate protection motivation theory into a model to examine whether panic buying is determined by the perception of risk, that is, fearfulness toward product shortage in particular.
The Role of Social Learning in the Panic Buying Model

Today, almost everyone obtains daily news and information through different media platforms. Thus, it is meaningful to examine how media from what can be called different platforms impacts consumers’ buying behaviors during the pandemic. We focus on the most representative two types of media—traditional media and social media. A particular concern is to what degree and in what way these media sources are responsible for motivating panic buying. We also shed light on fearfulness toward product shortage, which refers to consumers’ concerns of product scarcity. Consumers’ fearfulness toward product shortage is of great importance because it can distort their usual buying habits with the possibility of disrupting the overall retail distribution system (Tsao et al., 2018).

A recent study found that the misleading information disseminated on news media is responsible for amplifying consumers’ motivations of engaging in panic buying (Taylor, 2021). More specifically, news media reports and pictures of empty shelves can provoke people’s anxiety and pandemic-related distress leading to panic buying. There was another relevant study by Arafat et al. (2020) examining the characteristics and impact of panic buying as reported in the media. Information was gathered from the English media reports (e.g., newspapers, TV news) published or presented until the end of May in 2020. The keyword “panic buying” was used as the main search target, and most of the pandemic-related reports were sourced from developed countries, such as the United States, which is responsible for constantly reporting about item scarcity (Arafat et al., 2020). Even before COVID-19 occurred, Cheng (2004) mentioned that being overly exposed to the pandemic-related news could lead to fear and result in stockpiling behavior. Based on the theoretical framework and literature review, we propose that if consumers are more exposed to and learn from traditional media that other people are “fighting” for scarce items, consumers are more likely to feel fearful toward product shortage and engage in panic buying.

H1: Learning others’ buying behavior through traditional media positively affects fearfulness toward (a) product shortage and (b) panic buying.

It is not only traditional media that provides consumers information about others’ responses to a crisis and thus can change their buying behavior. Social media can be another important medium. Although we propose both traditional and social media will play a role in the panic buying model, we expect social learning through social media to exert relatively more influence than traditional media. According to Leung et al. (2021), seeing pictures of insufficient stock of supplies from stores on social media will cause consumers to be fearful. In other words, social media users can experience an increased feeling of helplessness when finding out the lack of necessities, which can prompt behavioral changes.

What consumers see and learn through social media can create the fear of supply imbalance in consumers’ minds and behavioral changes. A few previous studies (Ahmad & Murad, 2020; Leung et al., 2021). Zheng et al. (2020) support our proposition about social learning through social media. For example, (Ahmad and Murad 2020) investigated how social media affects mental health and fear about COVID-19 in Iraq. The findings showed that Facebook was the most commonly used tool for spreading a panic atmosphere regarding COVID-
19 in Iraq. That related to social media having a negative impact on people’s psychological well-being. Another study showed negative posts from different social media that were spreading rumors regarding insufficient products and could be identified as emotional triggers of public anxiety (Leung et al., 2021). Zheng et al. (2020) studied the influence of consumers’ social learning behavior on their purchase decisions under the risk of supply disruption and demonstrated the significant influence of social learning on consumer concerns and buying decisions.

When people perceive the availability of goods is limited, they tend to feel anxious and fearful about surviving through a pandemic. That is, learning about the risk of supply disruption by information that is spread out by other people via social media, where a consumer can easily see how friends and family act upon the crisis, can provoke fears in the consumer’s mind and intensify fear about product shortage. Thereby,

H2: Learning others’ buying behavior through social media positively affects fearfulness toward (a) product shortage and (b) panic buying.

The Role of Fearfulness toward Product Shortage in the Panic Buying Model

We take into account consumers’ fearfulness during the pandemic, particularly being afraid about products not being available, to pinpoint panic buying behavior. As introduced earlier, this relates to Rogers’ (1975) protection motivation theory that when individuals perceive life threats, they tend to make self-protective responses. Vacondio et al. (2021) showed that when people perceived threats, they tend to become more worried and indulge in self-protected behaviors. Perception of danger or threat triggered fearfulness in people, so they protect themselves as a coping mechanism. Similarly, Yuen et al. (2020) found when consumers learned about highly contagious diseases, they were likely to pursue self-protective activities to keep down their fears and perceived risk. Panic buying can be considered as an impulsive consumer behavior that is grounded in human fear (Li et al., 2020). Leung et al. (2021) suggested that peoples’ perception of threat could impact their levels of fear, and panic buying behaviors can be considered as a coping mechanism to control consumers’ fearfulness toward uncertainties, such as obtaining scarce items. Based on the literature review, we predict that when consumers learn about others’ buying behaviors on media, their fearfulness of product shortage will increase; thus, they might engage in panic buying to cope with their fears. It is necessary to recognize and empirically test for both direct effects and mediating effects of fearfulness toward product shortage in relation to panic buying. Therefore, it is proposed that:

H3: Fearfulness toward product shortage positively affects panic buying.

H4: Fearfulness toward product shortage mediates the effects of (a) learning others’ buying behavior through traditional media and (b) learning others’ buying behavior through social media on panic buying.
Panic Buying Behavior Affecting Emotional Well-Being

Empirically examining whether consumers’ emotional well-being, negative emotion in particular, is impacted by panic buying is one of the main matters to delve into in this study. Lins and Aquino (2020) conducted an exploratory study during COVID-19 and found that panic buying is negatively correlated with optimism, and thus they suggested that panic buying might be related to negative emotions. Several previous studies have specified that distress and anxiety can lead to panic buying (Lins & Aquino, 2020; Yuen et al., 2020); however, those studies are correlational investigations, not experimental. Therefore, those findings support significant associations between negative emotions and panic buying but not the specific order of causes–effects. Our perspective is that negative emotion is a consequence of panic buying so it relates to consumers’ overall emotional well-being.

Emotional well-being is an umbrella concept including the ability to have positive emotions and moods and to manage negative emotions in stressful situations (Fredrickson & Joiner, 2002). That is, emotional well-being embraces negative emotion. Meanwhile, Kang and Ahn (2014) defined that well-being is a state for an individual to be satisfied and happy about oneself. Prentice et al. (2021) found that people who tend to stockpile are likely to experience guilt because of the violation of their standards. If supply hoarders realize they are culprits because of panic buying, guilty feelings tend to arise (Prentice et al., 2021). It is plausible that when consumers engage in panic buying, which makes them experience negative emotions such as being anxious and guilty, positive moods such as being happy and satisfied cannot co-exist, thereby, overall emotional well-being will be deteriorated. Hence, we focus on negative emotions as an immediate consequence of panic buying in this empirical study.

H5: Panic buying positively affects negative emotion.

Figure 1 shows the panic buying model formulated based on the hypotheses we proposed.

![Figure 1: Conceptual model—A panic buying model.](image-url)
METHODS

Data Collection, Sample, Final Respondent Characteristics, and Instrument

To estimate our model to allow testing the hypotheses, we designed and conducted an online survey that allowed us to access a nationwide sample in a safe way given in-person contacts would not be prudent during the COVID-19 pandemic. An Institutional Review Board exemption was approved before data collection. The participants were recruited by Qualtrics, given that it not only offers a highly reliable online-based survey platform but also has a nationwide consumer panel pool (Ibarra et al., 2018). Respondents were screened to be over the age of 18 and live in the United States. The sampling was appropriate because the pandemic was not under control in the United States and thus was an issue in the media. Data collection was performed in the late fall of 2020, so the timing fits with seeking to understand the antecedents and consequences of panic buying. The target sample size of 400 was considered based on criteria of Wolf et al. (2013) for having enough response for estimating our model. To ensure the validity and quality of responses, we purposely added several attention filters and a speed checker through which invalid respondents were excluded from the final data set. In the end, 415 highly valid responses were used for data analyses. As for attributes of respondents, 46.3% were males; 53.0% were females; the median age was 39; 55.1% were 44 years old or younger; 33.5% were 45 years old or older; 29.6% had a high school degree or less; 42.5% were in college, and 27% had master's degree or higher; 65.6% earned $100,000 or less annually; and 28.4% earned more than $100,000 annually.

The online questionnaire consisted of five major sections: measurement items for the respondents' social learning via different types of media, their concerns about product shortage, buying behavior tendencies, emotional status since the pandemic began until they were answering survey questions, and demographic questions. All measurements were based on established scales (completed list along with references in Table 1).

Data Analysis Overview

We chose structural equation modeling (SEM) as the primary analysis tool to test the panic buying model because SEM allowed us to simultaneously test a causal model that has a number of constructs taking measurement errors into account. We used a two-step SEM approach recommended by Anderson and Gerbing (1988). First, a confirmatory factor analysis (CFA) was used to test how adequately the observed variables represent the latent variables (i.e., measurement model estimation), accompanied by examinations for the reliability and validity of the measures. We then examined the relations among the latent variables (i.e., structural model estimation) to test the hypotheses.

RESULTS

Measurement Model Estimation Results

As covered in the analysis overview, the first analysis step was measurement model estimation to ensure the reliability and validity of the multi-item
measures. A measurement model was specified with 18 observed variables representing five latent variables, which was run with CFA. The goodness-of-fit statistics included the chi-square value of 374.42 ($df = 151$), comparative fit index (CFI) of 0.95, Tucker–Lewis index (TLI) of 0.93, and root mean square error of approximation (RMSEA) of 0.06, which implied an adequate level of the measurement model fit. Given adequate fit, more specific estimates for measurement reliability and validity were examined. As shown in Table 2, all Cronbach’s alpha values and composite reliability values were greater than 0.70 which indicates the satisfactory reliability of measurement items. The range of average variance extracted (AVE) estimates was between 0.61 and 0.77, which is greater than the recommended minimum threshold of 0.50. The CFA loadings also exceeded the recommended cutoff value, that is 0.60, suggesting the sufficient validity of each construct. Lastly, through comparing the square root of the AVE of each construct and the correlation coefficients of paired variables, the discriminant validity of measures was confirmed (see Table 3).

**Structural Model Estimation and Hypothesis Testing Results**

After having adequate results from the first stage of analysis, we moved on to structural model estimation. A structural model was specified as follows: learning others’ buying behavior through traditional media and learning others’
buying behavior through social media as two exogenous variables, fearfulness toward product shortage and panic buying as subsequent endogenous variables, and negative emotion as the ultimate endogenous variable. In addition, we included age and gender as control variables in the empirical model to ensure we can examine the relationships among the main constructs of interest given the two demographic variables controlled. Model estimation resulted in a reasonable fit to the data: $\chi^2 = 425.89$ ($df = 154$), CFI = 0.94, TLI = 0.92, RMSEA = 0.07.

Subsequently, we examined the specific relations among the latent variables (see Figure 2). The results showed that learning others’ buying behavior through traditional media did not have a significant impact on fearfulness toward product shortage ($\gamma = -0.03, p = .60$). In a similar vein, it did not have a notable influence on panic buying either ($\gamma = -0.04, p = .45$). Therefore, H1a and H1b were not supported. However, learning about others’ buying behavior through social media relates to a noteworthy influence on both fearfulness toward product shortage ($\gamma = 0.54, p < .01$) and panic buying ($\gamma = 0.22, p < .01$).

### TABLE 2: The Final Measurement Model Properties

| Construct                                          | Coding | M   | SD  | CFA Loading | Cronbach Alpha | Composite Reliability | AVE   |
|----------------------------------------------------|--------|-----|-----|-------------|-------------------|-----------------------|-------|
| Learning others’ buying behavior through traditional media | MD1    | 3.48| 1.12| 0.71        | 0.84             | 0.84                  | 0.64  |
|                                                    | MD2    | 3.57| 1.04| 0.81        |                   |                       |       |
|                                                    | MD3    | 3.47| 1.06| 0.87        |                   |                       |       |
| Learning others’ buying behavior through social media | SL1    | 3.01| 1.16| 0.64        | 0.81             | 0.82                  | 0.61  |
|                                                    | SL2    | 3.00| 1.16| 0.84        |                   |                       |       |
|                                                    | SL3    | 3.10| 1.13| 0.85        |                   |                       |       |
| Fearfulness toward product shortage               | FL1    | 2.83| 1.15| 0.93        | 0.86             | 0.87                  | 0.77  |
|                                                    | FL2    | 2.85| 1.23| 0.82        |                   |                       |       |
| Panic buying                                       | BP1    | 3.20| 1.09| 0.84        | 0.89             | 0.89                  | 0.68  |
|                                                    | BP2    | 3.07| 1.15| 0.86        |                   |                       |       |
|                                                    | BP3    | 3.17| 1.18| 0.75        |                   |                       |       |
|                                                    | BP4    | 3.00| 1.17| 0.84        |                   |                       |       |
| Negative emotions                                  | NEM1   | 2.76| 1.05| 0.85        | 0.92             | 0.92                  | 0.66  |
|                                                    | NEM2   | 2.56| 1.06| 0.88        |                   |                       |       |
|                                                    | NEM3   | 2.55| 1.03| 0.87        |                   |                       |       |
|                                                    | NEM4   | 2.76| 1.08| 0.82        |                   |                       |       |
|                                                    | NEM5   | 2.69| 1.06| 0.71        |                   |                       |       |
|                                                    | NEM6   | 2.65| 1.16| 0.71        |                   |                       |       |

### TABLE 3: Discriminant Validity Test Matrix

| Construct | 1 | 2 | 3 | 4 | 5 |
|-----------|---|---|---|---|---|
| 1 = Learning others’ buying behavior through traditional media | 0.80 | | | | |
| 2 = Learning others’ buying behavior through social media | 0.41 | 0.78 | | | |
| 3 = Fearfulness toward product shortage | 0.22 | 0.49 | 0.88 | | |
| 4 = Panic buying | 0.19 | 0.50 | 0.59 | 0.82 | |
| 5 = Negative emotion | 0.04 | 0.14 | 0.36 | 0.09 | 0.81 |

**NOTE**
Italicized numbers in the diagonal line are the square root of the average variance extracted. Others represent squared correlations between latent variables.
Therefore, H2a and H2b were accepted. In addition, the results showed that fearfulness toward product shortage statistically increases panic buying ($\beta = 0.56, p < .01$). Furthermore, the results support there being a positive effect of panic buying on negative emotion ($\beta = 0.14, p < .05$). Therefore, H3 and H5 were supported.

**Mediating Effect Testing Results**

To examine the mediating effect of fearfulness toward product shortage in the model (H4a and H4b), we examined the significance of the indirect effect using the bootstrapping method with bias-corrected confidence estimates suggested by Preacher and Hayes (2008). Specifically, we used a 95% confidence interval (CI) of the indirect effect obtained using 2000 bootstrap resampling. No statistical mediating effect of fearfulness toward product shortage was found in the relationship between learning others’ buying behavior through traditional media and panic buying ($\beta = -0.03, CI = -0.12$ to $0.05$). However, fearfulness toward product shortage indeed mediated the effects of learning others’ buying behavior through social media on panic buying ($\beta = 0.32, CI = 0.23$–$0.45$). Therefore, H4a was not supported, whereas H4b was supported.

**DISCUSSION**

Panic buying is considered as an unhealthy consumption pattern that can cause problems not only for individual consumers by deteriorating their emotional well-being, but also it can lead to supply disruptions affecting availability of retail and other products. To better understand this type of undesirable consumer behavior, particularly given the current pandemic, we developed a panic buying model that deals with antecedents and consequences. The findings reveal that learning about others’ purchasing behavior through traditional media does not directly amplify consumers’ fearfulness about product shortages nor cause people to indulge in panic buying. In contrast, the results demonstrate

![Figure 2: Structural equation modeling results.](image-url)
that learning about other consumers’ buying behaviors from social media can significantly affect individuals’ concerns about products not being available and thus prompt panic buying. The findings have also proven that fearfulness toward product shortage plays a vital mediating role in accelerating the effects of learning others’ behaviors through social media on panic buying. Finally, the results provide empirical evidence that consumers’ engagements in panic buying can trigger experiencing more negative emotions, which is a reason why such abnormal buying behaviors are an important matter to be addressed.

Theoretical Contributions

Given the ongoing global pandemic, this study makes a timely contribution and has important theoretical implications by presenting a panic buying model and empirically testing it. The results have deepened the understanding of the mechanism underlying social learning by traditional and social media, concerns of product scarcity, panic buying behavior, and negative emotions. Specifically, the results clarify the role of social media in the panic buying process. There have been a few studies that examined the content and nature of panic buying as reported either in social media (Leung et al., 2021; Naeem, 2021) or traditional media (Arafat et al., 2020; Laato et al., 2020). This study advances understanding by considering both media sources in a single model and showing that each media source works differently in exerting influence. Social learning through traditional media shows no significant effects, whereas social media has a large impact on panic buying with involvement of fearfulness toward product shortage. By demonstrating such distinguishable effects regarding traditional media versus social media influencing consumer concerns and behaviors, this study makes unique contributions to the literature on effects of social media on panic buying behaviors in comparison to those of traditional media.

Although panic buying has been capturing scholars’ interest because of the current pandemic, there has remained a dearth of relevant studies that inform comprehensive understanding of the mechanism underlying the behavior. To conceptualize our model, we integrated social learning theory, which proposes that people tend to mimic the crowd through perception and imitation (Bandura, 1977). The results from our model testing confirm the theoretical premise that consumers indeed imitate other buyers’ purchasing behaviors that they observed through social learning, which is manifested through panic buying. Also, this study sheds light on consumers’ fearfulness in resource scarcity, which has yet to be highlighted in the literature. Our focus was not on general fear. Rogers’ (1975) protection motivation theory supports the idea that when people sense life dangers, they tend to make self-protective behaviors. We scrutinized consumers’ fearfulness specifically toward product shortage and the role of such fear in the panic buying process, which adds a rigor to protection motivation theory.

Another uniquely important contribution of this study is addressing consumers’ emotional well-being in relation to negative emotions being impacted by panic buying. Consumers act strongly based on buying recommendations made by social media because they believe imitating the crowd is useful in making the best purchase decisions or might provide them a sense of security during the pandemic. Especially when consumers do not
have access to getting enough supplies just like other people shown from social media, they tend to feel a sense of threat. Consumers make proactive judgments through social media. But the findings show the propensity for a negative psychological consequence when they engage in panic buying, which provides empirical evidence as to why such behavior should be addressed.

**Practical Implications**

We sought to identify factors that cause panic buying so we can help consumers realize how this type of unhealthy buying behaviors is motivated and how to elude engaging in such behavior. Addressing such behavior is important not only for individuals but also for reducing the detrimental impact on retail markets in the future. This study provides broad practical implications for individual consumers, social media managers, and retailers during a crisis. This matters because another type of crisis can occur at any time.

In a technologically well-developed world, messages and rumors can be spread easily. This study showed that learning about others’ buying behavior, especially through social media, such as seeing their friends on social media stockpiling the necessary things, can prompt a person to be more fearful about what if things are running out, and in turn, promote engaging in panic buying. The point is that panic buying may give temporary security but will not be good for emotional well-being. And, as raised before, personal actions have negative consequences not only to themselves but also for other consumers and businesses in marketplace.

The results could help consumers to start to consider whether they have been stockpiling unnecessary products irrationally just because they saw others doing so through social media. Consumers should be more aware of the validity of different information shared through social media and act mindfully, filtering out misleading information to avoid buying behaviors that more likely hurt their emotional well-being. Social media managers are encouraged to reflect on the results, practice greater cautions, and commit to more sensible and responsible reporting.

The results demonstrate the importance of consumers avoiding panic buying so as to share resources with others, especially vulnerable groups. This study can help retailers, including supermarkets and grocery stores, to optimize their inventory strategies so as to curtail panic buying and thus deal with relevant problems, such as price inflations, customer dissatisfaction, and supply disruptions. To curb panic buying, this study recommends the retailers establish reasonable purchase policies and limitations, provide transparent reports and explanations of their supply stocks, and advocate against unnecessary panic buying.

**Limitations and Recommendations for Future Studies**

Despite important contributions of this study, several limitations must be acknowledged. First, this study sheds light on social learning via the most representative types of media (traditional vs. social media) as antecedents in the panic buying model so the results can provide direct implications to media managers; however, this study did not include other sources of social learning
such as word-of-mouth because it may not controllable by those practitioners, which can be considered by future studies. Second, although online data collection was necessary for safety reasons and broader access for nationwide sample, it resulted in an exclusion of those who do not have internet access. Even though we controlled age and gender in the model to enhance the validity of the results, the majority of our participants were young adults who were more familiar with social media, which might have created overestimates of social media effects. Thus, future studies may consider including more diverse participants. Finally, external conditions, such as the severity of the pandemic, vaccination rates, and economic recovery speed, vary across different countries, and panic buying is still a pressing issue in different countries compared with current situations in the United States. Thus, future researchers may consider those external factors to be included as moderators in the model or testing the model with respondents from other countries, which adds more insight into understanding consumer behavior in crises.

**AUTHOR CONTRIBUTIONS**

Christine Huan planned and executed the study, wrote an initial paper as her course project, transformed it into a manuscript, and revised it for publication. Soona Park contributed to the process of data collection, analysis of the data, and writing a part of results. Jiyun Kang supervised the conceptualization, planning, and execution of the study, conducted data analysis for modeling, and contributed to writing the initial manuscript and revising it for publication.

**CONFLICTS OF INTEREST**

The authors declare that they have no conflicts of interest.

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