



Chinese public's panic buying at the beginning of COVID-19 outbreak: The contribution of perceived risk, social media use, and connection with close others

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Abstract

Panic buying is a globally witnessed behavior during the outbreak of COVID-19. This consumer behavior is related to many undesirable consequences, ranging from disrupting economic stability to hindering timely provision of supplies to those in dire need. As such, to understand the causes and underlying mechanisms of panic buying is crucial. Based on terror management theory, this study examined the contribution of perceived risk, social media use, and connection with close others to panic buying. Data were collected through an online survey from 972 Chinese citizens (65.9% female, $M_{\text{age}} = 33.69$ years) at the beginning period of COVID-19 in early February 2020. The results found that individuals with a higher level of perceived risk were more prone to engage in panic buying, but this link was mitigated by connection with close others when individuals less used social media. Theoretically, this study advances the understandings of the psychological processes of panic buying during health crisis. Practically, alleviating individuals' perceived risk, establishing a healthy habit of social media use, and strengthening social ties are important to circumventing panic buying in times of COVID-19.

Keywords Excessive buying · Hoarding · Risk perception · Digital use · Close relationship · COVID-19

The corona virus disease 2019 (COVID-19) was first reported in late December 2019 in China and since then it has been spread rapidly around the world. As of middle March 2021, the COVID-19 pandemic has affected more than 190 countries/regions, totaling nearly 120 million cases and more than 2.6 million deaths worldwide (Johns Hopkins University Coronavirus Resource Center, 2021). The pandemic has imposed tremendous impacts on people's daily lives, emotions, attitudes, and behaviors (Burgess & Sievertsen, 2020; Li et al., 2020; Prime et al., 2020; Sibley et al., 2020; WHO, 2020). Panic buying is a globally

witnessed, salient behavioral response following the outbreak of COVID-19, especially during the early period (Yuen et al., 2020). This phenomenon has been observed in different countries/regions, as well as in many historical natural disasters and health crises such as SARS (Loxton et al., 2020). Because panic buying often results in stockpiling situation which disrupts economic stability and hinders timely provision of supplies to vulnerable groups (Wesseler, 2020; Zheng et al., 2021), research into the causes and underlying processes of this socially undesirable consumer behavior is of paramount significance. However, scientific findings and discussions about panic buying are few and scattered (Yuen et al., 2020). To bridge these gaps, we draw on terror management theory (TMT) to examine the joint contribution of three relevant factors, namely perceived risk, social media use, and connection with close others (Pyszczyński et al., 2020), to panic buying during the early stage of the COVID-19 outbreak.

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Overview of the Terror Management Theory

TMT is an important framework to explain and predict people's attitudes, emotions, and behaviors during the COVID-19 pandemic (Courtney et al., 2020; Pyszczyński et al., 2020). According to TMT (Greenberg et al., 1986; Pyszczyński et al.,

2015), the awareness of the inevitability of death with an inherent proclivity for self-preservation gives rise to the potential for existential terror, and such terror is managed by the anxiety-buffering system which contains three elements: cultural worldviews, self-esteem, and close interpersonal relationships. This theory further postulates that people manage the potential for anxiety inherent in awareness of the inevitability of death by maintaining cultural worldviews, self-esteem, and close relationships because they impart a sense that one is a person of value living in a meaningful world (Solomon et al., 2015).

Proximal and distal defences are two different systems people utilize to manage death anxiety, with proximal defences directly focusing on the problem of death while distal defences enabling people to construe themselves as valuable contributors to a meaningful, significant, and permanent universe (Pyszczynski et al., 1999). Which system is used depends on how conscious the death-related thoughts are. In particular, when death-related thoughts are in the current focal attention, proximal defensive system is activated to suppress the death-related thoughts or push the thoughts into the distant future by denying one's vulnerability to things that could kill or by engaging in healthier behavior to ensure a longer life (Pyszczynski et al., 2020). However, when death-related thoughts are not in the focal attention, albeit still cognitively accessible, the distal defensive system is activated to manage the death-related thoughts by maintaining cultural worldviews, enhancing self-esteem, and seeking close relationships. Put in other words, the defensive anxiety-buffering system is less used or functional when death-anxiety thoughts are strengthened (vs. minimized) in the consciousness.

In sum, TMT is an overarching framework which considers that people tend to use diverse strategies to cope with the existential terror, and that effective management of the terror would be related to better adjustment in response to threats while ineffective management of the terror would be associated with psychological distress (Pyszczynski et al., 2015; Solomon et al., 2015). Existing studies have provided robust evidence to support these tenets. For instance, boosting people's self-esteem, worldviews, or relationships makes them less vulnerable to anxiety and anxiety-related behavior; meanwhile, striving for self-esteem, defending cultural worldviews, or affirming close relationships in response to mortality salience would diminish the accessibility of death thoughts (Pyszczynski et al., 2020).

Panic Buying and the Role of Perceived Risk in Times of COVID-19

Panic buying refers to the behavior in which consumers purchase a large number of items to avoid the possibility of future

shortages (Herjanto et al., 2021). Research has found that panic buying is a complex phenomenon caused by multiple factors, including neural (e.g., neuropsychological impairment), psychological (e.g., anxiety) and contextual (e.g., supply scarcity) antecedents (Frost et al., 2009; Grisham et al., 2007; Tsao et al., 2019). Despite the existing studies, scholars have underscored that panic buying is still a mysterious behavior and the research of panic buying is still in its infancy (Tolin et al., 2015; Yuen et al., 2020).

Panic buying emerged almost in every country/region that suffers from the outbreak of COVID-19 during the beginning period. Yuen et al. (2020) conducted a systematic review to understand the psychological causes of panic buying following a health crisis, such as COVID-19. Based on the literature reviewed, they summarized that panic buying could be triggered by four categories of factors, including perception (e.g., perceived threats and perceived scarcity), fear of the unknown (e.g., anxiety), coping behavior (e.g., view panic buying as a compensatory process), and social psychological factors (e.g., observed behavior of others). However, this model only considered the main effect of each category but did not further delineate the underlying mechanisms, such as identifying how different categories of factors jointly affect panic buying (e.g., moderation). This study aims to address this gap.

Perceived risk, defined as an individual's perception about how likely they will contract COVID-19, is an important antecedent of panic buying (Yuen et al., 2020). At the beginning period of the COVID-19 outbreak, people not only witnessed a salient increase in morbidity and mortality, but also encountered enormous uncertainty and anxiety about their lives. During this period, COVID-19 has directly raised people's anxiety about death. Research indicated that citizens from different countries/regions had experienced a substantial increase in anxiety and fear concerning their safety, physical well-being, and livelihood at the beginning period of the COVID-19 outbreak (Evidation, 2020; Jungmann & Witthöft, 2020; Li et al., 2020). According to TMT (Greenberg et al., 1986; Pyszczynski et al., 2015), people are motivated to manage the death-related anxiety. Among others, panic buying is regarded as a form of self-protective, planned behavior in an attempt to minimize anxiety, because possessing enough quantities of goods (e.g., food and medical supplies) gives individuals a sense of safety, reduces the probability to contract the virus by minimizing visits to stores, and serves as the material foundation for people to perform precautionary behavior such as washing hands and wearing a mask (Yuen et al., 2020).

A few studies have examined the association between perceived risk and panic buying-related behavior. For instance, Herjanto et al.' (2021) conducted a cross-sectional study in 139 US participants, revealing that perceived risk was positively related to panic buying. In another study conducted among 1499 Chinese citizens at the beginning period of the

COVID-19 outbreak, Song et al. (2020) found that death threat was directly associated with materialism. To be specific, when consumers perceived the threat of death, they became materialistic and were more prone to hedonic consumption behavior because materialism, often manifested in terms of wealth and money, is considered as a crucial tool for consumers to defend against the threat of death. In a similar vein, Bentall et al. (2021) carried out a study examining different types of anxiety (general, death-related, and COVID-related) and risk perception (self and other) in the UK and the Republic of Ireland during the early phase of the COVID-19 outbreak. They found that anxiety and risk perception were positively related to more over-purchasing. Taken together, these studies suggest that perceived risk appears a robust predictor of panic buying in times of COVID-19.

The Role of Social Media Use and Connection with Close Others

Media has reported the situation of the pandemic in China since late December 2019, and the coverage has become ubiquitous since late January 2020. As the pandemic spreads globally, media coverage of the pandemic has been virtually non-stop. During this whole period, it is impossible to visit a social media website without being fed with information about what the death tolls and trends are, how much economic damage the virus has caused, and how much restriction and inconvenience it has brought to people's daily lives. During the outbreak of COVID-19, people have increased using internet and social media to gain information about the situation of the pandemic and to share the information with others. For instance, Du et al.'s (2020) study found that increased prevalence rate of COVID-19 was associated with more searches on the internet in US, UK, Canada, and Australia. Similarly, Barr (2020) reported that a vast number of Twitter users in US shared pictures of the stockpiling situation in supermarkets during COVID-19. According to TMT (Pyszczynski et al., 2020), excessive use of social media likely contributes to the persistent salience of the virus and its mortality threat, which pushes the death-related anxiety to the focal attention even more. In this sense, people are more prone to engage in self-protective behavior, such as panic buying, compared to those who do not excessively use social media. In this sense, excessive use of social media is not only directly related to more panic buying, but it is also likely to exacerbate the effect of perceived risk on panic buying because it strengthens the already existing death-related anxiety induced by the pandemic. Existing studies have found that increasingly using the internet is related to more panic buying during COVID-19 (Du et al., 2020) and that high exposure to social media information strengthened the link between perceived risk and panic buying (Herjanto et al., 2021).

Classic theoretical propositions, such as the need to belong (Baumeister & Leary, 1995) and attachment theory (Bowlby, 1969), suggest that people are innate to connect with others and affiliate with a social group, especially when an individual is in distress. Existing findings suggest that maintaining social connection, experiencing close relationships, and receiving social support are related to better mental health in times of COVID-19 (Grey et al., 2020; Pieh et al., 2020). According to TMT (Pyszczynski et al., 2020), seeking close relationships is an important anxiety-buffering strategy for people to manage death-related anxiety when they perceive that their lives are at risk because seeking close relationships not only provides a sense of security in their own right but it also validates their worldviews and self-esteem. According to TMT, these distal anxiety-buffering systems are activated or more functional when death-related thoughts are less salient in the consciousness. This suggests that when people's death-related thoughts are highly accessible by being excessively exposed to social media, it is likely that the distal anxiety-buffering systems (e.g., seeking close relationships) are less likely to be activated or that the effectiveness of these systems is weaker, compared to those whose death-related thoughts are not strengthened by excessive use of social media. In light of these considerations, the association between perceived risk and panic buying is likely to be moderated jointly by social media use and connection with close others. As far as we know, little research has directly addressed this idea so far.

The Present Study

In this study, we address the following questions: (1) what is the association between perceived risk and panic buying during the beginning period of the COVID-19 outbreak, and (2) is this association moderated jointly by social media use and connection with close others. To answer these questions, we conducted a cross-sectional survey in a sample of Chinese citizens in early February 2020 when the Chinese government was implementing large-scale lockdowns all over the country. Because panic buying is adverse to fighting against the COVID-19 pandemic, examining these questions is meaningful as the findings would identify whom are more prone to panic buying during a health crisis and inform the leverage points that prevention and intervention programs could target at. Based on prior findings (Bentall et al., 2021; Herjanto et al., 2021; Song et al., 2020), we hypothesized that perceived risk would be positively related to panic buying. Moreover, in light of TMT (Pyszczynski et al., 2020), the association between perceived risk and panic buying would be mitigated by connection with close others, especially when people use social media less excessively.

Method

Participants and Procedure

A total of 972 Chinese adults (331 men, 641 women, $M_{\text{age}} = 33.69$; $SD = 10.15$) who provided valid data in the online survey conducted during 2nd – 9th February 2020 constituted the participants of this study. These participants were from 31 regions in China, with sample sizes ranging from 1 (0.1% of the total sample, Hainan Province) to 325 (33.4% of the total sample, Guangdong Province). About 80.3% of participants reported a college degree or above. In addition, most participants reported no history of chronic physical diseases (90.95%) or no history of psychiatric/psychological disorder (98.87%). Around 98.35% of participants considered their current health status was good or above, and 94.55% of participants reported that they and their relatives/friends were not affected by COVID-19 at the time of the survey.

Ethical approval was obtained from the ethical committee of corresponding author's affiliation. After receiving a three-hour online training, over 200 volunteers who majored in psychology in different universities in China helped distribute the survey on various platforms, including WeChat (one of the most popular multi-purpose messaging APPs in mainland China), Weibo, QQ, etc. After participants clicked on the survey hyperlink, they could read the information sheet which clearly explained the aims and the procedure of the study and participants' rights to withdraw at any time during the research process. Participants provided their electronic consent prior to entering the survey. Participation was voluntary and no incentive was offered. To protect participants' privacy, no identifiable personal information was collected and all answers were kept confidential.

Measures

Perceived Risk

Participants' perceived risk was measured with three items. The three items are "How likely do you think you will be infected with COVID-19?", "How likely do you think you will contact with people who are suspected or have been diagnosed COVID-19?", and "How likely do you think your lives will be threatened by COVID-19?" Respondents rated these statements on a five-point scale (from 1 = *very unlikely* to 5 = *very likely*). A higher mean score indicated that participants had a stronger risk perception. The Cronbach's α of this scale was .89 in the present study.

Social Media Use

The Problematic Social Media Use (PSMU) Scale (Franchina et al., 2018) was used to measure how much

participants had used social media use (e.g., WeChat, Weibo, QQ) since the outbreak of COVID-19. This scale consists of seven items rated on a five-point scale (from 1 = *never* to 5 = *always*). A higher mean score indicated that participants had used social media more frequently since the outbreak of COVID-19. Sample items are "How frequently do you find it difficult to quit using social media?" and "How frequently do others (e.g., your parents or friends) tell you that you should spend less time on social media?" The Cronbach's α of this scale was .87 in the present study.

Connection with Close Others

Participants reported the changes in the frequency of connecting with family and friends before and after the outbreak of COVID-19 on two items. The two items are "How often do you connect with your family?" and "How often do you connect with your friends?" These items were rated on a five-point scale (from 1 = *much less compared to the days before the outbreak* to 5 = *much more compared to the days before the outbreak*). A higher mean score indicated that participants had connected with their family and friends more frequently since the COVID-19 outbreak. The Cronbach's α of this scale was .72 in the present study.

Panic Buying

Participants' panic buying was measured with two items: "since the COVID-19 outbreak, I've snapped up a large number of medical supplies (e.g., masks) from pharmacies and/or online stores" and "since the COVID-19 outbreak, I've snapped up a large number of meat, vegetables and other food ingredients from groceries and supermarkets". Participants indicated how strongly they agreed with each statement on a five-point scale (from 1 = *strongly disagree* to 5 = *strongly agree*). A higher mean score indicated that participants had engaged in more panic buying. The Cronbach's α of this scale was .83 in the present study.

Demographic

Several demographic variables were measured as covariates, including biological sex (1 = *males*, 2 = *females*), age, history of chronic physical diseases (1 = *yes*, 2 = *no*), history of psychiatric/psychological disorder (1 = *yes*, 2 = *no*), educational level (1 = *junior middle school or below*, 2 = *high school*, 3 = *college*, 4 = *bachelor degree*, 5 = *master degree*, 6 = *doctoral degree*), current physical health condition (from 1 = *very poor* to 5 = *very good*), and their relationship with COVID-19 (1 = *not affected*, 2 = *other, including*

suspicious case, diagnosed case, relatives or friends of suspicious/diagnosed case, etc.).

Data Analyses

Data were analyzed in SPSS 18.0 with .05 as the level of significance. First, descriptive analysis was carried out to capture the centralities/frequencies of the main variables and covariates. Second, we examined bivariate correlations between perceived risk, social media use, connection with close others, and panic buying. Third, we employed Hayes’ PROCESS macro (version 3.15, Model 3, bootstrapping $N = 5000$) to conduct a regression-based moderation model to investigate the joint effects of perceived risk, social media use, and connection with close others on panic buying, controlling for a number of covariates. Specifically, we examined three main effects (i.e., perceived risk, social media use, and connection with close others), three two-way interaction effects, and one three-way interaction effect, on panic buying. If the three-way interaction effect was significant, we then further examined the two-way interaction effect between perceived risk and connection with close others on panic buying by different levels of social media use. In the final step, we performed simple slope tests to examine the association between perceived risk and panic buying by various combinations of the two moderators (i.e., low social media use + low connection with close others, low social media use + high connection with close others, high social media use + low connection with close others, and high social media use + high connection with close others).

Results

Mean Levels of and the Bivariate Correlations between Perceived Risk, Social Media Use, Connection with Close Others, and Panic Buying

As shown in Table 1, participants reported relatively low levels of the perceived risk of the COVID-19 (2.28 out of 5) and panic buying (2.29 out of 5), low-to-medium levels of social media use (2.81 out of 5), and medium levels of connection with close others (3.30 out of 5). Regarding bivariate associations, both perceived risk ($r = .29, p < .001$) and social media use ($r = .13, p < .001$) were positively associated with panic buying. In addition, connection with close others was not significantly related to panic buying ($r = .05, p = .153$).

Main Analysis

The overall model accounted for 12.3% variance of panic buying. As shown in Table 2, after controlling for sex, age, education level, history of chronic physical diseases, history of psychiatric/psychological disorder, current physical health condition, and relationship with COVID-19, perceived risk ($B = 0.30, SE = 0.04, p < .001$) and social media use ($B = 0.07, SE = 0.04, p = .046$) were positively related to panic buying. The association between connection with close others and panic buying was not significant ($B = 0.02, SE = 0.04, p = .553$). Moreover, the two-way interaction between perceived risk and connection with close others ($B = -0.12, SE = 0.04, p = .003$) and the one between social media use and connection with close others ($B = 0.11, SE = 0.04, p = .003$)

Table 1 The Means, Standard Deviations, and Bivariate Correlations among the Study Variables ($N = 972$)

	1	2	3	4	5	6	7	8	9	10	11
1. Sex											
2. Age	-.10***										
3. Education	-.02	-.19***									
4. History of chronic physical diseases	.06	-.09**	-.10**								
5. History of psychiatric/psychological disorder	.01	.08*	.00	.03							
6. Current physical health condition	-.10**	.02	.05	.20***	.12***						
7. Relationship with the COVID-19	.03	.00	.02	-.02	-.10**	-.04					
8. Perceived risk	.06*	-.07*	.06*	-.04	-.01	-.17***	.08*				
9. Social media use	.07*	-.23***	.16***	.00	-.09**	-.15***	.01	.18***			
10. Connection with close others	.13***	-.09**	.12***	-.01	.00	-.08*	-.01	.01	.18***		
11. Panic buying	.04	-.10**	.05	.01	-.06	-.45	.06	.29***	.13***	.05	
Min.	1.00	17.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max.	2.00	67.00	6.00	2.00	2.00	5.00	2.00	5.00	5.00	5.00	5.00
<i>M</i>	1.66	33.69	3.48	1.91	1.99	4.02	1.05	2.28	2.81	3.30	2.29
<i>SD</i>	.47	10.15	1.13	.29	.11	.77	.23	.85	.90	.89	1.01

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2 The joint effects of perceived risk, social media use, and connection with close others on panic buying

	Panic buying ($R^2=0.123$)			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Sex	0.02	0.07	0.287	.774
Age	−0.01	0.00	−1.864	.063
Education	0.00	0.03	0.153	.878
History of chronic physical diseases	0.06	0.11	0.506	.613
History of psychiatric/psychological disorder	−0.42	0.30	−1.423	.155
Current physical health condition	0.01	0.04	0.210	.834
Relationship with the COVID-19	0.11	0.14	0.808	.419
Perceived risk	0.30	0.04	7.867	< .001
Social media use	0.07	0.04	1.999	.046
Connection with close others	0.02	0.04	0.593	.553
Perceived risk × Social media use	−0.01	0.04	−0.142	.887
Perceived risk × Connection with close others	−0.12	0.04	−3.020	.003
Social media use × Connection with close others	0.11	0.04	2.972	.003
Perceived risk × Social media use × Connection with close others	0.09	0.03	2.826	.005

were both significant, while the interaction between perceived risk and social media use was not significant ($B = -0.01$, $SE = 0.04$, $p = .887$). Most importantly, the three-way interaction among perceived risk, social media use, and connection with close others was found significant ($B = 0.09$, $SE = 0.03$, $p = .005$).

Breaking down the three-way interaction, we found that the interaction effect between perceived risk and connection with close others on panic buying was stronger when the level of social media use was low ($B = -0.20$, $p < .001$), but this interaction effect was not significant when the level of social media use was high ($B = -0.03$, $p = .522$). These results suggested that connection with close others moderated the association between perceived risk and panic buying when participants used social media less frequently but such moderation effect was not significant when they used social media more frequently.

We further broke down the two-way interaction effect between perceived risk and connection with close others, and examined the simple slopes for the association between perceived risk and panic buying by different combinations of the two moderators. The results are summarized in Table 3 and visualized in Fig. 1. The results showed that for participants who used social media *less* frequently and were *less* connected

with close others, the association between perceived risk and panic buying was significant ($B = 0.48$, $SE = 0.06$, $p < .001$). By contrast, for participants who used social media *less* frequently but were *more* connected with close others, the association between perceived risk and panic buying was not significant ($B = 0.13$, $SE = 0.08$, $p = .094$). Moreover, for participants who used social media *more* frequently, the association between perceived risk and panic buying was significant, regardless of whether they were *less* ($B = 0.32$, $SE = 0.07$, $p < .001$) or *more* ($B = 0.27$, $SE = 0.06$, $p < .001$) connected with close others. In sum, these results indicated that panic buying was a joint function of perceived risk, social media use, and connection with close others.

Discussion

Panic buying is a ubiquitous phenomenon at the beginning of the outbreak of health crises such as COVID-19 in many countries/regions (Loxton et al., 2020). This behavior is associated with a number of undesirable outcomes (e.g., stockpiling) that are adverse to the counteraction to the pandemic (Wessler, 2020; Zheng et al., 2021). To understand

Table 3 Association between perceived risk and panic buying by different levels of social media use and connection with close others

	<i>B</i>	<i>SE</i>	<i>t</i>	95%CI
Low social media use + Low connection with close others	0.48	0.06	8.450	[0.37, 0.59]
Low social media use + High connection with close others	0.13	0.08	1.676	[−0.02, 0.28]
High social media use + Low connection with close others	0.32	0.07	4.601	[0.19, 0.46]
High social media use + High connection with close others	0.27	0.06	4.235	[0.14, 0.39]

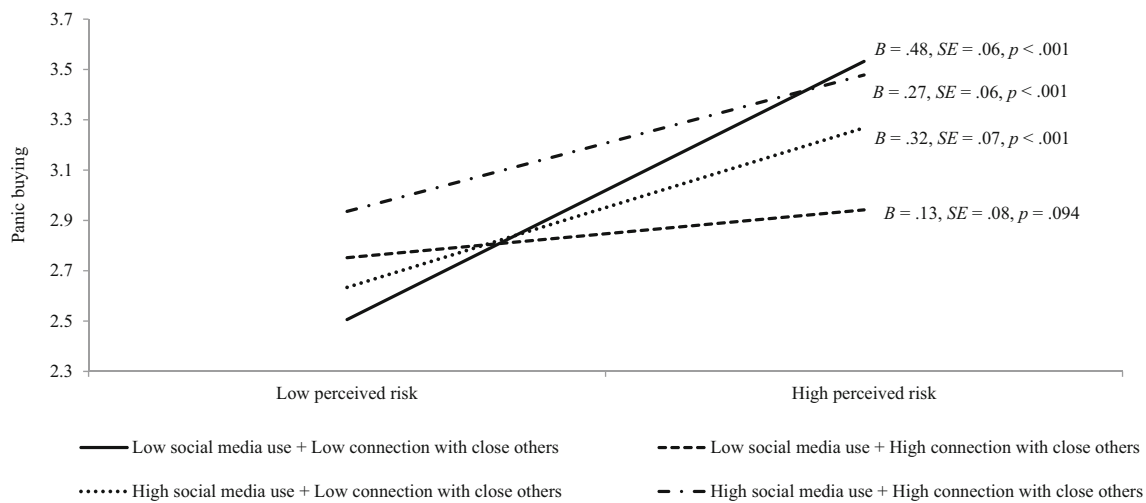


Fig. 1 Plot of the three-way interaction effects of perceived risk, social media use, and connection with close others on panic buying

which factors and how these factors contribute to panic buying, this study examined the role of three factors relevant to COVID-19, namely perceived risk, social media use, and connection with close others. Confirming our hypotheses, the results suggested that perceived risk was positively related to panic buying, and this relation was mitigated by connection with close others when individuals used social media less frequently.

Our results showed that at the beginning period of the COVID-19 outbreak and city lockdowns, the Chinese public showed an only modest level of panic buying. This could be because the measures adopted by the Chinese government were helpful in reducing people's panic buying, such that the Chinese government duly organized agricultural and industrial units to operate normally, even in times of the outbreak, to ensure the supply of daily and medical necessities (Deng & Peng, 2020). Despite the relatively low level of panic buying, the results also showed obvious individual differences in this consumer behavior, with some people engaging in more, while others engaging in less, panic buying. It is thus important to identify its risk factors and the underlying mechanisms.

The outbreak of the pandemic has largely triggered people's death-related awareness and anxiety (Jungmann & Witthöft, 2020; Li et al., 2020). According to TMT (Pyszczynski et al., 2020), people are motivated to adopt strategies to cope with the death-related thoughts and anxiety when they perceive that their lives are at risk. Panic buying is a self-interest, yet self-protective, behavior because it imparts people with a sense of safety to relieve the anxiety and fear caused by the pandemic (Yuen et al., 2020). Our current results corroborate prior studies (Bentall et al., 2021; Herjanto et al., 2021; Song et al., 2020), supporting that people with a higher level of perceived risk are more prone to panic buying.

Besides the role of perceived risk, two other factors relevant to the pandemic, namely social media use and connection

with close others, play an important role, too. Past research has found that excessive exposure to social media information exacerbated the relationship between perceived risk and panic buying (Herjanto et al., 2021), while possessing more social support mitigated the effect of perceived risk/threats on negative behavior in times of the COVID-19 pandemic (Grey et al., 2020; Pieh et al., 2020). Aligning with and going beyond the existing studies, this study examined a more complex, nuanced model by taking both social media use and connection with close others into account from the lens of TMT. According to TMT (Pyszczynski et al., 2020), people adopt the distal anxiety-buffering systems such as seeking close relationships with others, to manage the awareness and anxiety caused by mortality salience, especially when death-related thoughts are less salient in the focal attention. Consistent with TMT, our results revealed that a more frequent connection with close others mitigated the association between perceived risk and panic buying when people less used social media, which mitigated the death-related awareness in their consciousness.

Implications

This study bears some implications. On one hand, despite that an increasing number of studies are investigating panic buying, research into this issue is still in its infancy (Tolin et al., 2015; Yuen et al., 2020). Yuen et al. (2020) proposed a main effect model which explains that panic buying can be caused by four categories of psychosocial factors. Our results advance this model by revealing that these different psychosocial factors not only have direct, but also joint, effects, on the occurrence of panic buying. This indicates that there is a need for future research to consider various interaction effects among different psychosocial causes when examining the developmental process of panic buying.

On the other hand, our findings disclose that people who feel their lives are at higher risk, use social media more excessively, and connect with close others less frequently, are more prone to panic buying. These people may be in dire need of receiving interventions to mitigate their panic buying behavior. Relatedly, mitigating people's perception of risk, establishing a healthy habit of social media use, and maintaining social ties with close others could be promising leverage points for the prevention and intervention programs. In particular, social media needs to bear in mind that what and how they report about the pandemic may affect people's emotional and behavioral responses.

Maintaining close relationships via face-to-face contact has become less or even not possible in times of COVID-19 due to restriction of social gathering and city lockdown, and thus social connection has to rely on mobile phones and social media (Pyszczynski et al., 2020). When people are using their mobile phones to maintain social ties, they are also likely to be exposed to the negative information about COVID-19 and therefore their death-related thoughts are likely to be strengthened. As such, it is important for practitioners to figure out ways to help the vulnerable groups (i.e., those with a high level of perceived risk and excessive social media use) maintain social connection while keeping them from being exposed to negative news of the pandemic.

Limitations

We must acknowledge several limitations of this research. First, although we collected the data from various regions in mainland China, the nature of the sampling was non-random, which limits the generalizability of the findings. Second, we relied on cross-sectional design and self-report data, which prevents causal inference, although this research was among the earliest projects that investigated people's emotional and behavioral responses during the very beginning period of the COVID-19 outbreak around the globe. Third, we assumed that people who used social media excessively were more likely to be fed with negative information about the pandemic which would strengthen their death-related thoughts. Although studies have demonstrated a link between excessive social media use is associated with more anxiety during COVID-19 (Du et al., 2020), what we measured in this study should be seen as a proxy because we did not directly measure how much negative information people encountered from the social media. Relatedly, we only measured how frequently people sought connection with close others but did not directly measure their relationship quality. Although people are inherently motivated to seek connection with close others (or attachment figures) when they feel distressed (Baumeister & Leary, 1995; Bowlby, 1969), recent research found that it is also important to consider the role of relationship quality rather than the mere presence of relationship (Pieh et al., 2020).

Last, in order to increase the responding rate, we had to limit the number of items for each measure. Nevertheless, items for each measure had good face validity and satisfactory internal consistency. Future research may rely on structured questionnaires with multiple items to improve this issue. Despite these limitations, this study was among the first to understand panic buying by simultaneously considering several factors that are ecologically relevant to the pandemic, providing more nuanced contributions to the literature of this particular consumer behavior.

Conclusion

Panic buying is a globally witnessed consumer behavior that often emerges during the early period of the COVID-19 outbreak in many countries/regions as well as in other natural disasters and health crises in the history (Loxton et al., 2020). Drawing upon TMT, this study examines the joint contributions of perceived risk, social media use, and connection with close others to panic buying in a sample of Chinese population. The results suggest that people who perceive their lives at risk are more inclined to panic buying, but connection with close others mitigates this association when people are not using social media excessively. These findings inform that perception of risk, social media use, and relationships with close others are important leverage points to mitigate people's panic buying in times of COVID-19.

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Data Availability Yes, but upon request.

Declarations

Conflict of Interest The authors declare that they have no conflicts of interest.

Ethics Approval The investigation was approved by the Guangzhou University Ethics Committee (Protocol Number: GZHU2020007).

Consent to Participate The informed consent was obtained from the participants.

Consent for Publication This manuscript describes original work, has not been published in any language and is not under consideration for publication elsewhere. All the authors have contributed to this study in a meaningful way. The stated order of authorship corresponds to the authors' relative contribution to the research reported in the manuscript. There are no conflicts of interest to declare.

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