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Article:

Relevant, or irrelevant, external factors in panic buying

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1   **Relevant, or irrelevant, external factors in panic buying**

2   **Abstract**

3   In view of panic buying prevalence across countries during the COVID 19 pandemic, this

4   study explores the external factors that may influence consumer engagement or

5   disengagement with this buying behaviour and how they are related. Two studies were

6   undertaken to achieve this research aim. The first was to explore these factors through a scale

7   development processes. Three factors were revealed including (1) intervention and support

8   from the government to combat and manage the pandemic, (2) intervention and support from

9   businesses to prevent stockpiling or panic buying, and (3) influence of different categories of

10   social groups, namely, family and relatives, peers and friends, acquaintance and non-

11   acquainted social-media group. The second study collected data from five countries

12   (Australia, India, China, Vietnam and Indonesia) to understand the relationship between these

13   factors and panic buying engagement or disengagement. The rationale for the country choices

14   has been provided in this manuscript. The results show that interventions and support from

15   government and businesses influenced panic buying engagement, whereas social groups did

16   not. Implications of these findings are highlighted for the relevant stakeholders.

17   Keywords: COVID 19; panic buying; consumer behaviour; public policy

18

INTRODUCTION

Pandemics are associated with undetectable, volatile and uncontainable risks on a global scale (Pan and Meng, 2016). The current COVID-19 pandemic has resulted in substantial interruption to the economic, social and political system. To combat the pandemic, governments impose various interventions such as travel bans, lockdown and social distancing. Pandemics create fear among the public, such as fear of being infected, fear for family and friends, fear of disruption of essentials' supply, fear of job loss and financial constraints. These fears likely lead to irrational behaviours, such as stockpiling or panic buying.

Panic buying is a herd behaviour and transpires when consumers buy oddly large volumes of a product in anticipation of aperceived disaster and recourse scarcity, or after a disaster (Singh and Rakshit, 2020). This behaviour can be accounted for by the psychological reactance and anticipated regret theories, The former refers to a motivational state of protecting behavioural freedom in face of a crisis or a threat. The later indiates an emotional manifestation of a rejected option of choosing a particular behaviour related to risk of the pandemic (Gupta and Gentry, 2016). Panic buying can be viewed as an expected response during a pandemic and arguably a form of self-protection behaviour to minimise the risk (Xu, 2011; Yeun et al., 2020). Such behaviour can be attributed to the need for problem solving in a desperate situation in order to compensate for perceived threats and losses (Ballantine et al., 2014). On the other hand, panic buying is considered as malicious irrational purchase behaviour with a range of negative consequences for, inter alia, the buyers themselves, for retailers and other shoppers (Tsao, Raj, and Yu, 2019; Zheng, Shou, and Yang, 2020), such as price gouging (Pan et al., 2020), or household waste (Norberg and Rucker, 2020). The food sector has been under strain as a result of people panic-buying and stockpiling, leading to increased concerns about shortages of staple products and unavailability for the vulnerable populations who cannot

afford to stockpile (Nicola et al., 2020). Therefore, understanding the causes of panic buying behaviours would be conducive to addressing these consequences.

Prior research approached panic buying from supply chain management (Dulam, Furuta, and Kanno, 2020; Zheng, Shou, and Yang, 2020), quota policy (Shou, Xiong, and Shen, 2013), and controlling measures (Arafat, Kar, and Kabir, 2020). Researchers tend to underpin panic buying from a socio-psychological perspective and indicate that fear of uncertainty caused by the pandemic led to this buying behaviour (Arafat et al., 2020; Yuen et al., 2020). However, such fear is largely driven by the information received from external forces (e.g. governments, businesses, social group). Perceptions can be drawn from how and what these external forces communicate to the public and how individuals receive and interpret such information, which may affect their assessment of risk and severity of the pandemic. For instance, the preventive measures (e.g. social distancing, lockdown) undertaken by the government can be perceived as severity of the pandemic or potential of interruption of supply for essential goods. Social media posts on shoppers' stockpiling and empty shelves in supermarkets can be interpreted as missing out if not doing the same. Perceived risk, limitation, unavailability, and/or supply disruption of essential products increase desirability of these products and stimulates irrational and drastic measures such as panic buying (Arens and Hamilton 2018; Lyengar and Lepper, 2000; Lynn 1991). Research to date has not approached from the external factors that are intended for other purposes may affect consumers buying behaviours.

Every coin has two sides. Panic buying has not been a global phenomenon during the pandemic. Some countries were sighted (evident on social media news and posts) with excessive stockpiling in, for instance, Australia, the USA and the UK, whereas others with very little panic buying, such as China, Vietnam and Indonesia. In countries witnessing panic buying, a large proportion of people did not engage in this buying behaviour (Cranston, 2020).

The same information received from the aforementioned sources can be perceived and interpreted differently. Some may be pessimistic about the pandemic development and engage in irrational behaviours such as panic buying; whilst others may have more faith in governments' intervention and protective measures, and consequently are less likely to stockpile. Their interpretation and assessment of this information varies across their personal situations and backgrounds. For instance, the preventive measures may be construed as effective means to control the virus and to facilitate management of the pandemic, hence it seems unnecessary to stockpile out of panic. No research has attempted to investigate what deters the public from panic buying during the pandemic.

Consistent with the foregoing discussion, the current study aims to explore how external factors may be associated with panic buying engagement and disengagement during the COVID 19 pandemic. To fulfil the research aim, the study undertakes two steps. The first step is to explore the factors and develop the scales to measure each factor. The second draws upon the findings from Step 1 and examines the relationships between these factors and panic buying engagement or disengagement. The paper contributes to consumer behavioiur research by identifying factors from non-social-psychological perspective that may affect their purchase behaviours in a sustained crisis. The study also enriches for pubic policy research by revealing the potential spillover effect of government policies. Consequently the findings have implications for marketers, policy makers and other relevant stakeholders.

STEP 1 – FACTOR EXPLORATION

METHOD

Sample and data collection procedure

The study aims to identify the external forces that caused panic buying engagement and disengagement. The study was conducted in Australia as this country was one of the first to be reported with panic buying prevalence when the WTO announced the COVID 19 as pandemic.

To generate the relevant items, we searched all online news and social media posts (e.g. Facebook, Twitters) relating to panic buying from 1 to 31 March 2020 when stockpiling in Australia was most reported. After cleaning the data and analysing the themes, we concluded that panic buying engagement or disengagement was influenced by three forces: government, business and social groups.

We then developed the items using the collected information to represent each force and invited 5 scholars with the relevant expertise to ensure content validity. We label these forces as government, business and social group influences. Government influence included in this study refers to the preventive measures (i.e. intervention) undertaken by the government to control spread of the virus, and support from government (e.g. assurance and financial support from the relevant authorities). Business influence includes the retailers' measures and support from manufacturers, retailers and other members of the supply chain. The former refers to particularly retailers' measures to manage stockpiling such as imposing purchase limit and price change; whereas the latter refers to providing convenient shopping hours for disabled or healthcare workers, assurance from suppliers or manufacturers. According to Salazar et al. (2013), different social groups have different effects on consumer behaviours, with family and friends or the proximity being the more preferred reference group with more influence, and others being less. Consistent with the social group classification in Turner et al. (1987), family and relatives are referred to as Group 1, peers and friends as Group 2, those acquainted or non-acquainted from social network as Group 3.

After calculating the content validity, in accordance with Lynn's recommendation, we conducted a survey online to assess the factor structure, reliability and validity of the scales for each identified force. A 5-point Likert scale (1 = strongly disagree; 5 = strongly agree) was

used for the items. Online survey was distributed by Qualtrics to those who were Australian

residents and resided in Australia during the pandemic. A filter question was added to direct

those who indicated having engaged in panic buying to one set of questionnaire and those who

had not panic buying to the other. After four weeks of data collection, 392 usable responses

were generated after excluding missing data and those who did not engage in panic buying.

Exploratory factor analysis was conducted first. The reliability for each factor was

assessed using the inter-items correlations. The items with lowest correlated item-total

correlation were deleted. Subsequently, we used principal component analysis to explore the

factors based on Kaiser-Meyer-Olkin and Bartlett's test of sphericity indices to ensure sample

adequacy and validity of instrument respectively. One factor structure revealed from each

identified force with eigenvalue over one and factor loadings above .65 for selected items.

Next, confirmatory factor analysis was performed to examine the reliabilities and validities of

the three forces by randomly splitting the sample to two. The results show that factor

loadings, composite reliabilities, and average variance extraction (AVE) all exceed the

recommended cut-off values (Table 1). Hence, the three identified factors (government,

business and social group influences) were remained for analysis in next step of the study.

Table 1. Item descriptions and measurement model for perceived external influences on panic buying engagement/disengagement (the values on the left of slash are for panic buying engagement, the right for disengagement)

Scale item descriptions	Factor loading	Cronbach's alpha	CR	AVE
Government influence		.73 /.85	.77/.86	.52 /.60
• interventions and measures	.71/.81			
• Support scheme	.73/.84			
Business influence		.73 /.77	.81/.67	.68/.50
• Business intervention and measures	.77/.72			
• Support and assistance	.82/.67			
Social group influence		.82 /.75	.82 /.76	.70/.61
• Family and relatives	.80/.82			
• Peers and friends	.87/.74			
• Social acquaintance	.82./.74			

CR = composite reliability; AVE = average variance extracted;

STEP 2: PANIC BUYING ENGAGEMENT

LITERATURE REVIEW

Government influence and panic buying

4   Each country has taken different measures at different stages based on the status of the

5   pandemic. These measures convey information that can be construed differently. Some view

6   the measures as constructive steps to control the spread of the disease. Hence, the measures

7   instil social trust in the public (Yuen et al., 2020). The level of trust is dependent on the

8   government providing relief and recovery, maintaining order and control, and disseminating

9   information to the public during a disease outbreak (Kang et al., 2018). Trust is a key emotion

10 influencing the public's behaviours especially in a pandemic situation (Slovic, 1999). Trust

11 builds credibility in what the authority is communicating regarding the pandemic and also

12 influences motivations to comply. A lack of trust on the other hand builds anxiety and feeds

13 fear and interferes with what needs to be done (Bish & Michie, 2010; Vaughan & Tinker,

14 2009).

15 However, these measures have been progressively tightened and intensified along

16 with the exacerbating situation of the pandemic. For instance, travel bans had been extended

17 from international travellers to domestic travellers. Social distancing was practised from ban

18 of gatherings at large event venues to a limit of two people. The changes can be construed as

19 increased severity of the health crisis which may lead to fear-driven panic buying behaviours.

20 On the other hand, the preventive measures can be perceived as a positive means to end

21 the pandemic since they are intended to control the spread of the virus. This perception may

22 also lead some not to engage in panic buying. Along with these measures, the messages and

23 support from the authorities can influence the public's response to the pandemic such as panic

24 buying. Consistent with foregoing discussion, we hypothesise:

25 H 1. Government influence during the pandemic is related to panic buying engagement

H2. Government influence during the pandemic is related to panic buying disengagement

Business influence and panic buying

In addition to the assuring messages from the government, manufacturers and retailers undertook various interventions against stockpiling or panic buying. For instance, supermarkets in Australia (e.g. Aldi, Coles, IGA and Woolworth) informed the buyers that they would make every endeavour to ensure sufficient supplies (SBS, 2020). Toilet paper was one of the most popular panic buying items. One of the biggest manufacturers *Kleenex* posted "*'We are working around the clock at our mill in South Australia to keep the supermarket shelves stocked with Kleenex Complete Clean toilet paper.' As you can see, we won't be running out any time soon" (4 March, 2020).* Supermarkets and retailers intervened with panic buying by increasing price and imposing limits on purchase quantity of essential items (e.g. pasta, flour, tissues, hand sanitiser, toilet paper, paper towels and serviettes), as well as provide specific shopping time for health workers, the disabled and senior citizens.

In China, four major supermarkets — Zhongbai, Wushang, Zhongshang, and Wal-Mart guaranteed sufficient supply with no increase in price. Consistently, e-commerce platforms such as JD.com and Pinduoduo promised to provide consumers with non-interrupted home delivery services by contactless distribution (Sina Finance, 2020b). JD logistics has 700 warehouses with 800 million items, including food, daily necessities, home appliances etc., which have become solid foundation of material deployment (Lianshang Net, 2020). BYD, the largest manufacturer in China guaranteed supply of essential items such as face masks, handwashing fluid, disinfectant (Sina Finance, 2020c). Similarly, in Vietnam, retailers and manufacturers urged the public not to buy unusually large quantities of food, food, and staples, and confirmed that there would always be sufficient source of consumer goods, and that shops would be open even in the lockdown (Loc, 2020). As such, panic buying has not been an

1 outstanding scene in China and Vietnam. The foregoing discussion leads to the following

2 hypotheses:

3   H3. Business intervention during the pandemic is significantly related to panic buying

4 engagement

5   H4. Business intervention during the pandemic is significantly related to panic buying

6 disengagement

7 **Social group influence and panic buying**

8   Individuals often make decisions dependent on their social surroundings and the

9 attitudes, opinions, and beliefs of the larger group so as to conform to this group (Wang et al.,

10 2019). This conformation is referred to as a subjective norm (Azjen, 1991). This occurs when

11 inadequate information is readily available for one to assess a situation and make decisions.

12 Social learning from others' behaviours become a source of information. Social learning can

13 influence buying behaviours. Salazar et al. (2013) shows that herd behaviour by consumers is

14 influenced by specific social group information, which they term a biased social learning effect.

15   Norms lead to attitudes and actions that tend to be homogeneous (Azjen, 2005),

16 therefore individuals when in unstable conditions have a tendency to follow the behaviour of

17 people around them, referred to as reference groups. These groups have a strong influence on

18 product and brand choices for individuals (Clark and Goldsmith, 2006). Family members and

19 friends become a social network and a part of consumer considerations in determining choices.

20 The existence of protection and care for the family becomes part of individuals consideration

21 related to panic buying behaviour.

22   These social networks can be very powerful especially in passing on messages from the

23 government and other official bodies to the general public, however in many cases these

24 channels are misused and cause more anxiety (Yuen et al., 2020). Social networks provide

25 updates or advice to the public to cope with a health crisis and can be susceptible to abuse

which is ultimately due to fear and results in missing out or confusion (Chai et al., 2019). This can be accounted for by observational learning as one type of herd mentality referring to acting as others without thinking or having full information. Panic buying can be a result of mimicking behaviour of those who are believed to have made assessments (Yuen et al., 2020). From social learning perspective, the communication can be manifested in cues derived from others' behaviours. Such cues can be sourced from virtual and personal experience. Empty shelves where essential items stored in the supermarkets, and shoppers' brawls over toilet papers witnessed personally or through videos posted in social media, can form such cues which may lead others to mimic such behaviours to stockpile to minimise the risk of missing out. On the other hand, some individuals may perceive panic as irrational, unwise or inconsiderate of others as stockpiling has affected accessing essential goods for those disabled and health workers (Prentice, Chen and Stantic, 2020). Prentice et al.'s big data analytic study shows that many expressed negative sentiments towards panic buying, albeit some were positive. Consequently, we propose the following:

H5. Social group influence is related to panic buying engagement

H6. Social group influence is related to panic buying disengagement

METHOD

Sample

Step 2 of this study was intended to understand whether the three external forces identified in Step 1 affect panic buying engagement or disengagement. We collected data in Australia, China, India, Vietnam and Indonesia. The rationale for this decision is based on the effectiveness of COVID 19 management and the level of panic buying observed in these countries. Among the selected countries, panic buying was most prevalent in Australia with the least population. China and India are the most populous countries but manifested different outcomes from managing this pandemic. Having claimed to be the original epicentre of COVID

19, China adopted strict measures such as complete lockdown since the Covid-19 was identified. Although Beijing experienced the second wave of epidemic in May, the virus has been under control (Clinch, 2020). In mid-July when the research was conducted, 83,361 confirmed cases and 284 active cases were reported in China (National Health Commission, 2020). Panic buying was spotted but not prevalent. Vietnam reported the first infected case on January 30, 2020. As of 3 April 2020, there were 237 confirmed cases, with 85 recoveries and 0 deaths (Worldometer, 2020b). Despite Vietnam bordering China and being the 15th most populated country with 97 million people, the country managed the pandemic reasonably well. No new cases have been reported so far. Panic buying was rarely reported. Indonesia, the 4th most populous country, has approximately 270 million population. Since the pandemic was announced and the first cases were identified, panic buying has however been hardly sighted in this country.

Random sampling was deemed appropriate for this research since we intended to capture those who engaged or did not engage in panic buying during the pandemic. The sample sizes vary depending on the financial resource of the co-authors of this research as financial support was not readily available for research endeavours during this pandemic. Pilot studies were conducted prior to the formal surveys in these countries.

Data collection procedure

In Australia, online survey through Qualtrix was conducted. The screening questions included in the survey were age limit (must be 18 and above), residence and resident status, panic buying or not. Those who had engaged in panic buying were directed to one survey, those who did not to the other. After a month of data collection in Australia, 1132 respondents were collected. After the exclusion of 95 incomplete questionnaires, outliers, 1037 were used for data analysis. The survey was distributed through WeChat group Moments and Weibo during May and June 2020 in China, Facebook and LinkedIn in Vietnam and India, the online survey

link or scan barcode from the associations through email or messages in Indonesia between 14 May 2020 to 18 June 2020. The questionnaires were translated to local languages then translated back to English to ensure consistency.

In China, an E-survey link generated by Questionnaire Star after excluding those with missing values, inconsistent responses or extreme multivariate outliers. In India, the survey was conducted in major cities, namely Bangalore, Hyderabad and Chennai at time of lockdown. 228 usable responses were generated for this study. In Indonesia, data were collected from existing networking such as Hotel Human Resources Manager Association (HHRMA), Indonesia Hotel Training Manager Association (HMPPI), and Indonesian Hotel and Restaurant Association (PHRI). Of 300 questionnaires distributed, 296 fully completed and useable responses were received. In Vietnam, the questionnaire was designed online using Qualtrics platform. An anonymous link was distributed randomly with the support of this reputable marketing research tool. The survey lasted for a month, and 336 usable responses remained for data analysis. The demographic information for the respondents who engaged in panic buying is shown in Table 2, who did not engage in panic buying in Table 2. In this study, 5-Point Likert Scale was used for the questionnaire items.

Table 2: Demographics for respondents who were engaged (left column)) and disengaged in panic buying (right column)

Variables	Categories	Australia (196/841)		Vietnam (145/191)		China (110/193)		Indonesia(50/246)		India (118/110)	
Gender	Male	36.2%	40.5%	20.0%	31.4%	40.9%	40.9%	46.0%	50.0%	55.1%	70.9%
	Female	63.3%	59.5%	80.0%	68.1%	57.3%	59.1%	54.0%	50.0%	44.1%	29.1%
	Others	0.5%	0%	0%	0.5%	1.8%	0%	0%	0%	0.8%	0%
Age	18-25	11.7%	9.3%	22.1%	25.1%	15.5%	9.3%	0%	8.1%	17.8%	31.8%
	26-35	33.7%	17.6%	31.0%	47.1%	54.5%	46.6%	52.0%	28.0%	31.4%	36.4%
	36-45	28.1%	15.5%	42.1%	26.7%	19.1%	30.1%	32.0%	38.2%	42.4%	20.9%
	46-55	14.8%	15.3%	4.8%	1.0%	7.3%	10.4%	0%	24.0%	8.5%	10.9%
	56 or more	11.7%	42.3%	0%	0%	3.6%	3.6%	16.0%	1.6%	0%	0%
Education	High school	19.9%	27.9%	2.1%	2.6%	15.4%	21.2%	0%	0%	0%	8.2%
	Some diploma	17.3%	29.5%	3.4%	2.1%	18.2%	22.3%	12.0%	8.9%	11.9%	13.6%
	Bachelor	42.3%	27.8%	32.4%	45.5%	44.5%	38.9%	44.0%	41.5%	48.3%	62.7%
	Post-graduate	19.4%	12.8%	60.7%	49.7%	20.9%	16.1%	44.0%	49.6%	39.8%	15.5%
	Others	1.0%	2.0%	1.4%	0%	0.9%	1.6%	0%	0%	0%	0%
Marital	Single	26.5%	22.0%	28.3%	41.9%	23.6%	16.6%	16.0%	36.6%	22.0%	40.0%
	Married-no kids	12.2%	12.1%	2.8%	6.8%	3.6%	4.7%	24.0%	15.0%	8.5%	11.8%
	Married-kids	42.9%	37.6%	65.5%	49.2%	50.9%	68.4%	60.0%	39.8%	42.5%	27.3%
	Divorced	4.6%	10.6%	2.1%	1.6%	0.9%	1.6%	0%	8.5%	5.1%	5.5%
	Others	12.2%	17.8%	1.4%	0.5%	20.9%	8.8%	0%	0%	21.9%	15.4%

Data analysis

The purpose of this study was to understand whether the forces identified in Step 1 influenced panic buying engagement or disengagement in these countries. However, preliminary analysis shows that China, India, Vietnam and Indonesia had less or hardly any panic buying, testing a causal relationship for these countries was not appropriate. We then performed multiple regression analyses for Austrlia to assess which of these factors may be significantly related to panic buying engagement or disengagement, then conducted frequency analysis for the five countries to capture two groups who engaged or did not engage in panic buying, and their agreement, neutral or disagreement to the three. The following section present the regression findings for Australia first, then followed by the results showing percentage of respondents indicated their agreement, not sure, or disagreement to panic buying engagement or disengagement caused by each factor proposed in this research across the five countries with Australia being included for a comparison.

FINDINGS

Results of regression analysis of panic buying engagement and disengagement

The results show that the intervention undertaken by the government and businesses (e.g. retailers) had significant positive effects on panic buying. The assurance and support from businesses was negatively related to panic buying. This finding seems plausible since such assurance indicates that the essential items would not be out of stock. Contrary to what was proposed, the social group influence was not significant. The three social groups are family and relatives (social group 1), peers and friends (social group 2), acquaintance or non-acquainted social-media group (social group 3). In other words, people engaged in panic buying were not under anyone's influence, but acting for self-protection. In the case for people who did not engage in panic buying, government intervention and support from retailers and manufacturers exerted significant positive effects. Interestingly, family and friends also

influenced panic buying disengagement. Other social groups have no influence. The results are shown in Table 3

Table 3: Results for factors in panic buying engagement (n=192) and disengagement (n=841)

Extermal factors	β1	β2
Government intervention and measures	.12**	.13*
Government support	-.04	.01
Business intervention and measures	.12*	.05
Business support	-.20***	.24***
Social group 1	.09	.11**
Social group 2	.05	-.05
Social group 3	.05	.05
R^2	.45	.14
Adjusted R^2	.42	.12

*p<.05, **p<.01, ***p<.001, β1 = coefficient for panic buying, β2= coefficient for non-panic buying, t1= t value for panic buying, t2= t value for non-panic buying.

Results of frequency analysis for five countries

As our study was more exploratory in nature, the proposed relationships are unable to be accounted for by regression analysis per se. Further analysis for the five countries was performed to examine the percentage of the targeted respondents who indicated their agreement, disagreement or neutral to their panic buying caused by the proposed factors to address the research aim. Second, we present how respondents from each country responded to these factors in their panic buying engagement and disengagement. In case of panic buying engagement, most respondents in the five countries agreed that government intervention led to panic buying. India (80.5%) and Indonesia (76%) had the highest percentage. However, the majority disagreed that government support causes panic buying, especially Vitnam (77.2%) and India (81.4%). Likewise, the majority of respondents agreed that business intervention caused their panic buying with India (74.6%) and China (50%) being the highest in these five countries. In terms of social group influence, Indonesia has the highest percentage (76%) that agreed social group 1(family and relatives) influence their panic buying behavior. Highest percentage for social group 2 (peers and friends) and 3 (acquainted or non-acquainted others

from social media) were Indonesia (76%) and India (80.5). On the other hand, in the case of panic buying disengagement, most respondents from Vietnam (82.2%) and China (79.8%) agreed that government and business interventions helped them not to engage in panic buying. The results are shown in Table 4.

Table 4: Frequency results for those who were engaged (left column) or disengaged (right column) in panic buying

	Australia		Vietnam		China		Indonesia		India	
Government intervention										
Disagree	19.4%	18.2%	28.3%	5.8%	18.2%	6.2%	8%	31.3%	6.8%	10.0%
Not sure	30.6%	34.4%	26.2%	12.0%	20.9%	14.0%	16%	17.9%	12.7%	13.6%
Agree	50.0%	47.4%	45.5%	82.2%	60.9%	79.8%	76%	50.8%	80.5%	76.4%
Government support										
Disagree	72.4%	16.2%	77.2%	5.2%	70.0%	8.3%	0.7%	32.1%	81.4%	14.5%
Not sure	20.9%	34.4%	15.9%	13.1%	18.2%	15.5%	0.2%	21.1%	12.7%	30.0%
Agree	6.6%	49.5%	6.9%	81.7%	11.8%	76.2%	0.1%	46.7%	5.9%	55.5%
Business intervention										
Disagree	20.4%	15.3%	27.6%	5.2%	20.0%	17.6%	24.0%	13.0%	8.5%	16.4%
Not sure	31.1%	40.4%	35.2%	11.5%	30.0%	28.0%	32.0%	38.6%	16.9%	35.5%
Agree	48.5%	44.2%	37.2%	83.2%	50.0%	54.4%	44.0%	48.4%	74.6%	48.2%
Business support										
Disagree	75.0%	15.3%	46.9%	4.2%	72.7%	13.0%	70.0%	19.1%	74.6%	10.9%
Not sure	15.8%	44.5%	24.8%	12.0%	19.1%	28.5%	0.0%	28.5%	17.8%	20.9%
Agree	9.2%	40.2%	28.3%	83.8%	8.2%	58.5%	30.0%	52.4%	7.6%	68.2%
Social group 1										
Disagree	16.8%	33.9%	15.2%	32.5%	8.2%	31.1%	24.0%	9.8%	8.5%	13.6%
Not sure	26.0%	32.6%	33.1%	30.9%	23.6%	28.5%	0.0%	22.8%	18.6%	15.5%
Agree	57.1%	33.5%	51.7%	36.6%	68.2%	40.4%	76.0%	67.5%	72.9%	70.9%
Social group 2										
Disagree	18.9%	49.2%	32.4%	53.4%	8.2%	36.3%	24.0%	29.3%	11.0%	36.4%
Not sure	27.6%	30.1%	29.7%	19.4%	30.0%	23.3%	0.0%	30.5%	20.3%	24.5%
Agree	53.6%	20.7%	37.9%	27.2%	61.8%	40.4%	76.0%	40.2%	68.6%	39.1%
Social group 3										
Disagree	9.2%	34.2%	10.3%	30.4%	3.6%	34.2%	30.0%	16.3%	5.1%	23.6%
Not sure	27.0%	36.3%	30.3%	39.3%	29.1%	33.7%	8.0%	32.1%	14.4%	22.7%
Agree	63.8%	29.5%	59.3%	30.4%	67.3%	32.1%	62.0%	51.6%	80.5%	53.6%

DISCUSSION

The study drew upon panic buying phenomenon during the COVID 19 pandemic and explored the external forces that may influence panic buying engagement or disengagement. These factors include (1) government intervention, preventive measures undertaken, and support provided by the government to combat the pandemic, (2) business intervention, retail measures and support from businesses to manage stockpiling or panic buying, and (3) social group influence. The study investigated two sides of the same coin (namely the factors identified) and how these factors drove or deterred panic buying. As panic buying was manifested differently in different countries, the study collected data in five countries to generate more insights of the influence of COVID 19 on consumer behaviours. The countries were selected on the basis of effectiveness of managing COVID 19 and degree of panic buying sighted. As the study was exploratory in nature, establishing a structural model was not intended. Regression analysis was performed, followed by descriptive comparisons. Discrepancy and conformation were derived from the two initiatives. Discussion of these findings is as follows.

Government influence

In the case of panic buying engagement, the results show that the majority of respondents across five countries consistently agreed that government intervention was a reason leading to their panic buying. India in particular had 80.5 percent of respondents indicated that government intervention caused them to engage in panic buying. Indeed, on March 24, India's 1.3 billion people were asked to go into a three-week lockdown in response to COVID 19. The Prime Minister announced that the lockdown gave citizens only four hours to prepare which had been criticised as the cause of panic buying and hysteria amongst the public (Chaudhary and Du, 2020). In comparison, less than half of the respondents, albeit still the majority in Vietnam agreed to the influence of government intervention on their panic

buying. Although Vietnam has been successful in addressing the COVID-19 pandemic with timely government measures, panic buying still happened during pandemic. When the initial cases were reported, there was panic buying of surgical face masks and hand sanitisers. Before lockdown in the beginning of April 2020, the number of Vietnamese stockpiled food and essential items increased significantly.

The regression analysis indicates that government support was not significantly related to panic buying. This result shows that the majority of respondents (more than 70%) disagreed that government support caused their panic buying. In other words, due to government support, the citizens were less likely to engage in panic buying. The support is reflective of government assurance of handling the pandemic and resource abundance. Such assurance instils a sense of security and safety in the public. However, a minority of people across the five countries agreed that government support caused their panic buying. The support, for instance, the financial support to workers in Australia, may enable the receivers to stockpile. India had the highest percent (81.4%) of respondents who indicated government support was the reason they did not engage in panic buying. Although government announced 1.7 trillion rupees ($22.5 billion) of relief package to aid the most vulnerable (Buchholz, 2020), India still cannot afford to have Covid-19 spreading through the country due to population structure, medical condition (Chotiner, 2020) due to difficulty of social distancing practice. These facts made Indian citizens feel uncertain about coronavirus outbreak, thus leading them to engage in panic buying.

In the case of panic buying disengagement, the findings show that the majority people in five countries agreed that government intervention caused them to disengage in panic buying, especially in Vietnam (82.2%) and China (79.8%). This may be attributed the strict measures undertaken by the Vietnamese and Chinese governments to control coronavirus outbreak in the initial stage of Covid-19 which was comparatively well managed in the two countries. Only 464 (Worldometer, 2020b) and 724 active cases (Worldometer, 2020a) were

reported active cases in Vietnam and China respectively, much less compared with other three countries with Australia experiencing the second wave of coronavirus outbreak (Cave, 2020). Less than half of the respondents in Australia agreed that government intervention deter them from engaging in panic buying, followed by Indonesia (50.8%) and India (76.4%). Vietnam and China have received the highest score on their governments' response to the Covid-19 outbreak (Gilchrist, 2020). The findings indicate management of the epidemic and the public's response are largely dependent upon government interventions.

With regards to government support, the results indicate that the majority agreed that government support and assurance deterred them from panic buying. Interesting, the same pattern as government intervention is shown in the case of Vietnam (81.7%) and China (76.2%). The findings are reflective of importance of government support and assurance which can instil a sense of security and safety, as shown in the cases of Vietnam and China where Covid-19 was managed effectively with less phenomenal panic buying.

Business influence

The results show that the majority of respondents across five countries agreed that business intervention caused their panic buying. Business intervention is manifested influctuating prices for essential items and imposing limits of purchase. For instance, the instructions on supermarkets' shelves show limits to 20-kilogram rice, 10 kilogram atta, 4 kilogram pulses, 12 packets of biscuits of a single type and noodles, and 5 kilogram sugar (Bloomberg, 2020). Again, India had the highest percentage (74.6%) of respondents indicated that business intervention caused them to engage in panic buying. In comparison, less than half of the respondents, albeit still the majority in China agreed to the influence of business intervention on their panic buying. The findings may indicate various degrees of business interventions demonstrated in different countries.

The study shows that the majority of respondents disagreed that business support caused their panic buying. In other words, due to business support, the citizens were less likely to engage in panic buying. This is a reflection of the retailers and the manufacturers having sufficient stock of the consumer goods, foods, and essentials in this pandemic. This assurance imparts a sense of security and safety in the public. 75 percent of respondents in Australia indicated business support was the reason they did not engage in panic buying. In practice, the stock was made available timely facilitated by reduction of trading hours and the removal of overnight delivery curfews in New South Wales, Victoria, and Queensland, which enabled stores to restock shelves faster and increased production and deliveries (Financial Review, 2020).

In the case of panic buying disengagement, the results show that the majority of respondents across five countries consistently agreed that business intervention was a reason of non-panic buying. 86.2 percent of respondents in Vietnam indicated that business intervention prevented them from panic buying. The retailers in Vietnam actively increased stock of rice, noodles, and toilet papers and assured no increase of price and abundance of supply. The Prime Minister ordered government agencies to ensure food suppliers meet demands amid the ongoing Covid-19 pandemic in Hanoi (Hanoi Times, 2020). In comparison, less than half of the respondents, albeit still the majority in China agreed to the influence of retailer intervention on their non-panic buying because the adequate supply of physical business, the convenience e-commerce and delivery service and the increase in supply of anti-epidemic materials kept people away from panic buying (Sina Finance, 2020).

The majority of respondents agreed the business support caused their non-panic buying, particularly in the case of Vietnam with 83.3 percent of respondents agreeing to this measure. Indeed, retailers and manufacturers in Vietnam confirmed sufficient source of consumer goods, food, staple food and essentials for people; shops were open even in the lockdown (Loc, 2020).

However, the lowest percentage of respondents in Australia agreed the business support caused their non-panic buying, which may be construed as lack of support from retailers and manufacturers comparatively.

Social group influence

Social group 1 refers to the inner most circle of family and relatives. Social group 2 refers to peers and friends and Social group 3 refers to acquainted or non-acquainted others from social media. This includes friends of friends on social media platforms, celebrated personalities followed by respondents or even general shares of videos and posts gone viral on social media. The results show that across all the countries, the majority of respondents agree that all three social groups influence panic buying engagement.

For social group 1, Indonesia had the highest percentage of 75%, followed by India and China agreeing that family and relatives influenced their panic buying decision. This can be attributed to the family-oriented culture of the Indonesian society where the need is high to protect and take care of family. India and China share similar culture which was reflected in their response. Respondents in Vietnam scored the lowest with approximately 50% of the people agreeing that family and relatives influenced their panic buying. This can be attributed to a high level of trust on the government and business interventions. Similarly, the majority of respondents across all countries agreed that peers and friends also had a strong influence on panic buying engagement. Indonesia had the highest followed by India and China. The lowest ranking was Vietnam with only 39% of the respondents agreeing that peers and friends influenced their panic buying engagement. For social group 3, India ranks highest with a majority of 80% of respondents agreeing that they were influenced by non-acquainted others on social media to panic buy. This may be attributed to the intense social media campaigning with #Indiafightscorona and also the active posts by the Prime Minister on Twitter which was followed by the public and involved tweets and support from celebrities and other popular

icons. Vietnam followed very closely by Indonesia ranked lowest with 59% and 61% of respondents agreeing that non-acquainted others influence panic buying engagement.

The results for panic buying disengagement vary across the three social groups unlike the case of panic buying engagement where there was unanimous agreement across the countries and social groups. For social group 1, India ranks highest with 70% respondents agreeing that family and relatives influenced panic buying disengagement which means there is a low likelihood of family and relatives influenced their panic buying. This can be attributed to the group of respondents not getting biased by others opinion but deciding on their own or going by facts and details provided by the government and businesses. Australia and Vietnam had similar percentage of responses in agreeing, disagreeing and unsure response category averaging at 35%. This can be attributed to either a lack of understanding of the question or people choosing a safe response to the question. For social group 2, majority of respondents from Australia and Vietnam disagreed that peers and friends influenced their panic buying disengagement which means that peers and friends had a high likelihood of influencing panic buying. Majority of respondents in India, China and Indonesia agreed that peers and friends influenced their panic buying disengagement. For social group 3, majority of respondents from Australia and Vietnam were unsure of the influence of non-acquainted others on panic buying disengagement which can be attributed to the lack of understanding of the question. Majority of respondents in India and Indonesia agreed that non-acquainted others influenced their panic buying disengagement. It can thus be summarised for panic buying disengagement, similar patterns have been found between Australia and Vietnam as well as between India and Indonesia. However it is an interesting to note that respondents had divided opinions of panic buying engagement and disengagement across the five countries of study.

The case of Australia

1   The results show that the majority of the respondents admitted that their panic buying

2   behaviour was mainly influenced by the reference group, especially Group 3 – the social media

3   posters. Posts and comments on a massive run-out stock of essential items went viral on social

4   media. Australians fell into a 'herd mentality', acting how others' act, rather than making their

5   own conscious decisions. A small number of the respondents disagreed that government

6   interventions (19.4%) and business interventions (20.4%) were the reasons leading to

7   stockpiling. These factors may cause customers to desire higher inventories than usual but did

8   not significantly result in panic buying. Most respondents disagreed that government (72.4%)

9   and business support (75%) caused panic buying. The support has been evidently effective.

10   Especially, Australian Prime Minister asserted that shops would be open even during the

11   lockdown and the army could be used to help with food deliveries, if necessary. Retailers

12   confirmed that they would do everything they could to get as many products on the shelves as

13   possible. Manufacturers assured that they would work around the clock at their mill to keep the

14   supermarket shelves stocked.

15   In the case of panic buying disengagement, the majority of the respondents agreed that

16   they did not engage in panic buying behaviour because of government and business

17   interventions/support. These reasons reflect the important roles of these factors in keeping

18   Australian residents calm and not engage in irrational stockpiling. The Australian government

19   has undertaken many different measures during the pandemic. These measures showed that

20   they were effective in managing and controlling the spread of COVID-19. Prime Minister Scott

21   Morrison has repeatedly urged people to 'stop hoarding'. Australian supermarkets reintroduced

22   national rationing of essential groceries to reduce stockpiles. Manufacturers promised

23   sufficient stock for a long period.

24   Interestingly, more than 30% of the respondents across seven categories were not sure

25   the reasons for their non-panic buying behaviour. These results indicate that there was a group

of Australian residents who did not care about panic buying, and they did not think that their non-panic buying behaviour stemmed from any external influences. Social group played a minimal role in deterring panic buying. This is in contrast to the case of panic buying. Most non-panic buyers disagreed that Group 2 influenced their behaviour, indicating strong herd mentality in Australia.

The case of China

The result shows that majority of respondents who engaged in panic buying agreed that government intervention, business intervention, social groups (family and relatives peers; friends; social media non- acquaintances) led to their panic buying behaviour. While most respondents disagree that government support and business support were causes of their panic buying behaviour. Indeed, the Chinese experienced a challenging time given the virus was claimed to originate here. When the first case of Covid-19 emerged in China with little understanding of the virus (Lu, Stratton, and Tang, 2020), Heshmat (2020) indicated that uncertainty associated with the virus caused self-protection including panic buying or stockpiling to regain control of the uncertain situation. Wuhan lockdown prompted the first wave of stockpiling essentials as citizens were not sure of the timeline of lockdown (Sina Finance, 2020a). For social groups, WHAT? seems to be a reason for stockpiling face masks, food and daily necessities for their families. Meanwhile, social media platforms such as WeChat group, ?, TikTok and Weibo affected people's panic buying behavior (67.3%). For example, in the beginning of the lockdown in Wuhan pictures and short videos of empty shelves in social media platforms, which increased people's anxiety and resulted in stockpiling. Besides, various pictures with price tags were circulated in the WeChat groups, triggering concern of price increase (PhoenixNet, 2020). There was no evidence of restricted purchase of grain, food or toilet paper. However, many cities (e.g. Xiamen, Shanghai, Hefei, Yantai) restricted purchase of face masks (Zhang, 2020).

For respondents who did not engaged in panic buying, most of them agreed government intervention (79.8%), government support (76.2%), business intervention (54.4%) and business support (58.5%) impacted their decisions. Although the Chinese experienced strict lockdown, the government assured abundant supplies for necessities. For example, the Food and Agriculture Organisation of the United Nations warned a food crisis may occur in April and May 2020, but Chinese official declared enough stocks of the staples for more than one year (China New, 2020). Social media posts on Weibo and Zhihu etc. showed the public's confidence and trust in government interventions (Zhihu, 2020).

The adequate supply from physical stores, e-commerce and the increase in supply of anti-epidemic materials may also account for panic buying disengagement. When the Wuhan lockdown commenced, four major supermarkets in this city — Zhongbai, Wushang, Zhongshang, and Wal-Mart guaranteed supply without increasing prices. E-commerce JD.com, Pinduoduo and other platforms provided consumers with contactless home delivery services during Spring Festival and the lockdown period (Lianshang Net, 2020). Although there was insufficient supply of anti-epidemic materials at the beginning of coronavirus outbreak, manufacturers like BYD embarked on a mass and rapid production to meet the demand after Chinese Lunar New Year (Sina Finance, 2020c).

The case of India

The results show that the majority of the respondents agree that government and business interventions, and influence of social groups influenced panic buying during the pandemic while government support and business support had least influence in panic buying decisions. 80% of the respondents agreed that government interventions led to panic buying engagement as the public was only given a four-hour notice for getting their essentials before the first lockdown. Interestingly 80% respondents disagreed that government support caused their panic buying. In other words, the citizens were less likely to engage in panic buying if

there was support from the government. Social groups in India are vital influencers as can also be seen in the results. A majority of 70%-80% of people agreed that social groups including family and friends, peers and colleagues and social media acquaintances have influenced panic buying. In particular, the influence may be related to various videos and images posted on social media which showed live situations of empty shelves and traffic jams before lockdown and video logs of citizens about stockpiling. 75% of the respondents said that business intervention led to panic buying with an increase in prices due to low availability. In sum, panic buying engagement in India was largely influenced by government and business interventions as well as social group activity.

The results regarding panic buying disengagement show that the majority of respondents agree that government intervention, government support, business intervention, business support and all three social groups led to panic buying disengagement. Peers and friends (35%) exerted least influence on panic buying. This can be attributed to the cultural norms of the society where the belief and influence is higher on family when compared to peers and colleagues. When the above panic buying disengagement data is compared with panic buying engagement data shared earlier, it is interesting to note that for the categories of government intervention, business intervention and all three social groups majority of respondents also agreed that these categories led to panic buying which can be attributed to the argument that government interventions have successfully reached a certain number of citizens appeasing them during the pandemic however they have failed to assure a good number of other citizens who feel that these interventions led them to panic buy. Similar arguments can be drawn for business interventions of the retailers and impact of social groups. Given India's cultural diversity and different support of the government, citizens have diverse reaction to this pandemic and hence their self-protective behaviours.

The case of Indonesia

1   The results show that Indonesian people agreed that government intervention, family

2 and relatives, and peers and friends were reasons leading to their panic buying engagement.

3 Since Indonesia government announced the first two cases of COVID-19 on 2nd March 2020,

4 the wave of panic buyers has been hitting supermarkets and drugstores. People who lived in

5 Jakarta shared their experience at crowded supermarkets where customers were buying goods

6 and supplies in bulk for stockpiling, amid concerns over the possibility of a coronavirus

7 outbreak in the capital city (The JakartaPost, 2020). This panic buying phenomenon worsened

8 because of the spread of social concerns (Vivanews, 2020), especially within families,

9 relatives, peers and friends. Their panic buying was attributed to their observation of other

10 people engaging panic buying in the supermarket and dispatching news or pictures of panic

11 buying situations in the supermarkets or drugstores.

12   On the other hand, the majority of respondents in Indonesia disagreed that government

13 and business support were related to panic buying engagement. This is plausible. Indonesia

14 government has decided to allocate budget for handling COVID-19 was IDR 405.1 trillion.

15 The total budget will be allocated IDR 75 trillion for health sector expenditure, IDR 10 trillion

16 for social protection, IDR 70.1 trillion for tax incentives and stimulus for business credit, and

17 IDR 150 trillion for financing the national economic recovery program, including credit

18 restructuring and business guarantee and financing especially in micro, small and medium

19 businesses (the SMEs) (Setkab, 2020), however the government faced some obstacles, for

20 instance how to distribute social protection funding in a good governance and the low middle

21 income labour could gain and utilise the money during this pandemic. Furthermore, the supply

22 of essential items in Indonesia was not a concern, with no sign of shortage of staple foods such

23 as rice, eggs, sugar oils, hand sanitiser, masks, gloves, hand soaps, although prices of some

24 health supplements were dramatically increased (Reuters, 2020).

1   The results show that the Indonesian people agreed that family and relatives was a

2   reason leading to their non-panic buying engagement. In comparison, the respondents also

3   agreed that government intervention, government support, business intervention, and business

4   support influenced their non-panic buying engagement. Indonesia has their own regulation on

5   social and physical distancing, it was not purely lockdown, but the government had announced

6   the large-scale social restrictions and physical distancing policy (PSBB) to contain the

7   worsening COVID-19 outbreak. Large-scale Social Restrictions must be based on

8   epidemiological considerations, the magnitude of the threat, effectiveness, resource support,

9   technical operational, political, economic, social considerations, culture, defence and security

10   (Kemsekneg, 2020). Under PSBB regulation, the public in Indonesia still could do shoppingand

11   travellingto inter-provinces. Therefore, panic buying was not necessary. Furthermore,

12   Indonesian people trusted the economy policy that was developed to help the small medium

13   enterprise (SME) sector affected by the COVID-19 outbreak and ensuring the condition of the

14   community, especially the social safety net to the lowest society and how to protect as much

15   as possible the economic business sector so that they do not experience damage or can survive

16   in difficult situations (VOA Indonesia, 2020).

17   In addition, the business intervention and support were conducive to minimising panic

18   buying. The national police's food task force has issued circular letters to retailers, Association

19   of Indonesian Retail Entrepreneurs, and Association of Indonesian Market Traders to limit

20   purchase of a number of confectionary products such as rice maximum ten kilograms, sugar

21   maximum two kilograms, cooking oil maximum four litre and instant noodles maximum two

22   dozen (Bisnis, 2020). The Minister of Agriculture assured of sufficient stock of eleven staple

23   foods including rice, corn, shallots, garlic, large red chilies, cayenne pepper, beef or buffalo

24   meat, chicken, eggs, sugar, and cooking oil (Kompas, 2020). The social groups'influence also

25   played a significant role in managing panic buying with youtubers, social media influencers,

public figures, celebrities, musicians, artists, fashion designers, non-government organisations, religious organisations, and communities urging the public to stay safe and remain calm. the central government appreciated the social movement from society as a solidarity spirit as Indonesian (Liputan6, 2020). Therefore, panic buying was rarely sighted in this country.

The case of Vietnam

In Vietnam, the majority of those who engaged in panic buying agreed that their behaviour was mainly influenced by reference groups, especially Group 3-social media (59.3%) and Group 1-family and relatives (51.7%). These results show that panic buying behaviour in Vietnam was herd mentality whipped up by social media and news coverage or urged by family, relatives and friends. This reflects Vietnamese culture where people mimic others around them either personally or virtually. However, the majority of respondents disagreed that government support (77.2%) and business support (46.9%) were the factors that led to panic buying. The results show that the assurance of the Vietnamese government and business made residents stay calm and not worry much or stockpile. Vietnam has been successful in addressing the COVID-19 pandemic with timely government measures, therefore residents trust support from government and business. As a result, these factors deterred them from engaging in panic buying.

The majority of those who did not engage in panic buying agreed that they did not stockpile due to government intervention (82.2%), government support (81.7%), business intervention (83.2%), and business support (83.8%). These results are in line with significant trust of residents with early government and business intervention and support in the pandemic. This early success has been attributed to a key factor that Vietnam features a one-party government with a chain of command reaching from the national level down to the village level. It is particularly suited to mobilising resources, implementing public health strategies, and ensuring consistent messages while enforcing regulations stringently. Therefore,

government and business intervention and support were the most important reasons that panic buying was less phenomenal in Vietnam. However, the majority of non-panic buyers (53.4%) disagreed that Group 2-peers and friends influenced their non-panic buying behaviour. The potential reason is that the recommendation from peers and friends were not as persuasive as government and business intervention and support which were on a massive scale.

IMPLICATIONS

Theoretical implications

Given the prevance of panic buying sighted in some countries during the COVID 19 pandemic, the study draws upon self-protection and social influence theories and explored the factors that may influence panic buying engagement or disengagement. The study approached from a non-social-psychological perspective to identify external influences on individual buying behaivours. Despite its exploratory and descriptive nature, has implications for public policy, crisis management, marketing and consumer behaviour research. Despite the intervention undertaken and support by the government or relevant authorities to specifically combat the pandemic per se, these interventions and assurance have side effects on the public's response, panic buying in this case. This finding conforms to self-protection theory (Rogers, 1975). The theory indicates that people tend to adopt behaviours to sustain themselves based on their perceptions and assessment of severity of a crisis, probability of the reoccurrence, or vulnerability, the efficacy of the recommended preventive behavior. In this study, government measures, business interventions and social groups influence were perceived as indicators of sererity of the pandemic. This finding is consistent with that of Arafat et al. (2020a) showing that the assurance from the authorities and the related industries are needed to reduce the perceived fear of scarcity. Panic buying occurs when government announced the lockdown.

The study bridges the two research domains (public policy and consumer research) and provides insights into consumer behaviours during a health crisis such as a pandemic. The demonstrated impact of business intervention and support on consumer behaviours provides a fresh perspective on how contrasting marketing initiatives can exert the similar influence on consumer responses. Conforming to social influence theory (see Naeem, 2020), fear from one can be passed to others as such fear can be contagious and exacerbated by the media and social media, of images and videos of panic buying and empty shelves in stores as (Taylor, 2021). The study shows that the influence of social groups on consumer behaviours vary across different categories or tiers of social grouping as well as across countries indicate that both culture and affinity of social identity must be taken into consideration when analysing the reference group influence on consumer behaviours.

Practical implications

By the same token, the study has practical implications for policy makers, marketers as well as consumers. Since the preventive measures implemented for controlling spread of the virus have impact on the public's spontaneous protective behaviours such as stockpiling, the policy makers must take precautions when executing these interventions. Stockpiling or panic buying is not mere consumer behaviour, but a response to the government's pandemic control and prevention. Such behaviour can be reflective of the effectiveness of crisis management by the relevant authorities. For marketers, interventions such as price increase, imposing purchase limit can be effective in managing stockpiling, these measures may also affect customer response and consumer behaviours in the long run. For instance, price increase during a pandemic can be construed as a consumer rip-off or business manipulation. The purchase limits can be perceived as being unfair to those who normally need more quantity than the imposed limits. Such perception may lead to customer dissatisfaction and subsequent purchase behaviours. Hence, marketers and retailers must optimise marketing intelligence and conduct

thorough research to understand consumers' needs and wants and develop appropriate

strategies for different segments of customers at different occasions. As the study shows that

the intervention and support from the government and businesses did impact on panic buying

engagement or disengagement, those who disagreed with such assurance should give a second

thought of their stockpiling behaviours. To manage the pandemic effectively, the public must

also cooperate with the relevant authorities and not engage in behaviours such as panic buying

or overly expressing their exorbitant behaviours in social media to exacerbate the crisis.

Effectiveness of managing a pandemic is attributed to every individual's pro-social and

citizenship behaviours. Purchase in panic and stockpiling unusual amounts have undesirable

implications for the society in large and crisis management in particular. Excessive buying may

exhaust the purchaser's financial resources, and lead to other unpleasant consequences such as

guilt.

LIMITATIONS AND FUTURE RESEARCH

This research is an exploratory study with lots of descriptive analysis. A few limitations

must be acknowledged. First, the external factors included in this study require a more robust

theoretical foundation. Second, panic buying was phenomenal in a few countries such as the

USA and the UK, the choice of Australia can limit the generalisation of the findings. Third, the

sample size varied across the five countries due to the researchers' financial constraints. A fair

or statistically sound comparison is compromised as a result. Fourth, a causal relationship was

intended but not tested in other four selected countries because of the exploratory nature. We

acknowledge that descriptive analysis is less appealing. However, the findings of this research

can serve as a pilot study for further research on this topic. Given that a second wave of the

pandemic hit some countries like Australia, panic buying was sighted again in the hot spots

such as Melbourne. A longitudinal study should have been developed. Realisation of these

limitations stimulates future research initiatives with a more sound and rigorous research design.

CONCLUSIONS

This paper took an expolaratory approach and identified the external factors of panic buying. Two steps were undertaken in this study. The first identified the relevant factors. The second drew on the findings and performed regression analysis to understand how these factors affect panic buying. The results from regression analysis show that interventions and support from government and businesses influenced panic buying engagement whereas social group had no significant effect. In the case of disengagement in panic buying, government intervention and business support played significant roles. Surprisingly, family and relatives were a deterrent of panic buying rather than a driver given that this stockpiling initiative was construed as a self-protection behaviour during a pandemic. Implications were highlighted for the relevant researchers and practitioners.

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