Exploring panic buying behavior during the COVID-19 pandemic: a developing country perspective

Gurmeet Singh, Asheefa Shaheen Aiyub, Tuma Greig and Samantha Naidu
School of Business and Management, The University of the South Pacific, Suva, Fiji
Aarti Sewak
Griffith University, Brisbane, Australia, and
Shavneet Sharma
School of Business and Management, The University of the South Pacific, Suva, Fiji

Received 1 March 2021
Revised 9 April 2021
24 May 2021
Accepted 4 June 2021

Abstract

Purpose – This paper aims to identify factors that influence customers' panic buying behavior during the COVID-19 pandemic.

Design/methodology/approach – A self-administered questionnaire was distributed to 357 participants in Fiji, and structural equation modeling to analyze the collected data.

Findings – Results indicate that expected personal outcomes is positively associated with customers' attitudes while expected community-related outcomes negatively impact customers' attitudes. Factors such as attitude, subjective norms, scarcity, time pressure and perceived competition were found to positively influence customers' panic buying intention. Furthermore, scarcity and time pressure were confirmed to positively influence perceived competitiveness while perceived social detection risk negatively influences customer's panic buying intention.

Practical implications – The findings highlight the need for better measures to ensure that every customer has access to goods and services and is not deprived of such necessities in times of a crisis. These results will assist store managers and policymakers in introducing better management, social policies and resource utilization mechanisms to mitigate panic buying during the pandemic.

Originality/value – This study's findings contribute to the literature on customer's panic buying behavior during a global pandemic. Research in this area remain scarce, inconsistent and inconclusive. Novel insights are generated as this study is the first to combine the theory of planned behavior, privacy calculus theory and protection motivation theory. Applying these theories allows new relationships to be tested to better understand customer behavior during a global pandemic. With most studies on customer behavior during crises and disasters in developed countries, this study generates new insights by exploring customer behavior in a developing country.

Keywords COVID-19, Panic buying, Theory of planned behavior, Behavioral risk, Perceived behavioral control

Paper type Research paper

1. Introduction

In early 2020, the World Health Organization (WHO) confirmed coronavirus (COVID-19) as a global pandemic (Khanra *et al.*, 2021; Talwar *et al.*, 2021), triggering panic buying across many parts of the globe. As governments announced lockdowns to curb the spread of the virus (Bennett *et al.*, 2020), many people rushed to supermarkets to purchase essential supplies. Mainstream media, social media and scholarly research reported people stockpiling food items, medication and sanitary products out of fear of scarcity (Debiec, 2020; Norberg and Rucker, 2020). Most supermarket shelves were left empty by residents hoarding goods, a behavior that is typically observed at the outset of natural disasters such as cyclones or cold

Disclosure statement: No potential conflict of interest was reported by the author(s).

International Journal of Emerging Markets

1746-8809
DOI 10.1108/IJOEM-03-2021-0308

weather (Kitching, 2016; Rice, 2016). For instance, severe bulk buying of staples was observed among Taiwanese communities during the forecasted arrival of a super typhoon (*Nepartak*) in 2016 (Tsao *et al.*, 2019). Similarly, China's 2003 SARS outbreak caused people to bulk up on rice vinegar and medical products. Other notable public emergency crises in the past included: H1N1 flu in China, Hurricane Sandy in the United States, the nuclear accident in Japan, and Haiti's earthquake (Wang *et al.*, 2014).

This issue highlights the need to understand customer behavior during a global pandemic. Despite organizations and businesses being interested in disaster response, limited knowledge and research is available on the consequences of disaster and crisis on customer buying behavior (Hall *et al.*, 2020). Researchers have highlighted that studies relating to obsessive buying behavior remain scarce, inconsistent and inconclusive (Islam *et al.*, 2021; Iyer *et al.*, 2020). The COVID-19 has left many supermarket shelves empty worldwide, leaving the retail markets with a looming question of how prepared are their counteractive responses (Laato *et al.*, 2020). Most researchers (Islam *et al.*, 2021; Laatoh *et al.*, 2020; Lehberger *et al.*, 2021) found that such an area opens up to more discussion for retail markets to consider, namely, whether the unusual purchases impacted customers financial buying power or why do certain products go out of stock (should there be the redevelopment of policies to mold customers attitudes, subjective norms and perceived behavioral control). The majority of studies on crisis and disaster have been conducted in developed countries like New Zealand (Hall *et al.*, 2020), China, US, Pakistan and India (Islam *et al.*, 2021), Australia (Prentice *et al.*, 2020a, b), Italy, US, UK and China. Characteristics of developing countries, including culture, economy, education and income make customer behavior distinct from developed countries (Slack and Singh, 2020). Therefore, empirical evidence from developing countries is imperative to consider to ascertain the difference in customer behavior during a global pandemic. Due to the threat of the COVID-19 pandemic, this study applies the threat appraisal theory.

Based on this theory, perceived scarcity and perceived time pressure are added to the TPB. As a result of the threat of COVID-19, customers were competing amongst themselves to buy essential items before stocks run out. This led to the addition of perceived competition as another variable to the TPB. As hoarding behavior aimed at maximizing self-interest at the expense of others would not be accepted by society. This led to the addition of social detection risk to the TPB. This comprehensive model of examining customers' panic buying behavior was developed to answer the research question of what factors impact customers' panic buying intention.

The findings of this study will make the following contributions. First, this research contributes to the preceding literature by endowing a comprehensive insight into customers' panic buying during a pandemic. Second, this study offers unique insights by exploring the impact of scarcity brought about due to a global pandemic. This study is the first to investigate this behavior by integrating scarcity and time pressure on competitive customer behavior to purchase items before stock runs out. Third, this study is also the first to look at customers' panic buying behavior in a developing country like Fiji. The theory developing literature has shed light and underpinned testing research models and instruments in diverse context as crucial (Sharma *et al.*, 2020a; Venkatesh *et al.*, 2012). Further to this, this study can be used as a guideline for many Pacific Island nations that share similar characteristics to Fiji for example, Papua New Guinea, Solomon Islands and Vanuatu (Sharma *et al.*, 2021a; Singh *et al.*, 2021). It would be impractical to apply developed nations retail market practices to that of developing nations. Fifth, this study adds towards a better understanding of customers' attitude by adding expected community-related outcomes and expected personal outcomes as antecedents of attitude towards panic buying. Sixth, this study is also the first to examine the impact of social detection risk on customer buying behavior. These contributions will add

to the frontier of knowledge on customer behavior and provide retailers and policymakers assistance in devising strategies to reduce panic buying.

The following sections of this study are as follows: Section 2 discusses the literature and hypotheses proposed by this study. Section 3 highlights the methodology and provides details about the data analysis. Section 4 presents the results of the data analysis. Section 5 provides the discussion of results in comparison to existing literature. Section 6 highlights the limitations and future directions of this research. Section 7 provides the conclusion for this study.

2. Literature review

2.1 Customer panic buying

Panic buying is described as a compulsive behavior whereby customers purchase items in large quantities to avert real or perceived scarcity threats (Herjanto *et al.*, 2021). Existing literature indicates that panic buying can be triggered by neurological factors (anxiety and depression), social factors (social networking) and situational factors (supply scarcity) (Herjanto *et al.*, 2021; Yuen *et al.*, 2020). Studies show that customer buying behavior is significantly influenced by a persons' perception of the threat imposed by the crisis and the fear of product scarcity (Arafat *et al.*, 2020; Yuen *et al.*, 2020). Panic buying acts as a coping mechanism to curb anxiety and increase food security. While some reports condone the hedonic nature of individuals who engage in hoarding behavior, such acts can also be used to express care, protection, and love for themselves and their family (Novemsky, 2020). Some scholars have identified that individuals cultivate a sense of communal personality or togetherness within tight-knit communities, leading to an enriched collaboration and sustenance for other community members (Drury and Alfadhli, 2019; Drury and Reicher, 2012; Reicher and Haslam, 2009). While numerous studies show a significant relationship between psychosocial factors and panic buying behavior, Herjanto *et al.* (2021) call for more researchers to investigate cognitive function's effect on panic buying behavior, especially in different cultural and economic contexts.

2.2 Theoretical framework and research hypotheses

The theory of planned behavior (TPB) has been adopted to illustrate the factors influencing customers' panic buying behavior during COVID-19 in Fiji. Along with the three antecedents of TPB, namely perceived behavioral control, attitude and subjective norms, this study extends the model by adding other antecedents derived from other behavioral theories, namely the privacy calculus theory and the appraisal theory. The privacy calculus theory proposes that individuals compare perceived risks and anticipated benefits (Hassandoust *et al.*, 2021) in a particular situation. Hence, the inclusion of "expected personal outcomes" and "expected community outcomes" is recognized as antecedents to customers' attitude toward panic buying. The appraisal theory depicts a psychological process that an individual undergoes when exposed to an environmental stimulus (Cai *et al.*, 2018). It postulates that when confronted with a stressor, individuals engage in a primary appraisal of its relevance, potential benefits, and potential dangers (Pahayahay and Khalili-Mahani, 2020). Hence, the antecedents perceived scarcity, perceived time pressure, perceived competition and social detection risk were included to understand customers' attitude toward panic buying.

From the review of literature and theories, it was evident that due to the differences in emphasis of these theories, extending antecedents within the TPB could lead to a more holistic understanding of this phenomenon. Therefore, by combining relevant antecedents from TPB, privacy calculus theory and appraisal theory, a comprehensive model of examining customers' panic buying behavior was developed to answer the research question of what factors impact customers' panic buying intention in a global pandemic.

2.2.1 Theory of planned behavior. This study employs the TPB to understand customer behavior. TPB purports that intention to execute a particular behavior is regarded as the best predictor of actual behavioral performance. The intention, in such cases, is determined by perceived behavioral control, attitude and subjective norms (Ajzen, 1991), demonstrating the customers' likelihood of undergoing such behavior (Honkanen and Young, 2015). The higher the intention level, the more likelihood of customers engaging in that behavior. As such, the study seeks to understand customers' intention to engage in panic buying behavior. Several studies have applied the TPB and have ascertained that such intentions can directly and/or indirectly impact customer behavior (Moon, 2021; Sharma *et al.*, 2020b).

Perceived behavioral control is the level of control an individual has over an action based on their past experiences, while attitude is coined as how individuals evaluate and assess the perceived outcomes of their actions. Further to this, subjective norms are defined as how an individual perceives the normative pressure imposed socially by those they consider important (Ajzen, 1991). For this study's purpose, the researchers found that the perceived behavioral control addresses the customers' ability and ease to purchase more products than needed during the pandemic. The researchers viewed attitude as customers' evaluation of the outcome of buying more items in COVID-19 than they need, while subjective norms consider how customers consider the belief of significant members about purchasing more than necessary products during COVID-19.

2.2.2 Privacy calculus perspectives. According to the privacy calculus theory, an individual examines the benefits and risk associated with an action when making a decision. However, the benefit and risk assessment differs according to context. This theory has been used to examine customer behavior during COVID-19 (Sharma *et al.*, 2020b). Therefore, based on this theory, expected personal outcomes of panic buying and potential community-related outcomes panic buying would impact customers' attitude towards panic buying.

2.2.3 Protection motivation theory. According to Rogers's (1975), protection motivation theory (PMT) is used to understand an individual's social behavior. There are two dimensions of the PMT: threat appraisal and coping appraisal. This implies that an individual's protection motivation behavior derived from the perceived threat is caused by threat and coping appraisal. The PMT is has been used to individual's behavior during the COVID-19 pandemic (Itani and Hollebeck, 2021; Kim *et al.*, 2021a, b; Rather, 2021). Therefore, to study the impact of the threat imposed by COVID-19, the PMT is appropriate for this study.

2.2.4 Scarcity. Scarcity has been considered an influential determinant of customer behavior by many theories in customer psychology and behavioral economics. Customers exhibit a stronger intention to acquire scarce products or services (Chung *et al.*, 2017). The sense of scarcity has influenced many customers to engage in impulsive purchases. Advertisers have commonly used messages of scarcity in the form of "limited items remaining" or "last remaining item" to influence customer buying decisions (Chung *et al.*, 2017). In the context of social commerce, scarcity can take the form of a limited quantity of time (Rice and Keller, 2009). Limited quantity implies a restriction to the number of items available for purchase, while time limitation is the restriction of the duration for which a particular product or service is available (Chung *et al.*, 2017). This study looks at the perceived scarcity in terms of quantity and price that arise due to the COVID-19 pandemic. This provides novel insights by being the first study to combine the theory of planned behavior, privacy calculus theory and protection theory to understand customers panic buying behavior during the global COVID-19 pandemic.

2.3 Hypotheses development

2.3.1 Expected personal outcomes. According to Compeau *et al.* (1999), expected personal outcomes refer to the opportunities of rewards or increase in pleasure arising out of engaging in a certain activity. Some customers may perceive greater benefits or rewards resulting from

purchasing commodities before anyone else in the community. Several studies illustrate a positive relationship between expected personal outcome and behavior (Hsi-Peng and Kuo-Lun, 2007, 2009). A study conducted by Raude *et al.* (2020) suggested that because of certain differences in people's beliefs and expectations (personal outcomes), their social behaviors change. In this research context, the pandemic has affected the rate of personal outcome with relation to purchasing various commodities in the marketplace because of the belief that they will get greater benefits. As such, we posit that:

H1. Expected personal outcome positively influences attitude towards panic buying.

2.3.2 Expected community-related outcomes. Existing research indicates that providing support and sharing experiences often unite community members (Chung, 2011; Evans *et al.*, 2012; Kordzadeh *et al.*, 2016). People engage in a particular behavior if it reaps the rewards or benefits. Though individuals can act for their self-interest, their propensity toward communal self-help in emergencies is one of the unsurpassed resources accessible to a society (Danziger, 2020; Drury and Alfadhli, 2019). The study by Sharma *et al.* (2020b) found that the expected personal outcomes are positively associated with information sharing intention during the COVID19 pandemic. According to Kumalawati *et al.* (2021) during a crisis community should engage with one another, be vigilant, protect themselves and adhere to government injunctions. As such, we posit that:

H2. Expected community-related outcomes positively influence attitude towards panic buying.

2.3.3 Attitude. An individual's attitude toward a particular activity and its associated outcome is a major predictor of behavioral intentions (Chandran and Morwitz, 2005). Attitude has commonly been linked to behavioral intention rather than behavior (Sharma *et al.*, 2020a, b). Customer's intention to engage in panic buying can be associated with a heightened sense of financial security and aversion to the risk of scarcity (Chen, 2020; Consumer Council of Fiji, 2020; Talwar *et al.*, 2021), resulting in customers' making irrational decisions at times (Talwar *et al.*, 2021). Laato *et al.* (2020) confirmed that such panic buying can result in self-isolation for most customers. Lehberger *et al.* (2021) reported that people had negative attitude towards stockpiling goods, while others believed there was a need to stockpile. As such, we posit that:

H3. Attitude positively influences panic buying intention.

2.3.4 Subjective norms. Existing literature indicates that subjective norms influence customer preferences and behaviors (Connell and Kozar, 2012; Schultz *et al.*, 2007; White and Simpson, 2013). Fishbein and Ajzen (1975) and Cialdini and Trost (1998) purport that subjective norms set social pressures on an individual to execute a given behavior, whereby that individual is driven to comply with such societal pressures without the potency of laws. Subjective norms influence an individuals' perceptions of the expectations from family members, friends, online discussion forums and colleagues (Raman, 2019).

With regards to COVID-19, to be considered as actively taking part and being societally accepted, individuals feel societal pressure to engage in panic buying. This was evident in New Zealand, United Kingdom, Australia and Singapore, whereby individuals engaged in panic buying with lines stretching out onto the streets in every region (BBC News, 2020; El-Bar, 2020; Lewis, 2020; Yoon, 2020). Several studies indicate that subjective norms positively influence customers' purchase decisions and behavior (Chang and Watchravesringkan, 2018; Homburg *et al.*, 2010; Lee *et al.*, 2009). As such, we posit that:

H4. Subjective norms positively influence panic buying intention.

2.3.5 Perceived behavioral control. Khan (2020) and Long and Khoi (2020) revealed that the pandemic situation might incite customers to procure more reserve goods and services. This

is a result of high customer risk perception and high-risk awareness of the pandemic. During the COVID-19 pandemic, it was evident that most of the health products and other essential products were declared scarce. Panic buying had resulted in an augmentation of demand for the products (Long and Khoi, 2020).

Extant behavioral literature elucidates customer hoarding based on individual experience and sentimental perceptions (Deng *et al.*, 2017; Laatoh *et al.*, 2020; Sterman and Dogan, 2015). These decisions seep from psychological factors, namely, uncertainties about resource depletion, scarcity of goods and services, concern about an individual's inability to cater for shortage situations with their monetary ability, and lastly, the herd behavior that triggers panic. It is believed that customers do not act lucidly when panic spreads all over. The situation in Fiji was no different during the crisis. Customers' engagement in procuring more products and services results in the unbalanced supply market (Laato *et al.*, 2020; Long and Khoi, 2020; Talwar *et al.*, 2021). Many people are deprived of the opportunity to purchase goods as supermarket shelves remain empty. Due to such panic, the market gets more psychologically run-down. As such, a financial liability is placed on every individual (Long and Khoi, 2020). As such, we posit that:

H5. Perceived behavioral control positively influences panic buying intention.

2.3.6 Scarcity influence on perceived competition and panic buying intentions. Preceding literature suggests panic buying is often augmented by the distress, scarcity or unattainability of the product. Customers who witness scarcity or panic buying are more likely to hoard the product instantly before the other customer could purchase it (Debiec, 2020; Norberg and Rucker, 2020). Coskun *et al.* (2020) held that perceived scarcity and competition impacts customers' in-store behavior through human crowding. High levels of human crowding in retail stores can cause customers to experience competition and perceived scarcity. This leads customers to develop aberrant behaviors such as in-store hiding and hoarding. Similarly, during the COVID-19 crisis in Fiji, supermarkets and retail outlets were high on human crowding, leading customers to compete for essential products. Customers were noted to purchase products in large quantities as a result of fear of product scarcity. As such, we posit that:

H6a. Scarcity positively influences perceived competition with customers.

Behaviors such as in-store hoarding and hiding endow customers with opportunities to take ownership of the exceptional and/or scarce product before being procured by other customers (Hamilton *et al.*, 2019). This study postulates that customers are more likely to be actively involved in in-store hoarding behaviors, when procuring products and services during scarcity. The COVID-19 situation in Fiji created an urgency among customers to essential items before they finished. As such, we posit that:

H6b. Scarcity positively influences panic buying intention.

2.3.7 Time pressure influence on perceived competition and panic buying intentions. Researchers purport that customers do not understand all the information and are less likely to concede to choices when encountered with making decisions in limited time and complex situations (Chang and Kukar-Kinney, 2011; Godinho *et al.*, 2016), and as such, develops negative emotions (Sohn and Lee, 2017) and augmented impulse buying for products. However, Oppewal and Holyoake (2004) and Skallerud *et al.* (2009) found that perceived time pressure and impulse buying tendency negatively affect customers, resulting in customers not purchasing if there were competitors nearby.

Time pressure affects supply chains and may create tension and reduce collaboration between customer-customer and customer-retailer (Thomas, 2008), thus creating competition for product acquisition. Such pressure was evident in Fiji, whereby many customers sensed

an urgency to buy products quickly and hastily as the Fijian Government imposed curfew hours and restricted movement. As such, we posit that:

H7a. Time pressure positively influences perceived competition with customers.

Time pressure can influence customer's purchase decisions and buying behavior (Islam *et al.*, 2021). According to Herrington and Capella (1995), customer buying patterns are affected at different levels under varying time pressure circumstances. This notion is supported by Hausman (2000), stating customers who purchase during augmented levels of time pressure do not undertake any proper or prior planning and are simply engaging in impulse buying.

According to Sohn and Lee (2017) time pressure has a great impact on emotions that results in impulsive purchases. Zheng *et al.* (2020) also mentions that time pressure highly influences the ideology of group buying behavior. Additionally, Mitchell and Papavassiliou (1999) argue that time pressure confuses customers because they have to process bulk information with a limited time (Yao and Oppewal, 2015), thus resulting in customers unintentionally increasing their purchasing volume (Prentice *et al.*, 2020b). This notion can be related to the COVID-19 pandemic that saw many Fijian customers rush to purchase essential items in supermarkets. As such, we posit that:

H7b. Time pressure positively influences panic buying intention.

2.3.8 Perceived competition. Crowd shopping leads to perceived competition among many customers; thus customers believe they ought to procure the product before it finishes (Byun and Sternquist, 2011). Drury *et al.* (2013) mentions that such behaviors are due to an emergency or crisis that affects a person's psychological intent to stockpile or panic buy. According to Gupta and Gentry (2016), this leads to competitive behaviors such as in-store hoarding that can be instigated by fear of scarcity and uncertainty of availability (Byun and Sternquist, 2011) of various products and services. Castro *et al.* (2013) suggest that when customers notice that only a few items are left on the shelves, they may infer that the products are scarce (Van Bavel *et al.*, 2020). According to Moran (2020) this behavior can be classified as "following the crowd." This can be implied in the COVID-19 shopping scenario in supermarket chains in Fiji. As such, we posit that:

H8. Perceived competition with customers positively influences panic buying intention.

2.3.9 Perceived social risk. Perceived social risk is when poor product/service choices can result in disapproval or disappointment from family and friends (Maziriri and Chuchu, 2017). Faarup (2010) asserts that there are diverse stages of social risks and some customers are more sensitive than others to what reference groups think, especially teenagers. Newton (1967) argues customers under an augmented amount of social risk tend to need reassurance for their behavior from their reference group when engaging in purchasing a product or service. In the same vein, Almousa (2011) stated that customers seek approval or advice from reference groups to reduce social risks. Kim *et al.* (2009) and Zheng *et al.* (2020) found that product/service recommendations by family and friends are considered an important risk-reduction strategy. Close reference groups often have a major influence on individuals in terms of stockpiling on products during the pandemic (Billore and Anisimova, 2021; Zheng *et al.*, 2020). For instance, issues of stocking up on toilet paper. This concept is relatable to the COVID-19 spending activities, as many customers were purchasing products and services that could have resulted in social risks. As such, we posit that:

H9. Perceived social risk negatively influences panic buying intention.

The following figure represents the conceptual framework for this research, alongside the proposed hypotheses (see Figure 1).

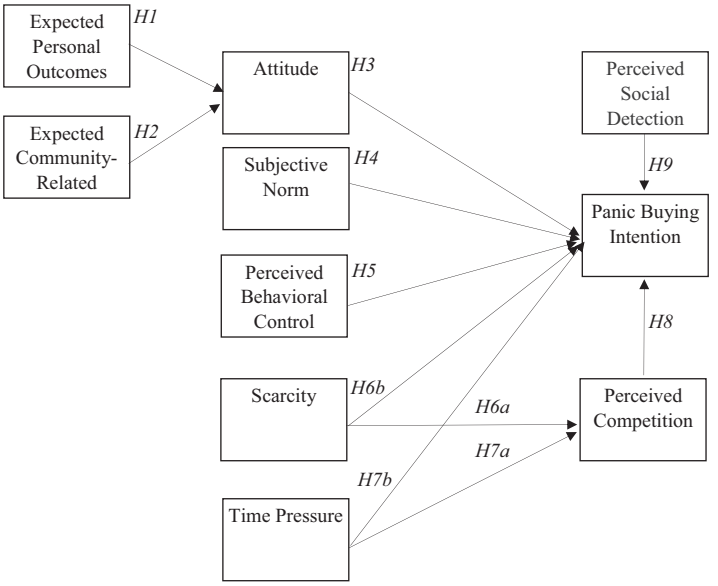

Figure 1.
Conceptual model

3. Research methods

3.1 Participants and procedure

This research aims to identify the factors driving panic buying behavior in Fiji. Fiji is a developing island nation positioned within the South Pacific Region, with a populace of around 0.9 million (Sharma *et al.*, 2020a). Due to the COVID-19 crisis, online data collection was considered the most feasible method. We conducted an online survey using SurveyMonkey. The authors of this study distributed links to the questionnaire using social media, such as Facebook. Using the snowballing technique (Pentina *et al.*, 2016), participants were requested to forward the survey link to people within their networks (Browne, 2005). To fill the questionnaire, respondents had to be more than 18 years of age. Data collection was done in Fiji from May to June 2020. The online survey methodology reduced the chances of social desirability bias (Sharma *et al.*, 2021a, b, c). Other studies have adopted similar methods of data collection (Sharma *et al.*, 2020c, d; Slack *et al.*, 2020a).

3.2 Measures

The measurement instrument scales employed in this study were adopted and revised from preceding studies. A five-point Likert scale was used. This Likert scale ranged from (1) "strongly disagree" to (5) "strongly agree." The attributes such as perceived behavioral control, subjective norms and attitude were formed as TPB constructs and were adopted from (Sharma *et al.*, 2021c). Time pressure was adopted from Oppewal and Holyoake (2004) and Herrington and Capella (1995). Scarcity was adopted from Brock (1968), while the perceived competition was adopted from Gupta and Gentry (2016). Perceived social detection risk was adopted from Wu *et al.* (2019). Expected personal outcome and expected community-related outcome were adopted from Chiu *et al.* (2006).

Appendix provides details for each of the variables.

3.3 Data analysis

SPSS and AMOS were used to perform the data analysis. Analysis of the empirical data was conducted using covariance-based structural equation modelling (CB-SEM) as it is most suited to analyze structured relationships. CB-SEM use also allowed for the linkage between the theory, philosophy and data (Wu *et al.*, 2019). Anderson and Gerbing (1988) recommended the measurement model be first examined using various fit indices. Following this, Anderson and Gerbing (1988) suggested confirmations of reliability and validity of the study's variables be done using appropriate tests. Other studies of customer behavior have employed this approach (Jain *et al.*, 2021; Pitardi and Marriott, 2021).

The data screening procedure involved examining responses where the respondents seemed unengaged and those that contained missing data. The *Z*-score values were used to identify 11 outliers that were removed from the dataset. Confirmation of normality of data was obtained by examining the kurtosis and skewness values. Variance inflation factors and tolerance values confirmed the absence of multicollinearity issues (Hair *et al.*, 2010). The remaining 357 responses after data screening tests were used for subsequent analyses.

The absence of multicollinearity issued was confirmed by variance inflation factors and tolerance values being within the suggested range (Hair *et al.*, 2010). The remaining 404 responses were used to perform subsequent analyses.

3.4 Demographic profile

Comprehensive demographic profiling of the participants was illustrated in Table 1. It shows that 47.9% of the respondents were male while 51% were females. 0.6% of the respondents identified as "others" while the remaining 0.6% did not wish to indicate their gender. An overview of the age distribution indicates that 13.7% were below the age of 20, 50.7% were between the ages of 21–30, 26.1% were between 31 and 40, 7.3% were between 41 and 50, 1.4% were between 51 and 60 while the remaining 0.8% were 61 years and above.

Table 1. Demographic profile

Characteristics	*N*	%
Gender		
Male	171	47.9
Female	182	51
Others	2	0.6
Do not wish to indicate	2	0.6
Age		
Less than 20	49	13.7
21–30 years	181	50.7
31–40 years	93	26.1
41–50 years	26	7.3
51–60 years	5	1.4
61 years and above		0.8
Do not wish to indicate	3	0.8
Qualification		
Primary school	–	–
Secondary school	69	19.3
Diploma/certificate	67	18.8
Bachelors' education	136	38.1
Postgraduate education	51	14.3
Others	16	4.5
Do not wish to indicate	18	5.0

4. Results

4.1 Common method bias

Due to this studying relying on self-reported data, it is critical to examine common method bias (Podsakoff *et al.*, 2003). Using the Harman's single factor test, the variance was computed to be 36%. As this was below the 50% threshold, it was confirmed that the common method bias issue would not influence the findings of this study.

4.2 Measurement model

The Cronbach's alpha tests ascertained the internal consistency of all factors. The following results were found: Expected Personal Outcome (0.918), Expected Community Outcomes (0.870), Attitude (0.933), Subjective Norm (0.958), Perceived Behavioral Control (0.833), Scarcity (0.841), Time Pressure (0.819), Perceived Competition (0.821), Perceived Social Detection Risk (0.898) and Panic Buying Intention (0.943). These results confirmed a high degree of internal consistency. Confirmation of content validity was obtained as the factor loadings of the study's variables were more than 0.60. Convergent validity was also confirmed as the average variance extracted (AVE) were more than 0.50. Following this, the discriminant validity of the constructs was examined. As a result of this test, items PSC4, PSC5 and PBC3 were removed to confirm discriminant validity. The constructs employed in this research had reported the AVE to be higher than the average shared squared variance and maximum shared variance (MSV). Tables 2 and 3 provide the detailed results of the discriminant validity tests and confirmatory factor analysis results. Furthermore, all HTMT values were less than 0.90, thus establishing discriminant validity (Barclay *et al.*, 1995; Bhutto *et al.*, 2020). This result is presented in Table 4. As per the recommendation of Hair *et al.* (2010), a good model fit was confirmed of the measurement model (χ^2/df = 3.10, CFI = 0.93; GFI = 0.90; TLI = 0.92; RMSEA = 0.068).

Following the evaluation of the measurement model, tests performed on the structural model obtained the following results. Expected personal outcome was found to have a significant impact on customers' attitude towards panic buying ($\beta = 0.777$, $p < 0.001$) while expected community-related outcomes was found to have a negative impact ($\beta = -0.219$, $p < 0.001$). Attitude buying ($\beta = 0.664$, $p < 0.001$), subjective norm buying ($\beta = 0.261$, $p < 0.001$), scarcity buying ($\beta = 0.614$, $p < 0.01$), time pressure buying ($\beta = 0.772$, $p < 0.01$), and perceived competition buying ($\beta = 0.423$, $p < 0.001$) was found to have a positive impact on customers' panic buying intention. Scarcity ($\beta = 0.117$, $p < 0.05$) and time pressure ($\beta = 0.617$, $p < 0.001$) were found to positively influence perceived competitiveness. Perceived social detection risk ($\beta = -0.082$, $p < 0.05$) was found to have a negative impact on customer's panic buying intention. This result confirms that all hypotheses apart from H5 were supported by empirical data from this study. Results show that the model explained a significant percentage ($R^2 = 0.57$) of observed variance for this study.

Figure 2 illustrates the results of the data analysis.

5. Discussion and implications

The results demonstrate that expected personal outcome (H1) is the most influential factor that affects the customer's attitude towards panic buying. The expected personal outcome is positively correlated with attitude, meaning that customers will engage in a particular set of activities if it produces personal benefits and rewards (Compeau *et al.*, 1999). The positive correlation between expected personal outcome and attitude towards panic buying indicates that customers will purchase items during a pandemic to secure their physical and mental well-being. If measures are imposed on customer's attitude in panic buying behaviors, it can moderate the amount of purchases a customer can make. The present studies empirical findings are consistent with Lu and Hsiao (2007) and Papadopoulous *et al.* (2013) study. Lu

	CR	AVE	MSV	MaxR(H)	PSC	EPO	F1	ATT	SBN	PBC	TPR	PCM	PBI	SDR
PSC	0.75	0.5	0.1	0.765	*0.709*									
EPO	0.92	0.74	0.64	0.927	0.317	*0.86*								
F1	0.87	0.63	0.22	0.874	−0.02	−0.4	*0.793*							
ATT	0.93	0.74	0.64	0.941	0.22	0.4	−0.47	*0.86*						
SBN	0.96	0.82	0.6	0.963	0.213	0.29	−0.29	0.27	*0.91*					
PBC	0.71	0.55	0.11	0.716	−0.03	0.17	−0	0.33	0.3	*0.74*				
TPR	0.79	0.56	0.41	0.822	0.287	0.55	−0.14	0.51	0.27	0.16	*0.75*			
PCM	0.77	0.57	0.41	0.892	0.262	0.28	0.025	0.33	0.38	0.19	0.34	*0.75*		
PBI	0.94	0.77	0.64	0.949	0.171	0.22	−0.42	0.3	0.43	0.32	0.59	0.43	*0.88*	
SDR	0.9	0.75	0.14	0.908	−0.04	0.11	0.128	0.1	0.16	0.27	0.35	0.38	0.23	*0.87*

Table 2.
Discriminant validity

		SL	CR	SMC	AVE	MSV
Expected personal outcome	EPO1	0.898	0.919	0.807	0.739	0.639
	EPO2	0.892		0.796		
	EPO3	0.869		0.756		
	EPO4	0.772		0.597		
Expected community outcome	ECO1	0.759	0.871	0.576	0.629	0.222
	ECO2	0.822		0.675		
	ECO3	0.767		0.589		
	ECO4	0.822		0.675		
Attitude	ATT1	0.832	0.934	0.692	0.738	0.642
	ATT2	0.854		0.729		
	ATT3	0.914		0.835		
	ATT4	0.898		0.806		
	ATT5	0.793		0.629		
Subjective norm	SBN1	0.854	0.958	0.729	0.822	0.597
	SBN2	0.912		0.831		
	SBN3	0.938		0.881		
	SBN4	0.937		0.877		
	SBN5	0.889		0.789		
Perceived behavioral control	PBC1	0.700	0.705	0.490	0.546	0.107
	PBC2	0.778		0.605		
	PBC3	0.604		0.365		
	PSC1	0.937		0.878		
	PSC2	0.620		0.385		
Time pressure	TPR1	0.834	0.792	0.695	0.564	0.410
	TPR2	0.803		0.645		
	TPR3	0.591		0.350		
Perceived competitiveness	PCM1	0.301	0.770	0.090	0.565	0.410
	PCM2	0.889		0.791		
	PCM3	0.902		0.814		
Social detection risk	SDR1	0.812	0.900	0.659	0.750	0.144
	SDR2	0.907		0.822		
	SDR3	0.877		0.769		
Panic buying intention	PBI1	0.906	0.944	0.821	0.771	0.642
	PBI2	0.855		0.731		
	PBI3	0.922		0.849		
	PBI4	0.892		0.795		
	PBI5	0.811		0.658		

Table 3.
Confirmatory factor analysis results

	PSC	EPO	F1	ATT	SBN	PBC	TPR	PCM	PBI	SDR
PSC										
EPO	0.36									
F1	0.04	0.36								
ATT	0.53	0.26	0.28							
SBN	0.25	0.12	0.69	0.07						
PBC	0.13	0.65	0.09	0.29	0.03					
TPR	0.41	0.52	0.44	0.28	0.55	0.37				
PCM	0.59	0.66	0.35	0.17	0.51	0.55	0.04			
PBI	0.17	0.27	0.49	0.31	0.33	0.38	0.54	0.62		
SDR	0.26	0.26	0.09	0.31	0.21	0.53	0.29	0.31	0.25	

Table 4.
HTMT analysis

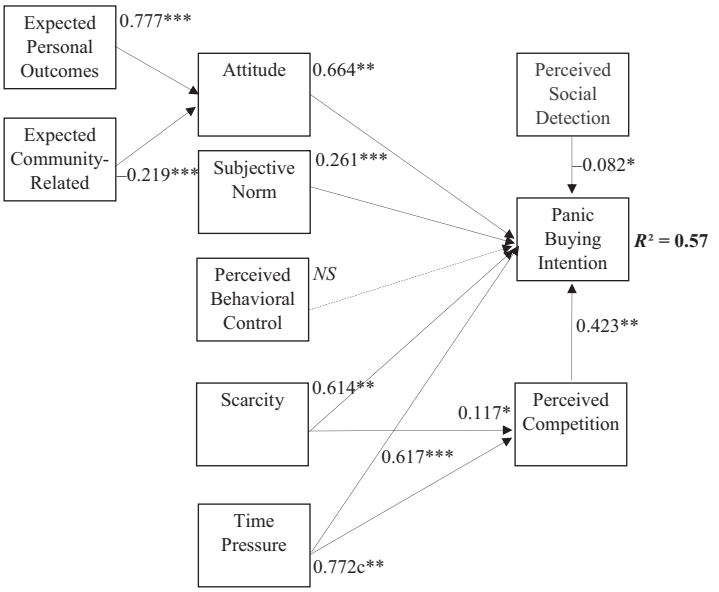

Figure 2.
Structural model

and Hsiao (2007) and Papadopoulous *et al.* (2013) upheld that expected personal outcomes demonstrated stronger effects on customer attitudes (behavioral intentions), inclining customers to use blogs more to expect rewards.

The expected community-related benefit (H2) is found to have a negative impact on attitudes. The customers did not perceive that their act of buying more than necessary would harm or disadvantage other customers. The present study noted that while personal expected outcomes may augment and result in expected community-related benefits, the results were not consistent with Danziger (2020). Danziger (2020) found that community responses with regards to COVID-19 were positive as communities offered help to the less privileged. For instance, volunteer groups were formed to endow services such as grocery shopping, assisting disabled people and their families and introducing legislative changes to accommodate such an impact. Expected community-related benefits may likely depend on local environmental factors. Fiji has encountered a limited number of COVID-19 cases; thus, panic buying was witnessed to a minimum compared to Australia and New Zealand (Kumar, 2020; Schultz, 2020).

Our empirical results also indicate that attitude (H3) has a significant and positive relationship in determining panic buying behavior. This implies that an individual's attitude towards a certain activity will influence its uptake (Ajzen, 1991). This study highlighted that in the context of a pandemic, the concern for security, health, and ability to cater to the needs of themselves and their family members' rests upon the customer. Customers perceive that the pandemic has shaped their attitudes in purchasing more essential products for their benefits than that of the community (Laroche *et al.*, 2001). The present study's empirical findings are consistent with the preceding studies, namely, Kim *et al.* (2021a, b), Liu *et al.* (2021), Yadav and Pathak (2016). These studies demonstrated that there is a positive relationship between attitude and customer behavior in food service delivery during COVID-19, post-pandemic outbound travel for Chinese travelers, and organic food in a developing nation.

The subjective norms (H4) have shown a positive yet weak significant relationship in defining panic buying behavior. Prior research indicates that people engage in activities that are deemed acceptable by society (San-Martin *et al.*, 2015; Slade *et al.*, 2015). However, our empirical results indicate that Fiji's panic purchases are likely triggered by personal concern (i.e. expected personal outcomes) compared to subjective norms. The empirical evidence has shown that perceived behavioral control has a negative impact on panic buying intentions. Customers act irrationally in a pandemic. Fijian customers purchased more products than they needed, which later resulted in customers requesting excess products bought to be returned to the supermarkets.

Scarcity (H6b) had been demonstrated to have a positive and strong impact on panic buying intentions. During pandemics, there is a lingering thought of a lack of resources to cater to every individuals' needs and wants. The feeling of urgency rises among customers as customers procure products immediately. Hence, regulating customers' freedom in purchasing decisions (Aggarwal *et al.*, 2011). Not only does it embeds fear of losing out on items in a pandemic, it also facilitates the need for customers to make prompt decisions. Stringent measures to normalize how products are purchased can reduce scarcity and equalize the distribution of goods and services among customers. Unlike the impact on panic buying intentions, scarcity has recorded a positive yet slight significant impact on the perceived competition (H6a). Scarce resources were recognized as the major influential factor in leading competition (Nichols, 2012). The customers' sentimental and behavioral can be affected by the retail store's scarcity situations (Byun and Sternquist, 2008; Nichols, 2010). As such, retailers could urge customers to stimulate competition among customers, allowing customers, to procure scarce products instantly (Byun and Sternquist, 2008; Gupta and Gentry, 2016). It is anticipated that faced with limited time and quantity offers, or customers developing uncertainty about a product, customers could engage in impulsive buying (Byun and Sternquist, 2008; Gupta and Gentry, 2016). Studies such as Islam *et al.* (2021) and Lehberger *et al.* (2021) illustrate that scarcity embeds fear in customers, causing them to purchase impulsively and obsessively during a COVID-19 situation. These findings were persistent with our present study's empirical results.

Empirical evidence illustrates that time pressure (H7b) has a positive and significant relationship with panic buying intentions. Prior research has indicated that when customers are being conflicted with time pressure, they normally avoid researching about a product (Konus *et al.*, 2008; Reutskaja *et al.*, 2011; Silayoi and Speece, 2004). Regarding the present study, customers will simply make purchasing decisions without considering whether their act is accurate. It can be noted that customers feel they have to be quick to make purchases to secure necessary items.

Similarly, time pressure also has a positive and significant relationship with perceived competition (H7a), and this study's empirical findings are consistent with preceding studies (Godinho *et al.*, 2016; Javed and Javed, 2015). The preceding studies illustrated that time pressure constrains customer decisions; mandating customers to make decisions within a stipulated time frame. Further to this, Javed and Javed (2015) research discovered that customers under time pressure are more inclined towards attractive product packaging and competition.

The present study highlights that customers wish to attain items, creating a demand for items in a pandemic. While the supply may be limited due to border restrictions, as we had noticed during the COVID-19 pandemic, such restrictions can put customers in jeopardy, triggering fear of losing out on essential commodities during a crisis. Time pressure also affects purchase decisions (Moon and Lee, 2013). Augmentation in purchasing hastening and intention can seep from time restrictions (Aggarwal and Vaidyanathan, 2003), resulting in customers making hasty decisions. Better management of such practices can be developed if governments place restrictions in supermarkets on the quantity purchased by individual

customers. Not only this practice will reduce panic buying, but it will also help to stimulate the economy to avoid scarcity and competition and create a form of food security.

Perceived social risk has shown a negative impact on customers' panic buying intentions (H9). Empirical findings of existing studies (Almousa, 2011; Prentice *et al.*, 2020a, b) have acknowledged that customers who are not aware of how to engage in such a crisis may mimic other individuals. The present study illustrates that often perceived social risks do not result in panic buying. The COVID-19 pandemic may result in social embarrassment due to the customers' poor choices to sustain themselves. Since reference groups' recommendations can result in customers feeling either humiliated or content about their purchases (Amin and Mahasan, 2014), customer believe that purchasing during the pandemic may result in social risks. The thoughts of reference groups become a concern for the customer, which later determines his/her actions.

Empirical evidence shows that perceived competition (H8) positively and significantly relates to customers' panic buying intentions. Existing literature indicates that human crowding in shops often leads to the perception of competition (Byun and Mann, 2011; Nichols, 2010), upholding a positive relation. The present study depicts that the perception of the scarcity of goods and services may result in competition. Customers felt that they were in competition with other shoppers, but they believed that customers should pay attention to the buying patterns of other customers.

5.1 Theoretical implications

This paper has made several theoretical contributions. First, this research contributes to the preceding literature by endowing a comprehensive insight into customers' panic buying during a pandemic. Despite organizations and businesses interested in disaster response, limited knowledge and research is available on the consequences of disaster and crisis on customer buying behavior (Hall *et al.*, 2020). Researchers have highlighted that studies relating to obsessive buying behavior remain scarce, inconsistent and inconclusive (Islam *et al.*, 2021; Iyer *et al.*, 2020). With the TPB, the theory can shed light on how retailers and researchers can forecast customer behaviors in such situations and cater for their unusual demands. The COVID-19 has left many supermarket shelves empty across the world, leaving the retail markets with a looming question of how prepared are their counteractive responses.

Second, the impact of scarcity on customers' consumption patterns brought about through promotional messages (Islam *et al.*, 2021). This study offers unique insights by exploring the impact of scarcity brought about due to a global pandemic. This study is the first to investigate this behavior by integrating scarcity and time pressure on competitive customer behavior to purchase items before stock runs out. Most researchers (Islam *et al.*, 2021; Laatoh *et al.*, 2020; Lehberger *et al.*, 2021) found that such an area opens up to more discussion for retail markets to consider, namely, whether the unusual purchases impacted customers financial buying power or why do certain products go out of stock (should there be redevelopment of policies to mold customers attitudes, subjective norms and perceived behavioral control).

Third, the majority of studies on crisis and disaster have been done in developed countries like New Zealand (Hall *et al.*, 2020), China, US, Pakistan and India (Islam *et al.*, 2021), Australia (Prentice *et al.*, 2020a, b), Italy, US, UK, China. This study is also the first to look at customers' panic buying behavior in a developing country like Fiji. The theory developing literature has shed light and underpinned testing research models and instruments in diverse context as crucial (Sharma *et al.*, 2020a, b, c, d; Venkatesh *et al.*, 2012). Such an undertaking makes it imperative to consider whether the impact suffered by developed nations is similar to that of the developing nation with fewer cases of COVID-19. This research provides insight that managers and state players can use to strengthen customer, financial and health relations.

Further to this, this study can be used as a guideline for many Pacific Island nations that share similar characteristics to Fiji, for example Papua New Guinea, Solomon Islands and Vanuatu (Slack *et al.*, 2020b). It would be impractical to apply developed nations retail market practices to that of developing nations. Panic buying had resulted in customers spending unnecessarily on items that were not immediately required. Unlike most countries, many customers in Fiji had requested if they could return the products in exchange for money (Kumar, 2020).

Fourth, it is useful to note that the expected community-related outcomes depicted a negative relation in determining attitude, unlike the expected personal outcomes. While the literature has supported community members having similar concerns (Chung, 2011; Evans *et al.*, 2012) and engaging in particular behaviors to reap benefits, this study had illustrated otherwise. It makes it noteworthy to consider that Fijian citizens had reacted differently to the rise of COVID-19. Several countries have witnessed that panic buying had left many supermarket stores empty (Chen, 2020). However, Fiji had witnessed a few items running temporarily low but did not encounter any shortages (Kumar, 2020). This makes a noteworthy difference that stands out in this research. It can be purported that the manner in which the customers and the nation reacts to panic buying influences customer behavior.

5.2 Managerial implications

The following managerial and practical implications can be derived from the findings of this study. This study confirms that customers' attitude towards panic buying is a key factor influencing such behavior. Government and retailers need to implement strategies and policies to ensure such attitudes towards panic buying are changed. Messages to reduce panic buying must be well thought out to not further exacerbate the problem. Ideally, all messages should be pilot tested before being released to the public at large. Instead of "Do not panic about grocery shopping!" customers could be presented with messages that do not contain negations; for example, "Shop sensibly for groceries." Public education is also critical. Government should ensure that facts about panic buying be presented to customers. Customers should be advised to avoid large crowds because of panic buying by simply waiting for a few days. Government can also work with retailers to ensure that online shopping and delivery options are available to customers. Such strategies will eliminate the time pressure motivator of panic behavior identified in this study. Large crowds gathering in supermarkets will be avoided, and the risk of COVID-19 transmission is reduced.

The confirmation of subjective norms shows significant others' actions on an individual's panic buying actions. Social influencers and family leaders highlight the negative consequences of panic buying on less fortunate members of society. Feeling of kinship and altruism must be emphasized to ensure that competition among shoppers is reduced and cooperation fostered. The expected personal outcome was considered the most influential factor in this study. This result highlights how customer behavior driver my self-interest leads to customers engaging in hoarding behavior. Despite it being a natural tendency for individuals to capitalize on opportunities with the fear of missing out on not purchasing essential items in the future. Therefore, the government and retailers need to work together to give customers assurance about stock availability and strategies that are in place to ensure that all individuals have access to necessary items. False news or rumors about stock outage circulating on social media sites needs to be quickly corrected by the government making public statements to make facts clear for customers. Retailers should also provide customers with honest information about stock arrival to put customers more at ease. By eliminating the fear of missing out on customers, panic buying behavior can be prevented.

The results demonstrated that the expected community outcomes had a negative relationship with customers' panic buying. This finding highlights the need for government

and policymakers to ensure that customers know the consequences of their panic buying behavior. Particularly, panic buying in metropolitan areas can lead to a lack of necessities and food shortage for remote communities. Smaller stores are faced with "supply challenges" due to being unable to secure items for sale. Awareness can be created of these issues through advertisements and media coverage of the issues faced by members of society who are unable to make purchases of necessary items due to customers hoarding behavior. This will also create a situation where customers are hesitant to engage in panic buying behavior due to the presence of social detection risk.

6. Research limitations and future directions

Despite this study being conducted meticulously, some limitations need to be highlighted. These limitations provide a strong basis for future studies. First, this study adopted a cross-sectional design that is based on responses that are self-reported and subject to biases arising due to the methodology and lack of information needed to confirm causality. Future studies can address this limitation by adopting an experimental or longitudinal research design. Second, despite this study's resulting model having a high predictive power (57%), there is still room to improve this. Other factors can be added to understand customer panic buying intention better and improve the model's predictive power. Third, generalization of the results should be made with caution as data collection for this study employed a non-probability base sampling technique. Future studies can attempt to employ a mix-methodological approach to research to gain more valuable insights. Additionally, culture has been found to significantly behavior (Sharma *et al.*, 2020b). Future studies can incorporate Hofstede's theory of culture to explore the impact of cultural dimensions (individualism/collective and uncertainty avoidance) to investigate the impact on panic buying behavior.

7. Conclusion

The purpose of this paper is to identify factors that influence customer panic buying behavior during the COVID-19 crisis. Through the participation of 357 respondents in the survey, this study confirmed that perceived personal outcome is positively associated while the expected community-related outcome is negatively associated with customers' attitude towards panic buying. Scarcity and time pressure were found to be positively associated with customers' perceptions of competition with other customers. The study also confirmed the positive association of attitude, subjective norms, perceived behavioral control, scarcity, time pressure and perceived competition on customers' panic buying intention. Perceived social detection risk was found to be negatively associated with customers' panic buying intention. This study's resulting model has a high predictive power (57%) in predicting customers' panic buying behavior. These findings contribute to the scarce literature on customer behavior during pandemic times and provide valuable insights to retailers and policymakers in devising strategies to avoid panic buying situations. Despite these contributions made by this study, more studies are needed on understanding customer behavior when faced with unprecedented challenges.

References

Aggarwal, P., Jun, S.Y. and Huh, J.H. (2011), "Scarcity messages: a consumer competition perspective", *Journal of Advertising*, Vol. 40 No. 3, pp. 19-30, doi: 10.2753/JOA0091-3367400302.

Aggarwal, P. and Vaidyanathan, R. (2003), "Use it or lose it: purchase acceleration effects of time-limited promotions", *Journal of Consumer Behavior*, Vol. 2 No. 4, pp. 393-403, doi: 10.1002/cb.116.

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211, doi: 10.1016/0749-5978(91)90020-T.

Almousa, M. (2011), "Perceived risk in apparel online shopping: a multidimensional perspective", *Canadian Social Science*, Vol. 7 No. 2, pp. 23-31, doi: 10.3968/j.css.1923669720110702.003.

Amin, S. and Mahasan, S.S. (2014), "Relationship between consumer perceived risks and consumer trust: a study of Sainbury store", *Middle-East Journal of Scientific Research*, Vol. 19 No. 5, pp. 647-655, doi: 10.5829/idosi.mejsr.2014.19.5.13624.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-423, doi: 10.1037/0033-2909.103.3.411.

Arafat, S.M.Y., Kar, S.K., Menon, V., Kaliamoorthy, C., Mukherjee, S., Alradie-Mohamed, A., Sharma, P., Marthoenis, M. and Kabir, R. (2020), "Panic buying: an insight from the content analysis of media reports during COVID-19 pandemic", *Neurology Psychiatry and Brain Research*, Vol. 37, pp. 100-103, doi: 10.1016/j.npbr.2020.07.002.

Barclays, D.W., Higgins, C. and Thompson, R. (1995), "The partial least squares (PLS) approach to causal modeling: personal computer adaptation and use as illustration", *Technology Studies*, Vol. 2 No. 2, pp. 285-309.

BBC News (2020), "Coronavirus: how do I get a food parcel?", available at: https://www.bbc.com/news/business-51737030 (accessed 11 April 2020).

Bennett, N.J., Finkbeiner, E.M., Ban, N.C., Belhabib, D., Jupiter, S.D., Kittinger, J.N., Mangubhai, S., Scholten, J., Gill, D. and Christie, P. (2020), "The COVID-19 pandemic, small-scale fisheries and coastal fishing communities", *Coastal Management*, Vol. 48 No. 4, pp. 336-347, doi: 10.1080/08920753.2020.1766937.

Bhutto, T.A., Farooq, R., Talwar, S., Awan, U. and Dhir, A. (2020), "Green inclusive leadership and green creativity in the tourism and hospitality sector: serial mediation of green psychological climate and work engagement", *Journal of Sustainable Tourism*, pp. 1-22, doi: 10.1080/09669582.2020.1867864.

Billore, S. and Anisimova, T. (2021), "Panic buying research: a systematic review of literature review and future research agenda", *International Journal of Conusmer Studies*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1111/ijcs.12669.

Brock, T.C. (1968), "Implications of commodity theory for value change", in Greenwald, A.G., Brock, T.C. and Ostrom, T.M. (Eds), *Psychological Foundations of Attitudes*, Academic Press, New York.

Browne, K. (2005), "Snowball sampling: using social networks to research non-heterosexual women", *International Journal of Social Research Methodology*, Vol. 8 No. 1, pp. 47-60, doi: 10.1080/1364557032000081663.

Byun, S.E. and Mann, M. (2011), "The influence of others: the impact of perceived human crowding on perceived competition, emotions, and hedonic shopping value", *Clothing and Textiles Research Journal*, Vol. 29 No. 4, pp. 284-297, doi: 10.1177/0887302X11422820.

Byun, S.E. and Sternquist, B. (2008), "The antecedents of in-store hoarding: measurement and application in the fast-fashion retail environment", *International Review of Retail Distribution and Consumer Research*, Vol. 18, pp. 133-147, doi: 10.1080/09593960701868241.

Byun, S.E. and Sternquist, B. (2011), "Fast fashion and in-store hoarding-the drivers, moderator, and consequences", *Clothing and Textiles Research Journal*, Vol. 29 No. 3, pp. 187-201, doi: 10.1177/0887302X11411709.

Cai, R.R., Lu, L. and Gursoy, D. (2018), "Effect of disruptive customer behaviors on others' overall service experience: an appraisal theory perspective", *Tourism Management*, Vol. 69, pp. 330-344, doi: 10.1016/j.tourman.2018.06.013.

Castro, I.A., Morales, A.C. and Nowlis, S.M. (2013), "The influence of disorganized shelf displays and limited product quantity on consumer purchase", *Journal of Marketing*, Vol. 77 No. 4, pp. 118-133, doi: 10.1509/jm.11.0495.

Chandran, S. and Morwitz, V.G. (2005), "Effects of participative pricing on consumers' cognitions and actions: a goal theoretic perspective", *Journal of Consumer Research*, Vol. 32 No. 2, pp. 249-259, doi: 10.1086/432234.

Chang, A.C. and Kukar-Kinney, M. (2011), "The effects of shopping aid usage on consumer purchase decision and decision satisfaction", *Asia Pacific Journal of Marketing and Logistics*, Vol. 23 No. 5, pp. 745-754, doi: 10.1108/13555851111183110.

Chang, H.J. and Watchravesringkan, K. (2018), "Who are sustainably minded apparel shoppers? An investigation to the influencing factors of sustainable apparel consumption", *International Journal of Retail and Distribution Management*, Vol. 46 No. 2, pp. 148-162, doi: 10.1108/IJRDM-10-2016-0176.

Chen, L. (2020), "Supermarkets urge people to stop buying online", available at: https://www.rnz.co.nz/news/national/412425/supermarkets-urge-people-to-stop-panic-buying (accessed 3 July 2020).

Chiu, C.-M., Hsu, M.-H. and Wang, E.T.G. (2006), "Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories", *Decision Support Systems*, Vol. 42 No. 3, pp. 1872-1888, doi: 10.1016/j.dss.2006.04.001.

Chung, J.E. (2011), "Social networking in online support groups for health: how online social networking benefits patients", *Journal of Health Communication*, Vol. 19 No. 6, pp. 639-659, doi: 10.1080/10810730.2012.757396.

Chung, N., Song, H.G. and Lee, H. (2017), "Consumers' impulsive buying behavior of restaurant products in social commerce", *International Journal of Contemporary Hospitality Management*, Vol. 29 No. 2, pp. 709-731, doi: 10.1108/IJCHM-10-2015-0608.

Cialdini, R.B. and Trost, M.R. (Eds) (1998), *Social Influence: Social Norms, Conformity, and Compliance*, McGraw-Hill, Boston.

Compeau, D.R., Higgins, C.A. and Huff, S. (1999), "Social cognitive theory and individual reactions to computing technology: a longitudinal study", *MIS Quarterly*, Vol. 23 No. 2, pp. 145-158, doi: 10.2307/249749.

Connell, K.Y.H. and Kozar, J.M. (2012), "Social normative influence: an exploratory study investigating its effectiveness in increasing engagement in sustainable apparel-purchasing behaviors", *Journal of Global Fashion Marketing*, Vol. 3 No. 4, pp. 172-179, doi: 10.1080/20932685.2012.10600847.

Consumer Council of Fiji (2020), "COVID-19- Council urges consumers to be considerate", available at: http://www.consumersfiji.org/press-releases/press-releases-2020/covid-19-council-urges-consumers-to-be-considerate (accessed 2 July 2020).

Coskun, M., Gupta, S. and Burnaz, S. (2020), "Store disorderliness effect: shoppers' competitive behaviours in a fast-fashion retail store", *International Journal of Retail and Distribution Management*, Vol. 48 No. 7, pp. 763-779, doi: 10.1108/IJRDM-06-2019-0193.

Danziger, P.M. (2020), *After Panic Buying Subsides, Will Coronavirus Make Lasting Changes to Consumer Psychology?*, Forbes, available at: https://www.forbes.com/sites/pamdanziger/2020/03/08/first-comes-panic-buying-but-afterwards-will-the-coronavirus-leave-lasting-changes-to-consumer-psychology/?sh=369f801677e8 (accessed 4 August 2020).

Debiec, J. (2020), "Evolution explains why we're falling victim to fear contagion as COVID-19 spreads", available at: https://www.fastcompany.com/90488140/mit-has-an-ambitious-plan-to-detect-if-youve-been-exposed-to-the-coronavirus (accessed 10 April 2020).

Deng, Y., Wang, M. and Yousefpour, R. (2017), "How do people's perceptions and climatic disaster experiences influence their daily behaviors regarding adaptation to climate change? – a case study among young generations", *The Science of the Total Environment*, Vol. 581, pp. 840-847, doi: 10.1016/j.scitotenv.2017.01.022.

Drury, J. and Alfadhli, K. (Eds) (2019), *Social Identity, Emergencies and Disasters*, Royal College of Psychiatrists, London.

Drury, J., Novelli, D. and Stott, C. (2013), "Representing crowd behaviour in emergency planning guidance: 'mass panic' or collective resilience?", *Resilience*, Vol. 1 No. 1, pp. 18-37, doi: 10.1080/21693293.2013.765740.

Drury, J. and Reicher, S. (2012), "Collective action and psychological change: the emergence of new social identities", *British Journal of Social Psychology*, Vol. 39, pp. 579-604, doi: 10.1348/014466600164642.

El-Bar, K. (2020), *UK Gov't Urges End to Panic Buying as Virus Deaths Hit 233*, Anadolu Agency, available at: https://www.aa.com.tr/en/europe/uk-govt-urges-end-to-panic-buying-as-virus-deaths-hit-233/1774353# (accessed 4 April 2020).

Evans, M., Donelle, L. and Hume-Loveland, L. (2012), "Social support and online postpartum depression discussion groups: a content analysis", *Patient Education and Counseling*, Vol. 87 No. 3, pp. 402-410, doi: 10.1016/j.pec.2011.09.011.

Faarup, P.K. (2010), *The Marketing Framework: International Marketing and Sales*, Fairchild Books, London.

Fishbein, M. and Ajzen, I. (1975), *Belief, Attitudes, Intention and Behaviour: An Introduction to Theory and Research*, Addison-Wesley, Massachusetts.

Godinho, S., Prada, M. and Garrido, M.V. (2016), "Under pressure: an integrative perspective of time pressure impact on consumer decision-making", *Journal of International Consumer Marketing*, Vol. 28 No. 4, pp. 251-273, doi: 10.1080/08961530.2016.1148654.

Gupta, S. and Gentry, J.W. (2016), "The behavioural responses to perceived scarcity – the case of fast fashion", *International Review of Retail Distribution and Consumer Research*, Vol. 26 No. 3, pp. 260-271, doi: 10.1080/09593969.2016.1147476.

Hair, F.J., Black, W.C., Babin, B.J. and Anderson, R.E. (2010), *Multivariate Data Analysis*, 7th ed., Prentice Hall, New Jersey.

Hall, M.C., Prayag, G., Fieger, P. and Dyason, D. (2020), "Beyond panic buying: consumption displacement and COVID-19", *Journal of Service Management*, Vol. 32 No. 1, pp. 113-128, doi: 10.1108/JOSM-05-2020-0151.

Hamilton, R., Thompson, D., Sterling, B., Chaplin, L.N., Griskevicius, V., Goldsmith, K. and Zhu, M. (2019), "The effects of scarcity on consumer decision journeys", *Journal of the Academy of Marketing Science*, Vol. 47, pp. 532-550, doi: 10.1007/s11747-018-0604-7.

Hassandoust, F., Akhlaghpour, S. and Johnston, A.C. (2021), "Individuals' privacy concerns and adoption of contact tracing mobile applications in a pandemic: a situational privacy calculus perspective", *Journal of the American Medical Informatics Association*, Vol. 28 No. 3, pp. 463-471, doi: 10.1093/jamia/ocaa240.

Hausman, A. (2000), "A multi-method investigation of consumer motivations in impulse buying behaviour", *Journal of Consumer Marketing*, Vol. 17 No. 5, pp. 403-419, doi: 10.1108/07363760010341045.

Herjanto, H., Amin, M. and Purington, E.F. (2021), "Panic buying: the effects of thinking style and situational ambiguity", *Journal of Retailing and Consumer Services*, Vol. 60, doi: 10.1016/j.jretconser.2021.102455.

Herrington, J.D. and Capella, L.M. (1995), "Shopper reactions to perceived time pressure", *International Journal of Retail and Distribution Management*, Vol. 23 No. 12, pp. 13-20, doi: 10.1108/09590559510103963.

Homburg, C., Wieseke, J. and Kuehnl, C. (2010), "Social influence on salespeople's adoption of sales technology: a multilevel analysis", *Journal of the Academy of Marketing Science*, Vol. 38, pp. 159-168, doi: 10.1007/s11747-009-0157-x.

Honkanen, P. and Young, J.A. (2015), "What determines British consumers' motivation to buy sustainable sea-food?", *British Food Journal*, Vol. 117 No. 4, pp. 1289-1302, doi: 10.1108/BFJ-06-2014-0199.

Hsi-Peng, L. and Kuo-Lun, H. (2007), "Understanding intention to continuously share information on weblogs", *Internet Research*, Vol. 17 No. 4, pp. 345-361, doi: 10.1108/10662240710828030.

Hsi-Peng, L. and Kuo-Lun, H. (2009), "Gender differences in reasons for frequent blog posting", *Online Information Review*, Vol. 33 No. 1, pp. 135-156, doi: 10.1108/14684520910944436.

Islam, T., Pitafi, H.A., Arya, V., Wang, Y., Akhtar, N., Mubarik, S. and Xiaobel, L. (2021), "Panic buying in the COVID-19 pandemic: a multi-country examination", *Journal of Retailing and Consumer Services*, Vol. 59, 102357, doi: 10.1016/j.jretconser.2020.102357.

Itani, O.S. and Hollebeek, L.D. (2021), "Light at the end of the tunnel: visitors' virtual reality (versus in-person) attraction site tour-related behavioral intentions during and post-COVID-19", *Tourism Management*, Vol. 84, 104290, doi: 10.1016/j.tourman.2021.104290.

Iyer, G.R., Blut, M., Xiao, S.H. and Grewal, D. (2020), "Impulse buying: a meta-analytic review", *Journal of the Academy of Marketing Science*, Vol. 48 No. 3, pp. 384-404, doi: 10.1007/s11747-019-00670-w.

Jain, N.K., Gajjar, H. and Shah, B.J. (2021), "Electronic logistics service quality and repurchase intention in e-tailing: catalytic role of shopping satisfaction, payment options, gender and returning experience", *Journal of Retailing and Consumer Services*, Vol. 59, 102360, doi: 10.1016/j.jretconser.2020.102360.

Javed, S.A. and Javed, S. (2015), "The impact of product's packaging color on customers' buying preferences under time pressure", *Marketing and Branding Research*, Vol. 2 No. 1, pp. 4-14.

Khan, M.D.N.A. (2020), "Intention to reserve food during covid-19 pandemic among Bangladeshi internet users: based on theory of planned behaviour", *European Journal of Medical and Educational Technologies*, Vol. 13 No. 2, pp. 1-9, doi: 10.30935/ejmets/8299.

Khanra, S., Dhir, A., Kaur, P. and Joseph, R.P. (2021), "Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic", *Journal of Hospitality and Tourism Management*, Vol. 46, pp. 26-39, doi: 10.1016/j.jhtm.2020.11.004.

Kim, L.H., Qu, H. and Kim, D.J. (2009), "A study of perceived risk and risk reduction of purchasing air-tickets online", *Journal of Travel and Tourism Marketing*, Vol. 26 No. 3, pp. 203-224, doi: 10.1080/10548400902925031.

Kim, J.J., Kim, I. and Hwang, J. (2021a), "A change of perceived innovativeness for contactless food delivery services using drones after the outbreak of COVID-19", *International Journal of Hospitality Management*, Vol. 93, 102758, doi: 10.1016/j.ijhm.2020.102758.

Kim, J.J., Yang, K., Min, J. and White, B. (2021b), "Hope, fear, and consumer behavioral change amid COVID-19: application of protection motivation theory", *International Journal of Consumer Studies*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1111/ijcs.12700.

Kitching, C. (2016), *Hurricane Matthew Sparks Apocalyptic Scenes in Supermarkets as Panicked Shoppers Stock up Food and Water*, Mirror, available at: http://www.mirror.co.uk/news/world-news/hurricane-matthew-sparks-apocalyptic-scenes-8989661 (accessed 19 March 2021).

Konus, U., Verhoef, P.C. and Neslin, S.A. (2008), "Multichannel shopper segments and their covariates", *Journal of Retailing*, Vol. 84 No. 4, pp. 398-413, doi: 10.1016/j.jretai.2008.09.002.

Kordzadeh, N., Warren, J. and Seifi, A. (2016), "Antecedents of privacy calculus components in virtual health communities", *International Journal of Information Management*, Vol. 36 No. 5, pp. 724-734, doi: 10.1016/j.ijinfomgt.2016.04.015.

Kumalawati, R., Murliawan, K.H., Yuliarti, A., Nasruddin and Nugroho, A.R. (2021), "Public communication for Covid-19 disaster mitigation", *Advances in Social Sciences, Education and Humanities Research*, Vol. 525, pp. 249-255, doi: 10.2991/assehr.k.210222.040.

Kumar, K. (2020), "Fijians trying to return goods: FCCC", available at: https://www.fbcnews.com.fj/news/covid-19/fijians-trying-to-return-goods-fccc/ (accessed 3 August 2020).

Laato, S., Islam, A.K.M.N., Farooq, A. and Dhir, A. (2020), "Unusual purchasing behavior during the early stages of the COVID-19 pandemic: the stimulus-organism-response approach", *Journal of Retailing and Consumer Services*, Vol. 57, 102224, doi: 10.1016/j.jretconser.2020.102224.

Laroche, M., Bergeron, J. and Barbaro-Forleo, G. (2001), "Targeting consumers who are willing to pay more for environmentally friendly products", *Journal of Consumer Marketing*, Vol. 18 No. 6, pp. 503-520, doi: 10.1108/EUM0000000006155.

Lee, R., Murphy, J. and Neale, L. (2009), "The interactions of consumption characteristics on social norms", *Journal of Consumer Marketing*, Vol. 26, pp. 277-285, doi: 10.1108/07363760910965873.

Lehberger, M., Kleih, A.K. and Sparke, K. (2021), "Panic buying in times of coronavirus (COVID-19): extending the theory of planned behavior to understand the stockpiling of nonperishable food in Germany", *Appetite*, Vol. 1 No. 161, 105118, doi: 10.1016/j.appet.2021.105118.

Lewis, H. (2020), "How panic-buying revealed the problem with the modern world. The pandemic has shown how just-in-time systems are also fragile", available at: https://www.theatlantic.com/international/archive/2020/03/coronavirus-panic-buying-britain-us-shopping/608731/ (accessed 11 April 2020).

Liu, Y., Shi, H. and Amin, A. (2021), "Factors influencing Chinese residents' post-pandemic outbound travel intentions: an extended theory of planned behavior model based on the perception of COVID-19", *Tourism Review*, Vol. ahead of print No. ahead of print, doi: 10.1108/TR-09-2020-0458.

Long, N.N. and Khoi, B.H. (2020), "An empirical study about the intention to hoard food during COVID-19 pandemic", *Journal of Mathematics, Science and Technology Education*, Vol. 16 No. 7, doi: 10.29333/ejmste/8207.

Lu, H.-P. and Hsiao, K.-L. (2007), "Understanding intention to continuously share information on weblogs", *Internet Research*, Vol. 17 No. 4, pp. 345-361, doi: 10.1108/10662240710828030.

Maziriri, E.T. and Chuchu, T. (2017), "The conception of consumer perceived risk towards online purchases of apparel and an idiosyncratic scrutiny of perceived social risk: a review of literature", *International Review of Management and Marketing*, Vol. 7 No. 3, pp. 257-265.

Mitchell, V.W. and Papavassiliou, V. (1999), "Marketing causes and implications of consumer confusion", *The Journal of Product and Brand Management*, Vol. 8 No. 4, pp. 319-342, doi: 10.1108/10610429910284300.

Moon, S.J. (2021), "Investigating beliefs, attitudes, and intentions regarding green restaurant patronage: an application of the extended theory of planned behavior with moderating effects of gender and age", *International Journal of Hospitality Management*, Vol. 92, 102727, doi: 10.1016/j.ijhm.2020.102727.

Moon, J.-Y. and Lee, K.-H. (2013), "Influence of time pressure on the purchase decision making process in apparel shopping", *The Research Journal of the Costume Culture*, Vol. 21, pp. 117-128, doi: 10.7741/RJCC.2013.21.1.117.

Moran, P. (2020), *"Herd Effect": Social Media Images of Empty Shelves Fuelling Panic Buying over Coronavirus, Says Prof*, CBC, available at: https://www.cbc.ca/radio/thecurrent/the-current-for-march-3-2020-1.5483657/herd-effect-social-media-images-of-empty-shelves-fuelling-panic-buying-over-coronavirus-says-prof-1.5483674 (accessed 24 May 2021).

Newton, D.A. (Ed.) (1967), *A Marketing Communications Model for Sales Management*, Harvard University Press, Boston.

Nichols, B.S. (2010), "Exploring and explaining consumer competition: a mixed-methods approach to understanding the phenomenon", available at: https://trace.tennessee.edu/ (accessed 3 July 2020).

Nichols, B.S. (2012), "The development, validation, and implications of a measure of consumer competitive arousal (CCAR)", *Journal of Economic Pyschology*, Vol. 33 No. 1, pp. 192-205, doi: 10.1016/j.joep.2011.10.002.

Norberg, M. and Rucker, D. (2020), "Psychology can explain why coronavirus drives us to panic buy. It also provides tips on how to stop", *The Conversation*, available at: https://theconversation.com/psychology-can-explain-why-coronavirus-drives-us-to-panic-buy-it-also-provides-tips-on-how-to-stop-134032 (accessed 6 April 2020).

Novemsky, N. (2020), "Why a pandemic leads to panic buying", available at: insights.som.yale.edu/insights/why-pandemic-leads-to-panic-buying (accessed 11 April 2020).

Oppewal, H. and Holyoake, B. (2004), "Bundling and retail agglomeration effects on shopping behavior", *Journal of Retailing and Consumer Services*, Vol. 11 No. 2, pp. 61-74, doi: 10.1016/S0969-6989(02)00079-6.

Pahayahay, A. and Khalili-Mahani, N. (2020), "What media helps, what media hurts: a mixed methods survey study of coping with covid-19 using the media repertoire framework and the appraisal theory of stress", *Journal of Medical Internet Research*, Vol. 22 No. 8, e20186, doi: 10.2196/20186.

Papadopoulos, T., Stamati, T. and Nopparuch, P. (2013), "Exploring the determinants of knowledge sharing via employee weblogs", *International Journal of Information Management*, Vol. 33, pp. 133-146, doi: 10.1016/j.ijinfomgt.2012.08.002.

Pentina, I., Zhang, L., Bata, H. and Chen, Y. (2016), "Exploring privacy paradox in information-sensitive mobile app adoption: a cross-cultural comparison", *Computers in Human Behavior*, Vol. 65, pp. 409-419, doi: 10.1016/j.chb.2016.09.005.

Pitardi, V. and Marriott, H.R. (2021), "Alexa, she's not human but ... unveiling the drivers of consumers' trust in voice-based artificial intelligence", *Psychology and Marketing*, Vol. 38 No. 4, pp. 626-642, doi: 10.1002/mar.21457.

Podsakoff, P.M., Mackenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioural research: a critical review of the literature and recommended remedies", *Journal of Applied Psyschology*, Vol. 88 No. 5, pp. 879-903, doi: 10.1037/0021-9010.88.5.879.

Prentice, C., Chen, J. and Stantic, B. (2020a), "Timed intervention in COVID-19 and panic buying", *Journal of Retailing and Consumer Services*, Vol. 57, 102203, doi: 10.1016/j.jretconser.2020.102203.

Prentice, C., Quach, S. and Thaichon, P. (2020b), "Antecedents and consequences of panic buying: the case of COVID-19", *International Journal of Consumer Studies*, Vol. ahead of print No. ahead of print, doi: 10.1111/ijcs.12649.

Raman, P. (2019), "Understanding female consumer's intention to shop online: the role of trust, convenience, and customer service", *Asia Pacific Journal of Marketing and Logistics*, Vol. 32 No. 4, pp. 1138-1160, doi: 10.1108/APJML-10-2018-0396.

Rather, R.A. (2021), "Demystifying the effects of perceived risk and fear on customer engagement, co-creation and revisit intention during COVID-19: a protection motivation theory approach", *Journal of Destination Marketing and Management*, Vol. 20, 100564, doi: 10.1016/j.jdmm.2021.100564.

Raude, J., Lecrique, J.M., Lasbeur, L., Leon, C., Guignard, R., du Roscoät, E. and Arwidson, P. (2020), "Determinants of preventive behaviors in response to the covid-19 pandemic in France: comparing the sociocultural, psychosocial, and social cognitive explanations", *Frontiers in Psychology*, Vol. 11, 584500, doi: 10.3389/fpsyg.2020.584500.

Reicher, S.D. and Haslam, S.A. (Eds) (2009), *Beyond Help: A Social Psychology of Social Solidarity and Social Cohesion*, Wiley-Blackwell, Oxford.

Reutskaja, E., Nagel, R., Camerer, C.F. and Rangel, A. (2011), "Search dynamics in consumer choice under time pressure: an eye-tracking study", *The American Economic Review*, Vol. 101 No. 2, pp. 900-926, doi: 10.1257/aer.101.2.900.

Rice, D. (2016), "Super typhoon Nepartak forecast to batter Taiwan", *USA Today*, available at: http://www.usatoday.com/story/weather/2016/07/06/supertyphoon-nepartak-taiwan/86745634/ (accessed 9 April 2020).

Rice, S. and Keller, D. (2009), "Automation reliance under time pressure", *Cognitive Technology*, Vol. 14 No. 1, pp. 36-44.

Rogers, R.W. (1975), "A protection motivation theory of fear appeals and attitude change1", *Journal of Psychology*, Vol. 91 No. 1, pp. 93-114, doi: 10.1080/00223980.1975.9915803.

San-Martin, S., Prodanova, J. and Jimenez, N. (2015), "The impact of age in the generation of satisfaction and WOM in mobile shopping", *Journal of Retailing and Consumer Services*, Vol. 23, pp. 1-18, doi: 10.1016/j.jretconser.2014.11.001.

Schultz, A. (2020), "Australia best at panic-buying, NZ is almost COVID-free, and the dollar is back", *Crikey*, available at: https://www.crikey.com.au/2020/06/03/virus-watch-australia-best-at-panic-buying/ (accessed 9 April 2021).

Schultz, P.W., Nolan, J.M., Cialdini, R.B., Goldstein, N.J. and Griskevicius, V. (2007), "The constructive, destructive and reconstructive power of social norms", *Psychological Science*, Vol. 18, pp. 429-434, doi: 10.1111/j.1467-9280.2007.01917.x.

Sharma, R., Singh, G. and Sharma, S. (2020a), "Modelling internet banking adoption in Fiji: a developing country perspective", *International Journal of Information Management*, Vol. 53, 102116, doi: 10.1016/j.ijinfomgt.2020.102116.

Sharma, S., Singh, G., Sharma, R., Jones, P., Kraus, S. and Dwivedi, Y.K. (2020b), "Digital health innovation: exploring adoption of COVID-19 digital contact tracing apps", *IEEE Transactions on Engineering Management*. doi: 10.1109/TEM.2020.3019033.

Sharma, S., Singh, G. and Aiyub, A.S. (2020c), "Use of social networking sites by SMEs to engage with their customers: a developing country perspective", *Journal of Internet Commerce*, Vol. 19 No. 1, pp. 62-81, doi: 10.1080/15332861.2019.1695180.

Sharma, S., Singh, G. and Pratt, S. (2020d), "Does consumers' intention to purchase travel online differ across generations?", *Australasian Journal of Information Systems*, Vol. 24, doi: 10.3127/ajis.v24i0.2751.

Sharma, S., Singh, G. and Pratt, S. (2021a), "Modeling the multi-dimensional facets of perceived risk in purchasing travel online: a generational analysis", *Journal of Quality Assurance in Hospitality and Tourism*, pp. 1-29, doi: 10.1080/1528008X.2021.1891597.

Sharma, R., Singh, G. and Sharma, S. (2021b), "Competitors' envy, gamers' pride: an exploration of gamers' divergent behavior", *Psychology and Marketing*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1002/mar.21469.

Sharma, S., Singh, G. and Sharma, R. (2021c), "For it is in giving that we receive: investigating gamers' gifting behaviour in online games", *International Journal of Information Management*, Vol. 60, doi: 10.1016/j.ijinfomgt.2021.102363.

Silayoi, P. and Speece, M. (2004), "Packaging and purchase decisions: an exploratory study on the impact of involvement level and time pressure", *British Food Journal*, Vol. 106 No. 8, pp. 607-628, doi: 10.1108/00070700410553602.

Singh, G., Slack, N., Sharma, S., Mudaliar, K., Narayan, S., Kaur, R. and Sharma, K.U. (2021), "Antecedents involved in developing fast-food restaurant customer loyalty", *The TQM Journal*. doi: 10.1108/TQM-07-2020-0163.

Skallerud, K., Korneliussen, T. and Olsen, S.O. (2009), "An examination of consumers' cross-shopping behaviour", *Journal of Retailing and Consumer Services*, Vol. 16 No. 3, pp. 181-189, doi: 10.1016/j.jretconser.2008.11.012.

Slack, N., Singh, G. and Sharma, S. (2020a), "The effect of supermarket service quality dimensions and customer satisfaction on customer loyalty and disloyalty dimensions", *International Journal of Quality and Service Sciences*, Vol. 12 No. 3, doi: 10.1108/IJQSS-10-2019-0114.

Slack, N., Singh, G. and Sharma, S. (2020b), "Impact of perceived value on the satisfaction of supermarket customers: developing country perspective", *International Journal of Retail and Distribution Management*, Vol. 48 No. 11, doi: 10.1108/IJRDM-03-2019-0099.

Slack, N.J. and Singh, G. (2020), "The effect of service quality on customer satisfaction and loyalty and the mediating role of customer satisfaction", *The TQM Journal*, Vol. 32 No. 3, pp. 543-558, doi: 10.1108/TQM-07-2019-0187.

Slade, E.L., Dwivedi, Y.K., Piercy, N.C. and Williams, M.D. (2015), "Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: extending UTAUT with

innovativeness, risk, and trust", *Psychology and Marketing*, Vol. 32 No. 8, pp. 860-873, doi: 10.1002/mar.20823.

Sohn, H.-K. and Lee, T.J. (2017), "Tourists' impulse buying behavior at duty-free shops: the moderating effects of time pressure and shopping involvement", *Journal of Travel and Tourism Marketing*, Vol. 34 No. 3, pp. 341-356, doi: 10.1080/10548408.2016.1170650.

Sterman, J.D. and Dogan, G. (2015), "I'm not hoarding, I'm just stocking up before the hoarders get here: behavioral causes of phantom ordering in supply chains", *Journal of Operations Management*, Vol. 39 No. 40, pp. 6-22, doi: 10.1016/j.jom.2015.07.002.

Talwar, M., Talwar, S., Kaur, P., Tripathy, N. and Dhir, A. (2021), "Has financial attitude impacted the trading activity of retail investors during the COVID-19 pandemic?", *Journal of Retailing and Consumer Services*, Vol. 58, 102341, doi: 10.1016/j.jretconser.2020.102341.

Thomas, R. (2008), "Exploring relational aspects of time-based competition", *International Journal of Physical Distribution and Logistics Management*, Vol. 38 No. 7, pp. 540-550, doi: 10.1108/09600030810900941.

Tsao, Y.C., Vijaya, P., Raj, P. and andYu, V. (2019), "Product substitution with customer segmentation under panic buying behavior", *Industrial Marketing Management*, Vol. 77, pp. 209-220, doi: 10.1016/j.indmarman.2018.09.004.

Van Bavel, J.J., Baicker, K., Boggio, P.S., Capraro, V., Cichocka, A., Cikara, M. and Drury, J. (2020), "Using social and behavioural science to support COVID-19 pandemic response", *Nature Human Behaviour*, Vol. 4, pp. 460-471, doi: 10.1038/s41562-020-0884-z.

Venkatesh, V., Thong, J.Y. and Xu, X. (2012), "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", *MIS Quarterly*, Vol. 36 No. 1, pp. 157-178.

Wang, L., Zhang, Y. and Tuo, Y. (2014), "The effect of product-harm crisis on consumers' panic emotion and risk perception", *Seventh International Joint Conference on Computational Sciences and Optimization*, Beijing, pp. 484-488, doi: 10.1109/CSO.2014.96.

White, K. and Simpson, B. (2013), "When do (and don't) normative appeals influence sustainable consumer behaviors?", *Journal of Marketing*, Vol. 77 No. 2, pp. 78-95, doi: 10.1509/jm.11.0278.

Wu, G.J., Bagozzi, R.P., Anaza, N.A. and Yang, Z. (2019), "A goal-directed interactionist perspective of counterfeit consumption: the role of perceived detection probability", *European Journal of Marketing*, Vol. 52 No. 7, pp. 1311-1332, doi: 10.1108/EJM-07-2017-0455.

Yadav, R. and Pathak, G.S. (2016), "Intention to purchase organic food among young consumers: evidences from a developing nation", *Appetite*, Vol. 96, pp. 122-128, doi: 10.1016/j.appet.2015.09.017.

Yao, J. and Oppewal, H. (2015), "Unit pricing matter more when consumers are under time pressure", *European Journal of Marketing*, Vol. 50 Nos 5/6, pp. 1094-1114.

Yoon, S.J. (2020), "Covid-19: restoring trust in government is key to addressing panic buying", available at: wangjapantoday.com/category/features/opinions/covid-19-restoring-trust-in-government-is-key-to-addressing-panic-buying (accessed 11 April 2020).

Yuen, K., Wang, X., Ma, F. and Li, K.X. (2020), "The psychological causes of panic buying following a health crisis", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 10, pp. 1-14, doi: 10.3390/ijerph17103513.

Zheng, R., Shou, B. and Yang, J. (2020), "Supply disruption management under consumer panic buying and social learning effects", *Omega*, Vol. 101, 102238, doi: 10.1016/j.omega.2020.102238.

Appendix

Table A1.
Survey items

Perceived scarcity
Products that I need will often be scarce during the COVID-19 crisis
I find items that I need to have limited availability during the COVID-19 crisis
I feel that the store sells out fast and rarely restock their merchandise during the COVID-19 crisis
I feel that the retailer will intentionally limit product quantity during the COVID-19 crisis
I feel that the government would ration products during the COVID-19 crisis
Expected personal outcomes
Buying more items than I need during the COVID-19 crisis would be helpful for me
Buying more items than I need during the COVID-19 crisis is good for my well-being
The personal benefits of buying more items than I need during the COVID-19 crisis would be significant
There are advantages to me in buying more items than I need during the COVID-19 crisis
Expected community-related outcomes Chiu et al. (2006)
Buying more items than I need during the COVID-19 crisis will harm other customers
Buying more items than I need during the COVID-19 crisis will disadvantage other customers
Buying more items than I need during the COVID-19 crisis would be insensitive for other customers
Buying more items than I need during the COVID-19 crisis will restrict other customers
Attitude
Buying more items than I need during the COVID-19 crisis is a good idea
Buying more items than I need during the COVID-19 crisis is a wise idea
I like the idea of buying more items than I need during the COVID-19 crisis
Buying more items than I need during the COVID-19 crisis is a pleasant idea
Buying more items than I need during the COVID-19 crisis is appealing
Subjective norm
Most people who are important in my life would understand my decision to buy more items than I needed during the COVID-19 crisis
Most people who are important in my life would agree with my decision to buy more items than I needed during the COVID-19 crisis
Most people who are important in my life would approve of me buying more items than I needed during the COVID-19 crisis
Most people who are important in my life would support me in buying more items than I need during the COVID-19 crisis
Most people who are important in my life would encourage me to buy more items than I need during the COVID-19 crisis
Perceived behavioral control
During the COVID-19 crisis, I could easily buy more items than I need
During the COVID-19 crisis. It would not be difficult for me to buy more items than I need
During the COVID-19 crisis, there are no barriers to prevent me from buying more items than I need
Time pressure
I need to be quick if I am to complete my shopping on time during the COVID-19 crisis
I feel pressured to complete my shopping quickly during the COVID-19 crisis
I do not have enough time to shop during the COVID-19 crisis
Perceived competition
I will be conscious of other customers' behaviors during the COVID-19 crisis
I feel like I am competing with other shoppers for products during the COVID-19 crisis
I feel in competition with other shoppers for limited products during the COVID-19 crisis
Perceived social detection risk
The important people around me will sense when I am buying more items than I need during the COVID-19 crisis
The important people around me will be able to recognize when I am buying more items than I need during the COVID-19 crisis
The important people around me can detect when I am buying more items than I need during the COVID-19 crisis
Panic buying intention
I intend to buy more items than I need during the COVID-19 crisis
I predict that I would buy more items than I need during the COVID-19 crisis
I plan to buy more items than I need during the COVID-19 crisis
I will always try to buy more items than I need during the COVID-19 crisis
I will recommend to others to buy more items than they need during the COVID-19 crisis

About the authors

Gurmeet Singh is Professor in the School of Business and Management, The University of The South Pacific, Fiji. Gurmeet Singh is the corresponding author and can be contacted at: singh_g@usp.ac.fj

Asheefa Shaheen Aiyub is a PhD candidate in the School of Business and Management, at The University of the South Pacific, Fiji.

Tuma Greig is a Teaching Assistant in the School of Business and Management, The University of The South Pacific, Fiji.

Samantha Naidu is a Teaching Assistant in the School of Business and Management, The University of The South Pacific, Fiji.

Aarti Sewak is a research Scholar at Griffith University, Australia.

Shavneet Sharma is a Assistant Lecturer in the School of Business and Management, The University of The South Pacific, Fiji.