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The Role of Perceived Scarcity and Anxiety on Panic Buying Behaviour Among Consumers in the United Arab Emirates

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Abstract. Panic buying, even though seldom and inconsistently documented, is acknowledged as an unpredictable human behavior that has endured throughout history, often surfacing in response to significant emergency situations. Due to the significant psychological and behavioral impact of panic buying on society, this study aimed to examine the determinants of panic buying behavior among the consumers in the United Arab Emirates. The purpose of this study is to investigate the influence of perceived scarcity and anxiety on panic buying behavior, the mediating effect of anxiety on the relationship between perceived scarcity and panic buying behavior, and the moderating effect of government interventions on the relationship between anxiety and panic buying behavior. This study is quantitative in nature and uses a convenient sampling method to collect the online survey-based data from 157 respondents. Data were analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM). The results of data analysis indicated that perceived scarcity and anxiety had significant influences on panic buying behavior, while perceived scarcity also significantly influenced anxiety. On the other hand, anxiety mediates the relationship between perceived scarcity and panic buying behavior. This study could not find evidence of the moderating role of government interventions in the relationship between anxiety and panic buying behavior. The findings highlight the role of perceived scarcity and anxiety in causing panic buying behavior and thus provide implications for policymakers on the control of panic buying among consumers.

Keywords: Anxiety, Government interventions, Panic buying behavior, Perceived scarcity.

1. INTRODUCTION

Panic buying, while seldom and inconsistently documented, is recognised as an erratic human behaviour that has persisted over time, typically emerging during major emergency events (Arafat et al., 2020). In early 2020, the World Health Organisation (WHO) declared the coronavirus a global pandemic (Khanra et al., 2021; Talwar et al., 2021), leading to widespread panic buying in numerous countries worldwide. Following the announcement of lockdowns aimed at controlling the spread of the virus (Bennett et al., 2020), many individuals hurried to stores to purchase essential goods. A significant portion of the media, including social media and scholarly studies, has indicated that consumers are stockpiling food items, medications, and hygiene products due to concerns about potential shortages (Debiec, 2020). The retail store shelves were predominantly left bare due to individuals stockpiling essential goods, a phenomenon typically observed during natural disasters like hurricanes, winter storms, or earthquakes.

Panic buying refers to a behaviour characterised by the excessive purchasing of goods in response to real or imagined threats of scarcity (Herjanto et al., 2021). A significant bulk purchase was observed among individuals in Taiwan when the government predicted the impending arrival of the Nepartak cyclone in 2016 (Tsao et al., 2019). Similarly, the SARS epidemic in China in 2003 prompted consumers to stockpile rice, vinegar, and medical supplies. Notable global emergency crises from past years include the H1N1 flu outbreak in China, Hurricane Sandy in the United States, the nuclear incident in Japan, and the earthquake in Haiti (Wang et al., 2014). In the UAE, there was a noticeable trend of panic buying as individuals began stockpiling essential goods. This behaviour was driven by concerns that supplies would dwindle following government advisories urging the public to maintain social distancing and avoid crowded areas to mitigate the spread of the COVID-19 virus.

This issue points out the critical need to examine consumer behaviour within the context of a panic buying situation. Despite the increasing focus of governments and business organisations on disaster and crisis response, there remains a lack of comprehensive information and previous studies regarding the factors influencing consumer buying behaviour during such events (Hall et al., 2020). It has been noted that studies concerning panic buying behaviour are still scarce, inconsistent, and at times contradictory (Islam et al., 2021; Iyer et al., 2020). The phenomenon of panic buying behaviour has garnered significant attention in numerous prior investigations (e.g., Cooper & Gordon, 2021; Omar et al., 2021; Billore & Anisimova, 2021; Li et al., 2021; Yuen et al., 2022; Prentice et al., 2022). This body of work explored various aspects of panic buying behaviour, including its occurrence in specific contexts, the social factors influencing it, strategies for prevention, and the impact of national culture on its prevalence. Furthermore, numerous studies have been carried out regarding the panic buying behaviour associated with crises and disasters in Western and other developed nations such as the UK (Hall et al., 2020), USA, Australia, Italy, and Germany (Debiec, 2020; Hall et al., 2020; Prentice et al., 2020). While considerable investigation has been conducted on panic buying behaviour, there is currently no comprehensive study that explores the interplay of perceived scarcity, anxiety, and government interventions in relation to this phenomenon.

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This study contributes to the literature by answering the following questions: What is the relationship between perceived scarcity and anxiety on panic buying behaviour? Does anxiety mediate the relationship between perceived scarcity and panic buying behavior? Does government intervention moderate the relationship between anxiety and panic buying behaviour? The present article is organized into a few sections. The following section discusses the review of past literature and hypotheses development, followed by the methodological part of the present study, including the research design and sampling method, measurements and data collection procedure. It then follows with the analysis and discussion of the findings. Last but not least, the last section covers the managerial implications.

2. LITERATURE REVIEW

This section analyses each hypothesis and substantiates it using relevant literature. The section initially addresses the direct relationship between perceived scarcity and anxiety, perceived scarcity with panic buying behaviour, and their interrelations, followed by the moderating effect of government intervention. Subsequently, the hypotheses are illustrated.

2.1. Panic Buying Behaviour

In the past twenty years, researchers have recorded various psychological responses individuals exhibit during an infectious disease outbreak, including fear, anxiety, depression, grief, guilt, irritability, feelings of isolation, and stigmatisation (Sim et al., 2020). Researchers can now examine the psychological responses associated with panic buying observed in several nations during the COVID-19 pandemic (Sherman et al., 2021). Panic is a subjective emotional condition that profoundly affects human behaviour (Taylor, 2021). Panic purchasing is socially undesirable (Shoib & Arafat, 2021), irrational (Cao et al., 2023), and an illogical (Alfuqaha et al., 2022) behaviour that occurs when a substantial number of consumers hoard essential goods during periods of uncertainty and fear to mitigate a perceived future threat (Yuen et al., 2020).

Panic buying is a recognised economic phenomenon that often occurs during significant global crises, epidemics, or natural disasters, particularly in the context of behavioural economics (Yuen et al., 2020). Individuals commence the accumulation of goods driven by apprehension or anxiety, attributable to their inability to procure these items in the future, their perception of scarcity, the trepidation of losing control over the environment, and feelings of insecurity or instability, all of which correlate with the severity of the prevailing circumstances, crises, or pandemics (Arafat et al., 2020). This behaviour significantly undermines social stability by disrupting the supply chain balance, driving up prices, and obstructing access to protective resources for vulnerable groups (Billore & Anisimova, 2021). Currently, there is a limited amount of empirical research addressing the causes and psychological mechanisms of this phenomenon during public emergencies, and the existing studies are fragmented (Chua et al., 2021 Yuen et al., 2020; Li et al., 2021). Consequently, it is essential to investigate the underlying factors of panic buying, particularly during public emergencies.

2.1.1. The Influence of Perceived Scarcity on Anxiety

Anxiety arises from the perception of personal danger or threat in these situations, along with stress (Tan, 2023). Prati and Mancini (2023) put forward a neuropsychological model of anxiety, describing it as a condition of the central nervous system marked by a behavioural inhibition system (BIS). This system reacts to novel stimuli or those linked to punishment or lack of reward, suppressing ongoing behaviour while heightening arousal and environmental awareness (Sherman et al., 2021). This system reacts to novel stimuli or those linked to punishment or lack of reward, suppresses current behaviour, and heightens arousal and attentiveness to the surroundings (Chorpita & Barlow, 2018). Recent advancements in cognitive and emotional theory indicate that anxiety is a key factor in negative emotions (Sarallahi, 2021). Anxiety is a key factor in the experience of negative emotions (Bakioğlu et al., 2021). In contrast to fear, anxiety often lacks a specific object, and the intensity of the negative emotions associated with anxiety may not align with objective realities (Tan, 2023).

Drawing from the scarcity principle, crowd psychology, and contagion theory, various scholars have examined the factors leading to and resulting from panic buying. Their empirical analyses indicate that panic buying can evoke intense feelings of guilt. Scarcity-induced stress can lead to anxiety, prompting consumers to engage in hoarding or panic buying behaviours (Singhn et al., 2023 Boccoli & Corso, 2023). Thus, it is hypothesised that:

Hypothesis 1: Perceived scarcity is positively related to anxiety.

2.1.2. The Influence of Perceived Scarcity on Panic Buying Behaviour

Perceived scarcity refers to an individual's understanding of restricted supply. This compels consumers to augment their purchases owing to heightened urgency or perceived value of the product (Suri et al., 2007). This may result from the potential loss of freedom, leading to increased awareness and interest in the unattainable commodity, hence enhancing the motivation to obtain the imminent substitute that may soon be unavailable (Gupta & Gentry, 2019). Reactance, a psychological motivational condition induced by the perception of restricted freedom in executing a certain behaviour, may promote panic buying behaviours (Yuen et al., 2022).

This occurs when customers may react quickly and even impulsively to perceived scarcity in order to regain lost freedom (Chang et al., 2024).

Panic buying is characterised by cognitive biases related to perceived threats, scarcity, and maladaptive behaviours like overspending (Cao et al., 2023). The core feature of the perceived scarcity model is the scarcity theory (De Bruijn & Antonides, 2022). The concept of scarcity emerged as a core economic challenge stemming from the existence of limited resources juxtaposed with theoretically boundless demands (Shi et al., 2020). As a result, various investigations have revealed that scarcity can have a psychological effect on the perceived value of a product (Zhang et al., 2022). This connects to the phenomenon of panic buying, where a person may feel compelled to purchase an item when they believe it is scarce (Omar et al., 2021). In a similar vein, Shi et al. (2020) demonstrates that the value of any good increases in relation to its scarcity. When an individual perceives an item as limited in availability, they might feel a heightened drive to obtain it in order to preserve their options (Arafat et al., 2020). Consequently, it is hypothesis that:

Hypothesis 2: Perceived scarcity is positively related to panic buying behaviour.

2.1.3. The Influence of Anxiety on Panic Buying Behavior

Anxiety is a broad or ambiguous sensation of imbalance (Mann et al., 2020) that arises from feelings of unease, tension, worry, or apprehension around potential outcomes (Knowles & Olatunji, 2020). An emotional state arises from internal (cognitive) or external (environmental) stimuli (Tuma & Maser, 2019). Anxiety arises from the interplay of stress and the impression of a threat posed by a negative consequence, regardless of the threat's actual existence (Sherman et al, 2021). It may cause individuals to behave awkwardly or enhance their efficacy by promoting proactive behaviours (Leong et al., 2021). In a condition of anxiety, consumers tend to exhibit risk-averse behaviour and perceive ambiguous cues as risky.

Past studies have explored how the perception of risk and the potential for adverse outcomes may have driven individuals to engage in extreme behaviours like panic buying as a means of safeguarding themselves from unfavourable circumstances following the onset of the COVID-19 pandemic (Yuen et al., 2020). It has been suggested that panic buying may assist individuals in alleviating the anxiety that arises from uncertainty and other negative emotions during a pandemic (Sim et al., 2020; Taylor, 2021; Yuen et al., 2020). Anxiety sensitivity is closely linked to fearfulness, and preliminary research suggests that it may serve as a risk factor for panic disorder (Alam et al., 2023). Epidemics bring about significant uncertainty, and individuals who struggle with this uncertainty and experience fear are more prone to heightened anxiety during times of widespread disease outbreaks (Taylor, 2019). The examination of the pandemic holds significant importance. Existing studies indicate that individuals often engage in specific purchasing behaviours as a means to consciously manage emotional distress. For instance, Liang et al. (2023) demonstrate that depression has a positive and significant effect on impulsive and compulsive buying behaviour.

In the context of epidemics, authorities implement various tiers of control measures, categorising regions into containment, control, and precautionary zones. Residents are mandated to adhere to home quarantine protocols and restrictions on the number of individuals and duration for essential purchases. The unpredictability surrounding future purchases, coupled with the uncontrollable progression of the epidemic and the market frenzy highlighted by online media, has heightened feelings of fear and anxiety among individuals. Thus, it is hypothesized that:

Hypothesis 3: Anxiety is positively related to panic buying behaviour.

2.1.4. The Mediating Role of Anxiety in the Relationship Between Perceived Scarcity and Panic Buying Behaviour

Panic buying can result in disruptions in the availability of specific product categories; however, it is emphasised by business experts and scholars that such behaviour is not directly triggered by supply shortages, but rather by elevated levels of consumer anxiety and fear (Kim et al., 2023). This anxiety and fear fundamentally stem from a perceived lack of time and resources. This phenomenon operates as a self-reinforcing cycle: as customers engage in impulsive and obsessive purchasing behaviours, anxiety surrounding scarcity increases, leading to quicker sell-outs of the product. Previous studies have suggested that panic buying is primarily triggered by interruptions in the availability of goods and services, such as natural disasters, pandemics, and extended strikes (Knowles & Olatunji, 2020). The presence of these stimuli induces feelings of panic or fear, driven by limited time and the number of individuals involved, resulting in impulsive and compulsive purchasing behaviours.

Moreover, it is also documented that anxiety partially mediates the relationship between stress and depression (Lianjie et al., 2023). Lee et al. (2011) discovered in their experimental study that anxiety mediates the relationship of stereotype threat and purchase intention of individuals in an automotive repair service context. Other study revealed how anxiety mediates the relationship between fear of Covid-19 infection, intolerance of uncertainty, and an individual's positive emotion (Bakioglu ˘ et al., 2020). Even, Otero-Lopez ´ and Villardefrancos (2013) found that anxiety is a mediator of the materialism influence (e.g. importance, and success) on consumers' addictive buying. As stated by scholars that the uncertainty of the span of the pandemic, the

likelihood of having limited access to daily necessities, and a fear that there will be a disruption to the supply system may make people anxious and, consequently, induce panic buying so that they can get rid of their emotional turmoil (Sim et al., 2020; Yuen et al., 2020). Omar et al. (2021) confirmed that uncertainty increased consumer anxiety, which led to mediate the relationship between the scarcity and panic buying as well. Therefore, the following hypothesis is developed:

Hypothesis 4: Anxiety mediates the relationship between perceived scarcity and panic purchasing.

2.1.5. The Moderating Role of Government Interventions on the Relationship between Anxiety and Panic Buying Behavior

Numerous findings have supported government intervention addressing panic buying. Keane and Neal (2021), Chen et al. (2022), and Tang et al. (2022) emphasized that government regulatory actions during panic events are essential for mitigating the extent of group buying and ensuring market stability. Mao et al. (2022) discovered that the government's intervention measures at various stages and the execution of rumor-refutation strategies can influence both the extent and frequency of public panic buying incidents. Additionally, Kogan and Herbon (2022) identified the role of government oversight in three distinct scenarios: (i) when there is no panic situation, (ii) when the merchant has adequate resources to manage panic buying, and (iii) when rationing and sales interruptions are unavoidable. Furthermore, Fu et al. (2021) noted that the timing of government external information release plays a crucial role in influencing the likelihood of subsequent panic buying events. Fu et al. (2022) demonstrated that monitoring supply is the crucial strategy to mitigate panic buying. Prentice et al. (2020) examined the timed-intervention policy implemented by the government to address the pandemic and highlighted the connection between the timing of governmental actions and the phenomenon of panic buying. Zhou et al. (2022) examined the effects of punishment and subsidy mechanisms on the strategic decisions made by the government, enterprises, and consumers, concluding that the government penalty mechanism outperforms the subsidy mechanism.

Keane and Neal (2021) highlighted that government policies, including restrictions and lockdowns during the early stages of the epidemic, led to significant panic among the public. The literature regarding intervention measures from a governmental viewpoint indicates that the government serves as the accountable entity during public health events. The methods of governmental intervention can be categorised into three main areas: communication, prevention and control, and assistance (Kogan & Herbon, 2022; Wu et al., 2024). Gupta et al. (2021) discovered that well-crafted government announcements can influence public anxiety levels and mitigate panic buying behaviour.

Prior studies have suggested that the government can alleviate the effects of panic buying through the implementation of rationing policies, improvements in supply chain efficiency, and the initiation of public awareness campaigns (Barnes et al., 2021; Gazali, 2020). This heightened the perception of resource scarcity and uncertainty, leading consumers to increasingly depend on situational influences like government actions, media messaging, and peer behaviour when making purchasing choices, while also igniting the fear of missing out (Esmark Jones et al., 2020). Furthermore, it is anticipated that governmental actions may influence the connection between panic buying and psychological effects, such as anxiety levels. During the pandemic, government measures like dedicated community hours for essential workers and the elderly were designed to safeguard vulnerable groups (Al Sakkal, 2023). These initiatives may enhance certainty regarding the current situation and mitigate the effects of anxiety and panic buying. Panic buying behaviour serves as an internal source of anxiety, whereas government interventions are viewed as an external factor. When people observe increased government involvement, they tend to link their actions to external influences. By tackling the underlying causes of anxiety and promoting a sense of stability and fairness, government actions can diminish the connection between anxiety and panic buying, resulting in more logical and rational behaviour among consumers. This will reduce the influence of anxiety on panic buying behaviour. Hence, it is proposed:

Hypothesis 5: The government intervention has a significant moderation effect on the relationship between anxiety and panic buying behavior.

Combining the above hypotheses, a theoretical model of perceived scarcity and panic buying behaviour mediated by anxiety is constructed using government intervention as the moderating variable. This is shown in Figure 1.

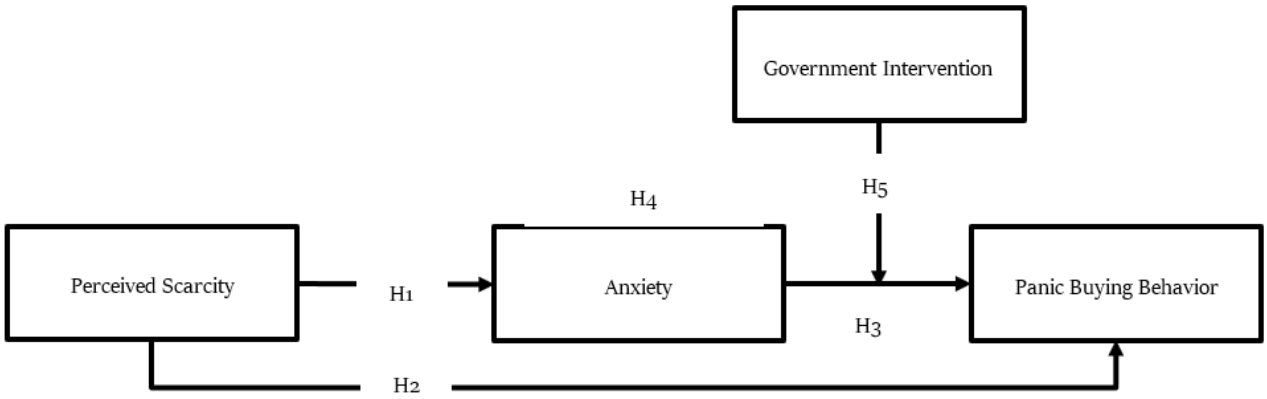

Figure 1: Research Framework.

3. METHODOLOGY

3.1. Research Design and Sampling

This study investigates the connections among consumers' perceived scarcity, anxiety, and panic purchasing behaviours within the context of United Arab Emirates (UAE) following their experiences during the periods of uncertainty or perceived crisis such as pandemic, geopolitical tensions, natural disasters or weather alerts or policy changes. The focus of this study was on consumers who increased their product purchases compared to their typical buying habits. Data collection took place among consumers in three prominent cities in UAE. To guarantee that the participants are representative, the questionnaire was meticulously crafted, taking into account the wording, layout, and order of the questions (Babin et al., 2019).

The online data collection method used enabled this study to engage with a significant number of respondents. Using a convenient sampling method, a variety of media platforms, including Messenger, WhatsApp, Viber, and other applications, were utilized to connect with potential respondents. A link to the questionnaire was distributed to potential respondents through these social networks. The questionnaire included filtering questions (e.g., those who experienced an unusual purchase) to ensure that respondents qualified before participating in the study. A total of 250 participants were invited to take part in the study, with only 157 agreeing to participate, resulting in a satisfactory response rate of 62.8 percent. A structured close-ended questionnaire method was utilized to gather the data. Furthermore, the questionnaire was designed to be clear and uncomplicated, allowing respondents to read and respond swiftly without losing motivation to engage in the study (Omar et al., 2021). Furthermore, we indicated that the respondents would remain anonymous and that their involvement would be voluntary in the questionnaire to enhance the response rate.

3.2. Measurement of Variables

The theoretical model presented (Figure 1) and the associated hypotheses (H1 to H5) were evaluated through the Structural Equation Modelling (SEM) approach. SEM analyses the connections among multiple latent constructs at the same time, taking into account measurement errors. Consequently, SEM addresses measurement error, thereby enhancing the accuracy of model estimation. Importantly, in contrast to regression analysis, it is possible to estimate correlations with the endogenous constructs simultaneously through structural equation modelling. This technique is commonly utilised in the social sciences, aiming to uncover and explain the causal relationships among a group of unobservable variables. The subsequent sections provide a detailed exploration of this process.

Panic buying behavior was operationalized as the act of buying unusually large amounts of merchandise due to a forecast of supply disruption caused by a severe disaster or crisis (Waseem et al., 2022). Panic buying behavior measure for this study was based on a study of Huan et al., (2021) and Chua et al., (2021) with four items. Anxiety is a generalized or unspecified sense of disequilibrium that emerges from the feelings of being uneasy, tense, worried, or apprehensive about what might happen (Omar et al., 2021) and has been identified as one of the most important factors that trigger people to panic buying behavior (Mcleod & Mcleod, 2020; Sobaih & Moustafa, 2022; Thomas & Mora, 2014). For this study, anxiety was measured by instruments adapted from Mishra et al., (2022) and Omar et al., (2021) which consists of 6 items. Perceived scarcity is defined as an individual's conception of limited availability (Chua et al., 2021). This induces consumers to increase the amount they purchase due to an increased urgency or perceived value of the good. Five items, adapted from Singh et al. (2021) were used to measure perceived scarcity. Government intervention is operationalised as the regulatory action taken by the government that seeks to change the decisions made by individuals, groups, and organisations about social and economic matters (Barnes et al., 2021). As for the concept of government interventions, the scale composed of four items developed by Hyland-Wood et al. (2021) and Barnes et al. (2021) was employed.

4. DATA ANALYSIS

From the 250 respondents, 157 consumers completed the questionnaire, representing 62.8% of the total population. The findings reveal that 54.8% of the participants in this study were female, while 45.2% identified as male. Of the participants surveyed, 54.8% were single, while 40.1% reported being married. A significant portion of the respondents fell within the age range of 23–38 years, accounting for 46.5%. This was followed by individuals aged 18–22 years at 27.4%, and those in the 39–54 years' category at 24.2%.

4.1. Common Method Bias

This study utilised both procedural and statistical approaches to identify any potential presence of common method bias (CMB) (Podsakoff et al., 2012). Initially, all measurement scales utilised in the study were derived from prior research. This minimises unclear terminology and item uncertainty in the questionnaire. Secondly, a well-defined initial criterion for the sample frame was implemented during the online survey data collection process to ensure adherence to the sample criteria and participation in the study. Through the implementation of online snowball sampling, we guaranteed the privacy and confidentiality of the respondents' answers. The filtering questions were incorporated into the online survey, allowing for the control of the sample's representativeness (Tehseen et al., 2017).

Consequently, the potential for common method bias was reduced during the design phase of the survey questions (MacKenzie & Podsakoff, 2012). The study employed Harman's single-factor test to assess common method variance (CMV) within the data as a statistical remedy. The findings indicated that one factor exhibits a variance value of less than 50% (Podsakoff et al., 2012). The minor methodological variance indicated that common method variance was not a primary issue in the data. Additionally, the correlations matrix procedure was employed to assess the influence of CMV on the correlations between latent variables. The relationship between all the constructs is below 0.9. Therefore, the findings indicate that common method bias does not pose a concern in this study (Pavlou & El Sawy, 2006).

4.2. Measurement Model Evaluation

In this study, the Factor loading, Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted for all the constructs were tested to assess the measurement model.

Table 1 showed that the indicators' outer loading varied between 0.628 to 0.862. Hair Jr. et al. (2017) recommend that there must be a minimum value of 0.708 of outer loading of the indicator for a scale of measurement. Considering the variables' content validity as indicators, only those with a value over 0.40 should have been kept. Nevertheless, since all the values of indicators' outer loading are above 0.628, this study included all the indicators.

Furthermore, the CA and CR values of the 4 latent variables Anxiety, Government Intervention, Panic Buying Behavior, and Perceived Scarcity, show that the lowest and highest CA are 0.888 and 0.938 respectively. On the other hand, CR values range from 0.893 and 0.938. The values of CA and CR were analyzed to determine the internal consistency of this study's variables, with a 0.7 threshold value suggested by Hair et al. (2017). This means that the CA and CR of this investigation surpassed the recommended cut-off level value. Moreover, all AVE values of the constructs were assessed in this study as well, and it was found that they exceeded the 0.5 criterion by ranging from 0.529 to 0.668. As a result, these findings support the convergent validity, consistency, and reliability of the constructs of this study.

Table 1: Results of Measurement Model.

Latent Construct	Standardized loadings	CA (Cronbach's Alpha)	CR (Composite Reliability)	AVE (Average Variance Extracted)
Anxiety (AY)		0.938	0.938	0.668
AY1	0.798			
AY2	0.814			
AY3	0.821			
AY4	0.782			
AY5	0.825			
AY6	0.825			
AY7	0.862			
AY8	0.797			
AY9	0.832			
Government Intervention (GI)		0.937	0.938	0.666
GI1	0.761			
GI2	0.809			
GI3	0.752			
GI4	0.822			
GI5	0.842			
GI6	0.84			
GI7	0.835			
GI8	0.851			
GI9	0.829			
Panic Buying Behavior (PBB)		0.888	0.893	0.529
PBB1	0.628			
PBB2	0.774			
PBB3	0.768			
PBB4	0.738			
PBB5	0.681			
PBB6	0.671			
PBB7	0.743			
PBB8	0.769			
PBB9	0.756			
Perceive Scarcity (PS)		0.928	0.93	0.636
PS1	0.801			
PS2	0.773			
PS3	0.702			
PS4	0.777			
PS5	0.811			
PS6	0.825			
PS7	0.833			
PS8	0.834			
PS9	0.814			

This study also examined the latent variable covariance for every single factor that was part of this study. As presented in

Table **2** below, there is a strong covariance between the latent exogenous and endogenous constructs, particularly between anxiety and perceived scarcity, as well as between anxiety and panic buying behavior. In addition to that, the covariance among the exogenous latent variables, especially between government

intervention and panic buying behavior, shows a moderate relationship. The results show that the most significant correlation, 0.739, is found between anxiety and perceived scarcity, suggesting a substantial relationship in which a greater sense of scarcity is strongly associated with increased anxiety.

Next, it is followed by the covariance between anxiety and panic buying behavior, which is 0.722, which indicates a strong correlation between higher levels of anxiety and panic buying behavior. The significant relationship between perceived scarcity and panic buying behavior (0.705) suggests that panic buying behavior tends to increase in conjunction with perceptions of scarcity. Meanwhile, a lower correlation between anxiety and overall impact is shown by the covariance between anxiety and government intervention, which is 0.253. Similarly, there appears to be some association between government intervention and panic buying behavior, however not as significant as there is with anxiety, as indicated by the moderate 0.37 connection between the two.

Lastly, the covariance between government intervention and perceived scarcity is the lowest at 0.336, suggesting a minor correlation between perceived scarcity and an increase in overall effect. There is also a significant positive covariance of 1.276 for the interaction term Government Intervention and Anxiety, indicating a relatively strong relationship between these two variables. This may suggest that the combined effects of anxiety and government intervention have a significant impact. Thus, government intervention demonstrates moderate to weak correlations with the other variables, whereas Anxiety continues to have the most significant relationships with Panic Buying Behavior and Perceived Scarcity. One especially potent factor is the combination of anxiety and government intervention.

Table 2: Latent Variables Covariance.

Variables	Anxiety	Government Intervention	Panic Buying Behavior	Perceived Scarcity	GI x AY
Anxiety	1	0.253	0.722	0.739	-0.147
Government Intervention	0.253	1	0.37	0.336	0.369
Panic Buying Behavior	0.722	0.37	1	0.705	-0.091
Perceived Scarcity	0.739	0.336	0.705	1	-0.167
Government Intervention x Anxiety	-0.147	0.369	-0.091	-0.167	1.276

The scale's discriminant validity was also examined in this study using the Heterotrait-Monotrait (HTMT) ratio approach. According to Hair et al. (2017), HTMT provides more accurate results when the outer loadings of the measurement model vary significantly. The results shown in Table 3, reveal that the HTMT values for all relationships of constructs are below the suggested threshold of 0.85, which demonstrates a strong discriminant validity. Specifically, the highest value is between anxiety and perceived scarcity (0.789), indicating a significant association between anxiety and perceived scarcity, but it remains below the threshold, proving that these two constructs are distinct. The discriminant validity of these variables is further supported by the high but still acceptable values between anxiety and panic buying behavior (0.785), and panic buying behavior and perceived scarcity (0.769). The difference between government intervention and the other latent variables in the model is further supported by the lower values between government intervention and the other constructs, ranging from 0.266 to 0.406, which indicates weak relationships with the other variables.

The difference between this interaction term and the other factors is further supported by the extremely low values of Government Intervention and Anxiety across all constructs, with the greatest value between Government Intervention and Anxiety being 0.338. Consequently, the results guarantee the discriminant validity of the scale.

Table 3: Discriminant validity assessment (Heterotrait- Monotrait Approach).

Variables	Anxiety	Government Intervention	Panic Buying Behavior	Perceived Scarcity	Government Intervention x Anxiety
Anxiety					
Government Intervention	0.266				
Panic Buying Behavior	0.785	0.406			
Perceived Scarcity	0.789	0.358	0.769		
Government Intervention x Anxiety	0.134	0.338	0.085	0.153	

5. RESULTS AND DISCUSSION

5.1. Results

This study investigates the direct relationship between anxiety, perceived scarcity, government intervention, and panic buying behavior of fast-moving consumer goods among expatriates in the UAE. In addition to that, the mediating role of anxiety on the relationship between perceived scarcity and panic buying behavior was likewise examined. Moreover, the significance of the variables' path coefficients, the R^2 (variance explained), and the f^2 (effect size) were utilized to evaluate the structural model and the hypotheses developed in this investigation. Furthermore, using the VIF (Variance Inflation Factor) as shown inTable 5, potential multicollinearity issues in the model were assessed.

The VIF values for all independent variables in the model are below 5, the suggested cut-off level according to Akinwande et al. (2015), which indicates that there were no significant multicollinearity issues. Specifically, the VIF for Perceived Scarcity → Panic Buying is 2.402, which remains within the acceptable range. Followed by the VIF for Anxiety → Panic Buying, which is 2.207, which suggests that there is a moderate but acceptable level of multicollinearity. Then, Government Intervention-> Panic Buying Behavior with a VIF of 1.347, and Government Intervention × Anxiety → Panic Buying, with a VIF of 1.223, both showing minimal multicollinearity. Lastly Perceived Scarcity → Anxiety with a VIF of 1, which means that there is no collinearity with other variables. As a result, it is confirmed in this analysis that multicollinearity is not a concern in this model, ensuring reliable regression estimates.

Table 4: Variance Inflated Factor (VIF).

Independent Variables	VIF
Anxiety -> Panic Buying Behavior	2.207
Government Intervention-> Panic Buying Behavior	1.347
Perceived Scarcity -> Anxiety	1
Perceived Scarcity -> Panic Buying Behavior	2.402
Government Intervention X Anxiety -> Panic Buying Behavior	1.223

Meanwhile, a bootstrapping procedure (n=134, sample = 5000) was also conducted to assess the path coefficient, standard error, and t-statistics. In a one-tailed test, the findings show that the majority of the relationships in the model are statistically significant, with all but one path having crucial t-values surpassing the 0.1% level. Panic buying behavior is strongly influenced by anxiety ($t = 6.606$, $p < 0.001$). It also shows that it is strongly impacted by perceived scarcity with the mediation of anxiety ($t = 6.374$, $p = 0.001$). Likewise, anxiety ($t = 18.028$, $p < 0.001$) and panic buying behavior ($t = 4.617$, $p < 0.001$) are also highly predicted by perceived scarcity.

Nonetheless, panic buying behavior is not substantially impacted by the interaction between government intervention and anxiety ($t = 0.645$, $p = 0.519$), indicating that government intervention has a modest moderating influence on this connection. This demonstrates that anxiety and perceived scarcity are directly influence panic buying behavior, with interaction effects having little to no impact. Furthermore, the result also shows that the R^2 values for anxiety and panic buying behavior are 0.546 and 0.606 respectively, which indicate a moderate to strong explanatory power. Table 5 and Figure 2 below presents the result of the measurement model of the direct and indirect relationships among the variables in this study.

Table 5: Result of Measurement Model.

Hypothesis	Relationship	Std. Beta	Std Error	*t*-values	p-values	Decision	R^2	f^2
H1	Perceived Scarcity -> Anxiety	0.739	0.0006	18.028	0	Supported	0.546	1.204
H2	Perceived Scarcity -> Panic Buying	0.322	0.0010	4.617	0	Supported	0.606	0.109
H3	Anxiety -> Panic Buying	0.441	0.0009	6.606	0	Supported		0.223
H4	Perceived Scarcity -> Anxiety -> Panic Buying	0.326	0.0007	6.374	0	Supported		
H5	Government Intervention X Anxiety -> Panic Buying	-0.025	0.0005	0.645	0.519	Not supported		

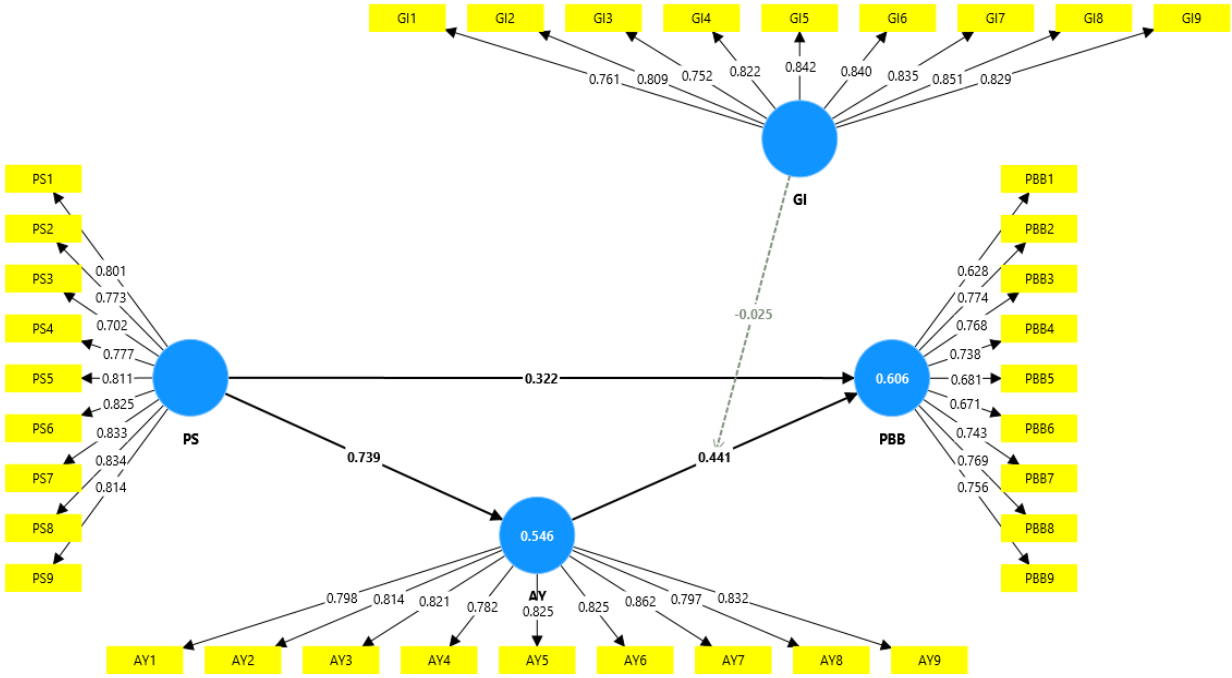

Figure 2: Structural Model.

With a high effect size ($f2$ = 1.204) and a significant relationship (Std. Beta = 0.739, t = 18.028, p = 0), the relationship between perceived scarcity and anxiety accounts for 54.6% of the variance in anxiety (R2 = 0.546), suggesting that perceived scarcity has a significant impact on anxiety. This means that H1 is supported. Furthermore, perceived scarcity and panic buying behavior have a significant relationship (Std. Beta = 0.322, t = 4.617, p = 0). The effect size is small ($f2$ = 0.109), and 60.6% of the variance in panic buying behavior is explained (R2 = 0.606). Nevertheless, H2 is supported. Moreover, the result also shows that there is a relatively small effect size ($f2$ = 0.223) and a significant relationship between anxiety and panic buying behavior (Std. Beta = 0.441, t = 6.606, p = 0). Therefore, H3 is supported. Meanwhile, the role of anxiety as a mediator is accepted by the significant mediation (Std. Beta = 0.326, t = 6.374, p = 0), which indicates that H4 is supported as well. However, H5, which examines government intervention moderating effect on the relationship between anxiety and panic buying behavior is not supported because of non- significant relationship (Std. Beta = -0.025, t = 0.645, p = 0.519). The overall result indicates that perceived scarcity has a significant influence on anxiety and indirectly influence on panic buying behavior, however there is no evidence to support the moderating effect of government intervention.

5.2. Discussion

Based on the findings of this study, anxiety is greatly influenced by perceived scarcity, which is consistent with the previous literature. According to Mehrabian & Russell (1977) and Islam et al. (2018), the Stimulus-Organism-Response (S-O-R) framework supports this relationship by arguing that external stimuli, such as perceptions of scarcity, may influence an individual's emotional state, like anxiety, which in turn influences behavior. In line with previous research showing that scarcity elicits a sense of urgency and the perceived risk of unavailability, the results show that perceived scarcity acts as a potent stimulus, causing anxiety (Donovan & Rossiter, 1982; Liu et al., 2016). People who experience anxiety may engage in activities such as panic buying because they feel pressured to acquire scarce resources. Indeed, Fiore & Kim (2007) state that the S-O-R model, which emphasizes that environmental stimuli impact emotional and cognitive states, which in turn affect behavioral outcomes, has been widely employed to explain such consumer behavior. Anxiety's relevance in connecting perceived scarcity to consumer behavior is further supported by its role as an organismic variable in this paradigm. According to a study led by Islam et al. (2018), increased anxiety intensifies feelings of urgency and scarcity, which increases the desire to take immediate action to reduce potential risks. The findings also support empirical research conducted by Chang et al. (2011), that used the S-O-R model in online and retail settings, demonstrating the model's adaptability in capturing the dynamic interaction of emotions, behavior, and stimuli.

Furthermore, the result which indicated that panic buying behavior is influenced by perceived scarcity is likewise consistent with studies by Court et al. (2009) and Grier & Davis (2013). They found that people respond quickly to obtain limited resources when they perceive scarcity, whether it be temporary or permanent, which disturbs the iterative consumer decision-making process. This behavior was particularly noticeable during the COVID-19 pandemic when widespread panic buying was caused by shortages of necessities like medical protective equipment (Li et al., 2020). Different levels of scarcity, macro, communal, or individual, intensify

consumer responses according to how severe the perceived shortage is (Cannon et al., 2019).

According to the study conducted by Hodkinson (2016), consumers' anxiety and fear of missing out are heightened by the feeling of scarcity, which leads to impulsive behaviors like panic buying. For example, reduced availability to needs during the epidemic enhanced the pressure to store commodities, even among customers not directly impacted by shortages. These findings emphasize the significance of scarcity as a significant external stimulus, which interrupts the consumer's logical decision-making cycle and incites emotional reactions that prioritize short-term benefits over long-term planning. This study adds to the body of research and supports the conclusions of Arafat et al. (2020) and Arafat et al. (2021), that in order to prevent irrational customer behavior in future crises, it is important to implement the tactics that reduce feelings of scarcity, such as better inventory control and open communication.

In times of crisis, Yuen et al. (2020) and Sobaih & Moustafa (2022) state that consumers resort to panic buying as a coping strategy to regain a sense of security due to increased health and resource availability concerns. The Behavioral Immune System (BIS) theory, which holds that perceived risks trigger defensive responses to reduce injury, lends more credence to the role of anxiety in panic buying (Schaller, 2011). This is consistent with research showing that consumers restructure their surroundings through hoarding in response to anxiety that is exacerbated by feelings of severity and shortage (Rapolienė et al., 2019).

The S-O-R theory is also found to be consistent with the acknowledgment that anxiety acts as a mediator in the relationship between perceived scarcity and panic buying behavior. This paradigm claims that perceived scarcity acts as an external stimulus that intensifies physiological and emotional states such as anxiety, which in turn triggers panic buying behavior (Mehrabian & Russell, 1977). Lianjie et al. (2023) indicate that anxiety is emphasized by this mediation effect as a crucial organismic variable that converts external stimuli into useful reactions, especially in unpredictable circumstances like as the COVID-19 pandemic. Anxiety is made worse by perceived scarcity, according to Omar et al. (2021), when people rush to acquire items even if they are not urgently needed because they fear that resources will run out. As a protective reaction to the expected shortage, panic purchasing is further fueled by anxiety, which heightens the sense of urgency and uncertainty (Lianjie et al., 2023).

The analysis conducted reveal that government intervention fails to effectively moderate the relationship between anxiety and panic buying, as these behaviors are primarily influenced by profound emotional and psychological factors, including fear, distrust, and social contagion. Although governmental actions might alleviate certain logistical factors contributing to panic buying (such as disruptions in the supply chain), they frequently overlook the fundamental emotional triggers that persistently propel individuals toward irrational, self-preserving actions. The present finding is consistent with Park et al. (2022) who found that government interventions, such as price caps and supply chain reassurances, were not effective at moderating the relationship between anxiety and panic buying. However, the finding is contradicting to Yuen et al (2020) who found that effective government communication, transparent supply chain management, and policies like rationing or pricing restrictions could help reduce the impact of anxiety on panic buying. Similarly, the present finding also inconsistent with Sim et al (2020) who discovered that clear and timely government interventions reduced public anxiety and perceptions of scarcity, which in turn decreased panic buying behaviors.

The insignificant moderating influence of government intervention on the relationship between anxiety and panic buying is probably due to the fact that anxiety represents a significant emotional state that may result in irrational decision-making. In situations where individuals experience a diminished sense of control, they often resort to actions such as panic buying as a means to restore their feelings of security. Despite the implementation of government interventions like public announcements or rationing systems, the emotional response of anxiety can often take precedence, leading individuals to prioritize their own survival over the reassurance offered by collective measures.

5.3. Managerial Implications

This study has several practical contributions that can help researchers, practitioners, and policymakers comprehend and address panic buying behaviors during public health crises like the COVID-19 pandemic, disaster. The study's findings clarify the direct relationships between scarcity perceptions, anxiety, and panic buying behaviors, in which the positive associations observed between perceived scarcity, and anxiety emphasize the role of digital platforms and supply-related stressors in exacerbating consumer anxieties and driving panic buying behaviors. This offers valuable insights for decision-makers regarding the management of panic buying and enhances readiness for potential future natural disasters, geopolitical crises, or pandemics that can spark panic buying. Initially, in light of the effects of perceived scarcity and emotional reactions on panic buying, it is essential to implement effective measures to mitigate the spread of panic buying. Secondly, media play a crucial role in disseminating information and shaping public perceptions; therefore, the tendency to exaggerate information should be limited. The sources of information must recognize their duty to mitigate the spread of rumors and misinformation.

The mediation analyses likewise highlight the critical role of anxiety in mediating the relationships between scarcity perceptions, and panic buying behaviors, emphasizing the potential of targeted interventions, such as

government communications and supply chain management strategies, in moderating anxiety levels and subsequently reducing panic-driven consumer responses. Specifically, it can help reduce panic buying and support consumer well-being during public health emergencies. Additionally, suitable limits and quotas may be established on products to reduce situations of stock-outs. This will certainly diminish the perception of scarcity and anxiety associated with substantial purchases. Furthermore, organizations ought to strengthen their supply chain and logistics resilience to effectively navigate uncertainties. In this context, advanced technologies like IoT, blockchain, and big data analytics can be utilized to gather real-time data and address the requirements effectively.

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