

Panic Buying Behavior during Pandemic: Protection Motivation Theory Paradigm

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ABSTRACT

The COVID-19 pandemic has currently taken over the public's attention. Due to the pandemic, the situation had become uncontrollable which caused people to react with an act of self-protection. This resulted in the escalating level of panic buying by many people from around the globe. Drawing on the Protection Motivation Theory, this research developed an analytical model to analyze the key points behind the phenomenon of panic buying. Afterwards, the data was collected from 126 respondents who live in Indonesia through a survey questionnaire via Google Form. Through independent sample t-test and linear regression, the collected data was then being analyzed to verify the proposed model. The result reveals that the Protection Motivation Theory was a significant framework that influences this phenomenon. Threats of "perceived scarcity" during the pandemic were coped using the "outcome expectation" which led to the intention of "panic buying behavior". Results and discussion from this paper are given to give new insights to assemble potential solutions and measures which can be applicable to control panic buying in the following health crisis.

Keywords: protection motivation theory, panic buying behavior, perceived scarcity, outcome expectation

1. INTRODUCTION

The world had to face major change ever since the first COVID-19 (Coronavirus Disease 2019) case was reported in December 2019. In less than no time, COVID-19 had spread rapidly all around the world and caused an era of perplexity. Having infected more than 118,000 people in many countries which led to the death of more than 4,200 people, this COVID-19 outbreak was eventually announced as a global pandemic on March 11, 2020 by the World Health Organization (WHO) [1]. The aftermath of the COVID-19 pandemic forced many people to ineluctably face a highly uncertain condition. This uncertainty resulted in the shifting in consumer behavior which is often identified as the act of "panic buying". Furthermore, the correlation between changing consumer's demand and supply availability due to COVID-19 had also influenced this phenomenon [2]. Sky-high levels of products were being purchased by people all over the world, either through offline or online platforms. Tissue papers, face masks, and hand sanitizers were just a few examples of how distressing panic buying could happen because of the COVID-19 pandemic [3].

High levels of panic buying had caused serious impacts on

both the macro and micro scale. Realizing the principle of panic buying is essential to prevent this phenomenon from causing unpredictable consequences [4]. Looking back at the past, some studies had shown that panic buying especially increased in times of crisis. Higher demand from consumers which was not complemented with equivalent supply had been indicated as one of the catalysts of panic buying [3]. Therefore, people are preparing themselves with all the needs they need with the expectation that this act can ensure their safety and well-being in the future [5]. Social influences may as well stimulate the act of panic buying as a manifestation of "group dynamic" [6]. Since the COVID-19 pandemic has become every nation's main focus, much research has been done regarding the situation. Following this, the phenomenon of panic buying has also stolen the society's attention [3]. Up until this point, studies about panic buying mainly analyzed the cause and impact of panic buying. Based on previous study about the cause of panic buying, panic buying is influenced by many factors. One of the most significant causes is because of social influences, either through social media or families and relatives [7]. Exchanging information and past events with families or relatives has also triggered the act of panic buying [3]. The influences from families or

relatives turn out to be impactful in leading an individual's choice to do panic buying. The studies about the impact of panic buying are somewhat more thorough. Starting from disturbance in supply chain to the psychological disorders (e.g. stress, anxiety, or fear of missing out) in the society, the impact of panic buying may vary from bigger to smaller scale [4].

The objective of this study is to figure out the root and key points behind panic buying in the context of the Protection Motivation Theory. Through this study, the gap between available research that hasn't elaborated deep enough will be analyzed. This study will concentrate on evaluating the main cause of panic buying from the individual side of people residing in and outside Java. The results of this study will be beneficial to advance people's knowledge about the panic buying phenomenon. Understanding the root of this phenomenon can be helpful to anticipate and prevent the act of panic buying in the future.

2. Literature Review

2.1. Protection Motivation Theory

This research will analyze the phenomenon of panic buying using the Protection Motivation Theory (PMT) proposed by Rogers in 1975. Protection Motivation Theory is a framework used to define individuals' reaction towards possible threats, especially during health crises. Originally, Protection Motivation Theory combines two aspects; threat and coping appraisal, which will eventually lead to the intention of taking protection measures as a form of self-protection [8]. Threat appraisal comes when someone is feeling vulnerable and causing them to experience a particular threat. While encountering a threat, people tend to respond with coping strategies for their own good [9]. As a result of these two combined aspects, people went on a coping mode by developing an intention to be their strategy to combat the threat.

2.2. The Determinants of Panic Buying Behavior

Panic buying is an act of purchasing huge quantities of particular products in times of crisis to prevent future stockouts. Available research has suggested that panic buying could be triggered by many determinants. Panic buying behavior happened because of the combination of

social influences [7], product unavailability or perceived scarcity [3], perceived feeling of insecurity and instability, anticipatory anxiety [10], and outcome expectation. These five aspects have been indicated as one of the most significant determinants of panic buying. From those determinants, the Protection Motivation Theory could be applied to investigate the key reason behind the panic buying behavior. Based on the Protection Motivation Theory, threat appraisal from panic buying behavior came from perceived scarcity. To cope with this threat, the coping appraisal was applied through outcome expectation. Thus, the intention to panic buy came afterwards.

2.3 Perceived Scarcity and Panic Buying Behavior

In this research, perceived scarcity is defined as the consumers' understanding of market situations regarding product availability during the pandemic. Perceived scarcity boosts the attractiveness of particular products because of limited access to them [11] [12]. Empty shelves of products will make people feel greater influence from perceived scarcity. The greater the influence from perceived scarcity, people are more likely to feel that they are more vulnerable towards the risk from the pandemic [13]. This will result in the act of panic buying to prevent product scarcity.

H1: Perceived scarcity has a positive and significant effect on panic buying behavior.

2.4 Outcome expectation and panic buying behavior

This research terms outcome expectation as future outcome that was expected from consumers consisting of perceived benefit and perceived barrier. People will expect to gain benefits from panic buying in the future. Perceived can be categorized into economic, functional, hedonic, and social utility [14]. Outcome expectation will be favorable when the perceived benefit counteracts the perceived barrier. On the other hand, outcome expectation will be unfavorable if the perceived barrier exceeds the perceived benefit [3]. When outcome expectation is favorable, the panic buying phenomenon will more likely to happen.

H2: Outcome expectation has a positive and significant effect on panic buying behavior.

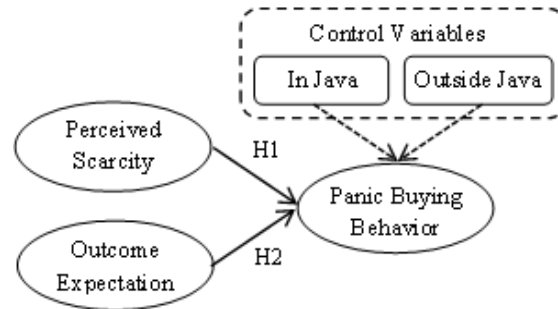


Figure 1. Conceptual Framework

3. METHOD

This research is quantitative research using a cross sectional design method. The population in this study is spread across several cities in Indonesia. The sampling method used is probability sampling method which means that all respondents have the same opportunity to be selected as a sample, while the sample selection technique used in this study is simple random sampling. The sample in this study was 126 respondents in several cities in Indonesia.

Table 1. Sampling Profile of Respondents

Characteristics		Freq.	Prop. (%)
Gender	Male	56	44.44
	Female	70	55.56
Age	≤ 20 y.o.	105	83.33
	> 20 y.o.	21	16.67
Education	Basic Edu.	4	3.17
	Higher Edu.	122	96.83
Domicile	Java	95	75.40
	Outside Java	31	24.60

Data collection in this study was carried out by distributing questionnaires online using Google Form. Based on the data collected, it is known that the majority of respondents were female at 70 out of 126 respondents or 55.56% of the total respondents. Furthermore, 96.83% of the respondents' educational level are in higher education and as many as 95 respondents live in Java. Some instruments were adapted from previous studies to measure research variables, research objects were measured using a five-point likert scale with point 1 indicating "strongly disagree" and point 5 indicating "strongly agree". Table 1 shows the sampling profile of respondents. The data analysis method in this study uses independent sample t-test and linear regression with the help of the JASP 0.14.1 program and the significance level of 5%.

Table 2. Measurement Items and Constructs Validity

Construct	ID	Loadings	Cronbach's α
Perceived scarcity	PS1	0.765	0.755
	PS2	0.870	
	PS3	0.804	
	PS4	0.748	
	PS5	0.802	
Outcome expectation	OE1	0.831	0.894
	OE2	0.769	
	OE3	0.875	
	OE4	0.761	
	OE5	0.797	
	OE6	0.826	
Panic buying behavior	PBB1	0.765	0.808
	PBB2	0.661	
	PBB3	0.837	
	PBB4	0.773	
	PBB5	0.725	

Validity analysis has been carried out on the instrument with the results of convergent validity analysis that is the loading factor of all indicators of all variables showing the value above 0.7. Meanwhile, reliability analysis is based on Cronbach's alpha which shows a value of more than 0.6 so that all indicators in the study are reliable.

4. RESULTS AND DISCUSSION

Table 2 below shows the results of the independent sample t-test, which is a parametric test used to determine whether there is a difference in the mean between two independent groups or two unpaired groups (which in this case is a classification of respondents' characteristics) with the intention that both groups of data come from different subjects.

Table 3. Parametric Test of PBB Based on The Characteristics of Respondents

	t	df	p
PBB Gender	-1.054	124	0.294
PBB Age	0.965	124	0.336
PBB Education	-0.545	124	0.586
PBB Domicile	-0.657	124	0.512

Based on the output above, it is known that the t-statistic value for the parametric test of panic buying behavior based on gender is $-1.054 < 1.96$ with a p-value of $0.294 > 0.05$ (95% confidence level), so it can be interpreted that the data variance of panic buying tendencies between groups of males respondents and women are homogeneous or the same (there is no significant difference). Meanwhile, the t-statistic value for the parametric test of panic buying behavior based on age is $0.965 < 1.96$ with p-value of $0,336 > 0.05$. Therefore, it can be concluded that the data variance of panic buying tendencies between the group of respondents aged younger than or equal to 20 years and respondents aged older than 20 years is homogeneous or the same.

Similar result were also obtained in the parametric test of panic buying tendencies between groups of respondents with different levels of education, namely basic and higher education (t-statistic of $-0.545 < 1.96$ & p-value of $0.586 > 0.05$). Furthermore, the results of the t-statistics ($-0.657 < 1.96$) and p-values ($0.512 > 0.05$) from the parametric panic buying behavior test based on the respondent's domicile also gave homogeneous results, meaning that both respondents residing in and outside Java also experienced relatively similar panic buying tendencies.

In this research, hypothesis testing is done using Multiple Linear Regression (MLR) analysis. Based on this analysis, the following results were obtained:

Table 4. The ANOVA Table for Regression

Model	Sum of Squares	df	Mean Square	F	n
H ₁ Regression	37.133	2	18.566	35.642	<.001
Residual	64.072	123	0.521		
Total	101.205	125			

The sig. value in the ANOVA table above is a series of tests to ensure that the regression model used is good and feasible to use. From the results of the ANOVA output table above, it was found that the value of sig. $0.001 < 0.05$, so it can be concluded that the regression model can be used to predict the dependent variable, which is panic buying behavior. Simply put, both perceived scarcity and outcome expectations have the ability to influence panic buying behavior.

Table 5. Model Summary of Regression Linear

Model	R	R ²	Adjusted R ²	RMSE
H ₀	0.000	0.000	0.000	0.900
H ₁	0.606	0.367	0.357	0.722

Moreover, the p-value of H2 is 0.001 with a t-statistic

Table 6. Hypothesis Testing Result

Model	Unstandardized	Standard Error	t	p	Collinearity stats.	
					Tolerance	VIF
H ₀ (Intercept)	2.630	0.080		32.811	<.001	
H ₁ (Intercept)	0.445	0.299		1.490	0.139	
Outcome expectation	0.397	0.076	0.433	5.246	<.001	0.756 1.323
Perceived scarcity	0.301	0.095	0.261	3.162	0.002	0.756 1.323

value of 5.246. This result stated that the p-value of this hypothesis is less than 0.05 (95% confidence level), while the t-statistic value is higher than the t-table value of 1.96. Thus, it can be concluded that the outcome expectation variable also has a significant positive effect on panic buying behavior.

The core finding of this study related to the significant association between two constructs of panic buying behavior in the protection motivation paradigm confirms the utility of the threat appraisal and coping appraisal approach to comprehend consumer

From table 5 above, it is known that the correlation coefficient (R) of the regression model is 0.606, so the correlation formed between the two independent variables (perceived scarcity and outcome expectation) simultaneously on the dependent variable (panic buying behavior) is a high positive correlation. The magnitude of the coefficient of determination (R Square) is 0.367 or equal to 36.7%. This figure means that the perceived scarcity (X1) and outcome expectation (X2) variables simultaneously (together) affect the panic buying behavior variable (Y) by 36.7%. While the rest ($100\% - 36.7\% = 63.3\%$) is influenced by other variables outside this regression equation or not examined variables. Based on hypothesis testing results on table 6, it can be concluded that both H1, as well as H2 are supported. Based on the table 5, the t-statistic value of H1 is 3.162 which is greater than the t-table value of 1,96 and the p-value is 0.002 which is less than 0.05 (95% confidence level). This shows

that the perceived scarcity variable has a significant positive effect on panic buying behavior.

behaviour in terms of panic buying intention. Protection Motivation Theory (PMT), developed by Rogers in 1975, is an assessment process of threat and response assessment processes that result in the intention to carry out the adaptive response (protective motivation). According to Rogers, the essence of Protection Motivation Theory is that when people are faced with information exposure (sources of information), they will evaluate this received information (cognitive mediating process), and finally react to the received information (protection motivation behavior). Cognitive mediating process has 2 types, namely the threat appraisal process and the coping appraisal process. Threat appraisal can be said as a perception of risk where there is the concept of uncertainty and consequences, while coping appraisal is related to the individual's belief in its ability to prevent or mitigate threatening security events. In line with this research, the result elaborates that there are two constructs that underlie the intention of panic buying behavior, namely perceived scarcity as a form of threat appraisal and outcome expectation as coping appraisal.

In relation to the first hypothesis, the relationship between perceived scarcity and panic buying behavior actually has a psychological relationship on how people digest their perceived risk [15]. Psychologically, consumers will process and digest the perceived risks through three levels of stage. Firstly, consumers will be facing the "framing of a situation or problem" phase where at this stage they will perceive risk through identifying the situation [16]. At the second stage, which is the "screening stage", consumers will determine the level of seriousness of the problems or issues. Lastly, consumers will be facing the "evaluation stage", where they determine the strategy to be carried out or the outcome behavior, which is panic buying behavior, through a cognitive and affective evaluation process. Regarding the second hypothesis, Groza et al. (2016) stated that psychologically there are three types of thinking style, which are judicative (evaluation-based behavior), executive (compliance-based behavior), and legislative (creative-

based behavior) [17]. Associated with this theory, outcome expectation variables in this research can be defined as a part of judicative thinking style. According to Zhang and Sternberg (2002), this judicative thinking style is closely related to the involvement of heavy screening activities, assessments, and deep evaluations of issues and surrounding situations as the basis for making decisions on an action [18]. Simply put, because of the COVID-19 pandemic, people need to be more analytical and critical in analysing situations, especially regarding this economic uncertainty [19]. In addition, this thinking style encourages consumers to investigate the content, structure, and timing of a situation and match these situational characteristics with available problem-solving tools [19]. In line with this concept, outcome expectation can be considered as the perceived benefits that consumers expect to gain from the act of panic buying and what are their potential losses if they don't do panic buying.

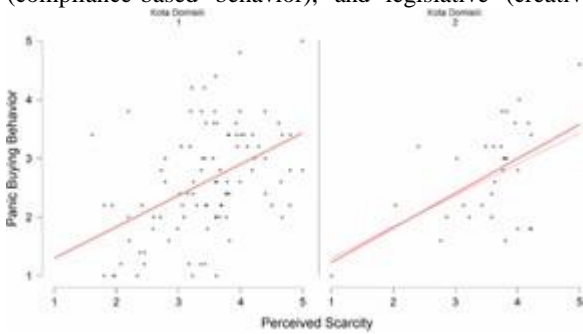


Figure 2. Linear Modeling of perceived scarcity Effect on PBB Based on Domicile

Based on the plot of the statistical model above, it presents an unique phenomenon that the slope of the linear graph of perceived scarcity effect on panic buying behavior of respondents residing outside Java is higher than the slope shown for respondents in Java. This means that given at a low level of perceived scarcity, although people who live in Java will have a relatively slightly

higher panic buying tendency, however, any increase in the level of perceived scarcity of respondents outside Java will contribute to a higher level of panic buying behavior than respondents in Java. Mathematically, the difference in the equations of the two lines lies not only in the constant value, but also in the variable coefficient which also shows the degree of slope of the graph.

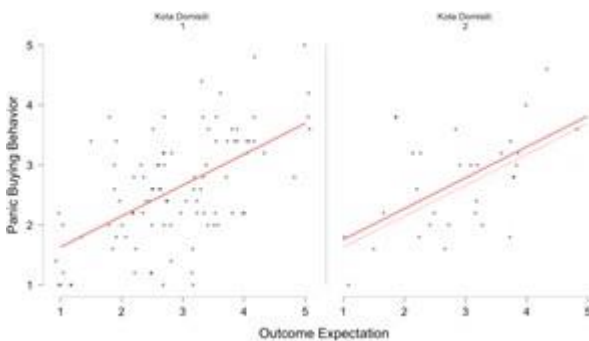


Figure 3. Linear Modeling of outcome expectation Effect on PBB Based on Domicile

Based on the plot of the statistical model above, there is no difference in slope as shown in the previous linear model of the relationship between perceived scarcity and panic buying behavior. From the linear modeling that explains the relationship between the outcome expectation and panic buying behavior variables from two domicile categories above, it can be seen that there is a tendency for respondents outside Java to have higher panic buying intention than respondents in Java at a certain outcome expectation level. Mathematically, the difference in the equation of the both two lines lies in the value of the constant only.

The analysis conducted proves that people outside Java island tend to have a higher chance to do panic buying. This result is relatable with the real situation happening right now. Based on data from the Ministry of Industry in 2021, the five regions listed as having the largest industrial estates in Indonesia are Batam in Kepulauan Riau (the most), followed by Karawang (West Java), Bekasi (West Java), Tangerang (Banten), and Serang (Banten). However, the imposition of large-scale social restrictions (PSBB) and restrictions on community activities (PPKM) by the government will inevitably change logistics operations between regions, especially across the island. The Head of Corporate Communications from several start-up marketplaces in Indonesia also said that they felt the effects of this policy, including the temporary deactivation of delivery services between regions (especially outside Java) and delays in picking up packages. Therefore, their access and supply of people outside Java to essential products during this pandemic is more limited, which in turn will increase the intensity of their panic buying tendency.

5. CONCLUSION

Ever since the COVID-19 pandemic started, the phenomenon of panic buying has happened at an unimaginable level that never happened before. Following this phenomenon, this research drew on the Protection Motivation Theory to investigate the key reason of the panic buying behavior. The threat appraisal of this phenomenon was perceived scarcity, while the coping appraisal was outcome expectation. Both the threat and coping appraisals caused the development of the intention to panic buying. Furthermore, the respondent's domicile is modeled as a control variable and the results show that when faced with certain perceived scarcity and outcome expectations, residents outside Java have a relatively higher tendency to engage in panic buying behavior. Therefore, the government or the apparatus should initiate a "Special Logistics Line" during public activities restriction (PPKM and PSBB), which distinguishes between logistics and people transportation so that logistics operations can still run smoothly.

REFERENCES

- [1] Hanaei, S., & Rezaei, N. (2020). COVID-19: Developing from an Outbreak to A Pandemic. *Archives of Medical Research*, 51(6), 582-584.
- [2] Hall, M. C., Prayag, G., Fieger, P., & Dyason, D. (2020). Beyond panic buying: consumption displacement and COVID-19. *Journal of Service Management*, 32(1), 113-128.
- [3] Chua, G., Yuen, K. F., Wang, X., & Wong, Y.D. (2021). The Determinants of Panic Buying during COVID-19. *International Journal of Environmental Research and Public Health*, 18(6), 1-28.
- [4] Prentice, C., Quach, S., & Thaichon, P. (2020). Antecedents and consequences of panic buying: The case of COVID-19. *International Journal of Consumer Studies*, 1-15.
- [5] Teofilus, & Steven, Ng. (2017). Analisis pengaruh variabel antisedan dari impulsive buying (studi empiris pada Giant Ekstra Jatiasih). *Jurnal Manajemen Teori dan Terapan*, 10(1), 21-36.
- [6] Eva, N., Saputra, D. R., Wulandari D. A., Yahya, F. A., & Annisa W. (2021). Panic-Buying Behaviour During the Covid-19 Outbreak: A Cross-Cultural Psychological Study. *International Conference of Psychology*, 4(15), 80-87.
- [7] Arafat, S. M. Y., Ahmad, A. R., Murad H. R., & Kakashekh, H. M. (2021). Perceived Impact of Social Media on Panic Buying: An Online Cross-Sectional Survey in Iraqi Kurdistan. *Frontiers in Public Health*, 9, 1-6.
- [8] Maddux, J. E., & Rogers, R. W. (1983). Protection Motivation and Self-Efficacy: A Revised Theory of Fear Appeals and Attitude Change. *Journal of Experimental Social Psychology*, 19(5), 469-479.
- [9] Hodgkins, S., & Orbell, S. (1998). Can Protection Motivation Theory Predict Behaviour? A Longitudinal Test Exploring the Role of Previous Behaviour. *Psychology and Health*, 13, 237-250.
- [10] Lehberger, M., Kleih, A. K., & 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*, 161, 1-19.

- [11] Maghsoudi, A., Zailani S., Ramayah, T., & Pazirandeh A. (2018). Coordination of efforts in disaster relief supply chains: the moderating role of resource scarcity and redundancy. *International Journal of Logistics Research and Applications*, 21(4), 407-430.
- [12] Sheu, J. B., & Kuo, H. T. (2019). Dual speculative hoarding: A wholesaler-retailer channel behavioral phenomenon behind potential natural hazard threats. *International Journal of Disaster Risk Reduction*, 44, 1-10.
- [13] Rasmara, A., Aghamolaei, T., Madani, A., Hosseini, Z., & Zare, S. (2018). Prediction of safe driving Behaviours based on health belief model: the case of taxi drivers in Bandar Abbas, Iran. *BMC Public Health*, 18(380), 1-8.
- [14] Yuen, K. F., Wang, X., Ma, F., & Wong, Y. D. (2019). The determinants of customers' intention to use smart lockers for last-mile deliveries. *Journal of Retailing and Consumer Services*, 49, 316-326.
- [15] Conchar, M.P., Zinkhan, G.M., Peters, C., Olavarrieta, S. (2004). An integrated framework for the conceptualization of consumers' perceived risk processing. *J. Acad. Market. Sci.* 32(4), 418-436.
- [16] Herjanto, H., Gaur, S., Hong, J.H.H. (2017). Factors influencing consumers' purchase intention of genuine products and intention to use pirated products: Malaysian perspective. *In: Paper Presented at International Conference on Management and Entrepreneurship (I-Come)*, July 13-15, Bali, Indonesia.
- [17] Groza, M.D., Locander, D.A., Howlett, C.H. (2016). Linking thinking styles to sales performance: the importance of creativity and subjective knowledge. *J. Bus. Res.* 69, 4185-4193.
- [18] Zhang, L.F., Sternberg, R.J. (2002). Thinking styles and teachers' characteristics. *Int. J. Psychol.* 37 (1), 3-12.
- [19] Sternberg, R.J. (1999). *Thinking Styles*. Cambridge University Press, New York, U.S.A.
- [20] Kementerian Perindustrian Republik Indonesia. (2021). *Daftar Kawasan Industri*. Retrieved August 2, 2021, from <https://kemenperin.go.id/kawasan>.