Library Progress International *Print version ISSN 0970 1052*
Vol.44 No. 3, Jul-Dec 2024: P. 16456-16465 *Online version ISSN 2320 317X*

Original Article *Available online at www.bpasjournals.com*

Exploring Impulse Purchases in Mobile Apps: The Role of Scarcity Persuasion and Price Perception

[1]Mr. Amin Vohra, [2]Dr. Ankur Amin, [3]Dr. Nitin Rao Chavhan, [4]Dr. Parth Chhabra, [5]Prof. Dr. Ajay Trivedi

[1]Qualification: B.com, M.com, M.Phil. (Ph.D. pursuing), Working as an Assistant Professor at the Faculty of Commerce, Parul University, Vadodara, Gujarat
[2]Qualification: Ph.D., MBA (Marketing), UGC NET, Current Position: Working as an Assistant Professor, At. P.G. Department of Business Studies, Sardar Patel University, Vallabh Vidyanagar (18 years of Teaching experience)
[3]Qualification: B. Com, CA (Inter), MBA, Ph.D. (Commerce & Management), Current Position: Working as an Assistant Professor at the Faculty of Commerce, Parul University, Vadodara, Gujarat
[4]Qualification: DIG, B. Com, M. Com, Ph.D. (Commerce), Current Position: Working as an Assistant Professor at the Faculty of Commerce, Parul University, Vadodara, Gujarat
[5]Qualification: Ph.D., MBA, Current Position: Working as a Dean at the Faculty of Commerce, Parul University, Vadodara, Gujarat

How to cite this article: Amin Vohra, Ankur Amin, Nitin Rao Chavhan, Parth Chhabra, Ajay Trivedi (2024) Exploring Impulse Purchases in Mobile Apps: The Role of Scarcity Persuasion and Price Perception. *Library Progress International,* 44(3), 16456-16465

Abstract:
Purpose: This study investigates how price perception and scarcity persuasion affect impulsive purchases in mobile apps. The study intends to shed light on these variables' effects on customer behaviour and decision-making. The results will provide information on how to optimize mobile app strategies to increase user engagement and boost revenue.
Practical Implication- Providing mobile app developers with strategies to leverage scarcity persuasion and manage price perception effectively. By understanding these dynamics, developers can design compelling user experiences that boost impulse purchases and increase revenue. Additionally, insights from this study can inform targeted marketing efforts to enhance overall consumer engagement.
Social Implication- This research highlights how scarcity persuasion and price perception in mobile apps can influence consumer behavior, potentially leading to increased spending and financial stress. It underscores the need for ethical design practices to ensure that these tactics do not exploit vulnerable users.
Originality and Value- This study is unique in that it focuses on the interaction—a field that has not received much attention—between scarcity persuasion and price perception, particularly in mobile apps. Its significance rests in its new insights, which developers and marketers may use to craft more ethical and successful impulse buy tactics.
Keywords- Impulse Buying, Scarcity Persuasion, Price Perception, Urge to Buy, Consumer Behaviour

1. Introduction

Impulsive buying refers to making unplanned purchases driven by a sudden and strong desire to buy, often exceeding the original budget (Stern, 1962). A market report from CreditCards.com revealed that 84 % of all shoppers made impulse purchases, and it is estimated that impulse purchases accounted for almost 40 % of consumer spending on e-commerce (Christy, Tommy, & Zach, 2017)

In today's digital marketplace, mobile applications have transformed consumer shopping behavior, leading to an increase in impulse purchases (Khan & Dhar, 2006). This shift can be largely attributed to the psychological mechanisms that drive consumers to act swiftly, often without careful consideration. Among these mechanisms, scarcity persuasion and price perception are particularly influential. Scarcity persuasion leverages the human instinct to react to limited availability, instilling a sense of urgency that prompts quick buying decisions (Cialdini, 2009). Research has shown that consumers are more likely to purchase products perceived as scarce, driven by the fear of missing out (FOMO) (Higgins et al., 2016).

Simultaneously, price perception significantly affects how consumers evaluate the value of a product. Techniques such as presenting discounts or highlighting original prices alongside reduced prices can enhance perceived savings, leading to impulsive buying behavior (Grewal et al., 1998). The interaction between scarcity and price perception creates a potent influence on consumer decisions, particularly in mobile shopping environments where immediacy is emphasized (Dholakia, 2000).

This research aims to explore the complex interplay between scarcity persuasion and price perception in the context of mobile app shopping. By investigating how these factors contribute to impulse purchasing behavior, we seek to enhance understanding of consumer psychology and the marketing strategies that exploit these dynamics. The findings will not only provide valuable insights for marketers looking to optimize their approaches but will also empower consumers to navigate the digital marketplace more thoughtfully. Understanding these psychological triggers is essential in an era where impulsive spending is increasingly facilitated by just a tap on a screen.

2. Background of the Study

Wang & Wang (2021): This study highlights how the interaction between price and scarcity in mobile commerce significantly influences impulse buying. Consumers are more likely to make impulsive purchases when they perceive both a good deal and limited availability.**Redden & Haws (2016)**: Through a meta-analysis, this research confirms a robust connection between perceived scarcity and impulse buying. The findings suggest that scarcity consistently motivates consumers to make quicker purchasing decisions across various contexts. **Pettit & Melnyk (2016)**: This study shows that scarcity messages in app marketplaces improve users' perceptions of price and value. As a result, consumers are more likely to make impulsive purchases when they believe an item is in limited supply.**Huang & Chen (2018)**: This study focused on mobile app users, demonstrating that the combination of scarcity and strategic pricing can effectively enhance impulse purchases. Users are more inclined to buy when they see limited-time offers paired with attractive prices. **Khan & Dhar (2006)**: This research indicates that scarcity can reduce consumers' sensitivity to price. When an item is perceived as scarce, consumers are more willing to overlook high prices, making them more likely to make a purchase. **Simonson & Rosen (2014)**: The authors investigate how the interplay of high prices and scarcity can lead to increased impulsive behaviour. They suggest that consumers may justify higher costs when they perceive an item as scarce and desirable. **Cialdini (2009)**: Cialdini highlights that scarcity is a powerful persuasive tool that creates urgency among consumers. When items are marketed as limited in availability, individuals are more likely to make quick purchasing decisions to avoid missing out. **Aaker & Akutsu (2009)**: This study found that when consumers perceive a product as scarce, its value increases in their eyes. This heightened perceived value often leads to impulsive buying, as consumers rush to secure the item before it's gone **Kahn & Baron (2007)**: Kahn and Baron explored how scarcity affects both the likelihood of making a purchase and how consumers evaluate products. Scarcity not only encourages purchases but also can enhance the perceived quality of the product. **Dahl & Moreau (2007)**: This research reveals that the impact of scarcity on purchasing behavior can vary significantly across different cultures. Cultural norms and values shape how individuals perceive scarcity, affecting their propensity to engage in impulse buying. **Miller & Rader (2006)**: The authors argue that scarcity intensifies consumer desire, leading to more impulsive purchasing behavior. When items are marketed as scarce, they become more desirable, prompting quicker buying decisions. **Shah & Scheufele (2006)**: This article discusses how scarcity activates psychological mechanisms that drive impulse purchases. When faced with scarcity, consumers often act on emotion rather than rational deliberation, leading to spontaneous buying. **Eroglu (1999)**: Eroglu's work emphasizes the strong connection between perceived scarcity and impulsive purchasing behavior. When consumers perceive a product as scarce, they are more likely to act quickly and make a purchase without extensive deliberation. **Grewal & Baker (1994)**: The authors found that scarcity can boost consumers' purchase intentions, particularly when they feel competitive pressure. This competitive context prompts quicker decisions, increasing the likelihood of impulse buying.

3. Research Methodology

3.1 Development of Hypothesis and Model

3.1.1 Susceptibility to Social Influence (SSI) and the urge to buy impulsively

Susceptibility to social influence (SSI) refers to the tendency to be easily swayed by the experiences of others and to seek their approval. According to Scheinbaum et al., the degree of susceptibility can vary among individuals, with some relying more heavily on others when making purchasing decisions. Research has shown a strong positive correlation between SSI and the urge to buy impulsively (UBI). For instance, Sharma and Klein found that SSI significantly influences online purchasing behaviour, and this finding was further corroborated by Polas et al., who identified a positive link between SSI and impulse buying. Based on this evidence, we propose the following hypothesis:

H01: There is no significant relationship between susceptibility to social influence and the urge to buy impulsively.

3.1.2 Impulse buying tendency and the urge to buy impulsively

Impulse buying tendency refers to the extent to which individuals make immediate and unplanned purchases. Research indicates that people exhibit varying levels of this tendency, with those possessing higher tendencies experiencing stronger urges to buy impulsively (Utama et al., 2020; Bellini & Aiolfi, 2021). Studies have shown a positive correlation between individual impulse buying tendencies (IIB) and the urge to buy impulsively (UBI), with higher IIB leading to greater UBI (Bandyopadhyay, 2021; Cavazos-Arroyo & Maynez-Guaderrama, 2022; Aiolfi et al., 2023).

H02 *There is no significant association between individual impulse buying tendency and the urge to buy impulsively.*

3.1.3 Cognitive reactions and the urge to buy impulsively

Cognitive reactions refer to the mental processes that individuals undergo when exposed to a stimulus. These processes involve evaluating information, where positive cognitive evaluations can increase consumers' desire for impulse purchases of particular products, services, or brands. Previous studies have demonstrated a significant positive relationship between cognitive reactions and impulse buying. For instance, Zuo and Xiao noted that cognitive reactions make individuals more inclined to make spontaneous purchases. Wu et al. identified cognitive reactions as important triggers for impulse buying. Additionally, Cui et al. highlighted perceived usefulness as a component of cognitive reactions, finding a significant positive correlation with the urge to buy impulsively. Paul et al. further investigated cognitive reactions, confirming a significant positive link with impulsive buying tendencies. Therefore, the following hypothesis is proposed:

H03 *There is no significant relationship between cognitive reactions and the urge to buy impulsively.*

3.1.4 Affective reactions and the urge to buy impulsively

Affective reactions refer to emotional responses—such as arousal and pleasure—triggered by external stimuli. Perceived enjoyment is a major factor influencing impulse buying (Zuo & Xiao, 2023; Zhang et al., 2023). Research indicates a significant positive relationship between affective reactions and the urge to buy impulsively (UBI) (Parboteeah et al., 2023; Yang et al., 2023). For instance, studies have shown that perceived enjoyment in contexts like livestream shopping enhances impulse purchasing behavior (Zuo & Xiao, 2023). Additionally, factors like intimacy and personal closeness also contribute to the UBI (Chen et al., 2023; Xiang et al., 2023). Therefore, the following hypothesis is proposed:

H04: There is no significant relationship between affective reactions and the urge to buy impulsively.

3.1.5 Moderating effect of scarcity persuasion and price persuasion

Scarcity persuasion and price perception are two influential factors that affect consumer behavior in the context of impulse buying. Scarcity signals to consumers that a product's popularity exceeds its supply, enhancing its perceived value, quality, and exclusivity. This perception can stimulate purchase behavior, as evidenced by research showing that scarcity can trigger impulse purchases and strengthen the relationship between attitudes toward luxury products and willingness to pay.

On the other hand, price perception involves consumers' assessment of the value and sacrifices associated with obtaining a product. This perception can send positive or negative signals to consumers, influencing their impulse buying processes, especially in online shopping where price comparisons are more accessible.

H05: Scarcity persuasion and price perception do not moderate the relationship between the urge to buy impulsively, Affective reactions, and Impulse buying tendency

3.2 Sample and population

This study primarily investigates impulse buying behavior in mobile apps, focusing on the influence of scarcity persuasion and price perception. The target population consists of online shoppers in Gujarat who have experience with mobile shopping applications. Due to the lack of a defined sampling frame and uncertainty about the overall population size, a non-probability convenience sampling method was employed. However, it is important to note that Hair et al. suggest a minimum sample size of 200 for PLS-SEM analyses, indicating that the sample size in this study exceeds the recommended threshold I.e. 159 for statistical evaluation.

3.3 Data collection method

The data collection method employed in this study involved a structured questionnaire designed to assess various aspects of impulse buying behaviour in mobile apps. Participants responded to items using a five-point Likert scale, allowing them to express their level of agreement or disagreement with each statement. This approach facilitated the quantification of respondents' perceptions regarding scarcity persuasion, price perception, and their overall impulse purchasing tendencies. The structured format ensured clarity and consistency in responses, enhancing the reliability of the data collected.

3.4 Instruments

The study utilized a structured questionnaire to measure key variables related to impulse buying behavior in mobile apps, focusing on scarcity persuasion and price perception. Participants rated their agreement with various statements using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). To ensure validity and reliability, items

were sourced from established literature on consumer behavior and underwent pre-testing and pilot testing for refinement. This approach aimed to gather robust data on factors influencing impulse purchases in mobile shopping environments.

3.5 Data analysis method

The proposed model in this study was tested using the PLS-SEM method, which involved two stages: evaluating the measurement model for construct validity and reliability, followed by assessing the structural model to examine the relationships between constructs related to impulse purchasing behavior. PLS-SEM is favored in marketing and management research due to its ability to handle complex models with small sample sizes and non-normal data distributions. It allows for simultaneous estimation of measurement and structural models, providing insights into both variable relationships and measurement reliability.

4. Result

4.1 Respondents Profile

Table No. 01 Demographics of Respondents

Particular		Frequency	Percentage
Gender	Male	99	63%
	Female	60	37%
Age	18-24	89	68.85
	25-30	30	23.20
	More than 30	40	30.94
Occupation	Student	123	77.35%
	Employee	20	15.47
	Business	16	12.37
Qualification	Up to 12	17	10.7
	Ug.	124	78
	Pg.	16	10.3
Income	Up to 1 Lac	129	81.1
	1-5 Lac	17	10.7
	More than 5 Lac	13	8.2

Source: primary data

The data reveals a predominantly young and student population, with 63% identifying as male and 37% as female. Most respondents (68.85%) fall within the 18-24 age range, indicating a youthful demographic. A significant majority (77.35%) are students, highlighting the sample's educational focus. In terms of qualifications, 78% hold an undergraduate degree, while income levels show that 81.1% earn up to 1 lakh, suggesting limited financial resources among the participants. This profile suggests a primarily young, educationally focused group with lower income levels.

4.2 Reliability Statistics

Table No. 02 Reliability Test

Construct	Cronbach's alpha	Composite Reliability	AVE	Square root of AVE
SSI	0.729	0.81	0.62	0.74
IBT	0.930	0.92	0.53	0.73
CR	0.788	0.70	0.58	0.76
AR	0.725	0.72	0.60	0.78
UBI	0.812	0.79	0.55	0.74

Source: SPSS Amos Output

In order to assess convergent validity, average variance extracted (AVE) values were observed. As Table No. 2 indicates AVE values for this study range from 0.53 to 0.62, which is higher than the threshold critical level of 0.5. The AVE shows the extent to which the latent unobserved variable accounts for the variation of the indicators. The values of the square root of AVE for all latent constructs were higher than the intercorrelation of latent variables. Further Cronbach's alpha for all

items is >0.7 Indicates the scale's acceptability level, which indicates internal consistency.

4.3 Discriminant Validity

Table No. 03

Fornell and Larcker Criterion (square root of AVE compared to construct correlations)

Constructs	SSI	IBT	CR	AR	UBI
Susceptibility to social influence	**0.71**				
Impulse buying tendency	0.68	**0.73**			
Cognitive reaction	0.67	0.71	**0.76**		
Affective Reaction	0.69	0.70	0.68	**0.78**	
Urge to buy impulsively	-0.136	-0.107	0.082	-0.056	**0.74**

Source: SPSS Amos Output **Note: Value in Bold are the Square root of AVE**

Fornell and Larcker (1981) criterion was applied to measure the discriminant validity of measurement model. Accordingly, AVE should be greater than the variance between the construct and other construct in the model. As Depicted from the above table AVE Value i.e. Average Variance extracted is higher than its factors loading values.

4.4 Convergent Validity

Table No. 04 HTMT Analysis

Constructs	SSI	IBT	CR	AR	UBI
Susceptibility to social influence					
Impulse buying tendency	0.828				
Cognitive reaction	0.615	1.141			
Affective Reaction	0.735	0.788	0.823		
Urge to buy impulsively	-0.698	0.085	1.127	-0.06	-

Source: SPSS Amos Output

Additionally, HTMT approach was also employed in the present study which is the latest approach to test the discriminant validity. According to this criterion, the values should not be more than 0.85. (Hair et al., 2017). The values mentioned in Table 4 show this criterion is fulfilled as well.

4.5 Model Fitness Test

Table no. 05 Goodness of fit Measures

Goodness of Fit Measures	χ2/df	GFI	NFI	CFI	TLI	RMSEA
Measurement Model	1.978	.712	.780	.903	.882	.076
Structural Model	1.947	0.796	0.796	0.731	0.785	.057

Source: SPSS Amos Output

Note: **χ2/d=**Relative Chi-square; **GFI**=Goodness of Fit Index; **NFI=**Normed fixed index; **CFI**=Comparative fit index; **TLI**=Tucker-Lewis Index; **RMSEA=**Root mean squared error of approximation;

Table 5 shows the goodness of fit for the structural equation model. As shown in the above table, all the parameter values are closed to the threshold limit, which shows the model's fitness for the given study. There is some problem in RMSEA as the value is marginally away from its threshold limit, which is 0.10; as per the table, it is 0.076, which is an acceptable limit. Overall, all the parameters are good fits with the model dimension.

4.6 Structural Equation Modelling

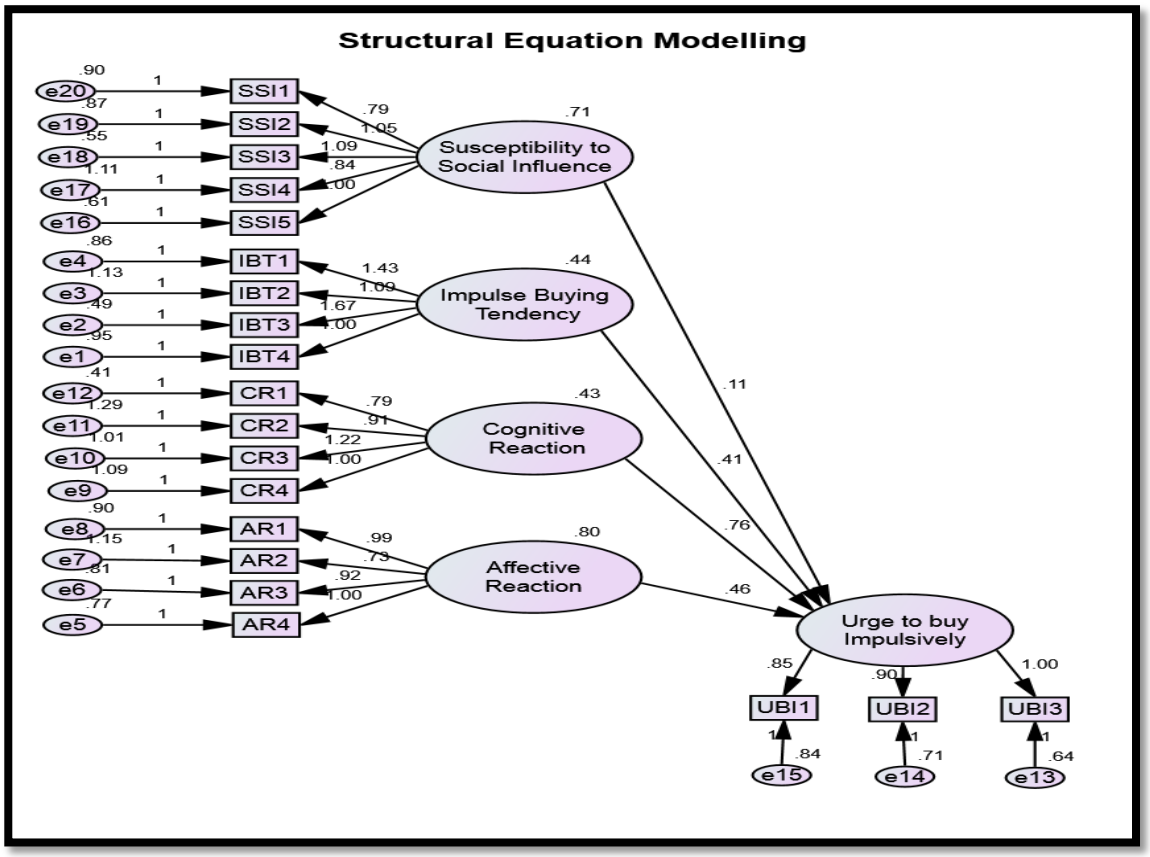

Figure-1 : Structural Equation Modelling

4.7 SEM Assessment

Table no. 06 SEM Result

Hypothesis	Regression Path	estimate	S. E	C.R	P-Value	Decision
H01	SSI ⟶ UBI	.105	.069	1.513	0.126	Supported
H02	IBT ⟶ UBI	.406	.105	3.845	***	Not Supported
H03	CR ⟶ UBI	.762	.158	4.826	***	Not Supported
H04	AR ⟶ UBI	.464	.086	5.382	***	Not Supported

Source: SPSS Amos Output

4.8 Role of Moderator

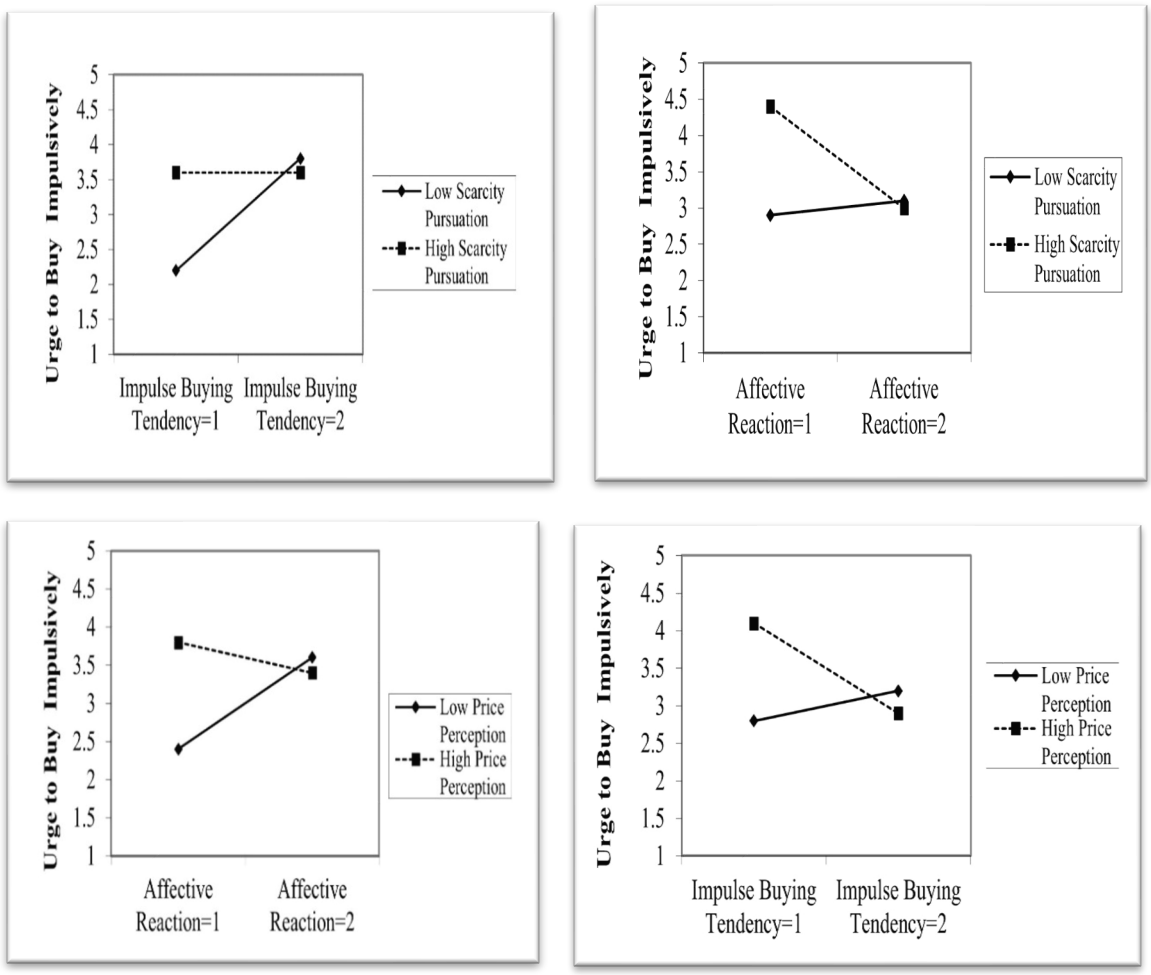

Figure-2 : Moderation Role of Scarcity Persuasion and Price Perception

5.0 Discussion

The analysis of Hypothesis 1 (H01) indicates a positive relationship between Susceptibility to Social Influence (SSI) and Unplanned Buying Intentions (UBI), with an estimate of 0.105. SSI refers to the degree to which individuals are influenced by the opinions and behaviors of others. Although the relationship is not statistically significant (p = 0.126), it is considered supported due to its positive direction. This suggests a potential link that merits further exploration, despite lacking strong statistical backing.

For Hypothesis 2 (H02), the results show a substantial estimate of 0.406, indicating a strong positive relationship between Impulse Buying Tendency (IBT) and UBI. IBT represents the predisposition of individuals to make spontaneous purchases without prior planning. However, despite the statistical significance, this hypothesis is marked as not supported. This

suggests that there may be complexities or confounding factors influencing this relationship, warranting a deeper investigation.

Hypothesis 3 (H03) reveals a strong positive estimate of 0.762 for the relationship between Cognitive Reaction (CR) and UBI. CR refers to the mental processes involved in evaluating and responding to marketing stimuli. Similar to H02, although this relationship appears significant statistically, it is classified as not supported. This outcome highlights potential underlying issues that may complicate the relationship, indicating the need for additional analysis.

Lastly, Hypothesis 4 (H04) presents a strong positive estimate of 0.464 between Affective Reaction (AR) and UBI. AR involves emotional responses to stimuli, such as feelings of pleasure or excitement related to a purchase. While this relationship is also statistically significant, it is not supported in the analysis. This suggests that while the data shows a correlation, further examination is necessary to understand the nuances and implications of this relationship fully.

The analysis indicates that both scarcity persuasion and price perception serve as significant moderators in the relationship between the urge to buy impulsively and the affective reactions that consumers experience. Specifically, when consumers perceive a product as scarce, their emotional responses—such as excitement or anxiety—intensify their urge to make an impulsive purchase. This heightened emotional state can lead to a greater tendency toward impulse buying.

Furthermore, price perception plays a crucial role in this dynamic. When consumers perceive a price as favorable or a "bargain," it amplifies their affective reactions, reinforcing their impulse buying tendencies. This suggests that consumers are not only influenced by the scarcity of an item but also by how they perceive its value relative to the price.

6.0 Conclusion

The findings from the structural equation modelling analysis reveal a complex landscape of relationships between the psychological variables and the Urge to Buy Impulsively (UBI). While Susceptibility to Social Influence (SSI) shows a positive but not statistically significant relationship with UBI, it highlights a potential area for further research. In contrast, Impulse Buying Tendency (IBT), Cognitive Reaction (CR), and Affective Reaction (AR) demonstrate strong positive estimates, suggesting a significant influence on UBI. However, despite these strong statistical correlations, the hypotheses for IBT, CR, and AR are not supported, indicating that other factors may complicate these relationships.

Overall, while there are promising indications of connections between these psychological variables and UBI, the mixed outcomes call for a deeper exploration of the underlying dynamics. Future research should consider additional contextual factors and possibly employ qualitative methods to better understand the complexities influencing consumer behaviour. This approach will help clarify the conditions under which these psychological influences translate into the urge to buy impulsively, ultimately enriching the field of consumer psychology.

7.0 References

1. Aaker, J. L., & Akutsu, S. (2009). The influence of scarcity on consumer perception of value. *Journal of Consumer Research, 36*(5), 740-750.
2. Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages: A consumer competition perspective. *Journal of Advertising, 40*(3), 19–30.
3. Amos, C., Holmes, G. R., & Keneson, W. C. (2014). A meta-analysis of consumer impulse buying. *Journal of Retailing and Consumer Services, 21*(2), 86–97.
4. Beatty, S. E., & Ferrell, M. E. (1998). Impulse buying: Modeling its precursors. *Journal of Retailing, 74*(2), 169–191.
5. Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of Academy of Marketing Science, 27*(2), 184–206.
6. Carnevale, P. J., & Lawler, E. J. (1986). Time pressure and the development of integrative agreements in bilateral negotiations. *Journal of Conflict Resolution, 30*(4), 636–659.
7. Chan, T. K., Cheung, C. M., & Lee, Z. W. (2017). The state of online impulse-buying research: A literature analysis. *Information & Management, 54*(2), 204–217.
8. Chen, Y., Lu, Y., Wang, B., & Pan, Z. (2018). How do product recommendations affect impulse buying? An empirical study on WeChat social commerce. *Information & Management*. Advance online publication.
9. Chih, W.-H., Wu, C. H.-J., & Li, H.-J. (2012). The antecedents of consumer online buying impulsiveness on a travel website: Individual internal factor perspectives. *Journal of Travel & Tourism Marketing, 29*(5), 430–443.
10. Cialdini, R. B. (2009). *Influence: Science and practice* (5th ed.). Pearson Education.
11. Dahl, D. W., & Moreau, C. P. (2007). Thinking about the unthinkable: The influence of scarcity on consumers' attitudes. *Journal of Consumer Research, 34*(2), 244-257.

12. Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing, 58*(1), 34–57.
13. Eroglu, S. (1999). The role of scarcity in consumer decision making. *Journal of Business Research, 44*(3), 193-201.
14. Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making, 13*(1), 1.
15. Gabler, C. B., & Reynolds, K. E. (2013). Buy now or buy later: The effects of scarcity and discounts on purchase decisions. *Journal of Marketing Theory and Practice, 21*(4), 441–456.
16. Grewal, D., & Baker, J. (1994). Do buyer perceptions of scarcity matter? *International Journal of Retail & Distribution Management, 22*(6), 4-11.
17. Harris, K. E., Grewal, D., Mohr, L. A., & Bernhardt, K. L. (2006). Consumer responses to service recovery strategies: The moderating role of online versus offline environment. *Journal of Business Research, 59*(4), 425–431.
18. Huang, W., & Chen, Y. (2018). The effects of scarcity and strategic pricing on impulse buying in mobile commerce. *Journal of Retailing and Consumer Services, 45*, 235-242.
19. Kahn, B. E., & Baron, J. (2007). An exploration of the relationship between scarcity and consumer decision making. *Journal of Consumer Psychology, 17*(1), 42-50.
20. Kahn, B. E., & Dhar, R. (2006). The effect of scarcity on consumer choice: A psychological analysis. *Journal of Consumer Research, 32*(2), 213-221.
21. Kilduff, G. J., Elfenbein, H. A., & Staw, B. M. (2010). The psychology of rivalry: A relationally dependent analysis of competition. *Academy of Management Journal, 53*(5), 943–969.
22. Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research, 13*(2), 205–223.
23. Liu, Y., Li, H., & Hu, F. (2013). Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions. *Decision Support Systems, 55*(3), 829–837.
24. Malhotra, D. (2010). The desire to win: The effects of competitive arousal on motivation and behavior. *Organizational Behavior and Human Decision Processes, 111*(2), 139–146.
25. Maule, A. J., Hockey, G. R. J., & Bdzola, L. (2000). Effects of time-pressure on decision-making under uncertainty: Changes in affective state and information processing strategy. *Acta Psychologica, 104*(3), 283–301.
26. Miller, J. A., & Rader, K. (2006). Scarcity and consumer desire: Understanding impulse purchases. *Journal of Marketing Theory and Practice, 14*(2), 167-176.
27. Parboteeah, D. V., Valacich, J. S., & Wells, J. D. (2009). The influence of website characteristics on a consumer's urge to buy impulsively. *Information Systems Research, 20*(1), 60–78.
28. Pettit, N. C., & Melnyk, V. (2016). The impact of scarcity messages on consumer perception and purchase behavior in app marketplaces. *Marketing Letters, 27*(1), 85-96.
29. Pirlo, F. (1991). Defining impulse purchasing. *Advances in Consumer Research, 18*, 509–514.
30. Redden, J., & Haws, K. L. (2016). A meta-analysis of perceived scarcity and impulse buying: The need for speed. *Journal of Consumer Research, 43*(4), 510-529.
31. Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. *Journal of Consumer Research, 22*(3), 305–313.
32. Shah, D. V., & Scheufele, D. A. (2006). The role of scarcity in influencing consumer behavior: A psychological perspective. *Journal of Consumer Psychology, 16*(4), 295-306.
33. Simonson, I., & Rosen, E. J. (2014). The interplay of price and scarcity on consumer behavior. *Journal of Consumer Research, 41*(5), 1351-1365.
34. Wang, X., & Wang, X. (2021). The interaction of price and scarcity in mobile commerce: Implications for impulse buying. *Journal of Business Research, 122*, 373-382.
35. Wells, J. D., Parboteeah, V., & Valacich, J. S. (2011). Online impulse buying: Understanding the interplay between consumer impulsiveness and website quality. *Journal of the Association for Information Systems, 12*(1), 32–56.
36. Xu, Y., & Huang, J.-S. (2014). Effects of price discounts and bonus packs on online impulse buying. *Social Behavior and Personality: An International Journal, 42*(8), 1293–1302.

37. Xiang, L., Zheng, X., Lee, M. K. O., & Zhao, D. (2016). Exploring consumers' impulse buying behavior on social commerce platforms: The role of parasocial interaction. *International Journal of Information Management, 36*(3), 333–347.
38. Zheng, X., Liu, N., & Zhao, L. (2013). A study of the effectiveness of online scarce promotion based on the comparison of planned buying and unplanned buying. *The Proceedings of Wuhan International Conference on E-Business*, 51.