

The Impact of Limited-Quantity and Time Discount Strategies on Impulse Purchases in Live Shopping

Bingyu Bao

*University of California Davis, College of Letters and Science, Davis, USA
bbybao@ucdavis.edu*

Abstract. With the rapid development of the internet, online shopping has become one of the main channels for consumers. Among these channels, influencer live sales have emerged as a particularly popular business model, in which limited-time, limited-quantity discounts are commonly used as marketing tactics. This study examines how these two scarcity-based strategies influence consumers' impulse purchasing behavior through emotional and psychological mechanisms, along with other related factors. This study employed a mixed-methods approach, gathering data from consumers who regularly engage in live shopping through questionnaires and interviews. The data were analyzed using descriptive statistics, correlation analysis, and thematic analysis.

Keywords: Scarcity Marketing, Impulse purchasing behavior, Consumer psychology, S-O-R model, Live shopping

1. Introduction

With the rapid development of the internet, live shopping has emerged as a significant business model within online retail. People can purchase the goods they need without leaving home, enjoying a wider selection and more competitive prices. Live shopping further stimulates purchasing desire through real-time interaction, host recommendations, and instant ordering mechanisms.

Existing research on scarcity marketing and impulse buying behavior is relatively abundant, yet certain limitations remain. Most studies analyze limited-quantity scarcity and time-based scarcity separately, comparing their relative impacts, while paying less attention to how they jointly influence consumers' psychological states and behavioral responses. Simultaneously, emotions are recognized as a key factor in impulse buying. However, no research has examined the overall pathway linking marketing stimuli, emotional reactions, and purchasing behavior.

Based on these considerations, this paper focuses on the impact of limited quantity and time-limited consumption strategies in live shopping, as well as the influence of emotional responses on consumer impulse purchasing behavior. It explores how scarcity marketing strategies stimulate consumer purchases by affecting their psychological and emotional states. The study employs quantitative research methods, collecting data from live shopping users through questionnaire surveys for analysis.

2. Literature review

2.1. Quantity-based discounts and the scarcity principle

Scarcity was first proposed by Robbins, who argued that economics is a science of human behavior and choice, focusing on how scarce resources are allocated among competing uses [1]. Later, Cialdini developed the scarcity principle, proposing that people assign higher value to hard-to-obtain items and are therefore more inclined to desire them [2]. Katt examined the impact of Cialdini's scarcity principle on consumer attention and purchasing decisions in an online environment [3]. He focuses on university students in Europe and Estonia, examining whether labels such as "limited edition," "limited time," and "limited quantity" increase consumer attention and purchase rates. The findings indicate that scarcity-related labels lead to longer attention and a higher likelihood of selection, regardless of the product type. Previous studies show that quantity-based discounts increase purchase rates by enhancing perceptions of scarcity and uniqueness, although the effects vary across different product types and contexts. Barton et al. summarized 131 studies and concluded that scarcity of supply is more effective for experiential products than for durable goods [4]. Additionally, Jang et al.'s research further demonstrates that limited-quantity strategies are particularly effective for explicit products, as they better convey their uniqueness to consumers and attract more attention [5]. Hodgkinson later provides psychological evidence that scarcity stimulates impulse purchases [6]. His FOMO model suggests that people often engage in impulse buying due to psychological anxiety associated with the fear of missing out.

2.2. Time-limited discounts

Limited-time discounts are a common strategy in live-streaming e-commerce, and they can significantly influence consumers' impulse buying behavior. Young et al. conducted three experiments to study the impact of time pressure on decision-making [7]. Their findings show that time pressure increases the appeal of risk while reducing probabilistic discrimination, leaving individuals with less time to think and make optimal decisions. Liu et al. further found that time pressure can strengthen consumers' impulse-purchasing tendencies by eliciting positive emotions, indicating that feelings such as happiness and excitement play a key role in impulse purchase behavior [8]. Hao et al. emphasized the role of perceived urgency, noting that consumers may engage in impulse purchases when they have insufficient time to think and react, particularly with utilitarian products [9]. Basso et al. studied the effects of time pressure and choice overload on purchase delays and found that durable goods were more affected [10]. Hodgkinson's FOMO model also suggests that time pressure may induce anxiety and cognitive load, leading people to make impulsive purchases due to time scarcity [6].

2.3. S-O-R model and impulse purchase

Weinberg et al. discussed the concept of impulse buying, characterized by highly active emotions, low cognitive control, and largely passive responses [11]. As the S-O-R model illustrates, consumers are often driven by emotions such as excitement and enthusiasm, leading to irrational decisions. Vieira conducted a meta-analysis of the S-O-R model. In the retail industry, external stimuli influence consumers' behavior by affecting their emotional states [12]. Vieira emphasizes that positive emotions, such as pleasure, directly influence consumers' impulse buying behavior [12]. Hochreiter et al. highlight the differences in the S-O-R model across various fields, but in the live

commerce environment, it remains consistent [13]. External marketing stimuli, such as limited quantities or time-limited offers, can generate a sense of urgency or excitement, thereby driving consumers to make impulse purchases.

2.4. Research gap

Although existing research has examined the factors that drive impulsive consumption from various perspectives, several limitations remain. I find that most studies analyze quantity scarcity and time scarcity separately and focus on comparing which strategy is more effective. Moreover, some studies emphasize the role of emotions in impulsive buying but do not provide a comprehensive view of the overall process. For example, marketing tactics such as quantity and time scarcity may evoke different emotional responses in consumers, which, in turn, stimulate decision-making behaviors such as impulse purchases.

3. Theoretical model and hypothesis

3.1. Theoretical model

This research is primarily based on the S-O-R model as its theoretical foundation. The model suggests that marketing stimuli such as limited quantity and limited time can influence consumers' psychology and emotions, which in turn may stimulate impulsive purchasing behavior.

3.2. Hypothesis

3.2.1. Limited quantity positively influences the willingness to make impulse purchases

Limited-quantity cues lead consumers to perceive products as having higher value and greater appeal, thereby promoting impulse purchases.

3.2.2. Limited time positively influences the willingness to make impulse purchases

Time scarcity increases consumers' desire to make impulse purchases by heightening their sense of time pressure and tension.

3.2.3. The S-O-R model stimulates consumers' impulse purchases

The S-O-R model stimulates consumers' impulse purchases through environmental cues and their emotions and psychological states.

4. Research methodology

4.1. Research design

This study employs a quantitative research design to investigate how quantity and time constraints influence consumers' impulse buying behavior when shopping locally. The study uses a questionnaire to collect data from frequent users of livestream shopping platforms such as Taobao and Rednote.

4.2. Questionnaire design

The survey was refined placed on a literature review and proposed hypotheses, and was primarily measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The questionnaire collects baseline information, including gender, age, and the most frequently used shopping platforms. Moreover, it examines whether limited-quantity and limited-time labels influence consumers' impulse purchasing behavior.

4.3. Sample and data collection

The target sample size is 50-100 valid responses. By posting questionnaires on various social platforms, most respondents are frequent livestream shoppers or have participated at least once in the past three months, which helps ensure the relevance of their experience. This study collected 54 valid questionnaires. The study used inter-group comparisons and Pearson correlation analysis to explore the relationship between feelings of time urgency and quantity scarcity and impulse buying intentions.

4.4. Data analysis

The data analysis includes descriptive statistics, reliability and validity testing, group comparisons (t tests or mean comparisons), and Pearson correlation analysis. All analyses were based on the five-point Likert scale items, where above values indicate fitter perceived or behavioral tendencies.

4.4.1. Descriptive statistics

Table 1. Mean and standard deviation

	N (Statistic)	Minimum (Statistic)	Maximum (Statistic)	Mean (Statistic)	Std. Deviation (Statistic)	Skewness (Statistic)	Skewness (Std. Error)	Kurtosis (Statistic)	Kurtosis (Std. Error)
LS	54	2.00	5.00	3.9352	.75264	-.736	.325	.355	.639
TS	54	1.00	5.00	3.9259	1.07899	-1.158	.325	.782	.639
ES	54	1.00	5.00	3.7222	.88843	-.817	.325	.378	.639
IS	54	1.00	5.00	3.6605	.85535	-.841	.325	.919	.639
Valid N (listwise)	54								

Across the 54 valid responses, the mean values of all four variables in Table 1 range from 3.66 to 3.94, indicating medium to high levels of agreement with scarcity strategies and impulse-related statements. The skewness of all four variables is negative, suggesting that most participants' responses lean toward the agreement end of the scale.

4.4.2. Reliability and validity testing

Table 2. KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.804
Bartlett's Test of Sphericity	Approx. Chi-Square	179.196
	df	45
	Sig.	.000

KMO equals to 0.804, which is bigger than 0.8. The p-value of Bartlett's test of sphericity was 0.0, which is less than 0.001. This indicates a good correlation between the variables (Table 2).

4.4.3. Group comparison analysis

Table 3. Gender difference

	Gender	N	Mean	Std. Deviation	Std. Error Mean
IS	Male	9	3.3333	.94281	.31427
	Female	45	3.7259	.83269	.12413

Table 4. Independent samples test

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
I S	Equal variances assumed	.009	.923	-1.164	52	.212	-.39259	.31058	-1.01582	.23063
	Equal variances not assumed			-1.162	10.644	.271	-.39259	.33790	-1.13935	.35416

The mean impulse purchase score (IS) for the male sample was 3.33, and for the female sample it was 3.73. The p-value for Levene's homogeneity of variance test was 0.923, indicating homogeneity of variance. The p-value of 0.212 is greater than 0.05, suggesting that there is no significant difference in impulse purchase behavior between men and women (Tables 3 and 4).

Table 5. Age difference

		95% Confidence Interval for Mean						
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Below 18	1	4.3333	4.33	4.33
18-25	41	3.6179	.84512	.13199	3.3511	3.8846	1.00	5.00

Table 6. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.904	3	.635	.860	.468
Within Groups	36.872	50	.737		
Total	38.776	53			

The mean values in Table 5 range from 2.67 to 4.33. ANOVA (Table 6) shows that the p-value equals 0.468, which is greater than 0.05. This indicates that there are no significant differences in impulse buying tendencies across age groups. Therefore, this study should place greater emphasis on examining the relationships among psychological variables.

4.4.4. Pearson correlation analysis

Table 7. Pearson correlation

		IS	LS	TS
IS	Pearson Correlation	1	.576**	.531**
	Sig. (2-tailed)		.000	.000
	N	54	54	54
LS	Pearson Correlation	.576**	1	.342*
	Sig. (2-tailed)	.000		.011
	N	54	54	54
TS	Pearson Correlation	.531**	.342*	1
	Sig. (2-tailed)	.000	.011	
	N	54	54	54

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficients among the three variables in Table 7 are shown as follows. The Pearson correlation equals to 0.576 and p value is smaller than 0.01 in the relationship between IS and LS. The Pearson correlation between IS and TS is 0.531 with a p value smaller than 0.01. The Pearson correlation between LS and TS is 0.342 with a p value smaller than 0.05. These results indicate that impulse buying shows a significant, moderately positive correlation with both types of scarcity perception. A significant positive correlation also exists between limited-quantity scarcity and time-limited scarcity, suggesting that the two scarcity strategies are often used together in real settings to encourage purchasing behavior.

5. Conclusion

This study examines the impact of limited quantity and time-limited strategies in live-stream shopping on consumers' impulse purchasing behavior. Descriptive statistics, between-group comparisons, and Pearson correlation analysis were conducted on 54 valid questionnaire responses.

Research findings reveal that consumers' perceptions of both limited-quantity scarcity and time-based scarcity exhibit a significant positive correlation with impulse purchase intent, indicating that scarcity strategies can stimulate consumer buying by evoking emotions such as urgency. Furthermore, a significant positive correlation exists between limited-quantity scarcity and time-based scarcity, suggesting that consumers can perceive both strategies simultaneously, potentially reinforcing each other. Between-group comparison analysis further reveals no significant differences in impulse purchasing behavior across gender and age groups, suggesting that psychological states and emotions exert a greater influence on impulsive consumption behavior.

However, this study still has certain limitations. The relatively small sample size may partially affect the experimental results. Future research could expand the sample size and incorporate qualitative studies to draw more in-depth conclusions.

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