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Research on the Influencing Factors of Youth Impulsive Online Shopping Consumption Level

-- Based on Equal Part Linear Regression

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Abstract

Impulsive consumption is a hot social phenomenon that has appeared since the 2010s. It refers to the purchase behavior of customers without prior planning or awareness under the stimulus of external factors. On the basis of combing the existing literature, this paper analyzes the influence of factors such as commodity preferential atmosphere, herd mentality, and time pressure on the impulsive buying behavior of young consumers through the Equal Part Linear Regression method. The results show that factors such as commodity preferential atmosphere and platform preferential atmosphere have a positive effect on impulsive consumption.Finally, based on the research results, suggestions are made for merchants and e-commerce platforms.

Keywords

Impulsive Consumption; Online Shopping; Preferential Atmosphere; Time Pressure; Personal Emotion; Herd Mentality.

1. Introduction

Online shopping appeared in China for the first time in 1997, and Taobao was officially launched in May 2003. In the past 17 years, China's e-commerce has continued to grow. There are also generations born in the 90s and 00s who have grown up with the Internet. Online shopping has gradually become a part of the lives of young people in today's society. The development of e-commerce model is getting better and better, gradually surpassing physical business. So in order to further promote national online consumption, Taobao and Tmall launched the concept of "Double Eleven" carnival shopping festival in 2009. For consumers, this is the discount day of the year, and for merchants, this is the annual sales day. With the continuous development of "Double Eleven", as shown in Figure 1, it has become an annual event in China's e-commerce industry and has gradually affected the international e-commerce industry.

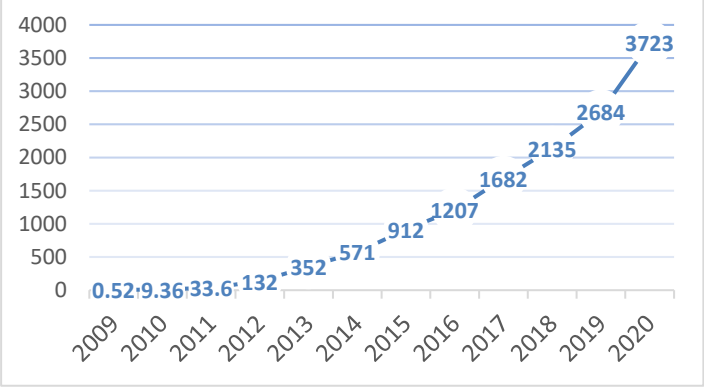

Figure 1. Annual transaction volume on Double Eleven (100 million /RMB)

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However, the "festival" atmosphere created by "Double Eleven" also made many customers impulsive consumption. The research on impulsive consumption can be traced back to the middle of the 20th century. Early scholars Cobb and Hoyer (1986) believed that impulsive buying is unplanned buying, that is, impulsive buying is an immediate purchase without purpose. From the 1980s to the present, scholars gradually began to study the influence of consumers themselves on impulsive consumption, and believed that impulsive consumption is a complex unplanned purchase.For example, foreign scholars Bayleya and Nanearrow (1998) divided impulsive buying into four categories according to consumers' self-worth needs: self-actualization, self-compensation, self-definition, and addictive. In traditional consumption, Beatty and Ferrel (1998) research proved that product design, in-store merchandise display, in-store color matching and smell, and store-playing music are all factors that induce consumers to purchase impulsively.Crawford and Melewar (2003) researched that the good help and guidance provided by salespersons in the purchase process of consumers can promote the occurrence of impulsive buying behavior. With the advent of e-commerce, more and more scholars have focused on the impact of e-commerce platforms on consumer impulsive behavior. Zhang Peng, Xie Maodi, and Zhao Mozhao (2018) believe that impulsive buying is the behavior of consumers making unplanned purchase decisions because the buying environment stimulates consumers to produce emotional and cognitive responses. And they believe that different marketing stimuli need to be created online and offline to achieve the purpose of making consumers impulsive consumption.Li Yifan (2019) is more inclined to believe that impulsive consumption is sudden and immediate consumption, and has no intention to consume beforehand and has not completed a certain purchase task. His research shows that online promotion activities do promote impulsive consumption. Research by Huang Yijun (2019) shows that purchase time restrictions, promotion incentives, and online reviews all promote impulsive online shopping behaviors of consumers. Consumers' perceived income and purchase pleasure play an intermediary role, and brand awareness plays a moderating role.Qian Qiannian and Huang Zhixi (2020) believe that impulsive consumption is unplanned consumption, and study the internet impulsive consumption behavior of youth groups from personal factors, commodity prices, and commodity reviews. Believe that personal habits, merchant discounts and product reviews will make consumers produce impulsive consumption. Combining the background of past research, this article will analyze the impact of six dimensions of commodity preferential atmosphere, platform preferential atmosphere, consumer herd psychology, personal emotion, time pressure, and impulse buying tendency on consumer impulsive consumption behavior through the equal part linear regression analysis method.

The article structure is as follows. This article explores the influencing factors of young people's impulsive consumption behavior in carnival shopping festival through three parts. The first part is the research method and research design, mainly introduces the equal part linear regression analysis method and the research design ideas of this article. The second part is empirical analysis, that is, empirical analysis of the collected 217 questionnaires. The third part is to draw conclusions through data analysis, and put forward suggestions for development.

2. Research Methods and Research Design

2.1. Equal Part Linear Regression

Pan Wen Tsao (2017) proposed an equal part linear regression method, which is characterized by linear regression modeling of data in several equal divisions, so that the model trend of each division can be independently observed and compared with general linear regression. Realistic data often implies some extreme value data, and these extreme value data are the objects of attention of researchers studying social sciences. If a linear regression model is used to

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summarize these extreme values with the concept of its average value, the research results will be distorted. The current models for solving extreme value data mostly use the component regression model of Koenker (1978), but the concept of quantile is relatively unfamiliar to most people, and the quantile regression model is more complex than linear regression model and difficult to understand. Such problems can be reduced if the analysis is performed with equal part linear regression.

Both linear regression and least squares regression use regression coefficients to explain the marginal effects of variables, but they treat linear data differently. The least-squares regression model assumes that y is a continuous dependent variable that depends on x, while the equal part linear regression model cuts the linear data into "τ" equal parts and performs regression modeling separately. Since the data points all have different trends, if standard linear regression analysis is adopted, the research results may be distorted. Therefore, we use the data points in different aliquots to fit the linear regression model respectively. At this time, the interpretation of the marginal effect is more reasonable with the result of equal part linear regression.

2.2. Research Design

This study refers to the scale design of Huang Yijun and Zhang Yichun (2019). The six dimensions of commodity preferential atmosphere, platform preferential atmosphere, consumer herd mentality, personal emotion, time pressure, and impulsive buying tendency are used as independent variables to explore its influence on the impulsive buying level of youth groups. In this study, least square regression and equal linear regression were used to analyze the influence of the explained variable on the explanatory variable. The linear regression model divides the sample points into three equal parts for regression analysis.

A total of 217 data were collected in this study, and 208 valid data were obtained after invalid data were eliminated. These data mainly come from college students in the Guangzhou University Town area, whose average age is about 21 years old, and is a typical representative of the youth consumer group.

The linear data points were cut into 3 equal parts, and the data points in different aliquots were used to fit the linear regression model respectively. These 3 equally divided linear regression equations can be expressed as

$$y_i^{\tau} = \beta_0^{\tau} + \beta_1^{\tau} x_i^{\tau} + \varepsilon_i^{\tau} \tag{1}$$

Other least squares estimator

$$\hat{\beta}_0{}^{\tau} = \frac{\sum_{i=1}^{n}(x_i{}^{\tau} - \bar{x}^{\tau})(y_i{}^{\tau} - \bar{y}^{\tau})}{\sum_{i=1}^{n}(x_i{}^{\tau} - \bar{x}^{\tau})^2} \tag{2}$$

$$\hat{\beta}_1{}^{\tau} = \bar{y}^{\tau} - \bar{\beta}_0{}^{\tau}\bar{x}^{\tau} \tag{3}$$

Coefficient of determination and confidence interval

$$(\hat{\beta}_i{}^{\tau} - t_{\alpha/2} \times s_{\hat{\beta}_t}, \hat{\beta}_i{}^{\tau} + t_{\alpha/2} \times s_{\hat{\beta}_t}),\ i=0,1 \tag{4}$$

Add the "τ" symbol to the specific position in the formula.

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3. Analysis of Empirical Results

3.1. Descriptive Statistics of Variables

Table 1. The average value, standard deviation and correlation matrix of each variable

Variable	1	2	3	4	5	6	7
1. Commodity preference atmosphere	1						
2. Platform preferential atmosphere	0.656***	1					
3. Herd mentality	0.701***	0.709***	1				
4. Personal emotions	0.640***	0.646***	0.645***	1			
5. Time pressure	0.547***	0.620***	0.678***	0.615***	1		
6.Impulse buying tendency	0.582***	0.681***	0.680***	0.654***	0.532***	1	
7. Impulsive consumption	0.481***	0.503***	0.586***	0.468***	0.649***	0.455***	1
Mean	3.943	3.525	3.566	3.478	4.363	3.453	3.006
Std	0.854	0.920	0.864	0.858	1.357	0.893	1.057

p>0.05 n.s. p<0.05* p<0.01** p<0.001***

The data in Table 1 shows the correlation coefficient between the variables and the mean and standard deviation of the variables. There is a significant correlation between the variables (p<0.001).

Table 2. Confirmatory factor analysis results

Variable	Cronbach**α**	KMO	Sig.
Commodity preference atmosphere	0.806	0.653	***
Platform preferential atmosphere	0.893	0.680	***
Herd mentality	0.688	0.616	***
Personal emotions	0.774	0.647	***
Time pressure	0.806	0.694	***
Impulse buying tendency	0.798	0.701	***
Impulsive consumption	0.835	0.674	***

As shown in Table 2, in the reliability test, the Cronbach α coefficients of all variables are above 0.68, and the maximum is 0.893, and its internal consistency is high. In the validity test, the KMO of all variables is greater than 0.6, and the Bartlett sphere test is significant (p<0.001), indicating that the variables have a certain validity and the regression analysis can be continued.

3.2. Regression Analysis of Influencing Factors of Impulsive Consumption Level

Table 3 shows the prediction results of the linear regression of the dependent variable impulsive consumption. It can be seen from the table that the correlation coefficient R^2 of the equal part linear regression model is between 0.260-0.317, and the model has a certain explanatory power. From the results of equal part linear regression, the coefficient of commodity preferential atmosphere in the second equal division model is positive and significantly correlated (p<0.05), indicating that commodity preferential atmosphere has a certain positive effect on moderate impulsive consumption. The coefficient of platform preference atmosphere in the second and third divisions is positive and significant (p<0.05), indicating that the promotion of platform preference atmosphere has a certain positive effect on the medium and high level of impulsive consumption. The coefficient of herd mentality is positive and significant only in the first division (p>0.05), indicating that herd mentality has no

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significant effect on the level of high impulsive consumption. Personal emotions are not significant in the three equal divisions ($p>0.05$), indicating that personal emotions have no significant effect on the improvement of impulsive consumption.The time pressure coefficient was positive and significant in the first division ($p<0.05$), but it turned into a significant negative effect in the second and third divisions ($p<0.05$). It shows that time pressure has a positive effect on low impulsive consumption, but it has a weakening effect on medium and high impulsive consumption levels. The coefficient of consumer personality in the first quartile was positively significantly correlated ($p<0.05$), but there was no significant correlation between the second quartile and the third quartile. It shows that at the level of low impulse consumption, the improvement of consumer's personality will increase the level of impulsive consumption.

Figure 2 is the trajectory graph of equal part linear regression coefficient and confidence interval. The red dotted line in the figure is the standard linear regression line, and the upper and lower horizontal lines are the confidence interval of the standard linear regression. The irregular thick line is the equally part linear regression line, and the upper and lower gray areas are the confidence intervals of the equally part linear regression. Since the equal regression line of the independent variable of impulsive buying propensity X6 is almost within the confidence interval of the standard linear regression, the difference between the two models is not obvious. Therefore, next, we analyze one by one the linear regression trend changes of the five independent variables of commodity preference atmosphere X1, platform preference atmosphere X2, herd psychology X3, personal emotion X4 and time pressure X5.

As shown in Figure 2b, the equal linear regression of the commodity preferential atmosphere X1 decreases slowly at the low and high quintiles and then rises slightly, indicating that the marginal influence of the commodity preferential atmosphere first slowly decreases and then increases. The mid-quantile fluctuates greatly, but the overall line segment is above the confidence interval of the standard linear regression, which is partially underestimated, indicating that when the commodity preferential atmosphere is reduced, the impulsive consumption behavior of young people will be affected and reduced.

As shown in Figure 2c, the equal part linear regression of platform preferential atmosphere X2 is located above the confidence interval of the standard linear regression at the low and high divisions, and it is also partially underestimated. It shows that the platform preference has a greater positive impact on impulsive consumption behavior in the lower and higher divisions. However, most of the fluctuations at the middle quantile are within the confidence interval of the standard linear regression, which is consistent with the conclusions obtained by the general linear regression.

It can be seen from Figure 2d that the equal part linear regression line of Crowd Psychology X3 is above the general linear regression confidence interval at the low and high divisions, and the two regression models are quite different. It shows that in the low-level and high-level impulsive consumption behaviors, the herd mentality is seriously underestimated. Therefore, it can be seen that the young people with higher herd mentality have a higher level of impulsive consumption. From the trend point of view, there is a downward trend in the first division, indicating that the marginal influence of herd psychology on low-level impulsive consumption behavior is diminishing. In the second division, the overall trend is flat; in the third division, the linear regression line of the herd mentality rises and then drops sharply, and the marginal influence on high-level impulsive consumption behaviors increases and then drops sharply.

From Figure 2e, the linear regression line of personal emotion X4 fluctuates within the confidence interval of the standard linear regression at the lower quartile, indicating that the marginal influence of personal emotion in the lower quartile tends to be flat. In the middle and high quartiles, the fluctuations are large, but most of the linear regression lines of the quartiles are above the confidence interval of the standard linear regression, with a high degree of significance, and most of them are underestimated.

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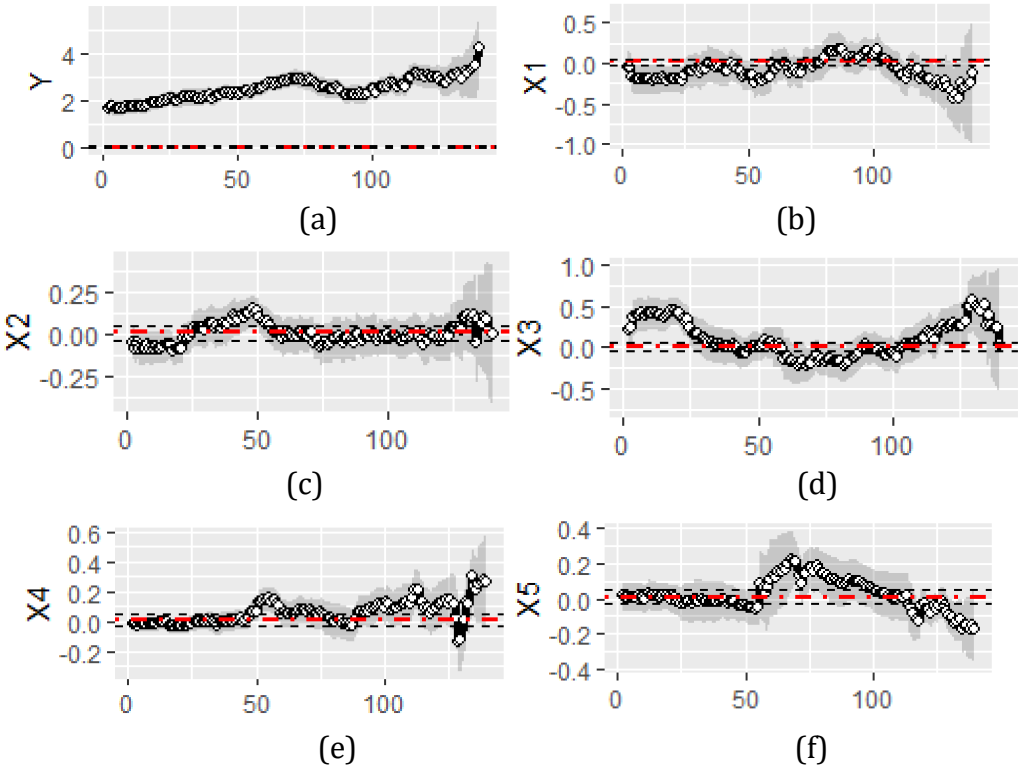
From Figure 2f, we can find that the equal linear regression line of time pressure X5 rises at the middle quantile and then falls, but they are all above the confidence interval of the standard linear regression. The difference between the two regression models is large, that is, the degree of significance is high, and most of them are underestimated. Therefore, the greater the time pressure in the middle level of consumption, the greater the probability of impulsive consumption behavior for young people.

Table 3. Equally part linear regression running results

Variable		Model0			Model1			Model2			Model3	
	conf	T	Sig	conf	T	Sig	conf	T	Sig	conf	T	Sig
Constant	0.86	2.19	*	1.65	8.4	***	2.93	3.19	***	3.99	4.26	***
X1	0.37	2.30	*	-0.04	-0.44	n.s.	0.72	0.80	**	-0.03	-0.06	n.s.
X2	0.33	1.09	*	-0.04	-0.75	n.s.	0.19	0.27	*	0.16	0.65	*
X3	0.54	2.23	*	0.80	2.51	*	-0.11	0.12	n.s.	-0.05	-0.10	n.s.
X4	0.07	1.01	n.s.	-0.04	-0.95	n.s.	0.07	0.02	n.s.	0.23	1.16	n.s.
X5	0.43	3.41	*	0.51	1.86	*	-0.12	0.23	*	-0.16	-1.26	n.s.
X6	0.01	0.43	n.s.	-0.08	-1.93	**	-0.04	0.04	n.s.	-0.01	-0.54	n.s.

$R0^2$=0.302, $R1^2$=0.317, $R2^2$=0.292, $R3^2$=0.260; p>0.05n.s. p<0.05* p<0.01** p<0.001***.



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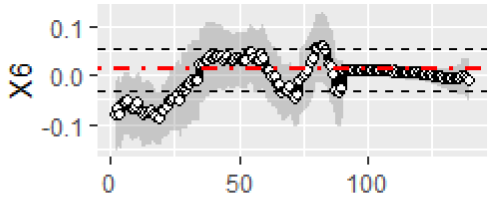

(g)

Figure 2. Equally part linear regression trend chart

Table 4 reports the difference in coefficients of equal part linear regression. Among the three equal part linear regression coefficients, the coefficients of each variable in the first and second divisions are significantly different. The regression coefficients of the 1st and 3rd quartiles have significant differences in the other four variables except platform preferential atmosphere, herd mentality, and impulse buying tendency. There are significant differences in the platform preferential atmosphere and time pressure between the second and third divisions. This shows that the influence of commodity preferential atmosphere, platform preferential atmosphere, herd psychology, personal emotion, time pressure, and impulsive buying tendency on impulsive consumption levels is significantly different in different quantiles, which is in line with the expectation of the equally part linear model.

Table 4. F test for the difference between the three equal regression coefficients

Variable	Model1-Model2		Model1-Model3		Model2-Model3	
	F_Value	Sig	F_Value	Sig	F_Value	Sig
constant	0.20	**	0.22	***	0.53	n.s.
X1	0.38	**	0.20	***	0.14	n.s.
X2	0.08	***	1.12	n.s.	14.2	***
X3	0.35	**	0.50	n.s.	0.13	n.s.
X4	0.07	***	0.08	**	0.14	n.s.
X5	0.01	***	0.06	***	9.3	***
X6	0.18	***	1.63	n.s.	0.86	n.s.

p>0.05n.s. p<0.05* p<0.01** p<0.001***

4. Conclusion

Nowadays, the technology of online shopping is becoming more and more mature. With its convenient and fast advantages, online shopping has been loved by more and more people and has gradually become a part of the lives of young people in today's society. In the online shopping festival, e-commerce platforms and merchants promote frantically. Young consumers are more likely to make impulsive consumption in online shopping festivals due to the influence of the outside world, such as the preferential atmosphere of commodities and platforms, as well as the influence of herd psychology, personal emotions, time pressure and impulsive buying tendency. This research is helpful to deeply understand the psychological mechanism of young people's online shopping impulsive consumption, and put forward relevant suggestions for rational shopping. At the same time, if online shopping platforms and merchants have a deep understanding of the above-mentioned factors on the impulsive consumption mechanism of customers, and adjust them in all aspects of marketing, it will also benefit their future development.

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Through analyzing and researching the various factors that affect the impulsive buying level of young consumers in the online shopping festival, some suggestions and practices for e-commerce platforms, online sellers and young online shopping groups are drawn:

First, for e-commerce platforms, it is extremely important to create a higher platform's preferential atmosphere (X2), which can attract consumers' attention by media spreading, improving platform pages, and issuing platform coupons. At the same time, multiple methods should be used to adjust the internal psychological mechanism of consumers, such as herd mentality (X3), time pressure of limited-time promotion (X5), pleasure purchase process (X4), etc. to promote impulsive purchases.

Second, for merchants, actively participating in online shopping festivals and using “promotion coupons”, “full discounts” for specific products and other direct means of benefiting consumers (X1) can attract consumers to purchase impulsively. In addition, it is more important to gain insights into consumer psychology, improve customer service levels, launch KOL live broadcasts to trigger consumer herd mentality, and precision marketing for customers with higher impulse tendencies.

Third, for young consumers, this research also provides a rational perspective on the online shopping festival. In the contemporary era of the proliferation of microfinance, young consumers should also have insight into their reasonable needs and make rational consumption.

Of course, there are still many areas that need to be improved urgently in the research of this article. There are only more than 200 data samples collected by the questionnaire in this paper, and the sample statistics are relatively insufficient, which makes the research and analysis results still have certain errors. Moreover, the accuracy of a small amount of data itself is not high, and the data is eliminated in the process of equal part linear regression, which also makes the analysis process of this study not accurate enough. In addition, this research only investigates and studies the impulsive consumption behavior of young people during the "Double Eleven" online shopping festival, and the research group is relatively limited. The article does not study the impulsive consumption behavior of other groups in other online shopping festivals. Future research can conduct research on impulsive consumption behavior of other groups.

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