Analysis of College Students’ Consumption Structure and Irrational Consumption Behavior Based on ELES Model

Xucong Hu1,a, Weihong Wang1, Sirui Huo1, Fengzhi Chen1

huxucong0237@163.coma

Faculty of Psychology, Southwest University, Chongqing, China1

Abstract: The Internet marketing industry is of rapid development currently. With the characteristics of convenience and commodity diversification, college students are an important consumer group. Mental accounting refers to the fact that people often divide into several independent accounts for different categories when making consumption decisions. Due to the poor self-control abilities, college students are prone to irrational consumption behaviors under specific e-commerce promotion festivals such as “Double 11”, in which their mental accounting structure is also changed. This study conducts a questionnaire survey on the consumption structure of college students daily and e-commerce festivals. Using ELES model analysis, it is found that the expenditure of college students’ mental accounts is mainly divided into survival, developmental and enjoying. Further, it is found that the essence of irrational consumption behavior is to squeeze survival, developmental consumption to increase enjoying consumption under the stimulation of online consumption festival. The data and results could be a reference for college students with important preventive significance.

Keywords: ELES model, College Student, Consumption, Mental Accounting.

1 INTRODUCTION

With the prospects of Internet e-commerce industry, the network consumption industry chain further improved. The network consumption platform products become various currently, the influence of “Internet celebrity economy” and e-commerce live broadcast is increasing under the new media environment, showing a blowout development trend [19]. The essence of shopping carnival is the product of the prevailing consumerism era: through the celebrity endorsements, shopping festivals and other ways to stimulate people’s desire to purchase, entice blind and irrational consumption [1]. In the post-epidemic economic downturn, online e-commerce has become the preferred choice to stimulate the economic development [18]. The shopping festival with Interactivity and entertainment complement with live broadcast, has long been transformed from new things to what public is familiar with and widely involved in.

As the young generation of consumer group with great potential, undergraduates hold a high acceptance of online shopping [17]. Due to the low threshold of online shopping and mental conformity, they are easy to listen to Internet celebrity, leading to excessive and blind consumption behaviors. They often uses “discount” as an excuse for their own impulse
consumption. The average annual expenditure of college students in China increased significantly, also with the rising of purchasing high-end and luxury products [6].

The mental accounting theory was first discovered by Thaler (1980). Influenced by mental accounting, individuals often violate some simple economic algorithms when making decisions, thus inducing many irrational consumption behaviors, which is one of the important reasons for the irrational consumption behavior of college students [3]. This is related to the non-substitutability, flexibility and other characteristics of mental accounting [9]. Flexibility refers that people tend to construct a special account to accommodate vague categories of consumption items, and when it’s tempting, they would fill it with other surplus accounts to complete the transaction [2]. Only from the perspective of consumer spending, this feature is more evident in college students’ consumption decisions (Yin, 2014). In order to further understand the structure of mental accounting expenditure during irrational consumption under specific stimuli, we pre-released and collected 164 questionnaires at the “618” consumption festival. After data analysis, we summed up two features: one is the psychological assumptions and the actual mental account does not match. That is, the difference between the expected consumption expenditure structure and the actual detailed expenditure is significant. The second is the weak execution. Those college students were vulnerable to external influences, highly likely to result in excessive consumption. During the e-commerce festival, 21% cost more than one month’s full living expense, and 47% cost more than half, but only 46% of the students believed to have irrational consumer behaviors in “618”. Most college students have a weak sense of consumption and are in a serious but unconscious dangerous state of excessive consumption. In addition to e-commerce platforms, the emergence of credit platforms with lower thresholds has led to the borrowing of college students who are not strong-willed and impulsive. This meet the economic needs of many college students, and the majority have fallen into an embarrassing dilemma [4]. Ant Huabei released “The reports of Chinese young adults daily-life consumption”, which showed every 1 in 4 youngsters would use advanced consumption on average [21]. If college students fail to repay their arrears on time, they would leave a record of dishonesty, or even fall into the trap of online loan and cannot extricate themselves, arousing more psychological problems to extreme or degenerate [10].

This study would explore the specific dimensions of college students’ mental accounts and the essential causes behind the promotion of those e-commerce festivals. For individual development, the university stage is not only a critical period to learn professional knowledge, but also an important period to learn financial management. If we could cultivate college students’ ecological consumption concept according to the explicit mental accounting, guide them to get rid of the negative influence of fetishism, liberate them from the joy of indulging in material wealth and improve their own quality development. It would help to cultivate college students’ personality and correct consumption concept. It is more conducive to the formation of green consumption patterns and the promotion of healthy consumption concepts in the whole society [14].

2 STUDY 1

Researchers have discussed the division of the implicit structure of mental accounting. For example, Kivetz (1999) divided mental accounting into regular income and windfall gain...
Thaler (1999) divided mental accounting into two mental accountings: common expenditure and luxury expenditure according to consumption expenditure. Some other researchers explored the Chinese mental accounting system, as Li, Ling, Fang and Xiao (2007) divided the Chinese mental accounting into three dimensions: the source, the expenditure and the storage of wealth. However, college students are a special consumer group, they have almost no independent economic access, their income source is often single but stable, mainly from their parents as living expenses. In Wu’s (2009) survey on college students’ consumption status: 96% of their consumption sources are dominated by the living expenses provided by their parents. Similar results were found in the survey conducted by Deng et al. (2005) that 95% of college students depend on their parents (families) for daily consumption. However, their consumption expenditure types are diverse, and an effective way to classify consumption expenditure structure is based on ELES model.

Extend Linear Expenditure System (ELES) is a demand function system introduced by C.Liuch (1973) based on the linear expenditure system model. The model assumes that people’s demand for goods is divided into basic demand and marginal demand, and has nothing to do with income. On the basis of meeting basic needs, the remaining marginal income will be distributed to other aspects of life. It has the advantages of complete theoretical basis, small data dependence and easy parameter estimation. It overcomes the limitations of Engel coefficient and can digitally reflect the consumption structure of college students.

Assuming that people’s consumption expenditure is specifically divided into $i$ types, the consumption expenditure of various commodities can be expressed by the model as follows:

$$V_i = P_i X_i + \beta_i(Y - \sum P_i X_i), i = 1, 2, 3, ..., n$$

(1)

Among them, $i$ is the type of the good or service. $V_i$ is the consumption expenditure of $i$ good, $P_i$ and $X_i$ are the price and basic demand of $i$ good, $P_i X_i$ is the basic demand expenditure of $i$ good, $\beta_i$ is the marginal consumption tendency, and $Y$ is the disposable income.

To deform the upper equation:

$$V_i = \beta_i Y + (P_i X_i - \beta_i \sum P_i X_i), i = 1, 2, 3, ..., n$$

(2)

Let

$$P_i X_i - \beta_i \sum P_i X_i = \beta_i$$

(3)

$$V_i = a_i + \beta_i Y (i = 1, 2, ..., n)$$

(4)

Let

$$\sum a_i = \sum P_i X_i - \sum \beta_i \sum P_i X_i = \sum P_i X_i (1 - \sum \beta_i)$$

(5)

So we can get $\sum P_i X_i = \sum a_i/(1 - \sum \beta_i)$. Thus, the basic demand for $i$ good is:
\[ P_i X_i = \alpha_i + \beta_i \left[ \sum \alpha_i / (1 - \sum \beta_i) \right] \]  

(6)

Model (4) is a simple linear regression model. Using the cross-section material, the estimated value of \( \alpha \) and \( \beta \) can be obtained by the least-square method.

Based on the ELES model, Ju (2014) conducted an empirical survey of several universities in Shanghai, and divided the consumption expenditure structure into basic living needs, developmental needs and enjoyment needs. On the basis of this, we speculate that the expenditure dimension of mental accounting is divided into three parts based on different types of consumption purposes: survival consumption (Mainly includes the most basic food, accommodation and expenses for the basic survival guarantee), developmental consumption (Mainly includes personal hobbies and individual developmental needs), enjoying consumption (Mainly includes games, love and other entertainment-oriented consumption purposes).

2.1 Methods and Materials

2.1.1 Participants

The participants were college students from Southwest University, in Chongqing, China. 416 data were distributed and recovered, in which there was 403 valid data, with an effective rate of 96.88%. There were 189 males (46.90%) and 214 females (53.10%), and mean age is 20.72 years old.

2.1.2 Materials

The “College Students Daily Consumption Expenditure Questionnaire” used in this study is mainly compiled, based on Ju’s (2014) questionnaire on the consumption status of college students. The questionnaire mainly focuses on the consumption income and sources of college students, and summarizes their common consumption expenditure categories, including: basic food, basic learning, transportation, accommodation, self-development, social contact, love, entertainment, image consumption, enjoying dietary, and further investigates the proportion of their daily consumption.

2.2 Results

2.2.1 Description Statistics of College Students Daily Consumption Structure

As shown in Table 1, we found that 98.01% of college students’ income comes from the living expenses provided by their parents, while only 11.41% had additional personal fixed income and 5.70% had other sources of income. It could be seen that for college students, the main source of consumption income remained the living expenses from their parents.

The average monthly income of college students were divided into 4 levels from 0 to 3000 yuan. The analysis results showed that the average monthly living expenses were about 2051.42 yuan, and the college students whose monthly living expenses were in the range of 1000-2000 occupied the main part, reaching 68.98%, followed by 20.84% whose monthly living expenses were in the range of 2000 - 3000. While those in the range of 0-1000 accounted for 6.69% and those above 3000 accounted for 3.72%.
The average monthly expenditure was about 1622.5 yuan, but the analysis showed that 44.34% of undergraduates’ monthly consumption expenditure outweighed their monthly living expenses. The specific proportion and structure of different types of consumption are further counted (See in Figure 1). The proportion of basic food, basic learning, transportation, accommodation, social contact, self-development, love, entertainment, clothing, makeup and enjoying dietary in monthly expenditure is: 35.36%, 5.03%, 4.37%, 3.85%, 6.52%, 6.12%, 3.44%, 9.38%, 11.50%, 3.54%, 9.89%. According to the different consumption purposes, we could find that survival consumption accounted for the highest proportion, reaching 48.61%, while developmental consumption and enjoying consumption accounted for 12.63% and 34.31% respectively.

![Figure 1: Consumption expenditure categories of college students.](image)

### 2.2.2 ELES Analysis of College students Daily Consumption Structure

SPSS 21.0 was used to analyze the data obtained from the “College Students Daily Consumption Expenditure Questionnaire”. Taking the cross-sectional data of college students’ average monthly income and consumption expenditure as the data source, the ELES model was used to carry out regression analysis on their consumption structure, in which income was the independent variable and expenditure was the dependent variable. The statistical results are shown in Table 2. From the determination coefficient, t test and F test value, we could find the fitting effect of ELES model is great.
According to the results shown in Table 2, from the marginal consumption tendency ($\beta$) of various types of consumption, the marginal consumption tendency of college students from high to low is entertainment, basic food, clothing, social contact, enjoying dietary, basic learning, makeup, transportation, self-development, love, accommodation. Among them, the marginal consumption tendency of entertainment, basic food and clothing is greater than 0.1, which shows that with the increase of living expenses, college students would spend more on entertainment and image consumption, and have higher requirements on the quality of daily food. In contrast, the marginal consumption tendency of transportation, accommodation and self-development is low, indicating that the improvement of campus infrastructure lifts the supply constraints and the willingness of college students to develop themselves is small.

Table 2: Parameter Estimation and Statistical Test Results of ELES Model.

<table>
<thead>
<tr>
<th>Consumption Categories</th>
<th>$\alpha$</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$t$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic food</td>
<td>469.317</td>
<td>.138</td>
<td>.073</td>
<td>2.866</td>
<td>8.214</td>
</tr>
<tr>
<td>Basic learning</td>
<td>-33.520</td>
<td>.079</td>
<td>.079</td>
<td>2.978</td>
<td>8.868</td>
</tr>
<tr>
<td>Transportation</td>
<td>-16.124</td>
<td>.060</td>
<td>.190</td>
<td>4.946</td>
<td>24.464</td>
</tr>
<tr>
<td>Accommodation</td>
<td>81.266</td>
<td>-.001</td>
<td>.010</td>
<td>-.048</td>
<td>.002</td>
</tr>
<tr>
<td>Social contact</td>
<td>.550</td>
<td>.081</td>
<td>.161</td>
<td>4.462</td>
<td>19.907</td>
</tr>
<tr>
<td>Self-development</td>
<td>37.750</td>
<td>.053</td>
<td>.061</td>
<td>2.591</td>
<td>6.713</td>
</tr>
<tr>
<td>Love</td>
<td>10.046</td>
<td>.038</td>
<td>.034</td>
<td>1.926</td>
<td>3.708</td>
</tr>
<tr>
<td>Entertainment</td>
<td>-108.189</td>
<td>.186</td>
<td>.134</td>
<td>4.017</td>
<td>16.135</td>
</tr>
<tr>
<td>Clothing</td>
<td>27.099</td>
<td>.125</td>
<td>.106</td>
<td>3.511</td>
<td>12.324</td>
</tr>
<tr>
<td>Makeup</td>
<td>-14.470</td>
<td>.067</td>
<td>.144</td>
<td>4.186</td>
<td>17.526</td>
</tr>
<tr>
<td>Enjoying dietary</td>
<td>60.279</td>
<td>.086</td>
<td>.111</td>
<td>3.596</td>
<td>12.932</td>
</tr>
</tbody>
</table>

Subsequently, the equation for calculating the basic needs based on the ELES model is:

$$P_iX_i = \alpha_i + \beta_i \left[ \frac{\sum \alpha_i}{1 - \sum \beta_i} \right]$$  \hspace{1cm} (7)

For example, the basic demand for basic food is $P_1X_1 = 540.12$, and the equation for income elasticity of demand is:

$$n_i = \beta_i \cdot \frac{Y}{V}$$  \hspace{1cm} (8)

Further statistical analysis is made on the estimation of college students’ basic consumption demand and income elasticity of demand. The results are shown in Table 3. The data shows that the valuation of most consumption categories is positive, and only the valuation of entertainment is negative, indicating that after the basic consumption demand of college students is met, the remaining income is more inclined to be used for entertainment. At the same time, according to the calculation results of the demand income elasticity equation, the income demand elasticity of entertainment and makeup is higher, which represents with the
increase of the income level of college students, they are more inclined to invest in the enjoying consumption related to entertainment and image.

Table 3: The results of basic consumption demand and demand income elasticity.

<table>
<thead>
<tr>
<th>Consumption Categories</th>
<th>Basic consumption demand forecast</th>
<th>Income elasticity of demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic food</td>
<td>540.12</td>
<td>0.33</td>
</tr>
<tr>
<td>Basic learning</td>
<td>7.01</td>
<td>0.74</td>
</tr>
<tr>
<td>Transportation</td>
<td>14.66</td>
<td>0.89</td>
</tr>
<tr>
<td>Accommodation</td>
<td>80.75</td>
<td>-0.02</td>
</tr>
<tr>
<td>Social contact</td>
<td>42.11</td>
<td>1.00</td>
</tr>
<tr>
<td>Self-development</td>
<td>64.94</td>
<td>0.70</td>
</tr>
<tr>
<td>Love</td>
<td>29.54</td>
<td>0.86</td>
</tr>
<tr>
<td>Entertainment</td>
<td>-12.75</td>
<td>1.54</td>
</tr>
<tr>
<td>Clothing</td>
<td>91.24</td>
<td>0.88</td>
</tr>
<tr>
<td>Makeup</td>
<td>19.91</td>
<td>1.15</td>
</tr>
<tr>
<td>Enjoying dietary</td>
<td>104.40</td>
<td>0.70</td>
</tr>
</tbody>
</table>

2.3 Discussion

We analyzed the income sources and expenditure categories of college students’ consumption, and found that consistent with previous studies, the majority of the college students’ income sources are still living expenses, and mainly concentrated in the range of 1000-3000, but the phenomenon of excessive consumption still exists. Based on the classification of mental accounts, it could be found that most of the consumption in college students’ life is still survival consumption, such as basic food and accommodation, followed by enjoying consumption, while less college students invest in consumption for developmental purposes. In the subsequent ELES model analysis, it is also found that with the increase of living expenses, college students mainly invest more in enjoying expenditure, such as entertainment, image, etc., indicating that for college students, the most attractive type of consumption is the mental account of enjoyment, which is also the cause of irrational consumption. It would be analyzed later.

3 STUDY 2

Consumption is a social interactive behavior, which often starts with the individual’s motivation to meet the need of consciousness or emotional experience. Therefore consumer behavior is a manifestation of the internal process to satisfy self-demand, under the initiation of external stimuli (inducement) (Wang, 2003).

The “online consumption festival” (e.g. “618”, “double 11”) initiated by the online shopping platform is often accompanied by activities in the form of discounts, promotions and so on, therefore consumers are favored by price advantages. This kind of external stimuli stimulates
consumers’ consumption motivation and makes it easier for them to make consumption decisions. In the eyes of consumers, “online consumption festival” means lower prices, and also the consumption time with most cost-efficiency, the inherent concept of “missing this time is a loss” is generated. In the long run, it forms a conditional reflection. Without comparing the price changes or paying attention to self-actual consumption needs, they would directly regard those festivals as the best time for consumption, resulting in the negative schema of “consume for consumption”. College students are still in the prefrontal development stage, so their emotional control and rational decision-making functions still immature. Once there is an external stimulation as “online consumption festival”, it is easier for college students to make decisions on enjoying consumption (e.g. entertainment, high-end clothing, makeup). However, the monthly consumption income of college students is fixed and controlled by the parents. When due to the fixity, in order to ensure the balance of income and expenditure, college students are often unconsciously affected by the independence of mental accounts, and unconsciously reduce their expenditure on survival consumption and developmental consumption. According to survey by Jiang (2022), there are no less than 100 various sizes of promotional activities in Taobao platform within one year. The increase of enjoying consumption after the stimulation functions as a reward for consumers. They cost only a few more every time, but the spiritual satisfaction feedback continues to strengthen the consumption imbalance of college students. Over time, when the enjoying consumption gradually squeeze survival consumption so that the most basic survival needs could not meet (e.g. food, clothing, etc.). This would be detrimental to health, and even induce borrowing and other advanced consumption behaviors (See the specific psychological mechanism in Figure 2).

According to the analysis of the psychological mechanism, it is predicted that college students would significantly increase the proportion of enjoying consumption, reduce the proportion of survival consumption and developmental consumption, and even exceed the monthly disposable income like overdrawning next month’s part, during the “online consumption festival” to keep the balance.

![Figure 2: Psychological mechanism of irrational consumption.](image)

### 3.1 Methods and Materials

#### 3.1.1 Participants

The participants were also college students from Southwest University, in Chongqing, China. 406 data were distributed and recovered, in which there was 399 valid data, with an effective rate of 98.28%. There were 194 males (48.62%) and 205 females (51.38%), and mean age is 20.43 years old.
3.1.2 Materials

On the basis of the “College Students Daily Consumption Expenditure Questionnaire”, we changed the guidance, and compiled the “College Students Consumption Expenditure Questionnaire on Online Consumption Festival”. It was released in the end of November after the “Double 11 Consumption Festival”, focusing on not only the category and specific amount of consumption expenditure in the past week’s consumption festival, but also counting normal expenses this month.

3.2 Results

3.2.1 College Students’ Consumption Structure on “Online Consumption Festival”

According to the results, 95.74% of the participants had consumption behavior in the “Double 11 Consumption Festival”, and found that the average consumption in the festival reached 1358.84 yuan, which accounted for about 64.39% of the monthly living expenses. However, more than 16.63% of college students would consume more than the monthly living expenses in the festival, and the highest could even reach 7.47 times of the monthly average disposable income.

The results are consistent with the hypothesis. As shown in Figure 3, the consumption of college students in the online consumption festival is mainly enjoying consumption, including enjoying dietary, clothing, bag, makeup, daily necessities, digital products. Clothing and enjoying dietary accounted for the largest proportion, reaching 28.77% and 23.63%, followed by makeup and digital products accounted for 15.43% and 18.76%, daily necessities and bags accounted for 8.87%, 2.43%.

![Figure 3: Detailed expenditure categories on “Double 11 Festival” (From high to low).](image-url)

3.2.2 Comparative Analysis of Daily and “Online Consumption Festival” Consumption Structure

In the results, we analyzed the proportion of college students’ daily expenditure on survival, developmental and enjoying consumption, and calculated the consumption structure after the “Double 11 Consumption Festival” to obtain the specific proportion of three types of consumption. The comparison results are shown in Figure 4. It could be found that under the influence of the festival, the weight of survival consumption and developmental consumption decreased, while the weight of enjoying consumption increased significantly. In order to
further judge whether the difference was significant, we would use variance analysis to observe weight changes.

Figure 4: Consumption structure in daily and online consumption festival.

In the two-factor analysis of variance, with time (daily vs online consumption festival) and mental accounting type (survival vs developmental vs enjoying consumption) as independent variables and consumption weight as dependent variable, it was found that the main effect of mental accounting type was significant ($F = 105.224, p < 0.01$), indicating that there were significant differences among the three different consumption types, but the main effect of time and the interaction between time and consumption type were not significant ($p > 0.05$). The further pairwise comparison results showed that the difference of survival consumption between daily and the online consumption festival was significant ($t = 12.179, p < 0.01$), the difference of enjoying consumption was also significant ($t = 26.151, p < 0.01$), while the difference of developmental consumption was not significant ($p > 0.05$). It could be found that the survival consumption of college students after the festival significantly reduced, the enjoying consumption significantly increased, and the development consumption nearly unchanged. This may due to the large individual difference in the direction of personal development, while the survival and enjoying consumption changes basically met the hypothesis.

4 GENERAL DISCUSSION

This study mainly used ELES model to analyze the consumption structure of college students’ mental accounts and finds three types: survival, developmental and enjoying. On this basis, through the comparative analysis of the changes in the structure of mental accounts by college students before and after the “Double 11” consumption festival, the reasons for their irrational consumption behavior of college students are explored. It is found that its essence is to compress the survival and developmental consumption to carry out enjoying consumption, which reflects the flexibility of mental accounts and would bring negative consequences to college students for a long time, such as affecting physically healthy development and even online lending. The theoretical significance of this study is to explore the consumption structure and mental accounting dimension of college students, and use ELES model analysis
to obtain data as supporting evidence. From this perspective, the causes of irrational consumption behavior were studied. In the meanwhile, it also has practical significance. Through the analysis, it provides reference for college students to understand their consumption proportion and tendency, so as to effectively control self-consumption and prevent potential irrational consumption behavior.

However, there are still some limitations in this study, which is to be further expanded in future. First of all, the sample size needs to be further expanded. All the participants invited are from Southwest University, which may only represent the consumption structure of college students in specific region (Southwest). In order to better explore the general consumption structure of Chinese college students, we should combine the consumer price index of each region, and use statistical methods like factor analysis in future (Lin, 2012). Secondly, since the self-report form of the questionnaire is mainly used, it is impossible that some college students could remember every consumer spending monthly without missing. Therefore, a better alternative approach is to monitor students’ monthly expenditure under the stimuli of online consumption festival, with the premise of informed consent. In this way could the accurate data be obtained. In addition, another future research direction is to put these data obtained through the ELES model into real life into intervention, which could flexibly calculate the reference value of the month according to individual income, so as to play a good preventive role in irrational consumption behavior.

5 CONCLUSIONS

To review, with the analysis of ELES model, this paper explores and verifies that there are three dimensions of college students’ mental accounting: survival, developmental and enjoying consumption. They are independent of each other, but under the stimulation of online consumption festival, college students often could not help the pleasure brought by enjoying consumption, resulting in irrational consumption behaviors, which in turn squeezes survival and developmental consumption, threatening to their long-term healthy development.

Acknowledgements: This research was supported by grants from Weihong Wang, and the SWU Research Funds (S202210635294) to Xucong Hu.

REFERENCES

contiguity in consumer-borrowing decisions. Organizational Behavior and Human Decision Processes, 58(1), 136-152.


