

An Exploration of the Psychological Factors Influencing College Students' Consumption of Mobile Phone in West China

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Abstract

The questionnaire survey method is adopted in this article to analyze the psychological factors influencing college students' consumption of mobile phone in west China, and the relationship between the college students' individual characteristic and the factors what they consider when they choose the mobile phone. Through the exploration, the influencing factors include the social attribute, the coherence, the novelty, and the reliability. Relative data are used to establish the NN model. By this model, the psychological prices of different types of mobile phone in college students could be distinguished, so manufactures could improve the products and implement the drumbeating based on that.

Keywords: Mobile phone, College students' consumption, Influencing factors, NN

1. Introduction

With the stable increase of the Chinese economy and the improvement of the mobile communication technology, the proportion of college students' consumption of mobile phone has not been ignored, and this proportion ascends continually, and the growth speed is obviously higher than other social consumption groups. Most college students belong to pure-consumption group, and as the goods with relatively higher price, the mobile phone has been possessed by more and more students. Some survey showed that 71.60% college students had the mobile phone, and the proportion of freshmen was 59.64%, and the proportion of sophomore was 66.46%, and the proportion of junior student was 76.07, and the senior student was 82.60% (Zheng, 2007, P.22-27). As the consumption group which should not be ignored, college students have deep concept of individualism, and they are easy to be impacted by foreign cultures, and they are leaders and forth-goers of the tide, and they have special consumption habit. As the future consumption principle, college students' consumption behavior should be studied necessarily for the mobile phone market.

Most past researches about the college students' consumption of mobile phone only limited in the description of phenomena, such as the proportion of purchasing mobile phone, the purpose, and the price of the mobile phone (Zheng, 2007, P.22-27 & Guo, 2006, P.57-58 & Gao, 2004). And part of them only studied the influencing factors of mobile phone consumption from the physical characteristic of the mobile phone (Zhang, 2006).

2. Theoretical analysis

To some extent, the mobile phone has not been the simple tool of talk, and more and more consumers have regarded the mobile phone as the necessary fashion thing, which indicates the status, the identity, the style, and the pattern (Deng, 2006).

The Fishbein Behavioral Intention Model thinks that consumers' purchasing wills to certain product are influenced by two factors, and one is consumers' attitude of the behavior purchasing certain product based on the comprehensive cognition, and the other one is that consumers accept and purchase this product to cater for the

whole society and the habit of the group they are in (Fishbein M, 1975, P.288-381).

The means-end chains theory supposes that consumers could have the logic knowledge structure in their memories because of the cognition to the product (Claeys C, 1995, P.13-208). Consumers believe that when they use certain one product, the special attribute of the product could help them to obtain the anticipated value. The meaning of the product attribute could be endowed by its perceivable result (Charles E. Gengler, 1999, P.172-188 & Marni A. Goldenberg, 2000, P.208-224).

Consumers' self-concept and life mode are associated with the products what they select, and their purchase decision is finally determined by their psychological activities. How consumers perceive the mobile phone, how consumers evaluate the relative characteristics of mobile phone, and what psychological feeling could the mobile phone bring them, and these factors will certainly influence their purchase behaviors.

By starting from consumers' psychological feeling and combining with relative theoretical analysis and literature materials, consumers' psychological influencing the mobile phone consumption are summarized as follows.

(1) Social attribute. It means that whether consumers could perceive the mobile phone consumption is consistent with consumers' ideal. Each consumer has his own ideal selfhood, and he hope he could belong to certain one group. Whether the product accords with consumer's ideal social attributes such as special identity and status may influence consumers' purchase decision-making. Sirgy (1982) reviewed past research results, and pointed out the coherence of the consumers' real self-image, the ideal self-image, and the brand individuality would influence consumers' consumption decision-making (Sirgy J, 1982, P.287-300). The star effect, the reference group, the brand orientation, the price perception, and the function will influence this dimension.

(2) Reliability. It means that whether the consumers think the mobile phone is reliable and deserves to trust when they purchase certain one mobile phone, and it is more reliable, the possibility purchasing the mobile phone is bigger. This dimension may be impacted by following factors including the product quality, the purchasing experience (Huang, 2004, P.79-86), and the product information source.

(3) Novelty. It means that the mobile phone is special, and it could bring new feeling to consumers' heart. Considering the age character of the college student group, they are easier to be attracted by novelty (Zhao, 2004, P.36-40). The novelty of mobile phone includes new appearance and sculpting, new function, and new type.

(4) Coherence. It means whether the product is consistent with consumers' individuality, style, and life concept (Zhu, 2008, P.62-65). These factors including the appearance, the brand concept, the special function, and the style of mobile phone will influence the coherence.

3. Questionnaire analysis

The Likert five-point counting method is adopted in the questionnaire which requires that the factors influencing the mobile phone consumption in each one question could be evaluated. There are 27 questions and 5 of them belong to the surveyed object's basic situation. The sending of the questionnaire includes two approaches. The first one is the sending of the pre-questionnaire including 15 pieces. After relatively analyzing and modifying of pre-questionnaire, the normal questionnaire will be confirmed. The second step is to send the normal questionnaire. The sending of questionnaires adopts simple sampling method, and there are about 200 pieces, and the surveyed college students mainly come from Southwest Jiaotong University, Sichuan University, Xi'an Jiaotong University, and Xi'an International Studies University. 184 of them were returned, and 12 of them were of no effect, and 172 pieces of questionnaire are effective.

Input that data to the SPSS12.0 statistical software package to analyze the items, and delete the question 7 (because the correlative efficient with the total questionnaire is less than 0.20). By the Gronbach's Alpha reliability analysis, the reliability level of the whole questionnaire is 0.936, bigger than 0.7.

3.1 KMO test and Bartlett test of sphericity

KMO test and Bartlett test shows that the KMO index is $0.737 > 0.5$, so the samples are fit for the factor analysis. In addition, the Bartlett test of sphericity statistic is 1586.073, and the significance level is 0.0000, which indicates that the correlative matrix of the mother-group has common factor, so it is fit for the factor analysis.

3.2 Confirmation factors

Solve the load matrix of the rotation factor by the Varimax method. Following standards are used to confirm the amount of the factor, (1) the factor eigenvalue is bigger than 1; (2) the factors must accord with the Screen Test, the scree figure will confirm the factors; (3) each factor contains three questions at least; (4) factors are named. The factor analysis result is seen in Figure 1.

Four factors including the social attribute (eigenvalue: 4.783; contribution rate: 35.146%), the coherence (eigenvalue: 1.238; contribution rate: 10.567%), the novelty (eigenvalue: 1.157; contribution rate: 8.814%), and the reliability (eigenvalue: 1.016; contribution rate: 7.771%) are abstracted, and the concrete factor loads are seen in Table 1.

3.3 Analysis of influencing path

In above analyses, college students' psychological factors influencing the mobile phone purchase are discussed, and the causes influencing college students' mobile phone consumption will be analyzed as follows.

College students' life cost levels, individualities, and purchasing motivations are different, so the factors including the mobile phone consumption will be different. Based on past researches and literatures, following hypotheses are proposed.

H1: College students' purchasing motivation (practicality degree) will negatively influence the mobile phone purchase from the social attribute, the coherence, and the novelty, and from the reliability, it will positively influence the mobile phone purchase.

H2: College students' individuality (extraversion degree) will positively influence the mobile phone purchase from the social attribute, the coherence, and the novelty, and it will not influence the mobile phone purchase from the reliability.

H3: College students' life cost level will influence the mobile phone purchase form the social attribute, the coherence, the novelty, and the reliability.

The structure equation method is adopted in this article to analyze, and the Lisrel8.53 software is used to test the hypotheses of the research, and the whole model structure is seen in Figure 2.

The influencing pathes are seen in Table 3.

In this research, the purchasing motivation positively influences the reliability factor, and negatively influences the novelty factor, and the individuality positively influences the novelty and the coherence factor. The level of the life cost will not significantly influence the social attribute, the reliability, the novelty, and the coherence, that may be because that the college students' total life cost level gap is not significant, so the samples could not be distinguished clearly.

4. Establishment of the NN model

The formed normal questionnaires will be analyzed further. In the questionnaire, the surveyed objects are the college students who have had the mobile phone. The factors influencing the mobile phone consumption aim at the purchased mobile phones. At the same time, the questionnaire includes the option, i.e. what price is the mobile phone which you bought, A: below 2000 Yuan, B: above 2000 Yuan. In past researches, the mobile phone price could be divided by the line of 2000 Yuan which is the boundary line of college students' psychological boundary when they buying the mobile phone. In this research, 72% students purchased the mobile phones below 2000 Yuan, and 28% students bought the mobile phones above 2000 Yuan. To further dig this information, college students' different psychological demands in the market could be studied as follows.

When consumers purchase new product, they always depend on their subjective favor, consumption experiences, consumption habit, and intuition. The push of product is always located in certain one special group, and the basic hypothesis is in that the life experience, the value orientation, and the favor are consistent. Consumers' perception of the product is more based on their psychological model, bot the subjective attribute of the corresponding product. The problems what is the relationship among four psychological factors influencing the mobile phone purchase, and how they act on the final decision together, are the problem of "black box" up to now. Bu the existing data could be utilized to establish the NN model for the psychological perception according with the mobile phones with different prices. In recent years, with the development computation method research, there are many researches using the NN method to evaluate the function (Rong, 2003, P.1-7). NN has the learning function, and it could obtain the mapping relationship among data by studying large numerous sample data. According to the optimal training rues, the BP algorithm could confirm and continually adjust the NN structure by multiple iterations until the weight is convergent. Therefore, it has many advantages such as small error, good convergence, good dynamics, and subjective result (Xu, 2004, P.169-172). By NN, when evaluating the new mobile phone with above four dimension, the data only need to be input into the trained system, the college students' psychological price could be judged blow or above 2000 Yuan. Aiming at this judgment result, the manufactures could further adjust the product combining with the original development intention by changing the appearance or the advertisement to make the product in the market with more pertinence and

competitive force.

According to the theoretical hypothesis and the result of the principal component analysis method, the numerical computation visualization software MATLAB2006a with high performance is selected to establish the BP NN, and the neural cell amount on the input layer is 15 (15 finally options), and the neural cell amount on the output layer is 1, and the neural cell amount on the concealed layer one is 4, and the neural cell amount on the concealed layer two is 1, and the approaching error is 0.0001, and 140 groups sample data and 32 groups of testing data are selected, and the Matlab NN tool box training network is adopted. The NN evaluation model is primarily confirmed by the experience formula, and by multiple experiments, the model structure is finally confirmed as seen in Figure 3.

Because the input vector and the output vector of the samples are in the internal of [0, 1], the neural cell transfer function of the concealed layer is the S-type tangent function logsig , and the neural cell transfer function of the output layer is the S-type logarithm function logsig (the input range is the whole set of real numbers), and the elements of the target vector are all in the interval of [0, 1]. The whole training process is seen in Figure 4.

The coordinate X denotes the training times, and the coordinate Y denotes the approaching error of the network.

By training the model by 140 samples, and the model achieves the pre-enacted error 0.000001 at 302 times, and by simulating the 32 tested samples, the nicety of the samples achieves 91.5%.

5. Conclusions

College students' consumption of mobile phone is not only determined by rational analysis and comparison. By the analysis in this article, the psychological factors influencing college students' purchase of mobile phone in west China include the social attribute, the reliability, the coherence, and the novelty. At the same time, college students' individuality will influence the mobile phone purchase to some extent. The NN model is established based on existing data to distinguish the mobile phones with different prices and the different factors what they consider when they purchase the mobile phone. By this model, the new developed mobile phone could be evaluated based on college students' exiting value view, life style, and individuality. The problem whether the pricing accords with the factors influencing college students' mobile phone purchase could also be judged according to the model. The west china is the place where the new growth point of Chinese economy is, and according to result of the model, manufacturers can change the drumbeating and sculpting of the mobile phone, make the practical price of the product consistent with the college students' psychological perception in west China, and make the push of the mobile phone become more successful.

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Table 1. Result of principal component analysis

Factor	Concrete factor and load
Social attribute	Star effect (0.538), Reference group (0.821), Brand orientation (0.851), Price perception (0.801), Function (0.728)
Coherence	Mobile phone appearance (0.714), Mobile phone style (0.760), Special function (0.779), Brand concept (0.676)
Novelty	New appearance and sculpting (0.748), New style (0.841), New function (0.701)
Reliability	Having purchasing experience (0.618), Product information source (0.820), Product quality (0.725)

Table 2. Fitting indexes of the model

χ^2	df	χ^2/df	RMSEA	NNFI	CFI
221.18	123	1.79	0.066	0.974	0.981

Table 3. Path analysis of the model

Original hypothesis	Standardized path coefficient	T	Conclusion
H1a: Purchasing motivation negatively influences the social attribute factor	0.057	1.077	Nonsupport
H1b: Purchasing motivation positively influences the social attribute factor	0.163	2.537	Support
H1c: Purchasing motivation negatively influences the novelty factor	-0.201	3.619	Support
H1d: Purchasing motivation negatively influences the coherence factor	0.038	0.393	Nonsupport
H2a: Individuality positively influences the social attribute factor	-0.067	0.855	Nonsupport
H2b: Individuality doesn't influence the reliability factor	0.019	0.231	Support
H2c: Individuality positively influences the novelty factor	0.151	2.121	Support
H2d: Individuality positively influences the coherence factor	0.171	3.125	Support
H3a: Living cost positively influences the social attribute factor	0.067	0.778	Nonsupport
H3b: Living cost positively influences the reliability factor	0.037	0.42	Nonsupport
H3c: Living cost positively influences the novelty factor	0.05	0.541	Nonsupport
H3d: H3b: Living cost positively influences the coherence factor	0.012	0.12	Nonsupport

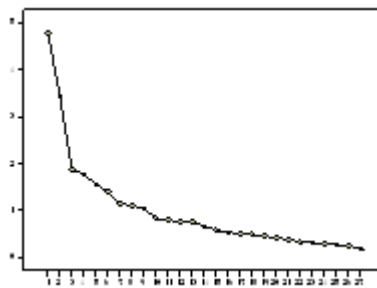


Figure 1. Scree Plot

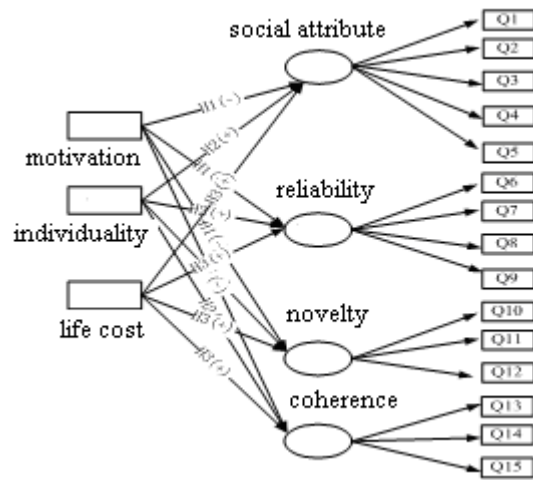


Figure 2. Relationship Model of the Individual Characteristic and the Influencing Factor of Purchasing Mobile Phone

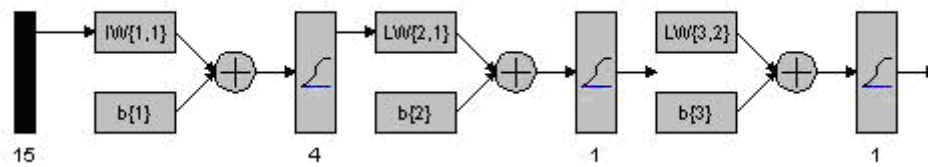


Figure 3. NN Model

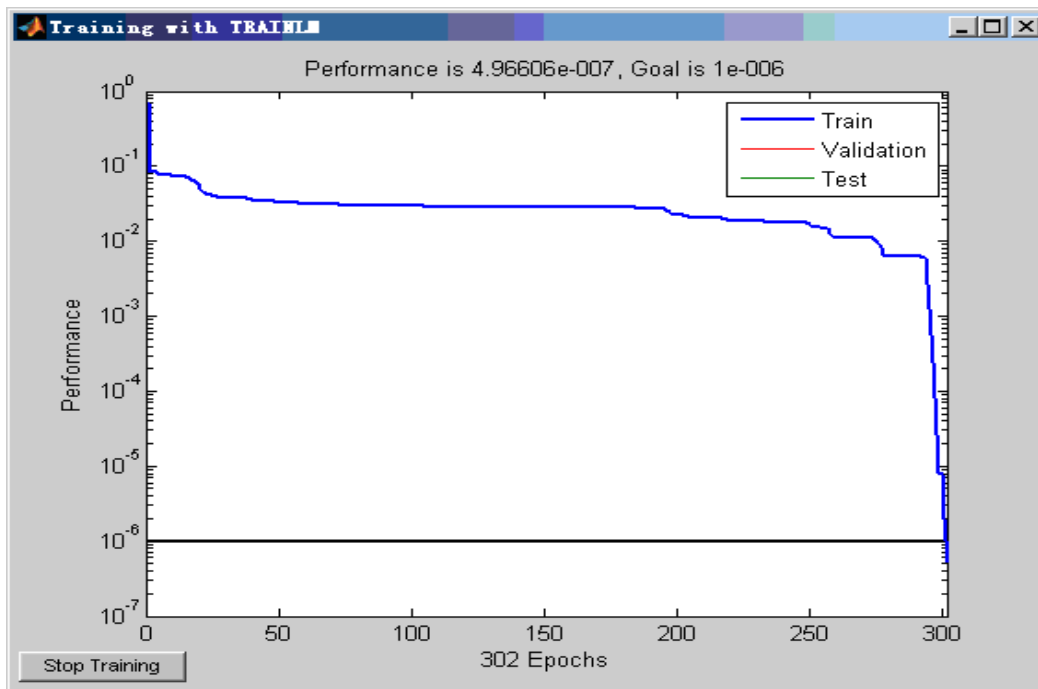


Figure 4. NN Training Process