# Analysis of the impact of consumer purchasing preference behavior in the Internet market based on conjoint analysis method

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**Keywords:** Internet era; psychological factors; conjoint analysis method; questionnaire survey; purchasing preference

**Abstract:** In today's society, online shopping is becoming more and more popular among consumers, and traditional industries, service industries and the Internet are increasingly integrated, which has changed residents' consumption behavior. Mainly include online shopping trends, changes in consumer preferences and mobile payment hotspots. The main factors affecting residents' consumption behavior in the Internet era are subjective psychological factors and objective environmental factors. As one of the important factors driving economic growth, consumption is crucial to the development of market economy. In order to better understand the consumer preference behavior of residents in the context of the Internet, this article uses the conjoint analysis method to construct a consumer decision-making process model. After a questionnaire survey, it analyzes the impact of consumer purchase preference behavior in the Internet market and finds that 60% of consumers Pay more attention to product quality.

## 1. Introduction

With the increasing influence of the Internet, traditional retailers are also striving to transform with Internet innovation, improve their adaptability, and create new Internet performance [1]. Fast information query and dissemination methods, convenient circulation methods and payment methods also break the time and space boundaries of consumers' traditional purchasing behavior. Consumers realize the advantages of e-retailing and online shopping over traditional channels [2]. The rapid rise of online retail platforms accounts for a considerable share of the entire global retail market. Many consumers are now addicted to online impulse purchases through e-commerce [3]. In this highly dynamic and uncertain era, developing the Internet market can help improve the elasticity and flexibility of enterprises and maintain their competitiveness [4]. The awakening of consumers' own interest in goods or services and the awakening of brand trust have a certain impact on purchasing behavior [5]. Consumers are getting smarter now and require smart technology to capture their highest interest in a particular product or service. Businesses and researchers believe that in today's era, more work needs to be done to reveal the role of evolving information and communication technologies in promoting marketing communications to attract consumers [6]. This article aims to understand consumers' purchasing preferences, which can help companies or e-commerce platforms predict user needs more accurately, thereby providing products that are more in line with consumer needs and increasing consumers' purchasing intentions and shopping experience.

## 2. Related Works

Jiang, Q and others proposed that the impact of Internet development has completely changed the model of financial development and economic growth [7]. Xiao, J and others discussed the development of marketing under the Internet+ background from various angles, including the establishment of Internet infrastructure, logistics system, branding, product deep processing, etc. [8]. Lu, F and others analyzed that with the development of the Internet and the strong support of national policies, network technology has been widely used in various fields, and the way of information release is not only faster, but also wider. With the strong support of the state, network

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technology has been widely used in various parts of society, and the number of Internet users is also increasing [9]. Wang, HS and others proposed that due to the popularity and rapid development of the Internet, it has profoundly affected people's lifestyles and covered all aspects of people's lives. The communication methods and marketing concepts of various industries have also undergone tremendous changes[10] . Gao, P proposed that in recent years, with the development of the Internet, Internet technology has swept the world and become a new round of technological revolution in the world economy. Internet marketing has become the darling of corporate marketing. It has a multi-dimensional and multi-level marketing layout and provides a carrier platform for the promotion of corporate marketing strategies. Compared with the traditional business model, it is more suitable for the development needs of the new era [11]. Karthika, I et al study Due to various technological advancements, people now have more choices than in the past, which has led to a consumer democracy where people around the world continue to use the Internet instead of any traditional mode for information search, in marketing and New phenomena are created in consumers' purchasing behavior decisions [12]. Huang, X and others also used to explore breakthrough innovations in product semantics of Internet products. A consumer purchase decision-making model of Internet products was constructed with product semantic perception as the antecedent variable. It explains how product semantics stimulates consumers' expectations and purchases of Internet products, and provides certain support for exploring consumer purchasing behavior preferences [13].

## 3. Methods

### 3.1 Conjoint analysis method

The conjoint analysis method is a realistic simulation of people's purchasing decisions and a method of studying consumer choice preferences. The role of the joint analysis method is mainly reflected in the following aspects: first, assisting market segmentation. Second, setting corporate benchmarks will help formulate marketing strategies. Third, it helps formulate price strategies. Fourth, the selection of the best outline is helpful for new product design. Fifth, the prediction of market share contributes to the formulation of overall strategy [14].

### 3.2 Definition of the concept of joint analysis

When using conjoint analysis, the following terms are used:

(1) Attributes: refers to certain characteristics or indicators of a product.

(2) Attribute level: refers to the value presented by the attributes of the product.

(3) Contour and full contour: Products are defined as contours. Full profile refers to all attributes and levels of a product.

(4) Utility: It is a value that reflects consumer preferences.

(5) Utility function: It is used to describe the utility of consumers to similar commodities and indicates the degree of influence of different types of commodities on consumer purchasing behavior.

(6) Relative importance weight: Indicates the influence coefficient of a type of product on consumers' purchasing decisions.

(7) Internal validity: Used to express the degree of correlation between the utility predicted by the conjoint analysis model and the utility evaluated by the respondents. The larger the value, the stronger the reliability.

(8) Maximum utility simulation: It is assumed that when consumers make purchasing decisions, they must choose the product with the largest total utility value, that is, the most preferred product.

### 3.3 Joint analysis calculation

#### 3.3.1 Full contour assessment

The full profile is usually used to evaluate the degree of consumer preference in the Internet market, and is decomposed into the utility of all attribute levels. The attribute levels are used as

predictor variables, and OLS regression is used to obtain the regression coefficients. The formula is as follows:

$$Y = a + \sum_{i=1}^{m} \sum_{j=1}^{n} v_{ij} x_{ij} \tag{1}$$

Among them, $Y$ is the preference score of the full profile; $i$ represents the number of attributes $i = 1,2,3,\cdots,m$, and $a$ refers to the utility when the consumer does not choose to be trapped, also called the intercept. $x_{ij}$ is the estimated utility of the $j$ th level of different attribute levels, and $v_{ij}$ is the regression coefficient, indicating the estimated utility of the $j$ th level of the $i$ th attribute.

### 3.3.2 Calculation of relative importance of attributes

The difference value is usually calculated using the difference between the highest attribute level value and the lowest attribute level value under this attribute, as follows:

$$c_i = \left\{ M\,\mathrm{ax}\left(v_{ij}\right) - Min\left(v_{ij}\right) \right\}, j = 1,2,\cdots,m \tag{2}$$

$$W_i = c_i / \sum_{i=1}^{m} \sum_{j=1}^{n} c_i \qquad i = 1,2,\cdots,m \tag{3}$$

Among them, $W_i$ is the relative attribute that affects preference behavior, $M\,\mathrm{ax}\left(v_{ij}\right)$ is the maximum utility value of the consumer, and $Min\left(v_{ij}\right)$ is the minimum utility value of the consumer.

Assuming that the basis of this analysis is established, if there is no difference between the utility values of various levels of an attribute, it means that this attribute has little impact on the respondent's purchase decision. On the contrary, if the difference between different attribute levels is large, it means that the attribute is of high importance in the overall profile.

### 3.3.3 Calculation of contour utility

The profile value reflects the consumer's preference for this product, and its calculation formula is as follows:

$$U_k\left(x\right) = a + \sum_{i=1}^{m} \sum_{j=1}^{n} w_i v_{ijk} x_{ijk} \;\; k = 1,2,\cdots p \tag{4}$$

$U_k\left(x\right)$ is the total utility of the $k$-th contour, and $k$ is the total number of contours. $w_i$ represents the consumer's relative importance weight estimate for the $i$-th attribute of the $k$-th profile.

### 3.3.4 Calculation of market share of profiles

The market share of the profile can visually show what combination of attribute levels is preferred by consumers. Assuming that the consumer is rational, he will only purchase the most preferred product. If the total utility function Y is the maximum utility value, then the probability P of the consumer choosing this product is 1, otherwise P is 0. Find the probability of all consumers choosing the product and take the average to get the expected market for this product. Occupancy rate:

$$\text{Product market share} = \frac{\sum_{i=1}^{N} \frac{1}{n} P_i}{N} \tag{5}$$

In the above formula, $n$ is the maximum number of people $i$'s evaluation of all products, and $N$ represents the total number of people surveyed.

Consumer behavior is the actions people take when requesting, using, and disposing of consumer goods.

### 3.4 Consumer Behavior Analysis

Figure 1 shows the process of consumers making consumption decisions. This process model is called the consumer decision-making process model [15]. To produce consumer choice behavior, several conditions need to be met at the same time: (1) Consumers generate consumption demand. (2) Consumers are faced with multiple brand choices and have a pre-purchase information search process. (3) Consumers can perceive the differences between different brands. When consumers make choices, they first identify consumption needs, and then search for internal information. If the internal information is insufficient, they begin to seek external information. After obtaining enough information, they begin to summarize the information. and evaluation to make purchasing decisions.

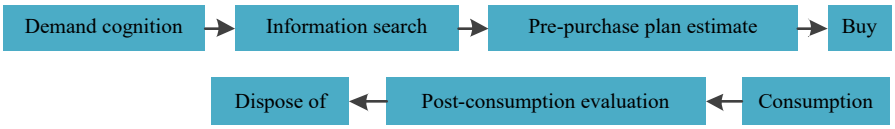


Figure 1 Consumer decision process model

## 4. Results and Discussion

The data collection of the conjoint analysis method is mainly in the form of questionnaires. This article randomly conducted a questionnaire interview with 200 people in a large shopping mall.

### 4.1 Questionnaire and data collection

Table 1 Results of the statistical analysis

| Variable | Classification | Quantity | Valid percentage |
|---|---|---|---|
| Gender | male | 88 | 44 |
| | female | 112 | 56 |
| Age | Under 20 years old | 22 | 11 |
| | 20-30 years old | 76 | 38 |
| | 30-40 years old | 55 | 27.5 |
| | Over 40 years old | 47 | 23.5 |
| Educational qualifications | High school and below | 41 | 20.5 |
| | College or undergraduate degree | 149 | 74.5 |
| | Master's or PhD | 8 | 4 |
| | PhD or above | 2 | 1 |
| Profession | Student | 81 | 40.5 |
| | Staff | 65 | 32.5 |
| | Government employees | 24 | 12 |
| | Other | 30 | 15 |
| Monthly income | No income | 52 | 26 |
| | Below 2,000 yuan | 18 | 9 |
| | 2000-3000 yuan | 34 | 17 |
| | 3000-5000 yuan | 48 | 24 |
| | 5000-8000 yuan | 25 | 12.5 |
| | 8000-15000 yuan | 14 | 7 |
| | More than 15,000 yuan | 9 | 4.5 |
| Main expenses | Clothes | 42 | 21 |
| | Food | 48 | 24 |
| | Live | 24 | 12 |
| | OK | 21 | 10.5 |
| | Educate | 25 | 12.5 |
| | Entertainment | 20 | 10 |
| | Medical | 11 | 5.5 |
| | Favor | 6 | 3 |
| | Other | 3 | 1.5 |

Table 1 shows the results of the questionnaire collection. It can be found that among the respondents who participated in this survey, 56% were women and 44% were men. The proportion of women was higher than that of men. There were also differences in age, education, occupation, income and major expenses. To get a general understanding, the main expenditures that account for the largest proportion are food and clothing.

### 4.2 Analysis of influencing factors

It is known that in the above survey, the most important aspects are clothing and food. On this basis, we further analyze the factors affecting the respondents' consumption. Table 2 shows the proportion of influencing factors. In addition to consumers' own needs, 60% of people value the quality of the product most, including reputation and evaluation of the product, followed by price. 22% said that on the basis of ensuring quality, Discounts are even better. The third is brand effect. 12% of people said that the credibility of well-known brands is still very high. The last is service. Only 6% of the first choice factors for purchasing are service. Taking this survey as an example, the quality of the product is the most important attribute. The highest utility value means the highest market share and the highest efficiency and profit. The future development direction of the company is to keep getting better and better in terms of quality.

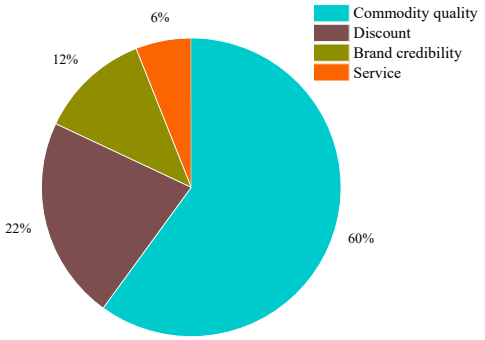


Figure 2 Proportion of influencing factors

## 5. Conclusion

This article builds a consumer decision-making process model based on conjoint analysis theory and algorithms. This article first introduces the concept of conjoint analysis method and introduces related influencing factors. Conjoint analysis calculations include full profile evaluation, evaluation of consumer purchasing behavior, calculation of relative importance of attributes, and measurement of consumer purchasing behavior weight. Through the calculation of the silhouette utility and the calculation of the market share of the silhouette, it provides a basis for analyzing consumer behavior. Finally, a questionnaire is designed for data collection, statistics and analysis. Through a questionnaire survey of these 200 people, the results show that consumer groups of different genders, different ages, and different occupations have very different factors that influence purchasing behavior, and the proportions are also different.

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