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Customer Choice Preference Analysis in Marketing Based on a Discrete Choice Model

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Abstract: In the construction and development of modern society, it is a powerful measure for enterprises to obtain more economic and social benefits to accurately grasp the basic needs and choice preferences of different consumer groups. This paper mainly discusses the characteristics of the customer object and the influencing factors of the choice preference in marketing. The MNL model is used to analyze the influence of a single statistical factor on consumers' choice preferences. Taking liquid dairy products as an example, subdividing consumer groups provides an effective basis for the construction and operation of the liquid dairy supply chain. While analyzing the basic information of the respondents, the correlation between different personal consumption characteristics and brand, price, taste, promotion, and outer packaging is analyzed through the correlation analysis method. The analysis results show that age and education level have a negative impact on brand or food quality and safety, while income has a significant positive impact on brand or food quality and safety. There are significant differences in the selection of liquid dairy products among consumer groups with different education levels.

Keywords: discrete selection model, marketing, individual characteristics, preference of choice

1. Introduction

Product competitiveness is the core factor that shows whether an enterprise has core competitiveness. With the continuous improvement of innovation ability and productivity in modern enterprises, the increasingly formed buyer's market brings more opportunities and challenges for enterprise reform. Since the main source of the improvement of the market economy is the consumer, customer satisfaction has become the main concern in market competition. Meeting the satisfaction of different types of consumer groups is the focus of discussion among all enterprises. Therefore, finding the correct marketing strategy to win customers' satisfaction and improve enterprises' market economic benefits is the focus of current enterprise managers. Especially in such fierce market competition, enterprises must start with customer satisfaction marketing if they want to get an absolute advantage in the market.

Customer satisfaction refers to customers' evaluation of the consumption experience of a series of marketing activities provided by enterprises [1-3]. In addition, customer satisfaction also implies that consumers have a positive experience in the consumption process, can fully meet their consumption needs and expectations, and then convey their feelings to the outside through direct expression or

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hints and affirming their consumption process. When customers purchase enterprise products, they will be affected by the comprehensive influence of product quality, appearance, price, and service quality as judged by marketing personnel. The greater the pleasure and satisfaction of customers in the consumption process, the greater the satisfaction. The final satisfaction evaluation is not only the unilateral result of an enterprise marketing strategy but also related to customers' own consumption demands and standards. Since the customers' consumption demands are uncontrollable, it is difficult to satisfy the demand during the consumption process. How to study the choices of consumer groups is an important link in the development and design of new products and services. Therefore, after putting forward an objective attitude, the in-depth study of all kinds of information on market development and the application of scientific methods for processing and analysis can provide real data and scientific decision-making suggestions for enterprise decision-making departments. Nowadays, the development of enterprises depends on consumers, who are the basic conditions for the marketing decisions of enterprises and have a close relationship with the marketing activities of enterprises.

The discrete choice model, also known as the combinatorial analysis model with choice as the core, belongs to the category of micro econometrics in practical research and can simulate individual choice behavior. After the multiple choice Logit model was proposed in the early stages of the research, a complete theoretical system including the multiple probity and mixed logit models has been constructed through recent years of research and development. According to different types of sample data, some scholars have divided the discrete selection eyebrow model into the following three categories, as shown in Figure 1 below [4]:

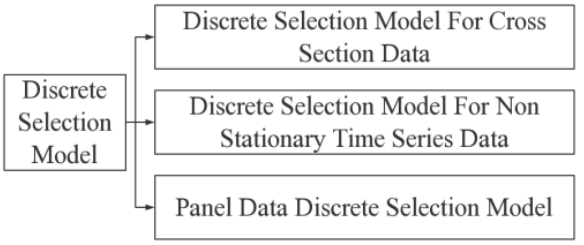

Figure 1: Types of discrete selection models [4].

From the perspective of the market research field, the application of discrete choice model to analyze consumers' choice preferences can be discussed from the perspectives of brand competition, market share, new product development, and so on. On the basis of collecting a large amount of data information, some scholars used the Logit model to study the characteristics of consumers' preferences when buying beer and ranked the influencing factors in order of importance, the most critical of which is the price range and packaging type. In addition, some scholars use the mixed logit model to study the way passengers leave the airport, collect samples in combination with market economy variables and ensure that statistical variables are closely related to the attributes of airport selection, so as to accurately evaluate the different attributes of airport location [5-6]. Therefore, with the emphasis on market research, the application scope of the discrete choice model has been extended.

2. Methodology - Discrete Selection Model

This kind of model is mainly used to analyze how consumers choose different products or services in an actual or simulated market competition environment. Under normal circumstances, a certain number of product or service selection sets should be constructed based on an orthogonal experimental design. Each selection set contains multiple products and service contours, and each contour is composed of attributes and different level combinations that can describe important features of the product

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or service. From the marketing research perspective, this kind of model will estimate unknown parameters, and the actual statistical analysis process is complicated. Specific steps are divided into 6 parts, as shown below [7]:

2.1. Identify Attributes and Levels

This part is an important attribute to describe the characteristics of products and services. Various factors influencing consumers' purchases or use of products and services should be fully considered. This article selected brand vs. food safety, price vs. food safety, taste vs. food safety, promotion vs. food safety, and outer packaging vs. food safety. Five dimensions of safety, using Likert the 5 scale, 1 means strongly disagree, 2 means disagree, 3 means neutral, 4 means agree, and 5 means strongly agree. Following the determination of various attributes, it is necessary to ensure that the level of attributes is too low or too high than the actual scope to avoid the correct understanding of consumers in the real market environment.

2.2. Choose the Set and Experimental Design

If the attributes and levels of products and services are limited, they can be combined and presented to consumers. At this time, the experimental design scheme should be selected. However, in the case of a large number of attributes and levels, a partial factor experimental design should be selected to control the number of product portfolios, and the orthogonal arrangement method will be selected for the experimental design to estimate and analyze the linear model of the main effect.

2.3. Questionnaire Design and Data Collection

This model combines the attribute level of the product and service profile into a variety of different products and services to form a selection set, which is intuitively presented to the consumer group to help them choose the most likely product and service to buy, and also enables the consumer group to evaluate multiple choice sets, so the final research results are closer to reality.

2.4. Data Coding and Sorting

The model has special requirements for the data format of the selected sets. Before analyzing the data, all the selected sets must be re-encoded and combined with the choices of the visitors. Since the discrete selection model is studied at the group level, the number of respondents is set as the selection frequency of all respondents, which is used as a weighted variable to simplify the data set [8-10].

2.5. Data Analysis

On the one hand, the selection frequency analysis examines the selection frequency of all respondents in selecting several optional products. The selection proportion of different attribute levels is clarified thereby calculating the proportion of choices for different attribute levels of two-dimensional interactions. On the other hand, the model is a probabilistic analysis. After selective data is encoded and integrated, the data is analyzed using a very limited multinomial logit model.

2.6. Check the Interpretation

Testing and evaluating the final results of the model can ensure the correctness of the model fit, help the enterprise correctly predict the choice ability of consumers, and scientifically formulate the enterprise marketing management measures.

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3. Result Analysis

3.1. Research Content

According to the development situation of the Chinese dairy industry in recent years, the data information of Guangming, Sanyuan, Yili, and Mengniu are selected for comparative study. Through surveys and interviews with several supermarkets in a certain area, the age, gender, per capital monthly income, education level, and consumption behavior of individual consumers are regarded as explanatory variables, and the analysis is carried out from three aspects. The three aspects are the influence of consumers' single characteristic factors on brand selection, the influence of consumers' multi-characteristic factors on the composition of brand selection, and different optimization marketing strategies according to customer preference [11-14]. The data from the consumer survey is shown in Table 1.

Table 1: Results of consumer survey statistics.

The variables	Sample characteristics	Sample size	The proportion
Gender	Male	131	43.7%
	Female	169	56.3%
Age	Under 20 years old	33	11.0%
	20-35 years old	185	61.7%
	35-50 years old	51	17.0%
	Over 50	31	10.3%
Average monthly income	Less than 1000 yuan	27	9.0%
	1000-3000 yuan	154	51.3%
	More than 3,000 yuan.	119	39.7%
Education level	Below high school	81	27.0%
	Bachelor’s degree or above	219	73.%
Liquid milk consumption per week	Under 10 yuan	117	39.0%
	10-50 yuan	152	50.7%
	Over 50.	31	10.3%

3.2. Result

SPSS 16.0 software is used for parameter estimation and test analysis of the research model in this paper. The parameter estimation results are shown in Table 2.

Table 2: Calculation results of parameter estimation.

Personal consumption characteristics	Brand vs. Food safety	Price vs. food safety	Taste vs. Food safety	Promotion vs. Food safety	Outer packaging vs. Food safety
The constant	17.457	1.239	34.12	-0.452	0.889
Age	-1.343**	0.892*	-0.934**	1.515***	-0.347*
Weekly consumption of hydraulic dairy products (con)	-0.004	-1.771**	0.453*	1.802*	0.552
Education (edu)	-0.761*	-0.188*	0.108	0.491	0.321
Revenue (inc)	0.001	-1.913	0.003	0.651	0.881*

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Table 2: (continued).

Gender (gen)	0.013	0.001	0.045	-0.332*	-2.883*
Note: ** means significant at the level of 0.01 and * means significant at the level of 0.05					

3.3. Analysis

Based on the analysis of the parameter results obtained in the above table, it can be seen that the age change and education level of consumers have a significant negative impact on the choice of brand or food quality and safety. In other words, the survey found that the older consumer group is more inclined to food quality and safety issues, while the younger consumer group is more concerned about the enterprise brand. Moreover, consumer groups with higher education pay more attention to food quality and safety issues, while consumer groups with lower education pay more attention to corporate brands. Meanwhile, the above research results prove that the gender, consumption level and personal income of consumers have no significant influence on food safety factors and brands.

From the perspective of the influence of a single statistical factor, the MNL model is used to directly study the influence of every single statistical factor, and the final estimated results are shown in Table 3.

Table 3: Parameter estimation results of a single statistical factor.

Attribute		B	Sig
1. The brand	Intercept	-0.84	004
	[Educatin=1, Below high school (including high school)]	0.12	032
	[Educatin=2, High school or above]	0	
2. The price	Intercept	-3.45	001
	[Educatin=1, Below high school (including high school)]	1.45	047
	[Educatin=2, High school or above]	0	
3. The taste	Intercept	-2.02	001
	[Educatin=1, Below high school (including high school)]	1.45	0.06
	[Educatin=2, High school or above]	0	
Note, a The Reference Category food quality and safety;b This Parameter Is Set To Zero Because It Is Redundant			

Combining the above values, it is possible to clarify the probability of different educated consumption groups when choosing liquid dairy products, as shown in Table 4.

Table 4: Results of probability statistics.

	Below high school (including high school)	High school or above
Safety.	52%	63%
The brand	24%	27%
The price	6%	2%
The taste	18%	8%

In understanding the choice preference of consumer groups in marketing, other single statistical factors of consumers can be regarded as categorical variables, such as income consumption limit, and age. The probability of selecting liquid dairy products can be accurately calculated, which can provide a predictive basis for the marketing strategy of enterprises, and the reasons for choosing dairy products can be clarified according to various characteristic factors of consumers.

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4. Conclusion

Facing the increasingly fierce competitive market environment, in order to master more consumer groups and provide products and services in line with customer needs, enterprises should learn to use the scattered choice model in marketing to study the choice preferences of customers. Comprehensively grasp the fundamental needs of different consumer groups, and gradually optimize the economic development director and main ways of enterprises. After understanding the current situation of the liquid dairy products market development, this paper collects a large amount of related data and information and analyzes the end consumption market for liquid dairy products based on the principles and application steps of the discrete selection model. The liquid dairy products supply chain study focuses on the characteristics of different consumer groups' preferences for liquid dairy products, which provides an effective basis for the reform and innovation of relevant enterprises in the new era. Therefore, enterprises should formulate standardized marketing strategies according to this feature, so as to strengthen marketing control and optimize the promotion mode of products and services.

This paper has limitations in the questionnaire survey sample data collection and research model. Due to the limitation of time and ability, the breadth of questionnaire samples selected is not enough. It is hoped that in future studies, a variety of research methods and approaches can be adopted and the sample scope can be expanded, thus strengthening the validity of survey data and ensuring the representativeness of survey objects and the authenticity of questions answered to the maximum extent. so that the research on the impact of consumer choice preferences on marketing strategies can have a wider universal value.

Moreover, five dimensions are selected for analysis: brand vs. food safety, price vs. food safety, taste vs. food safety, promotion vs. food safety, and outer packaging vs. food safety. However, perceived value has other influences on consumers' behavioral intentions in real life. According to the literature, only five dimensions of perceived value are selected in this paper, which is a relatively narrow scope of study.

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