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Must Hair Care Products That Target the Causes of Consumer Hair Loss Be More Popular?

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Abstract: Hair loss has become a problem for many people in the modern world where pressure is constantly increasing, and it is showing a trend of "aging". Many shampoo and hair care brands have launched hair care products specifically designed to improve the causes of hair loss through market research, but do consumers prefer to buy these products? What factors influence consumers' willingness to consume hair care products? In this paper, by crawling the data in Taobao, an e-commerce platform under Alibaba, we categorized the sales of products on the hot list of hair care products, focusing on products with anti-hair loss functions, and finally selected 13 products for crawling and analyzing the reviews. Through the psychological tendency of the review content, the authors concluded that most users have similar needs, including factors such as smoothness, flavor, oil control, cost-effective, and good reviews, etc. Based on the data obtained, the authors explored the psychology of consumers when purchasing, laying the foundation for the design of the questionnaire. After that, through the experimental method, by distributing the questionnaire to the subjects, the questionnaire contains two products, one contains anti-hair loss ingredients. Through the basic information of the subjects, the use of hair care products and the choice of the two products on the questionnaire, combined with the theory of consumer expectations, it is concluded that the hair care products designed for hair loss are not preferred over ordinary hair care products, and that the supply side of the market of hair care products does not need to pay too much attention to the causes of hair loss of consumers, but should pay more attention to their willingness to buy.

Keywords: hair care products, emotion dictionary, structural equation modeling, QCA group analysis

1. Introduction

According to the "Chinese scalp health white paper" shows that in China, the number of people with hair loss has exceeded 250 million, of which about 163 million men, women about 88 million, plus men are more likely to suffer from androgenetic alopecia, the prevalence rate of up to about 21.3%. Hair loss has gradually entered more and more people's vision, ranking in the top ten of the health issues that Chinese people are most concerned about. Similarly, people all over the world are suffering from hair loss, and according to the 6th Asian Hair Transplant Congress, there are about 2 billion people in the world. In the face of increasing hair loss in recent years, countries around the world

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have conducted in-depth studies on hair loss in order to decipher the causes of hair loss. Based on this, many shampoo and hair care brands have also launched various new shampoos and conditioners to address the causes of hair loss among the general public. Although these products have added ingredients to treat hair loss compared to ordinary shampoo and conditioner products, whether they can really attract consumers to buy them is still an open question. Based on the current research, which focuses on the causes of hair loss and the corresponding solutions, we focus on consumer preference for the products.

In the study of causes and solution strategies of hair loss, lifestyle habits, psychological reasons, and genes may contribute to hair loss. Dermal cells play a key role in hair growth of various cell types in the hair follicle, and Polygonum multiflora extracts can be used to support hair growth by eliminating the role of androgens in cultured human dermal cells[1]. In addition, "Cold" X5 Hair laser can be used in the treatment of androgenetic alopecia to promote hair growth [2]. In the study of psychosocial factors contributing to hair loss, a relationship between hair loss problems and psychological factors was found through stress-related psychometrics and hair sulfide measurements of 205 Korean college students with a clear gender profile, with women's emotional disorders more likely to lead to hair loss [3]. From the research perspective of media analysis theory, media reports marginalize the physical deficits of people with hair loss, bring them a strong stigma of hair loss, and increase the psychological stress of people with hair loss, so health personnel and health policy makers should focus on the mental health of people with hair loss [4].

The above studies have achieved many research results on the causes, treatments, and effects of hair loss, but the treatment of hair loss is a multidisciplinary field of study that integrates medicine, psychology, and economics, and most of the current studies are in the medical field, with little involvement in other areas. In addition, the current research only stays in the exploration of the causes of hair loss, and does not put forward specific measures to solve the current situation of hair loss for the general public, and also does not consider the needs of consumers for hair care products from the commercial and market point of view, to provide product recommendations for the market.

2. Study 1

Study 1 analyzes the e-commerce platform review data of China's hair care products, which classifies the products on the platform's hair care products hot list by sales volume, focusing on products with anti-hair loss functions, and ultimately selects 13 commodities for data crawling and analysis, including 7 shampoo products, 4 hair film products, and 2 hair conditioner products. This study is based on the content of the comments to understand the psychological tendency of consumers in purchasing hair care products and emotional tendency analysis, so that the production and sales of hair care products manufacturers can better understand the consumer's purchasing psychology.

2.1. Data and Measures

The data is provided mainly through the collection of data from the most important e-commerce shopping platforms in China, using Python crawler technology and browser simulation access data collection technology based on the Requests library to save the URLs of the relevant products, and then using proxy services and cookies to access the corresponding pages through the crawler to obtain the content of the comments. In the process of data mining, there are a large number of incomplete and inconsistent abnormal data, so the manual comparison method is used to pre-process the raw data, and the comment content of "invalid language such as numbers and letters" and "this user has not commented! " As well as a large number of repetitive comment content, there is a suspicion of brushing the invalid comments. In the end, we obtained 14,555 valid data. We use the Jieba library in Python (an excellent third-party library for Chinese lexicography), using dynamic programming to

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find the maximum probability of paths, to crawl the effective data and lexicography results are as follows:

Table 1: Jieba Segmentation Example Table.

Raw comment data		Segmentation results
I used the sample twice before evaluating it, and the smell is a very light and refreshing ginger cola flavor, without much fragrance. After washing the hair is quite light, the first wash kept for three days, not bad!	Long sentence	sample, evaluate, smell, very light, refreshing, ginger, cola, fragrance, hair, not bad
The oil control effect is not that good, the oil is still oil, the flavor is good, the price is also okay.	Middle sentence	oil control, effect
Poorly packaged with leaks	Short sentence	packaged, poorly, leaks

We split the main words into long, medium and short sentences based on the length of the sentence. These words include product features, product effectiveness, and user experience.

2.2. Analysis

1.Consumption tendency analysis based on review content. By integrating similar products, word frequency data of user reviews of similar products are obtained. The word frequency data can be sorted to obtain the degree of consumers' concern for different effects, i.e., the higher the frequency, the more the feature can be recognized as the core effect of this type of product. In conditioner products, users care more about the cost-effectiveness and smoothness of the product; in shampoo products, users care more about the smell and fluffy effect of the product; and in hair mask products, users care more about the smoothness and flavor. Although the demand is different, the focus of each product is also different, but most consumers have the same demand, mainly contains smooth, flavor, oil control, good reviews of the four factors, so merchants and manufacturers can be in the above aspects of the product in-depth exploration.

2.Sentiment Propensity Analysis based on Sentiment Dictionary. In this paper, affective tendency analysis refers to the process of identifying and extracting subjective information in the original material, and analyzing, processing and inductive reasoning on the text with emotional color. BosonNLP affective dictionary can score the affective value of each emotional word, by splitting the text, corresponding to the BosonNLP dictionary to match one by one and record the score value of matching to the emotional word, and finally the statistics are summarized. If the total score is greater than 0, it means the emotion tendency is positive; on the contrary, it means the emotion tendency is negative.

Using Python code, the results of analyzing the sentiment tendency of comments through BosonNLP sentiment dictionary are as follows:

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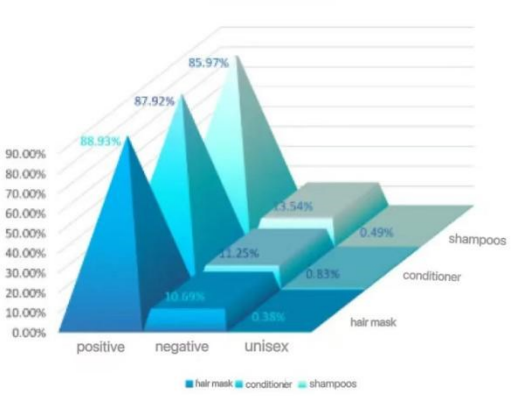

Figure 1: Comment Sentiment Value Analysis Chart.

As can be seen from the review sentiment percentage chart, most users have a positive attitude towards hair care products with anti-hair loss efficacy, and the sentiment attitude is roughly in the same trend. In the e-commerce platform, consumer users' comments on the corresponding products can largely reflect their intuitive feelings.

2.3. Results and Discussion

1.Consumer Side. In the sentiment percentage chart, it can be seen that most of the consumer reviews for these three commodities have a positive attitude, indicating that consumers have a high degree of satisfaction with the three types of products represented in the existing market, hair care products have a broad market prospect, but the emergence of negative comments indicates that there is still room for improvement;

2.Producers' Side. Different categories of hair care products should have their own focus. Manufacturers in the production of shampoo products should pay more attention to the product flavor, fluffy, oil control, packaging and other factors; in the production of hair film products should pay more attention to the smooth effect of the product, flavor, softening effect and other factors; in the production of hair conditioner products should pay more attention to the smooth effect of the product, flavor and other factors, and at the same time, need to take into account the cost-effective. Merchants should also focus on the marketing process of the product characteristics and advantages of the above publicity.

3. Study 2

Study 2 refers to the results of Study 1 on the reviews of hair care products on Chinese e-commerce platforms. We will explore whether consumers prefer shampoos with anti-hair loss ingredients from the perspective of the product through experimental methods; and whether it is necessary for manufacturers to spend more effort on anti-hair loss features to improve the competitiveness of their products through research and studies.

3.1. Main Study Design and Procedure

An experiment was conducted to create two posters with the same color and content, but with different products: one is a common shampoo on the market containing softening, volumizing, and oil-controlling effects; and the other is a shampoo with an anti-hair loss ingredient, targeting the current situation of people's hair loss. A total of 1,000 participants were recruited to participate in the test, and their personal information, daily shampoo adaptations, and preferences for the two shampoos were collected to observe which shampoo they preferred, to analyze different consumer preferences

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for hair care products, and to study the causes of hair loss and whether the addition of an anti-hair loss ingredient would be a better way to attract consumers.

A total of 1,000 participants from China took part in the experiment, and data were collected through questionnaires. There were 868 valid questionnaires, with a validity rate of 86.8%. In terms of gender: male is about 45%, female is about 55%; age composition: post 70 is about 25.90%, post 80 is about 33.40%, post 90 is about 21.70%, post 00 is about 19.00%; literacy level: elementary school and below is about 6%, junior high school is about 9%, senior high school is about 18%, specialist is about 23%, undergraduate is about 30%, master's is about 12%, doctor's is about 2%. , Dr. is about 2%. Among them, 190 people do not have hair loss, 407 people have physiological hair loss, and 271 people have pathological hair loss, of which 499 people follow the trend of self-deprecation of hair loss, accounting for 56.9% of the total sample, of which 90, 00 young people are predominantly, indicating that the dissemination of the Internet and other media has largely influenced the sample's perception of the current situation of their own hair loss.

In addition, we counted the purchase of hair care products of the samples. Through the Pareto chart of Figure 2, we can see that functional shampoos, conditioners and hair masks are more popular in the market, with cumulative percentages of 0.332, 0.623 and 0.828 respectively.

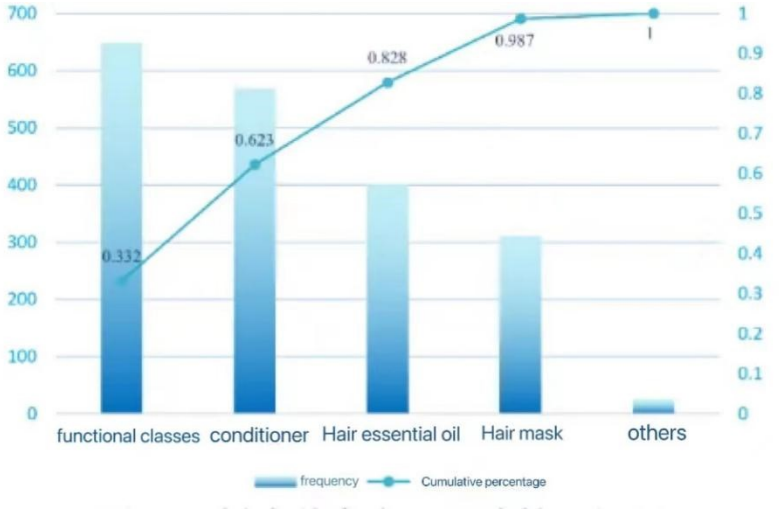

Figure 2: Sample Hair Care Products Shopping Pareto Chart.

After learning the personal information of most consumers and their product preferences, we then analyzed whether it is necessary for manufacturers, especially those who do not have a lot of data and the ability to conduct surveys, to investigate the hair loss habits of the general public and add anti-hair loss ingredients in order to attract consumers and increase market share. In the questionnaire, we judged whether hair care products with anti-hair loss could be chosen by more subjects by comparing consumers' choices of shampoos with ordinary effects (with softening, volumizing, and oil-control effects) and shampoos with anti-hair loss effects. The results, as shown in Figure 3, showed that 529 people chose the shampoo with normal efficacy and 339 people chose the shampoo with anti-hair loss efficacy. Among the subjects who chose anti-hair loss prevention, in terms of age: about 27% of the post-70s, 36% of the post-80s, 23% of the post-90s, and 11% of the post-00s, and in terms of gender, about 64% of the males and 36% of the females, the results of which were analyzed and plotted as Figure 4.

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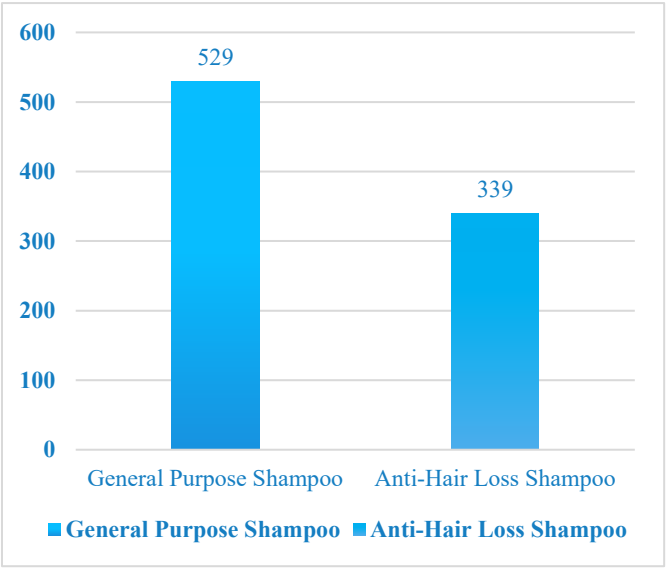

Figure 3: Chart of the number of people who chose between the two shampoos.

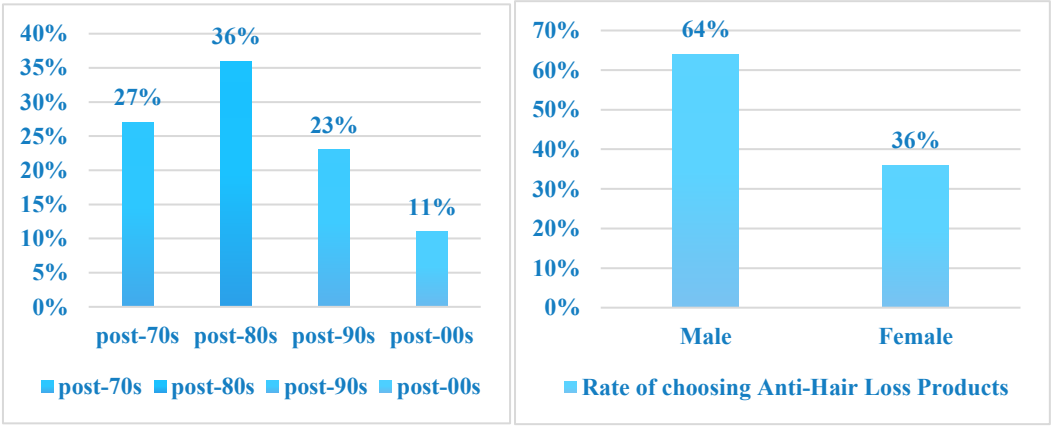

Figure 4: Percentage of age and gender among subjects choosing anti-hair loss.

In order to investigate whether anti-hair loss shampoos can attract repeat customers, we asked respondents who had purchased anti-hair loss shampoos whether they would repurchase them after using anti-hair loss hair care products. As shown in Figure 5, 63% of the respondents chose “no repurchase,” 27% chose “less than 5 repurchases,” 8% chose “more than 5 repurchases,” and 2% chose “more than 5 repurchases. 2% chose “not sure or don’t remember”.

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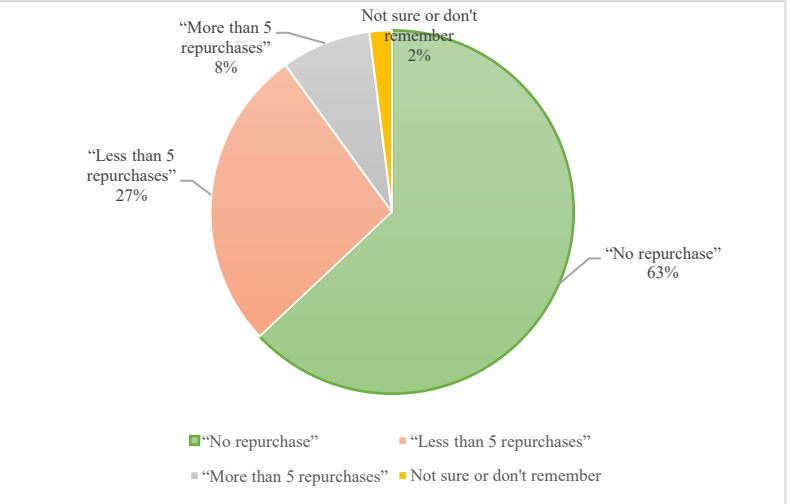

Figure 5: Graph showing the percentage of respondents who repurchased anti-hair loss products.

3.2. Analysis

Through the collection of research data, we found that compared to hair care products with anti-hair loss efficacy, hair care products with general efficacy are more preferred by consumers, this is because personal will has a greater role in the consumer behavior of hair care products than the current situation of the individual with the anxiety of hair loss, and most consumers have more preference for products they have used before, and have a high dependence on the products, believing that using the old products will bring a higher level of utility, and therefore do not try to buy hair loss products. The preference for anti-hair loss shampoos increases with age. The older the consumers, the more they prefer anti-hair loss shampoos. This is due to the fact that younger consumers tend not to have a strong perception of hair loss and mostly follow the trend of self-deprecating hair loss. Middle-aged and elderly people buy products with anti-hair loss efficacy more obviously, especially middle-aged and elderly men, this is due to the fact that after a certain age, hair loss has become a problem faced by many people, especially men in the number of hair loss is more, so the middle-aged and elderly men will buy anti-hair loss hair care products to regulate. However, from the quantitative point of view, anti-hair loss products have not occupied a large market in the middle-aged and elderly groups, the middle-aged and elderly groups are more money-minded, out of cost-effective considerations will not choose more expensive anti-hair loss products, and there is no more anxiety about the face value, that this is a very normal thing with the growth of age, and therefore will not deliberately buy anti-hair loss products. Therefore, although anti-hair loss shampoo is more in line with the current needs of the people, but people still prefer to buy the general effect of shampoo.

Consumer expectation theory is an expected consumer outcome that consumers fantasize about when they are dissatisfied with the reality of the situation, and consumer expectation triggers consumer purchase willingness and consumer purchase behavior. According to Blau's description and definition of expectations, consumer expectations are categorized into three types: general consumer expectations, special consumer expectations, and comparative consumer expectations. General consumption expectation refers to the base benefit that the user gets from the consumption behavior; special consumption expectation refers to the special benefit that the user gets from the base benefit at the consumption behavior; comparative consumption expectation refers to the expected benefit that may be gained from the consumption behavior next time after subtracting the cost of maintaining a certain consumption relationship. By asking the respondents who have purchased anti-hair loss products whether they will buy them back again, it is found that most consumers will not

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buy them back again or will only buy them back less often, which indicates that the comparative consumption expectations of consumers for hair care products for hair loss prevention are low, and purchasing anti-hair loss products will not bring more benefits to consumers, so consumers are not inclined to maintain the consumption relationship. From the perspective of consumer expectation theory, anti-hair loss products are more attractive to consumers with special consumption expectations, and this part of the consumer does not meet the special consumption expectations from the product, i.e., anti-hair loss products do not meet the special consumption expectations of the consumer anti-hair loss, but consumers have to pay a higher price. According to the law of diminishing marginal utility, it is more satisfying for consumers to obtain benefits that meet their expectations than to obtain benefits that exceed their expectations. Therefore, hair care product manufacturers should focus on the basic needs of consumers, such as smoothness, dandruff, oil control, etc., for anti-hair loss hair care products such as the need for long-term use to meet the special needs of the product, the manufacturer should focus on reducing the expectations of consumers for the product's special expectations of consumption, can not exaggerate the effect of the product to attract consumers, so that instead of the consumer will be because of anti-hair loss needs have not been met and will not be carried out. Long-term purchase.

For manufacturers, especially small and medium-sized manufacturers with insufficient user data and limited research resources, businesses do not need to over-explore the personal background and hair loss-causing habits of individual consumers and add more effective anti-hair loss ingredients to attract consumers. Compared to the in-depth excavation of the source of consumer demand, directly targeting their willingness to buy analysis, from the outside to stimulate the growth of their demand has a greater practical benefit, that is, manufacturers only need to consumers more preferred product features of production, publicity, and for the majority of consumers facing the need for hair loss, spend more costs may not reap better results.

4. Study 3

Consumption willingness reflects the subjective tendency of consumers to choose specific products and is an important indicator for predicting consumption behavior. In the rapid development of the industry market today, maintaining a keen sense of consumer willingness helps companies seize the first opportunity to develop a reasonable market strategy. However, consumer willingness is subject to multiple influences from various factors both within and outside the product itself. For hair care products, what factors influence consumers' purchase intention? For hair care products, what factors influence consumers' purchase intention? What is the combination path of these influencing factors? These are the questions that hair care companies need to solve.

Structural Equation Model (SEM) is a model for examining complex causal relationships, and it provides a means of estimating the structural relationships among the latent variables in a set model without the influence of measurement error. In this chapter, we first use structural equation modeling to explore what factors influence college students' willingness to consume hair care products, and in what direction and with what effect, by using the TAM+TPB theory in the study of willingness to consume.

Qualitative Comparative Analysis (QCA) is a theoretical method that explores how combinations of conditions lead to observable changes or discontinuities in the interpreted results by means of the complex attributes and influencing factors of the case itself, and it focuses on solving the "grouping" problem in the research process. It focuses on solving the "grouping" problem in the research process. Although structural equation modeling (SEM) can easily reveal the causal relationships between variables, it is difficult to exclude the existence of other explanatory antecedents, which leads to a too "constrained" research logic.

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On the basis of the SEM results, we continue to use OCA to explore how the combination of these factors influences consumers' willingness to consume hair care products, and how this process can be divided into several influencing paths, so that the final results can help us better understand consumers' hair care behaviors, and provide references for further exploration of the hair care market.

4.1. Design and Procedure

We first optimize five indicators based on the TAM+TPB theoretical framework, which are five dimensions of perceived usefulness, perceived ease of use, interpersonal influence, social influence, and self-efficacy, and the five indicators are defined as follows:

Table 2: Optimization of TAM+TPB model metrics.

Definition	Dimension
Improvement in hair or scalp health felt by users after hair care products.	Perceived usefulness
Ease of use of a particular hair care product by an individual.	Perceived ease of use
Level of motivation to agree with others/"significant others".	Interpersonal influence
Refers to the general objective environment, such as the attitudes promoted by social media towards particular things or behaviors.	Social impact
Whether you can accomplish the abilities required for your adoptive behavior, and whether you have the resources related to money and time.	Self-efficacy

Based on structural equation modeling to explore the factors influencing the consumption intention of hair care products. The structural equation model is divided into two parts: measurement model and structural model, and the specific formulas and meanings are as follows:

$$x=\alpha x\tau+\partial \quad (1)$$

$$y=\alpha y\omega+\varepsilon \quad (2)$$

Equation (1) is the equation describing the exogenous variables, where x denotes the vector of exogenously observed variables; $\alpha\tau$ denotes the relationship matrix between the exogenously observed variables and the latent variables, i.e., the matrix of factor loadings of the exogenously observed variables on the exogenous latent variables; τ denotes the vector of exogenous latent variables; ∂ denotes the vector of residual terms of the exogenously observed variables; and Equation (2) is the equation describing the endogenous variables, where y denotes the vector of endogenously observed variables; $\alpha\omega$ denotes the relationship matrix between the exogenous observed variables and the endogenous latent variables, i.e., the relationship matrix of the exogenous variables between the exogenous latent variables, i.e., the endogenous observed variables

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4.2. Results and Discussion

1.Interpretation of structural equation modeling results. From the results of the indicator path coefficient, it can be seen that the positive influences on consumers' willingness to buy hair care products are, in order of magnitude: perceived ease of use, social influence, interpersonal influence, perceived usefulness, self-efficacy.

(1) If the perceived ease of use increases by one percentage point, the willingness to consume will increase by 0.354 percentage points, and the influencing factors of perceived ease of use in order of magnitude are: perceived ease of use of product efficacy, perceived ease of use of method of use, perceived ease of use of the whole; (2) If the social influence increases by one percentage point, the willingness to consume will increase by 0.354 percentage points.

(2) If social influence increases by one percentage point, the willingness to consume will increase by 0.330 percentage points, and the influencing factors of social influence are, in order of magnitude, Internet marketing, discount promotions, and the social concept of paying attention to the value of the present day; (3) If interpersonal influence increases by one percentage point, the willingness to consume will increase by 0.330 percentage points.

(3) If the interpersonal influence increases by one percentage point, the willingness to consume will increase by 0.180 percentage points, and the influencing factors of interpersonal influence are, in order of magnitude, the thoughts of relatives and friends, the usage of relatives and friends, and the usage of important people; (4) If the perceived usefulness increases by one percentage point, the willingness to consume will increase by 0.180 percentage points.

(4) If perceived usefulness increases by one percentage point, willingness to consume will increase by 0.123 percentage points, and the influencing factors of perceived usefulness in order of magnitude are: technical content of the product, product effect, overall perceived usefulness, and the appearance of the product package; (5) If self-efficacy increases by one percentage point, willingness to consume will increase by 0.180 percentage points.

(5) If self-efficacy increases by one percentage point, the willingness to consume increases by 0.068 percentage points, and the influencing factors of self-efficacy in order of size are: economic level, and willingness to consume regularly.

Therefore, under the SEM single-factor influence results, perceived ease of use, social influence, interpersonal influence, perceived usefulness, and self-efficacy influence consumers' willingness to purchase hair care products from high to low, of which perceived ease of use has the greatest influence, and part of the consumer group may reduce their willingness to purchase because of the product's use is too complicated, and manufacturers need to comply with consumers' haircare habits and pay attention to the ease of use of haircare products.

2.Interpretation of QCA group analysis results. On top of the results of the structural equation modeling, further group state analysis we found that there are actually four modes of the influence process affecting consumers' willingness to consume hair care products:

(1) Mode I: The existence of self-efficacy in this mode is the core condition, social influence is present, perceived usefulness and perceived ease of use are absent as auxiliary conditions, and interpersonal influence is dispensable;

(2) Model II: This model has perceived usefulness, interpersonal influence present, self-efficacy absent as a central condition, perceived ease of use present, and social influence absent as a secondary condition;

(3) Model III: This model has perceived usefulness, self-efficacy present as a core condition, perceived ease of use present, and interpersonal and social influences absent as auxiliary conditions;

(4) Model 4: This model has perceived ease of use and presence of social influence as core conditions, and interpersonal influence and self-efficacy presence as auxiliary conditions.

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Therefore, we summarize the four modes as: self-external-driven, product-external-driven, self-product-driven, and multi-factor integrated-driven, respectively.

In the self - externally driven type, hair care consumption behavior is mainly the result of the joint action of product characteristics and external influences; in the product - externally concurrent type, hair care consumption behavior is mainly the result of the joint action of product characteristics and external influences; in the self - product driven type, hair care consumption behavior is mainly the result of the joint action of the result of the joint action of product characteristics and personal consumption ability; in the multi-factor combined-driven type, the generation of hair care consumption behavior is subject to multiple influences of the product itself, the external environment and the consumers themselves, especially the ease of use of the product and the social influence prompts consumers to buy hair care products.

For the consumers under the self-driven mode of influence: businesses need to focus on product promotion, through microblogging, Xiaohongshu, Zhihu and other youthful network platforms to strengthen marketing: at the same time, we need to pay attention to the self-efficacy of consumers to optimize the pricing of the product, but also by increasing the rendering of information on the hazards of hair loss, product ingredients, the efficacy of the use of the product and other aspects of the information, to reduce the economic constraints to increase the necessity of consumers on the hair care products. Perception.

For consumers in the product-driven mode of influence: improve the competitiveness of its efficacy and user-friendliness from the aspect of product research and development: expand the interpersonal influence of the product through the circle of friends activities and other modes on the basis of good word of mouth from the aspect of product publicity:

For consumers under the self-driven product-driven influence mode: businessmen should pay attention to the self-efficacy of college students on the basis of the efficacy of hair care products, the degree of ease of use to increase product research and development efforts to launch more targeted, better results, more convenient to use hair care products;

For consumers under the multifactor-driven influence model: the above three paths should be combined, especially focusing on product ease of use and expanding the scope of marketing to increase social influence.

5. Conclusion

Hair loss is an important issue facing people in the modern world, and more and more businesses are noticing the business opportunities and launching hair loss products to attract consumers based on the causes of hair loss in the modern world. Many previous studies have analyzed the causes of hair loss in modern people. However, in our study, we investigated whether anti-hair loss shampoos are more appealing to consumers than ordinary shampoos from a business perspective, and whether anti-hair loss shampoos are truly appealing to consumers through the preference of a large number of subjects for two different shampoo products. We found that young consumers are not more sensitive to the preference of anti-hair loss hair care products, i.e., consumers are not more inclined to buy anti-hair loss products, but are more interested in smooth, fluffy, oil-control products, which is due to the fact that young people are more likely to follow the trend of self-deprecation of hair loss, and the actual feeling of hair loss is not obvious, coupled with the role of self-esteem, so that young people will not be more preferred to buy anti-hair loss products. The preference of middle-aged and old-aged consumers for anti-hair loss hair care products will be slightly higher, but not obvious, this is due to the fact that middle-aged and old-aged people will face a more obvious and realistic hair loss problem than young people, but to a certain extent, they are not anxious about their own face value, and many of them do not care very much about their own hair loss, so they will not buy anti-hair loss products specifically to improve the status quo. Combined with the theory of consumer expectations, we

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analyze that anti-hair loss products do not meet the special consumer expectations, and manufacturers in order to achieve the purpose of attracting consumers, in the publicity will often exaggerate the efficacy of the product, which makes many consumers think that the product does not achieve the purpose of the product they want to prevent hair loss, or even think that the product does not have such efficacy, even if the product needs to be used for a long time in order to see the effect, the same Not conducive to the establishment of long-term consumer relations. On the other hand, the most basic general consumer expectations of consumers are most easily satisfied, and the basic function shampoos of smoothing and oil-control categories are more likely to establish long-term consumer relationships with consumers.

Based on the conclusions of Study 2, we analyze the measures that manufacturers should take to expand the market from the perspective of consumers' willingness to buy. We categorize the positive factors affecting consumers' willingness to buy into: perceived ease of use, social influence, interpersonal influence, perceived usefulness, and self-efficacy. Through structural equation modeling, we find that consumers are more sensitive to perceived ease of use, i.e., the most influential factor on consumers' willingness to buy is the degree of ease of use of the product, and some consumers will reduce their willingness to buy because of the complexity of the product, so vendors should pay attention to ease of use while conforming to the habits of consumers. Further, through the group analysis, we can get how hair care product manufacturers should motivate consumers to buy the products under the four modes of self-external-driven, product-external-driven, self-product-driven, and multifactorial integrated-driven. We find that manufacturers should improve product ease of use; strengthen marketing on youthful online platforms to give consumers the necessary perception of hair care products; expand the interpersonal influence of their products through various activities; and increase R&D efforts on portability and basic efficacy in order to launch hair care products that are more effective and easier to use. In particular, manufacturers need to focus on ease-of-use features and expand marketing to increase social influence.

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Appendix

Hair Care Products Crawl Code.

```
import time
import requests
import re
```

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```
import pandas as pd
df=pd.DataFrame()
comments=[]
for n in range(1,100)

url=f"https://rate.tmall.com/list_detail_rate.htm?itemld=578457969
092&spuld=966454964&sellerld=4178326724&order=3&currentPagc={n}&ap
pend=0&content=1&tagld=&posi=&picture=&groupld=&ua=098%23ElhvJpvWv
RyvUvCkvvvvvjiWR2qpgjiEPFLw6jrCPmPWljDnRsz90jDCP2WljtbRvhvCvvvvvm%
2BvpvEvvpl9OkUvUFW39hvCvvhvvmevpvhvvmv99gCvvpvvPMMvhvC9hvvCvpU9Cvv
OUvVvJZTlvpvUvvmvPAKSkE7gypvIvvvvvhCvvvvvvUvNphvUqQvvvOCvpvACvvv2v
hCv2vyvvvWyphvWmp9CvhQhvIGvCluQD7zWdigDN%2B31%2BE7rjC69D7z9aX7AVA3
l%2BExrV4tYmq0DyOvOHkx%2Fsjc6D400ameQiNoxdXyaUr2p6WpaejEmznAQ0fJ6R
vhvCvvvvvmvvpvZzPAScrMNznswOnEf%2F2Gynsb7e9%3D&needFold=0&_ksTS=16
42481338335_468&callback=jsonp469"
          headers={
'User-Agent':'Mozilla/5.0(Windows NT
10.0;Win64;x64)AppleWebKit/537.36(KHTML,like
Gecko)Chrome/97.0.4692.71 Safari/537.36 Edg/97.0.1072.62',
'cookie':'cna=ugsTGG+cFm8CASoxbRwPH2oY;lid=tb674441375;
enc=r5KDx4tmeMUN5z6lwh%2FHwSEFVHDG9EthFimplaaBRPObV6EW9vAEYwawzyMv
Vc4uPUnLYSantcUqnikH%2BMgjYA%3D%3D;xlly_s=1;
sgcookic=E100nCZFxtu0hlCOf0Lm2WLdiB6L6EDbMwI0q10INXq810oelOohntbwP
SrXg8tExLmAk%2FpwCVGb%2BxOpfcly7xfoh9XYaxbuzKR%2FtWbLCZj6G%2BiE1MN
ton50XDtRinH%2FKx%2Bt;ucl=cookie14=UoewAjpcr7CxmQ%3D%3D;
t=eabb0fle93c2618299ac3e0f721cc73a:
uc3=nk2=F5RDK1cgHPoTNrl%3D&id2=UNk3D4%2BUUAoQ6w%3D%3D&vt3=F8dCvU19
PU18UXxpKDc%3D&lg2=W5iHLLyFOGW7aA%3D%3D;
tracknick=tb674441375;
uc4=id4=0%40Ug49tdAd%2FeOpwD12AVOK9IhBWRR&nk4=0%40FY416FQYUfFEVP8L
b%2B8uc4Lmme5YHA%3D%3D;lgc=tb674441375;
_tb_token_=533b418583e56;cookic2=17013e5ca2158c972ecc80e0e97daf7e:
tfstk=c7rlByDZRCA_wC72bR6e35kmRKoPZN5IKNGTCrfitWx9UWwlictrNIWuoBmq
Hvl..;
1=eBSZauJrg5b5Fmv3BOfZourza779YIRfguPzaNbMiOCP_zfM739cW6KPD4YHCnGV
ns6vR3rQ1ZCLBc83tyzHIZXRFJXn9MptEdLh.;
isg=BDY2WgNaS2e6sT8AVHfoSG_h2w4V3qR3L8xngAfeZmv49d9COafoDXV-7-
Py3Kp',
'referer':
"https://detail.tmall.com/item.htm?spm=a230r.1.14.1.752441a2rGHJE&
id=578457969092&ns=1&abbucket=3',
'accept-encoding': gzip, deflate, br',
'acccpt-language':'zh-CN,zh;q=0.9,en;q=0.8,en-GB;q=0.7,cn-
US;q=0.6'
}
resp = requestsget(url, headers=headers)
#data requests
comment=re.compile("rateContent":"(.*?)","fromMall")#
Data parsing
```

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```
comments.extend(comment.findall(resp.text))
#print(result)
time.slecp(3)
#data retention
  df['commentaries']=comments
  #print(df)
  df.to_csv('product review.csv)

Sentiment value calculation code.
import pandas as pd
import jieba
#Calculating Sentiment Values Based on Possum Sentiment Dictionary
def getscore(text):
df = pd.read_table(r"BosonNLP_sentiment_score.txt",
scp=" ",names=['key', 'score'])
key = df[key].values.tolist()
score = df['score'].values.tolist()
# jicba participle
segs=jicba.lcut(text,cut_all=False)#back list
#calculated score
score_list=[score[key.index(x)]for x in segs if(x in key)]
return sum(score_list)
#read file
def read_txt(filename,data):
with open(filename,'r',encoding='utf-8')as f:
txt=f.read()
return txt
#write file
def write_data(filcname,data):
with open(filename,'a',encoding-utf-8)as f:
f.write(data)
if__name__=='__main__':
text=read_txt('commentaries.txt')
lists=textsplit("n')
i=0
for list in lists:
if list  != "
#print(list)
sentiments = round(getscore(list).2)
sentiment='sentiments value:'+str(sentiments)+'\n'
#write file
filcname='Conditioner Sentiment Analysis Results.txt'
write_data(filename,sentiment)#write sentiment value

Jieba participle
from collections import Counter
import jicba
import pandas as pd
comments list=[]
```

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```
with open("word cloud data.txt",'r',encoding="UTF-8")as f:
#read data
comments list=f.read()
f.close()
   #Segment all comments
result=jieba.cut(comments_list,cut_all=False)
result=
[
#cleaning data
word
for word in result
if len(word)>1
]
with open('stopwords.txt','r'encoding="utf-8')as f:
#Filtering of stop words
stopwords = f.read()
f.close()
result=[
word
for word in result
if word not in stopwords
     ]
#print(result)
counter = Counter(result)
#build Pandas and order
df=pd.DataFrame(list(counter.items()),columns=['word','count'])
df.sort_values(by=count, ascending=False,inplace=True)
#ascending=False descending order  inpalce=True change data self
     df.to_excel("result of word cloud map's word frequecy
analysis.xlsx,index=False)
```

Python sampling code

```
import random   #First level of random sampling
print(random.sample(range(1,125594),2))
                 #Second level of random sampling
print(random.sample(range(1,465377),4))
```