Intelligent Home Hair Color Helmet Consumer Risk Perception Analysis

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Abstract: In this paper, we study the macro environment of smart home hair color helmets and analyze the current situation of the industry, predict the risks that consumers perceive when purchasing smart hair color helmets, and conduct a questionnaire survey in this regard. Finally, based on the results of the questionnaire, we analyze the causes of consumers' perception of risk in smart home hair color helmets and propose countermeasures to reduce the risk, hoping to provide ideas for product development and improvement of smart home hair color helmets in order to better reach the market.

1. Background, Purpose and Significance of the Study

Due to the steady growth of China's economy and the gradual affluence of people's material living conditions, the main social contradiction in China has been transformed into the contradiction between people's growing need for a better life and the unbalanced and insufficient development. With the developed Internet community becoming more and more closely connected with people's daily life, the psychology of pursuing trends and social recognition for both men, women and children is rising, but there are still many market pain points in the huge hair dyeing market that need to be solved, and the intelligent home hair dyeing helmet can well solve the contradiction between consumers' demand for high quality hair dyeing and the lack of home hair dyeing equipment.

At the same time, with the continuous development of artificial intelligence and the rapid spread of the Internet of Things, the smart home appliance market has shown strong development momentum, the integration of high-tech intelligent systems will accelerate the innovation and development of the smart home appliance industry, and improve people's standard of living and sense of well-being, with safety, intelligence, convenience, comfort and other advantages have also won the majority of consumers. In the context of China's economic growth from high-speed to high-quality development, people's aspirations for a better life are rising, and the quality of life at home is also increasing, which requires revolutionary innovation in the highly competitive home appliance industry, and smart home appliances are bound to become the mainstay of the change process.

In addition, the current market development situation, the future hairdressing and beauty industry will develop in a thriving direction, and if it can be equipped with intelligent technology and "Internet +" will go to a new level. Therefore, combined with the development trend of both hair

dyeing market and intelligent home appliances, intelligent home hair dyeing helmet aims at this market vacancy and goes to the development wind of both hairdressing and intelligent home appliances markets, and hits the remaining pain points of traditional hair dyeing market through concept and technological innovation, which can provide consumers with high-quality hair dyeing innovative products and at the same time, actively respond to the national call of "mass entrepreneurship and innovation". At the same time, it can provide consumers with high-quality hair coloring innovative products, and actively respond to the national call for "mass entrepreneurship and innovation".

Since it is a brand new concept and innovative product for the niche market, the market and consumers have never been exposed to the smart home hair color helmet, so their attitude is unknown, therefore, this paper starts from the perspective of perceived risk and consumers, by studying consumers' risk perception of the smart home hair color helmet, in order to understand the main factors affecting consumers' purchase of hair color helmet, and suggest relevant countermeasures, which is important for a This is an important market research significance for a brand-new product to enter the market, which is beneficial for companies to make further adjustments to the product marketing plan.

2. Intelligent Home Hair Color Helmet in the Industry Environment Analysis

By analyzing the external environment of the domestic hair color market, we can have an understanding of the current situation of the industry. Only after grasping the external environment of the whole industry can we have a basis for analyzing the current situation of the industry market, and only then can we provide sufficient materials and theoretical support for the later arguments on the presentation of consumer perceived risks, the analysis of the causes of risks, and the suggestions of strategies to mitigate risks.

2.1. Introduction of Intelligent Home Hair Color Helmet

As a hair coloring tool, users need to put the hair dye of their favorite hair color into the dye storage of the smart home hair coloring helmet, put on the helmet and control it in the app to carry out smart hair coloring, hair care and facial care, which is convenient and quick to operate. Users can get high-quality hair coloring, hair care and skin care triple experience in the same period of time, saving time and money at the same time, greatly enhancing the consumer's sense of beauty and hairdressing experience at home.

The hair dyeing function module is the core function of the intelligent home hair dyeing helmet, and the helmet body is equipped with a dyeing solution reservoir, and its feeding port is exposed from the outer wall of the helmet body, and the dyeing solution is added to the dyeing solution reservoir through the feeding port, and the ultrasonic atomizer is connected to the dyeing solution reservoir, and the dyeing solution in the dyeing solution reservoir is atomized by the ultrasonic atomizer. In addition, the helmet body is equipped with a set of conveying pipeline, each conveying pipeline is connected with the ultrasonic atomizer, and the atomized dyeing solution of the ultrasonic atomizer is fed into the conveying pipeline, and the end of each conveying pipeline has an air outlet, which is located in the inner wall of the helmet body, and the atomized dyeing solution comes into contact with the hair through the air outlet to complete the dyeing of the hair. The intelligent hair dyeing helmet system combines the helmet and ultrasonic atomizer in a breakthrough way, and the dyeing solution atomized by the sonic atomizer can fully contact with the hair and achieve satisfactory dyeing and protecting effect.

2.2. Political Environment Analysis

Since scientific and technological innovation is the first driving force leading development, the home appliance industry and hair coloring industry need to build up an enterprise-oriented, market-oriented, industry-university-research deep integration technological innovation system if they want to obtain breakthrough development in the fierce competition. The country has a series of policies to support the innovation and entrepreneurship of college students. This product is designed and developed by a team of college students, which actively responds to the national policy call for innovation and entrepreneurship. Under the double pressure of epidemic and economic downturn, the employment pressure of college graduates is huge, and "mass entrepreneurship and innovation" is in line with the directional guidance of employment in society and colleges and universities, and at the same time, it is conducive to the establishment of an industrial transformation direction led by innovation and collaborative development, promoting the integration and development of home appliances and hair color industry, and also conducive to Promote the steady growth of employment, industry, investment, consumption and other aspects.

2.3. Economic Environment Analysis

In recent years, as China's economy takes off, the disposable income of Chinese residents is increasing, and according to the "2020 China Good Consumption Trends Report", "enjoying life with health" and "securing convenience with safety" have become two important trends of good consumption. In this context, Chinese beauty industry is becoming more and more popular. In this context, China's hairdressing industry has entered the fast lane of extremely rapid development, according to the data of Aimedia Consulting, by the end of 2019, the scale of China's hairdressing industry reached 351.26 billion yuan; it is expected that in the next five years, the market scale of China's hairdressing industry will maintain a compound growth rate of 4.6%, and the market scale will exceed 400 billion yuan by 2022. On the other hand, the average frequency of hair coloring frequency of domestic consumers in 2019 is as high as 2.9 times, and the industry penetration rate is as high as 65%, which is just like a promising blue ocean market. With the considerable market capacity of home hair coloring products, a large number of brands are flooding into this market, all hoping to seize market share.

Influenced by the epidemic sealing control, consumers' hairdressing frequency is decreasing, but in the post-epidemic era, the "face value economy" spurt recovery, more and more people choose to home hairdressing, among the types of consumer home hairdressing, self-service hair coloring gradually became the habit of consumers, online hair coloring market is growing at a high speed, according to L'Oreal Paris data. Home hair coloring products accounted for 57% of sales in China's hair coloring market in 2019, which can show the broad development prospect of home hair coloring products. In addition, according to the "2021 China Beauty Consumption Trends White Paper" jointly released by the First Financial Business Data Center and Fashion Bazaar, consumers are very enthusiastic about buying hair coloring products online, and the growth rate of the consumption of color hair coloring products far exceeds that of black and brown hair coloring products, and because the color system hair color is less durable compared with the conventional color system, the expansion of the color hair coloring market has also driven the Because of the expansion of color hair color market, it also drives the development of color fixation and color care washing products, and the consumption scale and growth rate of color fixation washing products for hair coloring are optimistic.

2.4. Socio-Cultural Environment Analysis

In the context of the continuous development of society and network technology, the Internet provides an efficient information circulation channel, and online social media is highly penetrated into people's daily life. The hot spots of these social media platforms can well predict and guide the fashion trends and cultivate consumers' keen fashion sense. In addition, the transformation of economic development has also driven the continuous change of people's consumption and values, people's pursuit of appearance is gradually diversified and all-age, the psychology of beauty and seeking social relationship recognition is increasing, and the image consumption naturally shows the characteristics of high attention and high spending, which makes China's hair and beauty industry obtain a natural and stable sustainable development basis and rapidly grow into a complete This makes China's hair and beauty industry obtain a natural and stable sustainable development foundation and grow rapidly into a complete industrial chain.

According to the Chinese government's forecast data, during the "14th Five-Year Plan" period, China's elderly population will grow by more than 10 million every year, and by 2025, the elderly population of 60 years old and above will exceed 300 million, and today's society is fast-paced and stressful, and the phenomenon of gray hair caused by the stress and busyness of middle-aged people is obviously increasing, and they belong to the backbone of society. They belong to the backbone of consumption in the society, there will be urgent demand for hair dyeing to cover the flower hair, the silver hair class is growing, the market demand for gray hair dyeing will be very strong. On the other hand, in the current society where fashion and retro trends are intertwined, various unique hair colors are constantly sought after by young people, and they do not forget to keep their true selves while catching up with trends.

The continuous expansion of these two major classes has brought a huge consumer base to the hair dye market. Data show that the market size of China's hair dye market is on an upward trend from 2017-2019, in which, the market size of China's hair dye market was only 5 billion yuan in 2017 and grew to 13.5 billion yuan in 2019, while in 2020, the market size of China's hair dye market broke through the 15 billion yuan barrier and reached 18.2 billion yuan.

3. Intelligent Home Hair Color Helmet Consumer Perception Risk Analysis

There are many causes of perceived risk to consumers, and categorizing the causes allows for a more focused study of the importance of each factor in the minds of consumers.

3.1 Concept and Analysis of Perceived Risk

First of all, perceived risk is the uncertainty that consumers feel in the process of purchasing a product because they cannot predict whether their purchase decision is correct or not. Perceived risk is different from other actual risks of products, it is very subjective, if the consumer does not perceive the risk, it can be said that the consumer does not have this perceived risk, so the perceived risk and the actual risk may not be the same, or even there is a large gap.

Fu (2004) classified consumers' perceived risk into five main areas: functional risk, physical risk, economic risk, social risk, and psychological risk. 157 samples were collected for this analysis by means of a web-based questionnaire.

3.1.1. Functional Risks

The risk that the products purchased by consumers do not meet the psychological expectations of consumers in terms of quality or performance is called functional risk. Consumers buy products

mainly to meet the demand of product functionality, if the product performance is worse than the competition or the product function can not achieve consumer expectations, it will make consumers disappointed, or even eliminated from the market. In this paper, the functional risk of smart home hair color helmet mainly refers to whether its performance can satisfy consumers.

This paper presupposes several influential factors that may cause consumers to take functional risks with smart at-home hair color helmets, as shown in Table1.

Table 1: Influencing factors of functional risk

Title item	Functional risk generating factors
G1	The degree of doubt about the effect of uniform coloring of home hair color helmets
G2	The degree of doubt about the power and time consumption of home hair color helmets
G3	The degree of doubt that the at-home hair color helmet will achieve the desired hair coloring effect

In this paper, a sliding scale of 1-5 is used to assess the magnitude of the impact of each type of risk in the minds of consumers when investigating and studying the associated risks. The 1st and 2nd intervals are very skeptical and somewhat skeptical, and if respondents choose the 1st and 2nd intervals, the lower the average value is, the more consumers believe this risk exists and has a greater impact, and the 3rd scale is average. Intervals 4 and 5 are somewhat trusting and very trusting, respectively, and if the respondent chooses the latter two scales, the higher the average value, the less importance this risk has for that consumer.

Through the analysis and collation of the questionnaire results, the results show that for the three pre-defined questions on functional risk, the average value of G1 is 3.59, G2 is 3.2, G3 has 3.56, and the overall average value is 3.45. It can be seen that consumers have more doubts about the time-consuming and power-consuming performance compared to other performance, and there is time risk, but the overall perception of product functional risk is not high. Not very high.

3.1.2. Physical Risk

Physical risk refers to the risk that consumers perceive that the product may pose a threat to the health and safety of the user. Since hair color helmet is a product used directly on the head organ, its safety performance is very important, and the degree of damage to the hair after dyeing is directly related to the user's hair quality and scalp health. In addition, since the helmet is a combination of hair dye and electrical appliances, whether the gas it emits will pollute the environment is also directly related to the health of consumers and others. Therefore, this paper considers that the product has material risks, as shown in Table 2.

Table 2: Influencing factors of physical risk

Title item	Physical Risk Generating Factors
W1	Do you have doubts about the safety performance of home hair color helmets
W2	Do you have doubts about the environmental performance of at-home hair color helmets
W3	Do you have doubts about the degree of damage to your hair after dying your hair with an at-home hair color helmet?

In order to more accurately measure the impact of material risk on consumers' purchasing of innovative products, three common situations that may cause consumers to perceive material risk are presented in the questionnaire, including: safety performance, environmental performance, and damage to hair quality after hair coloring. The mean value of W1 and W3 questions is only 3.18 and 3.11 respectively, which means that the respondents are worried about the safety performance of

helmets and the damage of hair quality, and the mean value of W2 is only 3.38. The surveyed respondents generally believe that the substance factor is a major factor influencing their purchase.

3.1.3. Economic Risk

Economic risk refers to the risk of financial loss resulting from the purchase of a product, often caused by overpricing or product quality problems that lead to financial loss. Regardless of the consumer tier, consumers will always consider the price of a product to a greater or lesser extent when purchasing a product. Therefore, when purchasing a smart home hair color helmet, consumers will inevitably consider its price. First of all, because the hair color helmet is an innovative product without any market experience and the production scale is relatively limited, it is difficult to form a scale effect, so under the cost constraint, the market pricing will be high, and when the company and product development is mature, the product pricing will be reduced with the reduction of various costs. Therefore, this paper argues that consumers may feel that if they buy the immature smart hair color helmet, they will suffer from the economic loss caused by the rapid "devaluation" of the product in the future, and furthermore, since it is a home appliance, additional costs will be incurred in the process of after-sales maintenance. Consumers will consider whether the smart hair color helmet is really value for money when buying the product, so it also has economic risks.

Table 3: Factors influencing economic risk

Title item	Economic Risk Generating Factors
J1	Acceptable price range for home hair coloring appliances
J2	Do you have any doubts about the value for money of buying at-home hair color helmets?
J3	Are there any doubts about the subsequent after-sales repair costs of home hair color helmets

This paper combines the current market situation and the characteristics of the product itself to speculate on possible situations that may easily lead to consumer hesitation in purchasing. Based on consumer psychology, three common factors related to product value and economic risk are proposed, and can be an important reference for product pricing. From the survey results in Table 3, 47.13% of the respondents think that the price range of 300-500 yuan is acceptable, and 29.3% of the respondents chose the price range of 100-300 yuan, which can indicate that the market acceptance of the critical point of 300 yuan is probably the highest. the average value of J2 is 3.64, and J3 is 3.06, the questionnaire fillers on the issue of value for money concerns in general, but the importance of after-sales maintenance is relatively high, and that the helmet's subsequent after-sales maintenance costs are likely to cause economic risks.

3.1.4. Social Risks

Social risk refers to the risk that a consumer will incur damage to social relationships, alienation and ridicule from others as a result of poor purchase decisions. Generally speaking, the products and brands that consumers buy and use, others and society will to a certain extent substitute this consumer into the target customer image of the product and brand. First of all, since hair color helmet is a new concept and new product, the market and consumers know little about it, so they may think that they have to spend more money on hair color helmet when they can just put on hair dye, and therefore there is a situation that they do not have the support of their family and friends. In addition, this article speculates that consumers may be worried about being alienated from their social groups if their hair color is not satisfactory after using the hair color helmet. Therefore there is a social risk for consumers to buy smart at-home hair color helmets, as shown in Table 4.

The results of the questionnaire survey show that for the factors influencing social risk, the mean value of S1 is 3.62, indicating that respondents are interested in hair dye helmets, and the mean value of S3 is 3.52, indicating that the degree of risk of alienation from friends and relatives due to unsatisfactory hair color is not high, but the mean value of S2 is only 3.22, which shows that hair dye helmets as a new product are exposed to social risk from consumers.

Table 4: Influencing factors of social risk

Title item	Social risk generating factors
S1	Do you have the desire to try our products when you come across them?
S2	Do you care about what your friends and family say before using a product that is unprecedented in the market?
S3	The degree of concern about being alienated from friends and family when the coloring is not satisfactory

3.1.5. Psychological Risk

Psychological risk refers to the risk of consumers suffering from psychological and mental harm due to the negative emotions caused by improper purchase decisions after purchasing the product. This paper argues that the use of hair color helmet is directly related to the personal image of the user, and the consumer will have anxiety, anxiety or even anger after purchase because of the quality of the product, the resulting effect and other issues, thus causing the psychological risk of consumer purchase, as shown in Table 5.

Table 5: Factors influencing psychological risk

Title item	Psychological risk generating factors
X1	Level of anxiety when using at-home hair color helmets
X2	The extent of regret after purchasing a home hair color helmet if it does not meet expectations
X3	Do you have doubts about the damage to your personal image after using at-home hair color helmets?

The results of the questionnaire show that the mean values of X1 and X3 are both low, only 3.19 and 2.96, especially the mean value of X3 is the lowest among the 15 questions, indicating that the respondents clearly perceive the psychological risk of using the hair color helmet after their personal image is damaged. Since the product is not yet available, the questionnaire fillers have no real experience of buying it, so the mean value of X2 is 3.54, which is still not very clear about the mood after purchase, but in general, the product still has psychological risk.

3.2. Analysis of the Causes of Consumer Perceived Risk of Smart Home Hair Color Helmets

From the above questionnaire results, it can be seen that there are more or less perceived risks in the five perceived risk levels: functional, material, economic, social and psychological. Any factor that causes consumers to feel uncertainty in their purchasing activities and results will constitute a cause of perceived risk for consumers, and analyzing the reasons behind the perception of risk is beneficial for product developers and companies to see The analysis of the reasons behind the risk perception will help product developers and companies to see the market's concerns about hair color helmets and make corresponding adjustment measures.

In the questionnaire analysis of 3.1, the total mean value of functional risk is 3.45, the total mean value of material risk is 3.223, and the total mean values of economic risk, social risk and psychological risk are 3.35, 3.453 and 3.23 respectively. it can be seen that none of the five total

mean values is more than 3.5, which indicates that the perceived risk of the product generally exists. Material risk and psychological risk are the two aspects with the highest risk perception among consumers. The four sub-questions of "whether you have doubts about the safety performance of home hair color helmets" and "the degree of anxiety when using home hair color helmets" had the lowest perceived risk trust among respondents, with the average value of each question not higher than 3.2.

The main source of the above sense of risk is due to the fact that smart hair color helmets are innovative products, and consumers do not have similar product experience in the market to provide references to draw from, while lacking sufficient and reliable information about the product, so there is no psychological expectation for consumers to have a greater sense of uncertainty and risk. In addition, the technical complexity and pricing of hair color helmets are high, which also increases the perceived purchase risk to consumers because customers are uncertain about the stability of safety performance, and it is difficult to compare the differences between different alternative products, while there is also a high opportunity cost.

4. Countermeasures to Reduce the Perceived Risk of Smart Home Hair Color Helmets for Consumers

After finding out the causes of consumers' risk perceptions, we propose corresponding countermeasures for companies to reduce consumers' sensitivity to risk perceptions and provide companies with ideas for adjusting their products and marketing programs to better meet customers' needs and expectations.

First of all, hair dye helmets need to focus on the protection of the product's own safety, and get the national quality and safety certification, because there is a certification endorsement, can largely dispel consumer concerns about safety and quality, so as to avoid a certain amount of functional and material risk.

Enterprises to improve after-sales service is also very important, through the repair, replacement, refund, compensation, etc. can provide peace of mind for the product protection, while through good after-sales service to make up for a time due to cost constraints difficult to press down the unit price of the product, so that part of the economic risk of consumers can be transferred.

In addition, the hair coloring function and appearance need to be enhanced, whether it is the coloring effect, hair care or the image when wearing the helmet, and the product needs to continuously improve the process to better reduce the possibility and concern of "hair quality damage after using home hair coloring helmet" and "personal image damage after using home hair coloring helmet The possibility and concern of "hair damage after using home hair color helmets" and "personal image damage after using home hair color helmets", in order to reduce consumers' perception of physical and psychological risks from the root.

From the overall value of the questionnaire survey in this paper, the overall mean value of the five risk constructs is 3.34, and the general perceived risk is at an average level, the main reason is that the respondents have not purchased or even contacted the smart hair dye helmet, so the marketing promotion of the product needs to put in enough effort to use a combination of online and offline marketing methods to break the channel barriers for consumers to obtain product information, and in the presence of sufficient product In the face of sufficient product information, the predictability and certainty of customers in the purchase decision will be enhanced. Through the "Internet + marketing", "Internet + physical stores" integration marketing model, subdivision of specialized product positioning and target customer groups, offline physical stores can allow consumers to have real product experience, can be expanded through flash mob and co-branding way Offline visibility. Compared with the pre-80s gray hair and gray hair crowd who prefer offline

stores, the post-90s and Generation Z, who grew up in the Internet era, prefer online shopping forms such as WeChat mini-programs and e-commerce under the stimulation of "lazy house economy", so online Internet marketing mainly targets young black hair group. Online and offline marketing and promotion activities are closely integrated to enable consumers to know and understand the information and functions of the products in a short time, which plays a key role in both increasing awareness and reducing the overall uncertainty of consumers.

5. Conclusion

As a product that is unprecedented in both the home appliance market and the hair dyeing market, smart home hair dyeing helmet is unfamiliar and new to any consumer. Through the perceived risks of respondents presented in the questionnaire survey, companies can find out the representative risks that consumers will worry about the product when smart home hair dyeing helmet enters the market. After finding the causes of these perceived risks, it is crucial for both the smart hair color helmet and the producer to adjust product and marketing strategies to effectively reduce or avoid some of the consumer's risk perceptions.

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