

RESEARCH ON VISUAL EXPRESSION OF PAPER MATERIAL IN PRODUCT PACKAGING STRUCTURE DESIGN

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ABSTRACT: For a commodity, the packaging is not only a container for holding goods but also a decoration for commodity promotion. The design of packaging can significantly affect the sales of goods. This paper briefly introduced paper material and the application of paper material in packaging. Then, taking the ginseng antler gift box of the "Li Liangji" brand owned by Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd. as the subject, the visual performance of paper packaging was studied. The results showed that paper material could integrate different themes through structural shape, pattern, and text and fully highlight the characteristics of products to make them attractive, replying on its advantages of easy to adjust and print, in the production of premium gift box and general gift box

KEYWORDS: paper material, packaging, visual expression, gift box

1 INTRODUCTION

Papermaking technology is one of the four great inventions in China. Before the advent of papermaking, most of the writing materials were bamboo slips, stone slabs, wooden boards, silk, etc. (Sirimamilla et al., 2019). Bamboo slips, stone slabs, and wooden boards are not only heavy but also difficult to write. Although silk is light and easy to write, it is expensive and can not be used by ordinary people (Qian et al., 2018). The emergence of papermaking enables people to use fiber materials, such as bark, linen, and fishnet, to mass-produce enough light and tough paper. As the cost of making paper is low enough, paper's price is low to the extent that ordinary people can afford it. The cheap paper has become a new text carrier, and its scope of application has gradually increased (Liao, 2015). Product packaging is one of the usages of paper. Paper is light and easy to fold so that it can be processed into a simple container. After the product is loaded, the paper container can be used as product packaging. Papermaking technology is constantly improved in the process of use. By adding different ingredients in the manufacturing process, the properties of the paper are changed, which changes the characteristics of packaging (color, texture, etc.) (Douglas et al., 2015). Also, text writing and pattern drawing on the internal or external side of the packaging paper is realized after combining paper with typography, which makes the packaging more beautiful and enhances the attractiveness and added value of the product. Fang et al. (2016) designed a green logistics box and corresponding logistics direct recycling mode to solve problems of excessive express packaging, difficult recovery, and low packaging

standardization. Muratore et al. (2018) took eugenol grafting onto cellulose for developing a biodegradable active packaging material. The experimental results showed that the paper was a good active packaging material with antioxidant, repellent, and insecticidal activities for castor and broad bean. Fadji et al. (2017) carried out specific mechanical property tests on corrugated paperboard under different environmental conditions. The results showed that environmental conditions impacted the mechanical properties of paper and paperboard; under the condition of refrigerated transportation, the modulus of elasticity strongly decreased in the range of 20-53% compared with standard conditions for all the paper grammages. This paper briefly introduced paper material and the application of paper material in packaging and analyzed the visual performance of paper packaging by taking the ginseng antler gift box of "Li Liangji" brand owned by Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd. as the subject.

2 PAPER MATERIAL AND ITS APPLICATION IN PACKAGING STRUCTURE

2.1 Introduction to paper material

Before the appearance of paper, the records of characters and patterns were mostly on materials such as slate, wood, bamboo slips, and silk. As mentioned above, these materials were either cumbersome, difficult to write, or expensive. The original papermaking technology was a by-product produced in the process of silk bleaching. The residual broken silk floss fiber in the water adhered to the surface of the bamboo mat for filtration. After drying, the thin sheet was obtained, which was the

original paper (Wang et al., 2015). However, although this kind of paper was consciously processed in the process of silk bleaching, it was still the by-product of silk bleaching, i.e., the production was limited by the quantity of silk bleaching; therefore, it is expensive. After that, Lun Cai improved papermaking technology. He not only separated it from the by-product of silk bleaching, i.e., specialized in papermaking rather than collect the leftover material in the process of silk bleaching, but also used cheaper plant fiber as the raw material (Briand Decré & Cloonan, 2019). Until modern times, the technological principle of improved papermaking technology has not changed substantially. The plant skin is crushed and dissolved in water, and the plant fiber is made to be as fine as possible by methods such as boiling and stirring to form a pulp. Moreover, the auxiliary materials with different formulations are added in the process to improve the paper characteristics. Then handsheet former with filtering function such as bamboo curtain to sheet the paper pulp. The sheet composed of the paper pulp fiber on the surface of the handsheet former is dried. Finally, the paper is obtained.

In the process of paper production, different subsidiary materials can be added according to the demand to obtain a paper of different types and properties. According to the production process, it can be divided into hand-made paper and machine-made paper. The former is manually obtained from the pulp sheet by a hand sheet former, and the latter is produced in bulk in the form of mechanization (Park et al., 2017). Compared with the machine-made paper, the hand-made paper is softer and more natural in texture. The aesthetic characteristics of hand-made paper make it more suitable for art decoration. The auxiliary materials added in the process of paper processing can make the finished paper more solid and firm. Moreover, its foldable characteristic allows the paper to be processed into different container shapes, which costs little. The above characteristics make paper material widely used in the packaging of various products.

2.2 Application of paper material in packaging

Packaging is simply defined as the containers and materials used to protect and promote goods and facilitate the transportation of goods in the process of goods circulation using one or more technologies (Chtioui et al., 2016). Packaging design is to beautify and decorate packaging materials by the technological process. Because of the low cost and the easily-processed structure, paper material has been used in commodity

packaging. The packaging of goods can be divided into transport-type packaging and sales-type packaging. The former are containers used for transportation, which is common in appearance and usually retains the necessary information, for example, corrugated boxes, cartons, paper bags, etc.; the latter is more inclined to improve product sales, which may be not a container, but decorated as a pattern on the outside of the container (Oguntala et al., 2019).

Compared with the other material packaging, paper packaging has natural and social attributes. The natural attributes of paper packaging include the protection function for preventing product damage, the convenience function for reducing the difficulty of transportation, the distinguishing function for distinguishing different products, and the promotion function for enhancing the attractiveness of products (Burg et al., 2015). The social attributes of paper packaging include the cultural attribute for satisfying consumers' pleasant psychology, the decorative attribute for improving the beauty of the environment, and the public attribute for promoting social spiritual benefits.

It can be said that the promotion function and social attributes of paper packaging mentioned above depend on the natural and social attributes of paper material. As paper material is made of plant fiber, it has different textures with different features. When paper material is used as packaging material, the combination of texture features and product theme can enhance the attractiveness and added value of paper packaging so as to strengthen the promotion function.

If the texture is the natural attribute that paper material can give to paper packaging, then the social attribute of packaging can be endowed or further improved by the social attribute of paper material from the aspect of visual effect (Liu et al., 2019). The natural texture of paper material can make the packaging have a corresponding texture after simple treatment. Also, paper material can also write and draw on the surface; therefore, paper can add artificial creations, such as calligraphy characters and characteristic patterns, to endow the ordinary paper with special social attributes. When paper material is used as packaging material, the corresponding social attributes, such as characters and patterns, are designed according to the characteristics of the products to express the information needed to be conveyed accurately to the greatest extent, realize the cultural, decorative and public attributes of the packaging, and enhance the attractiveness of the products (Zhang et al., 2015).

3 ANALYSIS OF THE VISUAL PERFORMANCE OF PAPER MATERIAL IN PACKAGING STRUCTURE

For a commodity, the degree of hot sale not only depends on the quality of the product itself but also has a great relationship with the level of marketing means. There are many kinds of marketing methods, such as advertising, star endorsement, online community promotion, etc., but the packaging of goods is also an effective marketing means. The first thing consumers observe when they face a commodity for the first time is the packaging of the commodity. The visual performance brought by the excellent packaging design can produce a maximum attraction to consumers.

3.1 Company profile

This paper analyzed the visual performance of paper packaging based on the packaging design of the "Li Liangji" brand. The following is a brief introduction to the "Li Liangji" brand. "Li Liangji" is one of the brands of Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd., whose predecessor was Li's herbal medicine shop, which was opened in 1914 by Jinbao Li, a Suzhou pharmaceutical farmer, in the early Republic of China. It was famous for its authentic medicinal materials. Later, it was incorporated into the collective supply and marketing cooperatives in the cooperative movement after liberation in 1982. Moreover, the founder's son also set up a herbal medicine processing factory to study the processing technology of decoction pieces. In 2002, the founder's grandson inherited the ancestral business and transformed "Li's herbal medicine shop" to establish Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd., which combines traditional techniques with modern technology. In 2004, the company registered the trademark of "Li Liangji" and won the famous trademark of Suzhou in 2007. In 2013, the traditional paste making process of the company was selected as Suzhou intangible cultural heritage. The company's tenet is "benefit the world and help people with conscience and good medicine"; its business philosophy is "specialized in pharmacy, to be honest"; its business strategy is "focus, professional, sincere, and honest"; its brand core is "inheriting the quintessence of traditional Chinese medicine, promoting technological innovation, and standardizing the standards of traditional Chinese medicine".

3.2 Analysis object

This paper analyzed the premium gift box and general gift box for ginseng antler owned by Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd., and their appearances are shown in Fig. 1. The general gift box can be regarded as a simple box container. The cover of the box is made like a window, which is opened from the middle. The whole gift box is the product of folding and pasting the paper material, with a simple structure. Compared with the general gift box, the premium gift box has a more complex structure. In the premium gift box, the internal material is more abundant, and the outer shell of the gift box is composed of thicker paper materials. The interior is made of foam and cloth, and the brand trademark is also painted on the cloth.



Fig. 1 The premium gift box and general gift box for "Li Liangji" ginseng antler

The above two gift boxes are paper containers for packaging ginseng antler. Understanding the sales target population of these gift boxes can evaluate the improvement of visual performance on packaging effect better. The middle-aged and elderly people are the sales target population for the company's ginseng antlers. The middle-aged and elderly people pay more attention to physical and mental health. As today's living standards improve, the health awareness of middle-aged and elderly people also enhances; therefore, their interest in ginseng antler becomes larger. In addition to the middle-aged and elderly people, the young people who have entered the society for some time have gradually become the main force of health care consumption. Nowadays, most of young people have received higher education; therefore, they understand the importance of health to themselves. Moreover, the increasing work pressure also makes the young people pay more attention to health preservation.

3.3 Analysis method

The purpose of this paper is to study the visual performance of paper packaging. The consumer's feeling on the visual performance of commodity packaging is a relatively subjective personal feeling, and it is difficult to use a mathematical formula to accurately measure the quality of visual performance and its advantages and disadvantages. Therefore, in order to change the relatively subjective visual performance evaluation into the objective performance evaluation as far as possible, this paper used questionnaire survey and Analytic Hierarchy Process (AHP) to score the three schemes of premium gift box and general gift box and also made a simple summary of the evaluation on different schemes. Fig. 2 shows three packaging schemes of the premium gift box, and Fig. 3 shows three packaging schemes of the general gift box.

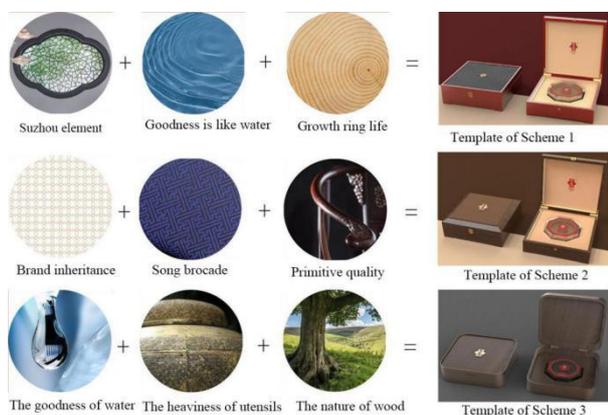


Fig. 2 Three schemes of the premium gift box

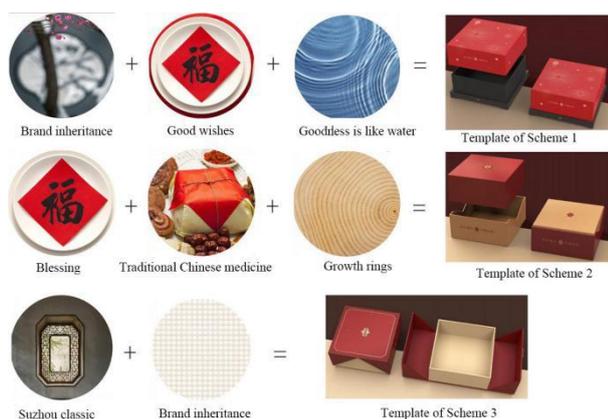


Fig. 3 Three schemes of the general gift box

3.4 Analysis results

In order to evaluate the visual performance of the premium gift box and general gift box closer to the objective, this paper used the questionnaire survey and AHP to evaluate the three schemes of the two gift boxes. The questionnaire survey focused on the visual expression of natural and social attributes. The natural attributes were

subdivided into protection function, discrimination function, and promotion function, and social attributes were subdivided into cultural attribute, decorative attribute, and public attribute. The final statistical results are shown in Table 1. The final score of Scheme 1 for the premium gift box was 7.18, the final score for Scheme 2 was 8.26, and the final score for Scheme 3 was 7.54. The final score of Scheme 1 for the general gift box was 6.42, the final score of Scheme 2 was 8.64, and the final score of Scheme 3 was 7.5. It was seen from the above results that the visual performance evaluation gap of the three schemes of the premium gift box was not very big, and Scheme 2 was slightly excellent.

The small difference between the three schemes was that the premium gift box itself was positioned as a high-end gift that was more excellent in the design. Based on the different target groups of gift boxes, general gift boxes are generally sold to young people with relatively low income, and they are usually used by themselves rather than giving gifts, and they tend to be low-price products. Therefore, the design of gift box packaging will not excessively pursue high quality, making the overall gap between the three schemes more obvious.

Table 1. Statistical results of the analytic hierarchy process and questionnaire

Middle layer		Natural attribute			Social attribute		
Weight		0.4			0.6		
Target layer		Protection function	Discrimination function	Promotion function	Cultural attribute	Decorative attribute	Public attribute
Weight		0.2	0.3	0.5	0.3	0.4	0.3
Premium gift box	Score of scheme 1	7	8	7	7	8	6
	Score of scheme 2	8	8	9	9	9	6

	Score of scheme 3	9	8	8	7	8	6
General gift box	Score of scheme 1	6	6	6	6	7	7
	Score of scheme 2	9	8	9	9	8	9
	Score of scheme 3	8	8	7	7	9	6

3.5 Evaluator’s evaluation and discussion on different schemes

The above analysis results were obtained by the quantitative evaluation of the visual performance of the three packaging schemes of the two gift boxes using the AHP, which had a good reference value in the overall comparison. However, simple numbers could not fully show the characteristics of the visual performance of packaging. Therefore, the evaluation and discussion of the evaluators on the gift box packaging scheme were summarized, as shown below.

The first is the evaluation and analysis of the visual performance of the three schemes of the premium gift box. In Scheme 1, the theme of gift box packaging is "Suzhou element", "goodness is like water" and "growth ring life". Paper material was made into a container similar to a wooden box, which matched the wood corresponding to the theme of "growth ring life". Then, the paper pasted on the surface of the box cover was printed with a pattern that combined three themes, i.e., the stone window in the "Suzhou element" is shaped like a growth ring and water wave spreading outward, and the stone window in the center is printed with the brand name, "Li Liangji". The above combination not only gave the gift box with the cultural element of Suzhou but also clearly marked its brand. Moreover, the concept of health preservation is imperceptibly conveyed by "goodness like water" and "growth ring life".

The themes adopted in Scheme 2 included "brand inheritance", "Song brocade", and "primitive

quality". Paper was made into paper boxes similar to wooden boxes, but in this scheme, the box’s surface was printed in the form of the lacquered wooden chair with "primitive quality". Then the paper on the surface of the box cover showed the texture of "Song brocade" in the chain form of "brand inheritance", and there was still a brand mark in the center. The lacquered wooden box surface made the gift box more primitive, and the label in the center clearly showed the brand.

The theme of Scheme 3 was "the goodness of water", "the heaviness of utensils", and "the nature of wood". Paper was made into a paper container similar to board to reflect the theme of "the nature of wood". Compared with the first two schemes, the eight corners of the gift box in this scheme were more smooth, reflecting "the goodness of water", and it made the gift box look softer and safer. The paper on the surface of the box cover was printed with a pattern similar to that of bronze ware with the theme of "the heaviness of utensils", which made the gift box look more heavy, and the trademark was in the center.

Next was the evaluation and analysis of the visual performance of the three packaging schemes of the general gift box. In Scheme 1, the theme was "brand inheritance", "good wishes", and "goodness is like water". The general gift box did not imitate wooden board using the paper material like the premium gift box but used the hardboard to make a paper box. In Scheme 1, the box and lid were separated. The paper lid was printed in red with the theme of "good wishes". The stone window shape in "brand inheritance" was distributed on the paper lid like the ripple in the theme of "goodness is like water". These designs made the packaging full of blessings.

The themes used in Scheme 2 were "blessing", "traditional Chinese medicine", and "growth rings". The whole gift box was made of cardboard. Similar to Scheme 1, the box and lid were separated, but the difference was that they were combined to form a package of traditional Chinese medicine. This design was very suitable for ginseng antlers and could make people quickly associate with traditional Chinese medicine. The realization of the theme of "blessing" was the same as that of Scheme 1: the lid was printed in red. The bottom of the box adopted burlywood, accompanied by the pattern of growth rings.

The themes of Scheme 3 were "Suzhou classic" and "brand inheritance". The gift box was made of cardboard. The box and lid were not separated, and it was opened in the middle like a double door. The gift box was very close to the package of traditional Chinese medicine. The window shape in the theme

of "Suzhou classic" was reflected in the edge pattern of the box lid, and the pattern of the theme of "brand inheritance" was printed on the box lid

4 CONCLUSION

This paper briefly introduced the paper material and the application of paper material in packaging. Then, taking the ginseng antler gift box of the "Li Liangji" brand owned by Tianling Traditional Chinese Medicine Decoction Pieces Co., Ltd. as the subject, the visual performance of paper packaging was studied. The results are as follows. (1) The relatively objective score of the premium gift box obtained by AHP was 7.18 for Scheme 1, 8.26 for Scheme 2, and 7.54 for Scheme 3; the score of the general gift box was 6.42 for Scheme 1, 8.64 for Scheme 2, and 7.5 for Scheme 3. (2) According to the questionnaire survey results of evaluators, all the premium gift boxes adopted imitating the paper material into wood boards and combined the characteristics of scheme themes; the general gift boxes all used cardboard to make containers and organically combined the features of different schemes in the packaging pattern and structure.

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