



Research on the Application of Co-branded Packaging of Luckin Coffee from the Perspective of Peirce Semiotics

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Abstract. The work aims to explore the research model and symbol extraction of the IP joint packaging design of Luckin Coffee and 'Line Puppy', and analyze the role of packaging design in brand communication. Through questionnaire survey and case analysis, based on Peirce's semiotic theory, a ternary relationship model was constructed to study the interaction between packaging, theme and consumers. The symbols were divided into image symbols, indicator symbols and symbolic symbols by using the trichotomy of symbols. Joint packaging design enhances brand influence and consumers' purchase motivation. At the same time, as an important means of brand communication, it provides new theoretical support for future product innovation and brand promotion.

Keywords: Packaging design, Peirce Semiotics, Joint name, Product innovation.

1 Introduction

Design giant Philip Stark once clearly pointed out: 'In some cases, I hope that designers can spend more time to create symbols, and the rest of the time to create physical objects[1]. 'In today's fast-changing consumer market, his idea has been widely recognized, that is, when modern consumers buy products, in addition to focusing on the practicality of the product, they pay more attention to the cultural and brand value that the product can convey. In this context, the packaging design of products should fully reflect its cultural characteristics and brand concept to meet the increasing needs of consumers.

At present, the popular trend of product packaging co-branding is permeated with Peirce's symbolic triangle theory. Whether it is the joint packaging of 'NBA and Olio'[2], or the joint packaging of Luckin Coffee and 'Coconut Tree', brands skillfully extract various symbols into product design, and realize the dual expression of external beauty and intrinsic value of packaging design.

However, the problem that needs to be vigilant is that with the wide application of symbols in packaging design, how to ensure the depth and uniqueness of these symbols so as not to fall into the flood of symbols and lack of depth and personality? This article takes the joint packaging of Luckin Coffee and 'Line Puppy' IP as the research object,

and analyzes how to use symbolic symbols in practice, not just visually. While emphasizing the practicality and functionality of the product, how to convey the cultural value and brand concept represented by the product through symbols gives the product a deeper level of value implication.

2 Semiotics - Bridge of Packaging Design

Saussure and Pierce, the founders of semiotics, provide a new thinking framework for understanding and analyzing packaging design[3]. In particular, Pierce's "ternary relationship" theory subdivides packaging design into three elements: symbolic representation, object and interpretation[4]. This theory provides an effective tool for us to dig deeper into the deep meaning of packaging design.

According to this theory, packaging design is not only an intuitive expression of brand and product, that is, symbolic representation; the object represents the actual object referred to by the symbol, which may be the values carried by the product itself or the brand; the interpretation involves consumers' understanding and perception of packaging design, and consumers recognize brands and products through design. The application of this concept enables us to grasp the profound meaning behind packaging design, so as to create a design that not only has visual appeal, but also effectively displays the intrinsic value of products and brands, prompting consumers to resonate and stimulate purchase behavior.

Taking the packaging of Luckin Coffee as an example, its design not only directly expresses the brand image, such as the logo of the deer, which is the 'iconic symbol'; at the same time, the color and pattern selection of packaging also has specific emotional orientation, which can stimulate consumers' specific feelings and guide them to understand the brand intention, which belongs to the 'indicator symbol'; in addition, the choice of brown kraft paper symbolizes the concept of nature and environmental protection and embodies the 'statute symbol'. Therefore, with the help of Peirce's symbolic trichotomy, we can make an in-depth and comprehensive interpretation of the packaging design of Luckin coffee, and understand the rich information and profound meaning it contains.

3 The Research Value of 'Line Puppy' Joint Packaging

3.1 More About the Submission Template

'Line puppy' is an IP created by Korean illustrator moonlab _ studio. It is mainly composed of white Maltese dogs and brown little golden fur. Its simple and lively line design and life-oriented dialogue style show an attractive visual style. By showing the puppy's mischievous and warm interaction, it conveys the theme of love and friendship, and brings a warm little happiness to the audience.

The joint marketing strategy makes the 'line puppy' successfully linked with the love emotion of Valentine's Day, enhances the public's awareness of the joint brand of 'Lucky x line puppy', and forms a lasting brand influence. Its success lies in the '

humanized ' IP image and the diversified story scenes set around the daily life of the puppy. Simple style, vivid dialogue and positive attitude towards life not only arouse the emotional resonance of users, but also stimulate their enthusiasm for secondary creation, thus enhancing the influence and recognition of the brand.

According to the data of the original warehouse IP data network, the marketing power and actual sales of ' Line Puppy ' have performed well on the major platforms. In addition, the launch of many derivative products also covers a wide range of markets, fully reflecting its innovation and scalability, Table 1 shows the IP heat of some mainstream platform line puppies. Fig. 1 shows the size and year-on-year change of the national beverage market from 2021 to 2023. The report of red food big data points out that the size of the beverage market has exceeded 261.3 billion yuan in 2023, with an annual growth rate of 22.8 %. In such a fierce competitive environment, brands need to adopt a more impactful market strategy.

Table 1. Line puppy IP market value.

Platform	Topic heat	Discussion degree
Little Red Book	850million	
Weibo	741 million	1292 million
Tik Tok	3.77 billion	
sales amount	72.0785 million	

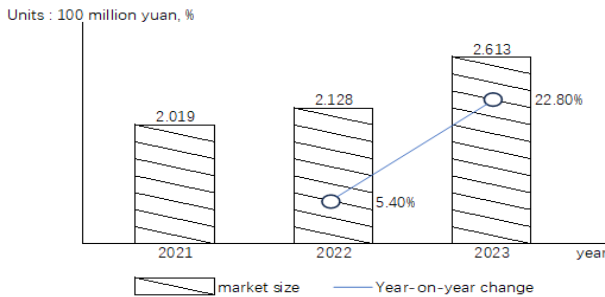


Fig. 1. National beverage market size and year-on-year change from 2021 to 2023.

We can clearly realize that the IP represented by ' line puppy ' not only undertakes the function of decoration and beautification in the joint packaging, but also serves as an effective medium for brand and consumer communication, which has far-reaching commercial value and social influence. This makes us more aware of the necessity and importance of joint packaging research, and deeply understand its connotation and wide application space[5,6].

3.2 Determination of internal Needs

According to the product needs and research needs of Luckin Coffee, a questionnaire was designed and implemented to identify the target population and their purchasing

motivation. The author chose Luckin Coffee store as the research site, issued questionnaires and collected effective recovery data. Through the analysis of the questionnaire data, it aims to understand the main audience of Luckin coffee products and their purchase intention.

Table 2 shows the reasons for customer purchase. According to statistics, a total of 200 questionnaires were distributed, and 186 valid questionnaires were successfully recovered, with an effective recovery rate of 93 %. The 14 invalid questionnaires were users who did not understand the joint activity, and the answers were invalid.

Firstly, the reliability of the questionnaire is analyzed. Table 2 can be seen from the above table that the reliability coefficient is 0.538, indicating that the reliability of the research data is good.

Table 2. Teliability analysis.

number of terms	sample size	Cronbachacoefficient
3	200	0.538

In the validity analysis Table 3 of the questionnaire, a factor was extracted through factor analysis, which included three items : the understanding of Lucky X-ray puppy IP, whether to drink Luckin 's new products and the reasons for purchase. The factor loadings of these three items on factor 1 were 0.83,0.85 and 0.48, respectively, indicating that they were strongly correlated with factor 1. The characteristic root value before factor analysis was 1.64, and the variance explanation rate was 54.83 %. The results after rotation did not change much, indicating that the extraction results were stable.

In the validity analysis Table 3, the value of Bartlett 's sphericity test is 31.174, and the p value is 0.000, which shows that the factor analysis model is statistically significant.

Table 3. Validity analysis.

Item	Factor	commonality
Do you know the joint name of Lucky X-ray puppy IP ?	0.83	0.687
Have you ever drunk Luckin 's joint new product ?	0.85	0.727
Why would you buy ?	0.48	0.230
Characteristic root value (before rotation)	1.64	-
Variance interpretation rate % (before rotation)	54.83%	-
Cumulative variance interpretation rate % (before rotation)	54.83%	-
Characteristic root value (after rotation)	1.64	-
Variance interpretation rate % (after rotation)	54.83%	-
Cumulative variance interpretation rate % (after rotation)	54.83%	-
KMO value	0.544	-
Barthes spherical value	31.174	-
Df	3.000	-
P value	0.000	-

The study interviewed the effective user groups for the reasons for purchasing joint products, and the text extraction of interview records is shown in Table 4.

Table 4. Text extraction.

Serial number	Text extraction
1	packaging
2	Love Collection Packaging
3	New Collocations
4	Taste fresh
5	tasty
6	Curious
7	Someone around to drink, want to try it
8	Did not drink, taste a taste
9	Love to drink
10	Price is not expensive
.....

According to the text information in table 4, SPSS AU is used for cluster analysis, and K-prototypes cluster analysis method is used to classify the samples, the final clustering obtained 5 groups. The proportions of the five groups were 22.64 %, 31.45 %, 18.23 %, 19.50 % and 8.18 %, respectively. On the whole, the distribution of these five groups of people is relatively uniform, indicating that the clustering effect is better.

Table 5. Summary of the basic situation of clustering categories

Clustering categories	Frequency	Percentage (%)
Coffee lovers	36	22.64%
Taste the fresh	50	31.45%
Packaging peripheral attraction	29	18.23%
IP nostalgia	31	19.50%
Other	13	8.18%
Footing	159	100%

The Table 5 show that nearly 18.23 % of the intended people said that their purchase behavior was affected by product packaging design. This finding emphasizes the importance of packaging design in brand strategy. Effective packaging design can not only affect consumers ' purchase decisions, but also convey the brand image, characteristics and value proposition of products.

4 Study on Peirce 's Semiotic Theoretical Model

4.1 A Study of Pierce 's Semiotic Ternary Relation Model

The research model of packaging design based on the ternary relationship of Peirce semiotics involves three elements: representation, object and interpretation. In this model Fig.2, packaging, theme and consumers as co-participants constitute the core framework of packaging design. The packaging design process constructs the visual information of the theme, and uses symbolic techniques to deal with different theme

elements to convey specific information and meaning. The final packaging design is displayed through appropriate media to effectively disseminate relevant information.

In this process, the ' object ' refers to the visual elements used on the packaging, designed to convey the meaning of the organization, through specific forms and combinations to express a specific meaning. The ' representation ' focuses on the specific product characteristics and brand image displayed by the packaging, covering product series, themes and content. Consumers obtain information and meaning through the observation and understanding of packaging design, and their interpretation and response constitute the interpretation of symbols. Different consumer groups will have different interpretations of packaging due to differences in cultural and educational background and social experience. Therefore, the whole process of packaging design, including production, dissemination and understanding, can be deeply analyzed with the help of the ternary relationship of Peirce semiotics.

The structure of this model maps the content elements of theme, packaging and consumers to the ternary relationship (representation, object and interpretation) of Pierce, which provides a systematic analysis idea for packaging design and highlights the importance and complexity of packaging design in information transmission[7,8].

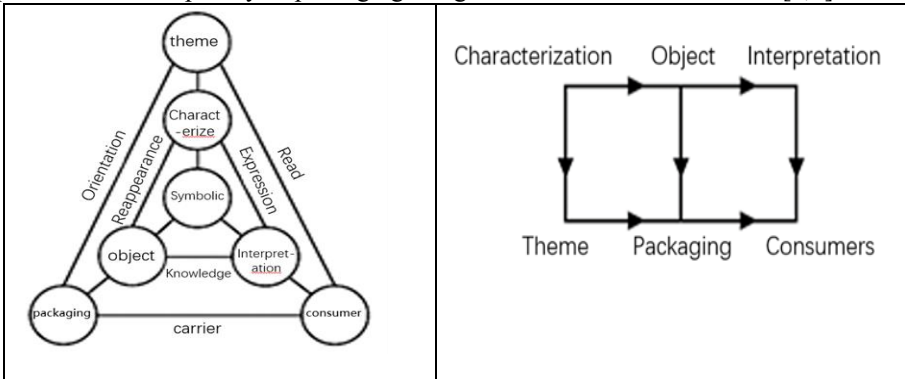


Fig. 2. Ternary relationship and mapping model construction.

4.2 Packaging Design Symbol Extraction Based on Peirce Semiology Trichotomy

In packaging design, the use of the three-part model in Pierce 's semiotic theory for analysis and design can provide us with a deeper perspective. According to this model, symbols can be divided into three categories: image symbols, indicator symbols and symbolic symbols. Image symbols directly present the characteristics or attributes of products, such as images, colors and shapes on packaging, which guide consumers to understand the appearance and characteristics of products. Indicators represent brands or products through specific logos or symbols, such as logos and trademarks. These elements play a role of recognition and memory in packaging design and help consumers quickly identify products. Symbols convey deeper meanings and emotions through metaphors, symbols or cultural symbols, and enhance consumers ' emotional connection and brand identity[9].

Therefore, designers can extract relevant elements from these three symbol models and design them carefully according to product characteristics, brand positioning and the needs of target audiences. This method not only ensures the close correlation and understandability between packaging and products, but also improves the communication effect and influence of packaging design. Through the rational use of these symbols, designers can create more attractive and meaningful packaging works.

5 Analysis of ' Line Puppy ' Packaging Design based on Trichotomy

5.1 Analysis of Image Symbols

The image symbol is similar to the things expressed, which can make the audience connect the two in visual thinking and realize direct expression[10]. For example, the sign of Rexroth Coffee is a deer. In ancient times, deer was regarded as a deity, symbolizing good fortune, happiness and longevity. In foreign countries, deer are often associated with luck. In addition, Luckin 's English name ' luckin coffee ' itself contains a good wish to bring people luck. The ' line puppy ' jointly named by Luckin and IP is also an effective image symbol. It uses a simple modern design style, cartoon image cute, convey a friendly and lively feeling. The tonality of the deer and the dog is very consistent, and both create a positive and pleasant brand image. In terms of visual expression, the image of the line puppy is created by minimalist lines, which complements the geometric and minimalist lines of the Luckin deer logo. The combination of the two is very coordinated visually, which not only conforms to the minimalist style preferred by young people, but also echoes the theme of the brand well. This design not only enhances the brand recognition, but also enhances the emotional resonance of consumers.

5.2 Analysis of Indication Symbol

Indicators play an important role in packaging design. They are the most intuitive and direct language tools, which can help consumers quickly understand and master relevant information[11]. This directly connected adjacency relationship enables consumers to have a preliminary understanding of the product with only a glimpse of the packaging. For example, Fig.3 the blue deer logo of Luckin Coffee is the most obvious brand recognition symbol. The packaging design of Luckin Coffee skillfully uses the attributes of the indicator symbol. Its blue deer logo not only has obvious recognition function, but also its unique image is impressive. This deer implies not only the brand itself, but also a symbol of lifestyle and emotional experience, with a strong emotional implication. The anthropomorphic image of the puppy reflects the living conditions of young people. The ' little butterfly ' image of the small white pear latte is not only a decoration of the product, but also allows consumers to think of the fresh breath of spring and the vibrant natural scene. Incorporating the pleasant atmosphere of spring into drinks stim-

ulates consumers ' feelings and expectations of seasonal changes and enhances the emotional connection between brands and consumers. The black pineapple latte of Qixi makes people think of the taste of the product through the hand-painted pattern of pineapple. The intimate relationship between puppies reminds people of the love between Qixi Valentine 's Day and young men and women, thus arousing consumers ' good impression and desire to buy products. It not only makes the product easy to identify and enhance the brand image, but also successfully uses emotional symbols to narrow the distance with consumers and improve the attractiveness of the product. This design skillfully combines practicality and artistry, with clear memory points and vivid images. It is a successful practice of packaging design.



Fig. 3. Luckin coffee logo and packaging. Images from the Internet

5.3 Analysis of Symbols

The application of symbols in packaging design is also crucial. They usually represent some abstract or indirect meanings that need to be understood through specific cultural or social backgrounds[12].

Qixi ' Xiugou Love Story ' is jointly named black pineapple latte. The words on the package ' Ouaili' and ' black pineapple ' homophonic ' like you '. Through such a creative name and design, it not only shows the sweetness and romance of Qixi, but also conveys love. Although the understanding of symbolic symbols may require some association or interpretation, it is also their charm, which can deeply convey the brand 's ideas and values.

The image of the deer has a very positive symbolic significance in many cultures, representing purity, elegance, adventurous spirit and a new beginning. For Luckin, which was once on the verge of bankruptcy, this symbolizes the company 's innovation and the spirit of exploration. In packaging design, different colors convey different emotions and symbolic meanings. Blue usually symbolizes reliability, security, trust and honesty, and also conveys a sense of calmness, rationality, freshness and cleanli-

ness. Therefore, it is widely used in the fields of science and technology, finance, medical and cleaning products in product packaging to enhance the professional image of products and the trust of consumers. Luckin's classic packaging uses kraft paper material, which symbolizes the concept of simplicity, nature and environmental protection. Its iconic blue background and blue logo convey the concept of reliability, trust and security[13]. Co-branded pink packaging is often a symbol of romance, softness, youth and vitality, and conveys a warm, feminine and sweet feeling to attract young people, female consumers and customers who like cute style.

The company's initiative to launch a joint line puppy symbolizes its innovative spirit and continuous update of products. However, pattern design should be more profound in this process. For example, the selection of background graphics and its story expression in ordinary joint packaging can further enhance the connotation of the design. In the design process, there is often a certain contradiction between readability and connotation. Readability emphasizes the clarity and simplicity of information, so that the audience can quickly understand; the connotation focuses on the depth and richness of the design, which may require more thinking and interpretation. Designers need to find an appropriate balance between the two to effectively convey information while maintaining the depth of content to attract and retain the audience. Excessive use of joint names or making information obscure will have a negative impact on the brand image. Therefore, how to achieve innovation while maintaining the core value of the brand has become an important issue that needs to be discussed in depth in the future design field.

6 Conclusion

Under the background of the current consumer market, product packaging design needs to fully reflect the cultural characteristics and brand concept of the product to meet the needs of consumers. Therefore, it is of great value to study the joint packaging design of Luckin Coffee and 'Line Puppy' IP from the perspective of Peirce semiotics, so as to provide reference for designers.

It can be seen from the research that 'line puppy' as IP has great influence and commercial value. Its concise, lively image and warm story setting have attracted a wide range of user attention and further enhanced the brand's influence and recognition.

At the same time, we also understand that when consumers choose to buy Rexroth coffee products, a large proportion of people are attracted by the packaging design of the product. In particular, the packaging design that integrates elements such as image symbols, indicator symbols and symbolic symbols not only provides visual beauty, but also conveys the cultural values and ideas of the brand in depth.

In addition, Peirce's semiotic theory can not only deeply and comprehensively analyze the packaging design of Luckin coffee, but also provide new ideas and methods for packaging design. Taking 'line puppy' as an example, both its lovely image and its deep symbolic meaning provide consumers with a strong motivation to buy products.

In general, joint packaging is not only a means of beautifying products, but also an effective means of brand communication. The use of Peirce semiotics to study and design joint packaging will undoubtedly enable packaging design to better convey the cultural value and brand concept represented by the product while realizing the practicality and functionality of the product, so that the product can meet the actual needs of consumers while also meeting their needs. In the future, the research on co-branded packaging design based on Peirce's semiotics will provide strong theoretical support for understanding consumer demand, enhancing brand influence, and exploring new product innovation directions.

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