The Application of Color in Food Packaging Design

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Abstract

In the 21st century, with the rapid economic development and fierce commodity competition, packaging design, as a visual communication tool for presenting the product's features and brand identity, has become an important marketing means for developing brand awareness and differentiating products. Color, as an important visual language in packaging design, is the key element that can directly and quickly touch consumers' reactions and is most easily recognized by the public among all the elements that constitute packaging design. Moreover, color carries humanistic characteristics and visual texture, which can help consumers accurately understand product information. Therefore, as a symbol and logo function, the color selection affects consumers' perception of packaging design. In the first half of this paper, the production of color was discussed, followed by three basic characteristics of color -hue, Brightness, and chroma, and then the concept of color psychology was introduced. In the second half of this paper, the application of color in food packaging was mainly expounded and studied in terms of color tone, weight, space and taste. This paper aims to explore how to effectively convey product information and achieve sales through the use of different elements of color in the design of food packaging based on the analysis and elaboration of the above contents.

Keywords

Packaging Design; Characteristics of Color; Psychology; Marketing.

1. Introduction

Human beings began to use color a long time ago, and their ability to use color flexibly was traced in the cave paintings in Nerga, Spain, see figure 1 below. In 1666, Newton discovered the spectrum through a prism and confirmed the view that objects present color by reflecting and absorbing radiation. This shows that the medium of color expression is color light: when the light shines on an object, the object absorbs the light with different spectral characteristics, and then acts on the human eyes through projection. After that, the photoreceptor cells of the retina transmit signals to their connected neurons, which are transmitted to the brain by the visual nerve, and then produce the feeling of color.

All colors have three attributes of hue, brightness, and chroma , which are called the three elements of color in color science, and are of great significance for understanding color and color expressiveness.

Hue is the appearance of a color and the biggest feature that distinguishes colors from each other, which can more accurately represent a certain color, such as orange red, emerald, and cobalt blue. The nature of hue corresponds to different wavelengths of color light, and the hue ring usually consists of 12-color hue, 20-color hue, 24-color hue, 40-color hue, etc.

Brightness is the subjective perception of light source and object surface brightness, mainly determined by the intensity of light, and different colors have different brightness. Chroma represents the chromatic degree, also called colorimetric, saturation, vividness, ash containing.

The greater the proportion of color components, the higher the chromaticity of color; the saturation of monochromatic light in the visible spectrum is the highest and that of white light is the lowest.

The physical effects of "hue, brightness, and chroma" are understood to evoke particular "psychological response" in the artist and the viewer (scheweetal. , 2011) The three basic attributes of color elicit a psychological response that drives the viewer's behavior and emotions, and this holds true for the interaction between product and consumer. human behavior, and color psychology came into being gradually. In 1810, German poet Goethe published the theory of spiritual color, studying the influence of color on human emotions, which can be seen as the basis of modern color psychology.

Color is often used to study human psychological activities. Although color itself has no direct connection with emotion, when light of different wavelengths acts on people's visual organs to produce color feeling, it will inevitably lead to some emotional psychological activities. In the field of marketing, the influence of color psychology on people's psychological activities is also reflected in purchase behavior.

Kesić, T (2006) mentioned a color study in the book 'Ponašanje potrošača' and shows that "60% of consumers' purchasing decisions for a product are based on the selection of colors." Therefore, in the design of food packaging, the selection of colors should fully take into account the influence on consumers' psychological feelings, which requires brands to use the abstract expression of color with different feelings to reflect the attributes of the products to achieve good marketing goals.

Warmth, distance, lightness, and color taste are some of the color factors that influence customer decision-making. The use of color in food packaging will be examined in depth in the following sections using various examples.

2. Warmth and Coolness of Color

The cold and warm feeling of color can be understood as the sense of temperature that the same color gives people. Hue mentioned before has no temperature difference between cold and warm. It is the association of people's feeling of cold and warm caused by visual hue.

Moreover, people refer to colors that look and feel warm, which evoke images of flame and the sun, such as red, orange and yellow. In the packaging design, warm colors will give people a feeling of warmth, liveliness and excitement. Especially in food packaging, warm colors are the most widely used. Eiseman (1998) concluded in the book 'Colors For Your Every Mood' that red is a very emotionally strong and vibrant color that will give people a strong sensation of appetite, if people have this

color on the table Food, it's easy to eat a few more bites; and yellow can have an uplifting effect, stimulating brain activity, reminiscent of sunlight to feel warm and comfortable. Therefore, it is reasonable to apply the above-mentioned colors related to taste and comfort to food packaging.

For example, a typical case is the packaging design of McDonald's, shown in figure 3 above. The brand primarily use red and yellow in hue, which appear to be harmonious and stimulate people's desire to eat. In fact, many fast food restaurants tend to have a yellow-red hue in their dining environment. For fast food restaurants, red, orange and yellow will not only bring customers a sense of pleasure and excitement, but also bring customers a sense of time extension. Therefore, using warm colors in the atmosphere like figure 4 as example can encourage customers to eat faster and boost the rate of table turnover, and as the result, customers will spend less time in the store as a result of this.

In contrast to the warm colors listed above, cool colors, such as cyan, blue, green, and purple in the color ring, are considered to be able to provide a feeling of coolness, a study conducted by Bart Hulshof of the University of Twente has proven that. Cool colors are usually applied in beverage packaging because they evoke feelings of tranquility, coolness, and vitality.

For example, most of Sprite's packaging designs use cool colors, with a gradient of blue and green at the bottom, with eye-catching turquoise lemons and irregular water droplets, visually reminiscent of the ocean, ice, and sky. This kind of color selection will provide people a refreshing and thirst-quenching sensation in the daytime, which can greatly enhance consumers' desire to buy. However, it should be noted that the warmth and coldness of hue are relative but not absolute, and different people will have different psychological feelings.

3. The Lightness of Color

The lightness of the color is mainly determined by the color's brightness. Colors with high brightness can be seen as lighter, and colors with low lightness can give a feeling of heavier. The obvious example of this measurement is that white is the lightest while the black represents the heaviest feeling. Moreover, in this measurement, under the same lightness, cool colors are lighter than warm colors, and colors with higher chroma will give a lighter feeling.

In food packaging design, high-lightness colors give customers a sense of flexibility and lightness, whilst low-lightness colors give people a sense of stability. The right mix of light and dark colors is crucial, and the selection of light and dark colors should be based on the needs of different customer groups. Specifically, more colors with low lightness are employed in the design of food packaging for male, middle aged, and elderly consumers who seek a more steady and tranquil mood. For example, the outer packaging design of whisky is made of brown and black color matching, with the yellow-brown liquid under the transparent glass bottle. This kind of design gives the overall color a heavy feeling and emphasizes the strong taste of the flavor, which well meets the psychological needs of male, middle-aged, and elderly consumers.

In addition, food packaging aims at female and younger customers may have a medium and high color brightness, giving people a romantic and warm sensation.

Petit's juice packaging is seen below in figure 6, which differs from the packaging that employs the fruit's primary color. It matches soft, high-brightness, and low-saturation colors, like adding white pigment to the original fruit color. If the juice packaging is matched according to the primary color of the fruit, the overall picture will be too bright, ordinary and uncharacteristic. Therefore, Petit didn't adopt the idea of the primary color of the fruit, but using color-matching design to make consumers' visual experiences more pleasant and offer them a warm and soft feeling. As the marketing result, this packaging is particularly popular among young girls, thereby enhancing its

market competitiveness in similar items.

Of course, when arranging the color structure of the picture in packaging color design, we should pay attention to the balance between the areas of "light color" and "heavy color," in order to achieve a visual equilibrium.

4. Sense of Space and Distance of Color

The sense of distance of color is a forward, backward and concave-convex visual effects caused according to different chroma of color. The color near to the viewer is called advancing color, and the color far away is called receding color. Warm colors with longer wavelengths and color lights with strong luminosity have a stronger effect on human eye imaging. This is because the retina has a strong effect in accepting this kind of color light and imaging in the eyes, resulting

in fuzzy bands at the edge of the imaging and a sense of color expansion. In contrast, the cool color light with short

wavelength and the color light with weak luminosity have a clearer imaging effect, giving people a shrinking visual effect. Generally, warm, light and bright colors have a sense of expansion. The combination with the strongest contrast in the sense of advancing and receding of colors is complementary color relationship. In the complementary color relationships of "red-green", "yellow-blue" and "white-black", the former shows a strong expansion trend, while the latter shows a clear receding effect. The advancing and receding of color creates a spatial sense of color.

In food packaging design, bright, clear colors are frequently used to emphasize the topic, and the proper use of forward and backward colors can create a more effective feeling of hierarchy and draw consumers' attention. As in several cases in figure 7, the image is overlaid with different areas of white, blue, yellow and red to give a strong visual conflict. The bright warm hue colors play a role in expansion in the picture, giving people a protruding visual effect. This type of packaging design makes it easier to deliver information in a short amount of time while also attracting the attention of consumers.

5. Taste of Color

The taste association that people have with color is known as the sense of taste of color. The use of real food colors in food package design can greatly aid people's sense of flavor identification. An experiment was carried out to see if people could correctly identify the taste of a drink by changing the color of the packaging, and the results showed that subjects could correctly identify the taste when they could see the 'real' color of the drink, but they could easily misidentify the taste when they couldn't see the color of the drink. When a grape juice drink was not visible in color, 30% of people assumed it was a cherry-flavored drink and 15% could taste citric acid.

So people's sensory capacities are diminished when they can't perceive color. This is one of the reasons why carbonated beverages are made colorful. In the 1950s, a carbonated beverage brand called 7 up added 15% yellow color to the outer packaging. The taste of the soda itself has not changed, but consumers feel better, and the lemon taste is stronger. Therefore, in the design of food packaging, especially the design of drinking packaging, the accurate use of the taste association of color can make consumers associate with the taste of the product, and then quickly make a purchase choice.

6. Conclusion

The proper use of color is inextricably linked to food packaging. In packaging design, it is necessary to take into account the psychological implication of color on people, combine the characteristics of the food itself and the needs of different consumer groups, use and grasp the three main attributes of color more rationally, and effectively communicate the characteristics and efficacy of the goods with visual language.

The rational use of color can lead to packaging differentiation, helping food products to stand out among similar foods and promoting product sales.

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