EXPLORING CHILDREN'S PICTURE BOOK DESIGN: ANALYSIS OF COMPOSITION AND COLOR APPLICATION

Yifeng LIN[1,2]* Olena GERASYMENKO[1]

[1]*Department of Art and Fashion Design, Faculty of Design,*
Kyiv National University of Technologies and Design, Kyiv, Ukraine
[2]*Department of Industrial Design, Faculty of Art and Design,*
Shaanxi University of Science and Technology, Xi'an, China

*Corresponding author: Yifeng LIN, Linyf0604@foxmail.com

Tutor: **Olena GERASYMENKO**, Associate Professor,
Kyiv National University of Technologies and Design

Abstract. *The work examines the use of composition and color in the design of children's picture books, as well as how these visual elements meet the cognitive needs of children and contribute to their emotional development. A methodological approach is used to analyze the composition and color of published picture books to explore the design strategies of children's picture books. The results showed that bright colors and simple compositions better attract children's attention and contribute to their cognitive and emotional development. It has been found that the use of color and composition in picture books is closely related to children's age and stage of cognitive development, so the right design can greatly increase the educational value and artistic charm of picture books. When developing the design of picture books, it is important to use color and composition, taking into account the cognitive and emotional development of children.*

Keywords: *Children's Educational Materials, Picture Book, Composition, Color Analysis, Children's Cognition, Children's Aesthetic Preference*

Introduction

Picture books play a vital role as an important tool in early childhood education, not only providing children with an initial reading experience, but also playing a unique role in promoting the development of their cognitive, emotional and social skills. In view of the unique cognitive characteristics of children at different stages of development and the basic cognitive ability of graphics, the visual design of picture books should fully consider children's cognitive psychology and aesthetic preferences, to improve the educational and artistic value of picture books.

1. Characteristics of Visual Cognition for Children

In the early stage of children's development, their visual system is growing rapidly, and their sensitivity and recognition of colors are gradually enhanced. According to the cognitive development theory of Swiss psychologist Jean Piaget, children rely on intuitive and sensory information processing, and bright colors are easy to be captured by children's perceptual system because of their high visual stimulation, and become an important clue for their cognition and understanding of the world. Colors with high saturation and contrast can be more easily processed by a child's visual system because these features are more easily distinguishable in a visual scene, thus promoting concentration of visual attention [1]. Therefore, the preference for bright, contrasting colors reflects children's natural tendency to easily process and recognize information in cognitive processing, which plays an important role in their visual preferences and learning processes.

From birth, children show an interest in simple graphics and shapes that is not only derived from visual novelty, but also related to the basic needs of their cognitive development. Jean Piaget's theory has mentioned that children undergo several stages of cognitive development,

among which the sensorimotor stage (0-2 years old) is when they begin to explore the world through the senses, including visual shape and pattern recognition [1], [2]. In this process, children gradually build an understanding of visual features such as shape, size and color by comparing, classifying and integrating visual information. Secondly, children's ability to recognize graphics and shapes not only depends on the development of visual perception, but also involves higher cognitive processes such as attention, memory, and thinking skills. For example, by observing and manipulating concrete objects, children learn to associate visual experiences with physical properties such as edges, angles, and symmetries, which helps them recognize and distinguish between different graphics and shapes [1]. Therefore, the recognition of graphics and shapes occupies a core position in children's early cognitive development, which is not only the basis of children's learning of the visual world, but also the cornerstone of their mathematical and spatial thinking ability development.

Story comprehension is a milestone in children's language and cognitive development, and the gradual increase in this ability reflects the growth of children in understanding complex information, tracking the sequence of events, recognizing cause-and-effect relationships, and understanding characters' motivations and emotions. According to the narrative theory of Jerome Bruner, an American cognitive psychologist, children begin to understand and construct the world through stories from an early age, and their story understanding ability gradually improves with age.

In the early stages, children's story understanding relies primarily on concrete actions and events, and as language skills and cognitive structures develop, they are able to deal with more complex story structures, including understanding abstract themes and implicit moral lessons in stories [1], [2]. In addition, the development of a child's understanding of a story is also related to the maturity of his or her theoretical mental capacity (the ability to understand the inner thoughts, feelings, and beliefs of others). As the theoretical mental capacity develops, the child is better able to understand the inner world of the characters in the story, including their intentions, desires, and emotions. This allows them to gain a deeper understanding of the storyline and the relationships between the characters. This model not only promotes the development of children's language expression and understanding ability, but also helps to cultivate their social cognitive ability and emotional understanding ability.

Piaget believed that in the process of development, children assimilate and adapt to this process through interactive experiences with the environment. They gradually construct complex thinking patterns and cognitive structures. In this framework, imagination is seen as an internal mental activity that enables children to mentally simulate and reconstruct experiences to create situations and solutions that differ from reality [3]. Secondly, the growth of imagination is closely related to children's cognitive progress, involving many aspects such as memory, attention and symbol manipulation. Through imagination, children can mentally explore and manipulate objects and events without direct experience, which is an important sign of their cognitive flexibility and the development of innovative thinking skills.

2. Analysis of Color Application Guided by Children's Psychological Orientation

Based on children's visual perception of color, bright colors can stimulate children's interest and curiosity, while high contrast helps to highlight important elements and simplify children's visual information processing [3], [4]. Therefore, in the design of children's picture books, the use of bright and high-contrast colors can attract children's visual attention, enhance the emotional expression of the story, and promote children's understanding and memory of the story content. For example, using bright blues, yellows and greens, as well as strong black and white contrasts, American illustrator Mo Willems in his picture book Don't Let the Pigeon Drive the Bus! [5], creates a series of dynamic and expressive scenes that effectively capture the visual attention of children.

Color simplification is an important visual strategy in children's picture book design. By limiting the number of colors and using simple and clear color combinations, this model creates a visual environment that is both easy for children to understand and interesting to them. Simplified color matching helps highlight key elements in the picture book, enabling children to identify and understand the characters, actions and situations in the story more quickly, while also promoting children's perception of basic visual elements such as shapes, lines and textures. This approach not only takes into account children's preference for bright colors, but also incorporates their weak visual processing ability of complexity, and strengthens their attention and understanding of the main content by reducing visual interference. For example, Northern Irish artist Oliver Jeffers' picture book How to Catch a Star? [6], tells the story of a young boy's desire to catch a star, showing themes of exploration, dreams and not giving up. Through the simplification of color, the emotion and theme of the story are conveyed in an intuitive and clear way. Jeffers uses a relatively simplified color scheme to construct scenes and moods in a few dominant colors, creating a dreamy and poetic visual effect.

Color can not only affect children's emotional responses, but also enhance the theme mood and visual atmosphere of the story, making the plot more vivid. For example, warm colors such as red and orange are often used to express warmth, happiness or excitement, while cool colors such as blue and green are used to create a calm, sad or mysterious atmosphere. Through specific color combinations, designers are able to guide children's emotional experiences in different scenes, deepening their understanding of the emotions and themes of the story. British illustrator Anthony Browne's Gorilla [7], for example, manages to convey the loneliness, longing and ultimately warmth and joy of the characters in the story through the use of dark and grey tones of the background and the skill of sprinkling bright colors into specific scenes.

3. Composition Design Based on Children's Cognition

Simple and clear visual layout can promote children's understanding and absorption of the story content [8]. This method emphasizes the use of clean lines, clear visual focus, and limited details in the layout of the page to avoid complications in the composition, thereby helping children to focus more on the plot of the story, the characters, and the theme that the book is intended to convey, helping to improve reading comprehension and visual recognition. The classic children's picture book Guess How Much I Love You [9], written by Irish writer Sam McBratney and illustrated by British illustrator Anita Jeram, demonstrates a warm and insightful visual narrative through simple, clear compositions. The heart of the story is conveyed - the big rabbit and the little rabbit compete with each other, trying to express the depth of love for each other.

Contrasting compositions highlight key visual elements, thereby directing children's attention and deepening their understanding of the story . This approach is achieved by enlarging scale, color contrast, unique visual angles, or placing key elements in prominent positions on the page. Through such design techniques, designers can effectively guide children's vision and make their attention focus on the main characters, objects or scenes of the story, thus deepening children's perception of the emotion and theme of the story. The Most Beautiful Four Seasons: Spring, Summer, Autumn, Winter [10] written by French writer Crementine Sude , creates visual focus through contrasting compositions, cleverly highlighting the theme of the changing seasons. He uses simple graphic design and contrast of layout to make the characteristics of each season more significant, thus deepening the reader's understanding and feeling of the different characteristics of the four seasons.

In the design of children's picture books, "guiding the line of sight" is a key composition design strategy. By arranging page elements and visual streamlines, readers are guided to move their eyes along a specific path, thus enhancing the narrative effect and visual experience of the story. This strategy can be achieved through lines, shapes, color gradients, character eye direction, or light and dark contrast, effectively directing the reader's attention to key information or plot turning points in the story. By consciously controlling the visual flow, designers are not only able

to enhance the rhythm and dynamics of the story, but also help readers understand and feel the emotion and theme of the story more deeply. For example, British writer and illustrator Oliver Jeffers' picture book named Here We Are: Notes for Living on Planet Earth [11] in depicting the Earth scene, O. Jeffers uses a progressive perspective from space to the Earth's surface to subtly guide the reader's eye from the macro universe to the Earth. When introducing children to human relationships, Jeffers uses the arrangement and interaction of characters to guide the eye [12]. The importance of family affection, friendship and social interaction is expressed through the eye contact, body language and spatial layout of the characters in the illustration. This composition not only allows children to follow the story visually, but also helps them understand complex social and emotional concepts.

Conclusions

Through a comprehensive analysis of children's cognitive development and their preferences for color and composition in picture book design, this paper illustrates the important role of children's picture books in promoting children's cognitive, emotional and social skill development. The study points out that the visual design of children's picture books needs to take into account children's cognitive characteristics such as intuitive way of thinking, the centrality of the cognition of graphs and shapes, the comprehension of the storyline, and the richness of imagination. Through the use of bright and contrasting colors, simple and clear layouts, and a colorful atmosphere that matches the mood of the theme, children's visual attention is effectively attracted and their cognitive and emotional development is supported. The study emphasizes the unique value of picture books as an early childhood educational tool, demonstrating how well-designed visual elements can contribute to children's holistic development. This study provides a theoretical basis for the visual design of children's picture books, emphasizes the central role of visual elements in supporting children's development, and provides an important reference for the design and evaluation of children's picture books in the future.

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