

A Bibliometric Analysis Of Interior Design And Colour In Children's Rooms In China

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ABSTRACT

Children's room as the main activities of children in the family, is an important space for children's life, play a key role in the growth and development of children. With the development of the times, people's living and cultural standards are also constantly improving, economic development has led to the prevalence of interior design industry, children's room interior design has also been considerable attention. Children's room economic development, people's concern for children in the continuous improvement, in order to children have a better family living environment, people are constantly researching the relevant areas. Colour is an important part of interior design elements, especially in the current requirements of people's lives, colour has become a decisive and important part of interior design. It is an important part of design to scientifically match the colour of indoor space interface of children's room. This article will analyze the relevant historical literature on the colour of the spatial interface, explore the influence of colour on the interior design of children's rooms, and do research on the interior design of children's rooms from the perspective of the influence of colour on children's growth, as well as to meet the needs of children's growth, and to promote children's physical and mental health and growth.

Keywords: Interior Design, Children's Room, Colour, Space, Interface

1 INTRODUCTION

Interior design industry is developing rapidly, and its professional standard is also constantly improved in the face of the needs and demands of modern society. In the 1990s was a decade of rapid development of interior design in China, and the market economy also led to business competition (Xu, 2018). With the deepening of reform and opening up and the accelerating pace of economic development, the people's living standards continue to improve. People's demand for interior design is constantly improving in all aspects, and the design of children's room is also emphasized accordingly. As the main place for children to live and study, children's room plays a key role in children's physical and mental growth. Children's rooms must function as dynamic environments that evolve with their occupants' developmental needs (Falkenberg et al., 2023). Although the interior design of children's rooms is part of the interior design of residential spaces, it is also designed and considered independently and specifically to meet the needs of children in response to their rapid growth and development. The focus is to combine the child's age, gender, and other factors for coherent design. Children's room is mainly for children to rest, study and play, is completely independent of children's space.

Colour can directly stimulate human visual organs and provoke various emotional responses in the mind (Li, 2023). Colour is one of the indispensable elements in interior space design, which not only affects people's emotions and perceptions, but also shapes the atmosphere and style of the space. The ultimate goal of children's room colour design is for children to live in comfortably with joy. Age-appropriate colour choices are necessary, and dynamic adjustments in children's room colours can foster independence and adaptability as they grow (Thompson & Lee, 2023). Since children's cognitive understanding of and sensitivity to colour vary across age groups, the colour palette for children's rooms should be adapted accordingly.

Most of children's activities are indoors, and indoor colours have a large impact on their activities, as well as on their level of comfort and pleasure. For children's room indoor space environment, colour expression is an important part, the colour of the indoor space environment has a great influence on the spatial sense, comfort, environmental atmosphere, efficiency of use of children's room interior design, and on human physiology and psychology (Yi, 2019). Therefore, in the interior design of children's room, the space interface should be reasonably designed to meet the growth needs of children.

The colour design of interior space should consider the functionality of different spaces comprehensively, so that

the overall colour tone of the space is unified, and the colour of each partition is relatively independent (Guan, 2021).

Colour is one of the indispensable elements in interior space design. It can not only affect people's emotions and psychological state, but also change the atmosphere and feeling of the space (Zhang, 2023). There are countless studies on colour in interior design, there are not many studies on children's room and colour, and there are only 152 studies related to "colour in children's room" retrieved from Chinese CNKI database, and the growth trend is slow in recent years. This study aimed to research on colour and interior design of children's rooms in the last 30 years (1995-2024); Secondly, this study examined the themes on children and colour related topics; Finally it summarised the colour related topics in children's rooms.

2 RESEARCH METHODS

According to the research content of the article on interior design and colour bibliometric analysis, in the children and the impact of colour to the number of literature for comparison, and finally the children's room colour bibliometric analysis. When conducting the analysis, the accuracy of the data and the scientific nature of the analysis method should be ensured. The results of the analysis should be presented in an objective and neutral way to avoid subjective bias. Bibliometric analysis is a dynamic process, and the results may change as new literature is released and the research field evolves. Therefore, regular updating of the analysis is necessary. CNKI data visualization presents information visually in the form of charts, graphs and images, making complex data and research results easier to understand and remember.

By searching the literature related to the colour of children's room to study the research on children's room and colour, the data of this paper comes from the Chinese domestic literature data CNKI academic journals database, this paper adopts the research method of combining Bibliometric analysis and literature review. in order to study the development trend and research hotspots within China.

2.1 DATABASE SELECTION

Database selection CNKI, CNKI was chosen because it is the largest academic literature database in China, which has wide influence in China and contains a large amount of Chinese literature. It brings together a large number of academic journals, dissertations, conference papers, patents and other academic literature resources from different fields, which reflect the latest research trends and academic discussions in China.

2.2 DEFINING KEYWORDS

In this study, focusing on the research with colour in the interior design of children's rooms, keywords were chosen to highlight the main focus and contribution of the study. "interior design", 'children's room', 'child development', 'colour', "space" and 'interface' are the keywords of this study. These keywords not only help to understand the core of this paper, but also provide practical references for researchers in related fields.

In this study, search attempts were made in the CNKI database using Chinese language, and the time frame of the search was set as 1995-2024, and the bibliometric analysis covered a 30years timeline. The study made a preliminary search attempt for some keywords in order to get more appropriate and precise keywords. For example: using the keyword "children's growth and colour" search, only 72 pieces of related literature; using the keyword "space interface colour" search, only 50 pieces of related literature; using the keyword "indoor space interface colour" search, there are only 8 pieces of related literature; the use of keywords "children's room space colour" search, there are only 2 pieces of related literature; the use of "children's room space interface colour" search, there are 0 pieces of related literature. It can be seen that the amount of data retrieved using the above keywords is small and less representative, which cannot provide effective data for the study. At the same time, the use of the keyword "spatial colour" search is too vague, and the retrieved literature involves more research fields, which cannot provide effective data for the study.

Therefore, the keywords were adjusted, and the keywords searched through CNKI were: 1, interior design and colour; 2, children and colour; 3, children's room colour; 4, interior space colour.

3 BIBLIOMETRIC ANALYSIS OF “INTERIOR DESIGN AND COLOUR”

Taking “interior design and colour” as the search keyword, 8497 results were found. Referring to the distribution of literature topics in Figure1, “interior design” accounted for the highest proportion in the first place, with 2586 articles. There are 462 articles on “interior space”, 423 articles on “modern interior design”, 279 articles on “interior space design”, 235 articles on “indoor environment” and 235 articles on “interior design”. There are 235 articles in “Interior Environment” and 221 articles in “Interior Environment Decoration Design”. Although these latter topics do not account for as much literature as the first one, “interior design”, the quantity of literature does not always indicate the quality of research, and the lesser literature may be equally important and influential.

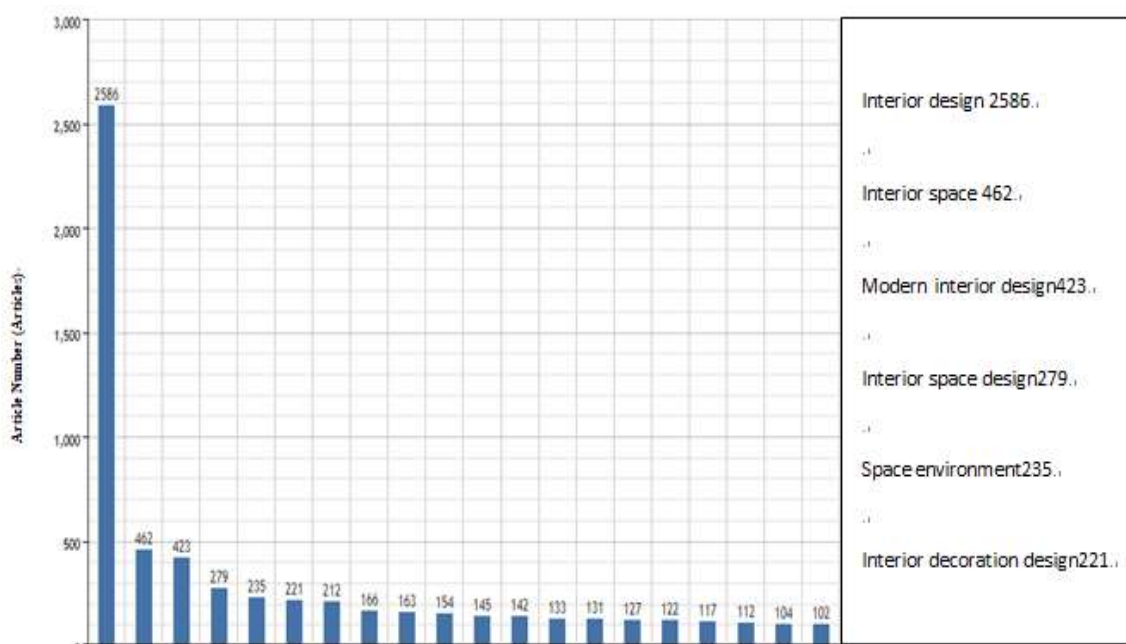


Figure 1: Distribution of Major Themes in the Literature

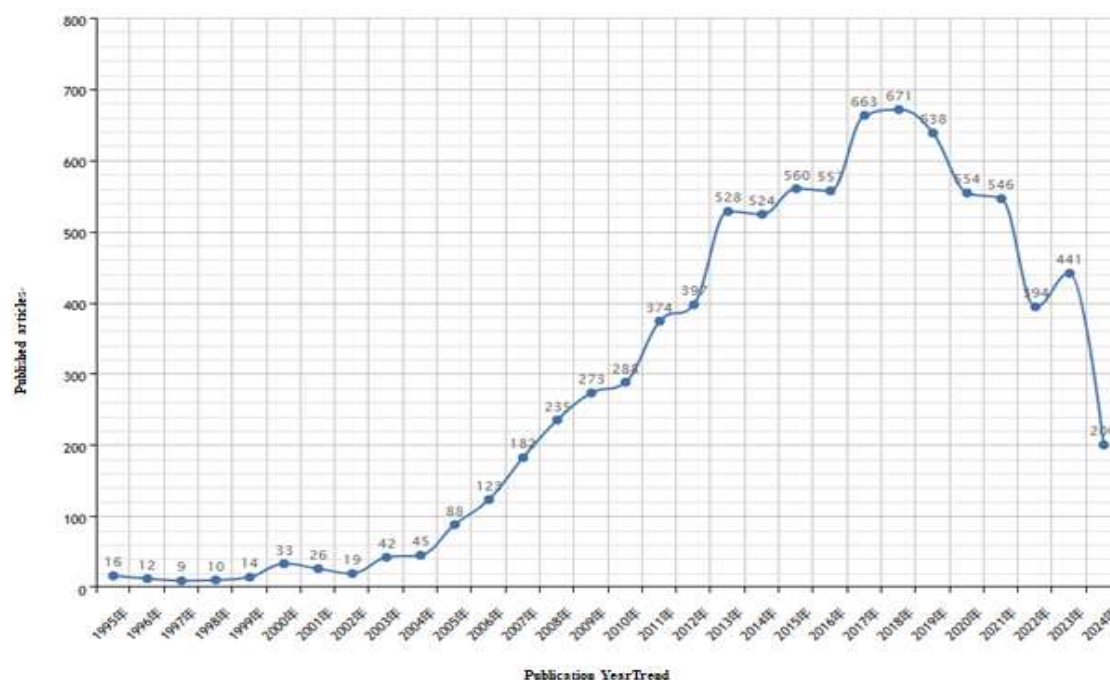


Figure 2: Distribution of literature by year of publication

From Figure2 literature publication year distribution can be seen in 1995-1999 in this period of time, the research output did not have significant progress or growth, belongs to stagnation, 2000 began with the recovery of China's economy, the development of the renovation industry began to pay attention to the interior design, so the 2000s began to have a small fluctuation to 2001-2005 year by year slowly increased to 220 articles. 2006-2010 the number began to show a positive growth trend to reach 1101 documents, 2011 began a surge in the number of documents, research output is accelerating, the number of documents also increased, from 2011 to 2015 has accumulated 2,383 articles, followed by 2016 experienced a small decline to only 557 articles in that year, to 2017- 2018 another wave of small peak reached 1334 articles, but from the beginning of the epidemic in 2019, a clear and gradual decline, to 2021 accumulated to 1,738 articles, 2022 the number of literature has declined to only 394 articles in that year, 2023 to 2024 so far the total number of literature is only 641 articles.

A review of the literature on interior design and colour shows that from the year 2000 was the era when interior design began to develop rapidly and our research on interior decoration emerged and began to develop rapidly. However, the construction industry faced delays in many construction projects due to embargoes and restrictions caused by the beginning of the epidemic. Then it also affected the interior design industry. So it led to a decline in literature output. The literature review provides a deeper understanding of the importance of colour and interior design.

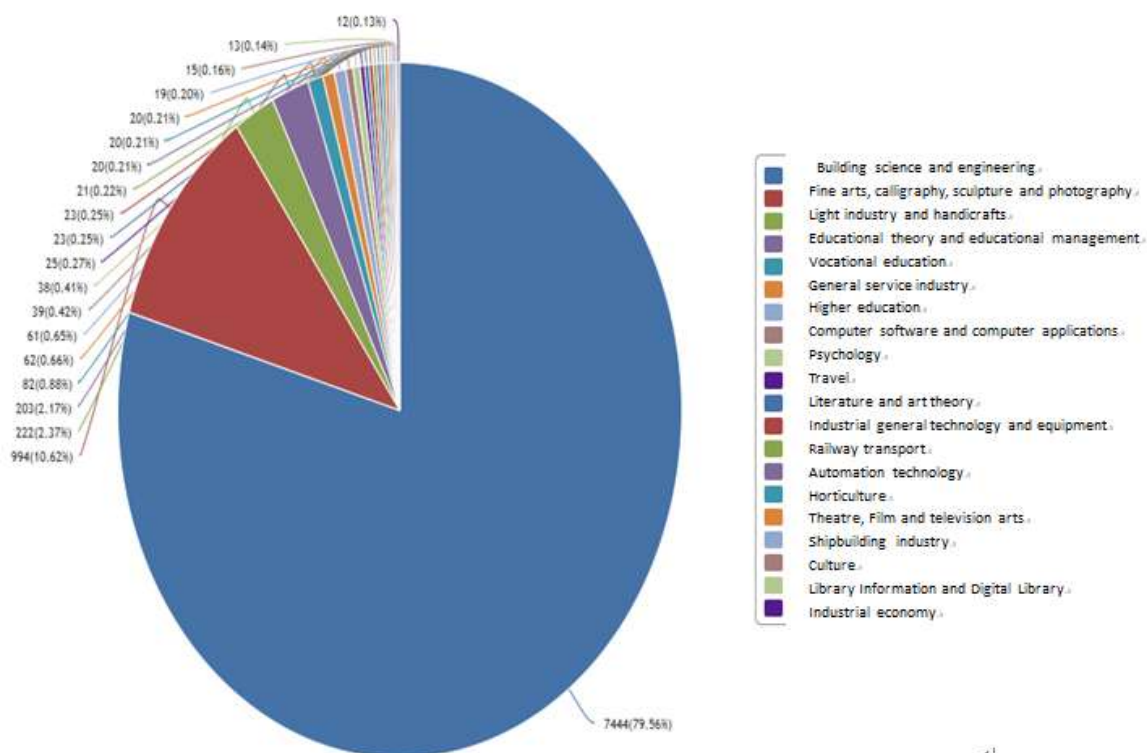


Figure 3: Distribution of disciplines in the literature

In Figure3 literature discipline distribution, in which the proportion of building science and engineering is the highest, accounting for 79.56%, the number of literature has 7444 articles, building science and engineering is a comprehensive discipline, which combines art, science, technology and social needs, this interdisciplinary nature makes its research field is wide, and the output of the literature is naturally more.

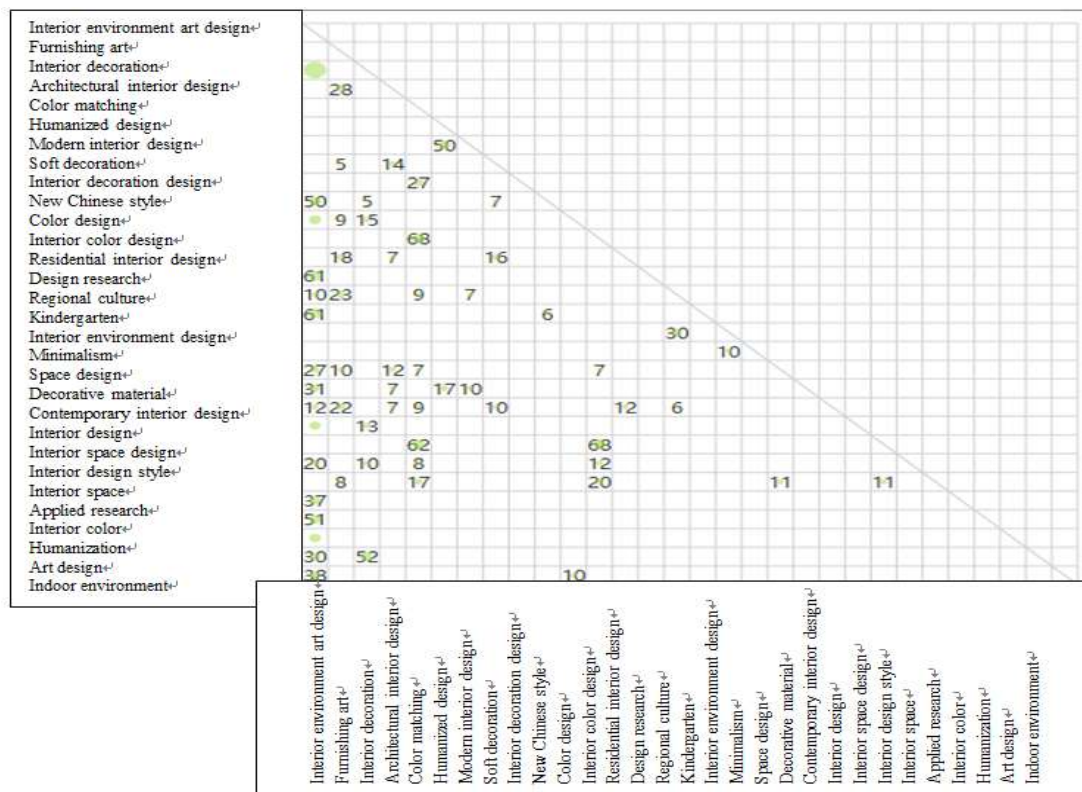


Figure 4: Literature theme co-occurrence matrix analysis

In Figure 4, the top three themes for interior design and colour were “interior design colour and colour palette” with 68 occurrences, “interior space design and interior colour design” with 68 occurrences, “interior space design and colour palette” with 68 occurrences, and “interior space design and colour palette” with 62 occurrences. “Interior space design and colour matching” appeared 62 times. The thematic co-occurrence analysis reveals that interior design is a specialized field that encompasses a wide range of styles and approaches, and that interior space design is a core component of interior design. Colour demonstrates a crucial role in interior design in specific data. The application of colour in interior space as an important part of interior design plays an important role in the expression of interior design concepts (Dan, 2022). colour has a profound effect on the atmosphere, emotion and functionality of a space. In the co-occurrence matrix analysis, although “design research” and “interior environmental art design” appeared 62 times, “interior colour” and “interior environmental art design” appeared 51 times. Artistic design of interior environments” appeared 51 times, even though the number of occurrences is not high, they may play a key role in a particular context, and it is recognized that the number of occurrences is not the only criterion. As an important element of interior art design, improving the level of interior art design is one of the keys (Di, 2019).

4 BIBLIOMETRIC ANALYSIS OF “CHILDREN AND COLOUR”

The relationship between children and colour can be said to be complementary, children perceive the world through colour and also express their personality by choosing colours (Gao,2017). Compared with adults, children's sensitivity and attention to colour is more prominent, and they are more able to sensitively perceive the difference between colours, and from another perspective, the influence of colour on children's muscles, psychology, emotion and daily behavior and action is more significant.

When searching for the keyword “children and colour” in Figure5, the search yielded 7102 results, of which the number of “design research” reached 405, “children's picture books” and “kindergarten” reached 405, and the number of “children's picture books” and “kindergarten” reached 405. The themes of “children's picture books” and “kindergarten” reached 330 and 251 articles respectively, the theme of “spatial design” had 193 results, and the theme of “preschool children” had 165 results. The theme of “space design” has 193 literature results, and the theme of “preschool children” has 165 literature results. The theme of “children's furniture” has 138 articles.

These themes are linked to colour in many ways, and these elements together form an important part of the environment in which children grow up.

Design research is also multifaceted in relation to children and colour, and it involves multiple fields such as psychology, education, and environmental design. colour is considered to be a powerful expression of emotion, and in interior environments, different colours can trigger different emotions and feelings, and different colour choices and combinations can create diverse atmospheres and emotional experiences (Ren, 2023). Children's picture books and nurseries need to attract children's attention. The use of bright, contrasting colours can catch children's eyes and stimulate their interest. colour choices in space design should help children identify shapes, colours, and patterns and promote their visual discrimination. colour among preschoolers not only adds visual appeal, but also has a profound effect on children's cognitive development, emotional experience and learning. Children's furniture in the colour and children's development is closely related to different genders, different ages of children's perception of colour experience is different, and its perception depends on the children's body sensory response to it. Children's perception of colour is actually the physical colour in the human body's psychological response. Different stages of development have different perceptual properties of colour, thus producing different cognitive effects.

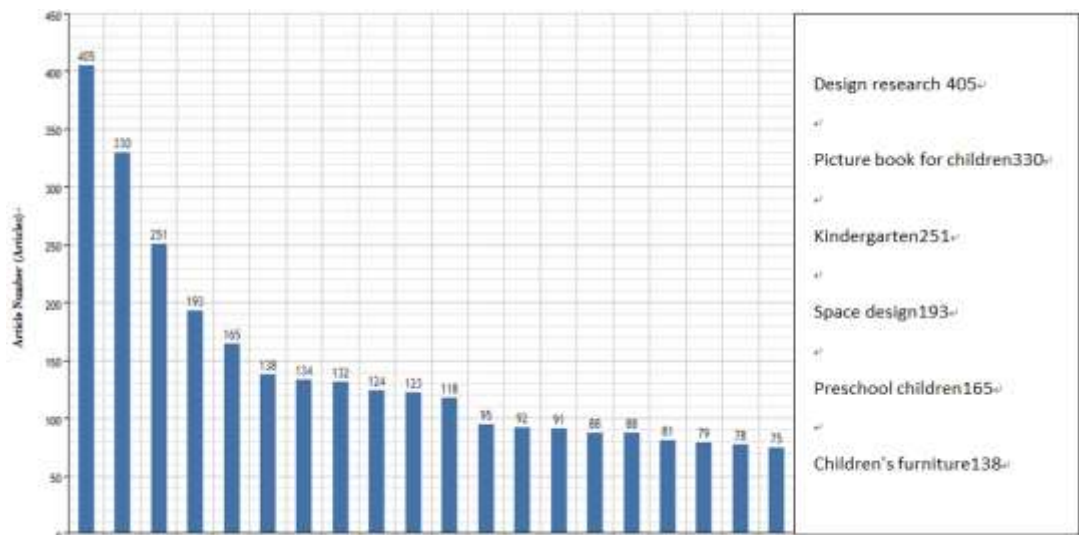


Figure5 Distribution of major themes in the literature

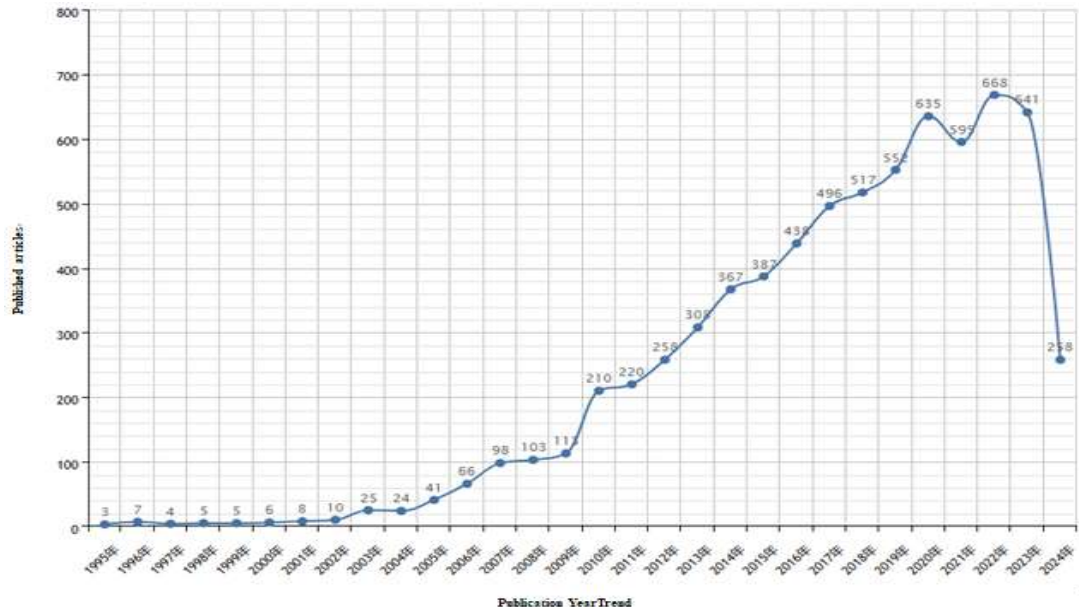


Figure 6: Distribution of literature by year of publication

In the distribution of Figure6 literature publication year, the literature has been hovering in the number of 5 to 10 articles from 1995 to 2002, until 2003 began to gradually rise, reaching 66 articles in 2006, 103 articles in 2008, 210 articles in 2010, reaching a small peak of 367 articles in 2014, another small peak of 635 articles per year in 2020, and a small drop to 595 articles per year in 2022, and a small peak of 641 articles per year in 2024 to 2021 a small decline to 595 articles per year, 2022 and gradually began to rise to 668 articles per year, 2023 ushered in the highest peak of 641 articles, 2024 to December 1 as of now there are only 258 documents. It can be seen that as time progresses people are beginning to pay more attention to the relationship between colour and children. There is a growing concern for children's physical and mental health, and colour is believed to positively influence children's emotional and mental health. Different colour environments have a significant effect on the cognitive abilities of young children (Jiang, 2024). colour education is also seen as a way to develop children's understanding of and respect for different cultures in contemporary social environments. Modern educational philosophies increasingly emphasize individualized and multi-sensory learning, so colour, as an important part of the visual element, is considered an effective tool for promoting children's learning and development. It is because of the combined effect of these factors that society's emphasis on the role of colour in children's development has been promoted, and so has fostered the development of research and practice in related fields.

5 BIBLIOMETRIC ANALYSIS OF “CHILDREN'S ROOM COLOUR”

Children's room is the place where children stay for a long time and spend at least half of their family activities. Reasonable and beautiful children's room design can develop children's independent living ability. Children are more sensitive to colour perception and will be attracted by some bright colours, and many bright colours promote the development of children's visual imagination (Liu, 2023). Children's room as a place for children to read, play and sleep, the colour design is different from the colour of the environment where adults live. Children are in the period of growth and development, active by nature, observe things more sensually, and feel more simple and sensitive to colour.

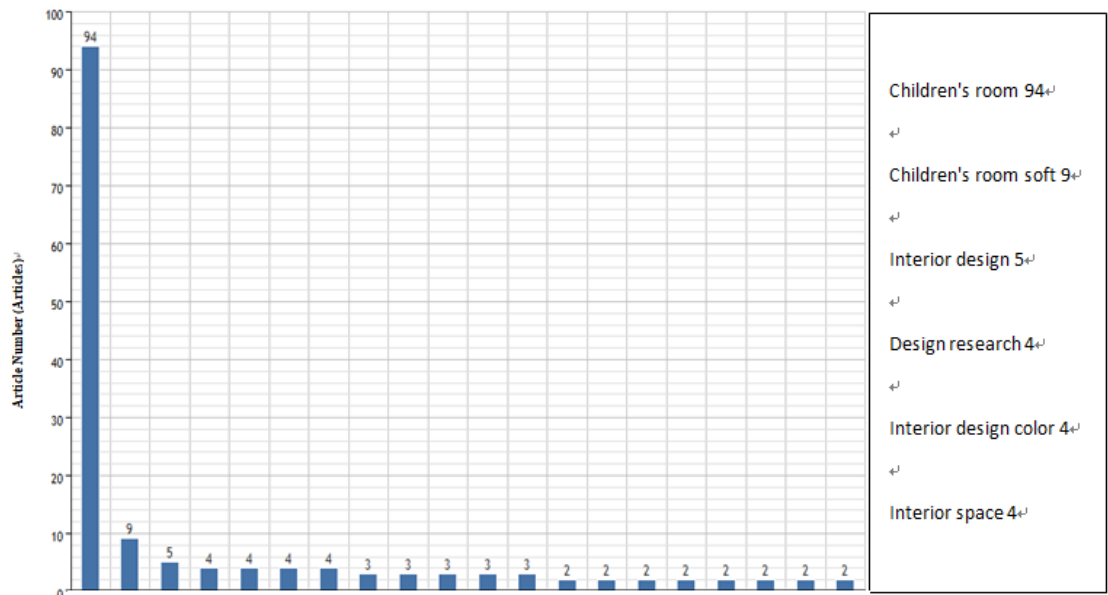


Figure 7: Distribution of Major Themes in the Literature

In the Chinese CNKI search, with “children's room colour” as the keyword, 146 relevant results were retrieved, and the distribution of literature topics in Figure7 showed that “children's room” accounted for the highest proportion of 94 documents, “children's room soft furnishings” had 9 documents, and “interior design” had 5 documents. The theme of “children's room soft furnishings” has 9 documents, and the theme of “interior design” has 5 results. The theme of “design research” has 4 literature results, and the theme of “interior colour design” has 4 literature results. Because the colour of children's room is a relatively new field of study, it has not received

enough attention and development, so the literature on the topic of children's room colour is relatively insufficient, but as people pay more attention to children's growing environment and mental health, more and more studies have begun to explore the impact of different colours on children's cognition, emotion and behavior, so the research in this field is gradually increasing.

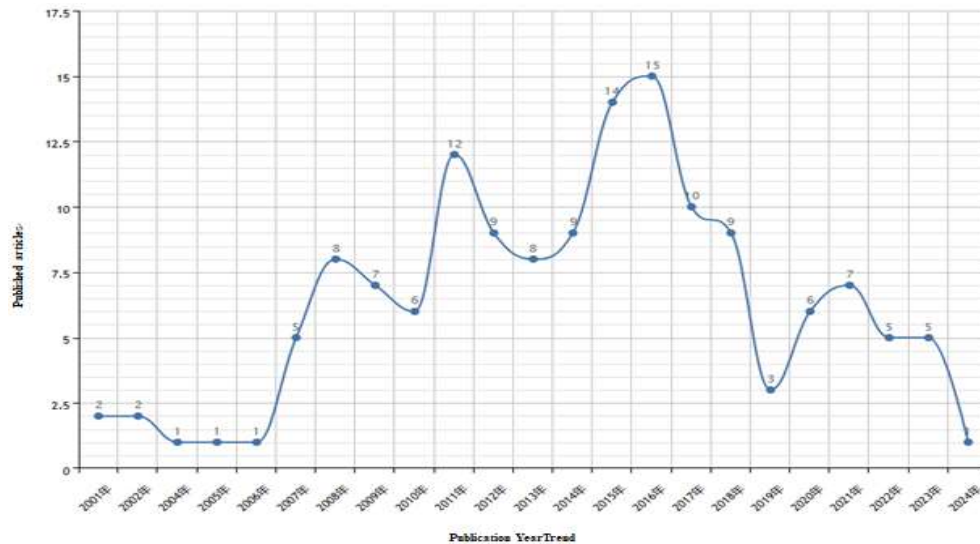


Figure 8: Distribution of literature by year of publication

As seen in the distribution of Figure8 literature publication years, the children's room colour literature only began to be published in 2001, but has been in a slump, to a small increase in 2008 published 8, 2010 fell to 6, 2011 rose to 12, 2013 and then fell to 8, 2015 began to rise to 14, 2017 fell to 10. In 2021, 7 articles were published and by 2023 only 5 articles were published. The instability and frequent changes in the distribution of years can be seen in the graph of the distribution of years of publication in the literature. The instability and frequent changes indicate that over time, children's room colour in researching different topics can lead to a change in the trend of literature publication. Also the research methodology may lead to instability in the year distribution of literature. Therefore, instability and frequent changes in the distribution of literature years may also be the result of a combination of factors, which reflects the dynamic changes and trends in the field of research.

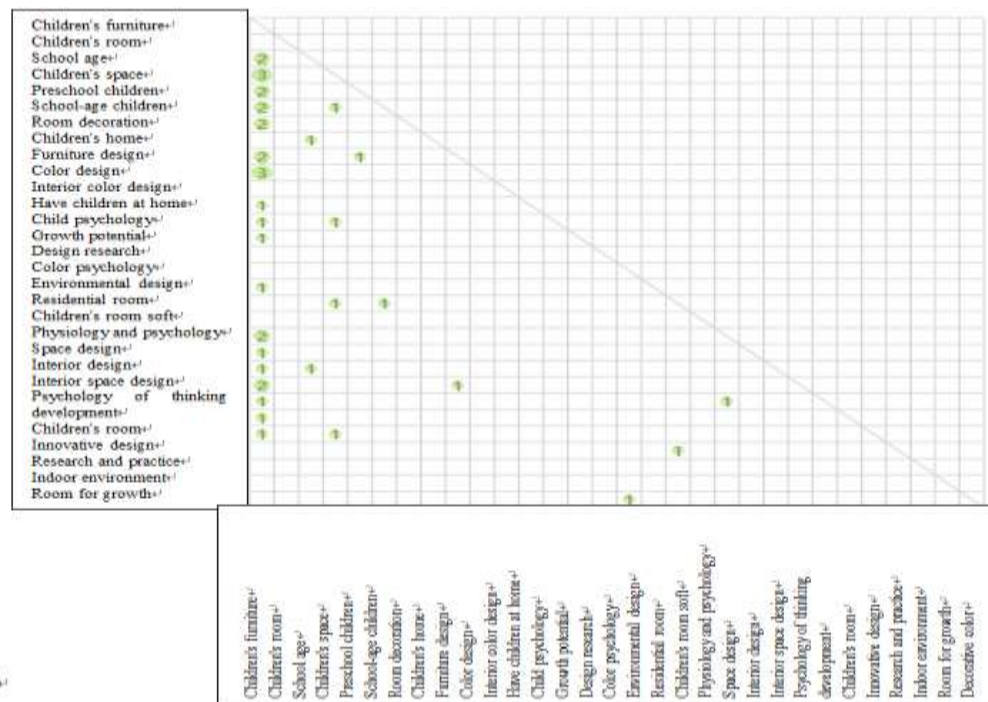


Figure 9: Literature theme co-occurrence matrix analysis

In the analysis of Figure 9 theme co-occurrence matrix, we can see that “children's space” and “children's furniture” co-occur 3 times, “colour design” and “children's furniture” co-occur 3 times, and “physiology and psychology” and “children's furniture” co-occur 2 times. “children's furniture” 3 times, ‘physiology and psychology’ and ‘children's furniture’ 2 times, from which it can be seen that the choice of colour in children's room needs to be coordinated with the children's spatial environment, to form a unified and harmonious visual effect, as well as a unified and harmonious visual effect. From this, it can be seen that the choice of colour in children's room needs to be coordinated with the children's spatial environment to form a unified and harmonious visual effect, as well as the colour has an important influence on children's physiology and psychology.

6 DISCUSSION

This section is a review and discussion of the literature related to the impact of colour on children's room interior design on children's room interior spaces. colour matching has a profound impact on the visual image shaping of interior space and the psychological feeling of users (Zhao,2024). Interior design relies heavily on colour schemes because they are key factors in expressing emotions and creating visual impact in a space (Enwin et al.,2023).

In interior design, colour schemes can not only create a design atmosphere, shape the design style, highlight the designer's aesthetic ability, and reveal the user's own personality, but also the characteristics of colour, can regulate and arrange the space, light and shadow, enhance the aesthetics of the design, improve the comfort of use, and make the design more in line with people's psychological comfort zone (Chen,2022). colour brings spirit and vitality to interior space, how colour is used is very important for interior design, regardless of the size of the space, colour can be used to create and change its tone. They are a very powerful tool in interior design and therefore can create various illusions in a space, if the colour is not chosen correctly, a small room may appear larger or smaller, one of the most important solutions is colour when the architecture itself does not allow for changes and flexibility (Ćurčić et al.,2019). In the section 3 of this study, the bibliometric analysis of “interior design and colour” shows that “interior design and colour” is of interest to researchers, and the research is influenced by the industry.

In the indoor space environment, by choosing the right colour, it can affect the emotional state and psychology of the occupants, in the children's room in the indoor space environment colour is related to the visual and cognitive development of children, but also related to children's psychological and physiological, then for the

colour design of children's room, it is important to consider that the colour in the indoor space environment has an impact on the physical and mental health of children as well. colour psychology is a discipline that studies colour as a determinant of human behavior, and every colour has a certain psychological value (Kraus, 2019). In section 4 of this study, the bibliometric analysis of "children and colour" shows that there is a growing concern for children's physical and mental health, and that colour is believed to have a positive impact on children's emotional and mental health.

Over time, people's psychological perception of the colour of the interior environment can change dramatically, affecting not only the visual aesthetics of the interior design, but also its practical usability. Different colours have different impacts and associations in people's psychology, and the lightness and darkness of colours can also have an impact on mood (Ren, 2023). While satisfying the functionality of the space, the matching and use of colours from safety to personalized considerations affect children's personality and mood, and play an important role in children's growth (Fan, 2021). Therefore, when using colour psychology, designers can better design children's rooms to meet children's physiological and psychological needs, and at the same time improve the overall quality of the children's room spatial environment. In section 5 of this study, the bibliometric analysis of the literature on "colour in children's rooms" shows that colour in children's rooms is a relatively new field of study that has not yet received enough attention and research.

Living space and indoor spatial environment are closely linked, while the living space is also part of the indoor spatial environment, the indoor spatial environment determines the basic characteristics of the living space, and together they build a complete living environment. The children's room is a separate area in the living space. Children's room is the space used by children in different periods, which is not only the children's bedroom, but also the children's communication site, learning occasion, game occasion, rest occasion (Lan, 2017). The colour of children's living space is particularly important for the indoor spatial environment, not only to meet the children's current living needs, but also must consider their needs change (Xu, 2017). With the growth of age, children's perception and preference for colour is bound to change. In the living space, the children's room as one of the areas, the colour should be coordinated with the colour scheme of the entire living space, so as to be integrated into the entire range of colours of the indoor spatial environment, in order to maintain the overall beauty and consistency.

In the interior colour only give full play to the functional characteristics of colour, rational use of colour, in order to achieve unexpected results, together to create a comfortable and perfect space. Interior design is inseparable from colour, especially in the application of children's room design. colour on children's psychology, health and cognitive development and the overall spatial atmosphere have an impact on the role of colour in the indoor environment and the impact of colour is also the result of the feeling of colour, the colour of the indoor environment will have a direct impact on the physiology and psychology of people and many aspects of behavior. Therefore, the colour in interior design is the role and influence of the close combination of colour and environment.

6.1 RESEARCH GAPS

In the analysis, colour has an effect on both the space and furniture of children's rooms, and these factors affect children's psychological and physiological health, but there are relatively few studies on the long-term psychological and physiological effects of children's room colour design on children, and there is only one piece of literature retrieved from China's CNKI database, so we need to find out the long-term impacts of colour design on children's growth and development by conducting more long-term tracking studies. Therefore, more long-term follow-up studies are needed to understand the long-term effects of colour design on children's growth and development. Educational issues and living environments are important, especially children's rooms where children spend a long time in contact, and their colour schemes have an important impact on children's physical and mental growth (Lv, 2019). Psychologists have found that colour has a regulating effect on children's mental activities, influenced by the colour of the surrounding environment, children in the process of development and growth, the change of colour has a significant significance on the development of the child's right brain development, physiological and psychological health and personality development (Zhen, 2017). colour is not only a visual language, it is a way to spread emotions, it has a more rapid communication ability than language, so in the design of children's room space, colour can be used as a bridge of communication, as a

special way to communicate with children. colour not only affects the visual aesthetics of interior design, but also affects its practical usability. However, in the past 30 years, there have only been 146 studies on "children's room colour", which requires more researchers to pay more attention and research. Children's room colour design is affected by children's age, personality, physiological and psychological aspects, so it is necessary to give comprehensive consideration to a variety of factors, in order to meet the practicality of the basis of designing a living space more in line with the physiological and psychological development of children, to maximize the value of colour, so as to improve the overall quality of the children's room (Guan, 2021). In the design of children's space, it is necessary to choose the colour carefully, consider whether the colour will have a physiological impact on children's healthy development, and choose the colour suitable for children, so as to create a warm and comfortable spatial environment for children (Dai et al., 2021).

Currently, we have limited knowledge of how colour in children's rooms systematically shapes children's psychological state and physical health during their growth. Therefore, these studies should fill the existing knowledge gaps and reveal the complex relationship between colour environments and children's long-term psychological adaptation, emotional regulation, cognitive ability, and physiological health, so as to provide proper guidance for the design of children's rooms.

6.2. RESEARCH LIMITATIONS AND RECOMMENDATIONS

As children grow into an individual, the colour scheme in a child's room environment can have an impact on them. However, there are a number of challenges to studying this area, and ensuring the continuity and reliability of data becomes critical in this long-term research process. Relatively few studies have been conducted on the long-term psychological and physiological effects of colour in children's rooms; children's development is a long-term process, and sample attrition and difficulties in tracking are a challenge when studying the long-term effects of children's room design and colour on children. It is recommended that long-term tracking studies be conducted according to the research objectives in order to observe the effects of children's room design and colour on children's long-term development. A combination of quantitative and qualitative research methods is used to gain a more comprehensive understanding of children's responses to children's room design and colour.

7. CONCLUSION

This study depicts bibliometric analysis of the literature related to interior design and colour in children's rooms in China. Through the bibliometric analysis of the literature related to interior design and colour in children's rooms in China, we not only reveal the research trends, hotspots, and gaps in the field, but also provide useful references for future research directions. From distribution of the main topics in the literature, distribution of literature by year of publication and literature theme co-occurrence matrix analysis it is understood that the research on interior design and colour of children's rooms in China has shown a growing trend year by year, and the scope of research is gradually expanding. This study not only helps us to understand more comprehensively the importance of children's room interior design and colour in children's development, but also provides interior designers and parents with a scientific basis to guide more rational and effective children's room design.

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