

The Influence of Illustrations in Literary Texts on Children's Reading Comprehension

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Abstract: This study investigates the influence of illustrations in children's literature on reading comprehension. The research addresses the existing lack of standardized experimental designs in the field and focuses on enhanceable aspects, such as excluding previously exposed subjects, fixing reading time for students, selecting high-quality classic children's literature texts, conducting the experiment within real classroom settings, and observing students' attention span during reading. The subjects consist of fifth-grade students from representative elementary schools in urban and rural areas in China. The experimental materials include different book types: mere text, text with original illustrations, and text with secondary illustrations. Through multiple-choice questionnaire and data on reading comprehension scores, preference, willingness to continue reading, and distraction levels, the study aims to provide valuable insights for educators, authors, and publishers to enhance children's literary engagement and comprehension. The results of the study suggest that the presence of illustrations and differences in the quality of illustrations do not significantly affect children's reading comprehension but do influence children's first impressions and choices when selecting books. The results provide useful insights for children's book publishers and children's book illustrators when providing illustrations for children's books.

Keywords: illustrations in literary texts, children, reading comprehension

1. Introduction

Illustrations play a paramount role in contemporary children's literature. Notably, in venues like Blackwell's bookshop and the Botanic Gardens in Oxford, one can readily encounter John Tenniel's iconic original illustrations adorning every copy of Lewis Carroll's *Alice in Wonderland* and various cultural items related to the story. These illustrations have attained such widespread recognition that they have become nearly as renowned as the books themselves [1]. Evidently, it comes as no surprise that when C.S. Lewis's masterpiece *The Lion, the Witch and the Wardrobe* was awarded the title of best children's book by the British Book Trust in 2008, the illustrations by Pauline Baynes were deemed instrumental. In his letter to Baynes, Lewis himself also recognized and emphasized the collaborative significance of both the text and the illustrations [2].

The history of children's book illustration dates back to the mid-seventeenth century, yet the true Golden Age of Illustration was in the late 19th and early 20th centuries, where the invention of the printing press enabled greater access to literature and a rising middle class demanded books for children. Renowned illustrators like George Cruikshank, John Tenniel, and Walter Crane emerged

during this period, each leaving their mark on children's literature with their distinct artistic styles. Beatrix Potter's pastel watercolor illustrations and Edward Lear's whimsical drawings also exemplified the diversity of this era [3].

Notwithstanding their reputation and widespread recognition, high expectations have also been placed on the role that these illustrations play in the teaching and learning process of teachers. They are expected to encourage students to creatively engage with literary themes, fostering meaningful aesthetic experiences and inspiring exploration of future literary texts [4]. Therefore, a pertinent question arises: do these illustrations truly have the anticipated positive impact on children's comprehension and understanding of the books?

2. Literature Review

In the realm of existing literature, scholarly opinions diverge on this matter. Some researchers posit that the visual effects induced by illustrations do not exert a substantial impact on children's reading comprehension during the actual reading process. Conversely, there are those who firmly contend that illustrations do indeed wield a significant influence on children's comprehension. Additionally, certain scholars advocate for a nuanced approach, asserting that factors such as the quality, style, colors, and layout of the illustrations necessitate careful consideration, rather than settling for a simple binary argument regarding their overall effect.

For example, an empirical study conducted by Jamye Brookshire, Lauren FV Scharff, and Laurie E. Moses delved into this subject. The study explored the influence of illustrations in original children's literature, with a focus on variables such as the degree of color brightness and darkness, and whether the illustrations' style was realistic or abstract. The findings from this study revealed a significant impact of illustrations on children's comprehension of the story's content. Moreover, the style of illustrations exhibited a notable influence on children's preferences for the literature [5]. Still, in the study done by Greenhoot, A. F., Beyer, A. M., & Curtis, J, interaction with a companion reader was taken into account, and the results of the study indicated that preschoolers' ability to recall the content of a book through the illustrations was enhanced when accompanied by their parents [6]. Nevertheless, an experiment conducted by Elizabeth J. O'Keefe and Robert T. Solman with fifth-grade students in Australia yielded different results. The study explored various factors related to illustrations, such as their presence or absence, their placement before or after the text, and the number of illustrations (2 or 3). Surprisingly, the findings indicated that these factors did not have a significant impact on children's reading comprehension [7]. The contrasting outcomes between the two studies may be attributed to the manner in which the variables for illustrations were set and the approach employed to assess reading comprehension. It is evident that the design and implementation of illustration-related variables, alongside the chosen methods of evaluating comprehension, significantly contribute to the observed differences in the study results. These crucial aspects should be taken into consideration while interpreting and comparing findings from different research endeavors.

In a meticulous 2020 meta-analysis, the researcher compiled and analyzed data from 39 past empirical studies, focusing on their variable settings and assessment methods. The literature review revealed substantial areas for improvement in the experimental design of existing studies. Key aspects that require attention include accounting for subjects' prior knowledge of the experimental materials, effectively dividing age groups of students, pre-assessing students' reading abilities, ensuring a fixed reading time for students, and carefully selecting appropriate test texts, etc [8]. Addressing these aspects in future research endeavors holds the potential to enhance the methodological robustness and validity of investigations exploring the impact of illustrations on children's reading comprehension.

Given the identified areas for improvement in existing experimental conditions, this study will strategically focus on enhancing the following aspects in the experimental design:

- Exclusion of Previously Exposed Subjects:** To ensure a controlled environment, subjects who have been exposed to the selected reading materials will be excluded from the experiment. This measure aims to minimize any confounding effects that prior familiarity with the texts may introduce.

- Fixed Reading Time:** To maintain consistency and avoid potential variations in comprehension due to differing reading durations, students' reading time will be standardized and fixed for all subjects during the experiment.

- Selection of High-Quality Classic Children's Literature Texts:** In order to provide a rich and engaging reading experience, high-quality classic children's literature texts will be carefully chosen as the experimental materials. These texts are known for their captivating storytelling and enduring appeal to young readers.

- Real Classroom Environment:** The experiment will be conducted within a genuine classroom setting to simulate real-world reading conditions. This approach aims to create a familiar and comfortable atmosphere for the subjects, promoting more natural reading experiences.

- Observation of Students' Attention Span:** To gain insights into the potential influence of illustrations on students' attention and focus during reading, this study will also observe and assess students' attention span throughout the experiment.

By focusing on these enhanceable aspects in the experimental design, this study aims to strengthen the validity and reliability of its findings and contribute valuable insights into the impact of illustrations on children's reading comprehension.

3. Method

A reading experiment was conducted in an authentic classroom setting to primarily investigate the effects of illustration variables on children's reading comprehension. The experimental design involved the following components:

3.1. Experimental Materials

3.1.1. Book Selection

The experimental study utilized the first two chapters of the book *The Lion, the Witch, and the Wardrobe* as the designated reading material. To investigate the influence of different presentation formats on children's reading comprehension, three distinct versions of the material were created:

- Mere Text (T):** This version comprised the plain text of the first two chapters, devoid of any illustrations or images.

- Original Illustration (O):** This version incorporated the original illustrations as they appeared in the book, accompanying the text of the first two chapters.

- Reprinted Illustration (R):** This version encompassed reprinted illustrations derived from subsequent published versions, accompanying the same text of the first two chapters.

To ensure consistency in textual content and page layout, all three versions of the reading material underwent appropriate reformatting (see Figure 1). An equal number of materials were prepared for each version, totaling 150 (slightly exceeding the total number of students tested) to prevent potential issues such as materials being damaged or lost.

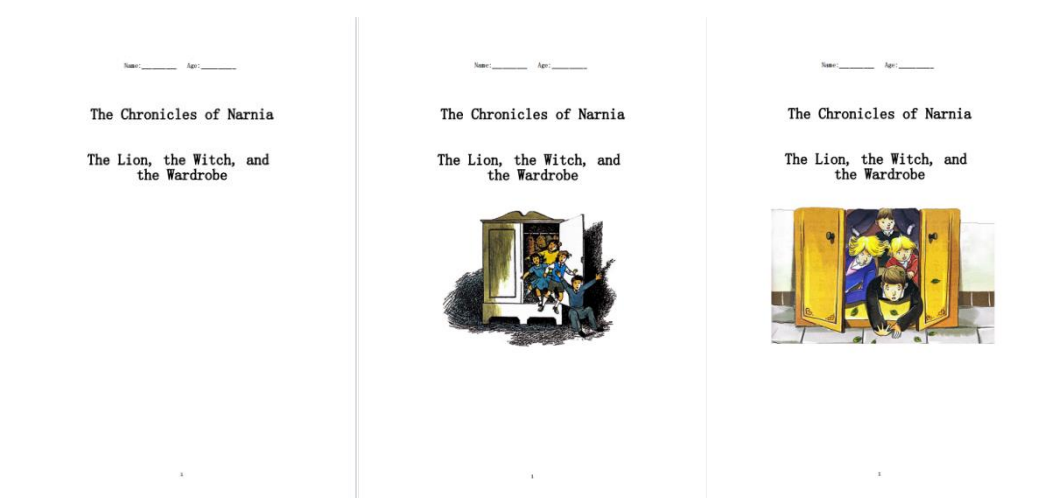


Figure 1: Covers for the three versions of the reading material.

3.1.2. Comprehension Questionnaire

A comprehensive questionnaire was meticulously developed to assess the impact of reading on various cognitive aspects. This questionnaire comprises a meticulously crafted set of questions that have been specifically designed based on different question sources. Each question is tailored to evaluate students' comprehension and understanding of the text, taking into account specific sources of information. For instance, if the answer to a question can be found in both the Original Illustration (O) and Reprinted Illustration (R) versions, the source is appropriately marked as O+R (see Table 1).

Table 1: Reading comprehension questionnaire.

Source	Question
O+R+T	The total number of children who were sent to the old professor's house in the countryside was ____.
O+R+T	Lucy entered the world of Narnia through ____.
O+T	When Lucy first entered the world of Narnia, she was headed in the direction of ____.
O+R+T	The creature Lucy encountered in the world of Narnia is ____.
O+T	Tamnath's little cave was put full of ____.
R+T	Tamnus played ____ for Lucy.
O+R+T	After informing Lucy of the real reason for inviting her, Tamnas felt ____.
R+T	The controller of the world of Narnia is ____.
O+R+T	Did Tamnath send Lucy home?
T	The game the children played before Lucy entered the world of Narnia is ____.
O+R	Among the children, there are ____ boys; there are ____ girls.
O+R+T	Narnia World has always been ____.
To what extent do you have the will to continue to finish the book?	
NO ☆☆☆☆☆ YES	

3.2. Sample

The study encompassed a sample of 128 children selected from three schools situated in Huining County, Baiyin City, Gansu Province, China. The subjects were chosen using a convenience sampling

approach. The selected schools were specifically chosen to represent socioeconomic backgrounds and academic performance levels that were relatively unsatisfactory. The subjects included students aged between 8 to 12 years old, with a predominant representation of students in grades 3 to 6. It is important to note that all selected students had no prior exposure to the experimental materials, ensuring that their familiarity with the content did not influence the study's outcomes. Additionally, their willingness to participate in the experiment was confirmed, further ensuring their active involvement and engagement.

3.3. Experimental Conductor

A team of four experienced residential social workers from the local school was carefully selected to serve as conductors for the experiment. Their responsibilities included overseeing the implementation of the experiment and accurately recording the necessary data. To facilitate the smooth execution of the experiment, all required materials, including printed reading materials and the reading comprehension questionnaire, were prepared and dispatched to the conductors. Additionally, a detailed teaching plan for the experimental class was provided, along with clear instructions on how to record students' book choices and distraction rates. To ensure consistency and adherence to the experimental protocols, all conductors were furnished with comprehensive online guidelines. These guidelines offered detailed instructions and guidance on effectively conducting the experiment and adhering to the standardized procedures.

3.4. Experimental Procedure

3.4.1. Reading Time (20 Minutes)

- Each child was given the freedom to choose their preferred book version without any external influence or hints. If the class size was less than 30, the remaining editions of 5 books were recorded. If the class size was more than 30, the remaining editions of 10 books were recorded. The children's preference for the book versions was determined based on the remaining editions, ranked from least to most favorite.

- Once each child had selected their desired book, they were instructed to read independently. During the reading session, any child who experienced a distraction lasting more than 3 minutes was marked as "distracted." The distraction rate was then considered when evaluating the subjects' level of interest.

3.4.2. Questionnaire (5 Minutes)

After the reading period, the conductor distributed a questionnaire to each child. The questionnaire consisted of twelve multiple-choice questions, assessing their comprehension of the text they had just read. Additionally, the questionnaire included a willingness-to-read rating question. The responses to the multiple-choice questions were utilized for the comprehension analysis, while the willingness rating was taken into account for assessing the subjects' interest level.

3.4.3. After-Class Activity (15 Minutes)

Following the completion of the questionnaire, the conductor engaged the subjects in extension activities such as story continuation and drama interpretation. This 15-minute activity was designed to create an authentic classroom environment and optimize the use of class time.

Additionally: It is important to note that the after-class activity was not conducted for the purpose of data collection. All subjects were requested to provide their name, gender, age, and grade information on the reading materials to facilitate subsequent data collation and analysis.

4. Result

After excluding the questionnaires with missing answers, the valid sample size for Groups O and R was 42, while the valid data size for Group T was 35, giving a total sample size of 119. The overall picture of the four quantitative variables is shown in the table 2.

Table 2: Overall descriptive data of four variables.

Book Version	Book Preference	Distraction Rate	Average Score of the Questionnaire	Average Score of the Willingness
T	Least	14.29%	7.63	9.4
O	Medium	11.9%	7.88	9.39
R	Top	9.52%	8.07	9.33

To investigate the effects of different versions of the reading material on children's reading comprehension, a one-way analysis of variance (ANOVA) was conducted. The grouping variable was the version of the material (T, O and, R), and the variables of interest were distraction rate, total score of comprehension questionnaire, and willingness to read while the book preference has been counted separately. Particularly, to further explore whether children's reading comprehension accuracy is affected by the version of a particular question source, multiple-choice question sources will be categorized, and versions with high expected correctness will be compared to versions with high actual correctness.

Table 3: One-way analysis of variance (ANOVA).

Analytic Term	Intergroup Variation	Total Deviation	Partial Eta-square	Cohen's f-value
Distraction Rate	0.041	12.281	0.003	0.058
Questionnaire Score	4.497	563.754	0.008	0.09
Willingness	2.327	422.632	0.006	0.074

As shown in table 3, based on the total score of the questionnaire, the Eta-square value was 0.008, indicating that 8% of the variance in the data originated from differences between groups, and the Cohen's f value was 0.09, indicating that the data were quantified as having a very small degree of difference in the quantification of the effect. The Cohen's f values for the other two variables, distraction and willingness, were less than 0.1, meaning that the degree of difference in the quantification of the effect for these two variables was again a very small degree of difference. Based on preliminary inferences, it is clear that neither the presence of illustrations nor differences in the quality of illustrations had a significant effect on children's reading comprehension, willingness, and distraction rate.

After incorporating the problem sources for further analysis, it can be found that questions sourced from both original and reprinted illustrations (OR, ORT) yielded high scores overall. Questions with reprinted illustrations (RT) also received high scores. However, questions with original illustrations (OT) had relatively lower scores, and questions with mere text (T) had the lowest scores. Although illustrations did contribute to children's reading comprehension through detailed analysis, it seemed that they have faced some difficulty in comprehending the material presented through original illustrations (see Figure 2). Overall, the effect of illustrations on children's reading comprehension, although the overall difference was not significant, was still evident in the details.

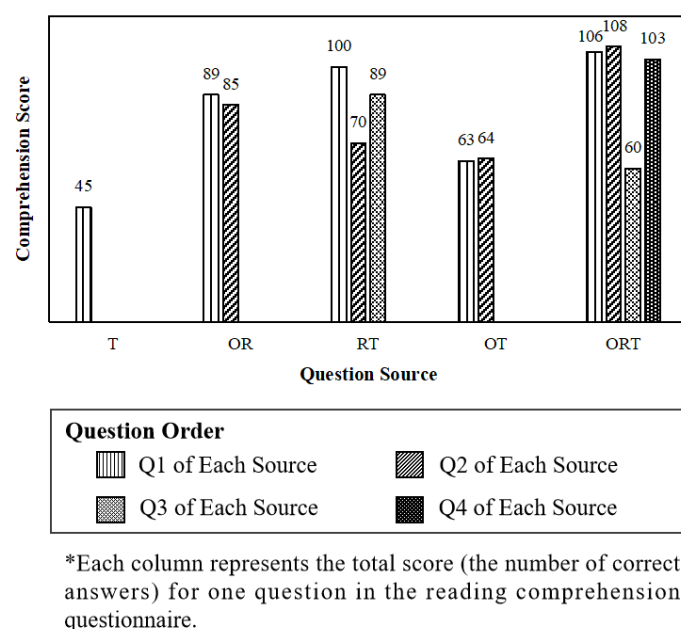


Figure 2: Influence of illustrations.

It is relatively more obvious that when it comes to the choice of version preference based on the first impression of the book cover, it can be seen that the two editions with illustrations were overwhelmingly preferred by children by 42% more (see Figure 3).

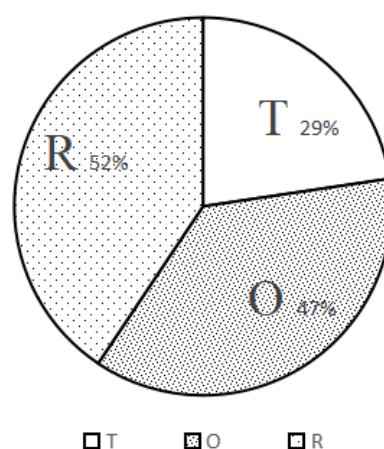


Figure 3: Proportion of children's book preference.

5. Discussion

The results of this study indicated that the presence of illustrations did not have a significant effect on children's reading comprehension levels (as measured by total scores on the Comprehension Questionnaire), and the reason for this may be that, as explained by dual coding theory, illustrations have the opposite effect of distracting children from the text in grades 3 to 6 [9]. However, it is worth noting that illustrations did have an impact on children's initial book edition choices. The importance placed on illustrations by publishers and the quality of the illustrations remain important factors to consider, as they can significantly influence children's initial preferences for certain editions.

Interestingly, children's performance on comprehension questionnaires varied by illustration type. Children tended to perform better on comprehension questions using reprint illustrations compared

to questions using original illustrations. This suggests that the brighter colours and clearer presentation of the reprint illustrations may have contributed to more effective comprehension of the story, which is consistent with the previous study of Brookshire, J., Scharff, L. F., & Moses, L. E [5]. However, it is worth noting that this difference in comprehension does not necessarily indicate that children had a better aesthetic experience, and this effect is often implicit. Children's lack of explicit judgements about the quality of illustrations should not be interpreted as a signal of reduced demand for illustrations in children's books.

In conclusion, although this study did not find a substantial effect of illustrations on children's reading comprehension levels, it However, it emphasises the impact of illustration as a visual medium for the first impression that children make when making book choices. Without precisely controlling for precise variables among the different illustrations, the results of the study are consistent with previous research: the effect of illustrations on children's reading comprehension is not as significant as one might think. However, in comparison to previous studies, this study further suggests that the impact of visual impact on first impressions, which in turn can influence children's book purchasing choices. As C.S. Lewis, the author of *The Chronicles of Narnia*, revealed in his autobiography, illustrations depicting scenes from Norse mythology inspired his imagination and the depiction of "spoken animals" in *Peter Rabbit* fueled his creative drive [10]. Quality illustrations have the power to draw readers into the story, allowing them to vividly imagine the narrative and making the reading experience more enjoyable and immersive. Even if the immediate impact on comprehension and retention might not always be apparent, illustrations undoubtedly enrich children's reading experiences by encouraging their creativity and enabling them to explore new realms of imagination. Therefore, publishers and educators should recognise the important role illustrations play in influencing children's initial book choices and stimulating their interest in literature. Future research could further explore specific aspects of illustrations that appeal to young readers and examine how illustrations can be optimised to support comprehension and aesthetic experiences in children's books.

The present study has some limitations that should be acknowledged. Firstly, the reading level of the experimental sample was relatively low, and the sample was geographically concentrated, which may limit the generalizability of the findings to a broader population of children. Additionally, the sample might not be fully representative of the overall reading level in the target age group, which could impact the external validity of the results.

Secondly, the experiment used illustrations from books published by actual publishers, and therefore failed to precisely control for differences between illustrations (e.g. light or dark, realistic or abstract, etc.), and the original illustrations could only be judged to have a high aesthetic appreciation based on the market and the ratings given to the book illustrations by critics.

To address these limitations and further advance the understanding of the influence of illustrations on children's reading comprehension, future research could take the following directions:

- Diverse and Representative Samples: Conducting the experiment with a more diverse and representative sample, including subjects from various geographical regions and with a wider range of reading levels, would enhance the generalizability of the findings.

- Equally Sourced Questions: Ensuring that questions are evenly sourced across all versions of the reading material would enable a fair and accurate comparison of the comprehension outcomes between different groups. This may involve randomizing the distribution of questions or using a balanced design.

- Exploring Inspiration for Teaching Methods: Research could delve into how illustrations can inspire innovative teaching methods and pedagogical approaches. Educators can be encouraged to creatively integrate illustrations into their teaching materials and classroom activities to enhance students' engagement and comprehension of literary texts.

6. Conclusions

In conclusion, this study investigated the influence of illustrations in literary texts on children's reading comprehension. While the presence of illustrations did not show a significant impact on overall reading comprehension levels, it did play a pivotal role in shaping children's initial book edition preferences. The publisher's attention to the quality and design of illustrations remains crucial, as they significantly influence children's book choices. Furthermore, the study revealed that children performed better on comprehension questions sourced from reprinted illustrations compared to those sourced from original illustrations, suggesting the potential benefits of clearer and more vibrant visuals for comprehension. Despite the absence of a statistically significant effect, the importance of illustrations in engaging young readers, sparking their imagination, and fostering a love for reading cannot be understated. High-quality illustrations continue to be an essential aspect of children's literature, enhancing the overall reading experience and igniting children's curiosity and interest in books. Future research should further explore the specific elements of illustrations that captivate young readers and investigate how illustrations can be optimized to support both comprehension and aesthetic experiences in children's reading materials. As educators and publishers continue to embrace the significance of illustrations, children's literature can be enriched, inspiring a generation of avid readers with new perspectives and meaningful connections to the literary world.

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