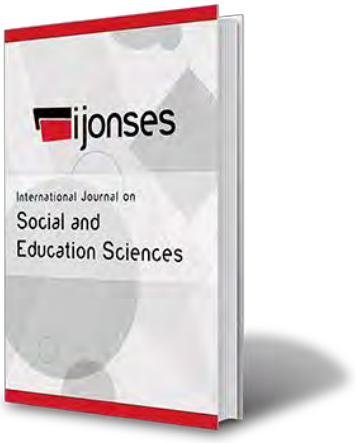

www.ijonses.net

Children's Reading of Visuals in Informational Picturebooks and Biographies

Sunah Chung
University of Northern Iowa, USA

To cite this article:

Chung, S. (2024). Children's reading of visuals in informational picturebooks and biographies. *International Journal on Social and Education Sciences (IJonSES), 6*(3), 409-426. https://doi.org/10.46328/ijonses.678

International Journal on Social and Education Sciences
2024, Vol. 6, No. 3, 409-426 https://doi.org/10.46328/ijonses.678

Children's Reading of Visuals in Informational Picturebooks and Biographies

Sunah Chung

Article Info

Article History

Received:
05 March 2024
Accepted:
30 June 2024

Keywords

Visuals
Informational picturebooks
Biographies
Shared reading
Case study

Abstract

Visuals in picturebooks play an important role in supporting children's reading comprehension and literacy development. This qualitative case study analyzes three American families' shared reading practices at home by analyzing their online surveys for family literacy environments, reading logs for a month, mother interviews, and video observation of their shared reading at home. The analysis of the collected data categorizes children's responses to visuals into three major themes: reflecting personal preferences and thoughts on visuals, interpreting visuals based on prior knowledge, and misreading visuals that interfere with understanding content. The discussion focuses on the roles of visuals in informational picturebooks and biographies and parents' support of children's reading comprehension using visuals.

Introduction

As a compound term, a 'picturebook' emphasizes the inseparable link between written text and visual features in children's picturebooks (Wolfenbarger & Sipe, 2007). Picturebooks tell stories through the interplay of visuals and texts (Arizpe & Styles, 2015; Sipe, 2008). Visuals and texts provide information in tandem, whether identical, supportive, or opposing in meaning (Nikolajeva & Scott, 2000; Sipe, 1998; Unsworth, 2006; Unsworth & Cheirigh, 2009). Visuals in picturebooks require children to think more actively about the pertinent context and visual resources when they construct meaning (Kachorsky et al., 2017; Serafini, 2015), impacting reading comprehension overall (Guo et al., 2020). Indeed, studies using eye movement apparatus have documented 4- and 5-year-olds (Ann Evans & Saint-Aubin, 2005) and third-grade children (Feathers & Arya, 2015) actively using visual information when they read picturebooks.

Visuals are used to understand the content better, and they are not limited to fictional storybooks. Informational picturebooks and biographies fall under the nonfiction category and are designed with the intent for children to explore the world and content-area knowledge (Baker et al., 2017; Dreher, 2000) by learning particular linguistic features and discipline-specific knowledge and vocabulary (Duke & Bennett-Armistead, 2003). The organized illustrations and photographs in informational picturebooks and biographies convey unwritten messages to readers. As the role of visuals in informational picturebooks and biographies is significant as a supporting tool for readers' comprehension, it is necessary to explore children's responses to visuals in informational picturebooks

and biographies.

In particular, mother-child interactions are children's primary literacy practices in a social context (Rogoff, 2003; Vygotsky, 1978). Shared reading is an enjoyable literacy practice, as 85% of 3- to 5-year-olds' parents in the United States read books to their children more than three times a week in 2019 (National Center for Education Statistics, 2021). As a knowledgeable adult, a parent provides appropriate guidance and encouragement to help the child complete challenging tasks and maximize learning. In literacy practices, a parent's responses to a child's needs and interactions invite the child to actively engage in reading rather than becoming a passive listener. Parents also actively interact with children when reading informational picturebooks. Studies demonstrate that mothers' extra-textual talk increase when reading informational picturebooks by adding comments, feedback, and questions related to the content (Potter & Haynes, 2000; Price et al., 2009; Torr & Clugston, 1999). Moreover, mothers' sensitivity to children's cues and needs may optimize what the children learn from the interactions in shared reading (Mol & Neuman, 2014). Children can benefit from parents' support for them to ponder the meaning of visuals, connect daily experiences with the visuals, and express thoughts about visuals.

Shared reading has been a well-known home literacy practice, but scholars have pointed out children's limited exposure to informational texts at home: parents are likely to read narrative books with their child at home rather than informational books (Yopp & Yopp, 2006). In this sense, the current study aims to explore three children's responses to visuals in informational picturebooks and biographies in shared reading practices by the following question: *How do children read visuals to understand the content in informational picturebooks and biographies?* To better understand children's reading visuals in picturebooks, the following sections include research on picturebooks as tools for interplaying visuals and texts to deliver messages and studies on children's reading of scientific textbooks.

The Interplay of Visuals and Texts in Picturebooks

Picturebooks are unique in how they present stories, emphasizing the interconnection of words and images in a way that young readers can actively engage with (Nikolajeva & Scott, 2015; Wolfenbarger & Sipe, 2007). Numerous studies in the 1970s focused on the historical aspect of picturebooks and how words and images combined to enhance their methods of delivering information to readers (Kümmerling-Meibauer, 2018). Exploring how children develop literacy skills and enhance their reading using verbal and visual texts is essential. Scholars' works related to visuals and multimodal texts (Kachorsky et al., 2017; Serafini, 2014, 2020) improve our knowledge and awareness of how pictures and words work together. In particular, scholars have examined how children make meaning through visuals in picturebooks. For example, 2nd-grade children use visual information, such as colors and lines, and pictorial story content, such as characters' facial expressions and body posture, to understand the characters' emotional changes and contexts in stories (Prior et al., 2012). In other words, visuals provide pictorial information to children to gain insights into understanding characters' contexts and reactions. Second-language learners also utilize illustrations in storybooks to comprehend the contents when the text explicitly references the graphics (Verhallen & Bus, 2011).

In addition to images, picturebooks have other unique features that aid in supporting child readers' reading comprehension, such as typography (Pantaleo, 2012), paneling (Pantaleo, 2013), page layout (Lambert, 2017), and endpapers (Sipe & McGuire, 2006). These studies show how child readers use artistic features to comprehend the content. For example, fourth-grade students demonstrate their literacy skills of visual meaning-making skills using panels in graphic narratives (Pantaleo, 2013). Explicit instructions about paneling in stories support children to use visuals and their understanding of paneling to aid their overall comprehension of the literature. In this sense, reading and interpreting visuals in picturebooks benefit child readers' literacy development.

Reading Visuals in Scientific Textbooks

The benefits of reading with visual aids are emphasized in numerous studies focusing on visuals in specific disciplines, such as in scientific textbooks (Coleman et al., 2018; McTigue & Flowers, 2011; Stylianidou et al., 2002). In the context of high-stakes tests that require students' ability to interpret visual information, it is crucial to investigate children's interpretation of visuals and instructional strategies to support their reading comprehension and assess their literacy development. For example, scholars analyze science tests in standardized testing materials for late-elementary and middle-grade levels from 14 States in America (Yeh & McTigue, 2009). Their study shows that most graphics in the analyzed science tests contain either partial or all the relevant information needed for students to answer the questions correctly. Their findings remark that it is significant for students to have knowledge and literacy ability to read visuals, such as charts, graphs, and pictorial-type illustrations, when taking tests in the science content area. Other scholars also emphasize the significance of reading visuals to comprehend content (Roberts et al., 2015). Their study examines third graders' reading comprehension and shows a positive correlation between reading comprehension and reading visuals such as diagrams, timelines, and captioned pictures in informational text. A meta-analytic study also shows the overall positive effect of visuals on students' reading comprehension (Guo et al., 2020).

However, children may not fully benefit from reading visuals, although visuals in literature enhance readers' comprehension. Scholars demonstrate that second, fourth, sixth, and eighth-grade students often miss critical information from the visuals in science texts, although science diagrams support their comprehension of scientific concepts (McTigue & Flowers, 2011). Their study also informs that students sometimes do not recognize their misreading of visuals, such as a diagram, and move along their reading, resulting in misconceptions in science class. Another study points out that more than 30% of children in third to fifth grades show incorrect interpretations when reading maps in social studies textbooks and trade books (Roberts & Brugar, 2014). Other scholars also report that students have difficulties reading pictures in science textbooks, implying that visual representations are not always straightforward to readers (Stylianidou et al., 2002). An experimental study reports that visual diagrams in fourth-grade students' science texts provide minimal or no support to students' comprehension (Coleman et al., 2018). Overall, these studies highlight the benefits of reading visuals in texts focusing on disciplinary content, but at the same time, suggest that children may encounter comprehension challenges with visuals.

Commercial informational texts or biographies may not enhance children's ability to interpret science graphics as

they are likely to include photographs and drawings rather than diagrams (McTigue & Flowers, 2011). However, this literature can prepare young children to be familiar with visuals on science and social studies at earlier ages, which can be transferred to abstract visuals such as diagrams. Commercial picturebooks that cover broader topics are readily available for children in their local public library. As such, understanding children's reading of visuals in commercial informational picturebooks and biographies is important for children to have experiences and knowledge on various types of visuals and a broad range of disciplinary areas, such as science, math, social studies, and art. Informational children's literature is evolving into more complex and multimodal texts (Smith & Robertson, 2019), and the literature intends to "convey information about the natural, social, or physical world, and that has particular linguistic features to accomplish the goal" (Duke & Billman, 2009, p. 110). Thus, it is necessary to investigate how children respond to commercial picturebooks' visual representations in various content areas, as teachers are likely to adopt commercial picturebooks in their curriculum, and parents check out informational picturebooks and biographies from local libraries.

Theoretical Framework

This study is based on the premise that picturebooks are semiotic spaces in which texts and visuals work together to support child readers' meaning construction. Child readers construct meaning in a transaction with visuals, design elements, and written texts in picturebooks in and out of school settings. Reading and interpreting visuals is not seen as an innate ability and should be actively taught to children (Pantaleo, 2016; Prior et al., 2012; Serafini, 2014; Sipe, 2008). In the past, visual images and design elements were likely to be considered distractions instead of beneficial features to support a child's reading comprehension. However, recent studies have shown that visuals and design elements assist a child in building meaning in reading picturebooks. In other words, reading visual information is a crucial ability required for children to understand the content of picturebooks.

Scholars also assert multimodality, which explains people's communication using multiple and different modes and how visuals and texts intertwine to create meaning (Kress, 2010; Kress & Van Leeuwen, 2021). Scholars in children's literature and literacy also emphasize the conjunction of visuals and words, which enhance a "synergy" of meaning-making (Sipe, 1998), as even visuals in picturebooks play an integral role in understanding the content (Nikolajeva & Scott, 2000; Serafini, 2020). Thus, it is essential to understand how and to what extent child readers use visuals in picturebooks.

It has been noted that the process of interpreting visuals is "one's ability to transact with an image to construct meaning (Serafini, 2014, p. 31)." However, it does not mean that individuals effectively perceive and interpret the visuals as multimodal ensembles that incorporate various modes to tell a story and information. As it is described, "we see what we learn to see (Sipe, 2008, p. 18)," children will see and interpret within their knowledge and experience. Using picturebooks as educational resources for learning about diversity, inclusion, and information on nature and the world is an acquired skill that needs to be taught to enhance one's learning and literacy development. As parents play an essential role in their children's reading of picture books, exploring children's reading practices at home is necessary. As such, the present study intends to expand the understanding of children's reading visuals in informational picturebooks through the shared reading practices of three families.

Method

This study is one piece of a larger research project exploring parents' understanding of informational picturebook features. Parents' knowledge of informational picturebook features, such as structure and visuals, can help parents to actively utilize those features in interacting with children. In addition to parents' knowledge, the field must examine child readers' responses to visuals in informational picturebooks and biographies. As such, this study explores *How children read visuals to understand the content in informational picturebooks and biographies.* By adopting a qualitative case study (Creswell, 2012; Duke & Mallette, 2020), the current study explored how meaning is constructed among the participants in a particular event, in this case, shared reading practices. Families' reading practices in informational picturebooks are considered a bounded system or a particular event to understand the context of a mother and child's interactions in reading visuals in informational picturebooks. The three participating children's dialogues with their mothers while reading informational picturebooks were majorly analyzed to answer the research question.

Participants

This study recruited parents pursuing or earning a higher education degree across the campus at universities in the Midwest of the United States. The rationale is that educational backgrounds and occupations can provide stable and representative information compared to other criteria, such as family income (Price et al., 2009). Thus, the researcher expected that parents with higher educational backgrounds would engage with a child in more discussions when reading picturebooks than those with lower levels of education. Considering children's emergent literacy (Teale et al., 2018), the researcher expected to recruit child participants who are old enough to discuss content in informational picturebooks but have minimal elementary school experience, as literacy is learned concurrently and interrelatedly through interactions. As a result, three families were recruited, and pseudonyms were assigned to the participants to preserve anonymity. All three parents attend graduate programs at the College of Education.

Table 1 summarizes the three family's demographics and background information.

Table 1. Participating Families' Demographic Information

Mother's & child's name (age)	Higher Ed major	Racial background
Emma (39) & Liam (4)	Curriculum and Instruction	White American
Sophia (38) & Helen (6)	Curriculum and Instruction	White American
Sunny (40) & Mary (6)	Educational Psychology	Korean American

Three mothers reported reading books with a child at home every day. All the families read more than 20 books over the past month. The three families' frequency of reading informational picturebooks in this study is slightly over the previous study by Yopp and Yopp (2006), which reported that the rates of parents' reading of informational picturebooks are around 7%. Emma and Liam reported that they read ten informational picturebooks out of 50 books (20%) over the month. Sunny and Mary reported that they read two out of 24 books (8.33%), and

Sophia and Helen reported that they read 3 out of 31 books (9.67%). Mothers in this study may have been aware of the effectiveness of reading informational texts to children. This interpretation is supported by interviews with three mothers about their thoughts on reading informational texts. They reported that reading informational texts with a child would enhance their child's disciplinary knowledge as the literature delivers facts about things and events.

Data Collection

The data includes three families' surveys for demographic information, a monthly reading log, video observations of their shared reading, and a post-observation interview with the mother. The researcher visited each family's home twice to collect video observation data in a natural setting, defined as "where participants experience the issue or problem under study" (Creswell, 2012, p. 45). Scholars have reported that book familiarity can enhance positive interactions between a mother and a child (Fletcher & Finch, 2015; Goodsitt et al., 1988). Thus, the researcher asked a mother and a child to select a book to read together from their bookshelf at home. Each mother and child selected a book for reading, resulting in two books per visit. A video camera and an audio recorder were placed in front of the participants. The researcher stayed in a different room to minimize the distraction of the researcher's presence.

On the second visit, each mother and child were asked to select informational picturebooks, including biographies, to read. The researcher defined informational picturebooks, which are written to convey facts and information about the natural and social world. The researcher also paraphrased the definition of informational picturebooks to child participants, saying that "a book about an animal or a person."

In addition to informational picturebooks, this study includes biographies, as both text types are under the nonfiction category and deliver information with authentic photographs, illustrations, and other types of visuals. Therefore, the seven shared reading videos out of 12 collected videos were analyzed in this paper to report children's reading of visuals in informational picturebooks and biographies, as shown in Table 2. Both Mary and Helen were old enough to read their books, and thus, they mainly read their books. Liam selected the book Alexander Calder: Meet the Artist from his bookshelf, but he was too young to read the book aloud. Thus, his mother, Emma, read the book to him.

Table 2. Book Title and Author of the Book Each Family Read

Informational Books (Year)	Selected by	Read by
Her right foot by Dave Eggers (2017)	Emma	Emma
Alexander Calder: Meet the artist by Patricia Geis (2014)	Liam	Emma
See inside your body by Katie Daynes and Colin King (2006)	Sunny	Sunny
Snakes by Nic Bishop (Scholastic Reader Level 2) (2016)	Mary	Mary
Maya Angelou by Lisbeth Kaiser and Leire Salaberria (2016)	Sophia	Helen
Time for kids: Snakes! by Lisa Jo Rudy (2005)	Sophia	Sophia
Martin Luther King Jr.: A peaceful leader by Sarah Albee (2018)	Helen	Helen

Data Analysis

This study adopted the qualitative data analysis process (Miles et al., 2018). Video and interview data were transcribed verbatim in NVivo12. When transcribing the collected data, children's and mothers' reading of the written texts were italicized in the excerpts to distinguish verbal interactions between a child and a mother. The analysis also adopted a multimodal lens to expand perspectives of interaction from linguistically dominant interactions to dynamic interactions with various modes (Jewitt, 2009). The initial transcript includes nonverbal gestures, as the transparency of coding is important when interpreting a mother and child's interactions (Bezemer & Mavers, 2011; Jewitt et al., 2016). The researcher utilized the term visuals in this study as graphical displays, such as tables, timelines, and photographs, and texts, such as labels or captions, along with illustrations and photographs (Norman, 2012).

A discourse related to visuals was analyzed to understand how children interpreted visuals when reading informational picturebooks and biographies. The unit of analysis of observation data is a mother-child interaction when reading both the left and right pages of the book, including a book cover. During the first analysis cycle, the researcher coded any emerging ideas and thoughts to capture the moments of interactions between a mother and a child. For example, a child's response to a photograph is classified as asking questions about the photograph or producing comments related to the photograph. A child's other responses to content are also classified to evaluate the connection with written texts. Any notable patterns relating to the child's direct interactions with the visuals were noted and identified during the second analysis cycle. For example, a child's pointing to photographs when responding to the content is noted as a cue to respond to visuals. The codes were applied at separate points in other weeks, with a gap of 7 days minimum in between to increase the reliability of the manual coding process.

Findings

In the present work, visuals in informational picturebooks are determined to be supportive of children's understanding of the content, but sometimes the visuals may cause confusion and are not matched to children's prior knowledge. Three major themes include personal reflection on visuals, using knowledge to verify the visuals, and misinterpreting them. Each theme will be discussed in this section with relevant excerpts.

Personal Reflection on Visuals

Fifteen occurrences of children's personal reflection on visuals in informational picturebooks and biographies were observed across the three children's cases. This theme includes a child's comments on illustrations or photographs with personal reflections. For example, Mary commented on a visual in the book *Snakes*, saying, "This snake looks cute," before she started to read the text in the following dialogue. Mary's mother, Sunny, repeats the word, cute, without further questions or comments.

> Mary: This snake looks cute.
> Sunny: cute

Mary: *Snakes, will…*
Sunny: Uh Huh. Yes, it is the last page.
Mary: *hide*
Sunny: Yes
Mary: *their eggs, too*
Sunny: Uh Huh
[…]

Another example is Helen's comment when she read the book about American civil rights activist Maya Angelou. The pages in the picturebook biography show Maya Angelou accomplished multiple career goals despite others' harsh comments about her skin color. After reading the text, Helen commented, "Her dress is pretty," as reported in the following excerpt. Her comment shows that she read visuals while she read the text. She even interpreted the visual to her personal preference. Without Helen's mother's response, she turned the page to read the next text.

Helen: *And she was right. She was a cook and a streetcar conductor. She was a dancer, a singer, and an actress.* Her dress is pretty.

This type of children's response to the visuals was not often related to the content topic. Mary's comment on the photo of a snake is not directly connected to the topic of the content, snakes laying eggs. Helen's comment on the illustration of Maya Angelou may not reflect the book author's message either. Mary and Helen's comments would not support their comprehension of the pages. However, this type of response to visuals can be connected to a child's preferences, experiences, and emotional aspects. It is also considered evidence of a child's reading of visuals in informational picturebooks. However, the examples here also suggest that a child's personal reflection on visuals may not be connected to the content knowledge in informational books if the goal of the visuals in informational picturebooks and biographies is to enhance child readers' understanding of the content. Furthermore, a mother's inactive response to the comment can make the child pay attention to the content again. Mothers rarely responded to this type of child's responses nor developed further discussion in this study.

Interpreting Visuals Using Prior Knowledge

The next category indicates that children use their background knowledge when interpreting and validating the illustrations and photographs in informational picturebooks. Children's active demonstrations of knowledge related to interpreting visuals were observed ten times. The following excerpt shows Liam's confidence in understanding oxidation by explaining the process across the illustrations. In other words, the excerpt demonstrates how the visuals in the book deliver the message of a chemical process. The excerpt also shows how a young child can apply his background knowledge to comprehend the content as well as read visuals to validate his knowledge in an informational picturebook.

Emma: *You may have noticed by now that the pictures of the Statue of Liberty in this book have her*

colored brown. You may have thought the illustrator of this book was not so good at his job, because we all know the Statue of Liberty to be a certain greenish-blue. But the Statue of Liberty was made of copper, and copper starts out brown. Then, very slowly, when left outside for long periods of time, copper will eventually...?

Liam: turn green!

Emma: *oxidize*, *and when it is oxidized, it turns this blue-green color.*

Liam: Wait, wait. Before it turns just like this, and this starting, and then it rains, and then, it became a, a, that stuff is the stuff that's brown fading away, and then when it is sunny, and then something has happened, and the wind blows by, and then she turns green.

Emma: When we were cleaning those pennies, those were oxidizing too, and they will more in this, like a brown stage, they will be quite in the green stage.

In this excerpt, Liam shows boredom by leaning back on the sofa as his mother reads the text to him. In this context, his mother, Emma, noticed his boredom and did not complete the sentence when she read the text. Instead, the last word of the sentence was open to Liam. Although he confidently shouts, "turn green," the words are not in the text. His response to the reading indicates his background knowledge of this topic, oxidation. When Emma turned the page, his eyes jumped to the visual and stopped her from turning the page. Then, he explained the oxidation process by reading the illustrations on the pages. The page contains six different illustrations: a portrait of the Statue of Liberty, raindrops, snow falling on the Statue of Liberty, sunshine, wind blowing, and another version portraying the Statue of Liberty. All illustrations are shown sequentially from left to right. Each illustration's backgrounds illuminate the change of the copper's color from brown to green as a result of oxidation. His confidence in interpreting the visuals connects with his prior knowledge of the scientific concept of oxidation. His active involvement in interpreting visuals facilitates his mother's response, connecting with their experiences at home.

Another example is shown in Helen's reading. Helen demonstrates how she interprets illustrations with her prior knowledge. When she read a biography of Maya Angelou, she saw an illustration of Maya Angelou, who is shown to be in the middle of autographing her books. One part of her hair is now turned white from age, unlike previous illustrations in the book. The following excerpt shows how Helen noticed this illustrated difference and how her mother, Sophia, facilitated Helen in clarifying her reading of visuals.

[…]

Helen: Look. She has a …

Sophia: What do you think that means?

Helen: She is getting old.

Sophia: She is getting older. Yes.

Helen: *Maya became a famous writer, teacher, and speaker, in-spring, inspiring everyone with her belief that you can be anything you want to be.*

Helen's knowledge that hair turns gray and white with age validates the intention of the illustrator's illustration.

The text does not explicitly describe Maya's aging. Helen's knowledge about aging and how she interprets the presented illustration aids her understanding of this page in the book and lets her move on to the subsequent text without confusion.

Misinterpretation of Visuals

The last theme in this study showcases how children misinterpret visuals in informational picturebooks and biographies, unlike the intent of the author/illustrator/photographer. Visuals in picturebooks are intentionally displayed to deliver unspoken, supportive, and parallel messages to the written content. However, visuals sometimes detract from the children's efforts to understand the content. Children's confusion and suspicion of the visuals were observed eleven times in this study.

The informational picturebook, *Alexander Calder: Meet the Artist*, includes play components, such as imaginative pop-ups, pull tabs, lift-the-flaps, and cutouts, to introduce the artist's sculptures and life. The pages describe the artist's artwork, called wire sculpture, with the photograph of the wire sculpture with thin lines of wire. A thin wire is attached to the book to support readers' understanding of the art concept of wire sculpture. Liam played with a thin wire attached to the book while Emma read the book to him. The following excerpt shows Liam's confusion about reading the photograph with the text description.

> Emma: *Wire sculptures. Calder created wire sculptures, whereby he drew portraits of friends and celebrities.* He drew. Do you draw the pen? You should draw something else.
> Liam: He drew it with the thin marker.
> Emma: with a thin marker? This is actually, even though in the book it looks like a thin marker, this is made from a wire. *This is a first wire portrait to make of Josephine Baker, an American singer and dancer, who was very popular in Paris. Try to make a profile portrait. There are countless possibilities.*
> Liam: How can you do that?
> Emma: Could you arrange this chain on the paper to make it looks like a profile, is the side of someone's face. The way someone's face is looking of the side. Could you show?
> […]

The text describes the artwork as the artist drew with wire in three dimensions. As the artist's three-dimensional sculpture is captured in a two-dimensional photograph, the photograph of the artist's wire sculpture does not help Liam to understand the artwork and the concept of wire sculpture. While the visuals caught his attention, his ability to think about the concept intended by the author was disturbed due to incorrect interpretations of the visual aid. Liam interpreted the photograph as a drawing with a thin marker, while Emma read the texts as describing a wire sculpture instead. Liam's examination of the photograph and concentration on making something with a wire attached to the book as instructed by his mother does not match and support his understanding of wire sculpture. With limited experience and knowledge of wire sculpture, the child cannot imagine the art in the photograph is made with wire.

Children's background knowledge and understanding of the texts can conflict and confound their understanding of the content, and visuals sometimes facilitate a child's suspicion instead of resolving the doubt. Mary read a book about snakes. Mary's question, "Is this actual, real picture?" and her facial expression imply her cautious distrust of the photograph of the snake and its prey, as seen in the following excerpt.

> […]
> Mary: *or..di..*
> Sunny: *organs*
> Mary: *organs to see the warm*
> Sunny: Uh Huh
> Mary: *body of an opossum*
> Sunny: Right.
> Mary: *opossum*
> Sunny: Uh Huh
> Mary: *at night.*
> Sunny: Yes, so they have some organs to see the warm body. They can see some warm body near, even though it's very dark, okay?
> Mary: Uh Huh. Is this actual, real picture?
> Sunny: Yes, real.
> Mary: Agh...
> Sunny: See, it is a real mouse. It is prey. Oh my god.

This dialogue shows Mary's suspicion of the photograph containing a snake on the left and a mouse on the right corner. The background of the photograph is total darkness. The photograph supports the textual description of a snake's unique heat-sensing organ. The vivid colors of the snake and the mouse in complete darkness may deliver the content, saying a snake can identify a mouse even in total darkness because of its heat-sensing organ. However, Mary's gaze at the photograph, her facial expression of confusion, and her hesitation to read the statement indicate that Mary could not interpret the visual as the text describes. Sunny's acknowledgment of Mary's confusion leads her to explain the visual more to support Mary's understanding of the text.

A similar case was observed in Helen's reading of Martin Luther King Jr.'s biography. Sophia and Helen studied the photographs at the end of the biography. One of the photographs shows a police officer taking Rosa Parks' fingerprint, who is well known in America as an activist in the civil rights movement. The caption next to the photo says, "Rosa Park is arrested for refusing to give up her bus seat." Helen and Sophia's interpretation of the photograph was not matched, as shown in the following excerpt.

> Sophia: Okay, are we done with this? Do you wanna read this part?
> Helen: Look,
> Sophia: um-hum
> Helen: There is Dr. King, and he was young.

Sophia: Oh yeah!
Helen: and there is Rosa.
Sophia: Rosa Parks. Ah, what's happening there?
Helen: There is the policeman, and he is taking her to jail.
Sophia: a jail. Do you know what is he doing right there?
Helen: He is putting; he is cuffing her hands.
Sophia: No, I think he is taking her fingerprints. When you get arrested, you will have to. They will take your fingerprints to identify you because everybody's fingerprints are different.
Helen: Why?
Sophia: That way, if you ever get arrested again, or anything else happens, don't be able to see a record of your print, you know, that was you.
[…]

Helen interpreted the photo by saying, "There is the policeman, and he is taking her to jail." Helen's interpretation may not be wrong, but her mother, Sophia, countered it. Sophia asked Helen for the details of the photograph. Helen explained, "He is putting; he is cuffing her hands." This dialogue demonstrates how Helen misinterprets the photograph that adult readers take for granted. Her background knowledge about Rosa Parks' arrest and the accompanying captions may play a role in her misinterpreting the visuals. That is, children's knowledge may help them validate the illustrations and photographs but not always confirm the credibility of images.

Discussion

The current study analyzed three children's responses to illustrations and photographs in informational picturebooks and biographies. The analysis indicates that children actively read and respond to visuals to understand the content in informational picture books and biographies. As the children read visuals, they are encouraged by the mothers to study and interpret the accompanying visuals, leading to important discussions surrounding central themes of the books, such as an artistic concept, a historical event, characteristics of snakes, or a chemical reaction. Unexpected consequences of visual interpretation occurred in a few instances where the visuals created an unintended effect of taking the child further away from correctly understanding the content.

Children's Active Reading of Visuals in Informational Picturebooks and Biographies

First and foremost, the present study shows children's interest in visuals and active interpretations of visuals when reading the text, as documented in the previous studies (Ann Evans & Saint-Aubin, 2005; Feathers & Arya, 2015). Children are aware of the relationship between images and texts when constructing meaning. It is natural for children to use visuals during reading, even in reading informational text and biographies for children. The present study is in agreement with previous research, which noted that parents gravitate towards meaning-focused talk but are also likely to point out the visuals in their efforts to support their child's reading comprehension (Hindman et al., 2014). It is worth noting that there are times when children appear to devote their attentional resources to the visuals over the text. At that point, parents may have an important role in supporting their children by shifting

their focus and actively facilitating interpretations of the visuals. As children have the ability to transact with an image to construct meaning throughout the process of interpreting visuals (Serafini, 2014), parents are encouraged to actively assist children's reading of visuals in informational picturebooks and biographies. Given that photographs make a significant contribution to the overall content in informational picturebooks and biographies for children, children's reading of visuals and their parents' support should be documented to understand the nature of shared reading of informational literature more comprehensively for children at home.

All three mothers in the present study actively respond to children's verbal questions, statements, and nonverbal gestures. Specifically, mothers reference label objects or characters, make references and recall information presented earlier, make predictions, and provide factual knowledge and explanations. Straightforward responses to the visuals as they pertain to the genre have the potential to initiate a relevant discussion by adding additional questions to child readers. Mothers' responses to children's comments on visuals are varied. Some comments are off the content, so mothers drew the children's attention to the main topic. Some inquiries are developed into further detailed discussions. Some are not encouraged and place the child readers' attention back on reading the text. However, there is potential to facilitate in-depth discussion by actively asking questions to the child reader, as a mother's response to a child's comments and questions in literacy practices can invite the child to engage in reading (Rogoff, 2003). For example, if a child reader observes something, say, that the snake in the photograph "looks cute," rather than moving on, a mother can actively work on that train of thought by asking point-blank to explain why it looks that way to them, in order to encourage the child's critical thinking skills. The mother would then have numerous opportunities in the shared reading experience to invite the child towards mature meaning-making and expressing articulate and nuanced thought.

Parents' Support of Children's Visual Reading as Learned Skills

The authenticity and clarity of the visuals are essential to children's comprehension (Coleman et al., 2018; McTigue & Flowers, 2011; Roberts & Brugar, 2014; Stylianidou et al., 2002), given the premise of informational picturebooks, which deliver factual information about people, events, animals, and history. At the same time, children's reading of visuals can be various, considering individuals' various literacy practices according to their cultural and historical contexts (Barton, 2007). It should be appreciated that children have diverse transactions of meaning with prior knowledge and experience. The present study illuminates the potential challenges children can have when reading informational picturebooks along with the potential benefits of reading with parents to support children's reading of visuals in informational picturebooks. This conclusion is consistent with the previous research, which explains the complexity of comprehension steps in reading science graphics (McTigue & Flowers, 2011). Children need to process the concepts from the illustrations, decide in what order the pictures should be studied, judge information from the visuals, and determine and integrate the related information from the text and visuals. Due to this complex process, certain visuals in informational picturebooks may disrupt child readers' attempts to understand the content, especially if they don't understand how the image should generally be interpreted to begin with. In other words, children need to be educated on how to interpret charts, graphs, and visual images to understand their roles and structures in picturebooks. This educational experience can start with shared reading practices with parents at home.

Considering multimodality (Kress, 2010), it is an important skill that children need to learn to communicate using multiple and diverse modes. It is beneficial to encourage child readers to scrutinize photographs and illustrations with a critical eye, as picturebooks have dynamic communication with texts and visuals (Nikolajeva & Scott, 2000; Unsworth, 2006; Unsworth & Cheirigh, 2009). It is encouraged to discuss child readers' thoughts and interpretations of visuals when reading, for example, historical texts. When child readers read the texts, mothers' prompts for their comprehension can be a critical starting point to evaluate the child readers' comprehension of the texts and visuals. The present study shows that children's prior knowledge supports children's reading of the visuals, but sometimes the knowledge interferes with the interpretation of the visuals. This observation implies that children may not always gain the intended information from the visuals. Biographies or history text visuals may need further disciplinary-specific instruction to interpret the photograph's context. Child readers may not have sufficient background knowledge pertinent to the time when the photograph was taken. In this context, it is emphasized to have positive, social literacy practices (Rogoff, 2003; Vygotsky, 1978) to discuss visuals with background knowledge.

Conclusion

The present work extends scholars' investigations into how children interpret visuals in picturebooks. Children reading texts independently with minimal to no assistance from parents or teachers are likely to be left contemplating the meaning of the content by themselves. However, as shown in the present study, children may need support from adults when reading visuals in informational picturebooks. In this sense, more studies need to be conducted to provide a general guideline for parents to support children's reading of visuals in informational picturebooks and biographies. The present study also indicates that child readers' prior knowledge can positively impact their overall comprehension of the text. However, their background knowledge can also hinder their interpretation of visuals. Parents' interactions with children while reading visuals in informational picturebooks and biographies may enhance the child readers' reading comprehension and, by extension, increase their literacy skills. Parents already have developed skills in understanding how to interpret visuals in books due to age, wisdom, and experience. Using picturebooks in shared readings, parents may have the opportunity to impart to their children that skill set, which general educators may not be able to provide in time-constrained classroom settings.

It is noted that the current study cannot be generalized to other shared reading cases. The participating parents in this study were studying in a graduate program in Education. Not all were in teaching professions and specialized in children's literature or early childhood. However, their educational backgrounds and learning environment may impact their reading of informational picturebooks and discussions with their children. Despite the limitation, with the data at hand, the present study offers several insights into what parents can do to improve the quality of shared reading of picturebooks with a child at home and encourage children to read visuals of informational picturebooks and biographies.

Recommendations

Scholars argue that more exposure to visuals does not guarantee readers' engagement in reading visuals and

learning visual reading strategies (McTigue & Flowers, 2011). They suggest that relevant visual reading strategies must be provided to enhance child readers' reading comprehension using visuals. Considering their arguments, I contend that pictorial illustrations and photographs, often observed in informational picturebooks for younger readers, can help and provide the basic tools required for deciphering visuals in science textbooks and journals when they are in upper elementary. The present study shows that children may have difficulties reading even simple visuals that make sense to adults. Scholars attest that visual complexity may impact young readers' cognitive process of reading the visuals (Guo et al., 2018). That is, a simple photograph may be accessible for young readers to process and integrate information from the photograph. A dense and intricate photograph may require extensive attention to process and attend to details and multiple sources to distinguish the necessary information. Pantaleo's "slow looking," where readers observe images carefully (Pantaleo, 2020), may also support children's interpretation of visuals in informational picturebooks and biographies. It is important to provide children with opportunities to read visuals carefully with adults who can facilitate their reading with sophisticated reading strategies and provide a comfort zone for discussing their understanding of the visuals. Thus, shared reading at home with adults' support can enhance children's reading and interpretation of visuals in informational literature and biographies at earlier ages. This approach is applicable to international audiences and their home literacy practices.

Acknowledgments

I appreciate the participating families in this study and the advisors, Dr. Teale and Dr. Phillips, who guided me to design and complete the original research. I also appreciate committee members Dr. Koss and Dr. Paciga, who encouraged me to complete this manuscript.

References

Ann Evans, M., & Saint-Aubin, J. (2005). What children are looking at during shared storybook reading: Evidence from eye movement monitoring. *Psychological Science*, *16*(11), 913–920. https://doi.org/10.1111/j.1467-9280.2005.0163

Arizpe, E., & Styles, M. (2015). *Children reading pictures: Interpreting visual texts* (2nd ed.). Routledge. https://doi.org/10.4324/9781315683911

Baker, L., Dreher, M. J., Shiplet, A. K., Beall, L. C., Voelker, A. N., Garrett, A. J., Schugar, H. R., & Finger-Elam, M. (2017). Children's comprehension of informational text: Reading, engaging, and learning. *International Electronic Journal of Elementary Education*, *4*(1), 197–227. https://iejee.com/index.php/IEJEE/article/view/221

Barton, D. (2007). *Literacy: An introduction to the ecology of written language* (2nd ed.). Blackwell Pub.

Bezemer, J., & Mavers, D. (2011). Multimodal transcription as academic practice: A social semiotic perspective. *International Journal of Social Research Methodology*, *14*(3), 191–206. https://doi.org/10.1080/13645579.2011.563616

Coleman, J. M., McTigue, E. M., & Dantzler, J. A. (2018). What makes a diagram easy or hard? The impact of diagram design on fourth-grade students' comprehension of science texts. *The Elementary School*

Journal, *119*(1), 122–151. https://doi.org/10.1086/698819

Creswell, J. W. (2012). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE.

Dreher, M. J. (2000). Fostering reading for learning. In J. T. Guthrie, L. Baker, & M. J. Dreher (Eds.), *Engaging young readers: Promoting achievement and motivation* (pp. 68–93). Guilford Publications.

Duke, N. K., & Bennett-Armistead, V. S. (2003). Filling the great void: Why we should bring nonfiction into the early-grade classroom. *American Educator*. https://eric.ed.gov/?id=EJ672467

Duke, N. K., & Billman, Al. K. (2009). Informational text difficulty for beginning readers. In *Finding the right texts: What works for beginning and struggling readers* (pp. 109–128). Guilford Press.

Duke, N. K., & Mallette, M. H. (2020). *Literacy research methodologies* (3rd ed.). Guilford Press.

Feathers, K. M., & Arya, P. (2015). Exploring young children's use of illustrations in a picturebook. *Language and Literacy*, *17*(1), 42–62. https://doi.org/10.20360/G2630C

Fletcher, K. L., & Finch, W. H. (2015). The role of book familiarity and book type on mothers' reading strategies and toddlers' responsiveness. *Journal of Early Childhood Literacy*, *15*(1), 73–96. https://doi.org/10.1177/1468798414523026

Goodsitt, J., Raitan, J. G., & Perlmutter, M. (1988). Interaction between mothers and preschool children when reading a novel and familiar book. *International Journal of Behavioral Development*, *11*(4), 489–505. https://doi.org/10.1177/016502548801100407

Guo, D., Wright, K. L., & McTigue, E. M. (2018). A content analysis of visuals in elementary school textbooks. *The Elementary School Journal*, *119*(2), 244–269. https://doi.org/10.1086/700266

Guo, D., Zhang, S., Wright, K. L., & McTigue, E. M. (2020). Do you get the picture? A meta-analysis of the effect of graphics on reading comprehension. *AERA Open*, *6*(1).

Hindman, A. H., Skibbe, L. E., & Foster, T. D. (2014). Exploring the variety of parental talk during shared book reading and its contributions to preschool language and literacy: Evidence from the early childhood longitudinal study-birth cohort. *Reading and Writing*, *27*(2), 287–313. https://doi.org/10.1007/s11145-013-9445-4

Jewitt, C. (2009). An Introduction to Multimodality. In C. Jewitt (Ed.), *The Routledge Handbook of Multimodal Analysis* (pp. 14–27). Routledge.

Jewitt, C., Bezemer, J., & O'Halloran, K. (2016). *Introducing multimodality*. Routledge.

Kachorsky, D., Moses, L., Serafini, F., & Hoelting, M. (2017). Meaning making with picturebooks: Young children's use of semiotic resources. *Literacy Research and Instruction*, *56*(3), 231–249. https://doi.org/10.1080/19388071.2017.1304595

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Routledge.

Kress, G., & Van Leeuwen, T. (2021). *Reading images: The grammar of visual design* (2nd ed.). Routledge.

Kümmerling-Meibauer, B. (2018). *The Routledge companion to picturebooks*. Routledge.

Lambert, M. D. (2017). Picturebooks and page layout. In *The Routledge companion to picturebooks* (pp. 28–37). Routledge.

McTigue, E. M., & Flowers, A. C. (2011). Science visual literacy: Learners' perceptions and knowledge of diagrams. *The Reading Teacher*, *64*(8), 578–589. https://doi.org/10.1598/RT.64.8.3

Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). *Qualitative data analysis: A methods sourcebook* (4th ed.). Sage.

Mol, S. E., & Neuman, S. B. (2014). Sharing information books with kindergartners: The role of parents' extra-textual talk and socioeconomic status. *Early Childhood Research Quarterly*, *29*(4), 399–410. https://doi.org/10.1016/j.ecresq.2014.04.001

Nikolajeva, M., & Scott, C. (2000). The dynamics of picturebook communication. *Children's Literature in Education*, *31*(4), 225–239. https://doi.org/10.1023/A:1026426902123

Nikolajeva, M., & Scott, C. (2015). *How picturebooks work*. Routledge.

Norman, R. R. (2012). Reading the graphics: What is the relationship between graphical reading processes and student comprehension? *Reading and Writing*, *25*(3), 739–774. https://doi.org/10.1007/s11145-011-9298-7

Pantaleo, S. (2012). Middle years students thinking with and about typography in multimodal texts. *Literacy Learning: The Middle Years*, *20*(1), 37–50. https://doi.org/10.3316/aeipt.189968

Pantaleo, S. (2013). Paneling "matters" in elementary students' graphic narratives. *Literacy Research and Instruction*, *52*(2), 150–171. https://doi.org/10.1080/19388071.2012.754973

Pantaleo, S. (2016). Primary students' understanding and appreciation of the artwork in picturebooks. *Journal of Early Childhood Literacy*, *16*(2), 228–255. https://doi.org/10.1177/1468798415569816

Pantaleo, S. (2020). Slow looking: "reading picturebooks takes time." *Literacy*, *54*(1), 40–48. https://doi.org/10.1111/lit.12190

Potter, C. A., & Haynes, W. O. (2000). The effects of genre on mother-toddler interaction during joint book reading. *Infant-Toddler Intervention*, *10*(2), 97–105. https://eric.ed.gov/?id=EJ618018

Price, L. H., Kleeck, A., & Huberty, C. J. (2009). Talk during book sharing between parents and preschool children: A comparison between storybook and expository book conditions. *Reading Research Quarterly*, *44*(2), 171–194. https://doi.org/10.1598/Rrq.44.2.4

Prior, L. A., Willson, A., & Martinez, M. (2012). Picture this: Visual literacy as a pathway to character understanding. *The Reading Teacher*, *66*(3), 195–206. https://doi.org/10.1002/TRTR.01098

Roberts, K. L., & Brugar, K. A. (2014). Navigating maps to support comprehension: When textbooks don't have GPS. *The Geography Teacher*, *11*(4), 149–163. https://doi.org/10.1080/19338341.2014.975143

Roberts, K. L., Norman, R. R., & Cocco, J. (2015). Relationship between graphical device comprehension and overall text comprehension for third-grade children. *Reading Psychology*, *36*(5), 389–420. https://doi.org/10.1080/02702711.2013.865693

Rogoff, B. (2003). *The cultural nature of human development*. Oxford university press.

Serafini, F. (2014). *Reading the visual: An introduction to teaching multimodal literacy*. Teachers College Press.

Serafini, F. (2015). Developing students' interpretive repertoires. *Language and Literacy*, *17*(3), 118–133. https://doi.org/10.20360/G2459V

Serafini, F. (2020). Understanding visual images in picturebooks. In *Talking beyond the page* (pp. 10–25). Routledge.

Sipe, L. R. (1998). How picture books work: A semiotically framed theory of text-picture relationships. *Children's Literature in Education*, *29*(2), 97–108. https://doi.org/10.1023/A:1022459009182

Sipe, L. R. (2008). *Storytime: Young children's literary understanding in the classroom*. Teachers College Press.

Sipe, L. R., & McGuire, C. (2006). Picturebook endpapers: Resources for literary and aesthetic interpretation. *Children's Literature in Education*, *37*(4), 291–304. https://doi.org/10.1007/s10583-006-9007-3

Smith, J. M., & Robertson, M. K. (2019). Navigating award-winning nonfiction children's literature. *The Reading Teacher*, *73*(2), 195–204. https://doi.org/10.1002/trtr.1811

Stylianidou, F., Ormerod, F., & Ogborn, J. (2002). Analysis of science textbook pictures about energy and pupils' readings of them. *International Journal of Science Education*, *24*(3), 257–283. https://doi.org/10.1080/09500690110078905

Teale, W. H., Hoffman, E. B., Whittingham, C. E., & Paciga, K. A. (2018). Starting them young: How the shift from reading readiness to emergent literacy has influenced preschool literacy education. In C. M. Cassano & S. M. Dougherty (Eds.), *Pivotal research in early literacy: Foundational studies and current practices*. Guilford.

Torr, J., & Clugston, L. (1999). A comparison between informational and narrative picture books as a context for reasoning between caregivers and 4-year-old children. *Early Child Development and Care*, *159*(1), 25–41. https://doi.org/10.1080/0300443991590104

National Center for Education Statistics. (2021, May). *Home literacy activities with young children*. Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/sfa/home-literacy-activities

Unsworth, L. (2006). Towards a metalanguage for multiliteracies education: Describing the meaning-making resources of language-image interaction. *English Teaching: Practice and Critique*, *5*(1), 55–76. https://www.learntechlib.org/p/71110/.

Unsworth, L., & Cheirigh, C. (2009). Multimodality and reading: The construction of meaning through image-text interaction. In C. Jewitt (Ed.), *The Routledge handbook of multimodal analysis* (pp. 151–163). Routledge.

Verhallen, M. J. A. J., & Bus, A. G. (2011). Young second language learners' visual attention to illustrations in storybooks. *Journal of Early Childhood Literacy*, *11*(4), 480–500.

Vygotsky, L. S. (1978). *Mind in society: The development of higher mental processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (eds.)). Harvard University Press.

Wolfenbarger, C. D., & Sipe, L. (2007). A unique visual and literary art form: Recent research on picturebooks. *Language Arts*, *83*(3), 273–280. http://www.ncte.org/pubs/journals/la

Yeh, Y. Y., & McTigue, E. M. (2009). The frequency, variation, and function of graphical representations within standardized state science tests. *School Science and Mathematics*, *109*(8), 435–449. https://doi.org/10.1111/j.1949-8594.2009.tb18291.x

Yopp, R. H., & Yopp, H. K. (2006). Informational texts as read-alouds at school and home. *Journal of Literacy Research*, *38*(1), 37–51. https://doi.org/10.1207/s15548430jlr3801_2

Author Information

Sunah Chung

http://orcid.org/0000-0003-2858-5138

University of Northern Iowa

107 Schindler Education Center, Cedar Falls, IA 50614

USA

Contact e-mail: *sunah.chung@uni.edu*