MIND THE MARGIN! ELEMENTARY SCHOOL CHILDREN'S (NON)READING OF PICTURE BOOK PERIPHERIES. AN EYE TRACKING STUDY

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Abstract

When we pick up a book, the first thing we see is the cover. We might read the title and the name of the author to identify the book. When we decide to read the book, we usually flip through the first pages until we reach the beginning of the narrative. Gérard Genette has described some of the elements we usually find within this transactional zone through his concept of paratexts. For written literature, Genette sees the function of these textual elements in guiding reception. Picture book publications have recently shown a development with regard to increasing narrative transgression. In particular, the images on the cover, endpapers, and within the title pages are often an integral part of the narrative, while the printed text (in the following referred to as 'print') continues to follow the conventions described by Genette. This leads to the question whether child readers adapt their reception behavior when they encounter such picture book peripheries. This paper discusses eye movement data recorded during picture book reception by 48 elementary school students. The data show a significant tendency for participants to pay only very selective attention to the peripheral areas of the picture book, even when the narrative extends into the periphery. The concept of typographic dispositives is proposed as a theoretical explanation for these findings.

Keywords: eye tracking, paratext, multimodality, picture book, literary literacy

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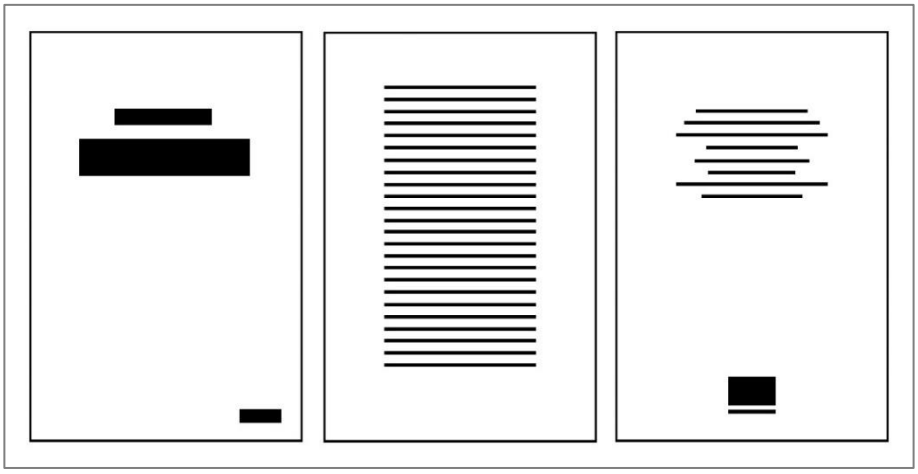
1. INTRODUCTION

Narratives do not begin ad hoc. They require a framing (Wolf, 1999). In books, the reader first passes through a transition zone (Wirth, 2009) —cover, endpapers, and title pages contain numerous text elements that do not seem to belong entirely to the main text. Coining the term “paratext”, Gérard Genette drew attention to the relevance of these elements for reception (Genette, 2001). Genette's concept has established itself in the conceptual inventory of literary studies and as a distinct field of research.

The notion of paratext has caused several controversial debates (Gilbert, 2018): An essential question in this discourse revolves around the identification of paratextual elements. Several authors suggest abandoning Genette’s definition which operates on the level of text function: “the problem of Genette's notoriously hazy definition of ‘paratexts’ can be alleviated by [...] insisting on a separation of paratexts from the main text on the levels of layout and/or typography as major criteria” (Wolf 1999, p. 108). The recipients recognize the framing function in typographic design. They recognize the title because of the large font and the central position on the front cover, just as the imprint is distinguishable by its small font and marginal position. Some elements will thus be seen as relevant (e.g., the title), others as irrelevant (e.g., the imprint) and may even go unread (Goodman 1980, p. 14). The crucial point is that typographic design can mark whole areas of the book as part of the framing. Wehde calls this aspect “typographic dispositives”. By this, she means “macrotypographic composition patterns that connote text types as syntagmatic gestaltlike ‘super-signs’” (Wehde, 2011, p. 119 translation by BD). Figure 1 shows three such typographic dispositives. Without knowing the verbal content of the texts, we identify them as title page, body text, and back cover due to their macrotypographic design.

Figure 1. Typographic dispositives (based on Wehde, 2011, p. 119)



I will refer to these areas on the first and last pages of the book, which are separated from the middle section by typographic dispositives and thus marked as a framing, as periphery. This term says nothing about the actual function of the text elements and thus is distinct from the functional concept of paratext.

What about the periphery in picture books? What happens when text and image come together on the multimodal surface of the book page?

> Every part of the book can serve the narrative, and indeed this is what often happens. If all the physical spaces of the picture book can be used for narrative purposes, then perhaps it is no longer appropriate to distinguish between ‚text' and ‚paratexts'. (Duran & Bosch, 2011, p. 123)

While I agree with the first part of Duran and Bosch's statement, I disagree with their latter thesis. Indeed, every element of the picture book can serve a narrative function. However, that does not mean that it loses its framing function. Framing and narration can, both functions can be fulfilled by one element simultaneously.

The multimodality of the picture book expands the semiotic complexity of the text. On the surface of the book page, numerous resources are involved in the semiosis: pictorial aspects, diagrammatic aspects, material connotation, symbolic and iconic aspects of written text, etc. A complete overview of the sign aspects involved is difficult because aspects overlap and create inter- and transmodal synergies or friction. The literariness of the multimodal text is therefore by no means limited to the level of verbal-linguistic polyvalence. And the aspect of framing in picture books must be extended beyond the literal picture frame (Mills & Unsworth, 2017, p. 11) to include framings set by typography and layout. A very central aspect of this structure is the organization of the heterogeneous set of signs through typographical dispositives, whose conventionality in the literary text already implies the possibility of being disrupted.

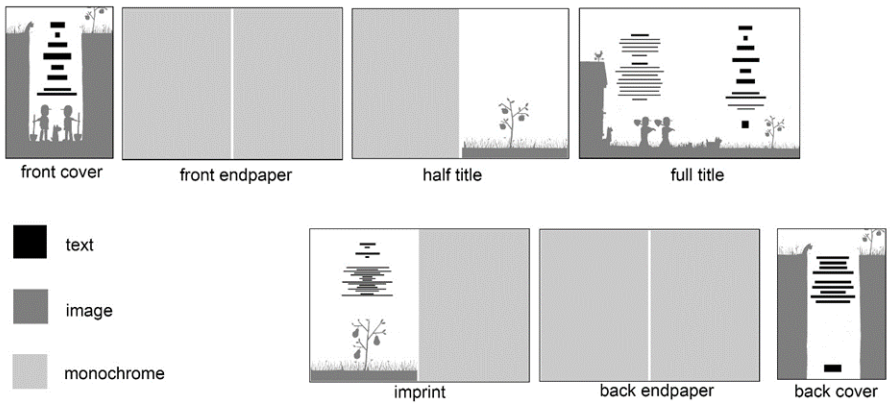
The picture book “Sam & Dave graben ein Loch” ([Engl.: “Sam & Dave Dig a Hole”] Barnett & Klassen, 2015) uses this twofold function of peripheral elements extensively (Dammers, 2021). The title already summarizes the plot. The protagonists dig a hole in the garden in front of their house to find something special. Accompanied by a dog, they dig through the soil, narrowly missing diamonds progressively increasing in size. Sam and Dave fall asleep, exhausted, meanwhile the dog keeps digging, and they fall into a void. They supposedly end up where they started—in a garden in front of a house.

In the end, the setting, its size, perspective, and color are identical to those presented at the beginning of the book. Nevertheless, numerous details disrupt this similarity: The cat's collar is blue instead of red, instead of the apple tree a pear tree grows in the garden, the hole has disappeared, the flower on the veranda and the weathercock on the roof of the house have undergone changes. These details provide the subtle information that the protagonists have *not* returned to the starting point, inviting further interpretations. Even more latent clues are hidden in the half title, imprint, and endpapers. There, the apple tree (half title page) and the pear tree (imprint) as well as the color of the two fruits (endpapers) emphasize a detail that

has changed between the beginning and the end. These image details appear in sections of the book where the text is marked as framing via typographic dispositives. Figure 2 shows a schematic overview of these sections.

Such multimodal play with the framing of the narrative is quite common in contemporary picture books (Duran & Bosch, 2011). This phenomenon is a very vivid example of literary polyvalence. It highlights that appropriate reception of literary texts also means paying attention to the supposedly marginal. With Rosenblatt, one can speak here of the necessity of an aesthetic stance in reading (Rosenblatt 1993, p. 381). In the case of the multimodal picture book, this also means not limiting the function of the image to illustrating the text but being attentive to possible intermodal gaps and frictions. “Nevertheless […] the primary motive for reading in schools usually has little to do with aesthetics. Instead, it stems from a desire to extract information […].” (Soter et al., 2010, p. 217. Also Applebee 1974; Purves & Pradl 2003; Langer 1998) Since illustrations in informative text types usually do not contradict the verbal text, a purely efferent stance implies that the reception of images can be neglected if the verbal text seems to be sufficient to understand the supposed message.

Figure 2. Schematic overview of the peripheral pages in “Sam & Dave graben ein Loch”



This aspect and the phenomenon of intermodal ambiguity in contemporary picture books lead to the questions of the study. The general question is whether attention to the periphery is diminished independently of the narrative function. Does the gaze data indicate that elementary school pupils already recognize the formal marking of conventional book sections by typographic devices? Or does the narrative relevance of these areas in "Sam & Dave dig a hole" attract attention? This implies several subquestions:

1) How do the recipients divide their visual attention between the periphery and center of the book?
2) Do these differences (if applicable) refer only to the print or also to the image?
3) Do the recipients allocate their visual attention in correspondence with the expected (conventional) relevance of the print elements?

2. LITERATURE REVIEW

The data presented here stems from a larger exploratory study on picture book reception (Dammers, 2024). So far, there are very few eye tracking studies on picture book reception. This circumstance justifies the explorative approach of the overarching study. Nevertheless, there are two relevant research approaches to picture book reception that need to be considered: Firstly, eye tracking studies on single text-image combinations of picture books- and secondly, reader response studies on the whole picture book.

Most eye tracking studies are screen-based, as this allows the direct projection of fixations onto the visual surface. Either the stimulus is a genuinely screen-based text-image combination (e.g., websites, picture book apps, ebooks) or it is a digitized version of print media (e.g., newspapers, print advertisements, picture books, nonfiction texts). As indicated in my previous remarks concerning the relevance of textual materiality, this circumstance limits the transferability of the findings to the original print version in the case of the picture book. The screen version offers a stimulus with a different materiality and framing. Another problematic point results from the majority of eye-tracking studies being situated in the research context of literacy studies. Picture books are seen here "mainly as 'stimuli', as instrumental objects for developing literacy, rather than aesthetic creations that can be read for pleasure" (Arizpe, 2013, p. 167).

The reader response approach indeed regards the picture book as an aesthetic object. The problem here is the embedding of data collection in a conversational context that forces an intensive engagement with the picture book. We learn nothing about how picture books are read without this framing (Smith, 2009, p. 91).

2.1 Eye movements in picture book-based text-image combinations

The first eye tracking studies using picture books as stimuli originate, as mentioned above, from the literacy studies. Duckett (2002) recorded the eye movements of first graders reading out a screen version of a very short, illustrated text. The gaze data show oscillations between text and images, indicating a strategic, transmodal construction of meaning.

In 2005, two studies on the print awareness of preschool children followed almost simultaneously (Evans & Saint-Aubin, 2005; Justice et al., 2005). Both studies investigate the extent to which preschool children fixate on the print in (digitized)

picture books during a read-aloud session. They use several picture books with different print styles. Following Smolkin et al. (1992), Justice et al. distinguish between "print-salient" and "picture-salient" picture books (Justice et al., 2005, p. 232). The participants (ten preschool children) focus on the print in the picture-salient books only 2.5%, in the print-salient 6% of their viewing time. Little inter-individual variance regarding print-related attention was found, and no significant correlation between this variance and personal variables. The authors see confirmation of earlier findings (Yaden et al., 1993) that young children who look at picture books show no interest in formal aspects of print, page format, and procedural conventions of reading. They also refer to observations that these formal aspects of print are hardly ever addressed by adult readers (Ezell & Justice, 2000; Justice & Ezell, 2000; Phillips & McNaughton, 1990).

Since then, numerous eye tracking studies on picture book reception have appeared (for an overview, see Dammers, 2024). Like many eye tracking studies from other research contexts, most of these studies work with smaller samples compared to the present study (Duckett, 2002; Evans et al., 2005; Justice et al., 2005; Okuizumi, 2020; Arya & Feathers, 2012; Yim et al., 2019; Justice, 2008; An et al., 2017; Tyler & Josephson, 2020; Takacz & Bus, 2016, 2018; Roy-Charland et al., 2007; Park & Yim, 2020; Ullrich, 2021; Mine et al., 2007; Luke & Asplund, 2018; Ishita et al., 2010; Arslan-Ari & Ari, 2021). Studies with more participants than this study are rare (Li et al., 2012; Liwanag et al., 2017; Oechslin, 2016; Liao et al., 2020), only one of them utilizes a sample size exceeding 100 participants (Li et al., 2012). None of the studies employed as many different picture books as the overarching project of this study (7), which also implies that none of the studies recorded such a high total number of receptions (135). All of these studies have in common that they use a screen version of the used picture book. In addition, the picture book is often conceived as an instrument (e.g., for foreign language acquisition) and not as an aesthetic object.

Studies without this perspective on the picture book as an instrument are rare: Li et al. (2012) analyzed the eye movements of 116 Chinese preschool children during the reception of a screen version of the “The Very Hungry Caterpillar” (Chinese translation), focusing on image-related gaze patterns. They note a focus on action-involved pictorial elements. Okuizumi (2020) examined the eye movements of 10 Japanese students during the reception of a double-page spread of “Basket Moon” (Ray & Cooney, 1999) and “June 29, 1999” (Wiesner, 1992). The participants then commented on the recorded eye movements in a stimulated recall interview. The participants' attempts to fill visual gaps correspond to their eye movements. Okuizumi's study is a rare exception in that it uses the original print-versions of the picture books. Her focus, however, lies on just a double-page spread. Eye movement studies taking the picture book in its whole materiality and spatiality into account are not available, yet.

2.2 Reception of the picture book periphery

Findings on the reception of picture book peripheries exist only as a by-product of other research goals. The reception of peripheral print elements is examined in literacy studies as an aspect of beginning print awareness (Lefebvre et al., 2011, p. 456; Murray, 2009, p. 201; Nevo & Vaknin-Nusbaum, 2017, p. 557; van Kleeck, 1998, p. 35). One result shows that in the early stages of literacy acquisition, children recognize the specific form and function of book and print elements before they are able to decode them. This ability is related to early literary experiences such as reading aloud (van Kleeck, 1998, p. 44).

The studies by Smolkin et al. (Smolkin et al., 1988; 1992) on print-salient picture books have already been mentioned as a reference within the first eye tracking studies. In their long-term study, Smolkin et al. examined children's utterances in read-aloud sessions that refer to print elements of the picture book and categorize the print elements according to formal and spatial criteria. They also observe children's questions about peripheral elements of print and refer to Goodman (1980, p. 14), who notes that sometimes even preschool children show awareness of the (supposedly) irrelevant print elements on the first pages of a book.

Nam and Kim (2019) provide evidence that teachers are also rarely aware of the relevance of picture book peripheries. This categorization of the periphery as irrelevant largely applies to researchers as well. Arizpe, for example, states for empirical studies on the reception of textless picture books: "peritextual [...] text is usually ignored." (Arizpe, 2013, p. 168)

Since the 1990s, there has been an increase in studies that follow a reader response approach (Evans, 1998; Holland et al., 1993; Kiefer, 1995). Among other aspects, the response to challenging (Evans, 2015a; Pantaleo, 2008; Volz et al., 2016) and wordless picture books (Arizpe, 2013; Dammann-Thedens, 2011; Dowhower, 1997) has been investigated, especially in the context of intercultural education and second language acquisition (Arizpe et al., 2014) as well as in reading aloud conversations in families (Dammann-Thedens, 2020; Elias, 2009; Wieler, 1997), schools, and kindergartens (Hoffmann, 2019a; 2019b; Knopf, 2010; Merklinger, 2015; Sipe, 2000; 2008).

Within this research perspective on the picture book as an aesthetic object one can also observe an increased awareness of the relevance of peripheral elements. For data collection the researchers artificially evoke close readings, such as anticipating and associating with picture book covers in guided read-aloud conversations (Aram, 2006; Arizpe, 2001; Arizpe et al., 2014; Arizpe & Styles, 2003a).

Sipe highlights child readers' utterances that address "the book as made object or cultural product". In this context, the children usually refer to peripheral markers (Sipe, 2008, p. 111). Sipe and McGuire (Sipe & McGuire, 2009) focus on statements about endpapers in read-aloud conversations. Pantaleo also notes an intensive engagement with peripheral elements (especially the cover) in her studies (Pantaleo, 2003; 2008; 2018).

Smith critically notes the context of data collection in these studies:

> Studies of children and their responses to picture books have typically been conducted in classrooms where teachers were already interested in what picture books have to offer […]. But what about the others? How do children whose teachers do not celebrate picture books, and who have nothing extrinsic to gain from working with them, respond? (Smith, 2009, p. 91)

Regarding picture book peripheries, this critique means that the data show how intensive and deep engagement with the complexity of peripheral picture book design *would* be possible *if* teachers offered a suitable framework. They thus provide valuable insights into the didactic potential of picture book peripheries. The data, on the other hand, say nothing about the extent to which readers pay attention to the periphery at all outside of such staged settings if they are not explicitly invited to do so. Intrinsically motivated attention to peripheral elements is mainly discussed in connection with picture book evaluation or selection (Aram & Aviram, 2009; Arizpe & Styles, 2003b; Evans, 2015b).

There is thus a need for picture book reception studies that a) approach reception processes which are not clearly didactically or pedagogically framed or structured and b) look at the data from a perspective that considers the picture book an aesthetic object.

3. METHOD

The overarching study follows the approach of Interactional Reception Research (Bucher & Schumacher, 2013). The core of this approach is the collection of eye movement data in scenarios that come as close as possible to real-world reception (Bucher & Schumacher, 2013, p. 11). Additional data (e.g., interviews) is collected to compensate for the complexity of multimodal media reception. The analysis of the gaze data is closely tied to the theoretical examination of the stimulus.

3.1 Participants

In order to be able to cope with the high organizational demands of the eye movement recordings over the full duration of the study, the entire data collection took place at an elementary school in Cologne-Ehrenfeld. The demographic data of this district are close to the average for Cologne. Prior to the first eye tracking session, a statistical sub-sample of $n = 48$ subjects was drawn from the school population that was balanced in terms of grade, sex, and reading comprehension (see figure 3).

The data discussed here is taken from this subsample. After the first eye tracking session, the sample was further reduced ($n = 10$). This second reduction was data-based (see also figure 4).

3.2 Materials

The standardized ELFE II test (Lenhard et al., 2018) was used to determine reading comprehension. A Pupil Core headset with a world camera (120 Hz) and binocular eye cameras (200 Hz) was used to record the eye movements. This mobile device is very light and allows minimal disturbance of the natural reception situation while using authentic print picture books. However, the system is sensitive to external influences (e.g., lighting conditions), individual physical characteristics (e.g., very dark eye color or eyelashes, reflective glasses, unusual head position), and calibration (e.g., slipping of the headset). Therefore, some degree of data loss was anticipated. This was considered in the sampling process by doubling the sample size (see figure 3).

A total of seven picture books were used as stimuli. All seven picture books are recent publications, having been published after 2010. For the first session, two picture books were chosen (in the German translation): “Grandad's Island” ([Ger.: “Opas Insel”] Davies, 2016) as a rather conventionally designed picture book and “Sam & Dave Dig a Hole” ([Ger.: “Sam & Dave graben ein Loch”] Barnett & Klassen, 2015) as a picture book that can only be fully understood by looking closely at the image details. Another criterion was the different layout of the two books. While “Grandad's Island” varies between different image formats and text-image arrangements, “Sam & Dave Dig a Hole” consists almost exclusively of full-format images and isolated text on an empty background.

3.3 Procedures

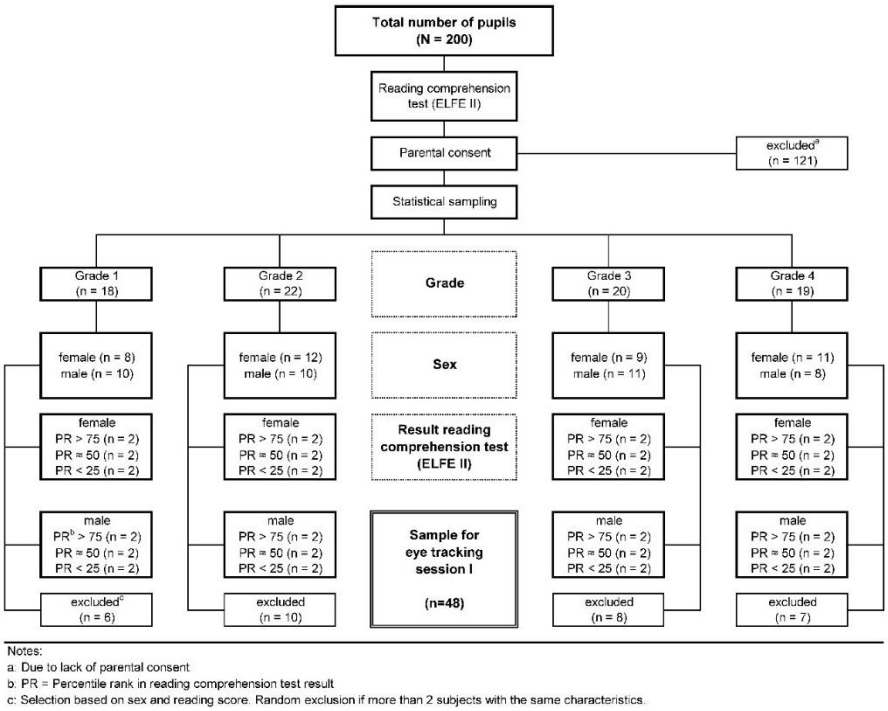
The gaze data was recorded in a three-stage process (see figure 4). The data discussed here originate from the first of three recording sessions. The procedure in this first session was intended to be as neutral as possible. The instructions varied between the two picture books. After the calibration process, the participants were informed that technical adjustments were still necessary. During the pretended waiting time, they were offered the first picture book (“Grandad's Island”). This was done to record a seemingly unobserved reception. The reception of the second stimulus (“Sam & Dave Dig a Hole”) was then embedded in a real-life scenario (reading time in the school library).

In this way, the setting follows an established procedure for investigating initial reception (Schumacher, 2013, p. 113). The sample size only allowed for a short follow-up interview. The questions concerned the plot and irritating aspects of the two picture books as well as individual evaluations by the participants. In addition, the children were asked if any of the picture books were already known. No participant knew the picture books before the study.

In the data analysis, it is not the subjects that are used as cases, but the total number of (possible) page receptions. This number derives from the number of subjects and the number of double pages of the respective book. The picture book

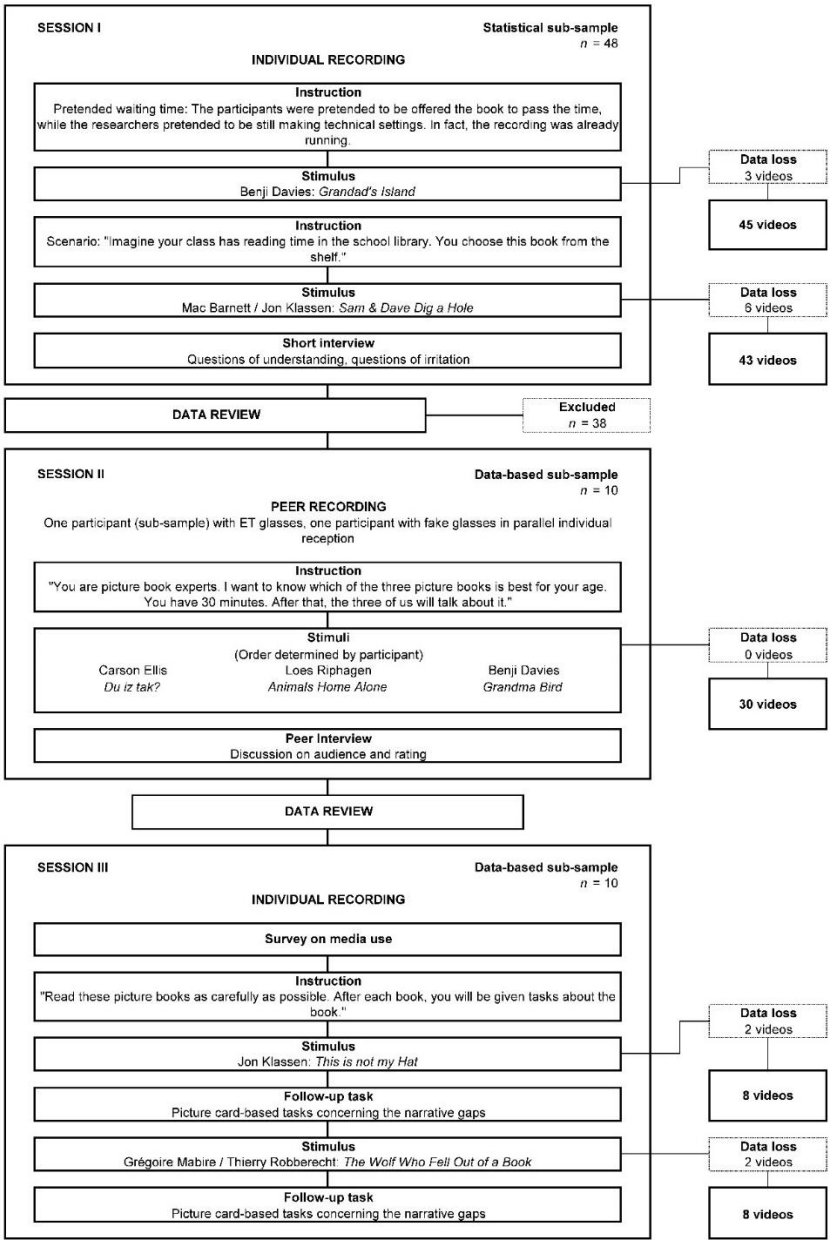
"Sam & Dave Dig a Hole" consists of 25 double pages. The recordings of 42 cases were completed successfully. Accordingly, the number of page receptions for this picture book is 25 × 42 = 1050.

Figure 3. Sampling and flow of subjects until first eye tracking session



To each of these cases a variety of variables can be attributed. Eye tracking provides time values for each of the cases. Each of these time values stands for the cumulative fixation time on a particular double page or a certain text element by a particular participant. The time values are differentiated according to modality. Thus, for each double page there is a time value for the image fixations and a time value for the print fixations of each participant. This distinction takes into account the very different processes during image and text perception. Each of these individual events can be further associated with personal (Who is looking?) and stimulus-related (What is being looked at?) variables. In this way, the data can be grouped and compared in different ways. The following data analysis examines differences in the fixation time of peripheral and central areas of the picture book.

Figure 4. Schematic representation of the three-stage data collection process



In a first step, an error bar chart was drawn for the mean values of the fixation times per double page in the periphery and center in “Sam & Dave Dig a Hole” separately

for image and text fixation times. In addition, a t-test was carried out. This statistical test is used to find out whether the difference between the values of two samples is statistically significant or not (Eid et al. 2017, p. 334). In this case the two subsamples are defined by the section of the book, either peripheral or central pages. The text fixation values are relative values (seconds per word). Those participants who did not read the text on the central pages were excluded from the t-test. The image values are absolute values (total image fixation time per double page in seconds). For the t-tests all values are subject-related mean values to avoid false conclusions due to the Simpson paradox (Eid et al. 2017, p. 729). The distribution is right-skewed in all subsamples of image and text fixation times. This is a common phenomenon for viewing time values, as they tend to accumulate close to 0. The skewness G_1 of image fixation time was found to be 1.61 for the periphery and 2.37 for the center. The skewness G_1 of text fixation time per word was found to be 1.04 for the periphery and .63 for the center. With equal-sided skewness, the t-test is robust even with small samples (Delaney & Vargha, 2000). Nevertheless, a log-transformation was used to increase the symmetry. The variance of the subsamples differs both in the image fixation times and in the text fixation times. With the same sample size, however, the t-test is robust against violations of the assumption of homogeneity of variance (Diehl & Arbinger, 2001).

The second step consisted of taking a closer look at the periphery. The image fixations are differentiated according to conventional page areas (e.g., front cover, endpapers, half title) and the text fixations per word according to conventional print elements (e.g., title, name of the author, imprint, blurb). These values were compared in an error bar chart for “Sam & Dave Dig a Hole”. Finally, the values for text fixation time per word were grouped into three classes: ‘no fixation’, ‘short fixation’ (< 300 ms) and ‘long fixation’ (≥ 300 ms). Below the threshold of 300 ms per word, decoding is very unlikely (Brysbaert, 2019; Taylor, 1965; Spichtig et al., 2016). The distribution of these fixation classes according to the conventional function of the text element was visualized in a stacked bar chart.

4. RESULTS

Figures 5 and 6 clearly show the heterogeneous distribution of visual attention. The average text fixation time per word is well below the threshold of 300 ms in the periphery, but well above it in the center. In the periphery, therefore, the text tends not to be completely decoded. However, the marking as framing also influences the selective attention on the images. The average image fixation time within the periphery is around 1.5 seconds per double page, while in the center it is around 3.5 seconds. It should be mentioned that the average image fixation time for this book was very low overall compared to the other picture books used. However, the lower attention to the periphery compared to the center can be observed across all books.

Figure 5. Image fixation times in peripheral and central pages of "Sam & Dave Dig a Hole"

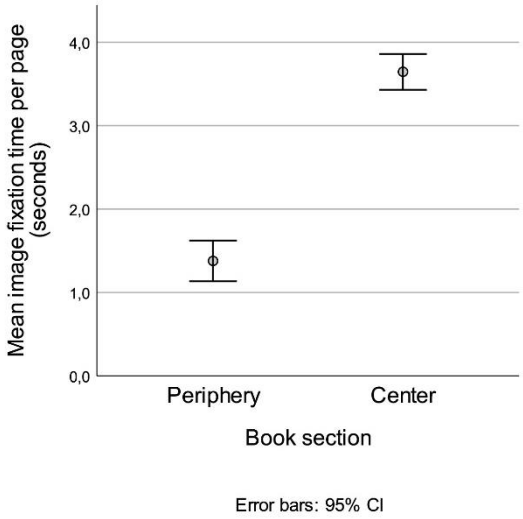
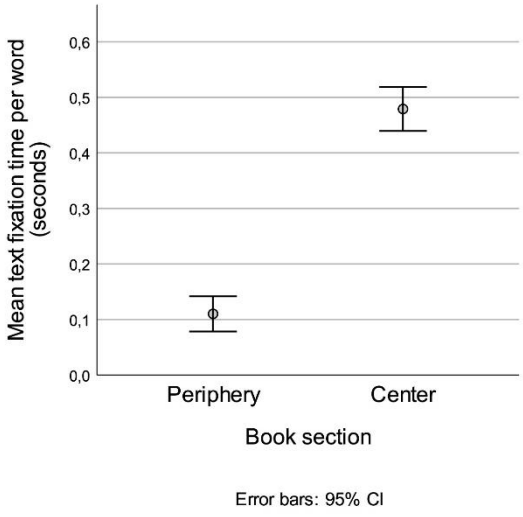


Figure 6. Text fixation times in peripheral and central pages of "Sam & Dave Dig a Hole"



The t-tests on the difference between the fixation times in the periphery and center confirm this finding: The first t-test was carried out to evaluate whether image fixation time per page differed by book section as peripheral versus central page. The pages of the periphery (*M* = .07, *SD* = .24) caused significantly lower image fixation

time than the pages of the center (M = .52, SD = .19), $t(82)$ = -9.55, p < .001. The second t-test was executed to evaluate whether text fixation time per word differed by status as peripheral versus central page. The pages of the periphery (M = -.1.04, SD = .39) caused significantly lower text fixation time per word than the pages of the center (M = -.23, SD = .16), $t(56)$ = -10.25, p < .001.

This observation is still not very precise. The content of the individual peripheral pages appears to be too different to be grouped together. Some pages contain images (cover, half title page, main title page, imprint), others such as the endpapers consist only of a monochrome page (which, however, is also related to the narrative). Some of the peripheral text elements are conventionally relevant for reception (e.g., title), others are mostly less relevant (e.g., imprint). A more detailed insight into selective visual attention is provided in figures 7 and 8, which show error bar charts on the mean fixation times on individual peripheral text elements (seconds per word) and on the images within the conventional and formally marked sections of the book (seconds per spread).

Although the fixation time of the front cover also tends to be less than that of the center, it seems to be assigned a significantly higher relevance than the other peripheral pages. These all have an average image fixation time of less than two seconds. It is also noticeable that the monochrome endpapers are slightly above half title page and imprint. On these pages, two indications of the change in setting are depicted: apple and pear tree.

Figure 7. Image fixation time in conventional sections of "Sam & Dave Dig a Hole"

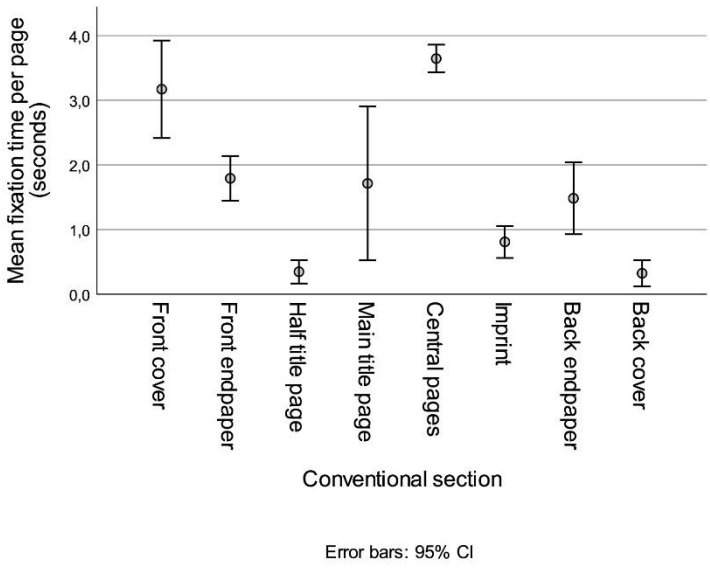
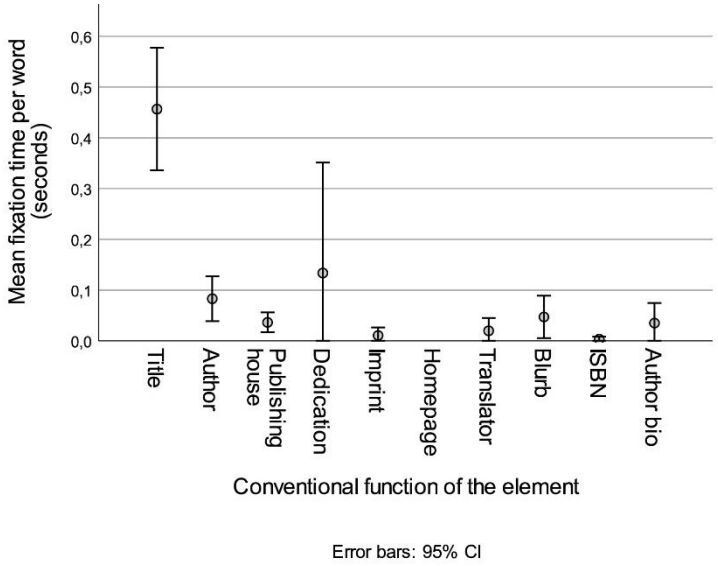


Figure 8. Text fixation time according to conventional function of the peripheral element in "Sam & Dave Dig a Hole"



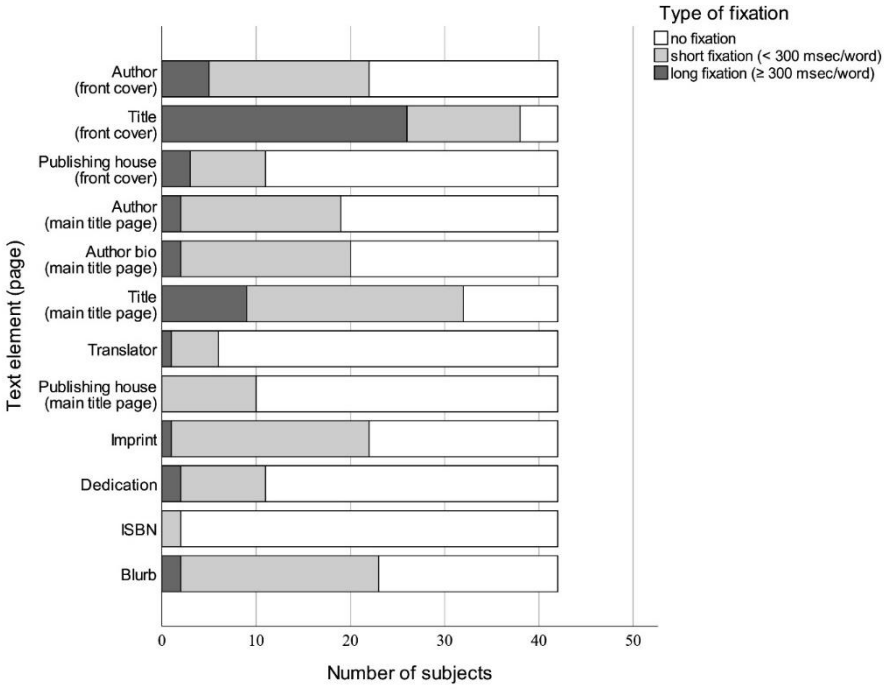
The special status of the front cover also seems to correspond to that of the title. The title is the only text element in the periphery that is above the limit of 300 ms/word. It can be assumed that all other elements are rarely decoded completely. This becomes even clearer in figure 9, which shows how many of the test subjects did not fixate the respective element, only fixated it briefly or for a long time. Decoding can only be assumed in the third group. The distribution not only corresponds to the conventional relevance of the elements for the reception of a text, but also demonstrates the effectiveness of typographic marking: the elements that appear repeatedly in identical form (title, author, publisher) are hardly fixated the second time they appear.

5. DISCUSSION

As the eye tracking data shows, the visual attention on print elements and images is significantly lower in the periphery than in the center of the picture book (see figures 3 & 4). If 200–250 ms are needed for word identification (Brysbaert, 2019), it is noticeable that the mean value for the periphery is half this duration. The low fixation time does not only apply to the text, but also to the images of the peripheral pages. These results answer the first two research questions of the study: The allocation of visual attention differs between the periphery and the center. These differences refer both to the print and to the image.

The separate examination of the various conventional page areas and print elements shows a selective reception of the periphery (see figures 7 & 8). The participants paid more attention to the written title than to the other print elements of the periphery. The case is similar for the cover image. It is fixated longer than the other peripheral images. This finding is an indicator that entire page areas are marked as relevant through formal aspects. The cover image seems to be interpreted as the pictorial counterpart to the written title. The other peripheral pages are hardly noticed. Small print seems to mark irrelevance, even for the image level.

Figure 9. Grouped fixation times of peripheral text elements



A special case can be seen in the main title (image) and dedication (print). Here the status seems to be unclear. Although the mean in these cases does not exceed that of the other peripheral elements, the variance is higher. These results give a tentative answer to the third research question: The allocation of visual attention tends to correspond to the expected (conventional) relevance of the print elements. In the case of the main title (image) and dedication (text), the variance indicates ambiguity.

The data from the other recording sessions support the hypothesis that typographical marking plays a crucial role in the context of the current study. The elementary school students in the recorded reading sessions seem to use typographic features to guide their visual attention when reading the picture books. In two

picture books from the second session, typographically ambiguous blocks of text appear on the main title page. They are accompanied by a full-format image in which the narrative already begins. A block of text clearly marked as a title makes the whole configuration of the double page appear contradictory: Its status as main title is unclear. The text blocks have different functions: In one of the cases it is an acknowledgement, in the other a motto in verse form. In the first case, the text element has a rather low narrative relevance, in the second a higher one. These elements account for numerous fixations. This means that in the peripheral field of vision and based on formal features alone, the subjects were obviously unable to determine whether the text element was relevant. Subjects with low reading comprehension skills tended to read the entire text block in both cases. Subjects with very high reading comprehension skills only read the first few words of the acknowledgement and then stopped. In the case of the motto, they also read the entire text block.

It should also be noted that the study has its limitations regarding the transferability to other picture books. Although the data for the six other picture books show similar trends (Dammers, 2024), only "Grandads Island" has a comparable sample size. In addition, the influence of the context of reception is unknown. An extension of the research approach to include family context and recreational reading would be useful.

6. CONCLUSION

The data confirm that already elementary school children read a picture book very selectively. The convention that the periphery contains mainly irrelevant frame elements seems to have been internalized by the participants This can also be interpreted as a sign of early reading socialization. Children learn about book and reading culture before they begin to decode words. Typographic devices seem to function as markers for relevance, as the participants do not ignore the periphery completely. The conventionally relevant elements (title and cover picture) also stand out in the gaze data as exceptions to the otherwise cursory peripheral reception.

First of all, it is impressive how specifically text elements are selected for reception. This efficient way of reception may be appropriate for informative texts. For literary texts, especially contemporary picture books, it is not an adequate mode of reception. The contemporary picture book is a useful example for aesthetic texts in general: the supposedly marginal can be essential here (Lotman, 1970/2015, p. 99). The data show that not even proficient readers seem to have learned this by the end of elementary school. When reading a literary text, the observed efficiency-oriented strategy can be described, with Reason's words, as a misapplication of good rules: "The more often a cognitive routine achieves a successful outcome in relation to a particular context, the more likely it is to reappear in conditions of incomplete specification" (Reason, 1990, p. 97). Thus, if it is often considered successful in the school context to read (literary) texts with the mere aim of efficiently extracting information, this strategy is also used when its adequacy is unclear. In this light, the

dominance of task formats of informative reading (including literary texts) in schools seems all the more problematic.

More generally, the results indicate the urgent need not to reduce reading literacy to efficient information retrieval. They also show that researchers and teachers should not misconstrue this requirement as the next step after reaching a certain reading proficiency. When Soter et al. write:

> if readers are not sufficiently proficient to enable them to move beyond the 'mechanics' of navigating the words on the page, they are not in a position to move to a level of interaction with the text that enables them to enter into that world in such a way as to engage aesthetically (Soter at al., 2010, p. 218),

they disregard the fact that literariness is not bound to the symbolic dimension of print. It is not even bound to written text at all.

In this sense the findings can also be put in a positive light: The picture book proves to be a promising subject for inclusive learning settings, and not because picture books are less complex. In Rosenblatt's words, the picture book offers an opportunity, "to grow into the emotional and intellectual and aesthetic maturity necessary for appreciating great works of literature" (Rosenblatt, 1995, p. 276). Regardless of reading comprehension, the contemporary picture book offers the possibility to experience an important aspect of literary literacy: to mind the margin. This goal is neither too easy for skilled readers nor too difficult for non-readers. This is because it belongs to a different dimension of literary literacy than reading comprehension in the sense of decoding. The most intriguing thing is that it nevertheless incorporates an exploration of print.

Furthermore, the potentials described above make the picture book an ideal object for the early and inclusive promotion of multimodal literacy. It provides complex text-image structures that carry central challenges of multimodal literacy:

The integral (not only illustrative or ornamental) function of the image (Rowsell et al., 2013), the need for non-linear parallel processing of text and image (Luke, 2003) and finally the consideration of diagrammatic potentials of typography as an intersection of pictorial and verbal signs (Unsworth et al., 2015; van Leeuwen, 2006).

The limitations of the present study with respect to transferability to other picture books have already been mentioned. Follow-up studies with other picture books would be beneficial in this regard. More extensive studies involving additional age groups and reception settings would be needed to examine the development of literacy and the contextual dependence of reading mode. Is the disregard for the periphery unique to the school context? Can a growing awareness of potentially relevant peripheral elements be observed among young people and adults? Furthermore, contrastive procedures with additional use of typographically manipulated stimuli could provide insights into the extent of the influence of typographic devices on the attribution of relevance. Extending the approach through the accompanying collection of reader response data would shed light on connections to literary comprehension. And finally, intervention studies would be a promising continuation in

order to further explore the didactic potential of such transgressive picture book framings to develop multimodal literacy.

REFERENCES

An, L., Wang, Y., & Sun, Y. (2017). Reading words or pictures: Eye movement patterns in adults and children differ by age group and receptive language ability. *Frontiers in Psychology.* Advance online publication. https://doi.org/10.3389/fpsyg.2017.00791

Applebee, A. (1974). *Tradition and reform in the teaching of English: A history*. NCTE.

Aram, D. (2006). Early literacy interventions: The relative roles of storybook reading, alphabetic activities, and their combination. *Reading and Writing*, *19*(5), 489–515. https://doi.org/10.1007/s11145-006-9005-2

Aram, D., & Aviram, S. (2009). Mothers' storybook reading and kindergartners' socioemotional and literacy development. *Reading Psychology*, *30*(2), 175–194. https://doi.org/10.1080/02702710802275348

Arizpe, E. (2001). 'Letting the story out': Visual encounters with Anthony Browne's *The Tunnel*. *Reading, Literacy and Language*, 115–119. https://doi.org/10.1111/1467-9345.00173

Arizpe, E. (2013). Meaning-making from wordless (or nearly wordless) picturebooks: What educational research expects and what readers have to say. *Cambridge Journal of Education*, *43*(2), 163–176. https://doi.org/10.1080/0305764X.2013.767879

Arizpe, E., Colomer, T., & Martínez-Roldán, C. M. (2014). *Visual journeys through wordless narratives: An international inquiry with immigrant children and "The Arrival"*. Bloomsbury Academic. https://doi.org/10.5040/9781472593283

Arizpe, E., & Styles, M. (2003a). A gorilla with 'grandpa's eyes': How children interpret ironic visual texts—a case study of Anthony Browne's Zoo. In E. Arizpe & M. Styles (Eds.), *Children Reading Pictures: Interpreting Visual Texts* (pp. 77–96). Routledge. https://doi.org/10.1023/A:1012760422501

Arizpe, E., & Styles, M. (2003b). On a walk with Lily and Satoshi Kitamura: How children link words and pictures along the way. In E. Arizpe & M. Styles (Eds.), *Children Reading Pictures: Interpreting Visual Texts* (pp. 55–76). Routledge. https://doi.org/10.4324/9780203005156

Arslan-Ari, I., & Ari, F. (2021). The effect of visual cues in e-books on pre-k children's visual attention, word recognition, and comprehension: An eye tracking study. *Journal of Research on Technology in Education*, *Jg. 2021*, 1–15. https://doi.org/10.1080/15391523.2021.1938763

Arya, P., & Feathers, K. M. (2012). Reconsidering children's readings: Insights into the reading process. *Reading Psychology*, *33*(4), 301–322. https://doi.org/10.1080/02702711.2010.518881

Barnett, M., & Klassen, J. (2015). *Sam & Dave graben ein Loch* (T. Bodmer, Trans.). NordSüd. (*Sam & Dave dig a hole,* published 2014).

Brysbaert, M. (2019). How many words do we read per minute? A review and meta-analysis of reading rate. *Journal of Memory and Language*, *109*, Article 104047. https://doi.org/10.1016/j.jml.2019.104047

Bucher, H.-J., & Schumacher, P. (Eds.). (2013). *Interaktionale Rezeptionsforschung: Theorie und Methode der Blickaufzeichnung in der Medienforschung* [Interactional reception studies: Eye-tracking theory and methodology in media research]. Springer. http://dx.doi.org/10.1007/978-3-531-93166-1

Dammann-Thedens, K. (2011). »Jetzt sieht es doch wie ein Mann aus!«: Umgang mit der Darstellung einer textlosen Bildnarration im Eltern-Kind-Dialog. ["But now it looks like a man!": Dealing with wordless picturebooks in adult-child-dialogues.] *Zeitschrift Für Literaturwissenschaft Und Linguistik*, *162*(41), 27–46. https://doi.org/10.1007/BF03379853

Dammann-Thedens, K. (2020). *Bilderzählungen im Gespräch: Kindliche und erwachsene Rezeptionspraktiken zwischen Konvention und Irritation*. [Pictorial narratives in conversations: Childrens' and adults' strategies of reception between convention and irritation.] kopaed.

Dammers, B. (2021). Der Spielplatz am medialen Rand: Entgrenzung und Paratextualität des Bilderbuchs. [The playground at the margin of the medium: Transgression and paratextuality of the picturebook.] In C. Bär, C. Jantzen, & S. Wittmer (Eds.), *Vom Bilderbuch aus—zum Bilderbuch hin: Perspektiven auf*

*Gegenstand, Akteur*innen und Unterricht* [From the picturebook—towards the picturebook: Perspectives on subject, participants and teaching.] (pp. 93–113). Schneider Hohengehren.

Dammers, B. (2024). *Bilderbuchperipherien: Mediale Räumlichkeit und Blickbewegungen im Bilderbuch*. [Picturebook peripheries: On medial spatiality and eye movements in picturebooks] *Studien zu Kinder- und Jugendliteratur und -medien: Vol. 16*. J. B. Metzler.

Davies, B. (2016). *Opas Insel* (J. Hohnhold, Trans.). Aladin Verlag. (*Grandad's Island*, published 2015).

Delaney, H. D., & Vargha, A. (2000). The effect of nonnormality on student's two-sample t test. http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED443850 (Paper presented at the 81st Annual Meeting of the American Educational Research Association, New Orleans, LA, April 24–28, 2000).

Diehl, J. M., & Arbinger, R. (2001). *Einführung in die Inferenzstatistik* [Introduction to inferential statistics] (3rd ed.). Klotz.

Dowhower, S. (1997). Wordless Books: Promise and possibilities, a genre comes of age. *Yearbook of American Reading Forums*, *17*, 57–80.

Duckett, P. (2002). Envisioning story: The eye movements of beginning readers. *Literacy Teaching and Learning*, *7*(1+2), 77–89.

Duran, T., & Bosch, E. (2011). Before and after the picturebook frame: A typology of endpapers. *New Review of Children's Literature and Librarianship*, *17*(2), 122–143. https://doi.org/10.1080/13614541.2011.624927

Eid, M., Gollwitzer, M., & Schmitt, M. (2017). *Statistik und Forschungsmethoden* [Statistics and research methods] (5th ed.). Beltz.

Elias, S. (2009). *Väter lesen vor: Soziokulturelle und bindungstheoretische Aspekte der frühen familialen Lesesozialiation*. [Fathers reading aloud: Sociocultural and attachment-theoretical aspects in early stage familial reading socialisation.] *Lesesozialisation und Medien*. Beltz Juventa.

Evans, J. (Ed.). (1998). *What's in the picture? Responding to illustrations in picture books*. Paul Chapman. https://doi.org/10.1111/1467-9345.00086

Evans, J. (2015a). Children's thoughts on challenging and controversial picturebooks. In J. Evans (Ed.), *Challenging and controversial picturebooks: Creative and critical responses to visual texts* (pp. 25–41). Routledge. https://doi.org/10.4324/9781315756912

Evans, J. (2015b). Could this happen to us? Children's critical responses to issues of migration in picturebooks. In J. Evans (Ed.), *Challenging and controversial picturebooks: Creative and critical responses to visual texts* (pp. 243–260). Routledge. https://doi.org/10.4324/9781315756912

Evans, M. A., & 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.1467-9280.2005.01636.x

Ezell, H. K., & Justice, L. M. (2000). Increasing the print focus of adult-child shared book reading through observational learning. *American Journal of Speech-Language Pathology*, *9*(1), 36–47. https://doi.org/10.1044/1058-0360.0901.36

Genette, G. (2001). *Paratexte: Das Buch vom Beiwerk des Buches*. [Paratexts: Thresholds of interpretation.] Suhrkamp.

Gilbert, A. (2018). Kontroversen um den Paratext.: Eine literaturwissenschaftliche Handreichung für den kunstwissenschaftlichen Gebrauch des Begriffs. [Controversies around the paratext: A literary guide for the aesthetic use of the term.] In L. Kolb, B. Preisig, & J. Welter (Eds.), *Paratexte: Zwischen Produktion, Vermittlung und Rezeption* [Paratexts: Between production, mediation and reception] (pp. 29–49). Diaphanes.

Goodman, Y. M. (1980). The roots of literacy. In M. P. Douglass (Ed.), *Forty-fourth Yearbook of the Claremont Reading Conference: Reading: A humanizing experience* (pp. 1–32). Claremont Reading Conference.

Hoffmann, J. (2019a). „guck mal jetzt (-) jetzt hat die katze drei köpfe". Aneignung narrativer Bilder im Kindergarten am Beispiel von David Wiesners 'Herr Schnuffels'. ["Look here (-) now the cat has three heads". Acquisition of narrative pictures in kindergarten with the example of David Wiesner's 'Mr. Wuffles!'.] In B. Uhlig, G. Lieber, & I. Pieper (Eds.), *IMAGO: Band 6. Erzählen: Zwischen Bild und Text* [Narration: Between image and text] (pp. 165–180). kopaed.

Hoffmann, J. (2019b). Grafisch erzählte Geschichten im Bilderbuchkinogespräch—David Wiesners 'Herr Schnuffels' in der Grundschule. [Graphic narration in shared picture book reading —David Wiesner's 'Mr. Wuffles!' in elementary schools.] *MiDU - Medien Im Deutschunterricht*, *1*(1), 44–65. https://doi.org/10.18716/ojs/midu/2019.1.5

Holland, K. E., Hungerford, R. A., & Ernst, S. B. (Eds.). (1993). *Journeying: Children responding to literature*. Heinemann.

Ishita, E., Mine, S., & Kunimoto, C. (2010). Analyzing viewing patterns while reading picture books. *Proceedings of the 10th Annual Joint Conference: Digital Libraries*, *Jg. 2010*. https://doi.org/10.1145/1816123.1816190

Justice, L. M., & Ezell, H. K. (2000). Enhancing children's print and word awareness through home-based parent intervention. *American Journal of Speech-Language Pathology*, *9; Jg. 2000*(3), 257–269. https://doi.org/10.1044/1058-0360.0903.257

Justice, L. M., Pullen, P. C., & Pence, K. (2008). Influence of verbal and nonverbal references to print on preschoolers' visual attention to print during storybook reading. *Developmental Psychology*, *44*(3), 855–866. https://doi.org/10.1037/0012-1649.44.3.855

Justice, L. M., Skibbe, L., Canning, A., & Lankford, C. (2005). Pre-schoolers, print and storybooks: an observation study using eye movement analysis. *Journal of Research in Reading*, *28*(3), 229–243. https://doi.org/10.1111/j.1467-9817.2005.00267.x

Kiefer, B. Z. (1995). *The potential of picturebooks: From visual literacy to aesthetic understanding*. Prentice Hall.

Knopf, J. (2010). Literar-ästhetische Rezeption im institutionellen Kontext: Eine empirische Studie in Kindergarten, Grundschule und Gymnasium. [Literary-aesthetic reception in institutional contexts: An empirical study in kindergartens, elementary schools and secondary schools.] In I. Winkler, N. Masanek, & U. Abraham (Eds.), *Poetisches Verstehen: Literaturdidaktische Positionen - empirische Forschung - Projekte aus dem Deutschunterricht* [Poetic understanding: Literary didactic positions - empirical research - projects from the German classroom] (pp. 174–185). Schneider Hohengehren.

Lefebvre, P., Trudeau, N., & Sutton, A. (2011). Enhancing vocabulary, print awareness and phonological awareness through shared storybook reading with low-income preschoolers. *Journal of Early Childhood Literacy*, *11*(4), 453–479. https://doi.org/10.1177/1468798411416581

Lenhard, W., Lenhard, A., & Schneider, W. (2018). *ELFE II: Ein Leseverständnistest für Erst- bis Siebtklässler - Version II* [ELFE II: A reading comprehension test for first- to seventh-graders—Version II] (3rd ed.). Hogrefe.

Li, L., Cortazzi, M., Liu, B., & Gao, X. (2019). Moving eyes on pictures following visual grammar benefits meaning making: Evidence from the independent reading of chinese preschool children. *Journal of Chinese Writing Systems*, *4*(1), 57–70. https://doi.org/10.1177/2513850219886109

Liao, C.-N., Chang, K.-E., Huang, Y.-C., & Sung, Y.-T. (2020). Electronic storybook design, kindergartners' visual attention, and print awareness: An eye-tracking investigation. *Computers & Education*, *144*, 103703. https://doi.org/10.1016/j.compedu.2019.103703

Liwanag, M. P. S. U., Martens, P., & Martens, R. (2017). Examining a reader's meaning-making process of picture books using eye movement miscue analysis. *Literacy Research: Theory, Method, and Practice*, *66; Jg. 2017*(1), 248–263. https://doi.org/10.1177/2381336917719256

Lotman, J. M. (2015). *Die Struktur des künstlerischen Textes* (2nd ed.). [The structure of the artistic text.] Suhrkamp. (Original work published 1970)

Luke, C. (2003). Pedagogy, connectivity, multimodality, and interdiscilplinarity. *Reading Research Quarterly*, *38*(3), 397–403.

Luke, S. G., & Asplund, A. (2018). Prereaders' eye movements during shared storybook reading are language-mediated but not predictive. *Visual Cognition*, *26*(5), 351–365. https://doi.org/10.1080/13506285.2018.1452323

Merklinger, D. (2015). Sprachformen für Unbestimmtheit und Ungewissheit: Literarisches Lernen im Vorlesegespräch. [Diction for indeterminacy and uncertainty: Literary learning in read-aloud-conversations.] In E. Gressnich, C. Müller, & L. Stark (Eds.), *Lernen durch Vorlesen: Sprach- und Literaturerwerb in Familie, Kindergarten und Schule* [Learning by reading aloud: Language and literature acquisition in the family, kindergarten and school] (pp. 143–159). Narr.

Mills, K. A., & Unsworth, L. (2017). Multimodal literacy. In K. A. Mills & L. Unsworth (Eds.), *Oxford Research Encyclopedia of Education.* Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.232

Mine, S., Shiozaki, J., Kunimoto, C., Ishida, E., Kurata, K., & Ueda, S. (2007). Children's eye movement while reading picture books. *Library & Information Science Research*, *58*, 69–90. https://doi.org/10.46895/lis.58.69

Murray, H. (2009). Conventions of reading. In D. R. Olson & N. Torrance (Eds.), *Cambridge handbooks in psychology. The Cambridge Handbook of Literacy* (pp. 200–220). Cambridge University Press. https://doi.org/10.1017/CBO9780511609664.012

Nam, A. R., & Kim, S. L. (2019). The present status of picture book reading activities and utilization of picture book peritexts of early childhood teachers. *Korean Journal of Child Education and Care*, *19*(3), 157–170. https://doi.org/10.21213/kjcec.2019.19.3.157

Nevo, E., & Vaknin-Nusbaum, V. (2017). Enhancing language and print-concept skills by using interactive storybook reading in kindergarten. *Journal of Early Childhood Literacy*, *18*(4), 545–569. https://doi.org/10.1177/1468798417694482

Oechslin, T. S. (2016). *Measures of visual function and attention related to common vision disorders part 1: Eye tracking during storybook reading in young children with hyperopia part 2: Functional magnetic resonance imaging of vergence in convergence insufficiency* [Doctoral dissertation, Ohio State University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=osu1461195190

Okuizumi, K. (2020). An analysis of L1 readers' meaning-making processes through producing and answering questions regarding picture books: Eyetracking measurements and interviews. *International Journal of Language Studies*, *14*(2), 103–116.

Pantaleo, S. (2003). 'Godzilla lives in New York': Grade 1 students and the peritextual features of picture books. *Journal of Children's Literature*, *29*(2), 66–77.

Pantaleo, S. (2008). *Exploring student response to contemporary picturebooks*. University of Toronto Press. https://doi.org/10.3138/9781442688063

Pantaleo, S. (2018). Learning about and through picturebook artwork. *The Reading Teacher*, *71*(5), 557–567. https://doi.org/10.1002/trtr.1653

Park, W., & Yim, D. (2020). Correlation analysis on the preschoolers' processing capacity, processing speed, story comprehension performance, and the eye movement patterns. *Journal of Speech, Language & Hearing Disorders*, *29*(3), 57–67. https://doi.org/10.15724/jslhd.2020.29.3.057

Phillips, G., & McNaughton, S. (1990). The practice of storybook reading to preschool children in mainstream New Zealand families. *Reading Research Quarterly*, *25*(3), 196–212. https://doi.org/10.2307/748002

Purves, Alan C., & Pradl, Gordon M. (2003). The school subject literature. In J. Flood, D. Lapp, J. R. Squire, & J. M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (2. ed., pp. 848–856). Erlbaum.

Ray, M. L., & Cooney, B. (1999). *Basket Moon* (1st ed.). Little, Brown & Company.

Reason, J. T. (1990). *Human error*. Cambridge University Press. https://doi.org/10.1017/CBO9781139062367

Rosenblatt, L. M. (1993). The transactional theory: Against dualisms. *College English*, *55*(4), 377–386. https://doi.org/10.58680/ce19939301

Rosenblatt, L. M. (1995). *Literature as exploration* (5th ed.). Modern Language Association.

Rowsell, J., Kress, G., Pahl, K., & Street, B. (2019). The social practice of multimodal reading. In D. E. Alvermann, N. J. Unrau, M. Sailors, & R. B. Ruddell (Eds.), *Theoretical models and processes of literacy* (Seventh edition, pp. 514–532). Routledge Taylor & Francis Group. https://doi.org/10.4324/9781315110592-32

Roy-Charland, A., Saint-Aubin, J., & Evans, M. A. (2007). Eye movements in shared book reading with children from kindergarten to Grade 4. *Reading and Writing*, *20*(9), 909–931. https://doi.org/10.1007/s11145-007-9059-9

Schumacher, P. (2013). Blickaufzeichnung in der Rezeptionsforschung: Befunde, Probleme und Perspektiven. [Eye-tracking in reception studies: Results, problems and perspectives.] In H.-J. Bucher (Ed.), *Interaktionale Rezeptionsforschung: Theorie und Methode der Blickaufzeichnung in der*

Medienforschung [Interactional reception studies: Eye-tracking theory and methodology in media research] (pp. 111–134). Springer. https://doi.org/10.1007/978-3-531-93166-1_4

Sipe, L. R. (2000). The construction of literary understanding by first and second graders in oral response to picture storybook read-alouds. *Reading Research Quarterly*, *35*(2), 252–275. https://doi.org/10.1598/RRQ.35.2.4

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

Sipe, L. R., & McGuire, C. E. (2009). Picturebook endpapers: resources for literary and aesthetic interpretation. In J. Evans (Ed.), *Talking beyond the page: Reading and responding to picturebooks* (pp. 62–80). Routledge. https://doi.org/10.4324/9781003061151

Smith, V. (2009). Making and breaking frames: Crossing the borders of expectation in picturebooks. In J. Evans (Ed.), *Talking beyond the page: Reading and responding to picturebooks* (pp. 81–98). Routledge. https://doi.org/10.4324/9781003061151

Smolkin, L. B., Conlon, A., & Yaden, D. B. (1988). Print salient illustrations in children's picture books: The emergence of written language awareness. *Yearbook National Reading Conference*, *37*, 59–68.

Smolkin, L. B., Yaden, D. B., & Brown, L. (1992). The effects of genre, visual design choices, and discourse structure on preschoolers' responses to picture books during parent-child read-alouds. *National Reading Conference Yearbook*, *41*, 291–301.

Soter, A. O., Wilkinson, I. A. G., Connors, S. P., Murphy, P. K., & Shen, V. F.-Y. (2010). Deconstructing "aesthetic response" in small-group discussions about literature: A possible solution to the "aesthetic response" dilemma. *English Education*, *42*(2), 204–225. https://doi.org/10.58680/ee20109691

Spichtig, A. N., Hiebert, E. H., Vorstius, C., Pascoe, J. P., David Pearson, P., & Radach, R. (2016). The decline of comprehension-based silent reading efficiency in the United States: A comparison of current data with performance in 1960. *Reading Research Quarterly*, *51*(2), 239–259. https://doi.org/10.1002/rrq.137

Takacs, Z. K., & Bus, A. G. (2016). Benefits of motion in animated storybooks for children's visual attention and story comprehension. An eye-tracking study. *Frontiers in Psychology*, *7*.https://doi.org/10.3389/fpsyg.2016.01591

Takacs, Z. K., & Bus, A. G. (2018). How pictures in picture storybooks support young children's story comprehension: An eye-tracking experiment. *Journal of Experimental Child Psychology*, *174*, 1–12. https://doi.org/10.1016/j.jecp.2018.04.013

Taylor, S. E. (1965). Eye movements in reading: Facts and fallacies. *American Educational Research Journal*, *2*(4), 187. https://doi.org/10.2307/1161646

Tyler, S., & Josephson, S. (2020). Using eye tracking to see how children read interactive storybooks with supplemental or incidental digital features. In S. Josephson, J. D. Kelly, & K. Smith (Eds.), *Handbook of visual communication* (pp. 28–48). Routledge. https://doi.org/10.4324/9780429491115-3

Ullrich, N. J. (2021). *The influence of text on coherence of story retells, reading comprehension, vocabulary acquisition, and eye gaze: A computer-based story telling task with eye tracking* [Dissertation City University of New York, Ann Arbor]. RIS. https://www.proquest.com/dissertations-theses/influence-text-on-coherence-story-retells-reading/docview/2587586730/se-2?accountid=10218

Unsworth, L. (2015). Persuasive narratives: evaluative images in picture books and animated movies. *Visual Communication*, *14*(1), 73–96. https://doi.org/10.1177/1470357214541762

van Kleeck, A. (1998). Preliteracy domains and stages: Laying the foundations for beginning reading. *Journal of Children's Communication Development*, *20*(1), 33–51. https://doi.org/10.1177/152574019802000105

van Leeuwen, T. (2006). Towards a semiotics of typography. *Information Design Journal + Document Design*, *14*(2), 139–155. https://doi.org/10.1075/idj.14.2.06lee

Volz, S., Scherer, G., & Schröder, K. (2016). "Ja, jetzt versteh' ich die Handlung mal überhaupt." Das metafiktionale Spiel mit Erzählwelten in David Wiesners 'Die drei Schweine' in der Aneignung durch Grundschulkinder. ["Now I finally get the plot at all." The metafictional game with narrative worlds in David Wieser's 'Three little pigs' in the acquisition by elementary school children.] In G. Scherer & S. Volz (Eds.), *Koblenz-Landauer Studien: Band 15. Im Bildungsfokus: Bilderbuchrezeptionsforschung* [Educational focus: Research on picturebook reception] (pp. 171–186). Wissenschaftlicher Verlag Trier.

Wehde, S. (2011). *Typographische Kultur: Eine zeichentheoretische und kulturgeschichtliche Studie zur Typographie und ihrer Entwicklung*. [Typographic culture: A semiotic and historico-cultural study concerning typography and its development.] *Studien und Texte zur Sozialgeschichte der Literatur: Band 69*. De Gruyter. https://doi.org/10.1515/9783110945799

Wieler, P. (1997). *Vorlesen in der Familie: Fallstudien zur literarisch-kulturellen Sozialisation von Vierjährigen*. *Lesesozialisation und Medien*. [Reading aloud in the family: Case studies concerning the literary-cultural socialisation of four-year-olds. Reading socialisation and media.] Beltz Juventa.

Wiesner, D. (1992). *June 29, 1999*. *Reading Rainbow: Vol. 67*. Clarion Books.

Wirth, U. (2009). Paratext und Text als Übergangszone. [Paratext and text as transition zones.] In B. Neumann & W. Hallet (Eds.), *Raum und Bewegung in der Literatur: Die Literaturwissenschaften und der Spatial Turn* [Space and movement in literature: Literary studies and the spatial turn] (pp. 167–177). Transcipt Verlag. https://doi.org/10.1515/9783839411360-007

Wolf, W. (1999). Framing fiction: Reflections on a narratological concept and an example: Bradbury, Mensonge. In W. Grünzweig (Ed.), *Grenzüberschreitungen: Narratologie im Kontext* [Transcending boundaries: Narratology in context] (pp. 97–124). Narr.

Yaden, D. B., Smolkin, L. B., & MacGillivray, L. (1993). A psychogenetic perspective on children's understanding about letter associations during alphabet book readings. *Journal of Reading Behavior*, *25*(1), 43–68. https://doi.org/10.1080/10862969309547801

Yim, D., Park, W., Kim, S., Han, J., Song, E., & Son, J. (2019). An eye-tracking study of picture book reading in preschool children with and without language delay. *Communication Sciences & Disorders*, *24*(2), 299–316. https://doi.org/10.12963/csd.19621