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Materiality in Picturebooks: An Introduction¹

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Picturebooks are material objects that play a key role in supporting children's development while empowering literacy and laying the groundwork for lifelong reading and learning habits that are not only critical for children themselves but also for society. Design and research in relation to picturebooks are growing while feeding upon interdisciplinary studies in art and design, social sciences and engineering, as form and content are synthesised to present children with myriad narratives in the most inspiring and effective ways (Kümmerling-Meibauer 2018). Thus, learning takes place during interactions with picturebooks, helping the child to acquire new vocabulary, step into literacy, and advance in cognitive skills. Maria Nikolajeva (2014) states that children's reading can be beneficial in gaining knowledge in relation to the world, other people, and themselves, and this is mostly acquired through words and images in picturebooks.

Children's reading practices have been mediated by novel book systems from hornbooks to tangible interfaces that serve to educate, entertain, and facilitate narrative. What role have the function of materials and material engagement played in transforming picturebooks and reading? What has been retained and what has been discarded as book systems have evolved? Why are certain materials valued over others? How does materiality enrich or hamper the reading process? Is it beneficial to present to children multisensory picturebooks that may foster embodied experiences?

In this special issue "Materiality in Picturebooks", we start by taking an overall look at materiality as an aspect of the picturebook – printed or digital – and study it alongside words and images. We then regard materiality as a system (media) of reading

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taking place in real space and involving children's bodily engagement with the text. This comprises not only emerging sensitivity to the material qualities of picturebooks but also to the spatial presence of these objects and their capacity to engage the reader. To finish, we contemplate materiality in picturebooks, besides words and images, as a gateway to the world through physical engagement.

We investigate the interactive, educational, ideological and personal properties of the materials used in structuring picturebooks. Material and sensory aspects of picturebooks are sometimes underappreciated elements, even when they operate in tandem with words and images as a third narrative system. Keith A. Smith examines this system as a whole, studying the physical presence of the book, concentrating on the emergence of content through the turning of a page, repetition, format, and spatial relationships. He explores how the bookmaker can explore formats other than the codex and promote progress through the use of the pages, timing and pacing in a book to optimally reveal content, noting the "[d]efinition of the book must change with interests. It might become a book-as-environment, book-as-performance" (Smith 1984: 342). Thus, picturebooks nowadays require a flexible approach to fully grasp the increasing possibilities that new materials and materialities present in paper-based, digital or emerging platforms as they impact the reading experience.

Hence, these new materials introduce natural or artificial textures, ranging from lace paper indigenous to a specific culture and geography to book corners that welcome biting that at times answer a need at a certain developmental stage. These aspects deserve a closer look as form and materials enhance the content, creating a space that supports bodily and mental experience by evoking meanings and sensations through their physical properties (Karana, Pedgley and Rognoli 2015). For the most part, children are eager to explore a subject through the experiential handling of the picturebook, and through the art and design notion of this literary object. It is while children are reading these materially rich picturebooks that they inhabit a space of embodied meaning-making, which will be explored further here.

An embodied meaning-making process can be applied to reading and to learning, encompassing cognitive experiences. Embodied cognition re-visits the body's relationship to the brain, then applies the arrived-upon conclusions to educational neurosciences and educational technology, taking a closer look at how cognition may benefit from sensorimotor processes (Paloma 2017). Embodied cognition in the realm of literacy is rooted in earlier experiments that focus on facilitating children's literacy skills. Grace Fernald studies the value of the embodied acquisition of information in 1943 with her work "Fernald Method of VAKT-Visual, Auditory, Kinesthetic and Tactile" (Fugate, Macrine and Cipriano 2018: 8). In the Fernald Method, letters were taught by tracing them on the student's back while verbally giving information about them in addition to the tactility involved.

Bettina Kümmerling-Meibauer and Jörg Meibauer have mapped the complex and particularised skills required for reading and applied this to their examination of the picturebooks' capacity to promote cognitive skills. They maintain that even the

simplest of picturebooks have the capacity to hone and challenge the child's cognitive skills with their existing affordances, suggesting that "[t]he images in picturebooks require knowledge of visual codes" (Kümmerling-Meibauer and Meibauer 2013: 146). In tracing the development of cognitive skills via picturebooks, studies so far have predominantly focused on the interaction between image and text in picturebooks and how they are processed. These studies are gradually taking into consideration picturebooks that involve further sensory engagement with the narrative mainly through tactile and audible codes, requiring children to utilise additional comprehension skills to make sense of the narrative. In this special issue, we also encapsulate the potential of edible codes to transmit the narrative, and discuss the technology that makes it possible. While we recount specific cases where multisensory input during the reading experience may be beneficial and thought provoking, we recognise and discuss the fact that in some cases it may impede learning.

Studies show that though material aspects of picturebooks may support engagement with the given content and enhance the child's approach to reading, the uninhibited use of materiality can also hinder reading and learning. Manipulative features may distract the child's focus if it does not facilitate a supportive connection with the narrative or if it diverts the child's attention too much, leading to disengagement from the narrative. These findings recommend that the material features in picturebooks be user-tested to ensure that the aim of the books is being met, especially for those that provide children with intentionally educational content (Ganea and Canfield 2015: 42).

Though there is a danger of material sensory overload, if materiality is used correctly in picturebooks, it involves other senses and demands the child's full attention and sensory involvement. Thus, multisensory learning is considered beneficial as it accords with the daily interactions of children in their natural environment (Shams and Seitz 2008). Rebecca-Anne C. Do Rozario (2012) explores how materiality and the narrative in picturebooks are intertwined and create synergies for playful reading while blurring the boundaries of physical and narrative space. The resulting multisensory engagement can raise novel sensations that may enable the senses to cross-pollinate and create new meaning. Though our "[p]erceptual and cognitive mechanisms have evolved for, and are tuned to, processing multisensory signals", at times, learning such as reading is directed by basic stimuli geared towards "unisensory processing" (Shams and Seitz 2008: 415). The multisensory and unisensory approaches to picturebooks generally cater to different audiences and in many cases are not interchangeable.

Studying the multisensory and unisensory materiality of the picturebook introduces a comparative approach to evaluating the medium's function in the reading process, making use of various formats such as the codex since it is the form most commonly used. Looking back on the history of the codex, we see how it once held a prime position in reading and was cherished by children. Patricia Crain studied the importance of the codex, inspired by the rhyme, "[m]y book and heart/ shall never part" (Crain 2013: 155) from *The New England Primer*, which was mainly used from the 17th to 19th century in the United States. In this rhyme, the heart of the child is analogous

to the book, depicting a bond that is unbreakable. Crain explores how the disappearing codex is not simply the loss of a book format but actually the loss of an aspect of the self, stating, “it’s really an enclosed, private, booklike self that we cling to and long for and fear losing” (Crain 2013: 174). The concerns that have precipitated increasing attention to the materiality of reading are reflected in the scrutiny of the future media for reading and learning and its impact on the child. To truly reflect on these issues, one needs to take a deep look at how the materiality of picturebooks is being affected, starting with the impact of changing technologies on picturebook production and what cognitive studies reveal about reading interactions supported by the social attributes of picturebook design and design technology, including perspectives from diverse fields of study. Thus, Daniel Miller (2005) suggests that our interactions with materiality become second nature. Miller’s view is supported by Karenleigh A. Overmann and Thomas Wynn (2019) who track evolutionary entanglements of materiality and cognition as depicted in the changing forms of reading over time.

Material, spatial and sensory encounters

This special issue stems from a workshop entitled “Material, Spatial and Sensory Encounters with the Picturebook Object”, which took place at Koç University, İstanbul, in June 2017. It builds on the exchanges facilitated by the workshop, and it aims to reflect on how book systems alter the way children perceive and engage with texts. Addressing the critical issues of where traditional book forms stand and how they have been altered to meet today’s needs via changing materialities is especially vital now as new media bombard children with sensory stimuli. Emerging technology shifts our perception and initiates alternative explorations of the visual, textual and sensory data of a reading experience. At the same time, physical and digital interactions not only introduce new ways to read but also unique ways to learn, perceive and react, impacting the child’s persona largely through her shifting role as reader. Considering that evolving systems in human computer interaction (HCI) support myriad approaches to embodied learning technologies, such as tangible interfaces and interactive games (Melcer 2018), the traditional modes of reading are also undergoing a transformation and adding material modifications to a time-honoured system.

In our exploration of materiality, our papers explore design elements of picturebooks that bring forth certain physical properties often relating to the narrative. First, our work takes a snapshot of how experimentation with the material aspects of reading can stimulate play, expand narrative, and alter the way texts are perceived and consumed by children. Jacqueline Reid-Walsh has studied the interactive capacities of picturebooks and their transformation over time, paying particular attention to the specific material qualities and movable structures that initiate play and blur the line between a book and a toy. Looking specifically at books created between the 17th and 19th centuries, she considers the role and agency devoted to the child (Reid-Walsh 2018: 210–211):

On the one hand, the book structure itself serves as a powerful prosthetic device that reinforces the ability of an interactor as a catalyst of the motion. On the other hand, an interactor's only being able to hold and open a codex-like artefact due to the absence of a tab emphasizes a passive role that turns the reader-viewer-player into a spectator marvelling at the apparent "life" of the unfurling of the contained object.

According to Reid-Walsh, the evolving relationship of the material aspects and a child's agency in interacting with them are critical to the level of engagement. Playful engagement with text through its materiality gained further ground when postmodern picturebooks presented novel narratives to include the child as a co-creator (Sipe and Pantaleo 2008) which heralded in today's cutting-edge picturebooks and their diverse approaches to materiality. Second, this special issue takes a snapshot of the picturebooks' objecthood and material significance for the creator, including designers, writers and illustrators, to name a few, as well as researchers who explore different aspects of content, such as its impact on learning and cognition. Third, this work turns the lens on society at large and identifies the transformation of children's reading in our era with case studies, exploring the influences on literacy and learning practices, the reading media, and ultimately the reader.

Fostering material engagement during reading

While book etiquette is something the child has to learn, such as reading page by page and holding the book in the right position, a recent picturebook has moved away from this approach and focuses mainly on the material qualities that turn this object into a plaything. The picturebook *Not Just a Book* (Willis and Ross 2018) gives excellent examples of physically engaging the reader, revealing how the material capacities of a codex can actually be a tool and a toy in real life: as a hat, tent for the cat, tunnel for a train, or a building block for a tower. At the end of the story, the narrative shares the sentimental aspects of reading, portraying the book as a loyal friend to the child throughout life. This story shows that the book's material affordances, besides its written and illustrated content, have fundamental value for the child.

From this perspective, Margaret Mackey studies literacy as a form of material engagement present in everyday situations that may be explored not only in picturebooks or their digital counterparts, but through something as simple as the labels on many household objects. On the one hand, Mackey talks about literacy in abstract terms as a system of signs. On the other hand, she remarks on literacy's physical presence, primarily addressing the tangible treatment of books and remarking that "[h]ow we physically handle our texts contributes substantially to how we comprehend them; the constitutive materiality of how, where and what we read remains significant in the digital age" (Mackey 2016: 172). For instance, when one considers the difference between the size of a smart-watch's screen to that of a computer, then it comes as no surprise that the medium presenting the text affects how we read (Obaid, Veryeri Alaca, Wozniak, Lischke and Billinghurst 2016). This observation is not only an issue for children's literature experts to ponder, but also authors, book designers, and

developmental psychologists, to name a few. Overmann explores how cognition and our interaction with objects of a literary nature influence the evolution of our behaviour and thinking through the ages. She states that, “[l]iteracy and numeracy provide examples of multigenerational, incremental change in both psychological functioning and material forms” (Overmann 2017: 354), hinting at the new material configurations in picturebooks to impact future reading.

Thus, the characteristics we attribute to the materiality of the picturebook object (for example passive versus active) alongside how we perceive matter and materiality have the capacity to alter the way we view literacy. Nicholas Thoburn draws attention to the fact that not only do content and the medium coin the material embodiment of the text, but they are responsible for drawing the reader in and bringing the text to life as “[a] multiform entity, with many different and divergent meanings, effects and scales of operation” (Thoburn 2016: 5). Inspired by this new materialism – which does not “prioritize mind over matter” (Ergin 2017: 68) but blurs the boundaries between the body and mind, people and things, and their relational becoming in the presence of one another – the co-dependency of material and meaning comes forward in contemporary picturebooks. Considering all the new and varied ways material agencies convey information, it is inevitable that the way we read is changing and growing. Thus, we need to re-evaluate our perception of and our interaction with a picturebook and its materiality in relation to our body and the senses. For instance, the element of touch can benefit from further study in regard to how we read and understand a picturebook. David Howes analyses how touch and tactility calibrate our understanding of the physical world often before the other senses. He wrote, “[i]t is the knowledge of the World one acquires through one’s skin” (Howes 2005: 27), which then extends to other bodily ways of knowing through the ears, nose, tongue and eyes. He refutes the notion put forth by philosophers such as René Descartes that the body and mind are discrete, and bodily ways of knowing contribute little to cerebral activity, instead supporting the theory that tactility regulates how we relate to the world. By applying his theory to picturebooks, touch becomes a striking way to activate the reading process and advance the story. Presenting the element of texture is just one way spatial cognition can be used to enhance a picturebook and add deeper meaning to the story, with certain surfaces sometimes even eliciting emotional responses. While many picturebooks require children to turn the pages in an uninspiring manner to move the story along, increasingly innovative ways of handling a picturebook are being explored with the aim of making the child more alert. Margaret Mackey studies the role hands play in the reading process as she notes, “[a]esthetic reading is also a manual event. Our hands are active participants in managing a text, analogue or digital, and their role is incorporated into the overall experience. Our hands manage our attention, participating in both the concrete and the abstract elements of the dual representation” (Mackey 2016: 170). Walter Benjamin highlights the critical role of hands to obtain experience, knowledge and memory while encountering physical forms supporting cognition and perception (Leslie 1998).

Being more attentive to the form of the book changes the typical book behaviour, requiring not only linguistic and visual skills but also spatial ones. Nora S. Newcombe notes that for many centuries spatial and linguistic intelligence have been regarded as distinct from one another. This explains the rationale behind the way many picturebooks presented their content through words and images, overlooking the potential of materiality to give another dimension to the story. Newcombe went on to discuss how thought may be spatialised symbolically, “using tools such as language, metaphor, analogy, gesture, sketches, diagrams, graphs, maps, and mental images” (Newcombe 2018: 522). This level of spatial cognition when applied to picturebooks triggers the multitasking that we see studied here by fusing together words, images and object manipulation. Pino Trogu goes one step further and credits the materiality of the book with the ability to help us remember and make it easier to register its content with its physically sequenced pages and our marks on them. He maintains that “[t]he physical embodiment of the printed book – the thick stack of pages assembled between the covers – enhances reading not simply through the tactile character of the paper, but also through its capacity to help in the actual remembering of the content of the book” (Trogu 2015: 30). As with the picturebooks studied for this special issue, we see scenarios where children not only hold the books but actually manipulate them in numerous ways, combining activity with reading.

The exposure to materially rich picturebooks turns into a creative encounter, a curated experience, an event or a performance. With the rise of multimodal literacies supported by technology, digital as well as printed picturebooks have the potential to create physical interactions and fulfil diverse needs. This may be traced back to earlier literary practices that employed flaps, pop-ups, and movables that allowed the child to take control and play with the physical parts and/or choose an alternative narrative. Veryeri Alaca (2018: 67) notes: “[t]his type of materiality empowers and encourages the reader to take the lead, decide, create, and configure, erupting into an inquiry into the constitution and mediation of narrative”. Where manipulative features and material engagement trigger creative involvement with the narrative, the child’s agency and aesthetic choices may be foregrounded. Considering that picturebooks have diverse purposes ranging from educational to artistic ones, the application of materials would require a different approach in each case and it would not be easy to create a standardised format for the user-testing mentioned earlier.

Kristen Kreider studied materiality in artworks that includes a text-based message much as many picturebooks do. What she calls a “communication event” enables the message to come to life in a spatiotemporal setting and has the potential to elicit an emotive connection between the artwork and its audience. Kreider notes that the aspects of these works may be studied as material poetics and states (Kreider 2015: 89):

Through these material aspects, an artwork is capable of relating physically and existentially to its material context, thereby relating necessarily to the world of objects and things or, phrased differently, the political space of appearance.

When Kreider's theory is expanded and applied to the case of children's reading and exploring of a picturebook, it brings to mind a range of encounters from sensory engagement with the text to the critical inquiry of its material presence in relation to its content.

Where Kreider studied the influence of material, Thomas McEvilley has studied how content emerges in artworks in his essay "Thirteen Ways of Looking at a Blackbird", originating from inspiration from a poem by Wallace Stevens. McEvilley categorises content into thirteen groups and uses them to define any given piece of art based on scale, material, permanency or context, to name a few. As McEvilley was inspired from poetry in his formulation, picturebooks borrow content formation strategies from this larger framework of art besides design and literature, and apply it to the medium of the book. In picturebooks as in art, it is not uncommon for specific materials to be selected to reveal and enhance the content. The materials selected to be used in artworks may appear with a certain passivity that has led McEvilley to remind us that "[t]hey are judgment pronouncements that the art viewer picks up automatically without necessarily even thinking of them as content" (McEvilley 1991: 74).

Considering that the typical picturebooks present both two-dimensional and three-dimensional physical qualities activated by the performative reading of the text, this puts them in league with two- and three-dimensional arts, time-based media, and performance, to name a few. Despite this expanded status, deriving meaning from the material and spatial aspects of the picturebook is not something that we are accustomed to. Overmann remarks on how unobservant we may be when reading, noting how "[t]he material form (printed page, computer display) seems unchanging, and its material agency is often unnoticed. The brain's activity in processing written language is mostly unconscious, as cognition is in general" (Overmann 2017: 390). Our automatic and learned response to books at times leads us to be unaware of their materiality, a materiality which fades into the background when we are passively reading and is only visible once we actively pay attention. Deliberating on what type of reading habits are transparent or assumed and what are opaque or progressive, we compare and contrast the materiality of picturebooks, discussing their different physical qualities and the affordances they bear in this vibrant time of print-based and digital reading. This dichotomy impacts our creations and our investigations into what picturebooks constitute as we move beyond the mere image and text-based content in the picturebook object.

With the advent of new media encounters, the terrain of children's reading is rapidly expanding, spawning a new ecology of reading in paper-based and digital formats, making us aware of material affordances. As children's reading practices move beyond the interplay of words and images, the materiality of reading comes to the fore, first in relation to the construction of the narrative and second as a system (media) meant to support the reading act. Hence, the cerebral act of reading increasingly merges with the physical processing of the narrative through diverse materialities. Helene Høyrup (2017) investigates the developing practices of reading as they relate to the

emerging field of new media and ludology, stating that “[t]he model of gaming looks at texts as material spaces of interaction, and as semiotic spaces of play and rhetoric” (Høyrup 2017: 86). These fields are so new that the up-to-the-minute books have yet to be categorised, and children’s increasingly social and participatory encounters with them have yet to be fully explored, not to mention their impact on the child and on the meaning of reading, literacy and text. Høyrup notes (2017: 82):

A focus on the materiality, semiotic, and ‘affordances’ of languages and media; on ‘systems’ or the grammar of knowledge; on play, design and rhetoric; and, finally, on social literature are among the scholarly and theoretical consequences of the digital turn.

Thus, Høyrup notes that with the new modes of sensory involvement during reading, the line between materiality and information blurs as the body gains further agency in understanding the multimodal texts. While we focus on the multimodal aspects of reading enriched by the senses, we aim to launch conversations on the materiality of picturebooks and invite others to contemplate the magnitude of this topic, hinting at potential avenues for future deliberation.

Themes and papers

In this special issue of *Libri & Liberi*, we investigate emerging as well as existing picturebook formats and reading experiences that can advance education, literacy, and creativity in relation to book design. Using theoretical inquiries and case studies, this collection aims to investigate the materiality of picturebooks and emerging reading situations while also taking into account how sensory books can enrich reading experiences. These investigations contemplate the interactions facilitated by the material qualities of picturebooks that support creative thinking, cognition and narrative development in children. The following synopses touch on the different issues each paper addresses on this subject.

The article titled “Picturebooks as Objects” analyses the notion of the picturebook as a physical entity with a potential to support the child’s cognitive development. Keeping the research gaps in this field in mind, co-authors Bettina Kümmerling-Meibauer and Jörg Meibauer start by reviewing the empirical research done by cognitive psychologists that chronicles children’s perceptions of objects. They then map out their argument, addressing three major issues: the materials of picturebooks (e.g. paper), types of picturebooks (e.g. pop-up), and type of actions (e.g. arranging) that may take place during the exploration of the picturebook. Age appropriateness and usability in different settings are just two points that are considered when looking at the materials used in picturebooks. In studying different types of books, the format of the book and how the child interacts with it is studied (e.g. picturebooks with flaps trigger the understanding of consistency and integrity). In the final section, a taxonomy of affordances is rendered for the functionally intended and unintended actions during picturebook use, revealing how the intrinsic notion of these objects may be extended by

children. This paper exemplifies how the objecthood of picturebooks may be significant but also challenging for children, while making links to the child's developmental stages.

"Theorising Materiality in Children's Digital Books" explores how narratives backed by the materialities in digital picturebooks facilitate participatory literacies. Natalia Kucirkova bases her argument on the socio-cultural theory that highlights the impact of personalisation, participation and interaction during the dialogic reading of the parent and the child. Kucirkova studies material aspects in digital reading experiences under external and internal properties while carrying out an empirical case study. This paper reflects the expanding field of literacies for children, such as multimodal, multiplayer, connected, and productive literacies heightening the territory of children's reading for pleasure in the digital realm.

Honglan Huang's paper "Komagata's Paperscapes: Theatricality and Materiality in *Blue to Blue*" dwells on the poetics behind the handling of the picturebook *Blue to Blue* by Katsumi Komagata. This paper brings forth how the story of a salmon's journey is conveyed through the use of different papers, die-cuts and various shaped pages that invite a child's hand to trace and guide the book's theatricality from page to page. The physical evidence and tactility invite multiple senses to derive meaning from the transformations in time and the narrative, focusing especially on the sense of touch, making links to Japanese paper production, print and book arts.

"The Accordion Format in the Design of Children's Books: A Close Reading of a Portuguese Collection" explores the accordion format and features a series of books by Andre Letria. Ana Margarida Ramos explores how this format facilitates contrasted experiences, such as the panoramic overview of the narrative alongside page-by-page reading. Ramos refers to the historic roots and the contemporary utilisation of this format, explaining all of its manifestations and the actions involved in the reading of the narrative when compared to a typical codex. She studies how accordions support experimental interactions between the pages, fostering rhythm and flow as found in riddles.

In "Ideology Conveyed via the Material/ity of Picturebooks", Angela Yannicopoulou explores the ideological messages that picturebooks convey through material aspects. Yannicopoulou considers how the narrative of a picturebook may be indirectly enriched or weakened by its material configuration that is at times only apparent to the most attentive of readers. It becomes clear that in some cases the material qualities unintentionally detract from the meaning of the picturebook, requiring careful evaluation of the book as a whole by its writer, illustrator, designer and editors. Examples in this paper range from intrinsic material qualities extending to more complex ones, requiring the reader's performative actions in cases where the reader is incorporated into the narrative.

In "Honing Emergent Literacy via Food: Edible Reading", the concept is that due to advances in food technology, picturebooks may take an edible form and be utilised

during children's introduction to early literacy. Ilgim Veryeri Alaca sees merit in edible reading and considers the likelihood that it may help children put their gustatory perception into action while being exposed to words and images "printed" on edible formats. This paper introduces the precursors of contemporary edible picturebooks and presents prototypes by Veryeri Alaca that are a combined literary and consumer product. Inspired by 2D and 3D printing technologies, edible picturebooks have the potential to increase the availability of reading materials to a wide range of children.

In the article "Materiality in Bruno Munari's Book Objects: The Case of *Nella note buia* and *I Prelibri*", Marnie Campagnaro analyses how Munari prioritised material aspects in his book designs based on two examples. Campagnaro explores Munari's narrative strategies in his picturebooks and how the notion of touch was predominantly put into action. These picturebooks facilitate interaction, imagination and play, introducing the child to an array of materials and objects from their daily lives. The tactile explorations of these objects spotlight sensory involvement that at times transmit an educational component through their handling.

Conclusion

We scrutinise the changing materialities of contemporary picturebooks and how they influence reading practices and alter the way children read, handle, and attend to their books. When materiality adds a multimodal element to picturebooks, reading becomes fluid and playful, endowing the text and images with deeper meaning through additional modes of expression. On the whole, this special issue aims to capture the evolving understanding of materiality as used in picturebooks at a moment in time. The articles in this issue consider which material, spatial and sensory encounters would be beneficial, and which would be disadvantageous for the child. Certain materialities give the child agency, enabling them to personalise the narrative, add their subjective perspective to the reading act, or expand on the given scenario to a greater extent. On the one hand, material encounters are conducive to immersive and embodied reading experiences, focus attention on the content, and increase enjoyment through enhanced sensory engagement, such as touch and taste. On the other hand, material and spatial interactions may be disturbing if they divert from the core content, or are not age or even child appropriate, as each child's attention may be different, and too much involvement in material aspects may hamper the act of reading and literary engagement. In this study on materiality, the diversity of picturebooks requires us to present a cross-section of books in order to address changing design, multimodal and multisensorial aspects of reading, and their impact on a child's cognitive development, reading habits, aesthetic understanding and emerging persona. While picturebooks are frequently studied by children's literature experts and psychologists, we hope the case studies presented here will create interest and encourage further study in other fields to the benefit of children's reading and growth.

References

- Crain, Patricia. 2013. Reading Childishly? A Codicology of the Modern Self. In *Comparative Textual Media: Transforming the Humanities in the Postprint Era*, eds. N. Katherine Hayles & Jessica Pressman, 155–182. Minneapolis: University of Minnesota Press.
- Do Rozario, Rebecca-Anne C. 2012. Consuming Books: Synergies of Materiality and Narrative in Picturebooks. *Children's Literature* 40: 151–166.
- Ganea, Patricia A. & Caitlin F. Canfield. 2015. Factors Affecting Young Children's Learning. In *Learning from Picturebooks: Perspectives from Child Development and Literacy Studies*, eds. Bettina Kümmerling-Meibauer, Jörg Meibauer, Kerstin Nachtigaller & Katharina J. Rohlfing, 33–51. New York: Routledge.
- Ergin, Meliz. 2017. *The Eco-poetics of Entanglement in Contemporary Turkish and American Literatures*. Switzerland: Palgrave Macmillan.
- Fugate, Jennifer, Sheila L. Macrine & Christina Cipriano. 2018. The Role of Embodied Cognition for Transforming Learning, *International Journal of School & Educational Psychology*, DOI: 10.1080/21683603.2018.1443856.
- Høyrup, Helene. 2017. Towards a Connective Ethnography of Children's Literature and Digital Media: The New Media Encounter. In *More Words about Pictures: Current Research on Picture Books and Visual/Verbal Texts for Young People*, eds. Naomi Hamer, Perry Nodelman & Mavis Reimer, 81–99. New York: Routledge.
- Howes, David. 2005. Skinscapes: Embodiment, Culture, and Environment. In *The Book of Touch*, ed. Constance Classen, 27–40. Oxford: Berg.
- Karana, Elvin, Owain Pedgley & Valentina Rognoli. 2015. On Materials Experience. *Design Issues* 31 (3): 16–27.
- Kreider, Kristen. 2015. Material Poetics and the 'Communication Event', *Performance Research* 20 (1): 80–89. DOI: 10.1080/13528165.2015.991584.
- Kümmerling-Meibauer, Bettina. ed. 2018. *The Routledge Companion to Picturebooks*. New York: Routledge.
- Kümmerling-Meibauer, Bettina & Jörg Meibauer. 2013. Towards a Cognitive Theory of Picturebooks. *International Research in Children's Literature* 6 (2): 143–160.
- Leslie, Esther. 1998. Walter Benjamin: Traces of Craft. *Journal of Design History* 1 (1): 5–13.
- Mackey, Margaret. 2016. Literacy as Material Engagement: The Abstract, Tangible and Mundane Ingredients of Childhood Reading. *Literacy* 50 (3): 166–172.
- McEvelley, Thomas. 1991. *Art & Discontent: Theory at the Millennium*. New York: McPherson & Co.
- Melcer, Edward F. 2018. *Learning with the body: Understanding the Design Space of Embodied Educational Technology*. PhD dissertation, New York University, Tandon School of Engineering, ProQuest Dissertations Publishing. <<https://search.proquest.com/docview/2051332547?accountid=11893>> (accessed 17 June 2018).
- Miller, Daniel. 2005. *Materiality*. Durham: Duke University Press.
- Newcombe, Nora S. 2018. Three Kinds of Spatial Cognition, In *Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience*, eds. John T. Wixted & Sharon L. Thompson-Schill, 521–533. Hoboken: John Wiley & Sons.
- Nikolajeva, Maria. 2014. *Reading for Learning: Cognitive Approaches to Children's Literature*. Amsterdam: John Benjamins.
- Obaid, Mohammad, Ilgim Veryeri Alaca, Pawel W. Wozniak, Lars Lischke & Mark Billinghurst. 2016. The Future of Books and Reading in Human-Computer Interaction.

- NordiCHI '16: *Proceedings of the 9th Nordic Conference on Human-Computer Interaction*, Article No. 145. DOI: 10.1145/2971485.2987684.
- Overmann, Karenleigh A. 2017. Thinking Materially: Cognition as Extended and Enacted, *Journal of Cognition and Culture* 17 (3–4): 354–373.
- Overmann, Karenleigh A. & Thomas Wynn. 2019. Materiality and Human Cognition. *Journal of Archaeological Method and Theory* 26 (2): 457–478. DOI: <https://doi.org/10.1007/s10816-018-9378-y>.
- Paloma, Filippo Gomez, ed. 2017. *Embodied Cognition: Theories and Applications in Education Science*. e-book. UK: Nova Science Publishers, Inc.
- Reid-Walsh, Jacqueline. 2018. *Interactive Books: Playful Media Before Pop-Ups*. New York: Routledge.
- Shams, Ladan & Aaron R. Seitz. 2008. Benefits of Multisensory Learning. *Trends in Cognitive Sciences* 12 (11): 411–417.
- Sipe, Lawrence R. & Sylvia Pantaleo, eds. 2008. *Postmodern Picturebooks: Play, Parody, and Self-Referentiality*, New York: Routledge.
- Smith, Keith A. 1984. *Structure of the Visual Book*. 4th ed. New York: Keith Smith Books.
- Thoburn, Nicholas. 2016. *Anti-Book: On the Art and Politics of Radical Publishing*. Minneapolis: University of Minnesota Press.
- Trogu, Pino. 2015. The Image of the Book: Cognition and the Printed Page. *Design Issues* 31 (3): 28–40.
- Veryeri Alaca, Ilgim. 2018. Materiality in Picturebooks. In *The Routledge Companion to Picturebooks*, ed. Bettina Kümmerling-Meibauer. New York: Routledge. 59–68.
- Willis, Jeanne & Tony Ross. 2018. *Not Just a Book*. Great Britain: Andersen Press Limited.