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The tradition of children's literature is historically connected with children's entertainment and play culture. Children's illustrated toybooks—titled 'playthings' and 'gifts' by their publisher John Newbury—were one of the earliest forms of children's books when the genre emerged in the 18th century (Brown 2006). Toybooks were soon accompanied with movable books, pop-ups, and other materially enhanced children's books (Field 2019; Reid-Walsh 2017). Market-related influences have also shaped contemporary children's literature, as the market of children's books is closely tied with the entertainment industry: emergent brands, topics, and cultural phenomena are often quickly adapted to book form (Sekeres 2009). This is apparent in the case of the mobile book apps that gained popularity after the arrival of smartphones and tablets (Turrión 2014).

Similarly, digital children's literature has been subject to growing scholarly interest ever since Apple introduced its first iPad in 2010 (Prieto 2015; Schwebs 2014; Turrión 2014). Contemporary digital literature can be described as "app- or web-based literature that builds its meaning in a digital way by using the resources inherent to the electronic medium such as multimodality, interactivity and hypertextuality" (Manresa and Real 2015, p. 10). According to Turrión, "the digital book app market dwells somewhere between the children's literature market and the general entertainment industry" (2014, p. 1). Its close relation to digital games, especially children's mobile games, complicates a clear-cut definition of the concept of digital children's literature. Stichnothe, for example, suggests that "book apps for children deserve an examination that takes into account their status as hybrid texts combining verbal, visual and sonic elements and being situated on the threshold between game and narrative" (2014, p. 7). In other words, the picture book app needs to be explored as a special case of playful digital media.

The relationship between book apps, children's games, and digital playthings also requires further examination that considers the specific affordances of the mobile platform. Reay sees a "panmedial critical discourse" (2018, p. 21), emerging from both children's literature and game studies, as necessary for navigating in the increasingly diverse media ecology. The study of children's digital games and gaming tends to focus on games as tools for the socialization and education of children, instead of the artistic or literary merit of the medium (Reay 2018). This tendency resonates with Sutton-Smith's description of "the rhetoric of play as progress" (Sutton-Smith 1997, p. 9), or how (children's) play is often understood primarily in terms of "development rather than enjoyment" (Sutton-Smith 1997, p. 10).

The main object of this interdisciplinary article is to demonstrate how children's book apps draw on both the aesthetics of picture books and the playful affordances of mobile games for young children. Leaning on five case studies of children's book

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apps, the article examines how picture book apps afford opportunities for a reading experience that contains features characteristic for children's digital play. In addition, I argue that taking into account the playful affordances of book apps expands our understanding of the book as a material object. This, in turn, broadens attitudes towards children's playful engagement with literature, beyond the digital context.

Playing with the Book: Children's Books and Book Apps

The tradition of picture book studies[1] is firmly based on studies that deal with the dynamics of picture books as a combination of two levels of communication: the verbal and the visual (Nikolajeva and Scott 2001; Nodelman 1988). Usually consisting of text and illustration, a picture book can be defined as an iconotext: a fundamentally dynamic, multimodal, and interactive unit that forms its meaning in the interpretation process often referred to as the hermeneutic circle (Nikolajeva and Scott 2001; Hallberg 1982). However, picture books can also be wordless; they convey "information through either a series picture–text combinations or a series of pictures only" (Kümmerling-Meibauer and Meibauer 2015, p. 1). As a result of their diverse functions as verbal-visual communication, a material artefact, and literature designed to be read together, printed picture books play with interactivity on semiotic, aesthetic, and material levels. In accordance, digital picture books make use of a wide range of communication forms and telling modes (Schwebs 2014). Picture book apps can, for instance, add audiovisual effects to storytelling or invite users in physical interaction with the app (Søyland and Gulliksen 2019). These features distinguish book apps from standard e-books (Al-Yaqout and Nikolajeva 2015).

Picture book apps offer different levels of interactivity, include varied audiovisual features, and differ in terms of origin. Previous studies have focused especially on two characteristics of children's book apps: (1) their interactive features, and (2) the amount of user options provided by the app (Stichnothe 2014; Schwebs 2014). The interactive features of children's book apps have provoked both fascination and criticism among literary scholars. Interactivity seems to stand as a characteristic, yet potentially problematic element of the book application. Against this background, Schwebs compares the use of a picture book app with playing hide-and-seek:

> The touchscreen allows the reader to trigger animations, manipulate objects and give life to people and animals. This part of the interactivity is a two-step process: identifying where in the picture the hot spots are hidden; and discovering what they hide, and how the objects behave. These activities play on the elements of surprise and suspense associated with veiling and unveiling. In this way the digital technology exploits the general fascination of the classic hide-and-seek game: searching is as much fun as finding. (Schwebs 2014, p. 3)

The dynamic that Schwebs (2014) describes is similar to classical point-and-click adventure games, a phenomenon of the 1980s and 1990s. The interactive features of today's book apps also resemble the interactive (CD-ROM) storybooks of the 1990s (Schwebs 2014; see also Lefever-Davis and Pearman 2005). However, playful and interactive dynamics are common in children's print literature, too: books like *Where's Waldo?* (Handford 1987) adapt the dynamics of hide-and-seek by challenging the reader to search for certain objects or characters.

Picture book studies seem to emphasize the novelty value of the interactive, tactile, or auditory features of contemporary book apps, disregarding the interactive tradition of children's print literature (Koskimaa and Lahdenperä 2017). For instance, Stichnothe sees the use of sound as "something truly unique to both book apps and e-books" (2014, p. 3). This statement clearly ignores many traditional forms of technologically enhanced children's literature such as sound and audio books or the classic *Disney Read-Along* books. One reason for this oversight is probably the fact that toybooks, sound books, and pop-up books are easy to count as toys or commercial playthings instead of literature (Field 2019). However, more recent discussions, such as Jamróz-Stolarska (2020), recognize the connection between children's playthings and the tradition of children's literature in relation to contemporary book apps.

The interactivity of book apps has received a great deal of criticism among literary scholars. Arguing that picture book apps designed for tablets emphasize engaging and interactive features, instead of paying attention to learning or story comprehension, Yokota criticizes children's apps "intended to entertain, engage and perhaps educate, etc. but not necessarily for the purpose of creating or telling a story" (Yokota 2015, p. 83). Turrión points out that many children's book apps contain "distracting" or "meaningless" interactive proposals that can even confuse the reader and "overexploit the interactive resources of the digital format" (Turrión 2015, p. 97). Both Yokota (2015) and Turrión (2014) seem to dismiss the diversity of the printed book: picture books or materially enhanced books with the main purpose of being playful, engaging, or fun. As Reid-Walsh (2017), who studies the history of movable books, suggests, children's print culture includes a broad range of artefacts that are important in their own right.

The interactive features of book apps can have an enhancing and engaging function, but Jamróz-Stolarska (2020) notes that seeking reader stimulation and engagement is not only a feature of book apps but also of the tradition of printed children's literature. However, Stichnothe separates most user participation from direct involvement in the story: user participation during running the app "creates the (often misleading) impression of being directly involved in the 'making' of the story" (Stichnothe 2014, p. 5). This point of view seems to ignore the medium-specific elements of book apps and turn the spotlight on the story; it is hard to imagine anyone criticizing flip-the-flap books based on this kind of reasoning. This article suggests that, instead of direct participation or even co-creation, engagement—being involved in something—is the key to conceptualizing reader interaction with a picture book app. In the next section, I therefore describe children's engagement with digital playthings, games, and books more closely.

Digital Play and Playful Affordances

As Zasacka notes, "literary reading, like play, has different rules than the reality" (2020, p. 201). Before continuing to reading and playful practices, it is necessary to reflect on children's play in the context of the digital medium. Play, in general, is a specific mode of action (van Oers 2013). Digital play refers to technology-mediated play that differs from other forms of play due to the digital media or devices used (Koivula and Mustola 2015). Although the use of media separates digital from

traditional play, their characteristics are ultimately alike. Koivula and Mustola (2015) determine the relationship between children's play and gameplay through four criteria of traditional play, drawing on Burghardt (2012), Caillois (1961), and van Oers (2013): rules, freedom, fun, and aims of play.

Van Oers (2013) distinguishes four different kinds of rules of children's play. Technical rules mean how, for example, toys or games are used. Conceptual rules refer to the rules that have a conceptual basis, such as meanings given to words or objects. Strategic rules support the course of an activity—for instance, division of roles—whereas social rules are socially negotiated rules of interaction. A tension between rules and freedom is always a part of play (van Oers 2013): play is an activity that is free from everyday life, yet still based on rules (Koivula and Mustola 2015). Koivula and Mustola's (2015) next criterion of children's digital play, fun, requires further elaboration. The description of the 'fun' and aesthetics of games by Hunicke, LeBlanc, and Zubec (2004) consists of eight categories: sensation (game as sense-pleasure), fantasy (game as make-believe), narrative (game as drama), challenge (game as obstacle course), fellowship (game as social framework), discovery (game as uncharted territory), expression (game as self-discovery), and submission (game as pastime). Fun stems from game design and the game itself, but it is also a socially constructed and shared experience (Koivula and Mustola 2015).

While the players' aims of play may be very different, fun, surprising, and creative ways of playing are common characteristics of children's digital play in practice (Koivula and Mustola 2015). Thus, the concept of affordance, originally coined by Gibson (1979), is helpful in theorizing children's engagement with digital media. Affordances refer to the user possibilities afforded by technology (Have and Pedersen 2016). In media theory, affordances are understood as "various sorts of interplay between a reader (or 'user') and a computer program" (Schwebs 2014, p. 2). However, these possibilities do not need to be actualized by the users of the technology (Have and Pedersen 2016). Child players may, for example, use only some features of digital games, dismiss some calls for interaction, or play against the rules. Against this background, Songer and Miyata (2014) base their model of playful affordances for gameful learning on the following dual qualities of play experience: contest–challenge, exploration–discovery, sensation–arousal, and imagination–creativity. According to Songer and Miyata, playful affordances "for autonomous, autotelic play" (2014, p. 207) are reason players enjoy games. To add, I argue that one aim of children's digital play is seeking some or all the four experiences, and this aim is acknowledged in the production of children's games and toys.

Playful Reading Practices

Children can have a creative material relationship with books. The ways children read (and do not read) books is apparent starting from the collections of Victorian toybooks and movable books that have been colored, chewed, ripped apart, or otherwise ruined (Field 2019). As already mentioned, discussions on digital children's literature have overlooked this tradition of playful books. Similarly, the initial digital steps of children's literature have been passed over; as Koskimaa and Lahdenperä (2017) note, interactive developments occurred in children's literature before they were recognized in electronic literature studies.

Nevertheless, the theoretical basis of the cybertext, hypertext, and more generally, electronic literature is worth mentioning here (e.g., Aarseth 1997; Koskimaa 2000). For instance, Espen Aarseth's (1997) concept of ergodic literature describes the dynamics of interactive literature. Aarseth defines ergodic literature as literature that requires reader's "nontrivial effort" (Aarseth 1997, p. 1)—more than simply turning a page—in the reading process. Although the idea of ergodicity is useful in the context of children's book app, it does not cover all the aspects of the affordances of mobile applications.

In their analysis of digital and augmented books aimed at young readers, Koskimaa and Lahdenperä (2017) rely on Caillois's (1961) classic distinction of playful play (*paidia*) and ordered play (*ludus*). Based on these terms, Koskimaa and Lahdenperä (2017) describe playfulness as a playful attitude towards the use of the app and/or how the user can creatively play with the features of the app. In contradistinction to playfulness, gamefulness refers to the more rule- or goal-oriented activities: the need to perform certain activities within certain rules when using the book app (Deterding et al. 2011; Koskimaa and Lahdenperä 2017). In this article, I refer to the use of game elements outside the context of games as gamification.[2]

Ensslin, who studies literary videogames, describes the game elements of hybrid works—combining both literary and game elements—in more detail:

> [L]udic mechanics, which occur in ludic-literary works that borrow from computer game technologies and structures such elements as rule-driven action, performance measurement, credit counts, winning and losing mechanisms, rewards, tasks, and challenges. (Ensslin 2014, p. 12)

According to Ensslin (2014), these kinds of elements are not common in (adult's) digital literature, but I claim that most book apps for children draw from digital games in one way or another. This is probably a result of children's literature being closely connected to the general entertainment industry.

No less importantly, the framework employed by this article relates to the idea of leisure-based reading, as children often read for pleasure and enjoyment (Dungworth et al. 2006). Sutton-Smith (1997) counts reading as one form of (solitary) play. Reading for pleasure is described as ludic reading by Nell, who defines it as an activity that is "at root a play activity, and usually paratelic, that is, pursued for its own sake" (Nell 1988, p. 7). This definition is significant for understanding leisure-based reading as an activity that may serve but does not need to serve any specific purpose. However, Nell's (1988) ludic reading experience is immersed and focused; therefore, ludic reading is in a kind of opposition with the playful engagement described by Koskimaa and Lahdenperä (2017).

To underscore one of my main points again, then, picture book apps are not only interactive story platforms, or digitized picture books, but rather a special case of digital media. The printed picture book is a multimodal and playful medium as such and picture book applications are a continuum of the joint history of children's print and play culture. The medium deserves to be examined from an interdisciplinary point of view. In this article, the theoretical standpoints of children's literature studies, picture book theory, game and play studies, and media studies, are combined in order to approach the hybrid subject of study.

Materials and Methods

In the following sections, I apply the idea of playful affordances to the analysis of five different picture book applications in order to examine how they afford possibilities for digital play. These case studies aim to cover a wide range of applications, from more book-like works to an augmented reality picture book, which is why the apps were not selected at random. To closer examine the selected works, I adapted a specific model of close reading of children's video games. The 'critical ekphrasis' model formulated by Reay (2018) focuses on the visual, auditory, tactile, and performative elements of children's video games. Reay's (2018) model aims to serve as a tool for the interdisciplinary dialogue between children's literature and game studies, thus also serving the aims of this study well.[3]

The method of examination is text-oriented in the sense that it pursues to transcribe the aesthetical experience, including the nonverbal signifiers of digital games, in written text (Reay 2018). In other words, I did not analyze the selected apps as text *per se*; instead, I transcribed the dynamic of reading/playing the apps into textual data. This kind of transcription allows capturing, for instance, the (poetical) meaning of gestures and actions, in addition to the audiovisual and textual signifiers of the game (Reay 2018). The subjects of this study are not only the multimodal texts, but also my experience of reading and playing the apps. Beyond this text-oriented and aesthetic analysis, I also analyzed the data qualitatively to find out how picture book apps afford opportunities for a reading experience that contains features characteristic for children's digital play. The works are discussed in relation to both (a) the results of the close reading and (b) its implications regarding the implied or hypothetical user of the applications: a dual audience (Beckett 1999; Wall 1991) of a child and a potential adult co-user.[4]

Max & Meredith: The Search for Percival (2016)

Max & Meredith: The Search for Percival (Move on Pluto 2016) tells the story of two children, Max and Meredith, who are looking for their lost dog in the fairy-tale-inspired town of Everdale. The app offers alternative storylines: a feature that is associated with gaming and role-playing by Stichnothe (2014). The alternative storylines also follow in the footsteps of the *Choose Your Own Adventure* series of gamebooks (1979–1998) and other forms of interactive fiction, both for children and adults. The user is presented with six opportunities for choosing between two options in different parts of the story, eventually leading to a total of eight different outcomes.

The affordances of the digital platform enhance the materiality and the aesthetic experience of using the app in two ways: by referring to familiar actions and sensations related to traditional reading, and by using multimodal features, such as sound, to complement the story. The story itself is presented rather traditionally by text (either read aloud or by the user), songs, and illustration with a limited number of animations or interactive hotspots. The text and hotspots can be turned on and off from the settings that are behind a childproof lock. In van Oers's (2013) categorization of rules in children's play, most of these features would be related to technical rules (e.g., how to use the app) or strategic rules (e.g., how to proceed with reading).

Figure 1: The map in Max & Meredith: The Search for Percival.

The logic of choosing between different storylines is rather simple, with two options popping up regularly as the story progresses. The user can also explore a map that visualizes the structure of the alternative storylines (see Figure 1). Although the user is free to choose between different options, the app directs the user towards exploring the different storylines and finding all eight endings. The technical rules of use are simple, and a child user is likely to be able to navigate the app quite independently or, alternatively, with an adult reading aloud. In addition, going through all different storylines unfolds the story in a way where each branch complements each other. This dynamic reflects the play experience of exploration–discovery in Songer and Miyata's (2014) model.

The app mimics the features of printed books by using a gesture that mimics page turning, followed with the sound of a rustling book page, as the main navigation tool. These book-like features are a common trait of children's book apps (Al-Yaqout and Nikolajeva 2015; Stichnothe 2015) and they play with the affordances of both printed and digital books. They also resemble the virtual materiality of touch screen devices described by Søyland and Gulliksen, who note that "a touch screen is paradoxical in that the user can touch objects without actually touching them, and see objects that are not actually there" (2019, pp. 3–4). Therefore, virtual materiality is an illusion or simulation without physical properties. Materiality refers to the way we still interpret these illusions in the same manner as physical objects. As there is little interactivity within the app and it includes several book-like affordances, the reading experience feels close to traditional reading.

Heston Hogs: The Way Home (2020)

Heston Hogs: The Way Home (Laitinen 2020) is an interactive picture book app that follows the journey of a young hedgehog. The app combines animated illustration, music, text, narration, and user interaction. The hedgehog, called Heston, is playing outside when he gets lost in the woods. The narrative foundation of the app is fairly traditional; a child's journey from the domestic environment to the (nature) outside is a recurring, conventional theme in children's literature (Nodelman 2008).

During his journey, Heston encounters different animals and challenges. Many of these interactions and tasks engage the user in various ways while the text addresses its reader in multiple places, asking them to help Heston or finish small tasks. For instance, in a scene where Heston is chasing a dragonfly, the narrator asks the user to tap the characters to affect their movement. This kind of addressing invites the user to identify and empathize with the young hedgehog; when Heston is hit by a thunderstorm, the user needs to give him a gentle stroke for comfort. In many scenes, the story does not continue without completing the tasks, such as tapping the right hotspots, finding objects, or swiping the screen. Only a limited and inconsistent amount of directions is given; in some scenes a dot appears on the screen to direct the user, but in other scenes the user needs to find the solution without assistance (see Figure 2).

Figure 2: Addressing and instructing the user in Heston Hogs: The Way Home.

The story unfolds in a predetermined manner and leads the young hedgehog back home. The illustration of each scene contains several objects to tap or drag. These gestures lead, in most cases, to sound effects and movement: rustling trees or popping mushrooms. Although the interaction is limited and repetitive, it invites the user in playful exploration (and, again, discovery) with the app without a specific goal. Adapting the dynamic between reading and playing is mostly up to the user(s); it is possible to observe each scene carefully, or to move the story forward as fast as possible.

The app utilizes the affordances of the digital platform by combining gamified elements, such as simple task-solving, with a picture book. The app also contains mini games that can be played separate from the story. These simple quizzes and puzzles are clearly aimed at young users. The gamified elements create a play experience that is rarely possible with a printed book. The app makes comprehensive use of the different poetic devices of mobile platforms: sound, touch, animation, and text. Together with the playful and gamified features described above, they create a reading experience that is enhanced with some elements of play, such as discovery and challenge (Hunicke et al. 2004; Songer and Miyata 2014).

Women Who Changed the World (2019)

Women Who Changed the World (2016) is a nonfictional[5] children's book app from Learny Land, a developer that has also published several educational mobile games for children. The app taps into the boom of children's books that are based on notable real-life women, launched by Favilli and Cavallo's *Good Night Stories for Rebel Girls* (2017). The app includes stories of eight women, from Pakistani human rights activist Malala Yousafzai to female astronauts. Each story is also accompanied by a biographical summary.

When navigating the app, the user is free to choose between the stories that consist of animated illustration, text, and tasks. Similarly to *Heston Hogs*, finishing the tasks is required to further navigate the stories. Different tasks vary from tapping and dragging objects to solving puzzles and answering quiz questions. Some of these tasks have no external purpose whatsoever, but some tasks enhance the stories by drawing attention to details. For instance, the user must assemble a puzzle based on the portrait of Frida Kahlo while the text states that Kahlo painted mostly self-portraits. In this example, the interactive affordances of the mobile platform semiotically broaden the picture book iconotext.

The nonfictional app is related to the concepts of edutainment and serious games: games designed for other primary purposes than entertainment, this purpose often being educational. As Abt (1970) noted when developing the concept of serious games though, seriousness does not always exclude entertainment. In *Women Who Changed the World*, the gamified elements and audiovisual effects increase the appeal of the biographical stories. The obvious aim of the app is to educate its readers about notable women and their life, often through user participation; in many places, the user is invited to engage in the revolutionary actions in a playful manner, such as planting trees or directing an airplane across the Atlantic.[6]

Figure 3: The bus scene in Women Who Changed the World.

Figure 4: One of the landscapes in 3 Red Balloons.

The pedagogical framework of the app is particularly visible in the tasks that challenge the user to consider issues related to equality, and the story of Rosa Parks is especially interesting in this context. At the beginning of her story, the user needs to place Parks's character inside a bus, but the seats in the back of the bus are already taken. As Parks cannot sit on the front seats, it is impossible to place the character inside the bus (see Figure 3). This mechanic engages the user in a way that relates to the idea of persuasive games and procedural rhetoric by Bogost (2007). Procedural rhetoric refers to the practice of persuasion produced by the computational processes of video games, or "the special way in which games convey meaning" (Stenros 2015, p. 124). In the case of Rosa Parks, the user is engaged in a simplified simulation that is limited in user participation but makes the mechanics of segregation apparent. This simulation is produced through the poetic power and affordances of the mobile application.

3 Red Balloons: A Cute Picture Book for Toddlers (2016)

3 Red Balloons: A Cute Picture Book for Toddlers (Jogo 2016) is a wordless adventure of a young elephant. Flown by three red balloons, the elephant flows through different landscapes around the world (see Figure 4). The scenes are similar to spreads in picture books. In addition to illustration, they contain interactive hotspots that the user can tap to launch short animations and sound effects. Visually, the app resembles a mobile game for young children but does not properly recall the mechanics of children's mobile games. On the other hand, the app features no text and only little narrative elements. Moving from one scene to the next one is simple and requires the user to tap the elephant. The user is free to navigate between the scenes or explore each spread at their own space.

Previous studies on digital children's literature have asked for picture book apps to provide the user with more opportunities for co-creation within the digital realm (Al-Yaqout and Nikolajeva 2015; Stichnothe 2014; Yokota 2015). Much like digital games, picture book apps vary in terms of how much freedom and choice they offer for the user. *3 Red Balloons* affords some tools for co-creation in a rather interesting way: the users are supposed to come up with the (missing) story themselves. The core idea of the application becomes clear only by reading a separate guideline for parents and the app's description in the App Store.

The scenes are filled with intriguing details and playful interactivity that draw attention to details and enhance the user experience. However, the app can become repetitive or even boring without adult endorsement and an interesting story developed around the given material. This dullness is not necessarily completely unintentional: in addition to encouraging child-adult interaction, the app guides the user towards bedtime through calming, soothing imagery and music at the end of the story. The affordances of the app are, in a sense, harnessed to the practice of persuasion serving parental purposes that may collide with the goals of the child user.

Relying on the users' understanding of the strategic and conceptual rules (van Oers 2013) of using the app, the app offers users some amount of co-creative freedom. In addition, the app supports intergenerational, shared play—the play of children and adults—in the form of shared storytelling and exploration. Adult and child users can

make up the story of the elephant and discover the hotspots together. Here, the concept of affordance comes to the fore; the opportunity for a shared play experience is afforded within the app, whether the potential actualizes in practice or not.

Mur, eli karhu (2016) and *Mur* (2017)

The Finnish picture book *Mur, eli karhu* ('A bear called Mur,' 2016), by author Kaisa Happonen and illustrator Anne Vasko, and the augmented reality (AR) app *Mur* (2017) are an exceptional pair among other works of digital children's literature.[7] Unlike book applications used only on mobile devices, the *Mur* entity combines a printed picture book with an AR application. The AR app is designed by Step in Books, the designer behind the picture book app *Wuwu & Co.: A Magical Picture Book* (2014) that has attracted the interest of literary scholars for its innovative interface (Koskimaa and Lahdenperä 2017; Nagel 2017). Though experiments with AR picture books were already made during the webcam era before the spread of mobile technology, only a handful of works have been published so far. As an augmented reality app, *Mur* can be located in the sphere of hybrid play products (Tyni et al. 2013) that have gained popularity especially after the rise of augmented reality and AR mobile games such as *Pokémon GO* (Niantic 2016). These products combine toys or other items with digital games or applications, creating a material-digital hybrid play experience (Tyni et al. 2013).

The picture book *Mur, eli karhu* is a self-contained, traditional picture book that tells a rather traditional growth story of a young bear who does not want to sleep through the winter and decides to become a winter bear. The *Mur* app works only when it is combined with the printed book, since the AR features of the *Mur* book work on a marker basis. When the user scans pages containing the marker (a little bird) with the camera of a mobile device, the *Mur* app opens AR scenes that are based on the illustrations of the book. The scenes either augment the illustrations (see Figure 5) or replace them completely with a virtual landscape where the user can move around (see Figure 6).

Both augmentation modes allow playing with the illustration by generating an interactive, digital version of the pictures. The basis of the interaction, tapping objects and characters, is the same as in other picture book apps. The AR experience contains a few mandatory tasks and several opportunities to play with the content of the book. A full experience is possible only with the user's understanding of how augmented reality works and how to use the book and application together. However, the app gives only little guidance on how to use the book and app together. Fortunately for the user, the animations progress partly without user intervention.

In the scenes with the virtual landscape, the user is placed in the position of the bear character. When looking down, the user can see their own bear reflection on the surface of a pond and bear footprints in the snow. This immersive experience is different from the third person narration of the book and enhances the reading experience in multiple ways, both audiovisually and spatially. When Mur is awake while other bears are hibernating in the story, the app places the user inside the nest where Mur is staying awake. This kind of augmented interplay between the picture book and augmented reality is the most intriguing element of *Mur*.

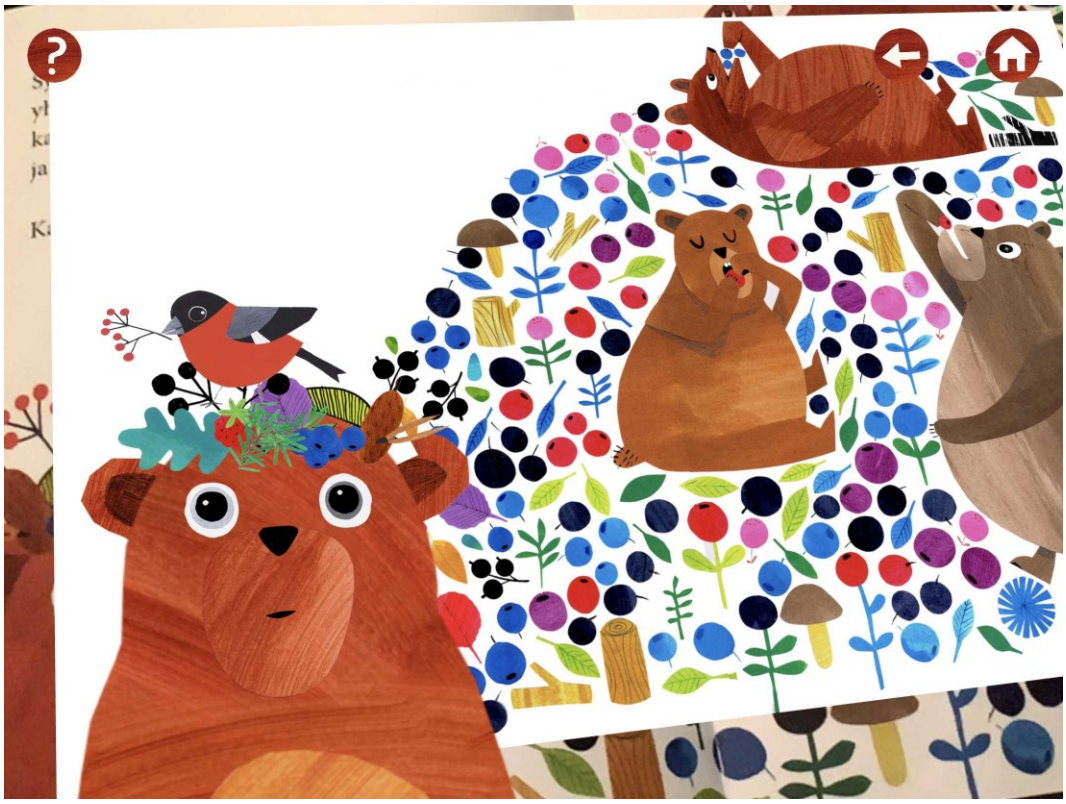

Figure 5: AR on top of the Mur, eli karhu *book.*

Figure 6: An immersive AR scene in the Mur *app.*

Augmented reality allows exploring the fictional world from a perspective that differs significantly from the usual ways of reading and playing. The dynamics of using the book and app together, or balancing between reading and playing, may also work as a distraction from the book. In addition, *Mur* probably requires an adult co-user to read the book and assist with the app, at least in the case of very young readers, which adds another layer of negotiation in reading the book. However, as mentioned in the theoretical section of this article, negotiating the social rules of play is one important aspect of children's digital play more generally.

Conclusions

It is important to highlight that the features of children's book apps previously (de)valued as mere decoration in some studies are common in children's mobile games. For instance, the popular mobile game *Toca Life World* (Toca Boca 2018) resembles playing with a dollhouse more than goal-oriented gaming, and many objects in the game world are instruments of playful interaction. Similarly, most of the interactive features of picture book apps are not heavily gamified; none of the apps discussed in this study included, for instance, credit counts or rewards.

Based on the previous analysis, it seems that using a picture book application resembles traditional reading but also exceeds its limits by enabling, for instance, play in the fictive world via the means of augmented reality. Navigating an app requires balancing between different modes of action: reading, playing, and exploring. This engagement has different forms that resemble the features of digital play (Koivula and Mustola 2015) and playful affordances (Songer and Miyata 2014): for instance, exploration and discovery, challenge and make-believe, and both solitary and social frameworks of play. Further examination of children's playful reading practices and intergenerational play is necessary from a premise that recognizes playing with a book as a valuable research topic.

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Notes

1 Most studies in this field favor the term ‘picturebook’ instead of ‘picture book.’ The former spelling emphasizes the synergetic verbal-visual nature of picture books. For clarity, this article prefers the latter spelling.

2 It should be added that Caillois’s (1961) *paidia* and *ludus* form a scale instead of an opposition. This is evident in many of the cases discussed in this article: in many places, playfulness and gamefulness cannot be completely separated.

3 Schwebs, who studies the aesthetic affordances of children’s book apps, connects Gibson’s (1979) affordances with media aesthetics that highlight “the importance of examining the medium itself in order to understand how objects appear and are perceived” (Schwebs 2014, p. 2). Similarly, to understand picture book apps as a medium, this study combines some aspects of media studies and aesthetic disciplines (Hausken 2013). I acknowledge that this approach is limited when it comes to the intended audience of children’s literature; studying my own aesthetic experience does not provide any understanding of actual children’s perspective on the subject matter. Accordingly, this study is not an audience study, but its multidisciplinary framework may serve as a stepping stone to such approaches.

4 The implied reader—a classical term coined by Booth (1961) and further conceptualized as the ‘implicit reader’ in Iser’s (1972) phenomenological reader-response theory—differs from the actual reader of the text. The implied reader is a hypothetical reader—a kind of model—that the author approaches with the text. In order to apply the term in the reception of children’s literature, it is important to highlight that picture books are usually designed to be read aloud by a literate reader. Shared picture book reading is a dialogical activity consisting of both verbal and nonverbal communication between the readers, often structured by the adult co-reader (Rohlfing 2015).

5 Children’s and adolescent nonfiction is a surprisingly uncommon subject of contemporary children’s literature studies. In the context of this article, children’s nonfiction refers to literature intended to educate and inform young readers. It is important to note that many nonfictional children’s books make use of narrative elements; see, e.g., Linda Liukas’s *Hello Ruby: Adventures in Coding* (2015).

6 This interaction as well as the other metaphoric and participatory elements of the app challenge its nonfictionality to some degree (see Thon 2019). However, drawing the line between fact and fiction in the case of children’s nonfiction is often especially challenging. This particularly concerns the picture book form, in which questions of representation and referentiality are multimodal by nature.

7 Unfortunately, the book has not been translated into English. Despite the language of the original text, I decided to include the book in this study because of its comparatively unusual nature.