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Interactive Storytelling: How Picture Book Conventions Inform Multimedia Book App Narratives

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Abstract. Book applications (apps) have become an active element in children’s publishing. Yet there are a lack of standards and design models within this arena. In this paper I analyse the ways in which book apps can draw on the conventions used in print picture books. I propose that through building closer ties between print and digital book formats, the evolutionary trajectory of digital literature may be strengthened. This inquiry involves investigating the use of multimedia, interactivity and playful design in print and digital children’s books. I also highlight two key issues relating to digital interactive narratives: the relationship between interactivity and narrative flow, and the relationship between text and audio narration. This is with the view to assessing how picture book conventions can be used to extend the design of digital interactive stories, particularly book apps.

Keywords: Digital Narratives, Interactive Stories, Book Apps, Digital Picture Books, Childrens Literature, Picture Books, Interaction Design, HCI.

1 Introduction

Since 2010 applications (apps) designed for touch screen mobile computers have become active elements in book publication: and book apps have emerged as a new picture book format [1]. Yet practitioners and publishers alike acknowledge that there are a lack of standards and an absence of dominant models within children’s digital publication [2]. In this discussion I begin to address this concern by highlighting picture book conventions that may be applicable to the design and analysis of children’s book apps.

Book apps are multimedia, interactive artefacts that feature playful design [3-4]. For this reason I begin by assessing the multimedia, interactive and playful aspects within both print picture books and children’s book apps. I then focus on two issues relating to digital interactive narratives: the relationship between interactivity and narrative flow; and the relationship between two key media components, text and audio narration. This is in an attempt to uncover some ways in which the design and analysis of print picture books may inform the design and analysis of digital interactive stories, particularly book apps.

2 Picture Books and Multimedia

Picture books are often considered to be ‘books intended for young children which communicate information or tell stories through a series of many pictures combined with relatively slight texts or no texts at all’ [5]. Picture books that combine text and imagery may be viewed as being multimedia artefacts. That is, they are composed of more than one media format [6]. Although picture books can contain a wide variety of media, text and images form the foundation blocks of these works.

Through picture books children learn to ‘read’ both text and images, and these media elements operate in a particular manner; they do not always ‘tell the same story’ [5], [7]. According to children’s literature theorists Maria Nikolajeva and Carole Scott, picture book images often provide contrasting information to that provided in the text. When works operate in this way they are deploying the picture book convention of ‘counterpoint’ [7]. Authors and illustrators use counterpoint in an attempt to add further depth to a narrative.

One example of counterpoint is evident in the print picture book *Rosie’s Walk*: Fig. 1 [8]. The protagonist, Rosie, is a chicken and according to the text she is simply strolling around a farmyard. Yet the visual story allows for multiple interpretations. Throughout her walk Rosie is perhaps intentionally defending herself by navigating paths that result in repeated injury to a stalking fox. The complex humour within the images, combined with the almost documentary-style instructional text, creates a depth to the story. In this excerpt the text and images impart independent aspects of the

narrative, an overarching unified story is formed when the reader combines these components of the work [5], [7]. The convention of counterpoint invites readers to actively engage in forming an understanding of what is occurring within the book: it encourages audiences to use their imaginations.



Fig. 1. An example of the picture book convention of counterpoint (Source: Hutchins 1968, pp. 3-4)

Conversely, when picture books present identical information within the text and images, the work is considered to be symmetrical [7]. Symmetrical design is evident in Fig. 2 [9]. In this example the visuals support the information provided in the text: the visuals do not provide additional information. When reading symmetrical works the audience 'remains somewhat passive'; their imagination is not engaged in decoding counterpointed narrative meaning [7]. The information provided in Fig. 2 may effectively educate an uninformed audience. Yet in designing this example I have not taken advantage of the depth of narrative possibilities available within multimedia book design.

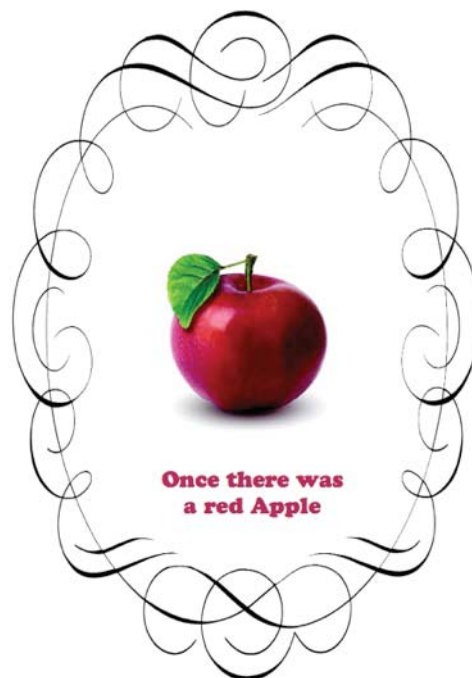


Fig. 2. An example of the picture book convention of symmetry (Source: Sargeant 2013)

Print picture books can incorporate media formats beyond text and imagery. For example, Jan Pienkowski's *Phone Book* features text, still and moving imagery and inbuilt audio [10]. When readers open and close this book the pop-up paper sculptured images move; and when a button is pressed, audiences hear the sound of a telephone ringing. Similarly, children's book apps integrate text, still and moving images, and audio. Potentially these digital works are continuing, and extending the tradition of a multimedia presence within the picture book art-form.

3 Interactivity in Picture Books and Book Apps

Multimedia and interactivity are central to the digital environment [11]. Some commentators believe that a printed book can never be interactive [12]. Yet in the field of children's literature, interactivity is considered to be an active component within both print and digital books. Children's digital narrative theorist, Krystina Madej, notes that: 'Interactivity is one of the key features of the digital environment;...it is also used as a key feature in many young children's books to engage and entertain. Interactivity in books is used in different ways and for different purposes: pop-up, open-the-flap, and peep-through-the-hole books give children the opportunity to play and learn as they make things happen' [13].

One example of an interactive print picture book is Pienkowski's *Phone Book*. In this work readers are invited to move the pop-up visuals and trigger inbuilt audio. The book responds and alters according to specific user touch and movement.

In the prototype book app *How Far is UP?* audiences are invited into a similar interactive environment [14]. The excerpt shown in Fig. 3 displays a scene from this work. When users touch the characters on the screen an animated sequence is triggered. When this sequence is completed, text appears. Users may also engage the device's accelerometer: a virtual rocket moves in response to the angle of the tablet. Audio can also be triggered by touching certain aspects of the artefact.

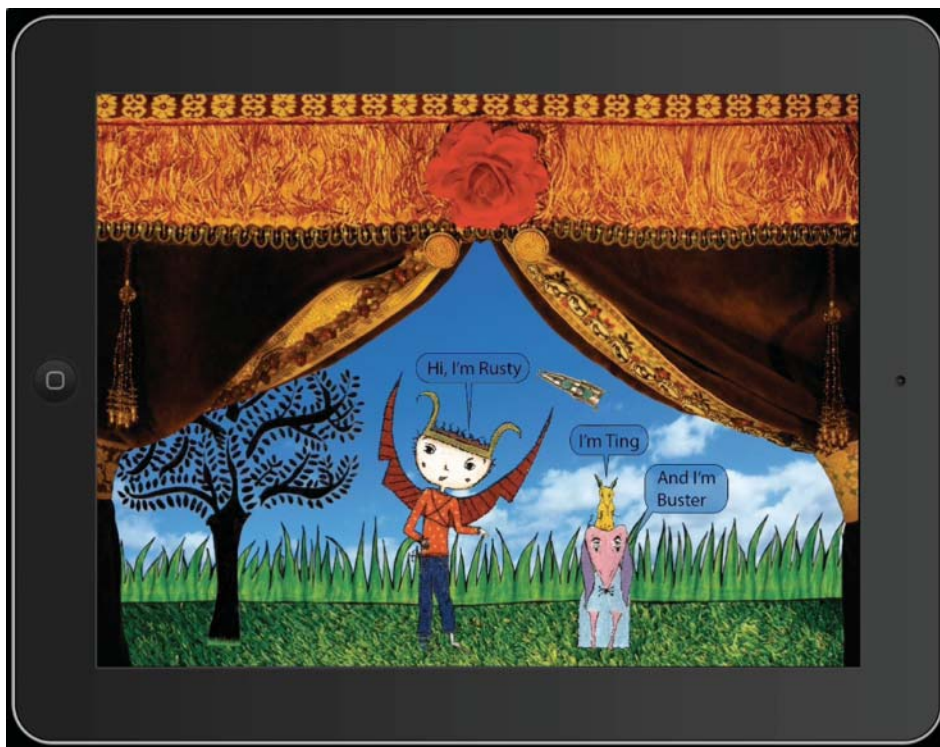


Fig. 3. Interactivity in book apps (Source: Sargeant 2013, p. 1)

The *Phone Book* and *How Far is UP?* are works that are interactive, as the media elements respond according to the audience's movement and touch. Both of these works invite audiences to play.

4 Play, Puzzles and Games in Picture Books and Book Apps

During the late Seventeenth Century philosopher John Locke spearheaded an educational movement, one that acknowledged childhood as being a distinct developmental phase within Western societies [13], [15-16]. Locke stated that children are not just miniature adults, they are a distinguishable group that possess their own specific needs. He proposed that children should not be hindered from being children and their curiosity and sense of play should be encouraged [17]. As a consequence, children's stories progressed from being proscriptive, intended as instruction for miniature adults, to being entertaining [13]. For example, during the Eighteenth and Nineteenth Centuries, author-illustrators such as Lothar Meggendorfer incorporated movable elements and playful interaction design into their books [18]. Children's book designers invited audiences to be playfully engaged with their works.

Play can be viewed as 'free movement within a more rigid structure' [19]. Designers of both print picture books and book apps commonly create playful content. This is evident in the book app *The Fantastic Flying Books of Mr Morris Lessmore* (henceforth known as *Flying Books*) [20]. Within this work users can create words by touching the screen and 'dragging' alphabet letters into a virtual bowl. A photographic image of the letters can be taken and stored on the mobile device. Users freely play within this environment.

The *Flying Books* also contains a more structured sense of play, in the form of puzzles. Puzzles 'hide a solution, and the player must experiment to divine that solution' [12]. Within book apps many designers allow for this type of solution-seeking action. For example, the *Flying Books* app contains virtual jigsaw puzzles in which users can touch the screen and drag sections of an image into specific locations with the aim of creating a unified picture.

Although these puzzle elements invite play, they are not in my mind, games. Games theorist Jesper Juul states that a game is a rule-based formal system. Games contain a variable and quantifiable outcome; different outcomes are assigned different values; the player exerts effort in order to influence the outcome; and the player feels attached to the outcome [21]. Although many book apps contain play and puzzles, formal games are only occasionally present in these works.

One example of a book app that contains formal games is Graeme Base's *Animalia* [22]. In this work games are based on rules: users locate hidden elements, points are assigned, tasks are timed and the user must exert effort to complete a task. The *Animalia* app is an extension of Base's print book of the same name. These works are centred on game-play: neither the printed book nor the app are narrative-based.

5 Play Versus Narrative Flow in Book Apps

Some literary commentators state that narratives consist of two parts: a sequence of events, and the ways in which the events are represented [23]. Others consider the term narrative to be equivalent to story [24]. Although I acknowledge the complexity of this debate, for the purposes of this discussion narrative will be considered to be equivalent to story. Narratives can be viewed as having a rhythmic continuum [5]. This continuum can be described as the narrative flow. The term 'flow', when used in this way, differs from how it is used in games studies. Within games, flow is considered to be an experiential pleasure [6], [19], [25].

The vexing endeavour of maintaining a narrative within a games environment has been well documented in the ludology versus narratology debate which ran throughout the first decade of this millennium [26-28]. These discussions highlight the complexities involved in combining narratives and formal game-play. On the one hand narratives can be viewed as being an intrinsic aspect of games [26]. Yet these elements create design challenges: there can be a conflict between the 'now of the interaction and the past of the narrative' [29]. The relationship between play and narrative is a relatively new concern in the field of children's literature. Perhaps this is because most books do not combine narratives and formal games; children's book narratives are usually coupled with less formal interactive play and puzzles.

Graeme Base commonly incorporates play and puzzles into his narrative-based print picture books. For example, in *Enigma*, Base uses puzzles to extend and enhance the story [30]. Readers of this work search the text and visuals to locate a set of symbols. These symbols form a combination that unlocks movable elements located in the back cover of the book. If the combination is correct, a code is revealed. The code can then be used to decipher mysteries from within the story. The reader interacts with the work to reveal hidden solutions. The puzzles are embedded within the story and the solutions assist readers in gaining a deeper narrative understanding. There is no conflict between play and narrative in this work: the puzzle-play does not invite the immersive continuum that is often experienced in formal games. The narrative is the continuum in this work, the puzzles allow for playful, active engagement with the narrative.

Some books present a less nuanced balance between playful interaction and narrative flow. The *Flying Books* for example, contains interactive elements that do not directly relate to the story. In this work users can play a virtual piano or arrange letters in a virtual bowl. These immersive activities are narrative tangents, they do not relate to the story, and they can be undertaken for any length of time. As a result, users who engage in these diversions may lose track of the

storyline. These interactive features appear to be designed for immersive play, rather than as a means of reinforcing or enhancing narrative content.



Fig. 4. Interactivity as an extension of narrative (Source: Sargeant 2013, p. 8)

In creating the book app *How Far is UP?* a central design goal has been to integrate the interactive features and the narrative. This design goal borrows from the practices used in picture book making. The excerpt within Fig. 4 has accompanying audio narration that states: 'UP. Past stars, comets, meteors'. Users can play within this responsive work as they learn factual information. For example, when a user touches the image of a meteor, text appears; text that extends upon the narrative. Users can also play with the virtual rocket, triggering it to fly within the environment. This activity relates to the core narrative content of the book. Through interacting with the work, users discover further visual and textual information relating to the overall story.

In book apps, interactivity is housed within a multimedia environment. This environment contains text, still and moving images and audio. I will now turn attention to the relationship between two of these media elements.

6 Audio Narration and Text in Book Apps

Audio narration can be present within print picture books via a CD supplement. In these cases recorded narration may be used in lieu of an adult reading the work aloud to a child. Some digital books borrow from this design concept. The book app, *The Monster at the End of this Book*, appears to follow and extend this idea [31]. In this work, text is highlighted as the corresponding word is spoken in the audio narration. This encourages budding readers to draw a connection between a specific written word and an associated spoken word.

Interplay between text and narration is not always present in book apps. Many works display identical data within the audio and textual material, and do not draw connections between these elements. In the *Flying Books* the audio narration directly mirrors the text. Nikolajeva and Scott may label these media elements as being 'symmetrical' [7]. Within this app the text can also be 'turned off'. This allows the user to view visuals and listen to a narration without text being present. In this mode, the work may operate more like an interactive film as opposed to a book. It is relevant to note that this work was initially released as a short film.

How Far is UP? presents another example of the ways in which the different media elements operate in book apps. In this work the imagery depicts a fictitious story: a trio of curios friends venture through the universe and struggle to find their way back to earth. The audio narration is a documentary style account of the protagonists' progression through space; and the written text imparts factual details regarding distance and space. One aim in making this app was to

drawn on the picture book convention of counterpoint. Fig. 5 displays the text and still imagery from an excerpt of the app. The accompanying narration states: ‘UP. Beyond black holes filled with wonders.’ The text and narration present different narrative content, this is with the view to taking full advantage of the narrative possibilities within multimedia storytelling.

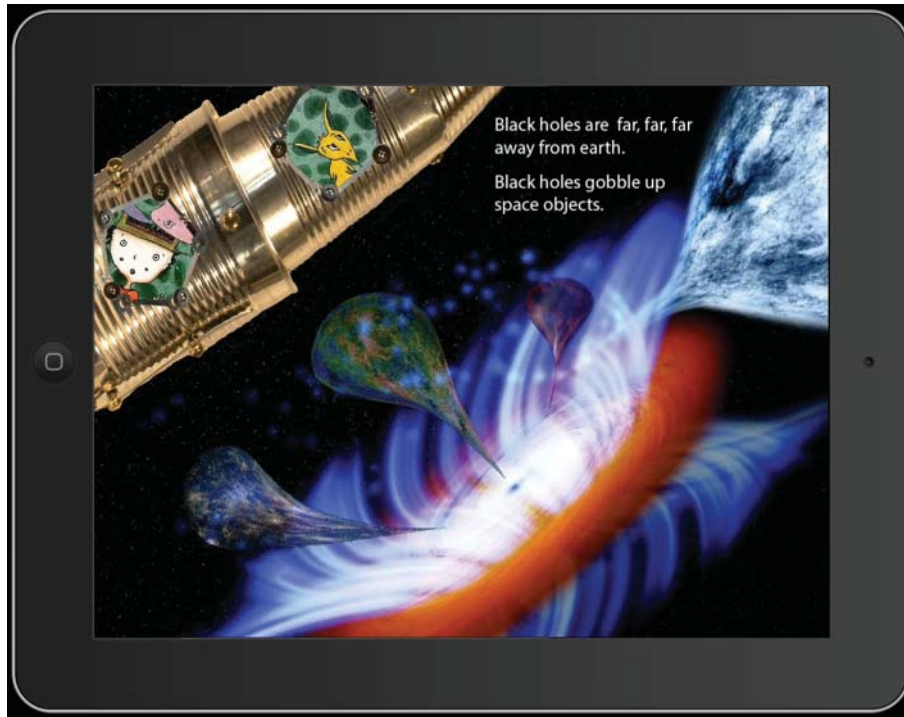


Fig. 5. Text and audio narration in book apps (Source: Sargeant 2013, p. 10)

7 Picture Book and Book App Design

The print picture book has evolved to incorporate a wide variety of media formats and complex, playful interactive design. As a result of digital developments, a new picture book format has emerged: the book app. These digital, multimedia, interactive works fuse text, still and moving images and audio. In helping formalise this new format, it may be pertinent to note the similarities between these digital works and the printed picture book. This is with the aim of drawing on picture book conventions in establishing design models applicable to book apps.

I propose that there are two central theories and methodologies deployed in picture book making that may be of relevance to the design and analysis of narrative-based book apps. Firstly, I suggest that all interactive book app features enhance and enrich the story. Secondly, I note that each media element can be used independently, to tell a different aspects of the narrative. These two recommendations may assist in providing starting points for a design model. One that seeks to enrich story content and to engage audiences, inviting users to become active participants in the narrative construction.

As books venture further into the digital realm, the connections between Human Computer Interaction (HCI) and literature strengthens. When designing and assessing digital, interactive narratives it is logical to draw on games and HCI studies, to illuminate the functional affordances of the work. Yet it may be equally as useful to acknowledge the ways in which the print picture book may inform the design of digital artefacts, particularly narrative-based, interactive, multimedia stories.

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