Down the Rabbit Hole:

Five Hedonic and Pragmatic Facets of Audience Engagement in Playable Stories

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***Abstract*— This paper presents an exploratory study that relates hedonic and pragmatic aspects of audience engagement to playable stories on different interactive media. Eighteen participants discussed their individual experiences with three different interactive adaptations of Lewis Carrol's *Alice in Wonderland*. The paper illustrates the initial findings of how *fun, attraction, excitement, satisfaction,* and *frustration,* as facets of audience engagement, are shaped by different attributes that are related to the affordances of each medium.**

Keywords-Playable Stories; Interactive Narrative; User Engagement; Hedonic Experience; Play

I. INTRODUCTION

This work in progress aims to explore the attributes that shape audiences' experience with playable stories, by mapping out the relations between engagement dimensions with attributes of the narrative media. This study is driven by a larger research that seeks to identify possible methods of interaction that can be applied to a model intended for playable interactive narratives. In it, the participants played with one of three interactive adaptations of *Alice in Wonderland*. Each represented a different mode of interaction: hypertext, touch-based and naturally tangible. This paper intends to present a structure that explores the relationship between different facets of audience engagement and medium-specific attributes of interactive narratives. Most of the published work in regards to engagement in interactive narratives, especially games and video games, has been grounded in quantitative methods (see [13] for details). Nonetheless, Ijsselsteijn et al. [7] argue that gaming experiences are so experientially rich that by just measuring engagement and involvement, other dimensions such as fun are left out of the traditional metrics. Additionally, Boyle et al. [2] note that in most studies of this type, the attention is placed on usability factors instead of the enjoyment of the game itself. Using an alternative and complementary approach that relies on semi-structured interviews, this paper intends to present instead an account of a study grounded on emotional and subjective aspects of a playable narrative experience. This paper is organized in the following way: Section 2 will introduce briefly the key concepts and related works relevant to the study as well as its procedures. Section 3 will present the findings, illustrating some attributes explored in the paper with statements from some of the participants. Finally, Section 4 will discuss the conclusions and future work of the study.

II. RELATED WORKS AND BACKGROUND

A. Concepts and Literatre

Playable Stories, a primordial component of this study, is defined by Ryan [19] as the narratives in which the audience observes the evolution of the story world, focusing on aesthetic pleasure, and free play. User engagement, on the other hand, can be characterized by the depth of someone's investment when interacting with a system and the context of the experience [11][15]. For example, Chapman [3] talks about *engagement* as something that draws, attracts and holds a person's attention, while Laurel [8] mentions playfulness, and sensory integration. Other concepts involved are *flow*, where there is intrinsic motivation, sustained focus, and loss of awareness, as well as *play*, as something that encourages learning, creativity, an urge to satisfy needs and a sense of competition or collaboration [4][17].

One of the most cited studies of user engagement is the User Engagement Scale (UES) originally developed by O'Brien and Toms and further revised by O'Brien et al. [11][12]. Among many adopters of UES, Wiebe et al.'s [22] adapted the Scale specifically for engagement in video game-

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based environments, which is highly relevant to this work. In their framework, which incorporates O'Brien & Toms's and Hassenzahl et al.'s theories, user engagement dimensions are classified into two categories: hedonic and pragmatic [6]. Hedonic aspects include pleasure, aesthetics and novelty, whereas pragmatic aspects include usability and whether the user would want to use it again. For games, it is commonly believed that user engagement is mainly driven by hedonic rather than pragmatic qualities [22]. These aspects were further developed into a four-factor model of User Engagement that considered [11]:

- **Aesthetic Appeal:** related to the perceived attractiveness and visual appeal of the medium.
- **Focused Attention:** describes the feeling of absorbed in the interaction and losing track of time during the experience.
- **Perceived Usability: t**he affect, either positive or negative, experienced because of the interaction and the degree of control and effort.
- **Reward:** associated also to *Satisfaction* [22], it describes the success of the interaction, the curiosity, and interest in the medium while having fun with it.

B. Study Procedure

Our first study covered eighteen individual sessions with the same number of participants from The Hong Kong Polytechnic University, including eleven Ph.D. students, four undergraduates, and three academic staff. Only one was a native English speaker, while the rest were non-native speakers from Europe, South East Asia and Mainland China. Ten were women; eight were men, all between 20 to 35 years old. The participants were based on a convenience sample recruited through a mass email as well as posters placed across different other departments on campus. Before each session, the participants were asked to complete the Common European Framework (CEFR) Can-Do self-assessment grid. This self-assessing tool allows the participants to categorize themselves as language speakers in three groups A (basic), B (independent), C (proficient) and 2 levels respectively. Each level describes the learner abilities in terms of reading, listening, speaking and writing the language [21]. One participant categorized himself as a beginner, eight as independent and nine as proficient English speakers. The purpose of this initial assessment was to single out problems caused by language abilities during the experiment.

At the beginning of the session, participants were asked to pick from a closed bag a piece of paper that contained the name of the adaptation they were going to interact and play. The chosen adaptations were Matthias Conrady's hypertext version *Allice Falling*, Emmanuel Paletz's *The Alice App* designed for touch-based tablet devices and Robert Sabuda's movable book *Alice's Adventures in Wonderland* (Figure 1). All participants read and interacted specifically with *Down the Rabbit Hole*, the first chapter of the *Alice in Wonderland* story, which appeared across all adaptations. Although the textual details of this chapter differ and might marginally influence the results, the three adaptations cover the same plot and characters with little to no changes in the narrative itself. Once finished, the participants completed a slightly varied version of the aforementioned UES questionnaire. Our survey contained 29 of the of the original 30 questions outlined by O'Brien et al. [12]. The

Figure 1. Media used in the study. **Left:** Matthias Conrady's *Alice Falling.* **Center:** Emmanuel Paletz's *The Alice App* **Right:** Robert Sabuda's *Alice's Adventures in Wonderland*.

discarded question –PU8 in the UES– addressed a matter associated to productivity and not applicable to interacting with a playable narrative. The session concluded with a semi-structured interview partly inspired by Fullerton's suggested list of general postgame questions for playtesters that focus on the experiential aspects of the game [5]. Other questions invited participants to elaborate on the reward and aesthetic appeal attributes from the UES, to ensure the interview to cover a wide range of emotions and experiences. All the sessions were video and audio recorded for a total of 12 hours worth of material. The duration of each session was, on average, 40 minutes; out of those, 5 minutes were dedicated to the Can-Do statements, 12 minutes for the participants to read and interact with the story, 5 minutes to complete the UES and 13 minutes for the semi-structured interviews.

Each session was later transcribed and grouped based initially on the medium the participants interacted with. Following Smith's *Shared Experiences* [20], each collection of interviews was analyzed and coded, later grouped into themes and then connected as clusters. The analysis of the information gathered was done through an inductive approach. Considering that our primary interest was to look at emotional and affective responses of the participants, the primary themes identified were mainly drawn from the key moments when participants were discussing their affective experiences:

- **Fun:** *pleasure without purpose. Framed in two types: solipsistic where every individual gets to define their version of fun, and consensual, where fun involves physical pleasure, abandonment, and debauchery* [10].
- **Attraction**: *object-based emotions or (appealing-ness)* It *concerns the person's attitudes and relative to their predispositions to like or dislike certain aspects* [14].
- **Excitement**: a positive emotional state that consists of *high levels of pleasure and arousal [18]*.
- **Satisfaction:** framed *as the pleasure or contentment one feels when s/he performs a required or desired action and experiences the result* [9].
- **Frustration:** is a *phenomenon that happens from the struggle to fulfill a will or particular goal* [1].

The first four aspects are classified as hedonic experiences while frustration as a pragmatic one. Although frustration can be classified also as a hedonic experience, the Perceived Usability attribute of the UES focuses specifically in frustration and other cognitive aspects of the experience [12] [22]. Considering these themes, the statements of each medium (hypertext, touch-base, and tangible) were grouped based on the attributes above. Only then, they were coded initially and organized. Some of the statements were placed across several attributes as they described different phenomena. There were statements that were split into separate entries due to their length and their theme, as sometimes the participants expressed multiple ideas in a single sentence.

III. FINDINGS

This section focuses on the qualitative findings from the exploratory analysis of the interview results, which concern the emotions and experiences perceived and discussed by the participants. Based on the language and comprehension criteria established for this study, the contributions from seventeen out of the eighteen participants were considered suitable. The excluded participant scored himself as A1 in his language proficiency assessment and his overall narrative comprehension was substantially lower compared to the other participants. The remaining participants presented an acceptable level of language proficiency –equal or above B1 in the self-assessment, and an adequate comprehension of the narrative –being able to recall key events in the story. Gender or age of the participants were not an excluding parameter of this study.

The interview findings aim to establish a relationship and a hierarchy between the experiences observed and the medium's affordances that induced them. These affordances are mostly experiential and their supporting attributes or features are of hedonic nature (Figure 2). This can be explained by Pucillo and Cascini's [16] characterization for experiential affordances, which are enabled by a product's hedonic features to contribute to users' basic psychological needs.

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The UES results, on the other hand, showed a comparative tendency among the three media on the four dimensions of engagement. For example, participants report higher scores in Focused Attention and Reward for the naturally tangible story (i.e., the movable book). Nevertheless, as the sample size was small, the current study findings weigh more on the interview than the UES questionnaire results.

A. *Fun*

The participants who played with the hypertext adaptation stated that the narrative ambiguity originated their sense of fun. This was most likely instigated by the plot, usually dependent on the adapting author, the navigational position of the hypertext, and certain interactive elements available to the audience. The feeling of uncertainty stimulated their imagination, with the support of such visual stimuli as animation or changes in text color and shape. Regarding this, Participant *5A stated: "I deliberately... when was like: Do cats eat bats? It didn't stop looping […] I kept trying not to press anything and [to] see what happens."*

In the touch-based tablet adaptation, fun was derived from the sense of feeling curious and anticipation about what happens in the narrative, with the support of dynamic elements that generate sound or motion. Because of the medium's perceptible nature, manipulation is also essential to foster fun; sometimes it can be exploratory, while in other cases it can have a diegetic effect. Participant *6B mentioned "I was quite curious, like when I saw... when it started there was the key basically.... and it fell down when I tested... so it made me expect in every page some kind of animation, so I was just checking if there was anything."*

In the naturally tangible narrative instead, the dynamics of motion and manipulation of three-dimensional objects contributed to the sense of ludic play, which was reported to have nurtured

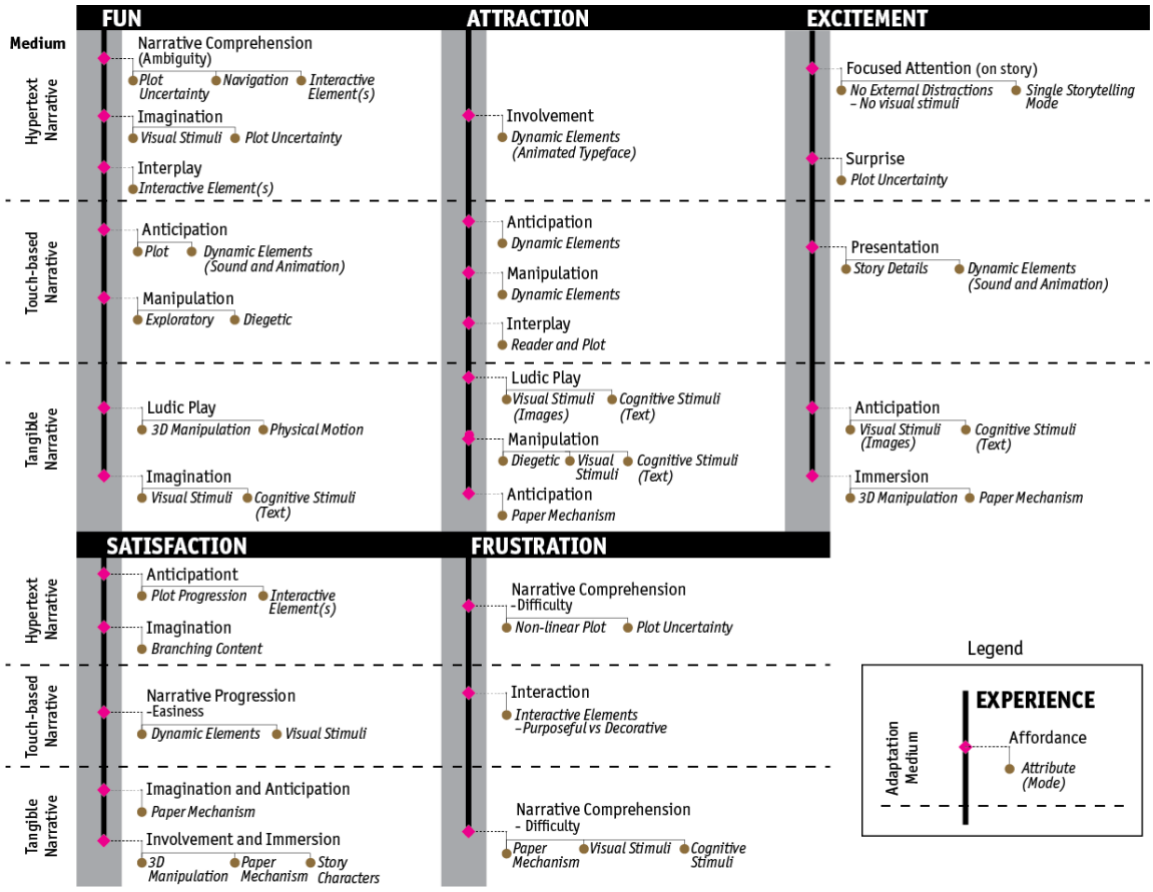

Figure 2. Attributes and modes between the experiences observed and the medium's affordances that induced them.

their imagination. This was also grounded in the different visual (images) and cognitive (text) stimulus of the experience. The latter especially, not only in the narrative itself but also for example, on the labels placed in the mechanisms that entice to act upon them. Participant *2C stated, "It's kind of like... you can have the playable thing to match what is happening in the story"* Only the participants that interacted with this medium mentioned being able to "play" with the story, while those that experienced the hypertext and touch-based narratives described the experience as being just fun but never mentioned the idea of ludic play. Although all narrative media offered a way of playing with the story, it seems that the sense of play develops better and is more rewarding in media that allow direct, three-dimensional manipulation.

B. Attraction

The second hedonic facet is the sense of attraction that entices audiences to interact with the narrative. In hypertext narratives for example, feeling involved with the dynamic elements seemed to be the most attractive affordance. This is particularly true with animated typeface that entailed the reader acting on it before moving forward in the story, for example Participant 1A expressed*: "I need[ed] to chase the words... like the "Cats eat bats" […] when the first sentence is popping out, I need to chase it... yeah, chasing something."*

Due to its manipulable nature, the different dynamics embedded in the touch-based narrative were the most attractive affordances, especially when several elements stimulated the participant's curiosity, which sets up their anticipation. About this, Participant 2B said, *"I was just turning a page, and I noticed that when I was trying to turn the page, there were some movements, so that made me curious that, while in the previous pages I did not do that... so that made me curious that there might be a purpose."* This also led to interplay between the reader and the plot. In some cases, it had a purpose like seeing how the character grew, while in other cases it turned into exploratory free play with the interactive elements.

In the naturally tangible narrative, the images and the text in the book were cognitive and visual stimuli to support play and manipulation that has a diegetic effect in the story. The participants expressed that the ingenuity of the medium –as having functional paper mechanisms– raised their curiosity with the experience. For example, Participant *4C* noted that *"… once you started seeing all these different elements and characters, the story starts taking shape and it all happens in your mind as you read."*

C. Excitement

Feeling excited changes the way an audience engages with a narrative. The participants expressed that in the hypertext narrative, it was the curiosity and the anticipation or surprise of an outcome coming from an uncertain part in the plot that generated excitement in them. Another essential affordance of excitement in this medium is the ability to focus on the story; probably due to the lack of external distractions such as images and a single storytelling mode.

In contrast, excitement was the least discussed in touch-based narratives, perhaps because the participants were already familiar with this mode of interaction and did not feel novel or foreign. There were cases in which the participants highlighted excitement from the dynamic elements of the narrative such as the moving images and other details of the story. Participant *3B* mentioned about this: *"…see there is a picture of a British king there... little details like that... I'm not sure everyone would pick that...but I appreciated that."*

In the naturally tangible narrative, the images of the movable book along with the texts of the story, acted as visual and cognitive stimulus, to fuel the sense of curiosity and anticipate the next. Playing and manipulating the paper mechanisms intensify the sense of immersion. Participant *4C* concluded, "*You don't know what the next page will give you, so there is a sense of... unexpected... something unexpected, […] like, something folded shows up... you flip it, and you discover more detail[s]".*

D. Satisfaction

The process of engagement is not exclusively linear, but a series of looping moments. Satisfaction seems to be mostly derived from that looping experience. In the case of the hypertext narrative, the sense of contentment was constructed by the

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plot progression based on specific actions on a branching point in the narrative or acting through one of the interactive elements. In both cases, this was motivated by anticipating the outcomes. This cause-effect factor also nurtured imagination, as the participants had to create mental images of what was happening in the story. For example, according to participant 5A *"When there is some underlying hidden text... for example what she thinks, it's not bulky at the very start, but when you read it you want to know what she thinks, that's why you click on it. And then it says what she is thinking."*

The visual features of the touch-based narrative allowed the participants to feel that the medium augmented the narrative and their imagination through different dynamic elements on the screen. These elements also eased the readers understanding of the text and what they thought the writer intended to tell. This was especially important to the participants with lesser second-language skills.

In the naturally tangible narrative, evidently, the sense of satisfaction comes from the cognitive stimuli of manipulating the paper mechanisms that produced movement and inspired their imagination and curiosity. Contrasting the other media, satisfaction was usually discussed from a more expressive standpoint as the participants felt happy and involved with the story and the characters. This also developed a sense of immersion as the plot progressed. For example, Participant 5C highlighted *"...and when we see some pop-up images like [the] big forest... although we are not in the forest, it made me feel like we are there... it's so huge it made me feel like I'm part of it... I'm part of Alice's story."*

E. Frustration

This experience is directly connected to the pragmatic qualities of user engagement. It is worth discussing as interesting statements were collected regarding frustration. It appears that the non-linear nature of the hypertext narrative is one of the main sources of frustration, especially when feeling uncertain about the plot position and the expectations on functional factors as well as the plot itself. Seemingly, the frustrations in hypertext narratives came from a series of chained factors that unfolded into a single struggle. In the other media however, they were isolated moments.

The most prominent concern on what makes the experience of the touch-based narrative frustrating was to tell those purposeful and functional interactive elements apart from those that appear to be decorative. Compared to the other media, ironically, what was frustrating to the participants on the naturally tangible narrative were the same distinctive features that generated fun and excitement: the paper mechanisms. These frustrations were visual—overwhelming images and colors, cognitive—text that was hard to engage with or understand because of the mechanisms, and dynamic—urge to play with the mechanisms overcoming the need to read.

F. Child's (and adult's) Play

One interesting observation, although not directly related to the experiences discussed, was a general consensus on the generational view of the story; namely, a certain sense of bending the generational appropriateness of the story was continually mentioned across the all media. For example, one participant mentioned that compared to a regular book, the movable one was too delicate for children, although for her being an adult felt it was ok to manipulate. Other participant stated that the story was told mostly to children, but that the medium made it more relatable to adults. One final participant argued that as an adult she does not get to engage with this type of narratives regularly and that although it was for children, its child-like aspects made her feel good.

IV. Conclussion and Future Work

This work-in-progress paper presented the initial findings from an exploratory study that identified five hedonic and pragmatic facets of user engagement in the context of playable stories. The preliminary findings provided a comparative account of how people engage with different but related narrative media and how this engagement relays their emotions into their own subjective experiences.

The initial findings also provided a promising structure to associate the affordances and their supporting medium-specific attributes to varied facets of audience engagement. Such affordances as

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ludic play, immersion, imagination, or manipulation lead to free play and pleasure as experienced in the unfolding of the narrative and in some cases, physically unleashing the storytelling spectacles. These findings, after validation, will help researchers and designers better harness the power of different interactive media to craft playable stories with more intended hedonic experiential effects.

As mentioned earlier, the scale of the current study-in-progress is not large enough to provide clear quantitative tendencies or a fully reliable interpretation during the exploratory data analysis. The next round of the audience study will increase the sample size and refine the procedure in order to reach more reliable findings. For example, considering the generational bias towards *Alice in Wonderland* as shown among our participants, we may, if possible, employ a second story example that is more adult-oriented to complement findings through *Alice*. Collecting data from more media can also help reveal new affordances or attributes. With more valid quantitative results complemented with interview results, we will potentially be able to interpret better the patterns emerged from them, as well as provide insights into the subtle differences between the engagement of users of a system, game, or software and audiences of a playable story, as well as the cause behind these differences. This presents an interesting opportunity to contribute further to the limited amount of theory available on playable stories.

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