Can Web Entertainment Be Passive?

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Abstract: This paper investigates the use of streaming multimedia narratives in web entertainment. Based on the experience gained during the user centered design process of a website for art and culture, we provide evidence that users want and like *"less clicking, more watching"* web experiences where the point of view of experts, artists, or celebrities is presented in a narrative form. Our results were obtained in a study where users evaluated two prototypes of cultural *tours* which stream continuously for several minutes unless the user chooses to exercise control over the flow or to explore hot links that lead to extra information. Those tours were positively evaluated as both entertaining and engaging. By measuring mouse activity, we determined that users who interacted more tended to report less entertainment and engagement. We also found that such "watchable" experiences are not necessarily a solitary experience and can be enjoyed by groups of people. Further studies also suggested that there are limits on the maximum duration of "watchable" experiences.

Keywords: web entertainment; user interface; navigation methods; web design; experimental studies; applications; cultural websites; hypermedia; user centered design.

Word Count: 6,282 words.

1 Introduction

Although people use the web to procure information about entertainment, travel, and hobbies, and have fun by web-surfing and chatting [5] there is hardly any web experience similar to the most common entertainment activity which is watching TV (see [21]). In this paper, we present our experience in developing an entertainment website for arts and culture where the user centered design (UCD) process led us to the design of TV-like, streaming, web-delivered multimedia experiences quite similar to TV documentaries enriched by "hot links" to extra content.

This approach of *"less clicking, more watching"*, suggested by an initial user testing, was further confirmed by laboratory experiments involving two prototypes of these "watchable" web experiences. Based on these results, we question the common belief that entertainment on the web must be highly interactive and participatory, following the model of video games and chat rooms. Contrarily, we have identified a strong desire for storytelling experiences, similar to the type that are the core of today's TV broadcasting.

Although almost half (47.5%) of Internet users spend some time with other members of their household every week [5], currently there are few entertainment opportunities appropriate for such group experiences. We also explored this possibility by testing our design with pairs of users. Our results indicate that such "watchable" web experiences can, in fact, be enjoyed simultaneously by a group of people.

This paper starts by discussing the concept of entertainment and its embodiment on the web. We follow by describing the context of our research, the e-culture project for a website on arts and culture. The UCD process of the website development is then examined, including the design concept that emerged from the initial discovery process. We follow by describing the evaluation process of the prototypes and the lessons and conclusions that can be drawn from this research, including possible limitations on the duration of "watchable" experiences on the web.

2 That's Entertainment!

Defining *entertainment* is by no means an easy task. Although the term is often used in everyday language, it is actually difficult to define it (see [7] for a discussion about the issue). For example, Langer describes entertainment as being *"any activity without direct physical aim, anything people attend to simply because it interests*

them," ([13], pg. 404). Similarly, Whitehead defines entertainment as *"what people do with their freedom"* ([13] pg. 404). For the purposes of this paper, we can say that people are entertained when they are voluntarily undergoing an experience that interests them and gives them some amount of pleasure or release.

Therefore, entertainment encompasses activities such as talking and gossiping; reading newspapers and books; listening to music and radio; watching movies and television; practicing sports; attending live performances of sports and arts; playing games; gambling; shopping (for fun); cooking, gardening, fishing, and other hobbies; eating, drinking, flirting, and smoking; tourist traveling, visiting museums, and going to amusement parks. However, when used in the context of the entertainment industry, we tend to narrow down this definition to activities where audiences are entertained by the knowledge, thoughts, images, and sound created by professional entertainers that are beyond their circle of family and friends.

In particular, we focus this paper on the most common of such entertainment activities, the one that takes 30 hours/week of the average American, or 46% of his/her total leisure time: watching television at home (according to [21], data of 1995).

3 Entertainment on the Web

Many of the entertainment activities listed above have their counterparts on the web. Talking and gossiping have a forum in electronic chat rooms; reading news on the web is becoming increasingly popular; the previously solitary video-game experience has found new meaning in the networked game era; shopping has gigantic proportions on the web, newly augmented by the thrills of on-line auction; and the growth of the gambling and the porno industries on the web seem to be stoppable only by legislation.

As said before, our research examines the possible web counterparts for the TV experience, i.e., web-based "watchable" entertainment experiences provided on the screen of a desktop computer. Currently, few websites have experienced success in this arena, and those that have are of limited scope [2]. The best examples are sites featuring animated cartoons, often based on parody, such as Joe Cartoon (www.joecartoon.com); sites that show short films, previews, and commercials such as Atom Films (www.atomfilms.com); and the "webcam" phenomenon.

The three most common explanations for this shortage of options are the lack of bandwidth for video; the inadequacy of the desktop sitting position; and the need of

interactivity in web entertainment (a typical case is [2]). However, networked video games have shown that the first two problems are not enough to deter entertainment: pre-downloading and local computer graphics rendering can deal with bandwidth problems, and people seem to sit forever in front of video-games.

So, if interactivity is the defining component of web experiences, then the concept of a "watchable", TV-like web experience is a contradiction in terms. In fact, throughout the development of the project described in this paper, web designers repeatedly told us that people are entertained by computers only when actively interacting with the content (see also [2, 16]).

This belief is strengthened by the repetitive failures of the traditional entertainment industry to create web entertainment. The first cycle, fueled by the success of the *"The Spot"* (www.spot.com) and by the MIT Media Lab preaching for interactive TV, failed spectacularly in 1997 both for Microsoft and AOL (see [10]). The dot.com phenomenon of 1999/2000 spurred a new wave of projects that also ended mostly in failure, particularly in the case of Steven Spielberg's www.pop.com, the Digital Entertainment Network and Pseudo (www.pseudo.com) [1, 2]. The opposite model, making the TV into a web device, has also mostly failed, notably in the case of WebTV [2].

Does that mean *"…the Internet will not be the main vehicle for electronic entertainment…"* ([2], pg. 32)? Although we do not have a definitive answer to this question, our work in the e-culture project, described in the remainder of this paper, suggests not only that people want and like to watch TV-like web experiences, but also that those experiences may be significantly different from both traditional TV viewing and web-surfing.

4 The E-culture Project

The research described in this paper originated from studies related to the creation of a website for art and culture. The goal of this website was to bring entertaining cultural content to users around the world. The website's goal was not to be a database of cultural artifacts or knowledge, but instead to attract users by enabling entertaining experiences similar to those provided by a visit to a museum, the attendance of a performance, or the watching of a cultural TV program. Success of the website was to be measured by its popularity and, specifically, by the proportion of repeated visits by users.

4.1 Discovery Phase

What kind of entertainment do people want from a website on art and culture? To answer this question, we conducted a variety of UCD activities including interviews with curators and cultural programmers, focus groups sessions in different cities in the United States, data collection from visitors to two different museums in New York City, data collection from web surveys on three museum websites, and usability walkthroughs of existing websites and a series of our own prototypes. The detailed description of these UCD activities and results is beyond the scope of this paper. We briefly mention here only some of the results that informed our design process.

Our usability walkthroughs were run with a total of 70 participants ranging from 9 to 72 years in age who were screened to insure cultural interest and experience with the web. Subjects were first shown excerpts of existing websites related to culture, and then they were presented mock-ups of new design ideas. The mock-ups of design ideas shown in the second part of the usability walkthroughs encompassed five different design approaches for exploring cultural content:

1. A filtering system based on direct manipulation of large databases with visual feedback (such as in [3]);
2. A set of lenses (tools) to manipulate the way content could be viewed (such as in [19]);
3. A chat system where people could talk about a particular artwork, based on [20];
4. A notebook system where the user collects and comments on artistic content, and later publishes the notebook for public/private viewing;
5. A streaming multimedia system where the user watches guided tours enriched by hyperlinks to extra content.

A major result of the usability walkthroughs was that most of the participants did not express interest in websites that involved active interaction with the content or other people, such as when using a filtering system, creating a notebook, or chatting. To our surprise, the guided tour format (design option 5) was clearly the best received among the design ideas. Also, among the existing websites, there was a preference for sites where the user was guided through an experience or discovery process and, even in these cases, participants strongly suggested the replacement of text by audio.

4.2 Less Clicking, More Watching

We summarized these findings by hypothesizing that in this domain of entertaining web experiences, users wanted **less clicking, more watching**. Users seem to be very comfortable with the idea of a streaming web experience that leads them through artistic and cultural artifacts where, unlike television, the stream can be paused, replayed, or interrupted for further exploration. Also, we found a strong desire for availability of related information through hypermedia links and in-depth analysis of the works of art.

Interestingly, some of the participants viewed the other more interactive design concepts and the existing websites presented in the usability walkthroughs as work-like experiences, not as entertainment. This may reflect an association between interactive tools that were presented in these designs and typical work-related applications from their real world experiences and, of course, with TV.

The usability walkthroughs also pointed out that users wanted a **human voice** behind the multimedia experience, that is, a personal viewpoint in the exposition of the content. They were also concerned about the "credentials" of the person behind the voice, and leaned towards experiences led by experts, artists, or celebrities. In particular, the users expressed their concerned about chat room-like scenarios where there would be no way to access the knowledge or experience of other participants. In many ways, they seemed to lean towards defining an entertaining web experience as something closer to traditional TV, but enriched by the opportunity to control its flow and to explore and find related information.

5 A "Watchable" Web Experience

Based on the results of the discovery phase, we developed a design concept for the cultural website based on the idea of providing users with multimedia tours guided by experts, artists, or celebrities. In our design, a tour presents information to the user continuously, from beginning to end, unless the user chooses to explore related material or to exercise control (that is, pausing, rewinding or fast forwarding to the next scene). While the tour is being watched, opportunities to obtain related information are presented as hot spots on the screen. All the related information is also available for exploration at the end of the tour, in a web page called the *Explore Page*. Of particular interest to us was whether users would choose to explore related information within the tour or after it (i.e., once they reached the Explore Page). We believed that there would

Fig. 1. Typical scene of a tour with its navigation map, including links to a side tour and two branches.

be users who would watch and then explore, and those who would explore while watching, so we provided both opportunities.

However, our web surveys also indicated that to access the majority of our targeted audience today, such web experiences must be available to users who have modems of 56Kbps in their computers. To cope with this requirement, we decided to explore multimedia experiences primarily based on still pictures and sound with minimal use of video. At 56Kbps, a continuous video stream is of insufficient quality, but at that speed it is still possible to download combined audio and images that have reasonable quality.

5.1 The Design Concept

In our design, the main multimedia experience, or main *tour*, is composed of multiple scenes connected linearly that play continuously to tell a story from the tour guide's perspective. The tours resemble a short documentary and play within a web browser window. The main tour is enriched by the addition of user controls such as pause/resume, a navigation map to enable scene changes, and by the inclusion of hot spots for two kinds of related content: side tours and branches. A *side tour* is a self-contained multimedia segment focusing in depth on some aspect of the tour. A *branch* is a static web page with text, pictures, and links to related information on a specific subject. Since side tours are more costly to produce than branches, we produced side tours only for highly desirable extra information.

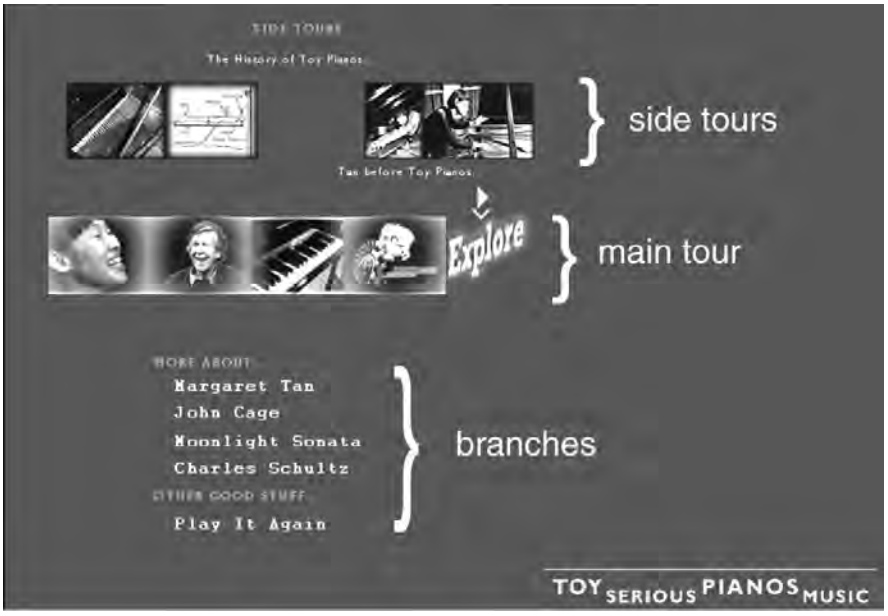

Figure. 2. Example of an Explore Page which allows access to the main tour and all side tours and branches.

Figure 1 shows a snapshot of a tour. The majority of the screen area is filled with tour content (pictures, text, occasionally very short segments of video). On the bottom left-hand side, a pictorial navigation map gives the user an idea of their position in the tour, the duration of different scenes in the tour, and the proportion of the tour remaining. Rolling the mouse over the map presents textual information about each scene, while clicking on the picture of a scene interrupts the current scene and immediately starts the scene corresponding to the clicked image.

As the tour progresses, hot spots indicating the availability of side tours and branches appear on the screen. These hot spots remain for a minimum duration of 10 seconds and then fade away. When a side tour is selected, the main tour is interrupted and the side tour is played. When a side tour finishes, the main tour resumes from the point where it was left. A click on a branch pauses the tour and opens a new window on the browser, displaying the web page associated with the branch. To resume the main tour, the user must click on the pause/resume icon above the map.

All the tour content including the main tour, side tours, and branches is available from the *Explore Page* at the end of the tour. Figure 2 depicts the Explore Page for the tour shown in fig. 1. Clicking on the tour map restarts the tour from the beginning of the scene that is clicked. Similarly, clicking on side tours and branches immediately starts

them. The user can access the Explore Page at any time during a tour by clicking on the corresponding hot spot on the right of the map (as show in fig. 1).

5.2 The Prototype Tours

The design concepts described above informed the design and development of two pilot tours that are the basis of the testing described in the rest of this paper. The first tour features the work of a toy pianist, Margaret Leng Tan. In the tour, the pianist talks about her involvement with toy pianos, how music is arranged for a toy piano, and her connections to Schröeder, the famous cartoon character created by Charles Schulz. Two side tours describe the history and mechanics of toy pianos and the work of Margaret Leng Tan before becoming a toy pianist. The main tour lasts 4:15 minutes and the side tours take 1:18 minutes and 0:50 minutes, respectively. The tour also includes five branches.

The second tour focused on Ludwig van Beethoven and his Ninth Symphony. Three side tours are provided; one about Beethoven's deafness, and two side tours enable the user to explore Beethoven's scores and his Heiligenstadt Testament. Beethoven's main tour lasts 10:10 minutes and the first side tour is 2:00 minutes in length. The other side tours, since they incorporate interactive elements, have no fixed duration, although their exploration typically takes about 1:00 minute each. There are also five branches available for user exploration in this tour.

6 Evaluating the Tours

After the discovery phase and the design and implementation of the prototypes, we evaluated the two tours with target users to better understand what works in these "watchable" experiences. Basically, we were interested in finding answers to the following questions:

1. Is a web tour based on the *less clicking, more watching* concept an entertaining experience?
2. Is watching a web tour more entertaining than interacting with it?
3. Does the personal interests of the users affect how much interaction they want from the tours?

4. Can watchable tours be a social experience, i.e., an activity enjoyed simultaneously by more than one person?
5. For how long will people watch a web tour?

6.1 Evaluating Entertainment

Traditional usability testing is based on the concept of identifying tasks to be performed by the user and on evaluating the success of a system or interface in helping the user to accomplish it. However, when we faced the issue of evaluating our design concept and prototypes, we realized that in entertainment there is no clear concept of task and therefore that most of the traditional methodologies are not appropriate.

More interestingly, in spite of the size of the entertainment industry (around 150 billion dollars in the United States alone [21]), there is hardly any published work trying to deepen the understanding of how to measure the subjective experience of entertainment, either in the behavioral sciences, social science, or human-computer interface literature. In fact, most of the research deals not with entertainment itself but with related concepts such as *engagement* [11, 23], *play* [8, 15], *flow* [6], and *pleasure* [4, 9, 22].

Moreover, the methodologies proposed in those different research fields seem to fall short of actually measuring entertainment, in particular in situations like watching TV. For instance, engagement currently appears to be measured by attention focus, curiosity, and intrinsic interest [23]. It is, however, a different question to ask whether people are entertained when they are engaged by something. For instance, driving in a storm is an engaging activity that can hardly be characterized as entertaining.

A concept similar to entertainment is the idea of *play*. Several definitions of play exist such as *"behavior motivated by the need to avoid boredom and maintain arousal"* ([8], pg. 17). Various theories of play exist, such as play as arousal-seeking behavior, caused by the need to generate interactions with the environment or self that elevate arousal towards an optimum for the individual [8, 15]. However, most of these works are really concerned with the learning that occurs during play action instead with the pleasing elements of the activity, and are methodologically based on measuring learning and retention.

Csikszentmihalyi's *flow theory* has direct relation to the areas of engagement and playfulness [6]. He describes flow as the *"holistic sensation that people feel when they*

act with total involvement. This is experienced when the center of attention is on a limited stimulus" ([6], pg. 36). Interestingly, watching TV is not very conducive to this idea of flow. In many ways, this theory presupposes that people experience flow in an entertaining experience mainly when actively participating in it, and therefore, flow theory can not provide a methodology for our study.

Instruments used in the psychiatric community to measure *pleasure* exist such as the observer-rated *Anhedonia scale* [22], the *Pleasurable Activity Scale* (self-rating) [4], and the self-reported *Pleasure Scale* [9]. However, since these measures are mostly designed to detect pathological mental states, we do not consider them an appropriate tool for evaluating our prototypes.

6.2 Method

Considering the fact that there is no established method to evaluate entertainment, as discussed above, we designed an evaluation experiment primarily based on directly asking the subjects whether they had an entertaining experience or not. The experiment is described in great detail in [12]; here we just provide an overview.

There were two groups of subjects who took part in the experiment. In the first group the subjects experienced the websites alone (Singles) while in the second group there were pairs of subjects viewing the websites (Pairs). Subjects in our study completed three web experiences, based on our two pilot tours. For each of the two tour topics, we had constructed a low- and a high-interactivity version of the tour. *Low-interactivity* tours had limited play control (pause and resume) and no side tours or branches; *high-interactivity* tours included all the elements described in the design section. Subjects first experienced both the low- and high-interactivity versions of one tour (in different orders) and then experienced the high-interactivity version of the other tour.

The subjects were recruited from the population of regular employees and student interns at the IBM TJ Watson Research Center in Hawthorne, NY. Eight subjects were randomly assigned to the Singles condition, and eight groups of two subjects each were randomly assigned to the Pairs condition. Subjects in the Pairs condition all knew each other before the experiment.

On arrival at the usability laboratory, subjects filled out a pre-session questionnaire (PreSQ) that collected demographic information. After that, the experimenter set the browser to the first site, briefly introduced it, and then left the room. After each tour,

subjects filled out a post-session questionnaire (PosSQ) describing their experience. On finishing this questionnaire, the experimenter returned to the room to set the browser to the next tour and then left before the user began the tour. Subjects were instructed to spend as much time on each tour as desired and to tell the experimenter when they were done. After all three tours were completed, the experimenter interviewed the subjects using the debrief questionnaire (DQ).

The main part of the post session questionnaire PosSQ was a set of four questions asking the users to rate the level of engagement, entertainment, satisfaction with the level of interactivity and subject matter appeal of each of the tours they experienced, using a seven point Lickert scale (1 = not al all, 7 = very much). We did not provide definitions of the terms. The actual questions were:

1. How engaging was the multimedia experience for you?
2. How entertaining was the multimedia experience for you?
3. How satisfied were you with the level of interactivity in the multimedia experience?
4. How appealing was the subject matter of the multimedia experience to you?

For each tour experience, we analyzed the videotapes and logged the user's mouse activity as follows. We counted the number of times the subjects moved the mouse pointer so that it was located on an object that could be selected (rollovers), and the number of times an object was actually selected and activated. The objects could have been branches, side tours, or navigation map scenes including the Explore Page. We obtained counts for each of these types of selections. Also, we broke the interactions into two groups - those that occurred during the main tour presentation, and those that occurred after the subject had reached the Explore Page, i.e., the end of the tour.

6.3 Results

The results in this section are gathered from the PostSQ, the DQ, and the analysis of user mouse activity. They reflect the data from the third, high-interactivity tour presented to each subject or pair of subjects. For this third tour the users were provided a fully interactive tour and were free to interact with it however they desired. The first two tours were used as learning trials to give users experience with low- and high- interactivity tours before their final tour experience.

	Singles	Pairs	Total
Engagement	5.56	5.50	5.52
Entertainment	5.00	5.38	5.25
Satisfaction with interactivity	5.37	4.63	4.87
Subject matter appeal	5.12	5.19	5.17

Table 1. Means for singles, pairs and all users on engagement, entertainment, satisfaction with interactivity, and subject matter appeal (1.0=not at all, 4.0=neutral, 7.0= very much).

Entertainment Value

The means for user ratings of the four aspects of the tours (how engaging, entertaining, satisfied with the level of interactivity, and appealing the subject matter was) were all above neutral (4.0), ranging from 4.63 to 5.56 (see table 1). Although the means of the reported values are not significantly different from the neutral point, we believe that this is mainly an effect of the small number of subjects. This belief is partially supported by the DQ, results showing that 18 out of 24 (75%) subjects said they would like to have the multimedia experiences similar to this again.

There were no significant differences between the means for singles and pairs on any of the four subjective measures.

Watching vs. Interacting

We analyzed the videotapes of user mouse activity, as described above. The results show that users interacted an average of 16 times during each of the tours, and that there is no statistically significant difference among the different kinds of user interactivity

We next analyzed the relationship between user mouse activity and the user's four subjective ratings of the tours. Results show that user mouse activity was negatively correlated with engagement and entertainment both before and after the Explore Page (see table 2). This means that users who watched the tours more, and interacted less, were more engaged and entertained.

	Engagement	Entertainment	Interactivity satisfaction	Subject appeal
Total mouse activity	**-0.44**	**-0.48**	**-0.44**	**-0.45**
before Explore Page	**-0.41**	-0.35	-0.29	-0.01
after Explore Page	**-0.46**	**-0.44**	-0.19	**-0.43**

Table 2. Correlations of user mouse activity with engagement, entertainment, satisfaction with interactivity, and subject matter appeal. (bold = correlations significant at the $p < 0.05$ level).

Subject Matter vs. Interaction

As shown in table 2, subject matter appeal was negatively correlated with mouse activity both considering the total mouse activity and the activity after the Explore page. In other words, subjects that liked the subject matter of the tours tended to watch more, while subjects with less interest in the subject interact more, perhaps looking for more appealing content. In fact, one of the subjects, during the DQ phase, reported that although she did not think that the sound of toy pianos was particularly interesting, she was pleased with the system because she was to be able to learn more about John Cage by following links provided by side-tours and branches.

Singles vs. Pairs

We analyzed the data for differences between single participants and pairs of participants. We found no differences between singles and pairs on the four subjective user ratings or on mouse activity of any type.

However, in the debrief questionnaire (DQ), 10 out of 16 pair subjects (62.5%) reported that they thought the experience was more fun as a pair than it would have been had they experienced it alone. Of the 18 out of 24 subjects who said they would return to the site, 12 (66.6%) said they would want to do the experience with family and friends rather than alone.

6.4 Duration of the Experience

During the experiment described above, we measured the time spent on each of the tour. Surprisingly, the duration of the experience did not correlate with any of the subjective user ratings nor to the mouse activity (see [12]). At the same time, we observed that, when subjects were constrained to simply watch the low-interactive tours of the first part of our experiment, they seem to prefer the 4-minute Toy Pianos tour better than the 10-

	Toy Pianos (low interactivity)		Beethoven (low interactivity)	
	4-minute	7-minute	5-minute	10-minute
Engagement	5.50	5.00	5.33	3.83
Entertainment	5.33	4.33	5.08	3.5
Subject matter appeal	4.33	3.50	5.17	4.08

Table 3. Means for the low-interactivity short and long versions of the two prototype tours in engagement, entertainment, and subject matter appeal (1.0=not at all, 4.0=neutral, 7.0= very much).

minute Beethoven tour. However, when exposed first to the high-interactivity versions of the tours, the preferences were reversed. Although these results were not statistically significant, they seemed to indicate that content was not the likely reason for the preference for the low-interactivity 4-minute tour over the longer 10-minute Beethoven tour.

This result raised the question of whether the duration of these "watchable" tours is independent of content and personal interest, being, in fact, a characteristic/convention of the medium (similarly to the well established duration of movies, sport events, and TV dramas and sitcoms).

To test this hypothesis, we produced two new versions of our prototype tours, a 7:30-minute long Toy Pianos tour, and a 5:00 minute Beethoven tour. Both tours were only produced in the low-interactivity version, and shown to subjects in a second experimental study that was a limited version of the first one. In the second study, each participant (only singles were tested) viewed and rated one of the shorter low-interactivity tours, using the same questionnaires that were used in the first study. These results were aggregated with a subset of the results of the first experiment, those cases where the low-interactive version of each tour was shown first. Table 3 contains a summary of the results collected from the user questionnaires.

By comparing the short and long versions of each tour, we can see that participants found the shorter low-interactivity version of Beethoven more engaging ($t=1.93$, $p<.08$) and more entertaining ($t=1.95$, $p<.07$) than the longer low-activity version, although these results are not statistically conclusive. Similarly, the analysis of the Toy Pianos tour data also show a non-significant trend that the shorter low-interactivity version was

more entertaining for users than the longer low-interactivity version ($t=1.67$, $p<.12$), and maybe more engaging ($t=0.89$, $p<.40$).

Finally, no significant statistical differences where found when comparing the 4-minute low-interactivity Beethoven tour with the 7-minute low-interactivity Toy Pianos tour. However, we can observe on table 3 that the collective findings from the second study, although not statistically significant (partially due to the small sample size), suggest that in terms of similarly passive web entertainment, the shorter the duration the better, and that an optimal length of time may be around 5 minutes.

7 Discussion

Is the web an interactive medium? Most certainly yes, but not exclusively, as this research shows that there seems to be space for watchable experiences. However, both the literature [14, 16] and our informal experience with web-designers during the project suggest a strong disbelief in TV-like experiences on the web. As an example, a researcher in the field replied to the verbal exposition of our results with the comment *"I hope you are wrong."*

A possible reason for this kind of reaction is a common misconception that equates interaction with choice among different story paths, following the hyper-fiction tradition [16], which was born at a time that user interaction was restricted to mouse clicks and processing power was at premium. Interestingly enough, choice-based hyper-narratives never took off as a popular genre, not even on the web. Moreover, it is questionable whether choice is not intrinsically at odds with the concept of drama and comedy (see [18]).

In the context of physically interactive spaces for entertainment, it has been observed that local responsiveness can be more important than narrative choice [17]. Similarly, most video-gamers, notably the popular action-based games, seem to be more anchored in high levels of local responsiveness than in real story changes (except for the choice of playing poorly and die).

This present work in many ways poses similar questions to the traditional view of the web where choice is the fundamental means of expression of the user. Although our work (and our subjects' views) is heavily influenced by the pervasiveness of TV as the primary entertaining experience for people, we should not regard our conclusions as an endorsement of TV as the ultimate entertainment experience. Instead, it possibly

indicates that a major factor in entertainment is who we are entertained by and not by the level of audience control over the entertainment experience. It is important to notice that our design was defined as much by the idea of *"human voice"* as by the *"less clicking, more watching"* paradigm.

In other words, maybe people not only have a remarkable interest in the flow and experience of listening and watching stories, but they are engaged by a storyteller as a respected person with a point of view. In this light, TV can be considered a highly developed and engineered storytelling medium, while the web is still trying to discover how to tell good stories.

8 Conclusion

In this research we designed and evaluated entertaining, narrative web experiences that gave users the freedom to interact only when they want to do so. Our results gave support to the *"less clicking, more watching"* design approach identified in the discovery phase. First, our results suggest that we achieved our goal of providing entertaining experiences. We believe that this is due to our design focus based on stories told from the perspective of a tour guide with the provision of opportunities for interaction.

Second, the negative correlation between mouse interactivity and entertainment and engagement seems to indicate that a tour is most entertaining when experienced as it was designed to be, that is, to be watched in a TV-like manner.

Third, the research showed that web tours were positively experienced both in an individual viewing setting and in a social context. In other words, watching content in a format similar to our tours can, potentially, become an experience enjoyed by a family or a group of friends. A possible explanation for this last finding is that, by replacing interaction as the basic structure of the experience, the group experience becomes feasible: the group need not constantly decide the next step to be pursued and can enjoy the social interaction and exchange of ideas enabled by the shared experience. If we consider how difficult it is for a group or family simply to decide which channels to watch on TV (the infamous fight for the TV remote control), it is easy to understand how that conflict can be amplified if they try, instead, to browse typical websites with a myriad of choices on every page.

Fourth, although our examination of the duration of the tours in this study is not statistically conclusive, the data suggest that there are limits on the duration of TV-like,

"watchable" experiences in the web, and that a maximum duration of approximately 5 minutes may be a reasonable boundary. Notwithstanding, we should not rule the possibility that longer experiences are possible once content producers better understand the "language" of the "watchable" web, as happened with cinema and TV as they matured throughout the 20th century.

To some extent, the user preference for TV-like experiences detected in the discovery phase of the e-culture project came as a surprise for us. Our subsequent experiments seem to support that web entertainment can be passive, and that *"less clicking, more watching"* is a useful design guideline for at least one domain. However, in order to better understand the possibilities of "watchable" experiences in the web, future research should expand the range and kind of streaming multimedia presentations and explore other topics, social contexts, and user demographics.

As the entertainment industry well knows, testing with focus groups in entertainment many times fails due to the inability of considering mass-level phenomena such as word-of-mouth and hype. This study was limited to laboratory conditions. So far, we have not been able to test our ideas in a public, high traffic entertainment website. This is, in fact, a critical next step for further understanding of the role of watching as a foundation of entertaining experiences on the web. Although we are planning to pursue this direction in the future, we also hope that the results reported in this paper stimulate other content developers to try experimenting with less interactive, more "watchable" websites in their quest for alternatives to the pale state of web entertainment.

References

[1] "The Sorry State of Digital Hollywood," in *Red Herring* (85). November 13. 2000.

[2] "A Survey of E-entertainment," in *The Economist*. October 7. 2000.

[3] C. Alberg and B. Shneiderman. "Visual Information Seeking: Tight Coupling of Dynamic Query Filters with Starfield Displays", *Proc. of CHI'94*, Boston, Massachusetts, pp. 313-317. April, 1994. 1994.

[4] S. L. Brown, D. R. Sweeney, and G. E. Schwartz. "Differences between Self-Reported and Observed Pleasure in Depression and Schizophrenia", *Journal of Nervous Mental Diseases*, vol. 167, pp. 410-414. 1979.

[5] J. I. Cole. “Surveying the Digital Future,” UCLA Center for Communication Policy, Los Angeles, California. October. 2000.

[6] M. Csikszentmihalyi. *Beyond Boredom and Anxiety*. Jossey-Bass Publishers, San Francisco, California. 1975.

[7] R. Dyer. *Only Entertainment*. Routledge, London, England. 1992.

[8] M. J. Ellis. *Why People Play*. Prentice-Hall, Englewood Cliffs, New Jersey. 1973.

[9] J. Fawcett, D. C. Clark, W. A. Scheftener, and R. D. Gibbons. “Assessing Anhedonia in Psychiatric Patient: the Pleasure Scale”, *Arch Gen Psychiatry*, vol. 40, pp. 79-84. 1983.

[10] J. Geirland and E. Sonesh-Kedar. *Digital Babylon: How the Geeks, the Suits, and the Ponytails Tried to Bring Hollywood to the Internet*. Arcade Publishing, New York, New York. 1999.

[11] R. Jacques, J. Preece, and T. Carey. “Engagement as a Design Concept for Multimedia”, *Canadian Journal of Educational Communication*, vol. 24 (1), pp. 49-59. 1995.

[12] C.-M. Karat, C. Pinhanez, J. Karat, R. Arora, and J. Vergo. “Less Clicking, More Watching: Results of the Iterative Design and Evaluation of Entertaining Web Experiences”, *Submitted to Interact'01*. 2001.

[13] S. K. Langer. *Feeling and Form*. Charles Scribner' sSons, New York, New York. 1953.

[14] B. Laurel. *Computers as Theatre*. Addison-Wesley, Reading, Massachusetts. 1991.

[15] J. N. Lieberman. *Playfulness: Its Relationship to Imagination and Creativity*. Academic Press, New York, NY. 1977.

[16] J. Murray. *Hamlet on the Holodeck: the Future of Narrative in Cyberspace*. The Free Press, Simon & Schuster, New York, New York. 1997.

[17] C. Pinhanez, J. Davis, S. Intille, Michael Johnson, A. Wilson, A. Bobick, and B. Blumberg. “Physically Interactive Story Environments”, *IBM Systems Journal*, vol. 39 (3&4), pp. 438-455. 2000.

[18] C. S. Pinhanez. *Representation and Recognition of Action in Interactive Spaces*. Ph.D. Thesis. Media Arts and Sciences Program: Massachusetts Institute of Technology. 1999.

[19] M. Stone, K. Fishkin, and E. Bier. “The Movable Filter as a User Interface Tool”, *Proc. of CHI'94*, Boston, Massachusetts, pp. 306-312. April, 1994. 1994.

[20] F. B. Viegas and J. S. Donath. “Chat Circles”, *Proc. of CHI'99*. 1999.

[21] H. L. Vogel. *Entertainment Industry Economics*, 4th edition ed. Cambridge University Press, Cambridge, United Kingdom. 1998.

[22] C. G. Watson. “Relationships of Anhedonia to Learning Under Various Contingencies”, *Journal of Abnormal Psychology*, vol. 80, pp. 434-48. 1972.

[23] J. Webster and H. Ho. “Audience Engagement in Multimedia Presentations”, *The DATA BASE for Advances in Information Systems*, vol. 28 (2), pp. 63-77. 1997.

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