

VIEWER RESPONSES TO INTERACTIVE NARRATIVE: A COMPARISON OF
INTERACTIVE VERSUS LINEAR VIEWERSHIP IN ALONE AND GROUP SETTINGS

Sangyeob (Michael) Lee
Ph.D. Student
Department of Telecommunication, Information Studies, and Media
Michigan State University
400 Communication Arts and Sciences
East Lansing, MI 48824
517-432-5915

Carrie Heeter
Professor
Department of Telecommunication, Information Studies, and Media
Michigan State University in San Francisco
2467 Funston Avenue
San Francisco, CA 94116
415-681-6473
<http://commtechlab.msu.edu/carrie/>

Robert LaRose
Professor
Department of Telecommunication, Information Studies, and Media
Michigan State University
413 Communication Arts and Sciences
East Lansing, MI 48824
517-353-6336

Research assistants Gregory Mercer, SungWook Ji, and Andrew Joseph Bare participated in study design and data collection.

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ABSTRACT

Interactive narratives are increasingly technologically possible and are expected to become an everyday form of entertainment, but for now actual implementations are rare. This 2x2 experiment compares group (2 person) versus alone viewer emotional reactions watching either a linear or an interactive version of a 7 minute digital video narrative, Modern Cinderella. Eighty subjects were randomly assigned to each of the four conditions. Enjoyment, story involvement, and arousal were not different across conditions. The interactive version sparked more viewer curiosity, more laughing out loud, and more discussion than the linear version. Those who experienced the interactive version were enthusiastic about being able to make choices. Interactive narratives appear to be fall in between high and low involvement. Group viewing of interactive narrative was different than alone viewing. Those watching with others thought less carefully about the choices and paid less attention. Alone viewers were the most curious.

INTRODUCTION

Since the 1970's, futurists, journalists, entrepreneurs, and artists have imagined possibilities for interactive television. Technological options for delivering interactive television to the living room continue to evolve, from the early QUBE experiments using two way cable, to the vastly more powerful broadband internet of today and enhanced television over HDTV of tomorrow. Services sometimes considered under the interactive television umbrella includes pay per view, video on demand, personal television (such as Replay TV and TiVO), integrated shopping and/or chat, viewer control over choice of camera angle of a particular live event, audience participation shows, polling, online learning, and interactive drama (Fuller, 1999; Rusch, 2004; Whitney, 2004; Albiniak, 2004; Reilly, 2003; Lee, 2003; Buell, 2001).

Writers, producers, game designers, and multimedia developers have been experimenting with experimental implementations of interactive narrative, based on a premise that the viewer/user interacts with, controls, selects, or otherwise influences the experience and outcomes of a story. Brenda Laurel defines interactive narrative as “a time-based representation of character and action in which a reader can affect, choose, or change the plot. The first-, second-, or third- person characters may actually be the reader. Opinion and perspective are inherent. Image is not necessary, but likely.” (Meadows, 2004, p. 62) The core attribute of interactive narrative is that the “reader/viewer/participant” makes choices which influence the plot or perspective of the story.

Laurel uses the concept of “first-personness,” to describe the experience of viewing a narrative (Laurel, 1986). By this she means that we feel for and with the characters, and include ourselves as a character (Laurel, p. 113). The representational nature of dramas allows

us to enjoy the experience with “no threat of pain or harm in the real world.” She describes a playfulness viewer/participants engage in while watching a representation, a “what if imagining” contemplating possible outcomes and resolutions which may occur in the drama. Interactive narrative may encourage even more engagement and what if imagining than a linear narrative when the viewer/participant actively makes choices to influence the story.

Janet Murray, in her seminal book *Hamlet on the Holodeck*, explained the concept of interactive narrative as “Mobile Viewer Movies”. “Viewers would watch a ‘mobile viewer’ cyberdrama with their remote control device in hand, ready to click and branch through the story as it unfolds. (Murray, 1997, p. 259). She described the cyberdrama like this: “The dramatic action would look like any ordinary television show, but whenever one character in a group of two or more exits to another room of a house or goes to another place in the fictional world, the viewer would have the option of choosing whom to follow” (Murray, p. 239).

Interactivity scholars trying to define the nature of the construct almost always include a dimension, which applies to audience-driven interactive narrative. Mark Meadows compared a structure of interactive narrative with musical notation; “An author may write the basic structure, it’s the participation and interpretation of that structure that makes it come alive” (Meadows, 2002).

The least-studied aspect of interactive narrative is home viewer responses. Presumably some day, whether through HDTV or over the internet, home entertainment consumers will have the option not just of watching movies at home but of participating by making choices while watching interactive narratives. Watching television in the home today tends to be a passive experience. Viewers (often more than one) gather in a relaxed setting such as a living room to sit back and watch a television program. Some radio and television broadcast

programs actively involve viewers through call in or online voting (e.g., American Idol), comments, or questions (e.g., Larry King, Talk Radio) but audience participation has rarely been used to interact with a fictional narrative.

Remote control channel changing devices combined with vastly increased channel alternatives already afford a rudimentary form of interactive viewing. Sampling small chunks of different programs is known as “grazing” (Eastman and Newton, 1995). Viewers can also watch more than one show at a time by switching back and forth at strategic times. Although the viewer is active in these scenario both cognitively (making choices) and physically (pressing buttons), the viewer is only interacting with a linear fictional narrative story in the most marginal way, by either watching or not watching at any given moment.

Interactive narrative viewing is imagined to be a cross between passively watching television on the couch (often with family or friends) and continuously interacting with a game alone on the computer (sometimes playing against others who are also physically alone on their computers). Since interactive narratives are not commonly available today, there are few opportunities to study viewer reactions. Key questions, often raised but not yet answered, include:

Will today’s passive TV viewers want to be more active participants, or will they prefer to just sit back and watch?

Are the same gratifications met by passive TV viewing also met by watching interactive narratives?

Will viewing interactive narratives with a group cause conflict or increase enjoyment?

An interactive narrative project, *Modern Cinderella*, provides researchers with content that can be used to compare viewer reactions to the experience of watching interactive narrative.

A linear and an interactive version of the story were produced.

INTERACTIVITY

What is interactivity? As a most basic level, Pearce asserts, “interactivity is at least as old as human communication” (Pearce, 1997). With the continuing evolution of media technologies, defining what is interactivity becomes more complicated. Even for communication scientists and interactive television professionals, it is difficult to agree upon a single clear, useful meaning of interactivity. Defining interactivity resembles “the hunt of medieval knights for the Holy Grail...” (Vos, 1999).

Kim differentiates two approaches to understanding interactivity in terms of new media technology (2002): the communication approach (Bretz, 1983; Rafaeli, 1988; Williams et al, 1988) and the media environment approach (Steur, 1995). In communication approach, the interactivity is defined as a relationship between communicators and messages being exchanged. This perspective looks more at interpersonal interactivity, including interactions between the viewer participant and a broadcast media producer, through new media. In two-way communication systems, most services that are considered interactive form will fall into basic characteristics of two-way communication. According to Kim, “interactivity is closely related to the shift of power balance in communication process as electronic media are recognized into two-way communication systems” (Kim, 2002). This means that interactive media gives viewers a power to be a speaker and producer not mere listener.

In contrast, the mediated environment approach considers interactivity as a user’s experience coming from technology. Here the focus is on the viewer/participant and not on interpersonal communication. When cable television was beginning to challenge network television’s monopoly on access to viewers, scholars focused their attention on the shift of power balance in the communication process in the environment of two-way communication. Rafaeli said, “one of the distinguishing dimensions [of interactivity] is the level of control the

consumer has over the information system” (Rafaeli, 1988). In this approach, interactive media is made up of more than one channel, the more channel options, the more interactivity...

More complex forms of interaction have been accompanied by more complex perspectives on the user/viewer experience. In today’s media environment and even more so in tomorrow’s media environment, viewer/participants control (to varying extents) their own experience not just through selective attention and perception and by direct technological interaction with the media potentially influencing the received media content and form. Heeter (2000) proposed a participant-centered definition of interactivity limiting what is considered an interaction to actions the participant can enact, which influence aspects of a designed experience the participant can perceive.

USER EXPERIENCE EXPECTATIONS

Lee’s (1995) five observations about how and why people watch television suggest that viewers will still want to watch linear narrative programming, even if they sometimes choose interactive narrative. 1) People enjoy low-involvement as well as high-involvement viewing and many have a need for low engagement use of television. 2) Routine is an important aspect of existing ways of viewing and may be an obstacle to viewers exploring new types of programs that require interactivity. 3) Relaxation and mood lift are critically important benefits that may be best delivered without demands for interaction with the set (Lee). 4) Television also is exceptionally successful as an engrossing storytelling medium. Interaction may have little to offer here, or it may turn out to be even more engrossing. 5) Finally, people enjoy talking about shared TV experiences; highly interactive individualized programming where viewer choices result in very different viewing experiences diverge from

the shared experience. Lee's ideas strongly predict the availability of interactive narratives will not mean the death of traditional television.

Whether viewing an interactive narrative is a low-involvement or high-involvement viewing experience is not yet known. Interactive narrative will require more overt viewer activity, but does this rise to the level of being high involvement? Might there be a need for an automatic selection mode when viewing interactive narratives, where the system makes choices for the viewer, or the producer offers a preset linear path through the story?

Card et al. (1983) propose a model of human cognition similar to computer processors. Cognition is seen as a series of processing stages with three different processors: perceptual, cognitive and motor processors. Applying these stages to interactive narrative, the participant perceives an interactive node, cognitively evaluates the alternatives, and physically acts to implement their choice.

Norman (1993) discusses two modes of cognition people may experience while watching television: experiential and reflective cognition. Experiential cognition focuses on the external experience. Reflective cognition compares, contrasts, evaluates and explores associated memories, thoughts, and feelings. Norman explains that both experiential and reflective cognition are essential for everyday life, but require different kinds of technological support (Norman, 1993). Interactive narrative potentially combines reflective and experiential cognition, requiring or stimulating more reflection than is occurs during traditional passive viewing.

VIEWER REACTIONS TO TRADITIONAL (LINEAR) TELEVISION

Anticipated benefits of interactive narratives include giving more control to viewers, providing multiple perspectives to viewers, and producing more personalized media

experiences. However viewers' reactions to interacting narratives (do they want to interact or not, and if so how often and in what ways?) have not yet been studied. Since interactive narratives are not yet common, a constructive starting point is research on linear media.

Zillmann and Bryant have conducted numerous studies of emotion and TV viewing, looking at program viewing. Their research shows that viewers use television to calm down, cheer up, and get ready for a trying day. Knoblock and Zillmann (2002) tested the theory of mood-management, confirming that subjects in an experimentally induced bad mood listened to highly energetic-joyful music for longer periods than did respondents in good moods. By the end of the study the moods of all three experimental groups were not appreciably different – subjects successfully selected media to balance their moods. Our emotions influence our media choices, and our media choices influence our emotions. *Interactive narratives offer more opportunities to exercise choice than linear narratives, where the primary choice is to watch or not watch. Will having to make choices interfere with or enhance use of media narratives for mood-management? A particular interactive narrative could be careful to provide only consistent choices within a particular mood range, so the viewer's primary mood-management choice is simply selecting the narrative, and not the choices made within the narrative. Conversely, a therapeutic interactive narrative could conceivably be designed to consistently offer a selection of story branching choices, which suit good, bad, and neutral moods. (This will not be tested in the present study.)*

Extensive emotional and attitude studies have been for television advertising. Emotional aspects of consumers' behavior that have been studied include not only liking and disliking, but also love, hate, fear, anger, joy, and so on (Holbrook and Hirschman 1982). Advertising research finds that positive emotion while watching a commercial creates a

positive attitude toward the ad (Ray and Batra 1983). Emotional responses of people such as pleasure and arousal influence their attitude toward the advertisement (Holbrook and Batra, 1987). The intriguing and adventurous nature of the content in interactive narrative will call forth more vivid feeling of enjoyment that will also affect on the attitude toward the interactive narrative. This change of the attitude toward the interactive narrative enhances the content of it repeatedly. Consequently people watching an interactive narrative will feel more enjoyment with more enhanced story (content) than people watching a linear version of the same story (content).

Another frequent factor studied in advertising is viewer arousal. In Zillmann and Bryant's book (1993, p.335), people use media to maintain the feeling states, change feeling states (moods) and excitatory (arousal). Other research on advertising suggested that people use television in order to increase arousal as well as decrease it (Condry, 1989). Also some studies on arousal state showed that television watching can cause a change in peoples' physical condition such as blood pressure and heart rate (Klebbber, 1985). By providing many chances of re-visiting a scene after it has been watched once, interactive narratives may afford more personal control over changes in arousal level. *Because of the requirement of interacting while watching, people watching an interactive narrative may experience more arousal than will people watching a linear version of the same story. Similarly, because interactive narrative viewers must reflect upon and actively make choices that influence the progression of the story, they may also feel more involvement*

GROUP VIEWING OF INTERACTIVE AND LINEAR NARRATIVES

Television viewing in the home often occurs in a group. Group viewing may increase enjoyment. Sandbvig, Saphir, and Chaffee (2000) define co-use and co-processing

of media. Co-use refers to watching or reading or listening to media together. Co-processing is sharing interpretations or evaluations of media content. The word co-viewing has been used to refer to parents watching television with children and offering their interpretations and evaluations of the content, to help mitigate negative effects and amplify positive effects of media content on children (Austin, Roberts, and Nass, 1990). Co-viewing was found to add to children's enjoyment of the program (Salomon, 1977). ***Although not testing in this experiment, co-viewing between parent and child of interactive narrative may be even more beneficial and enjoyable than co-viewing linear narrative because interactive narrative provides natural choice and discussion points and clear alternatives to talk about.***

Group viewing of linear television may also involve conflict over what to watch, who holds the remote control, and how often to change channels. Studies show adult females are significantly more likely to report that someone else changes channels when they wish they wouldn't than are adult males (Heeter, 1988). Females are also significantly more likely to watch an entire show from start to finish. Thus, group viewing of linear television already results in male-female conflicts over channel changing. ***Group viewing of interactive narratives requires someone to make choices at each branching node. One individual may control the remote and make the choice. The group may discuss the choice and arrive at a consensus. Group viewing of interactive narratives is probably more frustrating in terms of satisfaction with the choices made than alone viewing of interactive narratives.***

A study about connection and presence is also found a study on advertisements. Papacharissi and Rubin used "Social Presence" to assess the social presence of the Internet (Papacharissi and Rubin, 2000). Cowles and Crosby used bipolar scales such as 'impersonal – personal', 'active – inactive', and 'unsociable – sociable' for measuring "Presence" (Cowles

and Crosby, 1990). Keil and Johnson used the same presence bipolar scale with the one, which Cowles and Crosby used in their study (Keil and Johnson, 2002). Moreover, Bradner and Mark developed and used various presence measurements in their studies about social presence with video and application sharing (Bradner and Mark, 2001). *Following the results of previous studies, connection and presence may be used in a study of interactive media. People watching in the group interactive condition may feel more social presence with other people in their group than people watching in the group linear condition.*

METHODS

The interactive narrative, Cinderella 2003, was class project created in a graduate digital media design course. Viewers watch a drama on digital video. At two places in the story, action pauses and the viewer chooses what the main character's reaction should be to the current situation. The entire viewing experience (for a single path) lasts 5 to 7 minutes. The storyline features a modernized Cinderella who has a distinctly different personality depending on viewer decisions. For example, in the first selection point, when Cinderella's step-mother and her step-sisters went to a party, viewers must decide what Cinderella should do. Cinderella can go in one of three directions.(Figure 1) Two of the three directions were devised according to the possible personalities of modern Cinderella; she may be very aggressive in her jobs, or she may be very independent. The third option, crying and waiting for magic, is closer to the traditional Cinderella story. Mark Meadows (Pauses & Effects) believes real interactivity comes from characters not from structure. "A character that is present in an environment, someone who cares about something, someone who has some form of opinion, perspective, or passion, is something that gives a narrative a life." In the course of the story, viewers face situations in which they will have to make decisions based on behalf of

Cinderella. Many of the possible paths enact selected virtues from modern-day society and characters which are quite different from those of the traditional Cinderella story.



Figure 1 – The Screenshot of Selection Point in Cinderella 2003

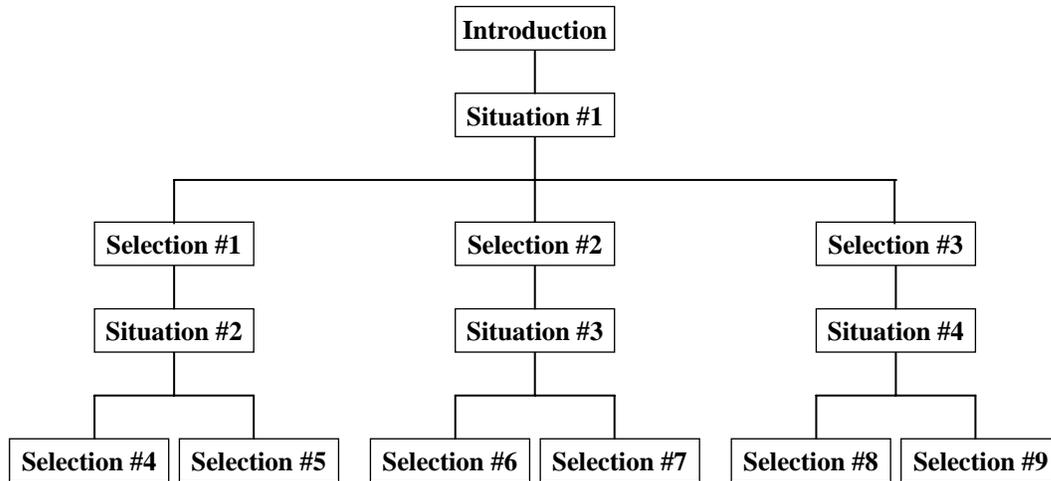


Figure 2 – The Path Diagram of Cinderella 2003

For purposes of this experiment, a linear version of Modern Cinderella was created by selecting one of the most popular choices at both branch points (Figure 2). Viewers of the linear version see an uninterrupted 7 minute story. The story is coherent and complete with no

indication of interactivity or alternative paths. A two by two experiment was conducted, comparing linear versus interactive viewing under alone viewing and group viewing conditions. For the purpose of the study a group consisted of 2 people watching together.

Each participant was randomly assigned to one of four treatment conditions: *Individual Interactive Video*, *Individual Linear Video*, *Group Interactive Video*, and *Group Linear Video*. The videos were shown to students over a three-week period in a conference room set up to simulate a comfortable home television watching experience including a couch with pillows for the subjects to sit on and a large screen upon which the video was projected. Subjects watched the video either alone or with one other subject depending on the condition they were assigned to (individual or group). When the interactive video was used, the subjects told a researcher in the back of the room their choice each time a decision was required. Immediately following their viewing experience, subjects filled out a questionnaire assessing their emotional reactions to the video.

Participants in this study were recruited from a sophomore level introductory digital media course at a large Midwestern university. A total of 80 subjects participated (20 for each of four conditions: Interactive-Group, Interactive-Alone, Linear-Group, Linear-Alone). Participants were given extra credit in exchange for their participation. Sixty-four were female, 23 were male, 2 left gender blank on the survey. Most were in their freshman, sophomore or junior year. Eighty-eight percent of the subjects grew up in the United States, and more than 90 percent have English as their first language.

The survey consisted of two parts. First a set of questions measured viewers' responses to interactive or linear video in terms of 4 emotional concepts, and all of the concepts were measured using 9 questions each. The four concepts were measured in the

questionnaire: *'Arousal and Excitement'*, *'Connection and Presence'*, *'Involvement'*, and *'Enjoyment.'* The operationalization of these concepts consisted of a combination of new measures created exclusively for this study and standard measures used in earlier studies. (cf. Thayer, 1965; Bradner and Mark; Holbrook and Batra, 1987; Keil and Johnson, 2002; de Greef & Ijsselsteijn; Ohanian). Participants were asked to rate their agreement to 36 questions with 5 representing strong agreement and 1 representing strong disagreement. All participants were asked the exact same questions, so that direct comparisons could be made

A second, exploratory component involved a series of questions in which the wording of the question was adapted to fit the viewing condition. For example, subjects in the alone viewing conditions were asked whether they were glad they watched alone, while subjects in the group viewing conditions were asked whether they wished they could have watched alone. Four different versions of the exploratory questions were developed, one for each condition. The questions were designed to be similar, addressing parallel constructs but using language that made sense for the viewing condition experienced. All exploratory questions used a 5-point Likert scale where 1 was strongly agree and 5 was strongly disagree.

EXPERIMENTAL RESULTS

Factor analysis was conducted on the 36 items initially developed to measure enjoyment, arousal, connection, and involvement. Principal components analysis with Varimax rotation was used. Five factors emerged accounting for 59% of the variance.

The scales were constructed by summing items that loaded .6 or higher on the factor. The summed scales were then divided by the number of items so that resulting means could be interpreted as roughly corresponding to the 5 point Likert scale used for the individual items.

The scales derived from factor analysis were named **Enjoyment**, **Curiosity**, **Story Involvement**, and **Attention**. Cronbach's Alpha was calculated to check the reliability of these scales. All reliabilities were above .74, with enjoyment at .90, Curiosity at .75, Story Involvement .77, and Attention .77.

Two way ANOVAs were used to compare alone versus group viewing and interactive versus linear conditions.

Enjoyment combined feeling joy, delight, energized, excited, amused, peppy, and happy. The overall F was not significant for enjoyment of Modern Cinderella ($F(3,79)=.255$, $p=.857$). Average responses were close to neutral (3) on the five-point scale of enjoyment, ranging from 2.88 to 3.0.

Curiosity combined "I felt curious", "I wondered how other people liked the ending of the show" and "I was motivated to watch the show more than once". The main effect for interactive for curiosity was significant ($F(3,79)=3.981$ $p=.012$). Those who experienced the interactive version were significantly MORE likely feel curious about other endings, wanting to watch again, and wondering how other people liked it (3.68) than were people who experienced the linear version (3.16). Interactive viewers watching alone were the most curious (an average of 3.95) while linear viewers watching in a group were the least intrigued (3.10). The main effect for group approached but did not achieve significance ($p=.085$).

Story Involvement combined "I was concerned about the result of the show.," "I thought carefully about the development of the plot.," "I was concerned about the result" and "I felt enlightened". No significant difference in Story Involvement was found for either group versus alone viewing or interactive versus linear ($F(3,79)=1.504$, $p=.22$). Linear viewers reported an in between (roughly 3.0) amount of involvement, while interactive

viewers tended to be less involved with the plot if they watched in a group (2.72) than if they watched alone (3.27). This trend does not achieve significance, but is suggestive of an impact of group viewing being associated with lower involvement.

Attention combined “I was surprised by events in the show,” “I concentrated on the TV during the show”, and “I paid a lot of attention to the show”. The overall F was significant for Attention in Modern Cinderella ($F(3,79)=3.57, p=.018$). A significant main effect was found for group viewing and Attention. Viewers watching in a group reported paying significantly less Attention to the show (3.74) than viewers watching alone (4.09). The interaction effect was also significant. Group versus alone viewing of the linear version had essentially identical Attention, while the difference of more Attention watching alone was found only among viewers of the interactive (4.22) and not the linear narrative (3.97).

Arousal failed to emerge as a factor in the factor analysis. Because literature has shown arousal to be an important aspect of viewers emotional responses to television that might be different between interactive and linear narratives, the individual item, “I felt aroused” was analyzed. Arousal did not differ by viewing condition in this study ($F(3,79)=.33, p=.804$). The mean for “I felt aroused” across the four conditions ranged from 1.95 to 2.2, on a scale where 5 = strongly agree and 1 = strongly disagree.

Another important item that did not factor was laughing out loud. Interactive viewers laughed out loud significantly more at Modern Cinderella than did linear viewers, regardless of whether they watched alone or with another person. The linear group’s mean was 2.58 compared to the interactive group mean of 3.6 ($F(3,79)=4.70, p=.005$).

EXPLORATORY RESULTS

Two research questions guided the exploratory analysis: 1.) Is watching an interactive narrative in a group better or worse than viewing it alone? and 2.) How does the experience of viewing an interactive narrative differ from the experience of viewing a similar, linear narrative?

Questions that were not applicable to a viewing condition weren't included in those groups' survey questions. For example, the question of "It didn't matter to me what choices were made" wasn't included in the surveys for people who watched linear version. The questions are listed with the text of multiple versions identified when different questions were asked of different conditions.

WATCHING WITH OTHERS VERSUS WATCHING ALONE

Six roughly parallel questions were asked of all respondents, with slightly different wording depending on whether the person watched alone or in a group. They were factor analyzed and four of the six items loaded .6 or higher onto a single factor. This factor, Discuss, combined:

- (GROUP) I talked to/(ALONE) would like to have talked to other people in the group.
- (GROUP) I was/(ALONE) would be interested in other people's responses to the video.
- (GROUP) I shared/(ALONE) would like to have been able to share my opinions and responses with others.
- (GROUP) I asked/(ALONE) would like to have asked others for their input.

Response categories were 1 = very much to 5 = not at all. Cronbach's alpha reliability of the scale was .74.

The urge to discuss Modern Cinderella had significant main effects for Group ($p=.001$) and Interactive ($p=.008$) as well as a significant interaction effect ($p=.023$). The overall $F(3,79)$ was 8.61, $p<.001$. Subjects who watched in a group were less likely to actually share ideas and talk with other people (mean=3.52) compared to how much those who watched alone wished they could have talked with others (mean=2.85). Those who watched the linear version were less likely to talk or want to talk about the program than those who watched the interactive version (3.43 versus 2.93). Those least likely to talk or to want to talk about the program were viewers in the linear group viewing condition (mean=3.99). These viewers had the opportunity to converse with their viewing partner, but did not do so and were not attracted to the idea of talking. Those who watched alone, whether watching the linear or interactive versions, were more wishful of talking with others about the show (mean =2.81 and 2.89). Those who watched the interactive version in a group enjoyed talking with others only slightly less than the alone viewers yearned to talk with others (3.05 versus 2.85).

INTERACTIVE VERSUS LINEAR EXPLORATORY COMPARISONS

Four items addressed reactions to making choices. One was asked of both linear and interactive viewers and the other three were asked only of interactive viewers. The number of items and sample size are too small for data reduction. Individual results are reported to understand more about viewers' emotional involvement in decision-making while viewing an interactive narrative.

(INTERACTIVE) I enjoyed being able to choose/(LINEAR) would like to have been able to choose.

Viewers who watched the linear version were, on average, neutral as to whether they would like to have been able to choose different endings. Viewers who experienced the interactive version were enthusiastic about having been able to choose different endings while viewers who experienced the linear drama were not particularly excited about the idea of being able to choose different endings. This difference (1.95 versus 2.88) is significant ($F(3,79)=4.38, p<.01$).

(INTERACTIVE ONLY) I thought carefully about the choices I made.

Watching alone versus watching with someone did not significantly impact how carefully viewers thought about the choices they made in the interactive narrative ($F(1,39)=1.92, p=.17$). Overall the responses were close to neutral (3) on the five-point scale of thinking carefully. If 1 represents high involvement (caring very much) and 5 represents low involvement (hardly caring at all) then making choices while watching an interactive narrative is a medium involvement choice.

(INTERACTIVE ONLY) It didn't matter to me what choices were made.

Among those who experienced the interactive narrative, a significant difference in group versus alone viewing condition was found for “It didn’t matter to me what choices were made” ($F(1,39)=3.10, p=.01$). Those who watched the interactive version alone were significantly MORE likely to care about the choices were made, while those who watched with someone else and thus had to share the decision making process felt less invested in the outcome (3.95 versus 3.10).

(INTERACTIVE ONLY) I was unhappy about the choices that were made.

One question was only applicable to group interactive viewers. We asked the extent to which they were unhappy about the choices that were made. Group interactive viewers were

not unhappy about the choices made in their two person groups. The average response was 4.3 on a scale where 5 was “not at all” unhappy.

DISCUSSION

Viewer enjoyment, story involvement, and arousal while watching Modern Cinderella were not different whether they watched the interactive version or the linear version, nor were these emotional responses different whether they watched alone or with someone else. Other aspects of the viewing experience were different, in consistent ways. The interactive narrative piqued more general viewer curiosity, such as wondering about how others liked the ending and having an interest in watching again, presumably to experience other endings. The interactive narrative resulted in more laughing out loud (whether viewers were watching alone or in a group) than did the linear version.

Group viewing seemed to have a larger impact on viewing the interactive narrative than the linear version. Attention was significantly lower in a group, particularly the group interactive condition than in the individual interactive condition. Attention did not differ between the alone and group viewing in the linear condition. Although not significant, this same general trend was observed for Story Involvement. Group viewing of the interactive version was associated with a trend toward less involvement with the content, plot, and characters than individual viewing of the interactive version. Involvement was nearly identical for group and alone linear viewing. Even the results for Curiosity show a difference not just between linear and interactive, but a significant interaction effect where group viewers of the interactive version were less curious than alone viewers. Watching an interactive narrative alone appears to heighten the experience.

The experimental medium of interactive narrative fared quite well in this experiment. In no ways was the interactive narrative found to be a more negative experience than the linear version, however in some ways the interactive narrative viewing was a more positive experience. Finding that the interactive narrative sparked curiosity and resulted in more laughter than the linear version is encouraging for the future of interactive narratives.

Viewing alone or in a group interacts in interesting ways with the experience of viewing an interactive narrative. Group viewing of the interactive version seems to dampen Attention and Story Involvement. This may be necessary to keep from being upset about not being in control. Watching the interactive narrative alone evoked more Attention and Story Involvement than viewing it in a group. Alone viewers imagined it would be nice to interact with other people, but those in the group viewing condition were less excited about talking with their viewing partner, especially when watching the linear version. Watching the interactive narrative alone gave viewers complete control over the choices and seems to have enabled them to care more about the choices. Subjects who watched in a group did not report being unhappy with the choices that were made, but they also cared less about the choices that were made. When watching with others it may have been necessary to care less about the outcome, in order to enjoy the experience. Watching an interactive narrative seems to be a moderately involving experience, more involving when watching alone than in a group.

We wondered whether watching in a group would be frustrating, since ones own preferences of what ending to choose had to be negotiated. Viewers were not upset about the outcomes, nor were they did it matter to them very much what choices were made. Having to make choices in the interactive narrative did not appear to produce conflict or dissonance, at

least based on the answers to the survey questions. We observed tendencies for viewers who watched alone to wish they had watched with others, and for those who watched with others to be happy to have done so.

This manuscript discusses general characteristics of interactive narratives and reports viewer's overall emotional responses to single experimental using a short 5 to 7 minute interactive narrative. Responses to the program were positive. Production values were quite high and the script was entertaining. However, the stimulus does not compare to broadcast television dramas or Hollywood movies. How would a higher quality, half hour, hour or movie length production impact the results?

One suggestion for future similar experiments is to use 7-point scales in the survey instead of 5-point. With 5-point scales, it is harder to detect real but subtle differences in people's responses. Also developing a new scale is important for further study of interactive television because most of emotional scales used in this study were borrowed from advertising research. Some of them worked well while some of them didn't.

One aspect this study does not address is gender differences for group viewing. In this experiment, subjects were required to make a decision of directions the story should take. Responses to this selection of male subjects and female subjects were quite different. When a group consisted of a male and a female, there seemed to be a conflict in the decision-making processes; one of them seemed unhappy about the group decisions. In the story, for example, most of male subjects wanted to leave prince in the point of selection when prince went bankrupt while most of female subjects still wanted to marry prince even though prince went bankrupt. These kinds decision-making conflicts were found mostly in the groups that consisted of mixed genders. This could be an interesting topic of future study. The conflicts

did not appear in the statistical analysis outcomes, although they were informally observed by researchers during the experiment. Our observations suggest there are underlying gender differences in the decision process which should be examined more carefully.

Another limitation of the study inherent in the experimental design is that people watching in a group were randomly assigned a co-viewer. This is very different from a home viewing environment watching with family and friends. We might assume that watching with family and friends would be even more enjoyable and less conflicted. Or, would there be more conflict? A study in more natural viewing circumstances could be interesting.

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