BEAR 71: HOW INTERACTIVITY AFFECTS USER EXPERIENCE IN INTERACTIVE DOCUMENTARIES

A THESIS
SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF ARTS
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MUNCIE, IN
JULY 2017
ABSTRACT

THESIS: Bear 71: How interactivity affects user-experience in interactive documentaries

STUDENT: Master of Arts

COLLEGE: College of Communications, Information, and Media

DATE: July 2017

PAGES: 86

This study has presented an analysis of the use of interactivity in the interactive documentary Bear 71. This study categorizes the documentary’s interactive elements into specific forms of interactivity, assesses how those forms affect the holistic user-experience, and makes recommendations for future interactive documentary iterations through a content analysis and 15-participant user-experience study. The user-experience study used data gathered from observations of user-experience sessions, semi-structured discussions, and surveys. The findings suggest that Bear 71 creates an innovative and engaging interactive digital narrative experience through the use of agency, immersion, and aesthetic. However, dissonance within the experience occurs because of several conflicting interactive elements within the documentary.
ACKNOWLEDGEMENTS

To my advisor Jennifer George-Palilonis for her strength and encouragement as an advisor, director, and mentor.

To my parents Mick and Jana for always inspiring my curiosity.

And to my partner Brice for being the best kind of inspiration: the kind you need when you want to quit.
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CHAPTER 1
INTRODUCTION

Emerging technologies have paved the way for exciting platforms for storytelling that immerse audiences in novel ways. Interactive documentaries are one type of emerging storytelling that uses new kinds of interactions on digital platforms to increase an audience’s experience of true events. But the field of digital storytelling has yet to develop a robust understanding of exactly how digital interactivity is used to create an immersive experience for users.

Interactive documentaries, also known as webdocs and i-Docs, are digital media art forms that have risen from the cross-section of documentary films and interactive digital narratives (IDNs). Documentaries focus on representations of reality and documentation of true facts (Juel, 2006), and IDNs involve forms of digital storytelling that use interactions between the computer or system and users to create a stronger connection between users and the story they are experiencing (Koenitz, Ferri, Haahr, Sezen & Sezen, 2015). Interactive documentaries can be characterized as the natural intersection of these two fields. In interactive documentaries, digital media is used to document true facts, events, and people, while allowing users to physically engage with content through various forms of interactivity (Gaudenzi, 2009).

However, interactivity is one of the most used, yet least understood terms in the digital media industry (Jenkins, 2004). Interactivity defines the state of being of a given artifact in which reciprocated actions occur between two responsive systems (Svanaes, 2000); in the case of this study, between a user and a single interactive documentary. Interactivity can occur in various forms (Zimmerman, 2004), although it is not exclusive to digital experiences. A lack of cohesive and encompassing definitions of interactivity, and perhaps a misuse of interactivity’s various
forms, has plagued the digital storytelling industry as well as other industries that involve digital interactivity (Rafaeli & Ariel, 2012).

Storytelling has always been an integral part of humanity, and technology has pushed the way humans tell stories to new heights. In his book *The Storytelling Animal* (2012), literary scholar Jonathan Gottschall writes, “Neverland [or storytelling] is our evolutionary niche, our special habitat” (p. 177). Throughout the book, Gottschall documents the progression of storytelling, beginning with oral, visual, performed, and written traditions and eventually ends with broadcasted and digitized forms. He argues that each stage of storytelling has been used as an evolutionary tool to teach the finer points of social life and survival.

It is worth noting that in an age of technology, it is easy to mistake new forms of storytelling for white noise. Content is flashier, and attention spans are shorter (Weatherhead, 2014). But Gottschall characterizes today’s wide range of digital storytelling as the precursor for storytelling’s next evolution. Gottschall writes, “More and more of us will be running around like larpers in la-la land, dreaming up characters and acting them out. But we will be doing so in cyberspace, not in the real world” (p. 190). His analysis isn’t far off from what interactive digital narrative researchers were theorizing more than 20 years ago.

Janet Murray, a seminal digital media theorist, proposed in her book *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (1997) that the potential for interactivity that digital spaces provide storytelling represents an extra dimension of user immersion that non-digital stories don’t. Murray notes that interactivity, specifically in digital environments, allows an audience varying degrees of control over the progression of events and sometimes even the outcome of a story. Both Murray and Gottschall predict that storytelling in digital spaces will eventually become so advanced that a user will create and experience a story simultaneously.
Our technology is not quite there yet, although technologies like artificial intelligence, virtual reality, and quantum computing are at the breakthrough point of creating the next evolution in digital experiences. Interactive documentaries and other IDNs provide an essential stepping-stone for understanding how interactivity creates agency and immersion in digital stories and experiences.

Although several interactive documentaries – such as 
* Bear 71* (Mendes & Allison, 2012) and 
* Fort McMoney* (Dufresne, 2013) – have been critically acclaimed in indie film festivals, a misunderstanding of interactivity has drawn some criticism to the term *interactivity* as a storytelling technique. *Interactivity* has been used as an industry buzzword to create interactive products (Joho, 2014). For example, it is common in today’s culture for television shows to feature *interactives* like quizzes on their companion apps. Although a user is interacting with the system – meaning they are creating actions and the computer is responding – that form of interactivity does little to help the user better understand or connect to the story being told.

The misuse of the term *interactivity* has created somewhat of an existential crisis in the world of IDN designers, in which some propose that interactivity and story have separate goals and purposes. One such argument states that pure forms of interactivity, like a game, evaluate the player’s performance, whereas pure forms of story, like a movie or book, require the audience to identify with a character or subject cognitively (Juul, 2001).

Not all stories require every form of interactivity, and not every game requires a story. However, when the two are used together, the interactivity should be intentional and enhance the user’s relationship to the artifact (Jenkins, 2004). In order to combat this rift, industry researchers and practitioners have proposed frameworks to define interactivity as a tool to strengthen this relationship between user and system (Jenkins, 2004; Gaudenzi, 2013; Nash,
2014). However, these frameworks only identify types of experiences. They do not assess how the specific interactive elements hinder or enhance that user’s experience with a given digital artifact.

Another issue that arises in this field of research is the challenge associated with defining a good experience and a bad experience. In the field of digital media and digital interfaces, researchers often define a “good” experience by identifying if it is usable—meaning the artifact adheres to certain design principles that make the artifact easy to navigate and its content easy to understand, known as usability (Nielsen, 2012). However, this form of evaluation does not assess a holistic user experience in terms of a reaction on an emotional and psychological level in addition to the functional and physical properties. One way to evaluate whether an experience is a good experience is to measure if the experience relates to a user’s values, emotions, sensibilities, and physical sensations. Put simply, we can determine if an experience is a good experience by measuring if it is pleasurable.

The seminal idea of holistic pleasurability (Tiger, 1992) and its four types: socio-pleasure, ideo-pleasure, phsysio-pleasure, and psycho-pleasure were used as an anthropological methodology for understanding human motivations. The framework has since been adapted to identify a user’s experience of both physical and digital spaces (Jordan, 1999). By breaking down and assessing whether a digital storytelling experience is physically, ideologically, psychologically, and sociologically pleasurable, we specify where breakdowns are occurring more accurately. Specifying these breakdowns gives insight to the reasons why a user might enjoy or dislike, agree or disagree with, or understand or misunderstand an experience.

Different forms of interactivity within an experience achieve different pleasures (see Table 3.1). Game designer Eric Zimmerman (2004) proposed that not all interactive elements are
alike. For example, when experiencing a novel, the feeling the thickness of its pages, which Zimmerman calls functional interactivity, is not the same kind of interactivity when a reader is saddened after reading the death of a main character, which he calls cognitive interactivity. The former appeals to the physical pleasure of the book, while the latter appeals to the ideological pleasure. Through the evaluation of pleasurability, this thesis aims to identify how different interactive elements enhance or hinder the user experience of an interactive documentary. Additionally, this study uses the award-winning interactive documentary Bear 71 as a foundational artifact to identify these connections and answer the following research question: How do the various modes of interactivity affect the holistic experience of an interactive documentary as it relates to social, physiological, psychological, and ideological pleasures?

Bear 71 is one of the most widely studied interactive documentaries, in part, due to the various ways the story intertwines reality and imagination. In Bear 71, users follow the tragic story of the anthropomorphized Bear 71 as she travels through Banff National Park and attempts to survive the growing threat of human encroachment. The producers of Bear 71 blended a fictional narrative with real wildlife research data, and aesthetic design with functional exploration. Several studies have used Bear 71 as a case study for the evolution of documentary techniques (Murphie, 2014), understanding digital experience design (O’Flynn, 2016), and innovative uses of wildlife data (Ray, 2014). Only one study so far attempts to pinpoint how exactly Bear 71 uses interactivity to create immersion (Nash, 2014). Kate Nash, Lecturer in Media and Communications at the University of Leeds, conducted a user experience study in which she analyzed motivations and strategies of interaction of 23 participants as they experienced Bear 71. However, much like studies of other interactive documentaries, this study analyzes just one form of interactivity: explicit. The study only identifies what methods
participants used to navigate through the documentary. In order to create a holistic understanding of the effects *Bear 71* has on participants, this study aims to drill down into specific interactive elements, categorize them into corresponding forms of interactivity, and assess whether they enhanced or hindered participants’ experience of the interactive documentary.

It is imperative to keep a human-centered approach to analyzing emerging forms of storytelling created through advancements of the digital media industry (Livingstone, 2004). By identifying how interactivity affects a user’s enjoyment and understanding of an interactive documentary, future practitioners can begin to build more meaningful and innovative experiences. As Nick Montfort (2015), associate professor of digital media at MIT, writes, “... it is the arrival at user-controlled computational narrative… that defines this field” (p. xii). Likewise, by analyzing interactivity as a tool used to assist people in understanding and enjoying the worlds in which we immerse them, future interactive documentaries and similar creations will move toward a “360-degree… cohesive, meaningful experience through distributed media” (O’Flynn, 2016, 76).

The following chapter provides a literature review that explores the history of research pertaining to the history of interactive documentaries its precursors: documentaries and interactive digital narratives, definition of forms of interactivity, identification of experience design, and the state of the industry today.
CHAPTER 2

LITERATURE REVIEW

In order to assess user experience with a digital experience like a documentary, it is important to understand the goals within which that experience was designed. Thus, this literature review covers six relevant topics: documentaries, interactive digital narratives, interactive documentaries, forms of digital engagement, interactive documentaries as pleasurable experience, and the state of the art in interactive documentaries.

2.1 Documentaries

First, a documentary can be identified by its representation of the truth. Representation of truth can be dependent on many influences, such as intentions of the filmmaker, alignment with conventionalist views, and expectations of the audience (Juel, 2006). Additionally, the perspective the artifact embodies as a narrative can affect how the truth is represented. Documentary expert Bill Nichols (2001) theorized six modes of documentary:\footnote{Bill Nichol’s (2001) six modes of documentary include expository, observational, participatory, reflexive, performative, and poetic. Each mode identifies a specific perspective created by the filmmaker by displaying the facts documented in a specific way in order to elicit a desired reaction from the audience. Expository directly addresses the audience and is most identified by talking heads giving exposition about the events or facts. Observational maintains distance between the filmmaker and the subject and has limited commentary in order to provide as unobtrusive of a representation of the subject as possible. Participatory involves formal communication and interaction between the filmmaker and the subject, which portrays the filmmaker and the crew as secondary subjects of the documentary. Reflexive. Performative requires the filmmaker to be the main subject of the documentary, in which the filmmaker and audience discover information together. And poetic is an artistic expression of real people, places, things, or concepts and are not expected to adhere to conventional documentary principles.} expository, observational, participatory, reflexive, performative, and poetic, which serve to identify potential motivations of why such a story is being told and the effects those motives have on the artifact's representation. For example, an observational documentary captures a subject as naturally as possible without exposition. The goal of this documentary mode is to explore a subject as holistically as possible without interference or influence from the filmmaker. Second, a documentary can be identified by its documentation of facts. Documentation of facts is fairly
The foundation of a documentary must always portray, in some way or other, real historical facts, events, and people (Juel, 2006).

The contemporary definition of documentaries fits the “prototypical” forms of documentaries but not “those on the periphery” (Plantinga, 2005, 115). Contention exists concerning the definition of a true documentary and the medium in which a documentary is presented. The classical view of documentaries follows an “image media” format and aspires to have the audience to both agree with the filmmaker’s proposition of “truth” and accept the film’s representation of the subject as fact (Plantinga, 2005, 114). With the development and accessibility of technology and other forms of media, documentation of the truth can exist in many forms of media and can be documented by more stakeholders than just the filmmaker. For example, the interactive documentary *Hollow* (McMillion, 2013) uses different media and user contributed data to create elements within the documentary itself.

Identifying the foundational subject matter and documentary’s evolving purposes can help researchers understand the intended roles and experiences meant for the audience or user. It is important to latch onto a stable but encompassing definition that can account for advances in media technology and expansion of audience roles.

### 2.2 Interactive Digital Narratives

Interactive digital narratives (IDNs) are stories told in a digital format that require the audience to physically interact with the story (Koenitz, Ferri, Haahr, Sezen & Sezen, 2015). IDNs encompass a wide variety of digital narrative art forms, including video games, interactive documentaries and interactive fiction. The role of the audience may be the aspect of IDNs that separates them most distinctly from other forms of art or narrative. The audience, in the digital
environment of IDNs, changes from “observers” to “participants” (Ascott, 1990). Rather than observing a narrative as it occurs, like with traditional documentaries, classical art, and novels, digital innovations invite the audience to become physically active participants in the narrative. This participation is often referred to as game mechanics. Game mechanics are motivators and affordances that prompt a user to create actions that achieve a given artifact’s purpose, goal, or challenge (Sicart, 2008).

Game mechanics are most associated with video games because a video game user passes a series of challenges to complete the game in its entirety. The term game mechanics is often interchangeable with terms like gamification and interactivity that describe user participation in various fields. Some terms are more taboo than others. For example, gamification is often considered a buzzword marketing term to those in game studies. But in the field of IDNs, the most used term is interactivity (Deterding, Dixon, Khaled & Nacke, 2011).

Tension between interactivity and narrative can occur when the audience is asked to become a participant, also known as ludonarrative dissonance (Brice, 2012). Ludonarrative dissonance is the byproduct of discordance between ludology, or interaction design, and narratology, or story design. Ludonarrative dissonance occurs when a required action on behalf of the user seems out of context or character for the narrative of that particular IDN. The user is left wondering, “Why did my character do that?” and the suspension of disbelief is thus broken. Typically, ludonarrative dissonance occurs because of bad interaction design or bad narrative design.

IDN designers typically find themselves in one of two camps: those that believe ludology and narratology are separate fields with separate goals (Juul, 1998), and those that believe ludology is a natural extension of narratology (Jenkins, 2004). Ludonarrative dissonance often
occurs when there is a lack of respect and integration of one or the other, or both. Additionally, the contention between ludologists and narratologists has begun to phase out in recent years with help from many of the seminal ludology researchers who write that the separation of ludology and narratology came from a misunderstanding of the role of interactivity (Frasca, 2003; Murray, 2013). In reality, not all digital artifacts need a story, and not all stories need digital interactivity (Jenkins, 2004). However, if the two happen to occur in a single artifact, it is paramount that the two remain cohesive, an aspect known as ludonarrative harmony (Pynenberg, 2012).

2.3 Interactive Documentaries

Interactive documentaries, also known as webdocs and i-Docs, fall between the two disciplines of documentary and interactive digital narrative by adhering to the criteria of documentary film and aligning within the parameters of IDNs. We can see areas of overlap between documentary film and IDNs in common definitions of interactive documentaries. One area of overlap includes an interactive documentary’s use of digital media (Galloway, 2007; Nash, 2012). Although the use of other forms of media may not be completely agreed upon within the traditional definition of documentaries, it is imperative in that of IDNs.

Another area of overlap between documentaries and IDNs involves narrative. Professor of Interactive Media at the University of Arts London Sandra Gaudenzi (2009) states that an interactive documentary must document the real. But unlike traditional documentaries, interactive documentaries occasionally use fictional elements to tell stories of the real. For example, *Bear 71* uses the fictional anthropomorphic narrator of a young grizzly bear with wildlife research data to tell the story of human encroachment on Banff National Forest. Not
only is *Bear 71* an interactive documentary, but it is also one of the most awarded interactive documentaries in recent years.

Interactivity is the third area of overlap. Researchers have not yet come to a consensus as to the name of this third area of overlap (Almeida & Alvelos, 2010). Some describe it vaguely as “an immersive deep dive” (O’Flynn, 2016, p. 72), while others more specifically identify that this area requires a user to “physically ‘do something’ with the artifact” (Gaudenzi, 2009, p. 31). However, it seems that the most agreed upon term for the physical and immersive quality of interactive documentaries is *interactivity* (Galloway, 2007; Nash, 2012; Aston & Gaudenzi, 2012).

These three areas of overlap between IDNs and documentaries are important to understand the desired experience for interactive documentaries. Because the field of interactive documentaries is still so new and nebulous, researchers and designers alike use the field’s two predecessors as references.

A few frameworks have been identified in an attempt to understand the unique qualities of interactive documentaries. One such framework categorizes interactive documentaries based on the kinds of system responses created to reciprocate a user’s actions (Gaudenzi, 2013). Another identifies that for IDNs in general, certain designed interactions create different types of narrative spaces that the user continuously fills with their reactions (Jenkins, 2012). Like Nichol’s framework for traditional documentaries, both of these frameworks identify the desired outcome of a specific artifact, but not exactly how the artifact achieves that outcome.

It is more accurate to view these terminologies and frameworks as general concepts, instead of definitive categorizations (Zimmerman, 2004). Mainly, it is imperative for researchers and practitioners to understand that the modes of interactivity that achieve these outcomes
“cannot work in the same way that narrative in other media functions” (Koenitz, 2015, p. 95).

This interactivity creates an inherent otherness in interactive documentaries and other IDNs that is hard to explain in concrete terms, yet is more easily identified when experienced. In order to clarify the nature of the modes of interactivity that is used by interactive documentaries, we must first identify the specific concepts of digital interactivity that allows interactive documentaries to be unique from their traditional predecessors.

2.4 Forms of Engagement: Interaction, Interactive, and Interactivity

There is a definite distinction between interaction, interactive, and interactivity, though the terms are often used interchangeably in popular culture. In order to have the quality of interactivity, there must first be a feedback system between the user and the artifact (Spierling, 2015). The issue is that many consider any interaction between a user and system to be interactivity, and that isn't correct. Some kinds of interactions are inherent with digital content, as all digital content requires some sort of apparatus, such as a mouse, keyboard or controller, and computer to be accessed. A user may simply click a button to make an action or move a story forward. Although that is an interaction, it is still passive experience. True interactivity needs to also create a sense of agency for the user (Murray, 1997) and need to be intentionally designed to “impact, involve, or enable” a human participant (Heeter, 2000, p. 11). Intentionally designed interactivity is the key to separating passive experiences from interactive experiences.

The kind of interaction that makes interactive documentaries and other IDNs an art form requires more than just a physical action to access content. In interactive documentaries, the actions of the user must somehow implicitly provide a role for the user to fill within the story being told (Gaudenzi, 2013). However, even in the most advanced artifacts, this feedback
system is still very rudimentary. The feedback system is still a mostly closed loop where the artifact's reactions to a user’s actions are predetermined (Grasbon & Braun, 2001). Though we have yet to reach the point where a user can experience a truly freeform artifact without some aspect of a predetermined outcome, interactivity is the most useful tool in allowing the user a sense that their interactions affect the outcome they will experience. To compound the problem, in digital technology, there has also been a bifurcation of the term *interactivity*. In digital experiences, interactivity can be understood as either a product or a process (Stromer-Galley, 2004). We can think of these diverging definitions as the difference between a website and a quest in a video game, respectively. The former is a product that involves hyperlinks to move a user from one page of information to another. But the latter is a process of interactions between the user and a system that fulfills some set of goals for that user by physically involving them in the achievement process.

To summarize, a better set of definitions may be:

- *Interaction* is defined as the actions and reactions between a user and a system, such as an interactive documentary.
- *Interactive* is an adjective used to describe the state of being of an artifact. If an artifact employs interactions along the spectrum of interactivity, it is interactive.
- *Interactivity* indicates a level of equal reciprocation between interactions, as well as a level of agency that allows a sense of authorship within an experience (Svanaes, 2000, p. 5).

### 2.4.1 Explicit interactivity

Although interactivity is often attributed to digital media, interactivity existed before the invention of the computer, which is important to consider because all interactivity can be used in both physical and digital experiences. In regards to digital experiences, the most important form of activity, based on game designer Eric Zimmerman’s (2004) four concepts of interactivity, is explicit interactivity.
Zimmerman’s four concepts of interactivity are cognitive interactivity, functional interactivity, explicit interactivity, and meta-interactivity, which occur within any experience, even those outside of a digital platform. Zimmerman defines *cognitive interactivity* as the immediate “psychological, emotional… reader-response.” *Functional interactivity* is defined as the sensory details a user has with a given artifact, such as the weight of the paper of a book. *Explicit interactivity* is the physical actions a user takes to participate with a given artifact. And finally, *meta-interactivity* is the interaction with a narrative outside of the experience, in which a user reconstructs the experience against their previous experiences and knowledge (2004).

Explicit interactivity has been progressed by digital technology more than any other form of interactivity. Explicit interactivity, above all other forms, allows for a user to achieve agency within an experience. Agency occurs when a user’s actions and participation has some sort of effect on the experience (Mateas & Stern, 2000). The concept of agency has shifted interactivity in digital media experiences away from “a binaristic ‘choose your own adventure’” storyline to an expansive, experiential conversation between user, artifact, and producer (O’Flynn, 2012). This advance in digital technology drove interactive documentaries from simple digital hypertext books to complicated game-like and narrative-based artifacts that involved higher levels of user participation (Koenitz, 2015).

By identifying specific user interactions with one or more of the four types of interactivity, we can begin to paint a picture of how interactions translate into methods employed by the user in order to make sense of the artifact’s content and meaning and the user’s role within that experience.

### 2.5 Interactive Documentaries as Pleasurable Experiences
2.5.1 Experience Design

Interactive documentaries are multifaceted, involving several different disciplines, with a driving force of experience design at its center (O’Flynn, 2016). A designed experience can be defined as any type of environment, digital, physical, or both, that uses the collaboration of multiple design industries and principles to achieve a specific atmosphere, goal, or outcome for their users. The term “experience” encompasses a spectrum of things: a physical product like a computer, a digital story like a videogame, and even an event like a concert. If the definition of designed experiences sounds familiar, that’s due to the fact that most designed experience use interactivity as a way to entice user participation to create a sustained relationship between the user and the environment they are experiencing (McClellan, 2000).

This outcome of each individual experience is dependent on the goals of the type of experience, such as an educational experience versus an escapist experience, though an experience can involve multiple goals. In digital media, much of the experience relies on a system’s ability to represent procedural, participatory, spatial, and encyclopedic affordances (Laurel, 1991). These affordances describe the system’s ability to execute its own defined rules, react to user input, represent space, and represent data, respectively (Koenitz, 2015). Without the accuracy of these affordances, the system devolves into traditional forms of media. For example, spatial affordances are paramount to a videogame. Without spatial affordances, the experience changes to that similar to a novel.

The type of desired experience for interactive documentaries is an overlapping one. On the surface, use of interaction design to create game-like interfaces as well as various narrative structures inherently creates escapist and entertainment experiences (O’Flynn, 2012). However, given that interactive documentary’s foundations lies in the field of documentaries, one
responsibility of an interactive documentary experience is to represent true events, people, or facts. In this definition, the primary goal of interactive documentaries is to create an educational experience.

Experience designer Nathan Shedroff (2000) proposed that individuals convert information presented by content producers into knowledge and wisdom through a process of understanding. This process of understanding occurs when a user experiences information through different forms of interactivity. Through these forms of interactivity, a user creates a new understanding of the information they are experiencing.

This theory of experience as understanding, specifically in digital media, has been developed in different frameworks over the last several decades. Digital media theorist Janet Murray (1997) proposed that a digital experience is made through immersion, agency, and transformation. Users immerse themselves in an experience, use agency to navigate through the immersion, and are transformed through new understanding. Interaction designer Hartmut Koenitz (2015) describes the experience of IDNs as system, process, and product. The system is the information given through an artifact, where the user processes the system through interactivity and creates a product of new understanding. Both of these frameworks identify understanding is truly created through interaction with information in a way that is both controlled and completely personalized by the user.

2.5.3 Meaning-making with Experiences

Meaning-making, which can also be known as sense-making, is the process in which an individual creates their understanding of reality through interactions with various stimuli (Dervin, 2000). In regard to interactive documentaries, the process of meaning-making is
important to a user’s understanding of their role within a given experience. In developing their role, a user first creates an understanding of the artifact they are encountering by gaining new knowledge from their sensory perceptions and judging that new knowledge against previously acquired experiences (Hein, 1999). This concept of meaning-making is one way that interactive documentaries can achieve both goals of presenting new information and allowing the user to construct a connection to that information through their own agency within their interactions. This personal agency in turn helps the user make sense of the information and construct symbolic messages that relate to the user’s own past experiences (Livingstone, 2004).

One issue specific to meaning-making in an interactive documentary is the expansive variability within individual perceptions (Whitehouse, 2000). That is to say that no single user will construct or perceive the same reality as another. By creating interactivity that allows a user agency when making sense of their experience, an interactive documentary maker gives up control of the artifact's ultimate meaning (Macy, Anderson & Krygier, 2010). It is this idea that user agency—facilitated through forms of interactivity—shares the control of meaning between the user and the creator that make IDNs like interactive documentaries unique experiences from other forms of digital storytelling.

2.5.2 The Four Pleasures

One way to identify the short-term effects of a designed experience is through the concept of pleasurableility. In 1992, anthropologist Lionel Tiger proposed a concept of emotional and hedonic enjoyment that he defined as the four pleasures: ideo-pleasure, socio-pleasure, psycho-pleasure, and physio-pleasure. Each of these four types of pleasure suggested that pleasure is derived not only through the physical senses, but also through cognitive concepts like values and concepts of beauty. Physio-pleasure is pleasure through the physical senses. Psycho-
pleasure refers to pleasure through the mind and emotions. Socio-pleasure is pleasure related to relationship and status. And ideo-pleasure is pleasure related to taste and values.

For digital media and digital interfaces, one way researchers have attempted to assess the pleasurability of a product is through usability testing. Usability is an attribute used to assess the quality and ease of use of an interface in digital experiences (Norman & Nielsen, 2012). However, this only assesses whether a product is physically or cognitively easy to use. This method does not address pleasurability in a holistic sense. By using Tiger’s framework of holistic, hedonic pleasure, we can more accurately identify how the experience connects to the user.

The four pleasures, from an anthropological standpoint, are a motivation methodology individuals subconsciously use to justify whether they like or dislike, agree or disagree, or accept or reject something. From an experience design perspective, the four pleasures are methods used by practitioners to create products that appeal to users on a holistic level in order to influence users to like, agree with or accept the product (Jordan, 1999).

2.6 State of the Art in Interactive Documentaries

Interactive documentaries have only recently come into the public eye. Many premiere at independent film festivals or ceremonies such as the Sundance and Tribeca film festivals as installations. A few entities, such as the National Film Board of Canada (NFB), the “European culture channel” ARTE, and the International Documentary Film Festival Amsterdam (IDFA) DocLab, produce many of the interactive documentary projects and host them on their websites because interactive documentaries are often independent or low budget projects.

*Bear 71* premiered at the Sundance Film Festival as a digital installation as well as a traditional film. The installation, film, and web versions of *Bear 71* gave audiences three
distinctive experiences depending on which version they encountered. Since its release in 2013, *Bear 71* has become one of the most heavily researched and awarded interactive documentaries (Murphie, 2014; Nash, 2014; O’Flynn, 2016; Ray, 2014). For the web version of *Bear 71*, the user takes on the role as an omnipotent tracker as they follow the life of a female grizzly bear, the narrator. Users are able to explore the vast layout of Banff National Park, known by the grizzly as “The Grid.” *Bear 71* is one of the best examples of an interactive documentary that gives the user free range to explore the story in its entirety, as much as the designers can provide. The experience of *Bear 71* is entirely dependent on the user’s whims and motivations and can thus give each user a unique understanding and experience. However, the conclusion of *Bear 71* is the same regardless of the user’s actions.

Another interactive documentary that has less freedom of exploration than *Bear 71* but a higher ability for personalization is *Do Not Track* (Gaylor, 2015). The user is taken through a series of chapters about Internet privacy and data mining. Throughout the chapters, the user is able to input personal information and choose between a series of options, which tailors the chapters to the user’s personal information. *Do Not Track* turns the user into a main character of the documentary. By using its high level of personalization, *Do Not Track* is able to access a user’s point of view to convey its message and information.

A third interactive documentary that uses a different approach to documentary storytelling is *Fort McMoney* (Dufrense, 2013). Based on the story of the Athabasca oil sands of Fort McMurray in Alberta, Canada, the user explores the town of Fort McMoney through multiple non-linear narratives, making decisions in a “choose your own adventure” style game. The user actually is able to affect the town’s economic future based on his or her decisions and influence. Though the town of Fort McMoney is fictional, all characters, interviews, and
locations are real. By giving the user heavy control on the outcome, *Fort McMoney* opens up the perspective of the user by placing him or her in the shoes of individuals who lived the non-fictional version of the documentary (Nogueira, 2015).

Interactive documentaries have also begun to explore uses the newest technologies like virtual reality (VR). *The Unknown Photographer* (Suty, 2015) is an interactive documentary made for VR, in which the user explores a virtual museum of unknown World War I photographs. Through these photographs and other media, the user can follow the narrative of three different stories. In this case, and similar to other VR interactive documentaries like *Clouds Over Sidra* (Milk & Arora, 2015), and *The Party*, the designers created a first-person perspective for the users to explore the narratives and messages. One element that may develop along with the development of VR interactive documentaries is the use of first-person character immersion and development for the user within the documentary. However, because the technology is so new, the use of first-person perspective with limited agency may detract from the empathetic process of relating another’s experience to the user’s own (Dwek, 2015).

All four of these interactive documentaries use different forms of interactivity to create various levels of user immersion. The specific kind of interactivity created depends immensely on the desired experience and the way the designers desire the users to encounter the information and story provided.
CHAPTER 3: METHODOLOGY

This study examines different forms of interactivity used in the interactive documentary *Bear 71* and their effects on usability and user-experience. This chapter outlines the design of a user experience study of the interactive documentary *Bear 71*, definitions of key concepts of the study design, a demographic breakdown of the participants involved in the study, and the recruitment methods used to obtain those participants. Procedures and instruments used to obtain data, a description and analysis of *Bear 71*, and the study setting are also discussed.

3.1 Study Design

This study addresses the following research question: How do the various forms of interactivity in *Bear 71* affect the user experience as it relates to physical, psychological, ideological, and sociological pleasures? By identifying the relationship between *Bear 71*’s interaction design and users’ perceived pleasurability, we can begin to understand the true effect the interactive documentary has on users and whether the documentary was successful in its goals. It is my hypothesis that although *Bear 71* was innovative in concept and design at its original release, the interaction design – specifically the explicit interactivity in the documentary – prevents fulfillment of all four pleasures for the user and thereby hinders the experience from accomplishing its intended goals and prevents the user from truly accepting *Bear 71*’s message.

To explore the research question and hypothesis, this study was divided into three parts. First, participants engaged in a user experience session with *Bear 71* in which they engaged with the interactive documentary for a minimum of 20 minutes. Second, participants responded to a User Experience Questionnaire (UEQ) to assess both user experience and usability of *Bear 71*. 
Third, participants were interviewed about specific aspects of the *Bear 71* user experience during a semi-structured interview session.

### 3.2 Participants

Fifteen participants (6 male, 9 female) were recruited to participate in this study at Ball State University in Muncie, Indiana. Participants were all English-speaking students, aged 18 years or older, and had not experienced *Bear 71* before this study. It was necessary for users to be primarily English speaking because the documentary features both audio and written commentary in English that are not translatable during the documentary. Finally, participants had not previously experienced *Bear 71* in order to accurately assess the first-time usability of the documentary and also to avoid any preconceived biases.

It should be noted that 10 participants were enrolled in or had a degree in digital media programs. Two participants were enrolled in or had a degree in design programs. Participants with experience and education in digital media may have had a higher probability of interest and expertise than others of digital technology used in *Bear 71*. Additionally, participants with experience and education in interaction or graphic design may have had a higher probability of interest and expertise in the visual design of *Bear 71*.

#### 3.2.1. Recruitment Procedures

Recruitment was completed through email solicitation using the Ball State University Communications Center mass email and the Digital Media Minor interdepartmental program. Undergraduate students were contacted through email distributed through the Communications Center and all course sections of the following Digital Media Minor classes were recruited as well: iCom 101, iCom 210, iCom 212, and iCom 375. The recruitment email is provided in Appendix A.
3.3 Protocol

3.3.1. Procedures

Before beginning the study, participants were introduced to the study design and goals through an oral introduction given by the principal researcher. The introduction included an overview of the study’s purpose, guidelines for participation, and a brief description of Bear 71.

The first segment of the study consisted of a user-experience session of Bear 71. Participants interacted with Bear 71 in any way they deemed desirable. Periodically during the session, the researcher paused the documentary during intermissions in the narrative to ask questions specific to an individual participant’s actions. An example of one of these questions was, “I noticed that you followed the main character and did not explore the other parts of the story. What motivated you to navigate the experience that way?” Each session lasted a minimum of 20 minutes and a maximum of 45 minutes.

After the user experience session, participants were given a User Experience Questionnaire (UEQ) (Laugwitz, Held & Schrepp, 2008). The UEQ is a standardized 26-item questionnaire used to analyze user experience through pairs of contrasting descriptive terms. For example, one pair might be “attractive” and “unattractive,” shown in Figure 3.1.

![UEQ example](image)

*Figure 3.1. The above image shows an example of a UEQ attribution pairing. Participants mark the circle closest to the attribute they think best fits their experience of the product at hand. An example of the UEQ can be found in Appendix B.*

Finally, participants engaged in a 10-question semi-structured interview designed to elicit qualitative data about their experience with Bear 71. A complete list of interview questions can be found in Appendix C. For example, one question was, “How do you think the way the Bear 71 experience was designed affected your ability to understand the story?”
Some questions arose naturally out of conversation with the participants, so the complete list of questions asked during each interview session varied from participant to participant. The purpose of this segment was both to identify initial reactions that may not have been stated previously and to elicit qualitative data about the interaction design of Bear 71 that made the documentary more or less pleasurable in various areas.

3.3.1.1. Data Capture Instrument Methodology

Upon comparison of Zimmerman’s modes of interactivity and Jordan’s four pleasures, it is clear that similarities exist between the two frameworks. For example, if an astronomy website features audio interviews of several renowned astrophysists, but the audio is too low to be audible and there are no subtitles, the user will not be able to understand the important information the website is trying to convey about astronomy. This is an example of how poorly designed functional interactivity can negatively affect an experience’s physio-pleasure. In the following chart, each type of pleasure is aligned with their corresponding mode of interactivity, as well as the tool used to capture or assess that information during the study.

3.3.2. Stimuli: Bear 71

Bear 71 is a 2013 interactive documentary created by Jeremy Mendes and Leanna Allison and hosted on the National Film Board of Canada (NFB) interactive documentary database. The story follows a young female grizzly bear named Bear 71 through her life in Banff National Park in Alberta, Canada. Users first encounter Bear 71 through an introductory video, using Bear 71’s anthropomorphized voice as narration, shown in Figures 3.2 and 3.3. The video explains that Bear 71 is a young grizzly that lives in the national park and was captured and tracked by wildlife researchers. This introduction sets up the premise of Bear 71, which is the bear’s struggle to remain wild and unmonitored in the face of human encroachment.
<table>
<thead>
<tr>
<th>Type of Pleasure</th>
<th>Mode of Interactivity</th>
<th>Instrument Used to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physio-Pleasure: Is it</td>
<td>Functional Interactivity: How a user interacts with or perceives something in regards</td>
<td>User-experience session, UEQ, Interview</td>
</tr>
<tr>
<td>pleasurable in regards to</td>
<td>to the five senses. (i.e. the weight of a book)</td>
<td></td>
</tr>
<tr>
<td>sensory details?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psycho-Pleasure: Is it</td>
<td>Explicit Interactivity: How a user interacts with something to understand the</td>
<td>User-experience session, UEQ, Interview</td>
</tr>
<tr>
<td>pleasurable in regards to</td>
<td>information it presents. (i.e. reading the words in a book)</td>
<td></td>
</tr>
<tr>
<td>ease of use and usability?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideo-Pleasure: Is it</td>
<td>Cognitive Interactivity: How a user responds to something on an immediate, emotional,</td>
<td>User-experience session, Interview</td>
</tr>
<tr>
<td>pleasurable in regards to</td>
<td>psychological level. (i.e. a book about a dog dying will make a user cognitively sad)</td>
<td></td>
</tr>
<tr>
<td>values and beliefs?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socio-Pleasure: Is it</td>
<td>Meta-Interactivity: How a user deconstructs, reconstructs, and measures information,</td>
<td>User-experience session, UEQ, Interview</td>
</tr>
<tr>
<td>pleasurable from a</td>
<td>meaning, and purpose against previous experiences. (i.e. a user might compare the</td>
<td></td>
</tr>
<tr>
<td>collective sociological-</td>
<td>book to the time his or her dog died when he or she was a child)</td>
<td></td>
</tr>
<tr>
<td>relationship perspective?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1. This table identifies how each of Zimmerman’s modes of interactivity corresponds with a specific type of Jordan’s four pleasures. Examples of each mode of interactivity and form of pleasure are given. Additionally, the instrument used to analyze each interactive element is provided. For example, a user response of an element of cognitive interactivity, such as an emotion, is captured using targeted interview questions to assess whether that element hinders or enhances the ideological pleasure of Bear 71.

After the introduction, participants were introduced to “The Grid,” a stylized topographical map of Banff National Park, shown in Figure 3.4. Participants follow Bear 71 across the park as her story is narrated in the voice of the bear. Audience members can explore the entirety of the park through navigation, video and audio media, and various character
interactions. The documentary is 20 minutes long and includes brief video intermissions, which add details related to the bear’s narration and path through The Grid.

Figure 3.2. Participants are shown details about length of the documentary and how to navigate through the documentary in the first part of the introduction.

Participants can explore The Grid by navigating with a mouse or arrow keys. The Grid features many interactive elements, such as camera footage from research lookouts, Bear 71 and other animal location trackers, highway and railroad traffic crossing video footage, and flora and fauna infographic data. Participants can choose to follow Bear 71 on her journey or explore The Grid at their leisure. Bear 71 continues to narrate the grizzly’s story regardless of the participant’s actions. Bear 71 concludes at the end of the narration and triggers a staged video of Bear 71’s death.
Figure 3.3. The introductory video uses wildlife footage to show how Bear 71 came to be tagged and studied by forest rangers. This image shows Bear 71 just before her release back into the park after being captured with a snare and tranquilizer dart. First person narration from the bear’s perspective describes the scene during the introduction.

Figure 3.4. The Grid layout of Banff National Park in Bear 71. The colored, dot-style elements represent topographical elements of Banff itself: blue represents the river, the green dots represent trees and foliage, and grey elements represent human development, such as a town and railroad. The camera and binocular icons indicate videos and images, respectively, that feature logged footage and photos from real trail cameras in the park. The “nametags,” which read Bear 71, Human 3134801, and Coyote 021 designate characters within the park. Human 3134801 indicates the user’s location as they explore the park. The play bar at the bottom of The Grid tracks the time elapsed for each chapter of the narration. The circular map in the upper right-hand corner is a navigation map.
3.3.2.1. Interactivity in Bear 71

A content analysis of *Bear 71* focused on the different modes of interactivity featured in the interactive documentary.

*Cognitive & Meta-interactivity.* Cognitive and meta-modes of interactivity are both cognitive processes that the user accesses to understand content and concepts presented in *Bear 71*. As previously stated, cognitive interactivity is how a user responds to content or a topic on an immediate, emotional, psychological level. Meta-interactivity is how a participant deconstructs, reconstructs, and measures information, meaning, and purpose against previous experiences. There are various emotions and comparisons to elicit in a given experience. The specific elements of both of these modes of interactivity will be determined by the responses given by the users, shown in Figures 3.5 and 3.6.

![Diagram of Cognitive Interactivity](image)

*Figure 3.5.* This chart shows the reactive emotional interactivity elicited by the content of *Bear 71*. However, *Bear 71*, as well as other experiences, can create a much wider range of emotions than featured in this chart. These elements of cognitive interactivity just happen to be the ones identified by the 15 participants in this study.
For a participant’s experience of *Bear 71*, these cognitive processes will be identified through the participant’s answers to interview questions. For example, one question asks, “What was your initial reaction to *Bear 71*?” This question is aimed at eliciting information about the participant’s use of cognitive interactivity. Another question asks, “What do you think was the intended purpose of *Bear 71*? Did you think they were successful? Why or why not?” This question is aimed at eliciting information about the participant’s use of meta-interactivity.

![Diagram of interactivity types]

**Figure 3.6.** *This chart features the various meanings and comparisons the participants identified after their experience with *Bear 71*. Similar to cognitive interactivity, meta-interactivity can elicit an infinite range of meaning. Though the message of a particular experience can be designed by the producer, the ultimate meaning is dependent upon the individual interpretation and previous knowledge and experience of each participant.*

*Functional Interactivity.* Functional interactivity is how a participant interacts with or perceives something in regards to sensory details. This mode of interactivity mainly concerns itself with the look and feel of a product. *Bear 71* is a digital experience, so the only elements designed for functional interactivity are elements created by the computer itself.

*Explicit Interactivity.* Explicit interactivity is the most extensively used form of interactivity in emerging, digital media. The reason is that explicit interactivity is the next best
way to experience the subject matter if the participant is unable to witness the subject matter on a first-hand basis. By using explicit interactivity to allow the participant to interact with digital media, producers can create a sense of presence and agency that users could not get with a passive form of media. In *Bear 71*, the producers use various way of revealing information in the form of videos, photos, audio, text, and environment to help the participants comprehend and interpret the data presented to them.

**Figure 3.7.** Because *Bear 71* is now solely a strictly digital experience, though at the initial release it was also consumed as a feature-length, traditional documentary. As a solely digital experience, functional interactivity for *Bear 71* is expanded from a strictly visual to both physical and digital sensory details provided by the apparatus itself: the computer the documentary is experienced through. These elements include the touch sensory details provided by computer set up, and the audio and visual details provided by the documentary.

**Figure 3.8:** The above flowchart depicts the first three levels of explicit interactivity, which involve the general content in the documentary that make up both the story and media elements users are able to interact with through the system. The producers use three specific categories to reveal the media: the environment, the characters, and the narrative.
Figure 3.9: This chart shows the specific interactive elements or media under the environment category of explicit interactivity. The environment is meant to create a sense of setting and place for the narrative being told and the data being given. Through photos, videos, audio, icons, and symbols, the participant is able to understand the layout of Banff National Park and all of the characters involved in the story.

Figure 3.10: This chart shows the specific interactive elements or media under the character category of explicit interactivity. The characters give context to the story being told and provide an additional outlet for wildlife data that is not relevant to Bear 71 but is relevant to Banff National Park. Through videos and text, the participant can get a more intimate look at the role each character plays in the story, including the user, which takes the form of webcam video.
Figure 3.11: This chart shows the specific interactive elements or media under the narrative category of explicit interactivity. The narrative is the meat of Bear 71. It gives the participant a sense of purpose as to why they are in this particular place learning all of this particular data. Through audio, video, and text, the participants are given an overarching story of Bear 71 and her struggle to adapt to her now human-centric world.
CHAPTER 4

RESULTS

The methodology for this study provided three types of data: observational data, discussion data, and survey data. Observational data consisted of notes taken by the researcher during each user’s experience session with Bear 71. The observational data addressed trends that occurred among one or more participants in relation to the way they explored and interacted with Bear 71. For example, during each user experience session, the researcher noted whether the participant chose to follow Bear 71 or explore The Grid without following Bear 71.

Discussion data consisted of qualitative remarks spoken by participants during user experience sessions and during interview sessions. For example, during one user experience session, a participant noted that she wanted to see video of the buffalo berry patch that the Bear 71 narrator mentioned. This remark identified that she wanted to see video that is related to the story. Additionally, participants answered six semi-structured questions (see Appendix C) intended to elicit interpretation and reaction to elements specific to the four forms of interactivity. For example, one question was, “What was your initial reaction to Bear 71?” P8 answered, “My initial reaction is that this is pretty depressing because they just captured a bear in the wild just to track data,” which identified her emotional reaction to the cognitive interactivity elements in the documentary.

Finally, survey data consisted of responses to the User Experience Questionnaire (UEQ) (Laugwitz, Held & Schrepp, 2008). This chapter reports the findings collected via these activities.

4.1 Observational data
Three main trends emerged from the observational data after analysis of user experience session notes taken by the researcher: 1) Eight participants were unable to determine how to interact with The Grid; 2) five participants stopped interacting with The Grid at a certain point and listened only to the narrative instead; and 3) only five participants followed *Bear 71* as she moved through The Grid, while two-thirds explored The Grid in a free-form fashion.

**Trend 1: Eight participants were unable to determine how to interact with The Grid.**
Eight of 15 participants needed to be given a hint (i.e. You can move your character with your mouse and interact with the animals by clicking on their icons) about how to do so after the first minute-and-a-half of the *Bear 71* experience. When asked if a hint was necessary to figure it out, one participant stated, “I wish it was a little more descriptive on the instructions instead of guessing what to do.” [P8]

**Trend 2: Five participants stopped interacting with The Grid at a certain point and listened only to the narrative instead.** The five participants who stopped usually did so either as a result of over-stimulation or disinterest in the physical navigation of The Grid. One participant stated, “Overall I liked the interactive idea, but I'm kind of old school, so I'd rather watch and listen instead of interact.” [P10] This participant also reported she would have equally preferred to watch videos and images, rather than interact. However, another participant stopped interacting because he was frustrated. “I stopped moving because I couldn't do it any more,” he said. “There wasn't much changing and interaction I could do further than just clicking on things.” [P5]

**Trend 3: Only five participants followed Bear 71 as she moved through The Grid, while two-thirds explored The Grid in a free-form fashion.** The 10 participants who did not track *Bear 71* at all reported they were either unable to find or follow her or were too
preoccupied by the other interactives to realize they had the option to track her. Eight of those 10 participants did not intentionally try to find Bear 71 once. According to one participant, “I felt like I couldn't catch up to him, so I just explored while I listened to the narrator to see what other animals were up to.” [P7]

4.2 Discussion and Interview Data

Discussion and interview data was analyzed using a systematic process that first required that all statements made by participants during the user experience session, as well as interview responses to be transcribed. Then, each sentence was analyzed to determine its meaning. Finally, each statement was categorized according to its positivity, neutrality, or negativity, the interactive element the participant described, and the mode of interactivity to which that element corresponds (Zimmerman, 2004): cognitive, functional, explicit, or meta.

As an example of a statement coded under functional interactivity, one participant stated, “I liked moving the mouse. It felt really natural.” [P9] This statement was categorized as a positive comment on the computer mouse under the physical attributes of functional interactivity. As an example of a statement coded under cognitive interactivity, another participant stated, “I feel like there was a lot of information thrown out in a very short amount of time” [P13] when discussing the first-person point of view of the narrative. This statement was categorized as a negative statement under the emotion of confusion of cognitive interactivity. As an example of explicit interactivity, another participant stated, “One thing I didn't like was when the video about the train at the end came. I wish they gave you a little more warning that was going to happen rather than just popping up.” [P2] This statement was categorized as a negative statement under the conclusion video, under narrative, under explicit interactivity. And as an example of meta-interactivity, a participant stated, “We're taking over the environment and
there's no place for the animals to go.” [P15] This statement was categorized under the theme of human encroachment under meta-interactivity.

The 15 participants in this study made a total of 784 statements that could be coded. The coding process was completed by one coder: the researcher. Several statements were thrown out as incomplete or irrelevant statements. Table 4.1 shows the total number of positive, negative, and neutral statements made by mode of interactivity.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Total</th>
<th>Negative</th>
<th>Positive</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>78</td>
<td>68</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Functional</td>
<td>45</td>
<td>7</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td>Explicit</td>
<td>575</td>
<td>437</td>
<td>132</td>
<td>56</td>
</tr>
<tr>
<td>Meta</td>
<td>86</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Table 4.1. This table displays the total number of codable statements made by all 15 of the study participants. As shown, explicit interactivity received the most statements overall by a large margin. Additionally, functional interactivity received the most positive statements overall from participants. A table of all coded statements can be found in Appendix D.*

It is important to note that although explicit interactivity was the most discussed mode of interactivity, the explicit mode included 19 interactive elements participants could potentially interact with in comparison with the four, 11, and 12 interactive elements of the functional, cognitive, and meta modes, respectively. So, although explicit interactivity was the most discussed mode, it also had the widest range of possible interactions. Additionally, statements referring to meta-interactivity were not categorized as positive, negative, or neutral. Statements about meta-interactivity involve the participants’ perceived message and meaning of *Bear 71* and their comparisons of that meaning or content to past experiences. These statements are not statements about whether a specific interactive element in *Bear 71* affected their experience positively or negatively, unlike statements attributed to cognitive, functional, and explicit interactivity.
Perhaps most notable is the fact that participants frequently commented on 11 specific elements of Bear 71. For cognitive interactivity, anger and sadness were the strongest emotions elicited by Bear 71. By way of example, P1 said, “I guess I’m angry that they [the producers] made me sad because I knew it [the death of the bear] was going to come. And then it happened.” On the other hand, functional interactivity illustrated through use of The Grid design was the most positively regarded of all interactive elements of the documentary. Participants used a wide variety of positive descriptors when commenting on the visual aesthetic of the documentary, such as: impressive, innovative, tremendous, minimal, cool, and soothing.

<table>
<thead>
<tr>
<th>Mode of Interactivity</th>
<th>Interactive element</th>
<th>Total</th>
<th>Negative</th>
<th>Positive</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Anger</td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Sadness</td>
<td>19</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Functional</td>
<td>Visual Design</td>
<td>34</td>
<td>13</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Explicit</td>
<td>Human Icon/Navigation</td>
<td>218</td>
<td>163</td>
<td>29</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Bear 71 Icon/Navigation</td>
<td>28</td>
<td>26</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Topographic Signifiers</td>
<td>43</td>
<td>36</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Other Animal Videos</td>
<td>37</td>
<td>26</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Story Narration</td>
<td>78</td>
<td>53</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Intermission</td>
<td>38</td>
<td>10</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Meta-interactivity</td>
<td>Human encroachment</td>
<td>17</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 4.2. This table illustrates the number of statements for the most commented elements under each mode of interactivity.

Alternatively, the way participants navigated as a character in The Grid was by far the most controversial interactive element of the documentary. Although most of the statements leaned negative, there was a very clear discordance between positive statements and negative statements. Nine participants expressed that they enjoyed being able to explore the entirety of Banff National Park, but 12 participants’ exploration was negatively affected by the unclear
objective of the documentary. For example P7 said, “I could freely move wherever I wanted, but I didn't know if I was supposed to follow the bear or where to find the bear.”

Overwhelmingly, the most discussed theme of character icon and navigation of the bear was her seemingly random path of navigation and frequent disappearances. This often conflicted with participants’ sense of direction and objective. For example, one user stated, “I know that they dropped me next to Bear 71, but by the time I realized I could control the navigation, I had lost him.” [P15]. Six participants were also confused by the symbols and motion of the stylized topography of The Grid. Eleven participants said they wished The Grid provided clearer directions or a key for the various symbols throughout the park.

Although participants expressed that they were intrigued by the potential to see an exotic animal in its natural habitat, repetitive footage and discordance between narration and video footage often hindered the experience, shown in Figure 4.1. According to one participant, “The small snippets are good, but I don’t know how they tie into the story yet.” [P6] Another participant stated, “I feel like I'm behind in the story because I got distracted with this other stuff they put in here.” [P1] The media used to create interactions with other animal characters confused participants because of a lack of context and continuity.

The audio narration that told the story of Bear 71 from the perspective of the bear was reported as one of the most attention-grabbing elements of the documentary. Many participants reacted to the anthropomorphized perspective of the bear positively; however, the users were so engaged with the narrative that they often missed some of the other interactives featured. Furthermore, when participants’ interactions did not align with the events in the narrative, they often said they felt like they were multitasking. One participant said, “I got a little frustrated because I wanted to be able to retain everything she was saying but also watch the clips and
Likewise, another user stated, “What's been confusing is as she was talking about the buffalo berry patch, I clicked on this video and it popped up something different than what she was talking about.” [P13]
the other videos that I clicked on, with the intermissions I didn't expect to see a family of cubs get run over by a train.”

Figure 4.2. When participant reach the sixth minute of the documentary, the screen is taken over by a one-and-a-half minute intermission, which features wildlife research footage of Bear 71 while she discusses her difficulties navigating around humans that visit the park. Participants have the option of exiting out of the video to continue interacting with The Grid, but participants generally enjoyed the chance to sit back and watch.

Although a wide variety of themes and messages were generated during analysis of participant statements, human encroachment was the theme most commonly addressed. For example, P4 stated, “Even though [daily human activities] seem so unobtrusive and unimportant to us, they affect the wildlife's existence very much.” There were several tangential themes to human encroachment, such as animal rights, conservation, technology, and wildlife research methods; however, the theme of human encroachment specifically focused on the intrusion of humans into a place they were presumed not to belong. One participant stated, “[Observation of nature is] a double-edged sword of keeping people safe but also keeping the bear safe. But it felt like it was less about keeping the bear safe.” [P14] Though the participant felt that the message of Bear 71 commented on both human nature and the natural environment, her negative emotions were directed toward the former. Another participant pointed out that although the
producers had a specific goal and theme in mind, the ultimate meaning is up to the individual user. She said, “I think it's tailored to the person that's experiencing it.” [P13]

4.3 Survey Data

The UEQ was used to quantitatively identify how the forms of interactivity of Bear 71 affected various pleasures for each participant’s experience. The UEQ addressed hedonic qualities: stimulation and novelty, which assist in analyzing sociological pleasure, pragmatic qualities: perspicuity, dependability, and efficiency, which assist in analyzing psychological pleasure, and attractiveness qualities, which assist in analyzing physiological pleasure. For example, a word pairing asking a participant to define his or her experience as attractive or unattractive would allow the participant to assess the visual design of Bear 71. Visual design is categorized as an interactive element under functional interactivity. If the participant were to describe Bear 71 as an attractive experience, this would indicate through quantitative data that the visual design enhanced the physical pleasure of the experience.

UEQ data identified both hedonic and pragmatic qualities— the sensory and practical pleasantness— of each user’s experience of Bear 71. Each of the 26 word pairings of the UEQ correlates with the attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty of the artifact creating the experience for the user. Answers to each pairing are given a value from -3 to 3. For example, in Figure 4.1, the user’s answer would have received a score of -2.

![Figure 4.3: An example of one of the 26 word pairings in the UEQ. In this example, the mark closer to the attribute “attractive,” indicates that the user would find their experience more attractive than unattractive. This answer would have received a score of -2.](image-url)
The proper method of analysis for the UEQ is provided by Laugwitz, Held, and Schrepp (2008) in the UEQ handbook and was used to identify the mean score of all 26 word pairings grouped by quality type (Figure 4.4, Figure 4.5, Figure 4.6, Figure 4.7, Figure 4.8, and Figure 4.9), the mean score for each attribute type (Figure 4.10), and the mean score of the overall attractiveness, hedonic, and pragmatic elements of Bear 71 (Figure 4.11). Additionally, the workbook suggests how Bear 71 compares to an existing benchmark of data from 9,905 people from 246 studies used in the original UEQ validity study of different products, including business software, web pages, web shops, and social networks (Figure 4.12). UEQ data from all 15 participants can be found in Appendix E.

Figure 4.4: This chart shows the average scores for the four word pairings in the UEQ that correspond with the attribute of perspicuity. A positive or negative score corresponds with the positive or negative attribute for each pairing. For example, the pairing complicated/easy received an average score of -.05. This means that the participants on average described Bear 71 as complicated, as opposed to easy, as indicated by the negative score. In general, participants found Bear 71 as understandable and easy to learn, but complicated and confusing.
Figure 4.5: This chart shows the average scores for the four word pairings in the UEQ that correspond with the attribute of efficiency. As shown, participants generally found Bear 71 as efficient and practical, but cluttered and neither fast nor slow.

Figure 4.6: This chart shows the average scores for the four word pairings in the UEQ that correspond with the attribute of dependability. As shown, participants generally found that Bear 71 was supportive, secure, and meets expectations, but unpredictable.
Figure 4.7: This chart shows the average scores for the four word pairings in the UEQ that correspond with the attribute of stimulation. As shown, participants generally found that Bear 71 was valuable, exciting, interesting, and motivating.

<table>
<thead>
<tr>
<th>Word Pairing</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>valuable/inferior</td>
<td>1.9</td>
</tr>
<tr>
<td>boring/exciting</td>
<td>1.2</td>
</tr>
<tr>
<td>not interesting/interesting</td>
<td>1.6</td>
</tr>
<tr>
<td>motivating/demotivating</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Figure 4.8. This chart shows the average scores for the six word pairings in the UEQ that correspond with the attribute of attractiveness. As shown, participants generally found that Bear 71 was enjoyable, good, pleasing, pleasant, attractive, and friendly.

<table>
<thead>
<tr>
<th>Word Pairing</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>annoying/enjoyable</td>
<td>0.9</td>
</tr>
<tr>
<td>good/bad</td>
<td>1.7</td>
</tr>
<tr>
<td>unlikable/pleasing</td>
<td>1.1</td>
</tr>
<tr>
<td>unpleasant/pleasant</td>
<td>1.2</td>
</tr>
<tr>
<td>attractive/unattractive</td>
<td>1.7</td>
</tr>
<tr>
<td>friendly/unfriendly</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Figure 4.9. This chart shows the average scores for the four word pairings in the UEQ that correspond with the attribute of novelty. As shown, participants generally found that Bear 71 was creative, inventive, leading edge, and innovative.

Figure 4.10. This graph displays the average score and standard deviation for each of the five attribute types: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Attributes in the green third of the graph indicate that the users perceived the quality positively. Attributes in the yellow third of the graph indicate that the users perceived the quality neutrally. As shown, no quality of Bear 71 was perceived negatively. Attributes perceived most positively were the overall attractiveness, stimulation, and novelty. Attributes perceived neutrally were perspicuity, efficiency, and dependability. The attribute perceived negatively, but still within a neutral range is perspicuity, or general comprehension.
Figure 4.11. This graph displays the average score of the overall attractiveness, pragmatic and hedonic qualities. The pragmatic measurement is the average of efficiency, perspicuity, and dependability attributes. The hedonic measurement is the average of stimulation and novelty attributes. Similar to Figure 4.8, qualities in the green third indicate a positive response and qualities in the yellow third indicate a neutral response. This graph indicates that users perceived the attractiveness and sensory pleasantness of Bear 71 more favorable than the pragmatic quality.

Figure 4.12. This graph illustrates the quality averages of Bear 71 against the benchmark averages of the 226 studies used in the validity study of the UEQ (Laugwitz, Held & Schrepp, 2008). The graph suggests that Bear 71 was rated much higher in the qualities of novelty and stimulation than an average digital experience but much lower in the qualities of dependability, efficiency, and perspicuity.

This chapter has identified through both qualitative and quantitative data how different interactive elements either hindered or enhanced the participants’ experience of Bear 71. Three
types of themes emerged from this research that help identify specific types of breakdowns or enhancement of the *Bear 71* experience: themes of aesthetics, agency, and immersion. Table 5.1 shows how each theme relates to user-experience qualities, forms of interactivity, and types of pleasurability, though these are not strict categorizations and occasionally include areas of overlap.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Corresponding User-experience Quality</th>
<th>Form of interactivity</th>
<th>Type of Pleasurability</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetic (attractive qualities)</td>
<td>Attractiveness</td>
<td>Functional Interactivity</td>
<td>Physio-pleasure</td>
<td>1. Participants found the design appealing, but wayfinding difficult.</td>
</tr>
</tbody>
</table>
| Agency (pragmatic qualities)    | Perspicuity, Efficiency, Dependability | Explicit Interactivity | Psycho-pleasure        | 1. Participants felt the experience was learnable but not initially intuitive.  
2. Participants were confused about the story progression and their objective as a character.  
3. Participants were often confused when presented with disjointed actions and visuals, known as ludonarrative dissonance. |
| Immersion (hedonic qualities)   | Novelty, Stimulation                   | Cognitive Interactivity, Meta-interactivity | Ideo-pleasure, Socio-pleasure | 1. Participants connected with the main character through the first-person perspective and anthropomorphized narrative.  
2. Participants felt their personal interpretation of the story’s moral further invested them in the story. |

Table 5.1. This table shows the relationships between the themes that emerged from this study’s qualitative and quantitative data and the three frameworks used to assess the interactive elements in *Bear 71*: UEQ assessment qualities (Laugwitz, Held & Schrepp, 2008), Zimmerman’s modes of interactivity (2004), and Jordan’s types of pleasure (1999). Though each element has been categorized in the above chart based on similar characteristics, these elements often have overlapping characteristics and should be viewed as guidelines rather than definitive categories.
As shown through observational, discussion, interview, and survey data elements of explicit interactivity, such as participant navigation and *Bear 71* navigation, caused immense confusion and uncertainty for participants. However, despite issues that made wayfinding and comprehension more difficult, participants also found the design and inventiveness of *Bear 71* to be appealing and innovative. The next chapter will discuss the several themes pulled from this data, how those themes affected the overall user experience and pleasurability of *Bear 71*, recommendations to improve those issues within *Bear 71*, and implications for the future practice and research of interactive documentaries.
CHAPTER 5
DISCUSSION

This thesis aimed to address how the user experience of Bear 71 was affected by its different interactive elements. Through analysis of both qualitative and quantitative data from 15 participants, the analysis of Bear 71 as a pleasurable or unpleasurable experience is multifaceted. The following sections illustrate why the themes found in the data are important for both the user experience of Bear 71 and the field of interactive documentaries as a whole.

5.1 Aesthetic: Participants found the design appealing, but wayfinding difficult.

Seven participants described the visual design positively during their interview sessions, using adjectives such as innovative, impressive, minimalist, and cool. Additionally, participants described Bear 71’s level of attractiveness using positive adjectives on the UEQ such as enjoyable, good, pleasant, attractive, and friendly. This gave Bear 71 an average UEQ score of 1.2 for all of its attractive qualities.

However, users also complained that the minimal design was often confusing because there were not enough visual signifiers that assisted with pointing the users in the right direction, also known as wayfinding (Arthur & Passini, 1992). Eight participants were given hints after the first minute and a half of grid exploration. The reason for this hesitation was twofold: 1) Participants were not given enough direction initially about how to move and 2) they were overwhelmed by the amount of movement and minimalist design used in The Grid. During the interview sessions, seven participants stated that the visual design was negative, using adjectives such as distracting, sketchy, elementary, and complicated. For example, P1 said, “I didn’t understand the symbols for what the motion represented until later.”
Additionally, 11 participants expressed a need for clearer directions or a key to help them understand where they could move or where they had already been. For example, P6 said, “I liked the exploration aspect, but I still needed a little bit of guidance at the beginning.” Bear 71 does give directions at the very beginning of the documentary, shown in Figure 5.1, but a secondary reminder was needed for many participants. Additionally, the documentary featured a small, circular map that showed the places where the participants had and had not explored, shown in Figures 5.2 and 5.3, but only four participants noticed the map during their user experience session.

The data that speaks to the aesthetic qualities of Bear 71 indicates a divided analysis of the physio-pleasure of Bear 71. Though the design was cool and immersive, it also left participants confused about where to explore. Though design in all its forms should strive to be inventive and intriguing to its audiences, cutting-edge design should never affect the artifact’s usability. In the case of this study, users’ time was wasted trying to decipher the boundaries and topographical signifiers, rather than being immersed in and appreciating the visual and auditory design of the environment. Overall, the physio-pleasure of Bear 71 was enhanced by its innovative design and setting immersion but was hindered by the lack of emphasis on directions and visual keys. The importance of physio-pleasure involves more than just standards of subjective beauty. Rather, physio-pleasure plays a key role in the functionality of an artifact. If something is displeasing from a sensory perspective, users may use said product less frequently or for a shorter duration than if the product had been designed better. In Bear 71, many participants quit interacting with the documentary, as previously mentioned. If guidelines had been displayed more prominently or the design of The Grid had been less visually confusing,
participants could interpret the setting more quickly and therefore spend more time exploring more important elements.

![Figure 5.1](image1.png)

**Figure 5.1.** This image shows the directions for how to use the mouse and keyboard to navigate through The Grid. These instructions were only given for a few seconds at the very beginning of the documentary.

![Figure 5.2](image2.png)

**Figure 5.2.** This image shows the usual layout of The Grid. In the upper right-hand corner is the preview of the legend that participants can click on at any time.
Figure 5.3. This image shows the fullscreen legend that shows participants places they have already seen (quadrants shown in light grey), places they haven’t seen (quadrants shown in dark grey), and where they currently are (quadrant shown in orange). It additionally shows where each animal is located (small yellow dots) and where Bear 71 is located. This map is displayed in The Grid on the upper right hand corner, shown in Figure 5.3.

5.2 Agency: Participants felt the experience was learnable but not initially intuitive.

Through both visual and interaction design, Bear 71 prompted intricate actions from participants. Participants were able to decide for themselves where, when, and how to interact with the documentary. These designed elements gave the participants a sense of agency and control over their experience. Although the innovative use of interactions, storytelling, and visual design gave Bear 71 a sense of novelty, a few breakdowns occurred when the documentary failed to meet standards of ease of use, which were expected by participants.

Ten participants in this study stated that they were confused or didn’t know what to do when placed in The Grid. Soon after beginning her experience session, one participant said, “I just realized I could move as the narrative is playing, but I’m not sure what that does.” [P4] This illustrates that not only did it take the participant an unanticipated amount of time to understand
what to do, but also that the purpose of her movement was initially unclear. Additionally, participants described *Bear 71’s* perspicuity qualities as understandable and easy to learn, but complicated and confusing. Overall, *Bear 71’s* perspicuity qualities, or qualities of clearness, received a score of -0.1. However, four participants stated that the more they interacted with the documentary, the easier it was to use. P5 said, “The more I interacted with it, the more I am beginning to understand what I am supposed to do.”

This data shows that participants understood the concept of how to move and what to do after a time; however, this initially unintuitive experience distracted the participants from absorbing valuable information. Similar to the documentary’s confusing visual design, the lack of guidance for how the participants could navigate through the documentary caused psychological strain and frustration throughout their experiences. Creating signifiers and aids are important elements in any experience to relieve cognitive load of the users. If a user is too busy trying to figure out the rules, guidelines, or boundaries of an experience, they will have less cognitive energy absorbing and interpreting an artifact’s message or purpose. In many digital experiences, psycho-pleasure is measured by the artifact’s usability. One element of usability is the time it takes for users to learn how to operate the artifact. While participants were all eventually able to learn how to navigate, five participants would not have been able to interact with the documentary without receiving hints by the researcher. Some experiences are purposely designed to challenge users. But if some users are not able to intuitively interact with the experience, that experience is possibly causing undo cognitive load on its users. With *Bear 71*, those five users would not have interacted with the documentary the way it was intended in a natural setting.
5.3 Agency: Participants were confused about the mechanics of the narrative progression and their objective as a character within the narrative.

Although *Bear 71* achieved novelty by allowing participant exploration, it failed in establishing a discernable objective for participants. Participants did not have to create any action, arrive at any checkpoint, or solve any puzzle for the narrative of *Bear 71* to progress. Participants had total control and range over what they interacted with, creating the ultimate choose-your-own-adventure narrative setting. While this interaction design was intentional, the trade-off between freedom and purpose quickly made some participants question what they were supposed to be doing and how they were integral to the story, if at all. These breakdowns mainly had to do with the participants’ navigation and objective, as well as *Bear 71*’s character navigation and purpose.

Twelve of 15 participants stated that they were confused about what their objective as a character was. While 11 participants enjoyed the freedom of exploration within The Grid and the agency it gave them, five of the participants quit interacting with the documentary at one point or another out of confusion or frustration. One participant said, “I don’t really have a strategy for navigating because I don’t know what [my objective] is.” [P3] Another participant stated, “I can’t quite tell if I’m doing it right.” [P12] Even though *Bear 71* was intended to have no one correct answer for how a participant should experience the documentary, participants still expected their actions to create some type of reaction within the story. This confusion forced participants to search for an objective that was non-existent and often prompted frustration when they couldn’t find that objective. Participant Five adamantly stated, “I stopped moving because I couldn't do it any more. There wasn't much changing and no interaction I could do further than just clicking on things.”
Many participants created their own objectives and motivations. Four participants aimed to explore the entirety of The Grid before their 20 minutes ended. Five participants desired to click on every clickable element in the environment, including all animals, lookout points, and flora. Only five participants actually followed Bear 71, the main character in The Grid and the narrator of the story. It is clear that the designers hoped that participants would at least occasionally follow Bear 71 because a constantly blinking arrow directs participants in Bear 71’s direction for the extent of the documentary, shown in Figure 5.4. However, only two participants noticed this arrow, and nine participants complained of being unable to find or keep up with Bear 71’s navigation. With such a large map to explore, so many elements to click on, and a lack of clear objective, six participants felt overwhelmed from trying to multitask. One participant said, “I guess it was overwhelming because I had so many options.” [P11] This is known as the paradox of choice (Schwartz, 2004) and can severely hinder a person’s agency over decision because of the sheer amount of available options from which to choose.

Additionally, seven participants expected their actions to have an immediate effect on the events or outcome of the narrative. For example, P6 felt that if he found the correct place in The Grid, he would prompt the next video to play, despite the fact that the videos played autonomously. Though participant actions affected when and what secondary elements they experienced— for example, whether they clicked on the videos of rub trees, shown in Figure 5.5, which were a key development in one of the narrative chapters— their actions had no effect on any of the events and certainly not the ending of the documentary. P3 said, “No, I didn't feel connected to it or that the story needed me to progress it.” This lack of agency pertaining to narrative events is due to the nature of a documentary: the story could not be changed because these were real events that actually happened.
However, the overwhelming possibilities of interaction and lack of agency did cause breakdowns in efficiency. On the UEQ, participants were neutral about the documentary’s pacing and inefficiency, but described *Bear 71* as cluttered, though practical. Overall, *Bear 71*’s efficiency qualities received only an average score of 0.4. This score is considered a neutral score, neither positive nor negative, but is still a low score compared to the five other qualities in the graph.

*Figure 5.4. This image shows the arrow that appears when participants explore a part of The Grid that is away from Bear 71. The arrow blinks with a grey ring. Participants can either follow the direction the arrow is pointing or click the arrow to be immediately taken to Bear 71.*

The issue of character objective presented many hindrances with the documentary’s psycho-pleasure, almost on an existential level. Participants felt a lack in purpose of their character’s actions and translated that missing element to their purpose as an audience member and active character in the story. Many of the participants who stopped interacting with the documentary stated they would have rather watched *Bear 71* as a traditional documentary. Though there were places to explore and elements to click on, the participants’ actions had no effect on the story. Part of the psycho-pleasure derived from an experience comes from a sense
of fulfillment that the user’s interactions are meaningful in some way. In the case of *Bear 71*, the participants’ actions allowed them to perceive wildlife information in new ways, but did not affect the way the participants translated that information into knowledge that was meaningful to their lives or future experiences.

![Figure 5.5](image)

*Figure 5.5. This image shows an example of a rub tree interactive, shown as the red, chaotic spiral toward the center of the image. This interactive element is unique in that only rub trees have this icon design and additionally are the only plants in the interactive that have a unique icon design. When the icon is clicked, a video of bears, humans, and other animals stopping by this rub tree plays.*

5.4 Agency: Participants were often confused when presented with disjointed actions and visuals, or ludonarrative dissonance.

Ludonarrative dissonance occurs when an experience requires something of the participant that is discordant with the participant’s anticipated motivations or actions (Brice, 2012). In this case, the *Bear 71* narrative often spoke of specific places and events that occurred in Banff National Park. Participants often searched for interactive elements or affordances that would indicate to where they should navigate in order to visually see or interact with something related to the event in the narrative. However, no elements, aside from the video introduction,
intermission, and conclusion, narrative blurbs, two interactive points featuring rub trees, and
*Bear 71’s* character video and bio, contained visual information directly related to the narrative.

Ten participants stated that they wished the videos, photos, and statistics that appeared
after clicking on a character, lookout point, or plant directly related to what the narrative
discussed. Participant One stated, “If they’re talking about a place, I want to know that I’m
looking in the right place. It’s hard to listen to narration about a bear and not see videos of a
bear.” This dissonance between verbal and visual information presented in *Bear 71* can cause
delayed information processing, due to the participant’s limited mental capacity, known as
cognitive load, to process two forms of unrelated stimuli, both in sensory type and topic (Paivio,
1986). To this end, seven participants described the intermission video as one of their favorite
elements of *Bear 71* because the clips in the intermission directly related to and enhanced
understanding of the narrative, despite the fact that the intermission occurred autonomously.

Additionally, characters in *Bear 71*, including Bear 71 and other animals featured in the
documentary, only have a single visual element that participants can interact with. When a
participant clicks on *Bear 71* or any other animal, they will only see the same video clip and bio
information on loop each time they click on the animal. Five participants complained that the
footage for each character was repetitive and didn’t add any new information to the story. This
repetition made the participants question the importance of the visuals to the experience.
Participant Thirteen said, “What was annoying is that I would click on those things but it was the
same clips. I thought I would be getting new videos but a lot of them were the same.” Participant
Fourteen’s frustration with the repetition lead her to hypothesize that the producers ran out of
wildlife footage and other assets to make more complicated character interactions, which may be
accurate. Regardless, participants still desired a deeper interaction between themselves and their guide *Bear 71*. P5 said simply of his disappointment, “I just wish there was more.”

On the UEQ, participants on average described *Bear 71* as unpredictable, but were neutral on whether the experience was obstructive or supportive. Though participants also said their experience met their expectations and felt secure, the dissonant elements caused participants to rate *Bear 71’s* quality of dependability as its second lowest quality. *Bear 71’s* dependability scored a neutral 0.4, but the previously mentioned issues hindered the participants’ sense of agency. Overall, the qualities of perspicuity, efficiency, and dependability, which make up pragmatic qualities, were collectively evaluated by participants as the worst aspects of *Bear 71*.

While *Bear 71’s* attractiveness and hedonic qualities generally enhanced participants’ immersion and engagement, its pragmatic qualities often created delays and hindrances to participants’ understanding and enjoyment of their experience. The data indicate that *Bear 71’s* psycho-pleasure was obstructed because of the documentary’s lack of continuity between its visuals and narrative. With this study, participants felt cognitive strain when their actions did not create a reaction within the documentary that enhanced the narrative. The connective thread between the two was either non-existent or lost depending on the timing of each participant’s individual navigation. This led participants to question the intended purpose of the interactive elements if they seemingly had no connection to the story being told.

5.5 Immersion: Participants connected with the main character through the first-person perspective and anthropomorphized narrative.
The producers used empathy as a key emotional tactic throughout *Bear 71*. Though a few participants were irritated by the potentially obvious pull on their heartstrings, such as P1 who stated, “I’m just mad I fell into [the producers’] ploy,” sadness and anger were the two strongest emotions by the participants toward the subject matter. Twelve participants stated they felt either sadness or anger on behalf of *Bear 71*’s plight at the end of the documentary as their first reactionary emotion. One participant even said, “If you [the researcher] weren’t here, I would have cried.” [P7] Most of this emotion was elicited through an empathetic connection with *Bear 71*’s first-person narrative that could only be achieved by creating a fictional, human-like version of the real *Bear 71*’s experiences. When *Bear 71* discussed the difficulties of navigating around barbed wire set by wildlife researchers to collect fur, P1 said, “That’s not cool. I wouldn’t want to be caught on barbed wire.” The participants felt this emotion for *Bear 71* because they identified themselves with her character.

This phenomenon is known as narrative empathy (Keen, 2006). Though it may seem manipulative from a superficial level, the use of narrative empathy is an intricate cognitive tool to help participants understand both information and perhaps also the producer’s desired viewpoint. In the case of *Bear 71*, the use of narrative empathy for the grizzly allowed participants virtually “feel” the harm that human encroachment is creating on the wildlife in Banff National Park. The emotional pull and the fictitious interpretation of *Bear 71*’s experiences gave the documentary a quality of novelty. Participants identified novelty as *Bear 71*’s highest rated quality with a score of 2.2. Participants described the documentary’s elements of novelty positively, using words such as creative, inventive, leading edge, and innovative.

Based on participants’ overwhelmingly positive analysis of *Bear 71*’s novelty as an experience, we can surmise that the documentary appealed to their socio-pleasure standards.
Socio-pleasure has to do with relationships with other people or experiences. In the case of this study, participants felt particular emotions, which were triggered by Bear 71’s story, because they were able to relate that story to their own past experiences. Whether the participants compared the grizzly’s story to their own personal experience or an experience they had seen or witnessed, like another documentary, appealing to participants’ socio-pleasures plays a key role in helping the audience accept the documentary’s message. If the documentary had not tapped into the participants’ personal emotions, for example if the story was told from a wildlife researcher’s third-person point of view instead of the bear’s first-person perspective, less participants would have felt badly about the bear’s story, and therefore possibly less contemplative about the human actions that lead to the bear’s demise.

5.6 Immersion: Participants felt their personal interpretation of the story’s message further invested them in the experience.

As previously discussed, the purpose of any documentary is to portray true facts; however, a documentary’s producers or directors can drive the audience’s interpretation of those facts depending on the way the facts are presented and portrayed. In the case of Bear 71, the producers were able to present real data gathered by wildlife researchers in the park but presented those facts in a fictional setting: the anthropomorphized life of Bear 71. By presenting these facts with inferred emotions and projected internal struggles via Bear 71’s inner monologue, participants were able to insert themselves into Bear 71’s point of view in an attempt to understand her story and the information it presents. This analysis of meaning, what Zimmerman (2004) calls meta-interactivity, is a process used by participants to transform information presented by producers into knowledge, or and wisdom (Shedroff, 1999). Though
meaning can be created through a number of forms of interactivity, meta-interactivity
specifically prompts users to make meaning of the information based on their past experiences.

Various themes arose from all 15 participants’ interpretations of Bear 71: animal rights, conservation, human encroachment, environmental solutions, human habits, wildlife research methods, national parks management, use of technology, and empathy through anthropomorphization. However, the two themes most discussed were the effects of human encroachment on the natural environment and empathy felt for Bear 71. Eleven participants stated that Bear 71’s mission was to advocate for better practices with human encroachment. For example, P11 said, “The animals have to overcome the burden of us.” Additionally, nine participants stated that they felt another purpose of Bear 71 was to create empathy with her character. For example, P3 said, “It all seems hopeless to me, and maybe that's the point because it is hopeless for the bear.” Though Bear 71 clearly focused on wildlife, human encroachment, and conservation, by allowing participants agency through how they interacted with the story, they were allowing participants to also create their own interpretation, understanding, knowledge, and meaning of that story and the information it presents (Macy, Anderson & Krygier, 2010). As P13 stated, “I think [Bear 71] is tailored to the person who’s experiencing it. I think you’re left to figure it out yourself.”

On the UEQ, participants described Bear 71’s qualities of stimulation as valuable, exciting, interesting and motivating. The documentary’s stimulation qualities were rated an average score of 1.6, the second-highest evaluation of all qualities. The high evaluation of Bear 71’s qualities of stimulation indicate that the documentary appealed highly to participants’ sense of socio-pleasure. Both qualities of stimulation and novelty can be categorized as hedonic qualities. Participants’ rated the hedonic qualities of Bear 71 at a 1.9, the highest overall quality
category, with attractiveness rated as second, and pragmatic qualities rated much lower than either of the former, shown in Figure 5.6. The analysis of the three quality groupings clearly shows that Bear 71 appealed to participants’ sense of aesthetics and emotional and psychological immersion, or physio, socio, and ideo-pleasures, respectively. However, as outlined in the sections in this chapter that detail agency, the issues of usability, interaction design, and ludonarrative dissonance prevented participants from enjoying and appreciating the documentary from a psycho-pleasure perspective.

5.7 Recommendations for Bear 71

In the UEQ’s benchmark evaluation, Bear 71 excelled comparatively in some areas but not in others. As shown in Figure 5.6, Bear 71 was above average in qualities of stimulation and novelty, both hedonic qualities. In attractiveness, Bear 71 scored slightly above average. But in pragmatic categories: perspicuity, efficiency, and dependability, Bear 71 scored severely below average. This finding seems to be consistent with the recommendations made by the participants of this study. Most of the recommendations suggested improvements to elements of explicit interactivity, which are identified by evaluating pragmatic qualities in the UEQ.

Many of the following recommendations to improve the experience of Bear 71 were taken from participant statements during the interview session. In order to improve initial usability, Bear 71 should feature more prominent direction for how participants can navigate the space after the video introduction and before being dropped into The Grid. Additionally, improvements to The Grid legend should be made. For example, many participants stated they wished there were a key for the topographic representations and a list of the interactive elements
they have and have not seen. The visibility of the arrow that tracks Bear 71 should also be more prominent.

![Graph showing UEQ scores comparison](image)

**Figure 5.6.** *This graph shows the comparison of the UEQ scores for Bear 71 compared to the benchmark scores of 246 product studies used for the validity analysis of the UEQ. On average, Bear 71 scored significantly above average in novelty and stimulation, slightly above average in attractiveness, and far below average in perspicuity, efficiency, and dependability.*

To improve the purpose of the participants’ interactions with The Grid, participants’ actions should have some kind of effect on the story. For example, one participant suggested that parts of the story be “triggered” by moving to a specific area of The Grid [P5]. Another participant suggested that there should be “side missions” that the participant can complete between breaks in the narrative [P3]. Or as a simpler option, other participants suggested that a clearer path to follow might have helped them understand the context of Bear 71’s narrative more clearly.

To improve the disconnection between the narrative and the interactive visuals, the visuals should have a wider variety and clearer connection to the narrative. This might also be able to be solved by establishing a clearer path for participants to follow so that the timing of their interactions have a higher probability of relevancy to the events discussed in the narrative. Tough variability in the wildlife footage presented in the documentary might be difficult to achieve, some form of change over time should be apparent so that the participants don’t feel as
if they are stuck or missing something. The interactive documentary’s use of explicit interactivity, though conceptually innovative, could have used a few technical adjustments to create an even better experience for its users.

5.7 Recommendations for IDN designers

There needs to be a coming-together of digital storytellers. As the field grows and IDNs in their many forms become evermore popular in current culture, its practitioners must be the ones steering the conversation of how to best create and analyze these experiences. Though this study aimed to analyze one interactive documentary, the outcome of the data has provided the following insights regarding how designers can best use and evaluate the experience of interactive digital narratives.

- Using holistic frameworks that analyze more than just the physical and functional elements show more accurately where breakdowns occur in digital, interactive experiences. As an intelligent species, humans perceive, analyze, and interpret experiences using a broad spectrum of tools. So our analyses of the stories we tell ourselves using new technologies should be equally as broad.

- Each type of interactivity needs to be used strategically. No one type of interactivity is a one-size-fits-all solution, and there is no magic combination that will create the ultimate IDN. Each individual IDN falls on a spectrum, and each has its own designed purpose. The use of the types of interactivity in any one digital experience should reflect that purpose to the best of its abilities.

- Agency is vital to interactive experiences. If a user does not feel a purpose in their actions or that they are being impacted, involved, or enabled, they will desire a way to absorb the
same information or experience in a way that is less energy-intensive. It’s the same to someone saying they would rather watch a movie than read the book it was based on.

- Designers should strive for ludonarrative harmony in every moment of an interactive experience. Narrative and game mechanics are not opposing forces. Rather, they are both different types of interactivity seeking to engage a user through different means. When used as opposing forces, the two can cause immense tension within an experience.

The digital world is ever-evolving, so the tools designers use to tell stories within that digital world should evolve at an equal pace. Although using the latest and coolest technologies to create immersive spaces and stories, the execution and effects of those technologies equally as important.

5.8 Conclusion: Implications for interactive documentaries and IDNs

The technology, design and evaluation of interactive documentaries are still in their infancy. The frameworks and methodologies used in this study are not definitive answers to how we might make a truly engaging digital experience. But they are a step in the right direction of human-centered, iterative design that can more accurately identify the successes and shortcomings of these unchartered water.

For example, when I first started research for this study, I showed Bear 71 to my advisor, ready to hear her sing praises of the documentary’s novelty and innovation. Instead, she wrinkled her nose and said, “There’s a lot going on here.” She chalked it up to the fact that she is trained in graphic design and the design confused her. However, this was a clear example of how opportunities for educating and immersing a user in an important message, like that of Bear 71, can be missed if holistic analysis is not conducted in some form.
In the case of *Bear 71*, this study found that though the design and message were strong and well-received, hiccups in the interaction design prevented participants from completely accepting the interactive documentary’s message. *Bear 71* has more freedom to use weird and unique forms of interactivity, but the challenge lies in using explicit interactivity to its most efficient and effective levels.

As for evaluation of interactivity, perhaps there should be a standardized version of how to holistically evaluate all sides of a digital, interactive narrative. Graphic and visual design has its standardized six principles. Usability has its standardized methodology. Using methods and frameworks that evaluate all aspects of a user’s experience, such as Zimmerman’s modes of interactivity, Jordan’s four pleasures, and the User Experience Questionnaire are a step in the right direction.

Though explicit interactivity is the hardest form of interactivity to effectively use in an interactive digital narrative like an interactive documentary, it is important to use all forms of interactivity to tell new and innovative stories. Technology will always evolve, and as it does, so must storytelling. In February of this year, The National Film Board of Canada announced that they were launching a reimagining of *Bear 71* as a VR experience (Dao, 2017). Now users can view the interactive documentary on their phones using Google Cardboard or other smartphone VR devices. It will also be available to other VR devices like Oculus in the near future. The graphic design of the reimagining is vastly different from the original, as shown in Figure 5.7. It’s less clunky and more realistic. And users can now literally walk around Banff to follow *Bear 71* on her journey. However, the premise and ludonarrative tools are the same, which beg the same question as the original: How is the interactivity used to create the immersive experience for the user?
It is important for digital storytellers to create innovative stories and experiences for users, but it is also equally as important to understand how that story or experience affects users. Analysis will not only help us tell better stories, but also help us understand the people we tell those stories to. *Bear 71’s* expansion into VR is the next progression of storytelling Jonathan Gottschall discussed at the end of his book *The Storytelling Animal* (2012, p. 194). Gottschall wrote, “People are moving en masse from the real to the virtual world… Virtual worlds give back what has been scooped out of modern life.” Although *Bear 71* in both its original and VR forms had pain points that caused issues for participants, its general use of immersion, agency, and aesthetic created an innovative experience that emotionally, psychologically, and physically engages its users. Once a more sophisticated understanding and use of interactivity is established in the evolving, digital frontier of storytelling, we can approach a golden era of digital storytelling. As Gottschall (2012, p. 186) wrote, “The future will see an intensification, even a perfection, of what draws us to fiction [and all forms of storytelling] in the first place.”


Dao, L. (February 9, 2017). With VR in your browser, see the world like a grizzly. Retrieved from https://www.blog.google/products/google-vr/vr-your-browser-see-world-grizzly/.


Galloway, D., McAlpine, K. & Harris, P. (2007). From Michael Moore to JFK Reloaded:


experience questionnaire. *HCI and Usability for Education and Work in Lecture Note in Computer Science*. 5398. 63-76.


www.unknownphotographer.nfb.ca.


Hello!

Are you interested in interactive digital stories? My name is Jessica Pettengill, a graduate student with the Center for Emerging Media Design and Development at Ball State University. I’m looking for participants for my graduate thesis study to test an interactive documentary, which focuses on the conflict between technology and the natural environment.

The purpose of this study is to examine how interaction design in interactive documentaries affects the user experience. Current interactive digital story producers are often split between story design and interaction design. Your participation in this study will help holistically evaluate the effectiveness of both story and interaction design of the interactive documentary Bear 71.

Participants will be asked to attend a 45-minute session that will include a 20-minute experience session, two surveys, and a semi-structured interview. Sessions will be scheduled to begin November 26. To qualify as a participant, you must be:

- Age 18 years or older
- Speak English fluently
- Not have previously experienced the interactive documentary Bear 71.

If you are interested in participating or would like more information about the study, please contact me. Additionally, if you know someone that qualifies and may also be interested in this study, feel free to share this information.

Contact information: jmpettengill@bsu.edu

This thesis is IRB approved: [916882-1]

Thank you for your consideration,
Jessica Pettengill
APPENDIX B

USER EXPERIENCE QUESTIONNAIRE

Please make your evaluation now.
For the assessment of the product, please fill out the following questionnaire. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites. You can express your agreement with the attributes by ticking the circle that most closely reflects your impression.

Example:

| attractive | ○ | ☒ | ○ | ○ | ○ | ○ | ○ | unattractive |

This response would mean that you rate the application as more attractive than unattractive.

Please decide spontaneously. Don’t think too long about your decision to make sure that you convey your original impression. Sometimes you may not be completely sure about your agreement with a particular attribute or you may find that the attribute does not apply completely to the particular product. Nevertheless, please tick a circle in every line.

It is your personal opinion that counts. Please remember: there is no wrong or right answer!
Please assess the product now by ticking one circle per line.

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APPENDIX C

SEMI-STRUCTURED INTERVIEW QUESTIONS

Study Title: The pleasurability of interactivity: A user-experience study of Bear 71
Participant #: 
Date:

Please answer the following questions as openly and honestly as possible. There are no wrong answers.

1. What was your initial reaction to Bear 71?
2. What elements of Bear 71 stood out to you? For example, was there anything in the documentary that interested you more or held your attention longer than others?
3. How do you think the design of Bear 71 affected your ability to understand the story?
4. What do you think was the intended purpose of Bear 71? Do you think they were successful? Why or why not?
5. What elements would you change or improve in Bear 71 and why?
6. Is there anything else you would like to add?
# APPENDIX D

## CODED INTERVIEW STATEMENTS

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## APPENDIX E

### UEQ SURVEY DATA

**Raw Survey Data**

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Transformed Data
The order of the positive and negative term for an item is randomized in the questionnaire. Per dimension half of the items start with the positive and half with the negative term.
Here you can find the transformed values per item. You can use these values for example for own statistical calculations. The +3 represent the most positive and the -3 the most negative value.

| Word Pairings | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1             | 1 | 2 | 2 | 0 | 2 | 2 | 1 | 1 | 3 | -1 | -1 | -3 | -2 | 3 | 0 | -3 | 2 | 0 | -2 | -2 | 1 | -2 | 1 | -1 | 3 |    |
| 2             | 3 | 3 | 2 | 3 | 1 | 3 | 1 | 2 | 0 | -1 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 0 | 2 | 2 | 3 | -3 | -1 | 1 | 1 |    |
| 0             | 1 | 0 | 3 | 2 | 0 | 1 | 1 | 0 | 2 | 3 | -2 | 0 | -1 | 0 | 3 | 1 | 3 | 0 | 1 | -2 | -2 | 2 | -1 | 3 | -1 | 2 |
| 3             | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 0 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 |
| 1             | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 2 | 1 | -1 | -1 | -2 | 0 | -2 | 0 | -2 | 2 | 1 | -1 | -1 | -2 | 1 | -1 | 1 |    |
| 0             | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 0 | 2 | -1 | 3 | -2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | -2 | 1 | -1 | 0 | 0 | 1 |    |
| 1             | 1 | 3 | 0 | 2 | 1 | 3 | 3 | 3 | 3 | 1 | 2 | -1 | 0 | 2 | 1 | 3 | 3 | 2 | 1 | -1 | 1 | -1 | 2 | 0 | 3 |    |
| 0             | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 3 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | -1 | 0 | -1 | 2 | 1 | 3 |    |
| 1             | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | -1 | 2 | -1 | 1 | 1 | 0 | 0 | -1 | 1 | -1 | -2 | 1 | 2 | 2 | 1 | 2 |
| 1             | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |    |
| 3             | 0 | 3 | 2 | 3 | 3 | 3 | 2 | 0 | 2 | 2 | 3 | 1 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 0 | 2 | 0 | 3 | 1 | 3 |
| 2             | 0 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 3 | -1 | 2 | 3 | 2 | 0 | 2 | 0 | 2 | -1 | 3 | 3 | 3 | 3 | 3 |    |
| 2             | 1 | 3 | 0 | 2 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | -1 | 3 | 3 | 3 | 3 | 3 | 3 | -2 | 1 | 0 | 3 | 1 | 2 |    |
| 1             | 1 | 3 | 2 | 3 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | -2 | 1 | 1 | 2 |
| 2             | 2 | 3 | 1 | 3 | 2 | 3 | 2 | 0 | 3 | 2 | 2 | -1 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | -1 | 3 | 0 | 1 | 1 | 2 |