

Lights, camera, interaction!
Interactive Film and its
Transformative Potential.

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Abstract

This thesis concentrates on the emerging field of interactive film. Digital interactive and networked media offer so many possibilities to create stories that it is necessary to define what an interactive film is and whether there is any continuity with the linear film form.

This thesis explores whether interactive narratives in the form of interactive film have the potential to offer a transformative learning experience regarding societal and political topics. *Butterfly* is an interactive short film that uses a second-screen technique to raise awareness of the dangers of cyberbullying. As a case study for a potential transformative experience, the film is described and evaluated by means of interactive screenings and a user experience study. Findings show there is definite potential for interactive films to create strong emotions in users and to possibly produce a transformative experience with educational implications.

Keywords: Transformative design, Interactive Narrative Design, Interactive film, User Experience Evaluation.

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This project is dedicated to everyone who has suffered or is suffering from bullying. Things get better, I promise.

Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as references.

Introduction

In 1995, the famous film critic Roger Ebert strongly criticised interactive film. “We don’t want to interact with a movie. We want it to act on us. That’s why we go, so we can lose ourselves in the experience.”¹ As seen with recent interactive films such as *Black Mirror: Bandersnatch* (David Slade, 2018) and *Possibilia* (Daniel Scheinert & Dan Kwan, 2014), Roger Ebert’s statement is reductive because interactivity is a powerful device to develop stories which are emotionally gripping, thought-provoking and in some cases transformative for viewers.

Interactivity refers to “an active relationship between two entities.”² As Chris Crawford explains in his book on interactive storytelling, interaction should not be confused with the words “reaction” and “participation.”³ A reaction is a one-way process, and participation can simply entail being part of something without truly interacting, whereas the word interactive refers to a two-way exchange. Film is “a series of moving pictures, usually shown in a cinema or on television and often telling a story.”⁴ For the purpose of this thesis a working definition of interactive film was created: “Interactive film is an experience made of prerecorded moving images, focused on narrative in which users influence the direction and/or outcome of an unfolding fictional storyline through their choices thanks to a limited type of interactivity that is sometimes imperceptible to the user.” This working definition was inspired by the many films seen and readings done for this thesis and will be used to understand this type of storytelling and compare it to other media. The rationale for this definition will be provided through the 1st Chapter, particularly in the section comparing interactive films to video games (p.23).

Many words have been used to refer to people watching interactive films, such as vuser,⁵ viewer,⁶

¹ Brian Moriarty, *Two-Minutes Hate: Siskel & Ebert on Interactive Movies*, (1995), online video recording, *YouTube*, 25 November 2015, <<https://youtu.be/xB3-ypalMS8>>, [Accessed 28 March 2020].

² Carolyn Handler Miller, *Digital Storytelling: A creator’s guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 58.

³ Chris Crawford, *Chris Crawford on Interactive Storytelling* (San Francisco: New Riders, 2013), p. 43.

⁴ ‘Film’ in *The Cambridge English Dictionary* [online] <<https://dictionary.cambridge.org/dictionary/english/film>>, [Accessed 17 October 2020].

⁵ W. C Seaman, ‘Recombinant Poetics: Emergent Meaning as Examined and Explored Within a Specific Generative Virtual Environment’, (PhD, University of Wales, 1999).

participant,⁷ and doer.⁸ The term “user” will be employed here because it “fits all types of interactive experiences.”⁹ The transformative effect of a project on users is seen as it encourages users to engage in reflection that affects their beliefs or actions outside or exogenous to the experience. While non-interactive content has proven its transformative potential numerous times through social movements^{10 11} or specific psychological research,¹² interactivity has the unique ability to let users see the responses to their choices happen before their eyes. This creates a sense of agency in users that can lead to a greater interest in events, in the story or in information shared which can lead to a change of opinion¹³ or even of behaviour.¹⁴

For didactic purposes this thesis will look at the potential of interactive film to increase pro-social behaviour through its ability to raise awareness and empathy and create insight. This will be measured by means of interactive screenings and a user experience study composed of both open-ended qualitative questions and psychometric PX measures.

The interactive films in existence at the time Roger Ebert made his statement, in 1995, seemed to rely on the core concept of interactivity to attract the audience, without developing complex narratives or interactive techniques. They were seen by many as “B-Grade films.”¹⁵ Today, the technological possibilities of the digital age have led “to the creation of new forms of the interactive

⁶ Kristen M. Daly, ‘Cinema 3.0: The interactive-image’, *Cinema Journal*, 50.1 (2010). pp. 81–98. <https://www.researchgate.net/publication/239858896_Cinema_30_The_Interactive-Image>, [Accessed 13 July 2020].

⁷ Ken Feingold. ‘OU: Interactivity as Divination as a Vending Machine’, in *Leonardo*, 28.5, (1995), pp. 399–402 <www.jstor.org/stable/1576224>, [Accessed 28 September 2020].

⁸ G. Davenport, B. Bradley, ‘The Care and Feeding of Users’, in *IEEE Multimedia*, 4.1 (1997). p. 8.

⁹ Carolyn Handler Miller, *Digital Storytelling: A creator’s guide to Interactive Entertainment* (Oxford: Focal Press, 2004), p. 59.

¹⁰ Sophie Martinez, ‘11 Films that Inspired Social Change’, *Moviemaker.com*, 1 August, 2020, <<https://moviemaker.com/11-films-that-inspired-social-change/>>, [Accessed 20th April 2021].

¹¹ Tobias Greitemeyer, ‘Effects of Prosocial Media on Social Behavior: When and Why Does Media Exposure Affect Helping and Aggression?’ in *Current Directions in Psychological Science*, 20.4, (2011), pp. 251–255. <<https://www2.psych.ubc.ca/~schaller/308Readings/Greitemeyer2011.pdf>>, [Accessed 19 February 2021].

¹² Curtis P. Haugtvedt, Jeff A. Kasmer, ‘Attitude change and persuasion’ in *Handbook of Consumer Psychology*, (New York: Routledge, 2008), <<https://doi.org/10.4324/9780203809570>>, [Accessed 23 November 2019].

¹³ Jeeyun Oh, S. Shyam Sundar, ‘How Does Interactivity Persuade? An Experimental Test of Interactivity on Cognitive Absorption, Elaboration, and Attitudes’ in *Journal of Communication*, 65.2, (April 2015), pp. 213–236, <<https://academic-oup-com.libproxy.york.ac.uk/joc/article/65/2/213/4082299>>, [Accessed 11 November 2019].

¹⁴ Christian Roth, Harmut, Koenitz, ‘Evaluating the User Experience of Interactive Digital Narrative’, in *AltMM '16: Proceedings of the 1st International Workshop on Multimedia Alternate Realities*, (2016), pp.31–36. <<https://doi.org/10.1145/2983298.2983302>>, [Accessed 13 November 2020].

¹⁵ Janet Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (New York: The Free Press, 1997), p. 192.

film that were not possible before.”¹⁶ Examples include the possibility of presenting an interactive story with “no cut to black, no judder, no dramatic record wiping sound, not even a momentary still frame”¹⁷ or creating interactive stories using “inexpensive technology that could be carried in a rucksack and installed in freeform spaces.”¹⁸ This thesis makes use of today’s technological possibilities to explore to what extent interactivity in film can be used for more than just entertainment. Through the creation of an interactive film with a second-screen experience and a survey of viewers’ answers, a response to the following question is attempted:

- How can interactive film be used to create an informative and transformative experience for the user?

This research question originated from a personal observation that despite the vast capabilities of interactivity as a tool to educate and inform viewers, its use is generally reduced to a “fun” device. In most interactive films, there is no real justification for their use of interactivity. Interactive films such as *Late Shift* (Tobias Webber, 2016) or *Mr. Payback: An Interactive Movie* (Bob Gale, 1995) rely on interactivity to entertain users, resulting in choices that are mostly either action-packed/violent or very funny (figure 1). Their interactive element is not necessarily valuable for the story or the character development, making these productions closer to games than films. There are of course interactive films that use interactivity to push the boundaries of narrative techniques such as *Kinoautomat* (Radúz Činčera, 1967) and *Possibilia* (Daniel Scheinert & Dan Kwan, 2014) that play with the idea of the predestined “unhappy” ending (user choices have no impact), or to create strong feelings in viewers (the TV drama *Black Mirror: Bandersnatch* (David Slade, 2018) uses interactivity to generate in the audience the feelings of frustration and confusion felt by the character), and many iDocs (interactive documentaries, web-docs, transmedia, docu-games, and interactive factuals) that aim to educate with their interactive content such as *Welcome*

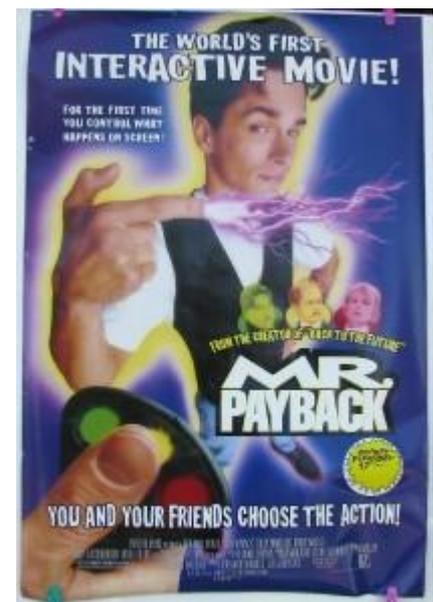


Figure 1: in *Mr. Payback: An Interactive Movie*, users can choose to have the headmistress of a private school torture the handcuffed hero with a cattle prod, or choose which celebrity guest appears on screen.

¹⁶ Patty Kostkova, Andreea Molnar, ‘Learning through Interactive Digital Narrative’, in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç  brahim Sezen, (New York: Routledge, 2015), p. 36.

¹⁷ Kathryn VanArendonk, ‘Is Black Mirror: Bandersnatch the Dawn of Interactive TV?’, *Vulture.com*, 28 December, 2018, <<https://www.vulture.com/2018/12/black-mirror-bandersnatch-netflix-interactive-tv.html>>, [Accessed 2 February 2020].

¹⁸ Chris Hales, ‘Interactive Cinema in the Digital Age’, in *Interactive Digital Narrative History, Theory and Practice*, (New York: Routledge, 2015), p. 46.

to *Pine Point* (Simons and Shoebridge, 2011) and *Netwars* (Lena Thiele, 2014). However, iDocs require very active participation and do not often use the structures and conventions of film: they are more similar to games or online surfing “shaped by the internet affordances,”¹⁹ and do not use interactivity at its full didactic potential because they are unable to draw on powerful filmmaking conventions (such as character development, dramatic structure, etc).

Researching how interactive film can have the effect of creating an emotional and cognitive response in users, and in some cases elicit transformation, is important because it will not only take us one step closer to exploring the creative and meaningful possibilities of interactive storytelling, but will also advance the fundamental quest for ways in which art and technology can improve the world. Only a few studies exist so far that evaluate the effectiveness of interactive (digital) narratives.^{20 21 22 23} Findings of these studies suggest that interactive narratives may be effective tools for raising awareness and empathy, creating insight, and increasing pro-social behaviour, and this thesis will attempt to see how this can be achieved with interactive film in particular. The results of this research will be useful for both researchers investigating the persuasive potential of interactive storytelling, and interactive storytellers interested in building didactic second-screen experiences.

The following thesis comprises three chapters and a conclusion. The first chapter attempts to define interactive storytelling by comparing it to other media that have shaped the genre through their narrative techniques (literature, cinema and theatre) and their use of interactivity (theatre, TV and video games). Other forms of art such as arts and crafts and music were excluded because they do not rely as strongly on storytelling and narrative and do not use screens and characters as often to convey story. These comparisons will help to understand the complexity of interactive storytelling, providing inspiration for the ways in which interactive film can diverge from the primarily entertainment purpose of many interactive stories. The research collected is from academic studies about interactivity in films and video games, and academic work on psychology, but also from

¹⁹ F. Bonino, ‘*Is Interactivity in Interactive Documentaries Exploited at its Full Potential*’, (MA, London College of Communication, 2011), p. 3, <http://www.interactivedocumentary.net/wp-content/2011/09/final_dissertation_Filippo-Bonino.pdf>, [Accessed 03 March 2020].

²⁰ M. C. Green and K. M. Jenkins, ‘Interactive Narratives: Processes and Outcomes in User Directed Stories’ in *Journal of Communication*, 64.3, (2014), pp. 479–500.

²¹ Sharon T. Steinemann, Elisa D Mekler & Klaus Opwis, ‘Increasing Donating Behavior Through a Game for Change’, in *CHI PLAY '15: Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, (New York: Association for Computing Machinery, 2015).

²² Sharon T. Steinemann et al, ‘Interactive Narratives Affecting Social Change,’ in *Journal of Media Psychology*. 29, (2017), pp.54–66.

²³ S. Parrott, F.R.D. Carpentier and C.T. Northup, ‘A Test of Interactive Narrative as a Tool Against Prejudice’, in *Howard Journal of Communications*, (2017), pp. 1–16.

literature, video games and interactive films, and interviews with specialists and directors involved in interactive films. The second chapter explores the practical problems specific to the medium of interactive storytelling through a practice-based enquiry. This strategy has been supported by other practice-based research projects exploring the emotional effect of games on users²⁴ ²⁵ or the best ways to design interactive experiences.²⁶ This chapter describes the creation of *Butterfly*, an interactive anti-bullying short film. *Butterfly* is a second-screen experience where the viewers see the story of Lisa, a victim of cyberbullying, unfold on two devices simultaneously. On the main screen (which would ideally be a cinema screen but was mostly a computer for most participants of the study), the audience follows the story of Lisa.



Figure 2: The poster of *Butterfly* revealing Lisa, the main character of the interactive film.

Lisa is a red-haired teenager, who is excited about all her schoolmates meeting her new boyfriend Josh. However, her perfect world is rocked when a fellow schoolgirl, Jess, is jealous and decides to torment Lisa. Each morning Lisa faces an increasing level of bullying in the form of face-to-face insults and mean texts about her looks, and even physical violence. Josh breaks up with her due to her reputation and Lisa is left devastated.

Synchronously to the story screened, users see on their own phones the online bullying Lisa has to face every day. At the end of the short film, they are asked to vote on their phone to see (or not see) a controversial picture of Lisa. The choice with the most votes results in one of the two possible endings: either Lisa cuts off her beautiful ginger hair because of the bullying, or her teacher, alerted by her ex-boyfriend, forces her bully to delete all the messages. Regardless of the winning choice, the controversial pictures are never shared, to make sure the users focus on the ending. (The film can be seen at <https://interstory-butterfly.web.app/> or on the video file accompanying this thesis called *Gallon_203034979_VideoFile.mp4*). The initial prototype of this interactive film was created

²⁴ Julia Ayumi Bopp, Klaus Opwis, Elisa D. Mekler, ‘“An Odd Kind of Pleasure”: Differentiating Emotional Challenge in Digital Games’, in *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, (New York: Association for Computing Machinery, 2018).

²⁵ Glenna H. Iten, Sharon T. Steinemann, Klaus Opwis, ‘Choosing to Help Monsters: A Mixed-Method Examination of Meaningful Choices in Narrative-Rich Games and Interactive Narratives’, in *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, (New York: Association for Computing Machinery, 2018).

²⁶ Jon Hook, ‘Interaction Design for Live Performance’, (PhD, Newcastle University, 2013).

before this thesis, for a previous university project. Similarly to the version analysed and discussed in this thesis, it was made in an attempt to touch users on the topic of bullying, and maybe even alter their behaviours when confronted with bullying. The two versions are different: the main film has been edited and colour-graded to create a more immersive experience depicting bullying in a realistic manner, and the interactive second screen has been completely redesigned. The differences between the versions are discussed in the second chapter as well as in Appendix 4. The third chapter outlines the testing phase, analysing feedback from the users in the form of open-ended qualitative answers and psychometric PX measures after viewing *Butterfly*. Finally, this thesis concludes with a reflection on the process and how the findings can inform the persuasive power of interactivity in film.

CHAPTER 1

Literature Review: What Is Interactive Storytelling in Film?

“I think some people will judge it just on a narrative basis, some people will judge it as a game,” he said. “It’s not up to us. It’s down to them.” Jones disagreed. “It wasn’t really designed as a game. It was designed as a cinematic experience.” “With game-y elements,” Brooker persisted. “You are making decisions. You are actively guiding it.”²⁷

Charlie Brooker and Annabel Jones, respectively writer and executive producer of *Black Mirror: Bandersnatch* (David Slade, 2018) disagreeing on the nature of their creation - *The New York Times* (Dec 28/2018).

“Hyper Movie,”²⁸ “cinematic FMV adventure game,”²⁹ “interactive film,” “Cinema 3.0,”³⁰ etc. No two academic scholars, journalists or even filmmakers seem to agree on which term to use when describing interactive film. Chris Crawford extends this issue to interactive storytelling and sums up the problem in *Chris Crawford on Interactive Storytelling*: “Interactive Storytelling is so new that nobody has any idea of what it is or how it works.”³¹ In his book he points out that Interactive Storytelling is seen differently in various creative fields. From a form of cinema to A.I., the purpose, functions and even names given to interactive storytelling vary enormously. Crawford’s statement is more than 20 years old and yet the debate has not ended. In 2008, the IRIS project³² (Integrating Research in Interactive Storytelling) identified authoring as an area of concern, while Andrew Stern argued for a focus on AI³³ and Janet Murray in 2010 identified a need to consider

²⁷ David Streitfeld, ‘Black Mirror Gives Power to the People’, *The New York Times*, 28 December, 2018, <<https://www.nytimes.com/2018/12/28/arts/television/black-mirror-netflix-interactive.html>> [Accessed 17 April 2019].

²⁸ Demaria Rusel, *The 7th Guest: The Official Guide*, (California: Prima Publishing, 1993), p. 344.

²⁹ Mike Diver, ‘Late Shift is an Intriguing Failure of an Fmv Game’, *Vice.com*, 19 April, 2017, <https://waypoint.vice.com/en_us/article/kbvzzz/late-shift-is-an-intriguing-failure-of-an-fmv-game>, [Accessed 28 April 2019].

³⁰ Kristen Daly, ‘Cinema 3.0: The Interactive-Image’, in *Cinema Journal*, 50.1, (2010), p. 81.

³¹ Chris Crawford, *Chris Crawford on Interactive Storytelling*, (San Francisco: New Riders, 2013), p. 43.

³² M. Cavazza and others, ‘The IRIS network of excellence: integrating research in interactive storytelling’, in *Interactive Storytelling: First Joint International Conference on Interactive Digital Storytelling*, (Heidelberg: Springer, 2008), pp. 14–19.

³³ A. Stern, ‘Embracing the combinatorial explosion: a brief prescription for interactive story R&D’, in *Lecture Notes in Computer Science*, 5334, (Heidelberg: Springer, 2008), pp. 1–5.

design conventions.³⁴ Recently (in 2018) there has been an attempt at forming a clear field through the name IDN: Interactive Digital Narrative. Koenitz insisted that the “tedious and repetitive”³⁵ debate opposing ludology to narratology, or games to movies, needed to stop. This attempt at uniformisation of ideas is still unsatisfactory because of a disagreement between different groups on what matters most when it comes to interactive storytelling. As a result a wide variety of groups are developing their own object-based media (OBM) softwares (see figure 3) and are not focusing on collaboration or the creation of stimulating interactive content.

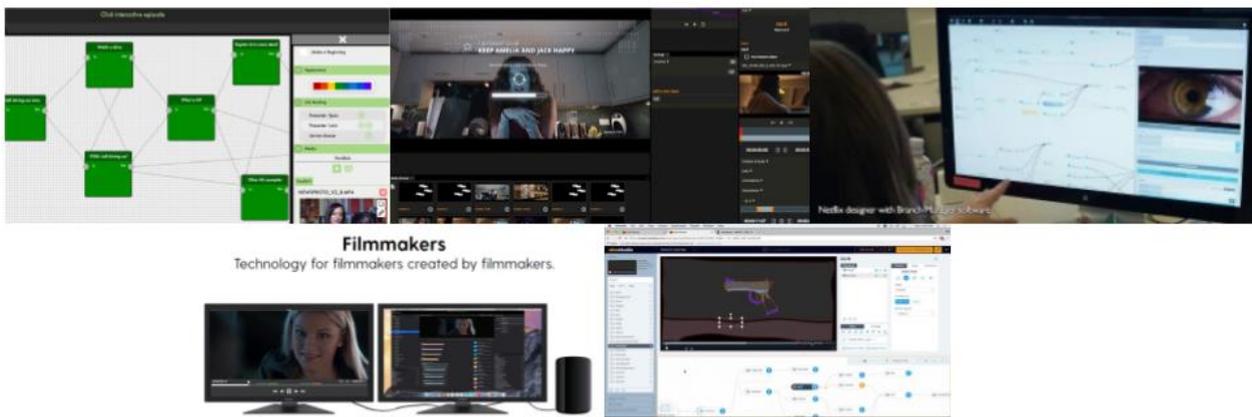


Figure 3 : Many companies are simultaneously developping their OBM Softwares. From left to right: BBC R&D has developed *Storykit*,³⁶ the Digital Creativity Labs *Cutting Room*,³⁷ Netflix *Branch Manager*,³⁸ Ctrl Movie *Ctrl Movie* and Eko *Eko Studio*.

There are many barriers to collaboration and content creation for interactive filmmakers that will be discussed at other points in the thesis. (See “the obstacles to the adoption of interactive film” on page 27).

Although the focus of this thesis is on the creation of a persuasive interactive film, other existing forms of storytelling can inspire interesting interactive and narrative techniques. This chapter will

³⁴ Janet H. Murray, *Inventing the Medium: Principles of Interaction Design as a Cultural Practice*, (London: MIT Press, 2012), <<https://www.jstor.org/stable/j.ctt5hhjgg>>, [Accessed 12 January 2020].

³⁵ Harmut Koenitz, ‘Thoughts on a Discipline for the Study of Interactive Digital Narratives’, in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018)

³⁶ Mike Armstrong and others, ‘Taking Object-Based Media from the Research Environment Into Mainstream Production’, in *SMPTE Motion Imaging Journal*, 129.5, (2020), pp. 30-38.

³⁷ Marian F. Ursu and others, ‘Authoring Interactive Fictional Stories in Object-Based Media (OBM)’, in *IMX '20: ACM International Conference on Interactive Media Experiences*, (New York: Association for Computing Machinery, 2020).

³⁸ Devon Ivie, ‘Netflix Created Wild Software for Black Mirror: Bandersnatch’, *Vulture*, 30 December 2018 <<https://www.vulture.com/2018/12/netflix-created-wild-software-for-black-mirror-bandersnatch.html>>, [Accessed 29 March 2020].

attempt to define what is interactive film by comparing it to other media, by seeing the obstacles to the adoption of interactive film as and by exploring the informative potential of the interactive format.

1.1. - Interactive Film and its Roots in Past Media

Interactive film might be a relatively new medium, often traced back to *Kinoautomat* (Radúz Činčera, 1967)³⁹ but it has deep roots in media such as literature, theatre and cinema. Understanding the narrative structures, how they create emotions in viewers and also the limitations of different ways to tell stories is essential for today's creators especially when trying to create a transformative experience.

1.1.a) Most Interactive Narrative Structures come from Literature and Theatre

Some non-linear structures and storylines used in interactive narratives can feel new and exciting, but have existed for centuries through other media such as literature and cinema. Many scholars such as Lev Manovich,⁴⁰ Janet Murray⁴¹ and Marie-Laure Ryan⁴² have tried to separate the different kinds of non-linear narratives. Benjamin Hoguet created a clear graphic⁴³ (see Figure 1) to define 6 recurrent interactive structures. Understanding the different types of narrative structures and frameworks that can be employed, as well as examples of stories relying on these techniques is essential when attempting to create an informative, immersive and engaging interactive experience.

³⁹ Chris Hales, 'Interactive cinema in the Digital age', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç İbrahim Sezen, (New York: Routledge, 2015), p. 46.

⁴⁰ Lev. Manovich, *The Language of New Media*, (Cambridge, Mass.: MIT Press, 2001), p. 40.

⁴¹ Janet H. Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, (Cambridge, Mass: MIT Press, 2000), p. 71.

⁴² Marie-Laure Ryan, 'Beyond Myth and Metaphor: the Case of Narrative in Digital Media' in *International journal of computer game research*, 1, (2001), <<http://gamestudies.org/0101/ryan/>>, [Accessed 29 April 2020].

⁴³ Benjamin Hoguet, *Créer et Produire pour les nouveaux médias*, (Paris: Dixit, 2016), p. 140.



Figure 4: Benjamin Hoguet noted 6 specific types of narrative structure that recur in interactive narratives.

Translation:

“Typology of interactive narratives

Linear - Elastic - Concentric - parallel - branching - Constellation

The author keeps most of the control

The public has most of the control

What Benjamin Hoguet calls the elastic structure can be seen as a modernisation of book commentaries such as the Talmud, which annotates the Old Testament stories with rabbinical commentary, including interpretations and additional stories, in hypertextual form.

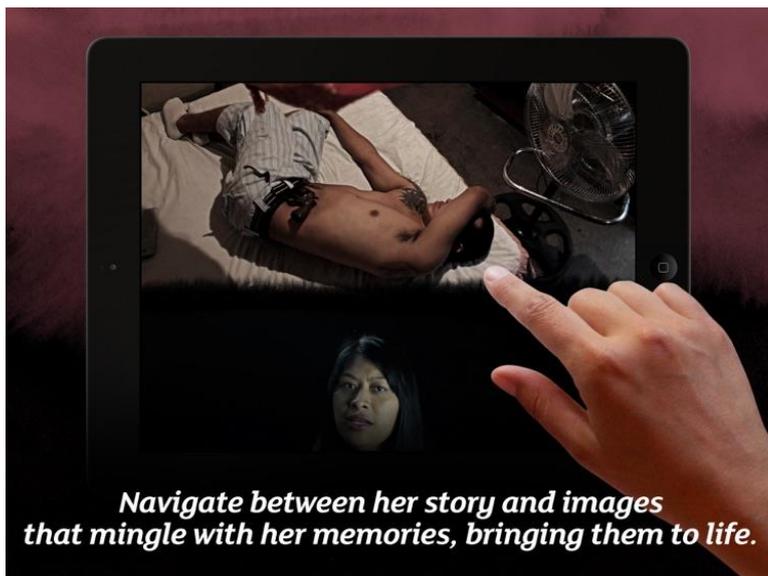


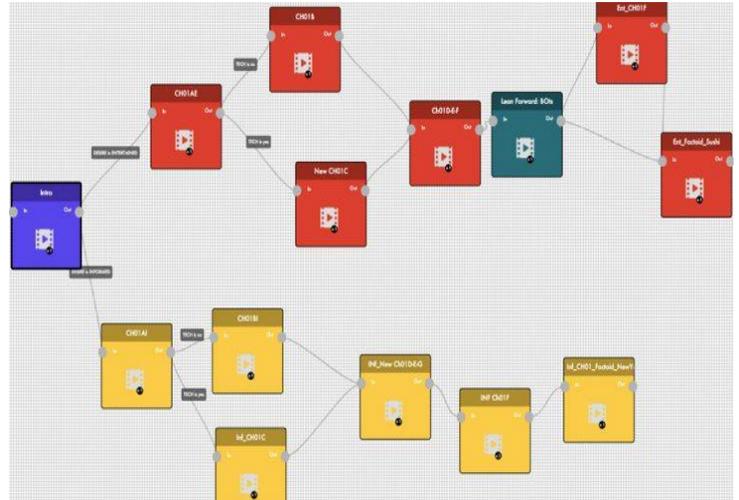
Figure 5: Today it is common to be able to see annotations and additional content while watching a story - the only difference is you must click on a button to see it. Examples include *Alma: A Tale of Violence* (Miquel Dewever-Plana & Isabelle Fougère, 2012) as seen on the left, and *A Short History of the Highrise* (Katerina Cizek, 2013). This technique has good informative potential as it asks users to pause in the story to read specific information. This suggests they will focus fully on the information, but it might also break their immersion and engagement in the story if it repeatedly leads them to interrupt the main content.

The concentric structure, also called the modular structure⁴⁴ by Carolyn Handler Miller, works as a “hub” where users choose a storyline to focus. During the International Conference on Interactive

⁴⁴ Carolyn Handler Miller, *Digital Storytelling: A creator's guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 124.

Digital Storytelling, Janet Murray argued that this kind of narrative structure might come from Gilgamesh or the canonical Christian Bible, both of which existed in multiple versions even in antique times.⁴⁵

Figure 6: The narrative structure of *Instagramification* (BBC R&D, 2019) reveals that the content is personalised at the beginning. After information is gathered about the type of content the users enjoys, multiple scenes can be shown without any interaction (see the yellow narrative branch). Other interactive films using this type of interactivity include *Brooke Leave Home* (DC Labs, 2020),⁴⁶ and *In Limbo* (Leo Bridle & Leo Powell, 2013). This type of content is an interesting tool to create personalised content that will engage users. However, it limits the interactivity during the experience, and can be experienced as passive content by users who do not notice they are watching content adapted for them.



Parallel narratives can be traced back to the 19th century with *Wuthering Heights* which tells overlapping parts of the same larger story from multiple narrators' standpoints.

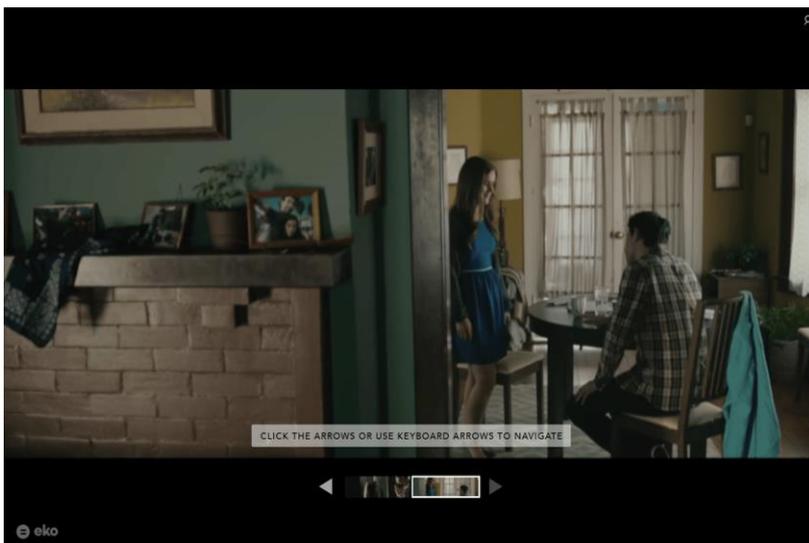


Figure 7: *Possibilia* is an example of an interactive film with parallel narrative. Parallel narratives are a very popular narrative choice, made for interactive films such as *Wei or Die* (Simon Bouisson, 2015) and *Possibilia* (Daniel Scheinert & Dan Kwan, 2014). As the image of *Possibilia* above shows, users can navigate between the various parallel storylines, In these narratives, the user is an observer. They do not impact the storyline but watch it unfold in various ways. This type of narrative is interesting for developing feelings of curiosity or powerlessness.

⁴⁵ Janet H. Murray, 'Research into Interactive Digital Narrative: A Kaleidoscopic View', in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018).

⁴⁶ Concannon, Shaune and others, 'Brooke Leave Home: Designing a Personalized Film to Support Public Engagement with Open Data', in *Proceedings of the ACM CHI 2020 Conference on Human Factors in Computing Systems*, (University of York: Association for Computing Machinery, 2020), pp. 1-14 <[https://pure.york.ac.uk/portal/en/publications/brooke-leave-home\(63f8ecd1-f822-4279-8d20-016a1a9a5cc4\).html](https://pure.york.ac.uk/portal/en/publications/brooke-leave-home(63f8ecd1-f822-4279-8d20-016a1a9a5cc4).html)>, [Accessed 15 June 2019].

Hoguet's fifth type of narrative, the branching narrative, is the most commonly-used type of narrative in interactive film. This type of narrative can be good to create informative interactive experiences because the dilemmas the users face can relate to complex issues present in our societies, and raise awareness about those issues.

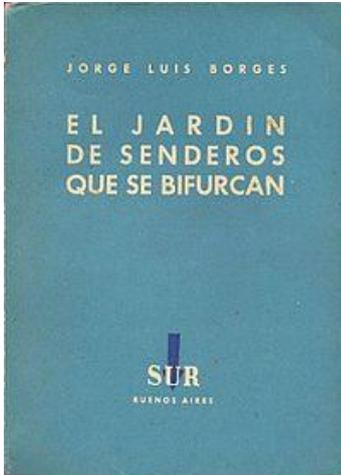


Figure 8: The idea of branched possibilities can be traced back in literature to *The Garden of Forking Paths* (original Spanish title: "*El jardín de senderos que se bifurcan*") written by Jorge Luis Borges in 1941. In this short story Borges described a novel that can be read in multiple ways, linking this concept with the idea of understanding humanity. The kind of text Borges described is now defined as "HyperText"⁴⁷ allowing the reader to "jump" to certain points in the story that became very popular in literature with the Choose-Your-Own-Adventure books created in 1979, a key inspiration behind many interactive stories. Branching narratives are able to confront users with complex dilemmas and make them think about the ways in which they decide to face the problems presented to them.

Finally, constellation narratives involve many components of content linked by a tag system, a date, a theme or any other relevant piece of information. This type of narrative can be seen in informative books such as Dictionaries and Encyclopaedias which order information by alphabetical order or dates. This narrative form can be an interesting device to inform users about a topic: dates could for example be the starting system for a film based on historical events.



Figure 9: In *Telling Lies* the narrative structure unfolds through keywords chosen by the user. This example of constellation narrative as well as *Her Story* (Sam Barlow, 2015) prove parallel narratives can be a great storytelling device.

⁴⁷ George Landow, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology*, (Baltimore: The John Hopkins UP, 1997), p. 12.

The fact that most of the narrative structures seen in interactive films can be found in pre-existing forms of stories indicate that many elements of this relatively new type of storytelling actually already exist, and have been tried out and studied in the past. Understanding previous types of narrative and seeing their potential and effect on the public can help to create an engaging and informative interactive film.

As well as the narrative structures above, some recurrent storytelling codes made to immerse and involve users in stories are prevalent in interactive films. The main one is the three-act structure, described by Aelius Donatus in the fourth century A.D.⁴⁸ and by Syd Field in his 1979 book *Screenplay: The Foundations of Screenwriting*.⁴⁹ This is a key idea in many forms of storytelling including interactive narratives that can be useful to create content users will engage with.

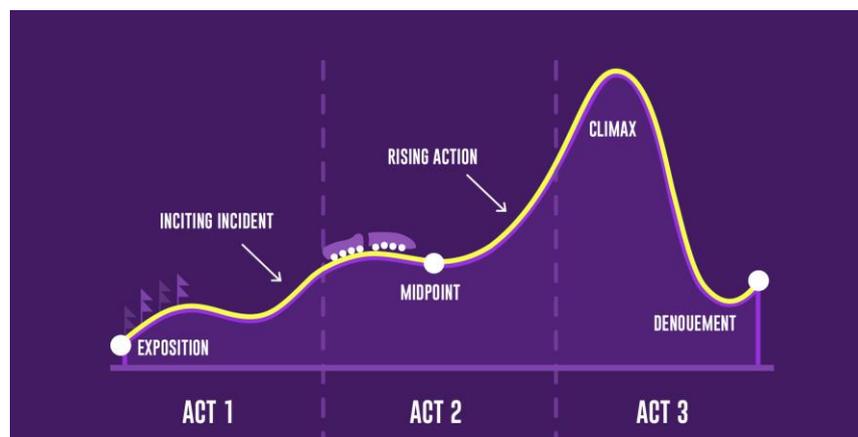


Figure 10: Syd Field and Aelius Donatus both argue that a story is divided into three acts, one for exposition, one for “rising action” and one for resolution or “climax.” This approach to structure defines the story as a tool to transform the character from one state to another.

The structure but also the point of view are key to the way a story is told because point of view is a very efficient tool to convey different emotions, expectations and to give insight on character’s personalities and internal dilemmas (see examples below). A theorist of narratology (the theory of narrative), Gerard Genette, identified the narrative modes that distinguish points of view and different types of narrators.⁵⁰ All of these are present in today’s interactive films, as the examples below show:

⁴⁸ Chrysanthi Demetriou, ‘Aelius Donatus and His Commentary on Terence’s Comedies’, in *The Oxford Handbook of Greek and Roman Comedy* (New York: Oxford University Press, 2013), <[10.1093/oxfordhb/9780199743544.013.041](https://doi.org/10.1093/oxfordhb/9780199743544.013.041)>, [Accessed 09 January 2020].

⁴⁹ Syd Field, *Screenplay: the Foundations of Screenwriting*, (New York: Delta Trade Paperbacks, 2005).

⁵⁰ Gérard Genette, *Figures III*, (Paris: Seuil Poétique, 1972).



Figure 11: External focus is when the story is told by an external narrator. It can be seen in *Black Mirror: Bandersnatch* in which the user controls Stefan's choices. This technique can be used to give a sense of power and knowledge to the user such as in the scene reuniting fiction and reality in which users can tell Stefan they are controlling him through Netflix.

Figure 12: Internal focus is when the story is told by an intradiegetic narrator such as in *Carmen Sandiego: To Steal or not To Steal* (Jos Humphrey, Kenny Park, 2020), in which the user acts as Carmen when making decisions. This technique creates a sense of connection and intimacy with the character.

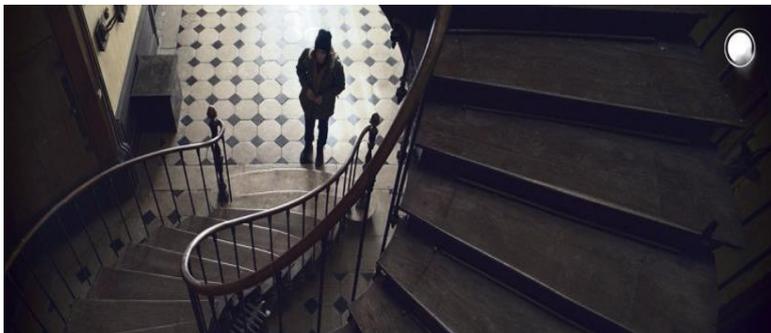
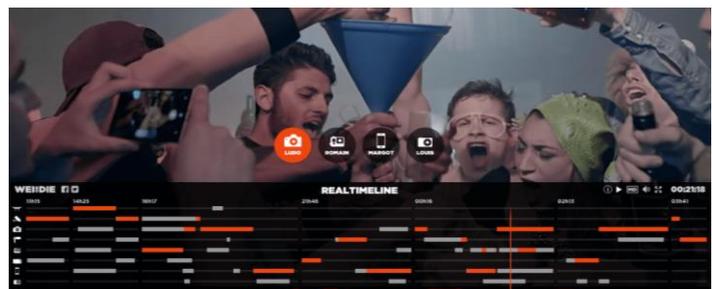


Figure 13: Zero focus is when the narrator knows everything, which is much more than the characters, such as in *Ordesa* (Nicolas Pelloile-Oudart, Frédéric Jamain, 2020) in which users are a ghost that is present in the house. This device is interesting to create an observational point of view. Users can play with their knowledge to guide their choices and impact the character's experience and reactions.

Figure 14: Variable focus is found in stories where the focus moves from one character to another, such as in parallel narratives like *Wei or Die* (Simon Bouisson, 2015) where users switch between phone cameras to see the different characters. This is a great tool to develop suspense and mystery.



Finally, even the type of characters seen in interactive film are borrowed from many literary codes and techniques noted in narratology, the study of narrative that began in Russia with Vladimir Propp and his book *Morphology of the Folktale* with ideas that can trace their theoretical lineage back to Aristotle's *Poetics*.⁵¹ In narratology, the actantial model developed by Algirdas Julien Greimas in 1966⁵² presents the idea that stories use six types of characters (the subject, the object, the opponent, the helper, the sender, the receiver). This can be seen in most interactive films (*Black Mirror: Bandersnatch* (David Slade, 2018) and *Late Shift* (Tobias Weber, 2016) to only name a few). It is a tool that can quickly convey the character's roles to the users because of how familiar they are with character types. Because interactive film requires users to interact in a way they are not accustomed to, the use of well-known narrative techniques can be a good solution for bringing users to grasp the story and interactivity without too much confusion.

All these elements reveal that interactive narratives are strongly preconstructed. Users might *feel* like they are creating the story, but everything they see and experience has been created and tested for them in advance. Interactive stories require a pre-written narrative, and in this respect are more similar to literature than they seem at first glance. To give an example of supposed free will in interactive storytelling, even free world games such as *The Sims* (EA, 2000-2006) actually contain a pre-constructed narrative, which differs from the typical lose/win structure seen in other games, being similar to the "bourgeois bildungsroman."⁵³ Other open-world games such as *Grand Theft Auto* (Take-Two Interactive, 1995) and *Red Dead Redemption* (Rockstar Games, 2010) actually come close to the "constellation narrative" described by Benjamin Hoguet⁵⁴ with many linear narratives hidden in the game. A lot of thought and work is therefore needed during the story development process of interactive films to create an effective and transformative narrative experience because changes will not be possible afterwards.

Inventing new types of narrative technique may seem impossible, given how many techniques and theories already exist and how prevalent they are in interactive film, but most new media forms build on previous ones in their beginnings before they establish their own visual and narrative

⁵¹ Aristotle, *Poetics* (Newburyport: Open Road Media, 2020).

⁵² Algirdas Julien Greimas, *Structural Semantics: An Attempt at a Method*, (Nebraska: University of Nebraska Press, 1984).

⁵³ Janet H. Murray, 'Research into Interactive Digital Narrative: A Kaleidoscopic View', in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018), p. 6.

⁵⁴ Benjamin Hoguet, *Créer et Produire pour les nouveaux médias*, (Paris: Dixit, 2016), p. 140.

codes. For example, the first silent films were strongly inspired by theatre,⁵⁵ but later developed their own visual and narrative techniques. In interactive film, many previously unused types of interaction are possible, such as eye tracking as in *RIOT 2.0* (Karen Palmer, 2017), and rich second-screen experiences enhancing the story as in *App* (Bobby Boermans, 2013), providing a fresh, unique experience for users.

1.1.b) - The Active Audience

A key particularity of interactive film is of course its “two-way” aspect. Different elements define interactivity: “an active relationship between two entities,”⁵⁶ ⁵⁷ ⁵⁸ personalisation of content,⁵⁹ user control,⁶⁰ and technology that alters the media form and content.⁶¹

During interactive films, the users get to be active or engaged. User engagement refers to a psychological state where users are either cognitively or emotionally involved in a experience,⁶² ⁶³ they are in a state of flow.⁶⁴ Some HCI research uses the term “cognitive absorption” to describe user engagement. Cognitive absorption has been defined as a temporal dissociation and focused immersion in the interaction,⁶⁵ or the state of being consciously involved in an interaction with almost complete

⁵⁵ David Mayer, ‘Acting in Silent Films: Which Legacy of the Theatre?’ in *Screen Acting*, (London: Routledge, 1999), p. 10.

⁵⁶ Carolyn Miller Handler, *Digital Storytelling: A Creator’s Guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 48.

⁵⁷ Yuping Liu & L.J Shrum, ‘A Dual-Process Model of Interactivity Effects’ in *Journal of Advertising*, 38.2, (London: Taylor & Francis, Ltd, 2009), pp. 53-68, <https://www-jstor-org.libproxy.york.ac.uk/stable/27749635?seq=1#metadata_info_tab_contents>, [Accessed 28 August 2020].

⁵⁸ Hannah Wood, ‘Dynamic Syuzhets: Writing and Design Methods for Playable Stories’ in *10th International Conference on Interactive Digital Storytelling, ICIDS 2017 Funchal, Madeira, Portugal*, (Switzerland: Springer, 2017), pp. 24-37, <https://doi.org/10.1007/978-3-319-71027-3_3>, [Accessed 07 July 2021].

⁵⁹ Sriram Kalyanaraman, S. Shyam Sundar, ‘The Psychological Appeal of Personalized Content in Web Portals: Does Customization Affect Attitudes and Behavior?’ in *Journal of Communications*, 56.1, (2006), pp. 110-132.

⁶⁰ Sally J. McMillan, Jang-Sun Hwang, ‘Measures of Perceived Interactivity: An Exploration of the Role of Direction of Communication, User Control, and Time in Shaping Perceptions of Interactivity’ in *Journal of Advertising*, 31.2, (2013), pp. 29-42, <<https://doi.org/10.1080/00913367.2002.10673674>>, [Accessed 16 April 2020].

⁶¹ S. Shyam Sundar, ‘Social psychology of interactivity in human-website interaction’ in *The Oxford Handbook of Internet Psychology*, (2007), pp. 89-104.

⁶² Rick Buselle, Helena Bilandzic, ‘Measuring Narrative Engagement’ in *Media Psychology*, 12.4, (2009), pp.321-347, <<https://doi.org/10.1080/15213260903287259>>, [Accessed 18 February 2020].

⁶³ J. Webster, Peter Chapman, S. Selvarajah, ‘Engagement in multimedia training systems’ in *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences*, (IEEE, 1999), <<https://doi.org/10.1109/HICSS.1999.772808>>, [Accessed 3 September 2020].

⁶⁴ Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience*, (New York: HarperCollins, 1990).

⁶⁵ R. Agarwal, E. Karahanna, ‘Time Flies When You’re Having Fun: Cognitive Absorption and Beliefs About Information Technology Usage’ in *MIS Quarterly*, 24, (2000), pp. 665-694. <<https://doi.org/10.2307/3250951>>, [Accessed 18 February 2020].

focus on the *activity*.⁶⁶

If interactivity offers such benefits as creating user engagement, involving them cognitively and emotionally, then why are most media forms passive? From antique rituals such as the rituals performed by the Apaches, the Dogons and the ancient Greeks that “involve the use of avatars, they are a form of role play, participants interact with each other and work towards accomplishing a particular goal”⁶⁷ to ancient storytellers,⁶⁸ audiences have been invited to join narrative experiences for hundreds of years. Butsch reminds us in his study on the development of American audiences that spectators were active, and could participate in or influence the story of plays until in “the Jacksonian era in the 1830s and 1840s, the upper classes grew to fear such working class sovereignty [...] Elites labelled exercises in audience sovereignty as rowdyism, [...] redefining it as poor manners rather than an exercise of audience rights.”⁶⁹ To this day certain forms of theatre particularly rely on interaction with the audience to shape the stories: audience participation has been used for political purposes (the plays by Russian playwright Vsevolod Emilievitch Meyerhold involved the audience in an attempt to recreate society through theatre⁷⁰) or entertainment (traditional pantomimes in the UK). Some believe that the ideal of the “active audience” was not lost by traditional mainstream media.⁷¹ For example John Fiske argues that audiences are not passive when consuming TV because they give meaning to the text and they make it a success by talking about it.⁷²

Even in plays with no audience interaction, various storytelling strategies that have been created to avoid detachment and full passivity are still very common, revealing that the attempt to engage the audience in the story is not recent. These techniques include the aside (a statement made by an actor, meant for the audience alone), the soliloquy (a speech in a play which the character speaks as if to himself or herself rather than to any other characters), the use of a chorus (a group of actors

⁶⁶ Jeeyun Oh, Saraswathi Bellur, S. Shyam Sundar, ‘Clicking, Assessing, Immersing, and Sharing: An Empirical Model of User Engagement with Interactive Media’ in *Communication Research, Themed Issue: Interactive and Social Media*, 24 (2000), pp. 665-694. <<https://doi.org/10.1177/0093650215600493>>, [Accessed 22 February 2020].

⁶⁷ Carolyn Handler Miller, *Digital Storytelling: A creator’s guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 9.

⁶⁸ Recep Yilmaz, Fatih Mehmet Cigerci, ‘A Brief History of Storytelling: From Primitive Dance to Digital Narration’ in *Handbook of Research on Transmedia Storytelling and Narrative Strategies*, (Hershey: IGI global, 2019), <<https://doi.org/10.4018/978-1-5225-5357-1.CH001>> [Accessed 20/06/2020].

⁶⁹ R. Butsch, *The Making of American Audiences: from Stage to Television 1750-1990*, (Cambridge: Cambridge UP, 2000).

⁷⁰ David M S Roy, *Twentieth-Century Theatre: Vsevolod Meyerhold*, (Scotland: Learning and Teaching Scotland, 2002).

⁷¹ S. Shyam Sundar, ‘Social psychology of interactivity in human-website interaction’ in *The Oxford Handbook of Internet Psychology*, (2007), pp. 89-104.

⁷² Fiske John, *Television Culture*, (New York: Routledge, 2011), pp. 63-83.

who described and commented upon the main action of a play with song, dance, and recitation) and the presence of an external narrator. These techniques are increasingly common in traditional film and TV (see figures below).



Figure 15 & 16: In *Deadpool* (Tim Miller, 2016) and *Fleabag* (Phoebe Waller-Bridge, 2016-2019), characters either directly address the audience or seem to know they're being observed. In both these examples this narrative choice adds humour to the situations the characters are put in.

The semblance of interaction with a character is a valuable device because it can “intensify our relationship with the fiction”⁷³ by increasing attention,^{74 75} creating intimacy between character and audience,⁷⁶ and providing a particular character with principal agency in and of the narrative. This device is therefore a great tool to engage users in interactive narratives as the examples below prove.



Figure 17: In *Tender Loving Care* (David Wheeler, 1996) Dr Turner, played by John Hurt, directly addresses the audience in between each scene to ask them how they feel about what just happened.

⁷³ Tom Browne, *Breaking the Fourth Wall: Direct Address in the Cinema*, (Edinburgh: Edinburgh University Press, 2012).

⁷⁴ Kew Laidlaw, T Foulsham, G. Kuhn, A Kingstone, ‘Potential social interactions are important to social attention’ in *Proceedings of the National Academy of Sciences of the United States of America*, 108.14, (2011), <<http://repository.essex.ac.uk/1492/>>, [Accessed 26th February 2020].

⁷⁵ Alison Gibbons, SaraGavins Whiteley, ‘Do worlds have (fourth) walls?: A Text World Theory approach to direct address in *Fleabag*’ in *Language and Literature*, (SAGE Publications, 2020), <<http://shura.shu.ac.uk/28056/3/Gibbons-WorldsFourthWalls%28AM%29.pdf>>, [Accessed 27 April 2021].

⁷⁶ Tom Browne, *Breaking the Fourth Wall: Direct Address in the Cinema*, (Edinburgh: Edinburgh University Press, 2012).



Figure 18: *Karen* (Blast Theory, 2015), where users have phone calls once or twice a day over a week with the main character. What begins as a professional relationship slowly becomes much more strange and intimate. Receiving phone calls on a phone at specific times can help to blur fiction and reality similarly to plays where live actors address the public in real time.

The active audience is not only present in theatres. Since the 1980s, users have become very active in their own homes thanks to the rise of interactive storytelling in books (Choose-Your-Own-Adventure) and video games such as *Dragon's Lair* (Cinematronics, 1983) and *Zork* (Infocom, 1980) to name a few. General ownership of home computers and the rise of CD-Roms in the 1990s normalised the use of interactive content. This was a significant period in the history of interactive films, particularly thanks to the rise in popularity of FMV (Full Motion Video) games that allowed creators to explore the possibilities offered by interactivity mixed with filmed content.⁷⁷

Interactivity is a key component of video games but with social media it is also becoming a key part of TV. The rise of “social TV”⁷⁸ is undeniable, with viewers commonly tweeting while they watch TV,⁷⁹ and programme-makers offering votes and second-screen apps to complement the shows.

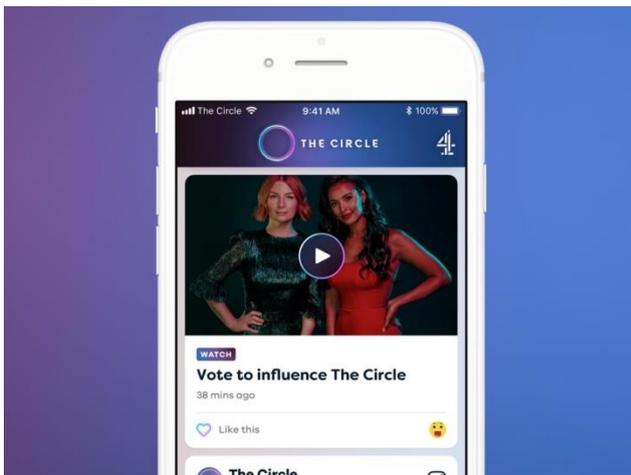


Figure 19: Viewers of the reality TV show *The Circle* could for example vote and influence the events happening on TV on the app dedicated to the TV show.⁸⁰

⁷⁷ Chris Crawford, *Chris Crawford on Interactive Storytelling*, (San Francisco: New Riders, 2013), p. 32.

⁷⁸ Jhih-Syuan Lin, Yongjun Sung, Kuan-Juc Chen, 'Social television: Examining the antecedents and consequences of connected TV viewing' in *Computers in Human Behavior*, 58, (2016), pp. 171-178.

⁷⁹ Christopher Buschow, Beate Schneider and Simon Ueberheide, 'Tweeting television: Exploring communication activities on Twitter while watching TV' in *Communications – European Journal of Communication Research*, 39.2, (2014), pp. 129-149.

⁸⁰ Unknown, 'The Circle App', *joipolloi.com*, <<https://joipolloi.com/case-study/the-circle-app/>>, [Accessed 18 Nov 2019].

The possibilities to impact the shows or stories are often more limited than first meets the eyes. Disney’s official *Second Screen* applications, while touted as “revolutionary movie watching experiences,”⁸¹ nonetheless emphasize that the new technology will not “overshadow” the television screen playing the film. In today’s society, the word “interactive” seems to be a commercial selling point as Espen J. Aarseth criticises in *Cybertext: Perspectives on Ergodic Literature*. He believes the word interactive reflects an industrial ideology in which interactive newspapers, interactive video, interactive television, and even interactive houses, all imply that the role of the consumer changes for the better thanks to interaction.⁸²

Interactive storytelling has existed for a very long time, and is an excellent way to engage users and create emotion. However, there is a risk it can detach people from the story and become a simple commercial “gimmick.” This is why when creating an interactive experience it is important to reflect on the use of interactivity and the form it will take.

1.1.c) Differences Between Video Games and Interactive Films

Video Games and interactive films might appear distinct because they belong to different industries with different audiences, different modes of production and are consumed very differently but they share many common features with cinematic video games⁸³ and performance capture allowing well-known actors to appear in games



Figure 20: Many film and TV actors “star” in video games. From left to right: John Bernthal in *Tom Clancy Ghost Recon Breakpoint* (Ubisoft, 2019), Elliot Page in *Beyond: Two Souls* (Quantic Dreams, 2013) and Keanu Reeves in *Cyberpunk 2077* (CD Projekt RED, 2020).

⁸¹ Variety staff, ‘Multitasking with Tron: Legacy’, *Variety*, (2011), <<https://variety.com/2011/digital/news/multitasking-with-tron-legacy-31863/>>, [Accessed 18 Nov 2019].

⁸² Kristoffer Gansing, ‘The Myth of Interactivity or the Interactive Myth?: Interactive Film as an Imaginary Genre’, in *Proceedings of the Fifth International Digital Arts and Culture Conference*, (2003), p. 48, <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.577.6981&rep=rep1&type=pdf>>, [Accessed 24 May 2020].

⁸³ Ivan Girina, *Cinematic games: the aesthetic influence of cinema on video games*, (PhD, University of Warwick, 2015).

Mechanically interactive films and video games also borrow techniques from each other with for example interactive films with joysticks (*Mr Payback: An Interactive Movie* (Bob Gale, 1995), and FMV games. To this day, video games and films are mixed, with a group of video games that have been labelled ‘interactive fiction,’ and ‘choose-your-own-adventure games.’ On *Steam* (a video game distribution software) interactive films such as *Late Shift* but also text based games such as *Choice of the Deathless* (Choice of Games, 2013) and puzzle based games like *Sorcery!* (inkle Ltd, 2016) can all be found under the ‘interactive fiction,’ and ‘choose-your-own-adventure game’ tags. The label ‘interactive film’ is also often used to define both games and films.^{84 85}

Using the working definition of interactive film developed for this thesis (“Interactive film is an experience made of prerecorded moving images, focused on narrative in which users influence the direction and/or outcome of an unfolding fictional storyline through their choices thanks to a limited type of interactivity that is sometimes imperceptible to the user”), a few differences can be noted between video games and interactive films.

Interactive films never have an open world, nor an avatar. Even when put in the shoes of a character such as the ghost in *Ordesa* (Nicola Pelloile-Oudart, Frédéric Jamain, 2020), the interactivity is limited to tiny actions influencing the story. FMV games of the 90s such as *Night Trap* (Digital Pictures, 1992) or video games compared to interactive films such as *Until Dawn* (Sony Computer Entertainment, 2015) still have puzzle games and fight sequences where the user is expected to “play.”

Another difference seen in most games is that video games’ narrative structures often rely on perfecting skills through repetition. When watching an interactive film, users are not expected to become better at making choices because there are no wrong or right answers. They are expected to choose based on their emotions and personality or through a visceral sense of amplified input and that is what will guide the story. There is nothing to win in the end. Sometimes users are even expected to guide the narrative without knowing (Figure 21 & 22)

⁸⁴ Luke Hutchinson, ‘Black Mirror: Bandersnatch Is A Fun Game, But A Bad Story’, *screenrant.com*, 1st Jan 2019, <<https://screenrant.com/black-mirror-bandersnatch-fun-game-bad-story/>>, [Accessed 06 April 2020].

⁸⁵ Vanessa Bogart, ‘Until Dawn is a Great Horror Movie...Even Though It's a Video Game’, *slashfilm.com*, 30th October 2017, <<https://www.slashfilm.com/until-dawn-horror-movie-video-game/>>, [Accessed 06 April 2020].



Figure 21: Eye-tracking technology can lead to narratives changing based on the user's focus without them necessarily noticing such as in *RIOT 2.0*, (Karen Palmer, 2017),

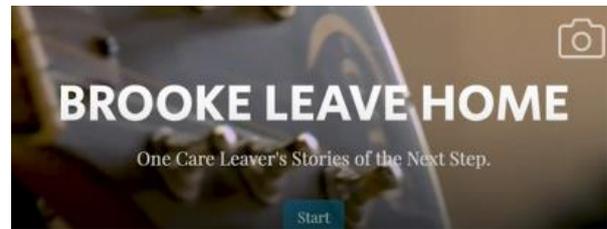


Figure 22: Object-based media narratives such as *Brooke Leave Home*, (DC Labs, 2020) are different depending on where the users live, which they notify at the very beginning of screenings. They might not know this information is for the story.

Of course this notion of winning isn't present in every game. Many games are not about points or winning but about resolving clues and unfolding a narrative through actions.

Many video games have narrative structures built around the idea of failing and trying again (and again and again). From *Dragon's Lair* (Cinematronics, 1983) to *Fortnite* (Epic Games, 2017), this pattern is extremely common. It can be frustrating but is also the source of strong pleasurable emotions.⁸⁶ Raph Koster even argued that the fun of gaming comes from learning how to play.⁸⁷ Errors are positive because they pose a challenge and an opportunity for the players to improve themselves. The importance of mechanics may result from restrictions caused by technology. Many game designers use the phrase “verb set” in referring to the actions that can be performed in an interactive game.⁸⁸ The most common verbs are walk, run, turn, jump, pick up and shoot. The user's possibilities are often limited to “moving, picking up objects, manipulating them, and solving riddles through manipulation. {...} The most obvious way to handle this problem is to choose a type of plot that puts great emphasis on physical actions.”⁸⁹ This explains the popularity of the archetypal narrative patterns described by Vladimir Propp⁹⁰ and Joseph Campbell⁹¹ where a hero goes through many settings, repeating similar tasks until they win. Of course this is not true to every video game such as *Journey* (thatgamecompany, 2012). Seen as “more an emotional investment

⁸⁶ Carolyn Handler Miller, *Digital Storytelling: A creator's guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 210.

⁸⁷ Raph Koster, *Theory of Fun for Game Design*, (London: O'Reilly Media, 2004).

⁸⁸ Carolyn Handler Miller, *Digital Storytelling: A creator's guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 58.

⁸⁹ Marie-Laure Ryan Marie-Laure, 'From Narrative Games to Playable Stories: Toward a Poetics of Interactive Narrative' in *Storyworlds: A Journal of Narrative Studies*, 1, (2009), p. 50.

⁹⁰ Vladimir Propp, *Morphology of the Folk Tale*, (Austin: University of Texas Press, 1968).

⁹¹ Joseph Campbell, *The Hero with a Thousand Faces*, (Princeton: Princeton UP, 1968/1973).

than a game”⁹² and “profound,”⁹³ this game is an example of a compelling interactive narrative not relying on winning but it is an anomaly among the many video games that exist.



Figure 23: *Journey* (thatgamecompany, 2012) is a walking simulator game that has no points to earn or skills to develop, simply a light to walk towards

A unique aspect of interactive film is its use of cinematic techniques and actors. Believable and emotional performances are key to creating a good interactive experience and this is difficult to achieve with CGI avatars often used in video games. Human facial expressions evoke stronger feelings in users than the same expressions expressed by avatars⁹⁴ ⁹⁵ but too realist-looking CGI avatars can create a “sense of unease and discomfort”⁹⁶ referred to as the “uncanny valley.”

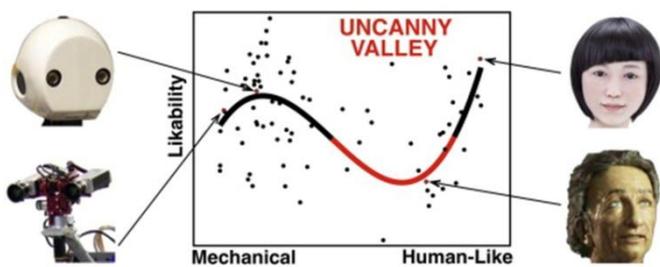


Figure 24: The “uncanny valley” refers to a theory by Mori Masahiro exploring why very realist looking android robots can create a negative emotional response in users. According to scientific research, this feeling might be due to our brain switching between two different hypotheses without coming to a clear conclusion when seeing an avatar: “this is a human being” versus “this is not a human being.”⁹⁷ Another explanation for it might be the confusion created when seeing that the very realistic avatars’s eyes have no life in them.⁹⁸

⁹² Ryan Clements, ‘Journey Review, We walk until this path is done’, *Ign.com*, 1st September 2016, <<https://www.ign.com/articles/2012/03/01/journey-review>>, [Accessed 2nd April 2021].

⁹³ Keza MacDonald, *Journey - Review*, *theguardian.com*, 13 March 2012, <<https://www.theguardian.com/technology/gamesblog/2012/mar/13/journey-ps3-review>>, [Accessed 2nd April 2021].

⁹³ Nicolas Six, ‘Avec l’interactivité, Netflix va-t-il changer notre façon de consulter les vidéos ?’, *lemonde.fr*, <https://www.lemonde.fr/pixels/article/2019/04/10/avec-l-interactivite-netflix-va-t-il-changer-notre-facon-de-consulter-les-videos_5448548_4408996.html>, [Accessed 5th May 2021].

⁹⁴ Kegel, L. C et al, ‘Dynamic human and avatar facial expressions elicit differential brain responses’ in *Social Cognitive and Affective Neuroscience*, 15.3, (2020), pp. 303-317, <<https://doi.org/10.1093/scan/nsaa039>>, [Accessed 25 November 2021].

⁹⁶ Harry Brenton, Marco Gillies, Daniel Ballin, David Chatting, “The Uncanny Valley: does it exist?” in *Proceedings of conference of human computer interaction, workshop on human animated character interaction*, (2005), [Accessed 25 November 2021].

⁹⁷ Mel Slater, Anthony Steed, “A Virtual Presence Counter”, in *Presence: Teleoperators and Virtual Environments*, 9.5, (2000), pp. 413-434, <<https://doi.org/10.1162/105474600566925>>, [Accessed 25th November 2021].

⁹⁸ Lawrence Weschler, *Why Is This Man Smiling? Digital animators are closing in on the complex system that makes a face come alive*, *Wired.com*, 6 January 2002, <<https://www.wired.com/2002/06/face/>>, [Accessed 23 November 2021].

As well as the “uncanny valley,” another issue might arise when attempting to create a strong emotional response with CGI characters: the fact that today, only a few years are needed for CGI visuals and current technologies to be obsolete. “The life expectancy of each generation of VR hardware is estimated for two to three years. Game based realizations are getting old as fast as the equipment.”⁹⁹ To create a strong emotional response not blocked by disgust, unease or bad VFX, a solution is to intentionally create less believable avatars. Princess Fiona in *Shrek* was actually made less human because “she was beginning to look too real, and the effect was getting distinctly unpleasant.”¹⁰⁰ Once users have noted that they are not seeing a real person, they are more open to connect with the character and to feel emotions as proven with the strong emotional response elicited by American animated characters.¹⁰¹ However if they seem too distant to humans with limited physical movements which is very common in video games, users will feel less connected¹⁰² and the animated look can give a light hearted dimension to the story. There is therefore a complicated balance to find: CGI avatars have to seem alive to touch users emotionally but not too realist either. If this is achieved, CGI avatars might still not be adapted to interactive films attempting to educate and to recreate lifelike situations because animated characters are often assimilated to children and fun entertainment. This assimilation might distract users from making choices seriously. Relying on human actors and not CGI avatars such as in most video games is therefore an efficient solution to create empathy and immerse viewers in interactive narratives.

Video games might be very successful and able to generate pleasurable emotions but interactive storytelling through their focus on storytelling over skill, winning and open narratives structures can create a different form of pleasure well described by transmedia screenwriter Boris Razon: “Interactive Fiction offers other satisfactions such as being impressed by a narrative unfolding under our eyes or the pleasure of the *mise en abîme*.”¹⁰³ [“Le plaisir d’être bluffé par une

⁹⁹ Rafal Hanzl, *Ways of Expression: The Impact of VFX Technology on modern storytelling in film and interactive media production*, (Phd, Inland Norway University of Applied Sciences, 2019), <https://brage.inn.no/inn-xmli/bitstream/handle/11250/2596989/Ways_of_expression.pdf?sequence=1 p 30>, [Accessed 23 November 2021].

¹⁰⁰ Harry Brenton, Marco Gillies, Daniel Ballin, David Chatting, ‘The Uncanny Valley: does it exist?’ in *Proceedings of conference of human computer interaction, workshop on human animated character interaction*, (2005), [Accessed 25 November 2021].

¹⁰¹ Maalou van Rooij, ‘Carefully Constructed Yet Curiously Real: How Major American Animation Studios Generate Empathy Through a Shared Style of Character Design’ in *Animation*, 14.3, (2019), pp. 191-206, <<https://doi.org/10.1177/1746847719875071>>, [Accessed 26 November 2021].

¹⁰² Harry Brenton, Marco Gillies, Daniel Ballin, David Chatting, ‘The Uncanny Valley: does it exist?’ in *Proceedings of conference of human computer interaction, workshop on human animated character interaction*, (2005), [Accessed 25 November 2021].

¹⁰³ Nicolas Six, ‘Avec l’interactivité, Netflix va-t-il changer notre façon de consulter les vidéos ?’, *lemonde.fr*, <

construction qu'on voit se bâtir. Ou le plaisir de la mise en abîme.»] *Mise en abîme*, a term coined in 1883 by Andre Gine¹⁰⁴ refers to a text referring to itself. The common expression “play within a play” describes this device well. Instead of solely focusing users on the story, the *mise en abîme* brings attention to the narrative structure, format, and themes of the text which adds a new layer of appreciation for users.

Video games and interactive films might be different but creators of interactive films can certainly inspire themselves from video games to create compelling interactive stories as the examples below prove:



Figure 25: The subtle interactivity of *Until Dawn* (Sony Computer Entertainment, 2015) is a great example of an interactivity that creates a sense of powerlessness: despite the appearance of game-like interactivity, the characters will always die, revealing the tragic situation they are in.



Figure 26: The video game *Life is Strange* (Dontnod Entertainment, 2015) can also inspire interactive film with its time travel device that allows users to change their mind and therefore avoid frustrating dead ends present in most interactive films.

Interactive film exists by imitating and transforming codes and techniques present in already existing media such as literature, theatre, video games and films. Not only can these storytelling channels help us to understand how interactive films arrived at their present state, they can also inspire new ways to tell stories.

¹⁰⁴ Mieke Bal, 'Mise en Abyrne et Iconicité', in *Littérature*, 29, (1978), pp. 116-128, <https://www.persee.fr/doc/litt_0047-4800_1978_num_29_1_2090>, [Accessed 22 November 2021].

1.2 - Obstacles to the adoption of interactive film

This section will explore the main obstacles to the adoption of interactive film. Interactive films have existed since the 1960s with *Kinoautomat*,¹⁰⁵ but it became much more popular in the 1980s, with technology such as CD-Roms that normalised the use of hypertext content. It then saw a boom with the arrival of online digital content.¹⁰⁶ Today, interactive films are more common but most of them seem to fall into two categories: entertainment, or training videos which might be due to the complicated production process required for interactive films.

1.2.a) Mere Entertainment

Ever since their beginnings, interactive films have been strongly associated with the idea of games and entertainment. This association can be problematic when trying to create emotional and impactful content. Users could avoid interactive film if looking for a touching and informative viewing or they could view the content as trivial and fail to focus on the message or content, focusing on the activities and interactivity instead. Many people first encounter interactive narrative when they are children, through the Choose-Your-Own-Adventure books created in 1979. More than 250 million copies¹⁰⁷ of these books have been sold, defining the genre as a playful experience aimed at children. This idea is also echoed in Netflix's decision to aim its first interactive content at children.

¹⁰⁵ Chris Hales, 'Interactive cinema in the Digital age', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç obrahim Sezen, (New York: Routledge, 2015), p. 39.

¹⁰⁶ Chris Hales, 'Interactive cinema in the Digital age', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç obrahim Sezen, (New York: Routledge, 2015), p. 44.

¹⁰⁷ Sally Lodge, 'Choosco Embarks on Its Own Adventure', *Publishers Weekly*, 18 January 2007, <<https://web.archive.org/web/20071009094529/http://www.publishersweekly.com/article/CA6408126.html>>, [Accessed 9 May 2019].

| Photo | Title Name | Type | Release Date |
|---|---|------------------------|--------------|
|  | Puss in Book: Trapped in an Epic Tale | Kids | 06/20/2017 |
|  | Buddy Thunderstruck: The Maybe Pile | Kids | 07/14/2017 |
|  | Stretch Armstrong: The Breakout | Kids | 03/13/2018 |
|  | Minecraft: Story Mode | Kids | 11/27/2018 |
|  | Black Mirror: Bandersnatch | Horror/Thriller | 12/28/2018 |
|  | You Vs. Wild | Kids/Adventure/Reality | 04/10/2019 |
|  | Captain Underpants Epic Choice-o-Rama | Kids/Adventure | 02/11/2020 |
|  | Carmen Sandiego: To Steal or Not to Steal | Kids/Adventure | 03/10/2020 |
|  | Unbreakable Kimmy Schmidt: Kimmy vs. the Reverend | Comedy | 05/12/2020 |

Figure 27: All interactive films produced by Netflix until December 2020. Apart from *Black Mirror: Bandersnatch* and *Unbreakable Kimmy Schmidt: Kimmy vs. the Reverant* (Claire Scanlon, 2020) all the interactive content on Netflix is made for children.

As the discussion between the creators of *Black Mirror: Bandersnatch* (David Slade, 2018) at the top of this chapter proves, interactive cinema is intricately linked with video games. In the 1980s, video games became the primary medium for interactivity, with arcade games such as *Dragon's*

Lair (Cinematronics, 1983).¹⁰⁸ This game requires players to make multiple choices, using a joystick, that affect the rest of the character's quest. The joystick, a key element of video games, was also used by viewers to make decisions in the first interactive films screened in cinemas such as *I'm Your Man* (Bob Bejan, 1992) and *Mr Payback: An Interactive Movie* (Bob Gale, 1995).¹⁰⁹ Later, the genre moved to the computer (*Tender Loving Care* was available on CD-Rom),¹¹⁰ a device also associated with video games and therefore the idea of entertainment. In today's digital age, paradigms are shifting when it comes to TV and cinema but interactive films are still associated with the idea of gaming. Chady Eli, the producer of the interactive film *Late Shift* (Tobias Webber, 2016), used the expression "the gamification of films"¹¹¹ when talking about interactive technology. *Black Mirror: Bandersnatch* further entrenched the genre in the video game world. Last but not least, *Late Shift*, which sold itself as an interactive movie, won multiple awards for...best video game.¹¹²



Figure 28: *Black Mirror: Bandersnatch's* entire plot relies on the viewer playing with the destiny of a video game creator (Charlie Brooker, the director and writer, was in fact once a video game reviewer).

Because of this association with gaming and the novelty of the technology used, interactive cinema is often considered as a "cinema of attractions"¹¹³ as opposed to narrative cinema. The term cinema of attractions is frequently used to describe films of the early 1900s, when exhibiting the visual possibilities of editing and special effects was more important than creating a self-sufficient narrative world on the screen. Interactive films often fit that definition, because of interactive filmmakers' tendency to rely on the interactive technology of their films more than the story to guarantee their success. This choice can be explained by the fact that creating an interactive film is expensive and complicated. Such a focus on the technology often results in poor content.

¹⁰⁸ Chris Hales, 'Interactive cinema in the Digital age', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç օbrahim Sezen, (New York: Routledge, 2015), p. 40.

¹⁰⁹ Chris Hales, 'Interactive cinema in the Digital age', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç օbrahim Sezen, (New York: Routledge, 2015), p. 39.

¹¹⁰ Callum Marsh, 'The Rise and Fall of the Interactive Movie', *thedissolve.com*, 3 October 2014, <<https://thedissolve.com/features/exposition/775-the-rise-and-fall-of-the-interactive-movie/>> [Accessed 17 January 2019].

¹¹¹ Megan Farokhmanesh, 'Late Shift Is Another Step Toward the Merging of Movies and Video Games', *theverge.com*, 15 October 2017, <<https://www.theverge.com/2017/10/15/16360964/late-shift-interactive-movie-films-as-video-games-chady-eli-mattar-interview>>, [Accessed 5 February 2019].

¹¹² Unknown, 'Late Shift Awards', *Imdb.com*, <<https://www.imdb.com/title/tt4796254/awards>>, [Accessed 9 May 2019].

¹¹³ Tom Gunning, 'The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde', in *Early Cinema, Space. Frame, Narrative*, (London: British Film Institute 2006), pp. 56-62.

Interestingly enough, even Borges, the first author to imagine a branched narrative, admitted that the concept of *The Garden of Forking Paths* was more interesting than the story itself. If it truly explored every possible storyline, it would have been a novel without any direction¹¹⁴—a paradox, in that it would hardly say more than a blank page. The same problem applies in film, as Roger Ebert pointed out when naming *Mr Payback: An Interactive Movie* “the worst film of 1995” because the experience came from the technology and not the story: “It is just that this is not a movie. It is mass psychology run wild, with the mob zealously pummelling their buttons.”¹¹⁵ The few interactive films that people know are considered so bad because they often have low production values, and tend to be full of clichés. *Late Shift*’s plot relies on a “cavalcade of clichés”¹¹⁶ and *Tender Loving Care* used all the tropes of “late-night cable TV from the 1990s.”¹¹⁷ These low production values are not surprising for a recent media form such as interactive film - video games also started out on low budgets - but it is a factor that does not help interactive films to be considered as interesting and intellectual content.

1.2.b) Training Videos

Another very popular category of interactive film exists: training videos. They are gaining momentum because of the rise in video consumption over written content^{118 119} and the demand for efficient, fast learning, spurred by the desire to be globally successful before competitors. Companies need employees to learn skills quickly and interactive videos are the perfect tool to do so. When interviewed about interactive film, Paul Banks, director of *Trenches* (National Army Museum, 2015) said “Interactive film has potential in education: that's kind of a no brainer.”¹²⁰ He cited the possibility of engaging children in museums and testing employees’ abilities in training

¹¹⁴ Dominic Moran, ‘Borges and the Multiverse: Some Further Thoughts’, *Bulletin of Spanish Studies Hispanic Studies and Researches on Spain, Portugal and Latin America*, 89, (2012), <<https://www.tandfonline.com/doi/abs/10.1080/14753820.2012.712326>>, [Accessed 3 May 2019].

¹¹⁵ Brian Moriarty, *Two-Minutes Hate: Siskel & Ebert on Interactive Movies (1995)*, online video recording, *YouTube*, 25 November 2015, <<https://youtu.be/xB3-ypalMS8>>, [Accessed 28 March 2019].

¹¹⁶ Mike Diver, ‘Late Shift is an Intriguing Failure of an Fmv Game’, *Vice.com*, 19 April 2017, <<https://www.vice.com/en/article/kbvzzz/late-shift-is-an-intriguing-failure-of-an-fmv-game/>>, [Accessed 04 November 2020].

¹¹⁷ Calum Marsh, ‘The Rise and Fall of The Interactive movie’, *thedissolve.com*, 3 October 2014, <<https://thedissolve.com/features/exposition/775-the-rise-and-fall-of-the-interactive-movie/>>, [Accessed 13 February 2019].

¹¹⁸ Unknown, ‘Video data shows changing YouTube habits - Think with Google’, *thinkwithgoogle.com*, (2019), <<https://www.thinkwithgoogle.com/feature/youtube-video-data-watching-habits/>> [Accessed 29 March 2021]

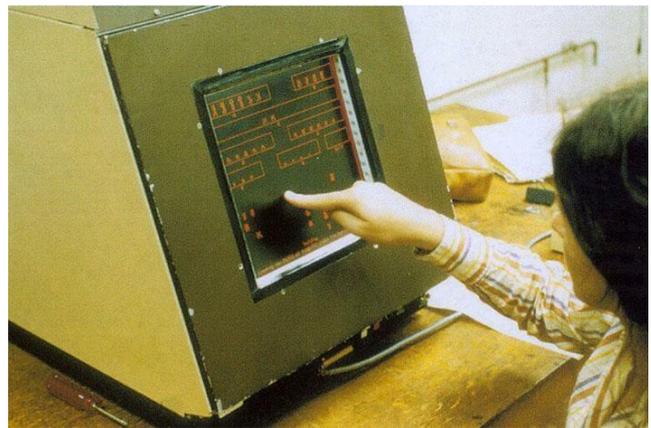
¹¹⁹ Julia Stoll, ‘Share of individuals who watched short video clips (such as on YouTube) in the prior week in the United Kingdom (UK) from 2016 to 2020, by age group’, *Statista*, 26 January 2021, <<https://www.statista.com/statistics/506291/watching-and-downloading-short-online-videos-in-the-uk-by-age-group/>>, [Accessed 29 April 2021].

¹²⁰ Banks, Paul. **Interview**. By Rebecca Gallon. 13th February 2020.

videos as examples. Theories on the educational potential of interactivity have existed for a long time, and can be seen with constructivism (a form of education theory defending the idea of learning through experience) which is “frequently associated with pedagogic approaches that promote learning by doing,”¹²¹ Augusto Boal’s Forum theatre¹²² or the “revolutionary”¹²³ 1963 Jackdaw Publications that turned schoolchildren into documentary storytellers by putting archival materials directly into their hands.

With the arrival of the computer in the 60s, technology and interactivity merged to create educational content. Interactive training videos are part of what is called Computer Based Training (CBT) or E-learning. In the 1960s, CBT gained in popularity because of the rising popularity of computers.

Figure 29: PLATO (Programmed Logic for Automatic Teaching Operations)¹²⁴ is one of the earliest examples of CBT. This computer system created for teaching is at the origin of many technologies commonly used for teaching today such as touchscreens (used in interactive whiteboards present in many schools¹²⁵), remote screen sharing and tutorials (today, tutorials for everything exist on Youtube¹²⁶). PLATO did not prove successful because of its costs but it was revealed how “the combination of computer and communication technology could change the face of education.”¹²⁷



With CD-Roms, serious games became very popular, one notable example being the famous *Carmen Sandiego* game series that began with *Where in the World Is Carmen Sandiego?*

¹²¹ Sandra Gaudenzi, ‘The Living Documentary: from representing reality to co-creating reality in digital interactive documentary’ (PhD, University of London, 2013), p. 10, <http://research.gold.ac.uk/id/eprint/7997/1/Cultural_thesis_Gaudenzi.pdf>, [Accessed 31 April 2021].

¹²² Augusto Boal, *Games for Actors and non actors*, (New York: Routledge, 2003), p. 28.

¹²³ Unknown, *Moments of Innovation*, MIT Documentary Lab, <<https://momentsofinnovation.mit.edu/interactive>>, [Accessed 13 October 2019].

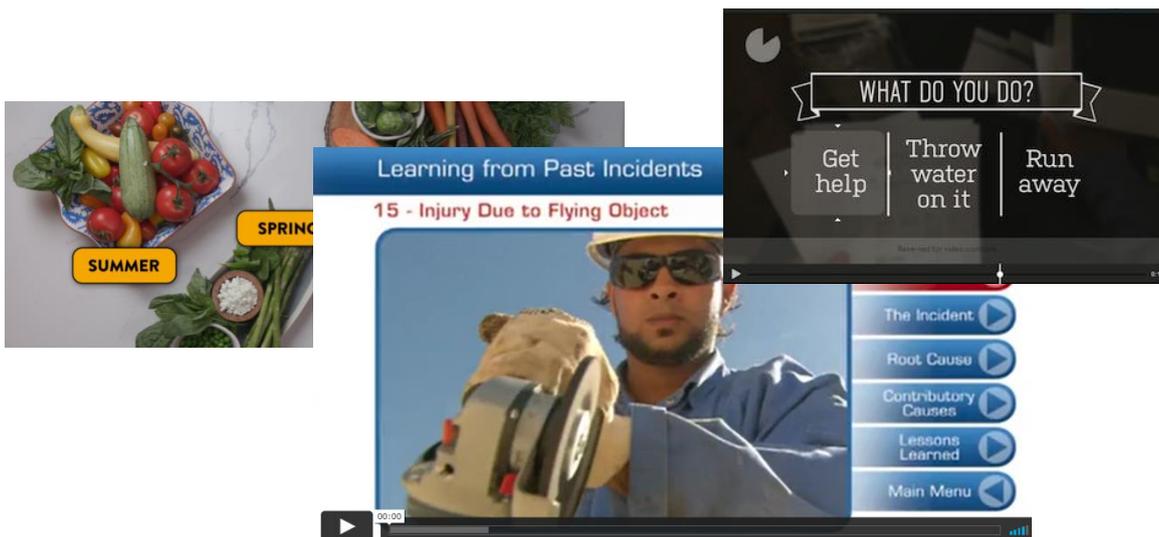
¹²⁴ Marion O. Hagler, William M. Marcy, ‘The legacy of PLATO and TICCIT for learning with computers’ in *Computer Applications in Engineering Education*, 8.2, (2000), pp. 127-131.

¹²⁵ Nitza Davidovitch, Roman Yavich, ‘The Effect of Smart Boards on the Cognition and Motivation of Students’, in *Higher Education Studies*, 7.1, (2017).

¹²⁶ Patricia G. Lange, ‘Informal Learning on Youtube’, in *The International Encyclopedia of Media Literacy*, (Hoboken: John Wiley & Sons, 2019), pp. 1-11, <<https://doi.org/10.1002/9781118978238.ieml0090>>, [Accessed 13 November 2020].

¹²⁷ Marion O. Hagler, William M. Marcy, ‘The legacy of PLATO and TICCIT for learning with computers’ in *Computer Applications in Engineering Education*, 8.2, (2000), pp. 127-131.

(Brøderbund Software, 1985). With the rise of mobile phones and the emergence of the internet, improved access to technology, personal online training is now prevalent.¹²⁸ ¹²⁹ E-learning in the form of interactive film is extremely common in museums¹³⁰ ¹³¹ and as training videos. Companies and museums can benefit from using this type of content for informative purposes because it is cost effective, requires no staff and does not take space. Training videos often take the form of questionnaires in between little video scenarios (see figures below). From the interactive content to the title of the videos, interactive training videos are typically very simple in structure and do not leave much to the imagination.



Figures 30, 31 & 32: From left to right, *Chef Brooke's Interactive Recipes* (Eko, 2020) allows users to choose ingredients by clicking on buttons. Then *Deloitte – Interactive Video* (Little Sisters Film, 2014), is a first-person experience introducing the viewer to the company culture as well as educating them about what is expected of employees. Finally *Adgas Interactive Live Action* (Myriad Global Media, 2019) is a health and safety video for the oil and gas company Adgas. In these three examples the dates and topics are different but the design and are very similar. By clicking on buttons, the next video clip is shown, showing to users exactly what they are expecting to see.

¹²⁸ J. P. Gee *What Video Games Have to Teach Us About Learning and Literacy*, (New York: Palgrave Macmillan, 2003).

¹²⁹ A. Granic, Lobel, and R. C. Engels, 'The benefits of playing video games', in *American Psychologist*, 69.1, (2014), p. 66.

¹³⁰ Selma Thomas, 'DIGITAL MEDIA IN MUSEUMS: A PERSONAL HISTORY' in *Digital Heritage and Culture*, (London: World Scientific, 2014), pp. 119-129.

¹³¹ Maria Roussou, Dimitris Efraimoglou, 'High-end Interactive Media in the Museum' in *Computer Graphics, ACM SIGGRAPH*, (1999), pp. 59-62.

As the images above show, the type of interactivity in training videos is straightforward and rarely focuses primarily on storytelling or creating an interesting visual experience. It could be argued that some examples are so simple that the use of video can be questioned. Some training videos that rely on interactivity and storytelling in a compelling, educational and interesting way however do exist:

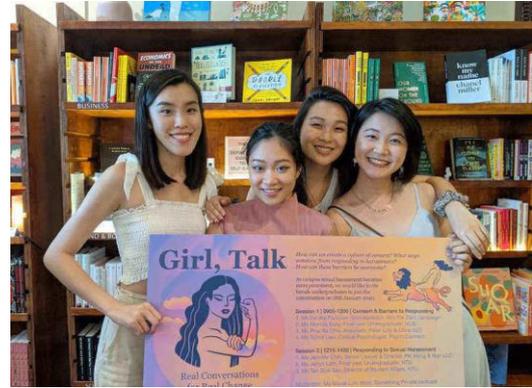
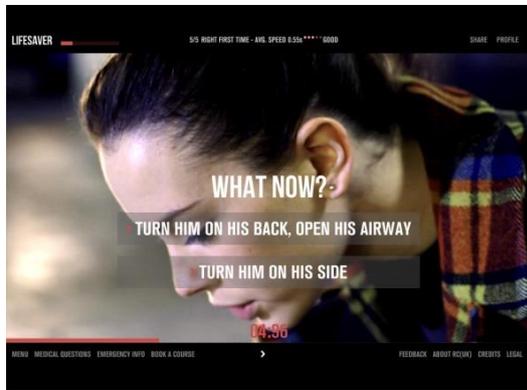


Figure 32 and 34: Some training videos rely on interactivity and storytelling in a compelling and educational way. On the left, *LifeSaver* (Martin Percy, 2015) uses movements imitating cardiac massage to affect the storyline. On the right, *Girl, Talk* (Seow Yun Rong, Dawn Kwan, Danelia Chim & Heather Seet, 2019) is an interactive VR film that puts users in the shoes of a woman being sexually harassed in the workplace.

The examples using interactivity in a fresh, compelling way are however not as popular as simple, straightforward training videos, leading to a limited vision of what interactive storytelling can offer.

1.2.c) Interactive Films are Complicated to Produce

There is a simple explanation for this focus on entertainment and training in interactive films. Interactive films are very complicated to produce. Writing an efficient, touching, branched storyline without dead ends depends on screenwriting skills, time and money. Interactive Fiction writer Aaron A. Reed explained that “[making] interactive fiction requires a unique blend of creativity and logical thought, of writing prose and crafting code.”¹³² To avoid spending money on filming, many writer's develop narratives that change in the details but not the key moments. This is the choice Paul Banks did when creating *Trenches* (National Army Museum, 2015): “we had to get the

¹³² Lisa Dusenberry, Robert Terry, ‘Serious Interactive Fiction: Constraints, Interfaces, and Creative Writing Pedagogy’ in *Journal of Creative Writing Studies*, (RIT Scholar works, 2018).

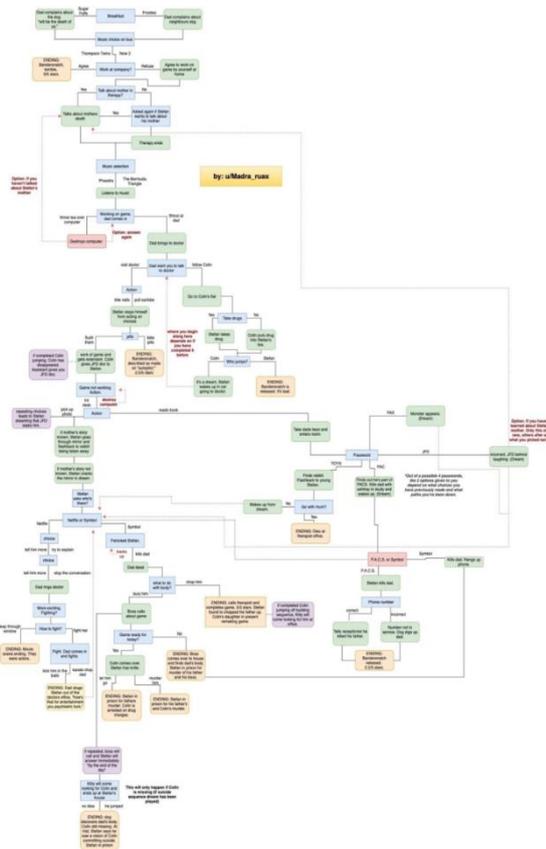
scriptwriter to rewrite the script so that the scenes would all essentially be the same thing until we get to that last twenty seconds which enables the shoot to be done faster and cheaper.”¹³³ This allows users to believe they are interacting with the story while creating much less content but it however limits the opportunity to explore the possibilities of creating a complex, compelling and creative narrative. A complex interactive scenario offers a more enjoyable experience¹³⁴ for the user

but is much more complicated to create as proven by the images below. To give an example of how long an interactive screenplay can be, Paul Irwin, director of the interactive TV show *Trylife* wrote 455 pages for one episode with 109 possible routes.¹³⁵



Figure 35: On the left, Ed Solomon Co-writer of interactive TV show *Mosaic* (Steven Soderbergh, 2018) sitting under the show’s narrative structure consisting of 15 different storylines.

Figure 36: The narrative structure of *Black Mirror: Bandersnatch* (David Slade, 2018).



¹³³ Banks, Paul. **Interview**. By Rebecca Gallon. 13th February 2020.

¹³⁴ Serge Petralito, Florian Bruhlmann, Glenna Iten, Elisa D. Mekler, & Klaus Opwis, ‘A Good Reason to Die: How Avatar Death and High Challenges Enable Positive Experiences’ in *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, (2017), pp. 5087–5097, <<http://dx.doi.org/10.1145/3025453.3026047>>, [Accessed 12 November 2020].

¹³⁵ Irwin, Paul. **Interview**. By Rebecca Gallon. 2nd September 2020.

Interactive film's long scenarios lead to much longer shoots than for traditional media. For example, more than 5 hours of edited footage¹³⁶ is available for users to see in *Black Mirror: Bandersnatch* (David Slade, 2018) even though the average viewing time is 90 minutes (the quickest path ends after 40 minutes).¹³⁷ For the 3 minute interactive music video *Words Hurt* (Romain Chassaing, 2017), 6 entire days of shooting were required to film the “47 scenarios and 27 chapters in this video.”¹³⁸ More time filming means more money which limits the opportunity for independent creators to create a complex story. The long and complex scenarios required for interactive film also lead to a bigger risk of continuity issues. All the parallel narrative possibilities need to be filmed one after the other so costumes, props, setting and even frames need to perfectly correspond to what was filmed maybe more than 3 scenes ago. Costumes were a big issue during the shooting of *Trenches* as explained by Paul Banks “If the main character ends up in the trench because he's volunteered his uniform would be different than if he went in the trench as a medical officer or as a prisoner. So that caused huge problems. We had to film those four scripts four times because he needed different uniforms.”¹³⁹

For the actors it can also be confusing to film again and again slightly different elements and different character arcs that can significantly alter the character's personalities. In the behind the scenes documentary of the interactive film *Late Shift* (Tobias Weber, 2016) the producer explains how complicated it was to guide actors “we have to say to the actors: so this is the strand where you haven't made the phone call so you don't know that he knows that he's been to the hospital and visited the guy who tried to steal your bowl for you. [...] I don't even really know what I'm talking about. Somehow this has been the language that we've been talking for the last eight weeks!”¹⁴⁰

After filming, the post-production process is also especially tricky. Transitions between choices need to be smooth but also slow enough for users to not feel as if they are missing elements. Until recently, distribution was also complicated but digital formats allow users to see interactive films as long as they have a computer and an internet connection, which most people have nowadays

¹³⁶ AlloCiné, *6 Trucs à Savoir sur BLACK MIRROR BANDERSNATCH*, online video recording, *YouTube*, 19 March 2019, <<https://www.youtube.com/watch?v=TKXyH4dMFzk>>, [Accessed 27 November 2021].

¹³⁷ Kathryn VanArendonk, ‘Is Black Mirror: Bandersnatch the Dawn of Interactive TV?’, *Vulture.com*, 28 December 2018, <<https://www.vulture.com/2018/12/black-mirror-bandersnatch-netflix-interactive-tv.html>>, [Accessed 2 February 2020].

¹³⁸ Chassaing, Romain. **Interview**. By Rebecca Gallon. 18th December 2019

¹³⁹ Banks, Paul. **Interview**. By Rebecca Gallon. 13th February 2020.

¹⁴⁰ LATE SHIFT - Your Decisions Are You, ‘1001 Late Shifts – The making of an interactive movie’, online video recording, *YouTube*, 10 June 2016, [Accessed 15 March 2019].

(almost 4.66 billion people were active internet users as of October 2020, encompassing 59 percent of the global population according to Statista¹⁴¹). This makes interactive film highly shareable, as proven by the wide release of *Black Mirror: Bandersnatch*. Netflix's director of product innovation Clara Engelbrecht proudly talks about the fact that the interactive film "launched globally day and day on more than a thousand devices (smart devices, game controls, ios, ipads, iphone, androids, computers, everything!) in 28 different languages."¹⁴² It is still complicated for small companies or creators to distribute their film as both Paul Irwin and Paul Banks told me during their interviews ("I wouldn't do it again, it's not worth the costs and the right software doesn't exist yet"¹⁴³; "It took me three years to understand no one would fund or distribute my project. I had to do it all myself"¹⁴⁴) but this aspect of producing interactive films will become easier as time goes by.

1.3 - What Interactive Film Could Be: An Informative Tool

Interactive film is still a new medium, which explains why it is strongly influenced by previous media forms and why filmmakers and producers are relying on known storytelling techniques and crowd pleasing genres when creating interactive films. This thesis defends the argument that more remains to be explored for creators of interactive films: it has great thought-provoking potential because it has a unique ability to mirror society, to explore narrative possibilities, to create emotions and to transform users.

1.3.a) A Mirror of Our Society

Interactive film offers a unique opportunity to mirror society using the recognized aesthetic of cinema while playing with mechanisms more commonly seen in video games. Representing life is important to understand the world we live in, to understand others and ourselves better. It is also

¹⁴¹ J. Clement, 'Worldwide digital population as of October 2020', *Statista*, 24 November 2020, [Accessed 5 December 2020]

¹⁴² Netflix, 'Black Mirror: Bandersnatch | Featurette: Consumer [HD] | Netflix', online video recording, *YouTube*, 3 January 2019, [Accessed 21 February 2020].

¹⁴³ Banks, Paul. **Interview**. By Rebecca Gallon. 13th February 2020.

¹⁴⁴ Irwin, Paul, **Interview**. By Rebecca Gallon. 2nd September 2020.

why art is important. As Bolognino, founder and CEO of META, an experience production company that specializes in “The Art of Being There,” has said: “is not the act of representing or mirroring life, no matter how silly the situation, or trivial the characters, in itself a commentary?”¹⁴⁵

Aesthetic choices can ensure a story is told in a realistic and believable way to give information to users about the world they live in. Because our society has already assimilated a number of cinematographic styles, it is easier to convince a modern audience that what they are seeing is a representation of reality through film than through other media. Through the actors but also largely through sound and cinematography, suspension of disbelief is easily achievable. Multiple cinematographic techniques can be used in an attempt to recreate reality. The documentary approach, using found footage, documents linked to the film’s subject, and interviews enhance the idea that what is being shown is the truth.



Figure 37: Welcome to Pine Point (ONF, 2011) mixes old family photos and archive videos to involve users in the story and topic.

Another very effective technique in interactive film is cinematic voyeurism, where users are put in the shoes of someone peering into and spying on other people’s activities and private moments.



Figure 38 & 39: Cinematic voyeurism, used in horror films through the recreation of fake found footage as seen in *The Blair Witch Project* (1999, Daniel Myrick & Eduardo Sánchez) and *Unfriended* (2014, Levan Gabriadze) also exists in interactive film. This concept is at the core of most of the projects of two famous contemporary interactive filmmakers, Sam Barlow and Simon Bouisson. They both create a voyeuristic aesthetic to ramp up the feeling of uneasiness. On the left *Her Story* (Sam Barlow, 2015) is filmed through security cameras and is all about the unreliability of its main character. On the right *Wei or Die* (Simon Bouisson, 2015) is nearly entirely filmed on the characters’ mobile phones.

¹⁴⁵ Jonathan Mandell, ‘Will future storytelling include live theatre’, *Howlround Theatre Commons*, 15 November 2017, <<https://howlround.com/will-future-storytelling-include-live-theatre/>>, [Accessed 10 August 2020].

Representing reality through imitation might seem logical, but sometimes, realism can be accomplished with abstract, exaggerated elements. This idea was underlined by artificial intelligence researcher Joe Bates, who insisted on the distinction between believability and realism.¹⁴⁶ Bates pointed out that the great animators did not mimic actual motions but created artificially expressive conventions (such as the unrealistically distorted ‘squash and stretch’) that were more persuasive than literal depictions. Many stylistic codes seen in film dramas also attempt to represent situations through visual effects, such as odd framing (*in Mr Robot* (Mark Featherstone, 2015), the character only fills a third if not less of the frame creating a feeling of uneasiness) sound modification (*Sound of Metal* (2019, Darius Marder) plays with sound to show a man going deaf), point-of-view shots and blurred images (*Vertigo* (1958, Alfred Hitchcock) recreates the symptoms of suffering and fear of heights through point-of view-shots. The dolly zoom technique was also created for *Vertigo*, to create a feeling of uneasiness). Many of these techniques can be seen in *Black Mirror: Bandersnatch* and *Late Shift*, which are strongly inspired by thrillers and dramas. Split screens seen in traditional films such as *Timecode* (Mike Figgis, 2000) can also show events from different perspectives.



Figure 40: In the interactive documentary *Gaza/Sderot* (Meron Rapoport, 2015) the split screen shows life on both sides of the Palestinian-Israeli borders.

Realism can be created aesthetically, but interactive storytelling also offers unique mechanical opportunities to represent life as it is for certain people. Creators can use the very type of interactivity to “translate an idea, a movement and become a performance.”¹⁴⁷ Clicking on a button

¹⁴⁶ Joseph Bates, ‘The role of emotion in believable agents’, in *Communications of the ACM*, 37.7, (1994), pp. 122–125.

¹⁴⁷ Benjamin Hoguet, *Le Pouvoir Narratif des Interfaces*, (Paris: Dixit, 2016), p. 11.

or using a joystick to guide the character are actions we are all familiar with. Many interactive films, however, use physical movement to reflect the story. In *Lifesaver* (Martin Percy, 2015) the required movement imitates a real cardiac massage, as the characters react in rhythm with the user's movement of the phone. Some interactive projects also play with our senses: *A Journal Of Insomnia* requires users to be awake at night. And then of course in virtual reality, the idea of movement recreating reality is key: *Carne y Arena*, for example, makes users walk in the sand, feel the cold and feel what people crossing the Mexican border feel.

Another interesting mechanism often used in interactive films is the transmedia approach. In a similar approach to found footage content, this mechanism uses the visual language of something "real" to make it appear more authentic and immersive. Some projects extend the universe of the film into the real world through social media such as the TV show *The Lizzie Bennet Diaries* (Bernie Sue, 2012).



Figure 41: *The Lizzie Bennet Diaries* (Bernie Sue, 2012) recreated the life of Jane Austen's *Pride and Prejudice* characters in a modern-day setting. People could ask them questions for their Q&A videos, and interact with their posts on their social media accounts. This extension is a great way to make the story feel as realistic as possible, as it evolves in real time and the characters can appear on users' social media feeds alongside posts from their real friends and family.

The transmedia technique also blurs the boundary between fiction and reality by allowing the audience to participate in a project. Following the constructivist idea that there are as many realities as there are perceiving individuals and that there is no single "truth," it is through the combination of multiple points of view that recreation of reality is possible. This is conveyed in participatory films such as *One Day on Earth* (Kyle Ruddick, 2012) that collected videos from 192 countries to recreate life experiences by people all around the world and *PBS American Portrait* (PBS, 2020), a TV show attempting to give a voice to all American citizens. In a non-documentary approach it can

be argued that the art created in the context of *Hit Record*,¹⁴⁸ a participatory website, is also universal as each part of their projects, from dialogues to images, comes from different people all around the world, to create one cohesive piece of art.

1.3.b) A field of New Narrative Possibilities

Despite its “B-Grade film” label, and its resemblance to previous media, interactive storytelling is actually a great field for the exploration of new forms of narrative.

A few examples have used interactivity to inspire their stories. Films such as *Kinoautomat* and *Possibilia* played with the idea of making an interactive film that is thematically about users’ inability to change things.



Figure 40: *Kinoautomat* stops 9 times for the audience to make a choice. However, regardless of what the audience chooses, the conclusion (shown in a flash-forward scene at the start of the film) is always the same—the main character ends up with his apartment on fire. The director intended the film to satirise the illusion of choice in a democracy.

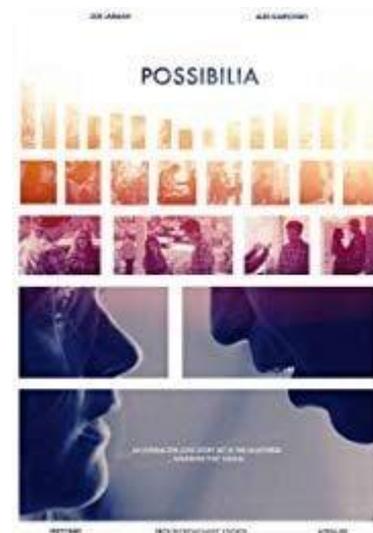


Figure 41: *Possibilia* portrays a couple breaking up in several different ways. The choice for the viewers concerns the way they will break up, not the outcome.

¹⁴⁸ Unknown, *HitRecord*, (2021), <<https://hitrecord.org/>>, [Accessed 1 May 2021].

Other interactive projects play with interactivity to make users relate to the character's experience in a way that would not be possible in traditional storytelling. Serious games use branching narratives to explain dilemmas certain people face every day such as CEOs when handling management crises in *A Game of Influence* (France Television, 2014) (see figure 42 below) or immigrants trying to flee the war in *Bury Me My Love* (The Pixel Hunt, 2017). These works use the interfaces to recreate dilemmas certain people have to face every day. Their narratives could certainly inspire interactive films. Interactivity also allows users to get an emotional understanding of characters. The choices offered in the branching narrative in *Black Mirror: Bandersnatch* become progressively more intense and strange to reflect on the main character's increasing confusion and paranoia. The documentary *A Journal Of Insomnia* only allows viewers to experience the film at night, creating a closer connection between the tired viewers and the insomniac subjects of the documentary.



Figure 42: In *A Game of Influence*, three indicators allow players to measure their performance: the stress level, how much the spin doctor trusts you and the amount of noise present in the media. If you become too emotional, you lose; if your coach does not trust you, you lose; and as your goal is to reduce media coverage of a scandal, you lose if the media noise gets too high. This unique mechanic might be a good inspiration for interactive film.

1.3.c) A Tool to Generate Emotions

Interactive storytelling has great emotional potential. Frome argues that only interactivity can generate what is called “ecological emotions.”¹⁴⁹ Ecological emotions (as opposed to “narrative emotions” experienced when reading books or watching films) are the feelings experienced and displayed when the viewer responds to the artefact as if what was represented were real.

¹⁴⁹ Jonathan Frome, ‘Eight Ways Video Games Generate Emotion’, in *Proceedings of the 2007 DIGRA International Conference*, p. 833, <<http://www.digra.org/wp-content/uploads/digital-library/07311.25139.pdf>>, [Accessed 13 April 2020].

Ecological emotions are more prevalent in interactive narratives, because the unfolding narrative is a direct impact of choices made by users. They might appear as vertigo felt when rotating the camera down in Tom Clancy's *Splinter Cell* (Ubisoft, 2002) or shivers and fear for ourselves felt when the narrator directly addresses users with their personal information that was collected through their location and answers in *Netwars* (Lena Thiele, 2014).



Figure 43: An example used by Frome to define narrative emotions is sadness that the user might feel when “Rick and Ilsa fail to stay together at the end of *Casablanca* (Curtiz, 1942).”

Interactivity develops stronger user engagement than films and books, as indicated by the fashion for *Let's Play* gaming videos (videos in which players of games film their reaction live) and according to Wong, Rigby & Brumby,¹⁵⁰ their ability to be more immersive than related non-gaming, TV content. Judging by the results of the Immersive Experience Questionnaire (IEQ), this study seems to indicate that the mere fact that interaction between the content and humans is happening captivates the viewer. Nonetheless, directly interacting is still more emotionally engaging for viewers. Research proves that people who engage in actual video game play feel more connected with the main character than those who merely watch someone else's segment of gameplay.^{151 152 153} The emotional impact of interactive film can be seen from a study by Martin Percy, the creator of *Lifesaver*, an interactive film teaching emergency skills like CPR.

¹⁵⁰ Priscilla Wong, Jacob M. Rigby, Duncan P. Brumby, 'Game & Watch: Are "Let's Play" Gaming Videos as Immersive as Playing Games?', in *Proceedings of the Annual Symposium Computer-Human Interaction Play*, (New York: ACM, 2017), p. 403.

¹⁵¹ J-H Lin, 'Do video games exert stronger effects on aggression than film? The role of media interactivity and identification on the association of violent content and aggressive outcomes', in *Computers in Human Behavior*, 29, (2013), pp. 535–543 <<https://doi.org/10.1016/j.chb.2012.11.001>>, [Accessed 18 Jan 2020].

¹⁵² W. Peng, 'The mediational role of identification in the relationship between experience mode and self-efficacy: Enactive role-playing versus passive observation' in *CyberPsychology & Behavior*, 11, (2008), pp. 649–652 <<https://doi.org/10.1089/cpb.2007.0229>>, [Accessed 28 April 2020].

¹⁵³ W. Peng, M. Lee, & C. Heeter, 'The effects of a serious game on role-taking and willingness to help' in *Journal of Communication*, 60, (2010), pp. 723–742 <<https://doi.org/10.1111/j.1460-2466.2010.01511.x>>, [Accessed 11 November 2019].



Figure 44: The heart rate of viewers of *Lifesaver* was significantly higher when watching the interactive version of the film. Percy compared the heart rate of viewers watching the film passively with the heart rate of viewers watching the interactive version in which they are expected to save a person who is having a heart attack. The results below indicate greater physical investment in people who watched the interactive version of the film. This might of course be due to the fact that the interactive experience requires physical movements but Percy argues that this is also due to the intense lifelike situation trainees are put in - the life of the victims in the films depends on them.

Marie-Laure Ryan, however, notes that the emotions experienced during video games (excitement, triumph, dejection, relief, frustration, relaxation, curiosity and amusement¹⁵⁴) are generally self-directed.¹⁵⁵ They concern our desires and the actions we undertake to fulfil them. Research has attempted to define how the public deals with emotions, and this can inform ways of constructing a story to create long-term attachment. Affective challenge requires viewers to deal with the ecological emotions cited above. In contrast, cognitive challenge (not to be confused with cognitive challenges in games^{156 157}) requires viewers to keep track of a complex narrative (interrelated stories or multiple plotlines), or interpret the meaning behind it.^{158 159} Emotional challenge,¹⁶⁰ a

¹⁵⁴ Nicole Lazzaro, 'Why We Play Games: Four Keys to More Emotions Without Story,' in *Player Experience Research and Design for Mass Market Interactive Entertainment*, (Oakland: XEOdesign, 2004), <www.xeodesign.com/xeodesign_whyweplaygames.pdf>, [Accessed 3 September 2020].

¹⁵⁵ Marie-Laure Ryan, 'From Narrative Games to Playable Stories: Toward a Poetics of Interactive Narrative' in *Storyworlds: A Journal of Narrative Studies*, 1, (2009), p. 56.

¹⁵⁶ Anna Cox Paul, Cairns, Pari Shah, and Michael Carroll, 'Not doing but thinking: the role of challenge in the gaming experience' in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, (2012), pp. 79–88, <<http://dx.doi.org/10.1145/2207676.2207689>>, [Accessed 15 September 2020].

¹⁵⁷ Alena Denisova, Christian Guckelsberger, and David Zendle, 'Challenge in Digital Games: Towards Developing a Measurement Tool' in *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, (2017), pp. 2511–2519, <<http://dx.doi.org/10.1145/3027063.3053209>>, [Accessed 26 August 2020].

¹⁵⁸ Anne Bartsch and Tilo Hartmann, 'The Role of Cognitive and Affective Challenge in Entertainment Experience', *Communication Research*, (2015), <<http://dx.doi.org/10.1177/0093650214565921>>, [Accessed 8 September 2020].

¹⁵⁹ Tilo Hartmann, 'Media entertainment as a result of recreation and psychological growth', *The International Encyclopedia of Media Studies* (2013), <<https://dx.doi.org/10.1002/9781444361506.wbiems112>>, [Accessed August 30].

distinct type of challenge that has been present in many recent papers, “confronts players with emotionally salient material or the use of strong characters, and a captivating story.”¹⁶¹ In a study exploring how these challenge types relate to the film viewer’s entertainment experience,¹⁶² it was found that dramas and thrillers provided viewers with both affective and cognitive challenge - and while perceived as less fun than light-hearted films and horror films, they scored highest on suspense and appreciation.

As well as a complex narrative, relatable characters can provide affective challenge. Characters can lead to a feeling with great didactic potential: empathy. Empathy is a complex construct that includes both cognitive (perspective-taking) and affective responsiveness to the perceived emotional state of another person. Research in neuroscience has determined that empathy can “increase social understanding, lessen social conflict, limit aggression, increase compassion and caring, lessen prejudice, increase emotional competence, and motivate pro-social behaviour.”¹⁶³ Empathy is most often triggered when there is a connection, an identification with the characters in a story. It is well known that stories have the ability to create strong feelings directed towards characters: this is what Aristotle calls catharsis.¹⁶⁴ Psychological experiments suggest that people who inhabit digital avatars of a race, gender, or age unlike their own can become more empathetic¹⁶⁵ and this is why many interactive films have relatable characters such as *Lifesaver* and *Wei or Die*. Todd Yellin, Netflix’s Vice President for Product, sums up the power of interactivity quite well: “If bad things happen, you’ll feel even more crestfallen, because you were responsible [...] If the character is victorious, you’ll feel even more uplifted because you made that choice.”¹⁶⁶

¹⁶⁰ Tom Cole, Paul Cairns, and Marco Gillies, ‘Emotional and Functional Challenge in Core and Avant-garde Games’ in *CHI PLAY '15: Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, (New York: ACM, 2015), pp. 121-126. <<http://dx.doi.org/10.1145/2793107.2793147>> [Accessed 5 February 2020].

¹⁶¹ Alena Denisova, Christian Guckelsberger, and David Zendle, ‘Challenge in Digital Games: Towards Developing a Measurement Tool’ in *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, (2017), pp. 2511–2519, <<http://dx.doi.org/10.1145/3027063.3053209>>, [Accessed 26 August 2020].

¹⁶² Anne Bartsch and Tilo Hartmann, ‘The Role of Cognitive and Affective Challenge in Entertainment Experience’, *Communication Research*, (2015), <<http://dx.doi.org/10.1177/0093650214565921>>, [Accessed 8 September 2020].

¹⁶³ Feshbach & Feshbach, 2009 in Kidd, Jenny ‘Gaming for Affect: Museum Online Games and The Embrace of Empathy’, *The Journal of Curatorial Studies*, 4.3, (2015), pp. 414-432.

¹⁶⁴ Aristotle, *Poetics*, (Newburyport: Open Road Media, 2020).

¹⁶⁵ Jonathan Belman and Mary Flanagan, ‘Designing Games to Foster Empathy’, in *International Journal of Cognitive Technology*, (2010), <<https://tiltfactor.org/wp-content/uploads2/cog-tech-si-g4g-article-1-belman-and-flanagan-designing-games-to-foster-empathy.pdf>>, [Accessed 23 April 2019].

¹⁶⁶ David Streitfeld, ‘Black Mirror Gives Power to the People’, *The New York Times*, 28 December 2018, <<https://www.nytimes.com/2018/12/28/arts/television/black-mirror-netflix-interactive.html>>, [Accessed 17 April 2019].

1.3.d) A Transformative Tool

Interactive film has a unique ability to create emotions, imitate reality and to teach and focus attention that leads to believing interactive film has transformational potential. The word “transformation” is key in Christian Roth’s granular framework to evaluate user experience of interactive narratives.¹⁶⁷ It has since been explicitly mapped to Murray’s category of transformation.¹⁶⁸ Roth’s framework is a big inspiration behind the user study conducted for this thesis.

Many theories defend the idea that learners construct knowledge from their experience. Ian Bogost suggests the expression “Procedural Rhetoric”¹⁶⁹ for talking about educating through interactivity. Procedural rhetoric is a practice of using processes persuasively. Bogost argues interactions and how interactions are conceived such as in video games can help users to learn information and to process ideologies. It is proven that children learn more through interactive processes than passively. The effectiveness of collaborative learning around games in formal and informal forums has received broad support from educational games scholars such as Ang, Zaphiris & Wilson,¹⁷⁰ Gee;¹⁷¹ Jenkins et al.;¹⁷² Steinkuehler & Duncan;¹⁷³ and Turkay et al.¹⁷⁴ A study by Boltman¹⁷⁵ shows that a spatial computer presentation of a children’s picture book, with animated panning and zooming between pictures, increases children's elaboration and recall abilities compared to the paper version or a non-spatial computer presentation. This suggests that interactive storytelling engages children more intensively and makes more lasting impressions.

Interactive storytelling is not only relevant because of the processes it offers to learners, it also has

¹⁶⁷ Christian Roth, ‘Experiencing Interactive Storytelling’, (PhD, University of Amsterdam, 2015).

¹⁶⁸ Christian Roth, Harmut, Koenitz, ‘Evaluating the User Experience of Interactive Digital Narrative’, in *AltMM '16: Proceedings of the 1st International Workshop on Multimedia Alternate Realities*, (2016), pp.31–36, <<https://doi.org/10.1145/2983298.2983302>>, [Accessed 13 November 2020].

¹⁶⁹ Ian Bogost, *Persuasive Games: The Expressive Power of Videogames*, (Cambridge: MIT Press, 2007), p. 4.

¹⁷⁰ Chee Siang, Panayiotis Zaphiris, Stephanie Wilson, ‘An Activity theoretical Model for social interaction in computer games’, in *HCI International 2007 conference*, (2011).

¹⁷¹ J.P. Gee, J. P. *What Video Games Have to Teach Us About Learning and Literacy*, (New York: Palgrave Macmillan, 2003).

¹⁷² H. Jenkins, R. Purushotma, M. Weigel, K. Clinton, and A.J Robison, *Confronting the challenges of participatory culture: Media education for the 21st century*, (Chicago: MacArthur, 2009).

¹⁷³ C. Steinkuehler, & S. Duncan, ‘Scientific habits of mind in virtual worlds’, *Journal of Science Education and Technology*, 17.6, (2008), pp. 530-543.

¹⁷⁴ S. Turkay, D. Hoffman, C. K. Kinzer, P. Chantes, and C. Vicari, ‘Toward Understanding the Potential of Games for Learning: Learning Theory, Game Design Characteristics, and Situating Video Games in Classrooms’ in *Computers in the Schools*, 31.1, (2014).

¹⁷⁵ A. Boltman, ‘Children’s storytelling technologies: differences in elaboration and recall’, (PhD, University of Maryland, 2001).

the ability to focus attention. This is why MOOCs (Massive Open Online Courses) often use a second screen, because interacting makes students feel more involved and helps them to remember the information from the course.¹⁷⁶ Interactive media is a relevant learning tool to engage a generation of students born surrounded with interactive and participatory media.¹⁷⁷

This ability to teach and focus attention leads to believing interactive films have transformational potential. There is some evidence that players will apply social skills and pro-social behaviour learned in digital games to relations outside their gaming environment.¹⁷⁸ Furthermore, research in neuroscience supports the argument that gameplay can physically alter the brain which, in turn, can alter an individual's mindset and behaviour. Buckley & Anderson¹⁷⁹ found that frequent exposure to certain types of media affects internal variables (emotions, cognitions, etc.) and can lead to permanent changes in personality.

However, transformation is extremely complicated to measure. There is a lack of long-term studies and additional research which would be critical to identify how specific and sustained behavioural and attitude changes can be produced by interacting. The meaning found by users in a project also highly depends on aesthetical and as Roth calls it eudaimonic appreciation.¹⁸⁰ This notion connects aesthetic presentation with the user's past experience. Users experience narratives differently in function of their personal taste and cultural heritage so it is very complicated to explore transformation on a large scale as it is such a personal experience that depends on many complex factors.

¹⁷⁶ Tobias Rohloff, Jan Renz, Max Bothe, 'Supporting Multi-Device E-Learning Patterns with Second Screen Mobile Applications', in *mLearn 2017: Proceedings of the 16th World Conference on Mobile and Contextual Learning*, 25, (2017), <<https://dl.acm.org/doi/pdf/10.1145/3136907.3136931>>, [Accessed 3 February 2020].

¹⁷⁷ Paul Darvasi, 'Empathy, Perspective and Complicity: How Digital Games can Support Peace and Education and Conflict Resolution', (Phd, York University, 2016), <https://www.academia.edu/29961691/Empathy_Perspective_and_Complicity_How_Digital_Games_can_Support_Peace_Education_and_Conflict_Resolution?email_work_card=thumbnail>, [Accessed 6 September 2020].

¹⁷⁸ D.A. Gentile, and J.R. Gentile, 'Violent Video Games as Exemplary Teachers: A Conceptual Analysis', in *Journal of Youth and Adolescence*, 9, (2008), pp. 127-141.

¹⁷⁹ K. E. Buckley, C.A. Anderson, 'A theoretical model of the effects and consequences of playing video games', in *Playing Video Games - Motives, Responses and Consequences*, ed. By P. Vorderer & J. Bryant, (2006), pp. 363-378.

¹⁸⁰ Christian Roth, Harmut, Koenitz, 'Evaluating the User Experience of Interactive Digital Narrative', in *AltMM '16: Proceedings of the 1st International Workshop on Multimedia Alternate Realities*, (2016), pp.31-36. <<https://doi.org/10.1145/2983298.2983302>>, [Accessed 13 November 2020].

Another point to note is that pro-social behaviour often occurs in the wake of a positive experience.¹⁸¹ ¹⁸² There is no evidentiary consensus that a happy or unhappy ending for a character would necessarily influence perceptions of user control, although it could be argued that users might want to distance themselves from responsibility for an unhappy ending.¹⁸³

The examples cited above underscore the value of interactive narratives beyond entertainment, with potential for application in education, health awareness and the communication of ideas. Of course, most of the research cited concerns video games, and research on the implementation of interactive films for educational purposes is still in its early stages. Even if all these examples are true for games, they might not apply to interactive films which often have a more limited scope of interactivity than video games.

Interactive storytelling in film is not the same as interactive storytelling in literature, cinema, video games or theatre, but it probably would not exist as we know it without the influence of all those media. This might explain why interactive film today is seen mainly as a source of entertainment, with fun stories and interesting ways of pushing the boundaries of assimilated narrative codes. But alongside this, interactive film has significant educational potential thanks to its unique capacity to create emotions, imitate real life and educate viewers. These are the aspects of the genre that might truly separate it from all the media to which it is often compared (video games, films) as the next chapter will attempt to prove with the creation of a second-screen interactive film.

¹⁸¹ J. M. George, 'State or trait: Effects of positive mood on prosocial behaviors at work', in *Journal of Applied Psychology*, 76, (1991), pp. 299–307, <[676c89b5eb8c6c3d6ad83241f101c2cd7653.pdf](https://www.semanticscholar.org/paper/676c89b5eb8c6c3d6ad83241f101c2cd7653) (semanticscholar.org)>, [Accessed 26 May 2020].

¹⁸² A. M. Isen and A. F. Levin, 'Effects of feeling good on helping: Cookies and kindness', in *Journal of Personality and Social Psychology*, 36, (1972), pp. 1–12, <[93706d0c21b5ca09e8f43a3ce01e03a2138c.pdf](https://www.semanticscholar.org/paper/93706d0c21b5ca09e8f43a3ce01e03a2138c) (semanticscholar.org)>, [Accessed 28 May 2020].

¹⁸³ Francesca R. Dillman Carpentier, Ryan P. Rogers and Lisa Barnard, 'Eliciting Behavior From Interactive Narratives: Isolating the Role of Agency in Connecting With and Modeling Characters', in *Journal of Broadcasting & Electronic Media*, 59.1, (2015), pp. 76-93, <[https://www-tandfonline-com.libproxy.york.ac.uk/doi/full/10.1080/08838151.2014.998222](https://www.tandfonline-com.libproxy.york.ac.uk/doi/full/10.1080/08838151.2014.998222)>, [Accessed 27 May 2020].

Chapter 2

Creating a persuasive interactive film

This project is a practice-based exploration of how to develop strategies to create informative and maybe transformative interactive experiences. It has many limitations because as seen above the creation of interactive film is complicated and transformative effects are hard to prove and define. It is not large scale longitudinal study but it might help creators and researchers to see the effect interactive storytelling can have on users and the elements to consider when creating an interactive experience. Determining if a film has transformative potential is very complicated because every user will process information differently and a longer study would be needed to see if interactive content can create a long term transformation.

Possible solutions to see how to create an informative and transformative experience for the user would be to compare users' responses to a passive film and to an interactive film, to track cognitive behaviour while watching an interactive film or to study user's personalities and behaviours for many years after viewing a complex emotional interactive film. These techniques require specific knowledge, equipment and time and are beyond the scope of a one year research project. This is why the research project, through psychometric tests, will attempt to give insight into the elements to explore and develop and the technical and creative constraints creators might face when attempting to create an informative and transformative experience.

After defining interactive storytelling and examining how it is done in different media including interactive film, this thesis now focuses specifically on interactive film to explore the educational potential of this format. This focus on film is due to the broad appeal of films: they are accessible to a large audience and are widely shareable via the internet on multiple devices (mobile phones, tablets, game consoles, etc). They also offer the opportunity to scale user choices and capture behavioural data (BBC R&D constantly analyses the choices of their audiences to develop better stories^{184 185}). As a filmmaker, creating a film was also more achievable than other forms of

¹⁸⁴ Hanson Nick, 'Making a Personalised, Data-Driven Documentary', *bbc.co.uk*, 5 August 2019, <<https://www.bbc.co.uk/rd/blog/2019-07-personalised-documentary-data-instagramifaction>>, [Accessed 17 March 2020].

storytelling. For this thesis, *Butterfly*, an interactive second-screen short film about bullying, was repurposed and used to investigate its emotional, engaging and transformative effect on users in the aim of exploring the pro-social possibilities of interactive film. This is explored through a user study in the form of open-ended qualitative answers and psychometric PX measures after viewing *Butterfly*.



Figure 45: Original Poster for the first prototype of *Butterfly*. *Butterfly* was originally developed for a BSc in Film and Television at the University of York also exploring how to create pro-social behaviours thanks to interactive narrative. The initial project had a much more limited scope and was also shorter: a full description is available in Appendix 4. The problem with the first version was that it relied on real social media (Twitter) instead of an app specific to the film, a Twitter Bot created using Node.js¹⁸⁶ and an applet through the web-based service IFTTT to collect the responses to the poll. Using a combination of three different solutions resulted in a very disjointed process that required a human host supervising all three different platforms for the experience to function.

For this Master's thesis, the project was repurposed to build a better interactive system around it and extended to conduct a user study to explore the educational potential of interactive film. The version of *Butterfly* developed as part of this thesis is longer, and relies on an app that is perfectly synced with the film once the film is launched. The new system was entirely programmed and developed by me, thanks to some guidance by Vincent Jonsson Qi who had experience with the JavaScript user interface library React. Most of the posts in the app contained the same content as in the first prototype but some changes were made to develop a more precise identity for the different characters. In the new version, users had a more neutral role than the previous version in order to truly appreciate and engage in the story and not the interactivity. For more details about the

¹⁸⁵ Andy Brown, 'Audience Data and Storytelling - What Do People Choose in Interactive Experiences?', *bbc.co.uk*, 5 August 2019, <<https://www.bbc.co.uk/rd/blog/2020-01-audience-choices-data-personalised-media>>, [Accessed 17 March 2020].

¹⁸⁶ Node.js, version 12.2 (Open Source: Ryan Lienhart Dahl, 2009).

differences between the two versions of *Butterfly*, see Appendix 4.

2.1 - The Concept

The aim of the research is to explore how to create an informative experience through the creation of an interactive short film. When creating *Butterfly*, as far as possible, the narrative and visual choices were guided by the aims corresponding to the core ideas detailed at the end of the first chapter in mind: imitating reality, creating an emotionally engaging experience and enhancing learning for users. How each idea was attempted will be detailed below.

2.1.a) A Second-Screen Experience: Mirror of Our Society

Creating a work viewers can recognise and therefore become immersed in is important because the state of engaged presence is linked to people experiencing more enjoyment¹⁸⁷ and being willing to spend time and energy on a project. This presence is defined as the psychological, more subjective sense of “being there” in the environment, and is mainly influenced by the content of the mediated world. As explained above, film is a great tool to engage people because it is such a popular medium. André Bazin, who was fascinated by the fine line between cinema and reality argues that like photography, film “completely satisfies our appetite for illusion by means of a process of mechanical reproduction.”¹⁸⁸

Butterfly is designed to reflect the increasing impact that bullying has on the main character Lisa’s daily life. The aim is for users to feel empathy towards her thanks to the story, the interactivity and the cinematography. This empathy can help to strongly engage users in the story and the interactive system of *Butterfly*. The entire film is set in one location, the school corridor. It represents schools in general, but also symbolises how Lisa is imprisoned in her situation (see figure 18 below), surrounded by bullies. Logistically this also allows the viewers to focus intently on the plot and the interactivity elements, without being distracted by a new setting.

¹⁸⁷ Edward F. Schneider, Annie Lang, Mija Shin, and Samuel D Bradley, ‘Death with a Story: How Story Impacts Emotional Motivational, and Physiological Responses to First Person Shooter Video Games’, in *Human Communication Research*, 30.3, (2004), pp. 361-375.

¹⁸⁸ Maurizio Guercini, ‘Image and Reality in André Bazin’s Film Theory’, *Cinélektá*, 8.28, (2017), pp. 89–105 <<https://doi.org/10.7202/1053856ar>>, [Accessed 21 Nov 2020].

Every choice is deliberately intended to make the viewers feel like a character in the film, specifically as if they were one of Lisa's peer group. Seeing her every day at school will involve them more deeply in the single choice they would have to make. Most of the film is shot on a Steadicam, moving in the corridor to give the impression of a person walking around in the school. Each scene consists of two different shots, in order to create a natural feel and pace to immerse the viewers. Exterior light from the ceiling windows is used to create natural lighting. A key influence for the film's pace and aesthetic is undoubtedly *Elephant* (Gus Van Sant, 2003) which perfectly captures what life feels like as a teenager.



Figure 46: In *Elephant*, the camera follows one character at a time, making each one the focal point of the narrative, and *Butterfly* follows Lisa in a similar way.

As well as the cinematography of the film, a second-screen experience was planned to create a persuasive story. Mixing a branched storyline with a platform imitating social media is innovative for interactive films, which until now have relied on simple questions that take the user out of the story and remind them of their externality to the project. Such extension of the story to the users' personal phones puts them more realistically in the position of a bystander. This idea of imitating social media came from the realisation that interacting through written texts interrupted the experience of watching a film. In most interactive films, the invitation to the user to interact with the story takes the form of two choices shown in writing at the bottom of the screen. In recent years, *Late Shift* and *Black Mirror: Bandersnatch* seem to have created a norm of displaying a countdown indicating how much

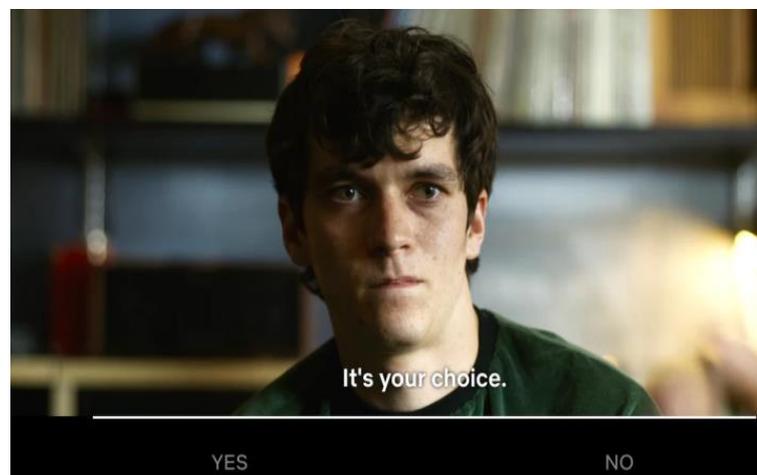


Figure 47: In *Black Mirror: Bandersnatch*, the white line indicates the time left for the viewers to make a choice

time is left to take the decision. If the users do not choose by the end of that time, the machine automatically selects a choice. This visual display detaches viewers from the story. It makes them aware that they are following a fictional narrative, at a remove from real life.

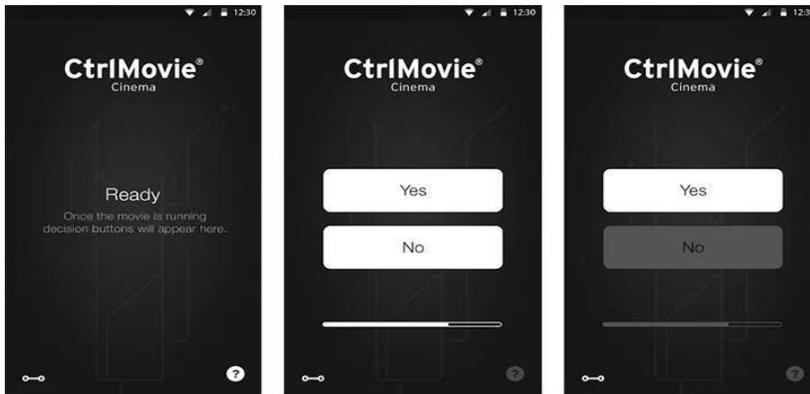


Figure 48: Users make the decisions on their phones for *Late Shift*.

To avoid any graphic that would pull users out of the story, creating a realistic form of interactivity involving the user's phones is a potentially more interesting way to immerse people in the story. FMV (Full Motion Video) Games such as *Simulacra* (Kaigan Games, 2017) use this technique to blur the boundaries between fiction and reality in order to create a more engaging and realistic experience. The second-screen experience in *Butterfly* was inspired by transmedia projects (projects telling a story across multiple digital platforms) such as *The Lizzie Bennet Diaries*, a web fiction series in which the characters were active in real time on social media.

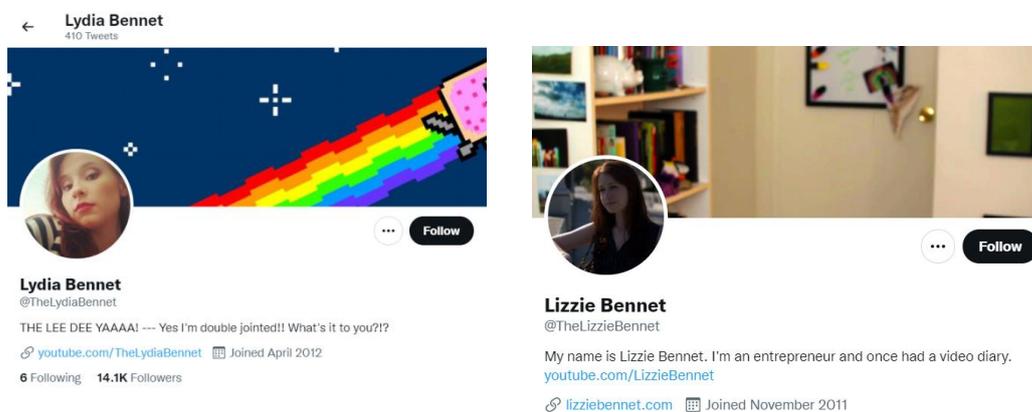


Figure 49 & 50: For *The Lizzie Bennet Diaries* creator Bernie Sue made sure that the characters used social media in a realistic way: Jane has a fashion-focused social media presence, unlike her sister who does not care about clothes.¹⁸⁹ Similarly, the second-screen experience in *The Lizzie Bennet Diaries* (Bernie Sue, 2012) portrays the personalities of the characters through the content and style of their posts. Emojis, abbreviations used in sms language and pictures on the second screen all reflected social media realistically. Above, Lydia and Lizzie have clearly different styles on Twitter.

¹⁸⁹ The writer's Panel with Ben Blacker. 2013. *The Lizzie Bennet Diaries*. [online] Available at: <<https://open.spotify.com/episode/3kdE1HzBBktq1wohifK25a?si=fNED73VCTquOZae3K3uVeA>>, [Accessed 6 September 2020].

The limitation of imitating social media and phones in this way is that phones and social media are very current, fast-changing technologies. In a panel discussion at the Sundance Film Festival, interactive filmmaker Jonathan Harris cautioned aspiring new media storytellers to think about the tradeoff between timeliness and timelessness in their work. “Whenever you’re dealing with bleeding edge technologies, there is the trap that you’re just doing things that are very timely,” he said, “but in five years they just look kind of silly.”¹⁹⁰ Considering the subject of the film *Butterfly*, imitating social media seemed logical to mirror the experience of victims of cyberbullying.

2.1.b) Interactive Film as a Tool to Generate Emotions

Interactive film has a unique potential to create emotional stories through its aesthetics, and more importantly through the narrative dilemmas the users face. In *Butterfly*, aesthetically, the illusion of realism is broken at one specific point in every scene. Each scene begins with a shot of Lisa from inside her locker.



Figure 51: The locker shot reveals Lisa’s emotional journey through the film. This shot was done for two reasons: to involve the users in Lisa’s story, and to link the film displayed on screen to the interactivity element through the omnipresent rectangular shape symbolising the fact that phones are unavoidable for Lisa (see figure 52). The locker shot was a good solution to encourage users’ involvement in Lisa’s story (a tough task for a seven-minute film), by showing from up close how the bullying physically and emotionally affects her day by day. The other shots include many characters users could decide to focus their attention on rather than Lisa, but with this shot there was no choice.

¹⁹⁰ Sean Flynn, ‘Are Interactive Films Transforming Modern Storytelling? Sundance’s New Frontier Has the Answer’, *IndieWire.com*, 28 January 2014, <<https://www.indiewire.com/2014/01/are-interactive-films-transforming-modern-storytelling-sundances-new-frontier-has-the-answer-30702>>, [Accessed 2 May 2019].



Figure 52: The rectangular shape is omnipresent in *Butterfly* as a reference to the shape of mobile phones.

Using interaction to enhance feelings is a complicated task. Offering users choices is good, but too many choices might negatively impact the experience and make users feel as if they are playing a game. Ryan argues that cognitive overload from the constant stimulation of goal-related demands can reduce empathic engagement.¹⁹¹ According to Frasca¹⁹² and Smethurst and Craps,¹⁹³ interactivity needs to relate to the decisive narrative points that will affect the character's life, otherwise the character might lose their personality and that makes it hard to identify with them and their problems. As proven in the first chapter of this thesis, interaction research in video games can inform how to create an emotional interactive film. It has been proven in the context of video games that cognitive and emotional empathy do not typically occur in users as they interact, but at times when “a player is not actually capable of influencing the game state: unskippable scripted or

¹⁹¹ Marie-Laure Ryan, 'From Narrative Games to Playable Stories: Toward a Poetics of Interactive Narrative' in *Storyworlds: A Journal of Narrative Studies*, 1, (2009), p. 56.

¹⁹² G. Frasca. 'Rethinking agency and immersion: Playing with videogame characters', in *ACM SIGGRAPH 2001*, (2001) <<http://www.siggraph.org/artdesign/gallery/S01/essays/0378.pdf>>, [Accessed 29 March 2020]

¹⁹³ T. Smethurst, and S. Craps, 'Playing with trauma: Interactivity, Empathy, and Complicity in The Walking Dead video game' in *Games and Culture*, 10, (2015), p. 273.

prerecorded cutscenes, for instance, or loading screens.”¹⁹⁴ These moments of inactivity allow players to reflect on their actions and experience and emotionally engage with the story. This is why, for *Butterfly*, an “internal/exploratory interactivity”¹⁹⁵ was chosen. In this category, “the user takes a virtual body with her into the fictional world, but her role in this world is limited to actions that have no bearing on the narrative events.”¹⁹⁶ During *Butterfly*, the users can observe (but not respond to) posts by the characters until the key choice arrives. They must decide whether or not to see allegedly “sexy pictures” of Lisa, that are being shared without her consent.

Limiting the interaction is also a good way to avoid the risk of having a gimmicky second-screen experience of the kind found in many existing apps (such as the previously cited *The Circle* or Disney’s second-screen applications). In tests of the original version of *Butterfly*, users had an identity, and they could like, share and comment on posts. They enjoyed that process so much that certain people created a virtual identity, imagined a fake romance between each other, made jokes and voted as their fictional character instead of as themselves (see Appendix 5). Although this approach had the potential for critical engagement, the introduction of role-playing was detrimental to developing empathy for the characters. It broke any emotional connection with the film, because it meant the users did not feel responsible for the consequences of the choices made. This experience aligns with Cohen’s¹⁹⁷ suggestion that, “identification is likely to increase enjoyment, involvement, and intense emotional responses, but it is less likely to produce critical stances.” This identification with the Avatar may reduce the critical distance necessary to truly engage with the material.

2.1.c) A Transformative Tool to Tackle Teenage Bullying

The purpose of interactivity was carefully considered when creating *Butterfly*. Some thought-provoking documentaries begin social movements simply because of their story, not their format,¹⁹⁸

¹⁹⁴ T. Smethurst, and S Craps, ‘Playing with trauma: Interactivity, Empathy, and Complicity in The Walking Dead video game’ in *Games and Culture*, 10, (2015), p. 273.

¹⁹⁵ Marie-Laure Ryan, . ‘Beyond Myth and Metaphor: The case of narrative in digital media.’ *International journal of computer game research*, 1, (2001), < <http://gamestudies.org/0101/ryan/>>, [Accessed 29 April 2019].

¹⁹⁶ Marie-Laure Ryan, ‘Beyond Myth and Metaphor: The case of narrative in digital media’ *International journal of computer game research*, 1, (2001), < <http://gamestudies.org/0101/ryan/>>, [Accessed 29 April 2019].

¹⁹⁷ J. Cohen, ‘Defining identification: A theoretical look at the identification of audiences with media characters’ in *Mass Communication & Society*, 4, (2001), p. 260.

¹⁹⁸ Kristin Hunt, ‘10 Documentaries That Actually Made a Difference’, *Mental Flow*, 3 July 2019, <<https://www.mentalfloss.com/article/79947/10-documentaries-actually-changed-things>>, [Accessed 19 October 2020].

but given the subject of this film, interactivity made sense. According to an Ofcom study from 2018, “Almost half of internet users in the UK have suffered ‘harm’ online.”¹⁹⁹ *Butterfly* should enhance the understanding of bullying through interactivity. Many people would not consider themselves bullies even if posting insulting and negative social media posts is part of their daily activity. For this reason, *Butterfly* would probably not work as well as a standard linear narrative, because people would not feel that it concerns them. But through the interactive element of a poll at the end of the film, their answer will directly impact a character’s life. Observational research has found that when bystanders intervene to defend the victim, they successfully reduce victimization more than 50% of the time.²⁰⁰ This is why interactivity could be an excellent device to make the users understand that they are taking part in bullying when they allow it to happen. Interactivity has the potential to make them reflect on the impact of their actions (or failure to act) because as well as creating “narrative feelings” (which are also experienced when reading books or watching films) in the users, “ecological emotions”²⁰¹ are generated through interactivity.

Interactivity also appeared as the best solution to arouse interest among the target audience of students aged between 18 and 24. People in this age group make very intensive use of mobile phones, but they do not understand the dangers that come with this intensive use.²⁰² They are one of the most vulnerable groups when it comes to the issue of cyberbullying, and especially prone to attempted suicide and self-harm.²⁰³ Interactivity is also a good way to gain attention from a generation whose attention is notoriously hard to capture because of the multitude of content available.²⁰⁴ Young people love interacting, as the success of Tinder’s interactive film *Swipe Night* (Karena Evans, 2020)²⁰⁵ and the rise of Netflix’s interactive content proves. There is currently a rise in interactive advertisements and music videos. According to Ed Davis, chief product officer of *TrueX*, this is due to “the increase in understanding of how important real attention from a

¹⁹⁹ BBC, ‘Almost half of the UK internet users harmed online’, *BBC.co.uk*, 18 September 2018, <<https://www.bbc.co.uk/news/technology-45519507>>, [Accessed 25 January 2019].

²⁰⁰ W. M. Craig, D. Pepler, and R. Atlas, ‘Observations of bullying in the playground and in the classroom’, *School Psychology International*, 21, (2000), pp. 22–36.

²⁰¹ Jonathan Frome, ‘Eight Ways Video Games Generate Emotion’, *Proceedings of the 2007 DIGRA International Conference*, p. 833, <<http://www.digra.org/wp-content/uploads/digital-library/07311.25139.pdf>>, [Accessed 6 May 2019].

²⁰² Vikram R. Bhargava Manuel Velasquez, ‘Ethics of the Attention Economy: The Problem of Social Media Addiction’, in *Business Ethics Quarterly*, (Cambridge: Cambridge University Press, 2020), pp. 1- 39, <<https://doi.org/10.1017/beq.2020.32>>, [Accessed 8 April 2021].

²⁰³ Denis Campbell, ‘NHS figures show ‘shocking’ rise in self-harm among young’, *The Guardian*, 23 October 2016, <<https://www.theguardian.com/society/2016/oct/23/nhs-figures-show-shocking-rise-self-harm-young-people>>, [Accessed 6 May 2019].

²⁰⁴ Jenny Radesky, *Digital Media and Symptoms of Attention-Deficit/Hyperactivity Disorder in Adolescents*, (Michigan: University of Michigan School of Medicine, 2018), <<https://jamanetwork.com/journals/jama/article/2687840>>, [Accessed 3 May 2019].

²⁰⁵ Kerry Flynn, ‘Tinder created an interactive show. Gen Z loves it’, *CNN Business*, 23 October 2019, <<https://edition.cnn.com/2019/10/23/media/tinder-interactive-show-swipe-night/index.html>>, [Accessed 30 October 2019].

consumer is.”²⁰⁶ Because *Butterfly* is aimed at young users, it is also important to consider their parents when creating an educational experience. “After all, in most cases, it is the parent who will be purchasing the product allowing access to the content.”²⁰⁷ The experience therefore needs to be easy to use for all ages, and the content should not be too shocking, so that parents will allow their children to watch it. This is why in *Butterfly* the sexy photos are never shown, all the insults are about Lisa’s ginger hair and the strongest word in the film is “sexy.”

2.2 - Production of *Butterfly*

Every production choice in *Butterfly* was made in order to create the most persuasive project possible (within the limited budget).

2.2.a) Creating the Film

The production of interactive films is very similar to the typical production of short films, but with a few differences. For *Butterfly*, at the specific key moments when the users will receive the texts, all the actors had to look at their phone and react, suggesting to the users that a new post has arrived on their phones. Supporting actors were also very important in order to create a realistic and believable environment. Gus Van Sant in *Elephant* created a very believable and immersive world because every single character is a relevant, complex, fully-constructed character where in another film they would be interchangeable extras. And so to imitate a real-life school environment in *Butterfly* a personality was created for every actor, even when they had no lines. The creation of a believable environment is important to avoid users being distracted by elements external to the story. The interactivity already has a risk of disrupting their experience because it is not a common element so everything else needs to be as realistic as possible. In the specific context of *Butterfly*, the secondary actors are in fact essential because they are the link between the interactive experience and the film. Their fake posts and interactions create a much more believable second-screen experience.

²⁰⁶ Samy Main, ‘Why Interactive Ads Are Becoming the Norm for Streaming Platforms’, *adweek.com*, 21 April 2017, <<https://www.adweek.com/tv-video/why-interactive-ads-are-becoming-the-norm-for-streaming-platforms/>>, [Accessed 13 May 2019]

²⁰⁷ Carolyn Handler Miller, *Digital Storytelling: A creator’s guide to Interactive Entertainment*, (Oxford: Focal Press, 2004), p. 134.

The other difference from traditional film production is that two endings were filmed instead of one.

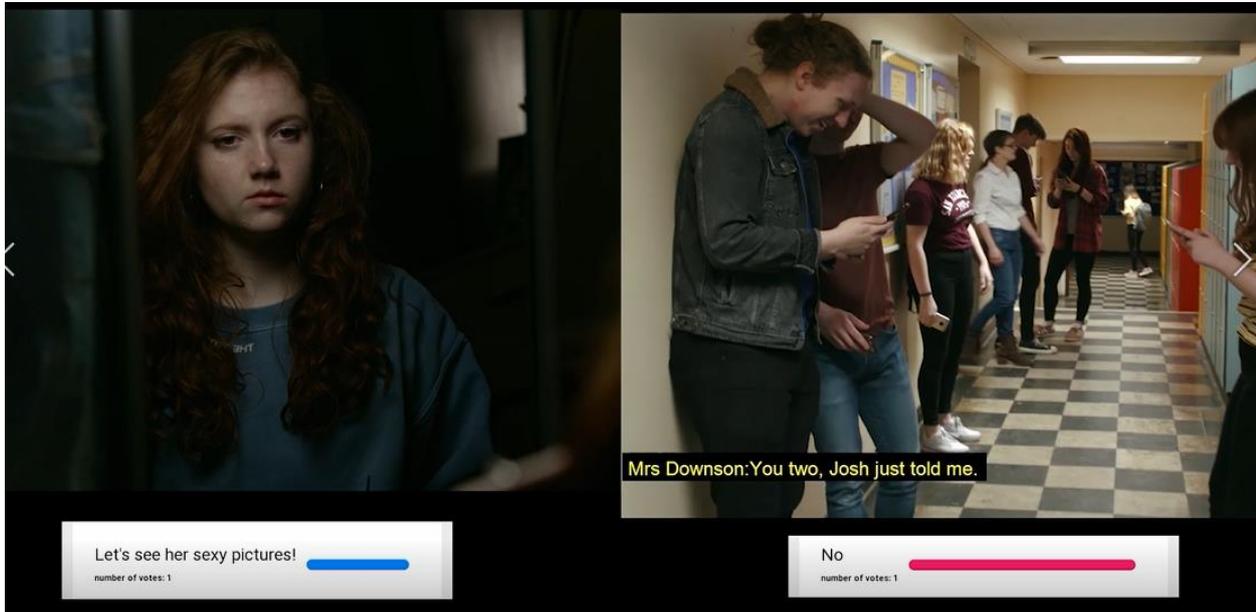


Figure 53: The main actress had to be reminded of her character's feelings in both scenes. In one other she was so devastated by everyone in the school making fun of her that she decided to cut off her hair. In the other, she was relieved and decided to ignore other people's opinions.

For big interactive productions with many choices, there are film crew members whose only job is to ensure everyone knows where they are in the story. This is essential again to avoid distracting elements that can disrupt the experience for users. Because my film is very short and only has one choice, the shoot went very smoothly.

2.2.b) Creating the Interactivity

When attempting to create an informative interactive experience it is important to create a simple and easy to use system. The interactions should feel natural to users. They should be focusing on the story and the information shared and not the interactive system. Every design choice was made with the idea of immersing the users in the experience in mind.

Here are the three production objectives for the interactive “app” that is the second-screen element of *Butterfly*. They were all thought to create a seamlessly simple and easy interactive experience:

1. Sending scheduled posts to be posted on the school’s gossip page
2. Collecting the users responses
3. Playing the chosen ending without any cut or judder.

To create the interactive second-screen experience, various techniques were attempted, such as the one used for the first prototype of *Butterfly* done for a BSc, using Twitter to create fake accounts and linking them with the film. This was only possible by using several different elements (a Twitter API that scheduled tweets to a fake Twitter account users could interact with, Processing, a software that played the different videos one after the other seamlessly and IFTTT, a web-based service that allowed the user’s responses to the poll to be collected) which resulted in a very disjointed process that required a human in the middle (see Appendix 4). In the context of this research project, the software Unity was used to attempt to create an app that could achieve all three production objectives, but again, linking the app with the film in real time was not possible.

The solution finally adopted was to use Google’s Firebase Console and the JavaScript user interface library React. Firebase works as the backend. This cloud-based database hosting service can be used easily to set up a database and is efficient at storing and retrieving data in real time. The video files and pictures uploaded on the app were stored on the Firebase Console. The project was written in JavaScript. It was bootstrapped with the Create React App. React works as the frontend. It allows developers to create large web applications that can change data, without reloading the page. The main purpose of React is to be fast, scalable, and simple. The app for *Butterfly* was built using three different components: one for the projection of the film and two for the social app. They each had a different function: a poll that would influence the ending of the film, and the posts that would appear on the second-screen experience. The three components were then imported onto the main component of code. The complete code is available in the appendix (Appendix 6).

Here is how the three objectives were achieved.

1. **Sending scheduled posts to be posted on the school’s gossip page**

For the experience to imitate social media and online bullying realistically, posts had to appear on the app at specific times, in sync with the actions that take place on the main screen. To allow users to understand that Lisa felt progressively worse as her bullying increased, posts are scheduled closer together as the film progresses to reveal the growing intensity of the bullying and her feelings. This is an example of how an interactive experience can be designed specifically to touch users on a specific subject or story.

The posts were entered in Cloud Firestore with the specific times, user names and profile picture information.

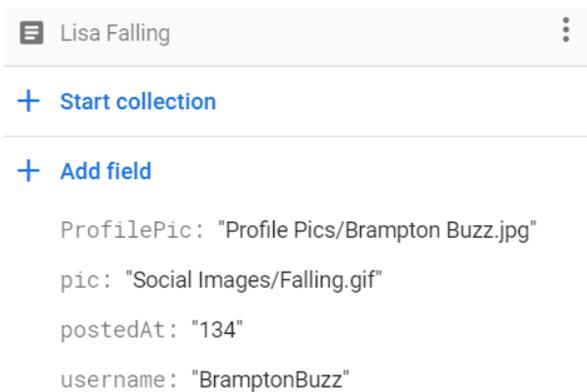


Figure 54: Each post had an assigned profile picture stored in Cloud Firestore. It also had some content in the form of text, an image or a gif. Finally the time at which it is posted on users' phones is present (in seconds) and the username under which the post was presented is indicated.

Here is the code behind these posts:

```

}
render(){
  var post = this.props.post
  var profilePic = 'ProfilePic' in post? post.ProfilePic:null

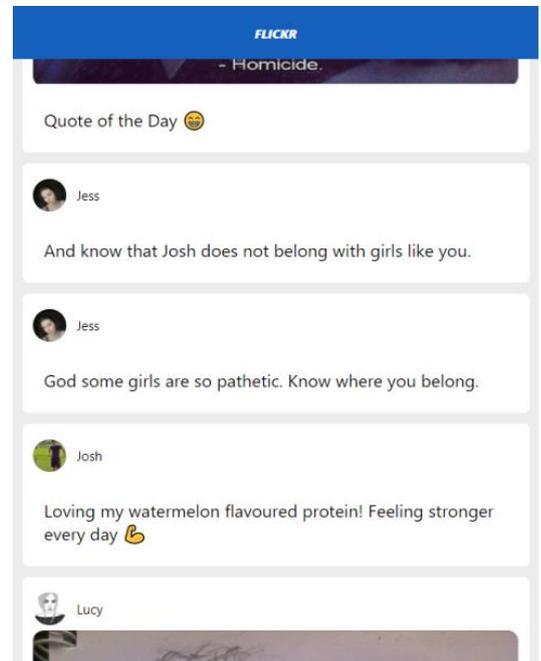
  return (
    <div className="post">
      <div className="header">
        <div className="profilePic">{profilePic} && <FirebaseImage path={post.ProfilePic} downloadUrl={null} fadeIn={true}></FirebaseImage></div>
        <p className="profileUsername">{post.username}</p>
      </div>
      <div className="image">{post.pic} && <FirebaseImage path={post.pic} downloadUrl={null} fadeIn={true}></FirebaseImage></div>
      <div className="content">{post.text}</div>
    </div>
  )
}

```

Figure 55: Posts are posted to the users' phone with the profile images and usernames thanks to the coding above.

It was important that the second-screen app should look similar to Twitter, with various posts by different characters that the users could scroll through and explore. In order for the user to be able to do this, 3 CSS files were created: one for the posts, one for the app as a whole and one for the poll.

Figure 56: The app's design was inspired by Facebook and Twitter. The aesthetic was kept simple, with two dominant colours: blue and white, suggestive of Facebook and Twitter. Only two shapes were used: rectangles with curved corners for posts, and images and circles for the profile pictures. A few fonts were tested before choosing the final one. The blue bar at the top of the app was added to create a closer resemblance with the social apps users are accustomed to. It is constantly displayed at the top of the page, reminding users where they are.



As explained above, although this interface was inspired by Twitter, the interactivity has to be more limited than on real social media in order to avoid users getting distracted by the interactive interface. In the older prototype of *Butterfly* that used Twitter, users interacted with each other about content unrelated to the story, and interacted as their avatars instead of themselves (see Appendix 5). This is problematic when attempting to create a serious and transformative experience because users are engaging with the content as a fun game instead of an informative interactive film. The possibility to like, share or comment was therefore deleted in the new version of the interactive film.

Notifications or buzzing in the phone to tell users when a new post has arrived would have been useful, but these effects were not created because of time restrictions. Instead, phone noises were incorporated into the short film's soundtrack, to prompt users to check their phones when a new post arrives.

2. Collecting the user's responses

For the ending chosen by the majority to be screened, a system to collect the users' responses had to be created. Collecting the users choices was necessary for the interactive system but is also a very interesting asset to see and analyse users choices and see how to enhance the interactive film to be

as informative and immersive as possible. Thanks to Cloud Firestore, a cloud-hosted database, the users' responses could be collected. Instead of typical HTTP requests, this uses data synchronization—every time data changes, any connected device receives the update within milliseconds. The Realtime Database API is designed to only allow operations that can be executed quickly. This enables creators to build a real-time experience that can serve a large number of users

without compromising responsiveness.

```
});
//subscribe to video time document
this.props.db.collection("sessions").doc("videoSession")
.onSnapshot((doc:any) =>{
  var data = doc.data()
  this.setState({
    currentTime:data.time,
    currentPart:data.part,
    ending1VoteCount:data.ending1VoteCount,
    ending2VoteCount:data.ending2VoteCount
  })
  console.log("Current data: ", doc.data());
});
```

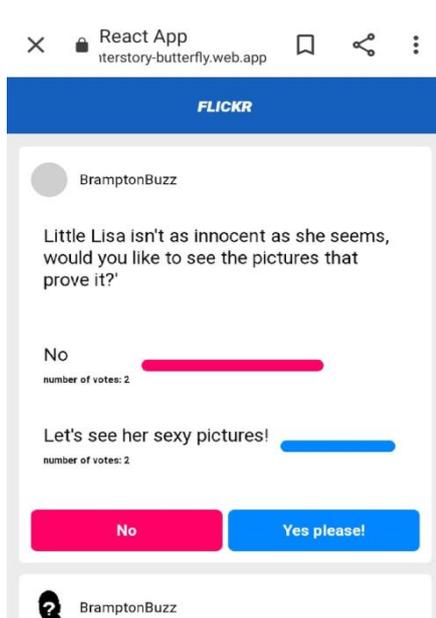
Figure 57: A collection group query was created using “This.props.collection”

3. Playing the chosen ending without any cut or judder

The film itself is composed of three different video sections: the main video, “Ending 1” in which Lisa’s problems are solved, and “Ending 2” in which she cuts her hair.

```
startEndingSelection(){
  //show selection screen
  this.setState({
    showSelectEndingScreen:true,
  })
  //start a countdown
  //when user play ending with highest votes
  this.interval = setInterval(()=>{
    var countdown = this.state.selectCountDownInSec-1
    this.setState({selectCountDownInSec:countdown})
    if(countdown === 0){
      clearInterval(this.interval)
      //load the ending here
      if(this.state.voting.ending1 > this.state.voting.ending2){
        this.setState({videoSrc:"https://firebasestorage.googleapis.com/v0/b/interstory-butterfly.appspot.com/o/Butterfly%20Ending%201%20(October%202020).mp4?alt=media&token=98c4b411-ae27-4075-92a3-b3d2916ce65a",showSelectEndingScreen:false})
        this.videoRef.load()
      }else{
        this.setState({videoSrc:"https://firebasestorage.googleapis.com/v0/b/interstory-butterfly.appspot.com/o/Butterfly%20Ending%202%20(November%202020).mov.mp4?alt=media&token=64f6d4f2-5f6e-459e-9d9a-cf289b567b81",showSelectEndingScreen:false})
        this.videoRef.load()
      }
    }
  },1000)
}
```

Figure 58: The two links correspond to the videos that were stored in the Firestore database, corresponding to both possible endings. “Boolean” was used to create conditions in the programme. If the Boolean expression evaluates to true, then the if block, corresponding to “Ending 1” is executed, otherwise, the else block corresponding to “Ending 2” is executed.



Do i feel superior to you because Twitter Polls are enabled on my account?



Figure 59: The poll for *Butterfly* (left) was created to resemble Twitter polls (example above). The presence of two different colours and the number of people who have voted was replicated, but buttons were added for extra clarity and ease of use. The fact that the name Flickr already belongs to an existing app was not known by me during the creation process and is coincidental.

Above is what the users see on their phones. Creating an interface similar to already known social media would help users to believe in the events happening in the story and immerse themselves more in Lisa’s experience. However, easy-to-use buttons were created to facilitate the experience and ensure everyone, even those not accustomed to Twitter would instinctively understand how to interact.

Figure 60: Below is the code that allows users to vote on the poll on their phones. The ending shown depends on whether the majority of votes in the polls are for “No”, which corresponds to “Ending 1”, or for “Yes please!”, which corresponds to “Ending 2.”

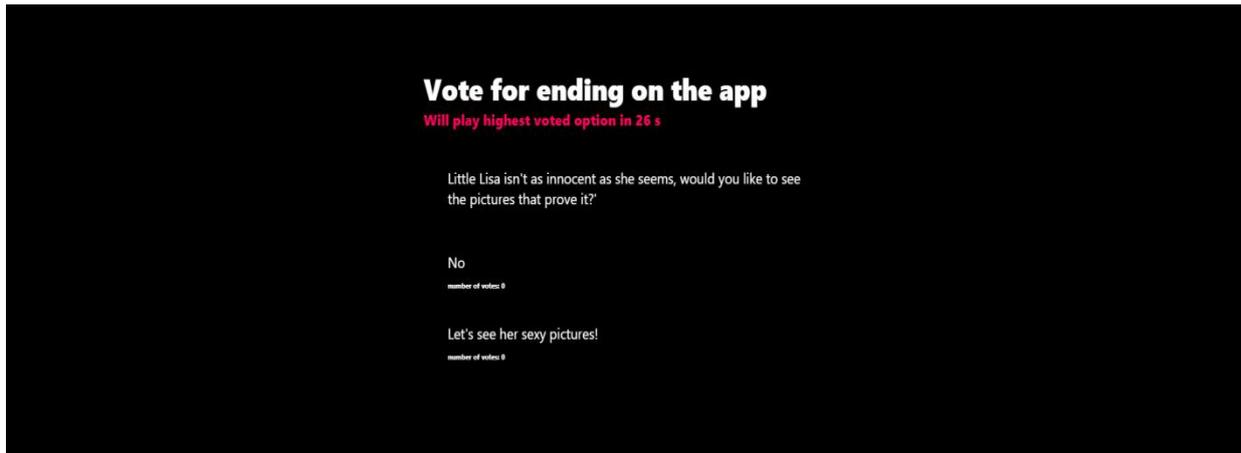
```

</div>
{!this.state.chosenEnding && !this.props.minimal && <div className="options">
  <button onClick={()=>this.chooseEnding(1)}>No</button>
  <button onClick={()=>this.chooseEnding(2)}>Yes please!</button>
</div>}
</div>

```

Sadly the creation of a seamless interaction was not achieved even though it would have allowed for a better immersion because the film had to be livestreamed in many locations. The time between the choice is made and the corresponding scene shown varied in function of people’s location and internet connection so a long pause had to be planned, too long for a video extract to play without being cut. The image therefore pauses with a countdown that was available on the film component.

Figure 61: A countdown appears on the film screen while people are voting to influence the ending.



2.3 - Limitations

Although the system that was created for *Butterfly* achieves the objectives, there still are issues with this model of a second-screen experience.

2.3.a) Accessibility

The system that was created relies on wifi. Users with no internet connection or a bad internet connection will not be able to watch it. If the film is screened publicly, enough bandwidth for a large quantity of people would ideally be necessary to run an event smoothly.

A phone or tablet is also required for users to interact with the story. Many if not most people do have phones, but there is the risk that their battery might be low. However, the fact that the experience operates via an internet link and is not actually an app to download is a good way to avoid problems to do with storage space and battery power.

The system only works if there is one screening happening at a time; more than one and the entire experience is disrupted. For this reason screenings are better if a host is present to make sure all the

users are ready and on the right link. As a result, for now the film is not simply a link that can simply be shared anywhere, its use and circulation need to be limited to avoid disrupted screenings.

2.3.b) Simplification of Complex Topics

A five-minute film cannot begin to cover the complexity of bullying. The narrative of *Butterfly* is quite superficial, but this is intentional as it is made for a teenage audience, hence the teenage drama type of storyline. The characters therefore correspond to stereotypes: the mean girl, the nice popular boy, and so on. Such shortcuts can be good to create a quickly understandable story, but the simplicity of the story might disrupt the user's immersion.



Figure 62: Both endings simplify the effect and solutions of bullying. The positive ending showing Lisa putting her phone away might suggest that letting go of your phone is enough to avoid the negative effects of bullying. It is of course not that simple. The negative ending also shows a short-term visual effect of bullying, with Lisa cutting her hair. It does not show the long-term negative effects it can have on people's mental health.

To help avoid misunderstanding of the topic, sharing additional resources on the subject before and after the screening can be a good idea. This is done for *Butterfly*, which ends with a link to the Anti-Bullying Alliance's website.

2.3.c) Low Level of Interactivity

The limited amount of interaction in *Butterfly* might block the possibility of transformation for users. According to Janet Murray, agency²⁰⁸ (the satisfying ability to make meaningful changes to a virtual environment) is essential for a transformation to occur. The vision of gamers as co-creators of their own experience is also often linked to transformation.^{209 210} In *Butterfly* the interaction lies in just one question, which might not be enough. Research in video games has shown that a balance where the player's skill matches the challenge of the game is considered optimal,²¹¹ most enjoyable²¹² and most immersive.^{213 214 215} While interactive film users are not "players", they are required to interact at least a little, and become involved with some sort of goal, and it might be valuable to attempt to recreate the most optimal video games when it comes to interactivity.

Even though the interactivity here is more natural and unique than in many interactive films, it should be borne in mind, as Peter Field, designer of *The Last of Us* (Naughty Dog, 2013) said, that "A good game mechanic is something that makes the player feel clever, not something that shows off how clever the designer is."²¹⁶ Essentially, in its current version *Butterfly* looks more interactive than it really is. Considering this, *Butterfly* could be made more complex, for example allowing users to react to posts with emojis that would affect what is then shown, or to see profiles of characters. A balance would need to be found, with less interactivity than in the first version of

²⁰⁸ Janet H. Murray, *Inventing the Medium: Principles of Interaction Design as a Cultural Practice*, (London: MIT Press, 2012), <<https://www.jstor.org/stable/j.ctt5hhjgg>>, [Accessed January 12, 2020].

²⁰⁹ Michael Wellenreiter, 'Screenwriting and authorial control in narrative video games', in *Journal of Screenwriting*, 6.3, (2015), pp. 343-361, <https://doi.org/10.1386/josc.6.3.343_1>, [Accessed 2 September].

²¹⁰ Nicholas David Bowman, 'Video Games as Demanding Technologies', in *Media and Communication*, 7.4, (2019), <<https://www.cogitatiopress.com/mediaandcommunication/article/view/2684>>, [Accessed 28 June 2020].

²¹¹ Annie Jin Seung-A, 'Toward integrative models of flow: Effects of performance, skill, challenge, playfulness, and presence on flow in video games' in *Journal of Broadcasting & Electronic Media*, 56.2, (2012), pp. 169-186, <<http://dx.doi.org/10.1080/08838151.2012.678516>>, [Accessed 8 December 2020].

²¹² Madison Klarkowski and others, 'Operationalising and Evaluating Sub-Optimal and Optimal Play Experiences through Challenge-Skill Manipulation' in *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, (2016), <<http://dx.doi.org/10.1145/2858036.2858563>>, [Accessed 28 June 2020].

²¹³ Tom Cole, Paul Cairns and Marco Gillies, 'Emotional and Functional Challenge in Core and Avant-garde Games' in *CHI PLAY '15: Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, (New York: Association for Computing Machinery, 2015), pp. 121-126, <<http://dx.doi.org/10.1145/2793107.2793147>>, [Accessed 5 February 2020].

²¹⁴ Laura Ermi and Frans Mayr, 'Fundamental components of the gameplay experience: Analysing immersion', in *Worlds in play: International perspectives on digital games research*, 37.2, (2005), pp. 37-53.

²¹⁵ Paul Cairn and others, 'Measuring and defining the experience of immersion in games' in *International journal of human-computer studies*, 66.9, (2008), pp. 641-661, <<http://dx.doi.org/10.1016/j.ijhcs.2008.04.004>>, [Accessed 9 February 2020].

²¹⁶ Peter Field, *The Last of Us - Level Design Breakdown*, online video recording, *YouTube*, 8 Jun 2020, <<https://www.youtube.com/watch?v=oGM8IR9znDY>>, [Accessed 30 March 2020].

Butterfly but enough interactivity to create an engaging experience for users. This could perhaps be achieved through a special app offering limited and specific interactions, rather than through unrestricted interactions on Twitter that can distract users (Appendix 5).

2.3.d) Complicated to Produce

A well-known issue with interactive film is that it is complicated to create, as it requires a wide range of skills from filmmaking to coding. This can be seen in the time it has taken to create a system for *Butterfly*. This system works but only for one screening at a time, requires wifi and is not as interactive and complex as originally planned. This problem is perfectly summed up by Digifish founder Paul Banks: “*Trenches* took over 2 years to make. After working our way through two scriptwriters, a complete change in concept, continuity issues, and a lot of anguish. I am no longer surprised that few others have done anything about it. It’s too expensive and complicated to make to interest investors. We filmed this film in 2016 and we still work with the National Army Museum but they’ve never commissioned another interactive film and that probably tells it all, doesn’t it.”²¹⁷

Despite all these limitations, the growing popularity of platforms like Netflix, the emergence of many object-based media (OBM) softwares that are being created (*Storykit*,²¹⁸ *Cutting Room*,²¹⁹ *Branch Manager*,²²⁰ *Ctrl Movie*, *Eko Studio*, etc) and the growing research surrounding user engagement²²¹ and attention economy²²² leads to believe that interactive content will become even more prevalent and that technical problems linked to the creation of interactive content may be overcome in the future.

²¹⁷ Banks, Paul. **Interview**. By Rebecca Gallon. 13th February 2020.

²¹⁸ Mike Armstrong and others, ‘Taking Object-Based Media from the Research Environment Into Mainstream Production’, in *SMPTE Motion Imaging Journal*, 129.5, (2020), pp. 30-38.

²¹⁹ Marian F. Ursu and others, ‘Authoring Interactive Fictional Stories in Object-Based Media (OBM)’, in *IMX '20: ACM International Conference on Interactive Media Experiences*, (New York: Association for Computing Machinery, 2020)

²²⁰ Devon Ivie, ‘Netflix Created Wild Software for Black Mirror: Bandersnatch’, *Vulture*, 30 December 2018 <<https://www.vulture.com/2018/12/netflix-created-wild-software-for-black-mirror-bandersnatch.html>> [Accessed 29 March 2020]

²²¹ Concannon, Shaune and others, ‘Brooke Leave Home: Designing a Personalized Film to Support Public Engagement with Open Data’, in *Proceedings of the ACM CHI 2020 Conference on Human Factors in Computing Systems*, (University of York: Association for Computing Machinery, 2020), pp. 1-14 <[https://pure.york.ac.uk/portal/en/publications/brooke-leave-home\(63f8ecd1-f822-4279-8d20-016a1a9a5cc4\).html](https://pure.york.ac.uk/portal/en/publications/brooke-leave-home(63f8ecd1-f822-4279-8d20-016a1a9a5cc4).html)> [Accessed 15 June 2019].

²²² Radesky, Jenny, ‘Digital Media and Symptoms of Attention-Deficit/Hyperactivity Disorder in Adolescents’, (Michigan: University of Michigan School of Medicine, 2018), <<https://jamanetwork.com/journals/jama/article/2687840>>, [Accessed 3 May 2019].

CHAPTER 3

Testing the persuasive potential of interactive film with *Butterfly*

In order to test the persuasive potential of interactive film, ten screenings of *Butterfly* and an accompanying survey were administered over Twitch. This chapter explores the creation of the survey and the results.

3.1 - Audience Testing

3.1.a) Related Research

Research concerning the user experiences of readers and viewers of entertainment media is common in social sciences²²³ and in cultural studies.²²⁴ Many studies exist to measure user responses to video games.²²⁵ ²²⁶ In contrast to video game research, user-centred research on interactive storytelling is very scarce and therefore not well-established.²²⁷ Existing papers on the experience of users of interactive film are rare and mostly focus on documentaries²²⁸ and virtual reality.²²⁹ Most of these studies draw on both qualitative and quantitative data to determine how immersive and entertaining different storytelling formats are.

In video games and interactive storytelling, research concentrating on immersion and engagement is common but the persuasive, transformative potential of interactive storytelling is under-explored.

²²³ Nicholas Abercrombie and Brian J. Longhurst, *Audiences: A Sociological Theory of Performance and Imagination* (London: Sage, 1998).

²²⁴ Virginia Nightingale, *Studying Audiences: The Shock of the Real* (London and New York: Routledge, 1996).

²²⁵ R. M. Ryan, C. S. Rigby and A. Przybylski, 'The Motivational Pull of Video Games: A Self-Determination Theory Approach', in *Motivation and Emotion*, 30.4, (2006), pp. 344–360.

²²⁶ C. J. Ferguson, A. Garza, J. Jerabeck, R. Ramos, and M. Galindo, 'Not worth the fuss after all? Cross-sectional and prospective data on violent video game influences on aggression, visuospatial cognition and mathematics ability in a sample of youth', *Journal of youth and adolescence*, 42.1, (2013), pp. 109–22.

²²⁷ Harmut Koenitz, 'Thoughts on a Discipline for the Study of Interactive Digital Narratives', in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018).

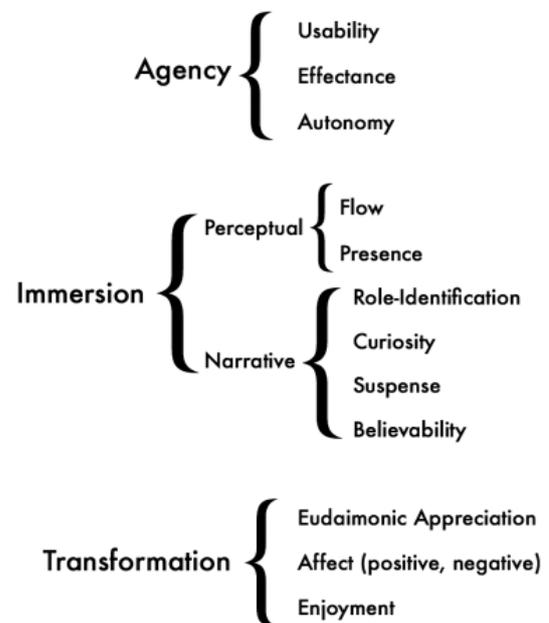
²²⁸ N. Basaraba, O. Conlan, J. Edmond, P. Arnds, 'User Testing Persuasive Interactive Web Documentaries: An Empirical Study' in *Interactive Storytelling, Lecture Notes in Computer Science*, ed. by Bosser AG., Millard D.E., Hargood C, 12497, (Switzerland: Springer, 2020) <https://doi.org/10.1007/978-3-030-62516-0_7>, [Accessed 21 February 2020].

²²⁹ M.C. Reyes 'Measuring User Experience on Interactive Fiction in Cinematic Virtual Reality' in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018).

Roth and Mekler²³⁰ conceptualised a personal transformation theory based on entertainment theory, which differentiates between pleasure-seeking hedonic and truth-seeking eudaimonic motivations to use entertainment media.²³¹ The study for *Butterfly* is strongly inspired by Roth and Koetnitz’s research on interactive storytelling. They separated elements of interactive storytelling in order to examine and understand the effects of agency, immersion and transformation on users.²³²

Many researchers conduct multi-dimensional assessments such as both IJsselsteijn et al.²³³ and Brockmyer et al.²³⁴ They define a host of concepts involved with game play experience such as immersion, flow, presence, absorption and dissociation. This approach will be used for the study revolving around *Butterfly*. Guided by the graphic on the left by Roth and Keonitz, the survey focuses on affect, enjoyment, eudaimonic appreciation and immersion in order to research the transformative and immersive potential of *Butterfly*.

Figure 63: Dimensions of User Experience as defined by Roth and Keonitz. Agency was not included in the study of this thesis because Roth and Koenitz’s notion of agency is measured with the amount of autonomy, of “freedom to choose”¹ an interactive narrative gives to users. Roth and Koenitz believe a good interactive system does not “push” users to do certain choices. In the case of *Butterfly*, this idea is not valid because users only interact once. Their lack of choice is meant to reflect the feeling of powerlessness Lisa feels while being bullied. For the final and only choice they face, users are intentionally pushed to be mean in order to learn to resist curiosity and to avoid being a bully or a bystander in the future. Roth and Keonitz also measure agency with local and global effectance, “the effect a chosen action has, e.g. how meaningful it is for the narrative progression.” This cannot be measured in the case of *Butterfly* because there is only



²³⁰ Christian Roth, Eliza Mekler, ‘Transformation’, in *INDCOR white paper 1: A shared vocabulary for IDN (Interactive Digital Narratives)*, (CoRR, 2020), p.32. <<https://arxiv.org/abs/2010.10135>>, [Accessed November 2020].

²³¹ A. Bartsch, and M. B. Oliver, ‘Appreciation as audience response: Exploring entertainment gratifications beyond hedonism’, in *Human Communication Research*, 36.1, (2010), pp. 53– 81.

²³² Christian Roth and Harmut, Koenitz, ‘Evaluating the User Experience of Interactive Digital Narrative’, in *AltMM '16: Proceedings of the 1st International Workshop on Multimedia Alternate Realities*, (2016), pp. 31–36. <<https://doi.org/10.1145/2983298.2983302>>, [Accessed 13 November 2020].

²³³ IJsselsteijn and others ‘Characterising and Measuring User Experiences in Digital Games’ in *Journal of Applied Mechanics- transactions of The Asme*, 1, (2007).

²³⁴ Jeanne H. Brockmyer, Christine M. Fox, Kathleen A. Curtiss, Evan McBroom, Kimberly M. Burkhart, Jacquelyn N. Pidruzny, ‘The development of the Game Engagement Questionnaire: A measure of engagement in video game-playing’ in *Journal of Experimental Social Psychology*, 45, (2009), pp. 624–634. <<https://faculty.ontariotechu.ca/kapralos/csci5530/Papers/geq.pdf>> [Accessed November 2020]

3.1.b) The Audience

Participants were recruited from various social networks (e.g., Instagram, Facebook, Twitter). A total of 72 participants completed the survey, but 2 participants were excluded because of wifi issues that made the screening not relevant to this research, and two participants had issues submitting their survey. This resulted in a final sample of 68 participants, ranging from 18 to 64

years of age. The majority of participants were young because of the researcher's age group, but also the fact that they were comfortable with technology. Two people aged over 40 decided to abandon the experience before the end because they were overwhelmed by the technology. Participants will be identified as follows: from P.1 (Participant 1) to P.68 (Participant 68).

Figure 64: Age of participants

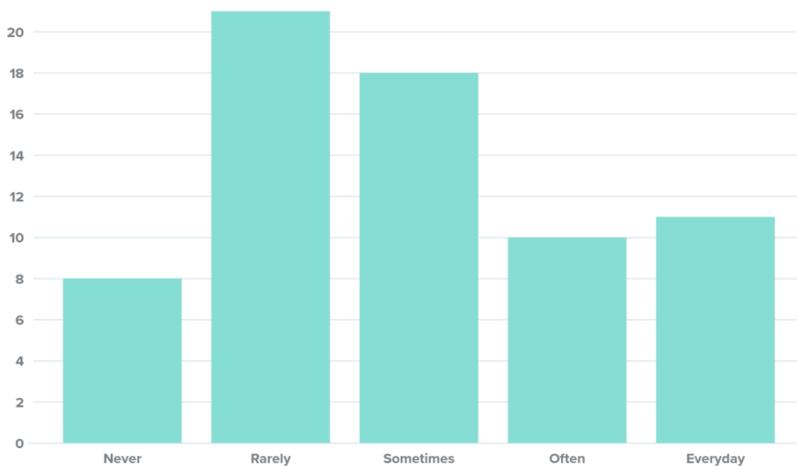
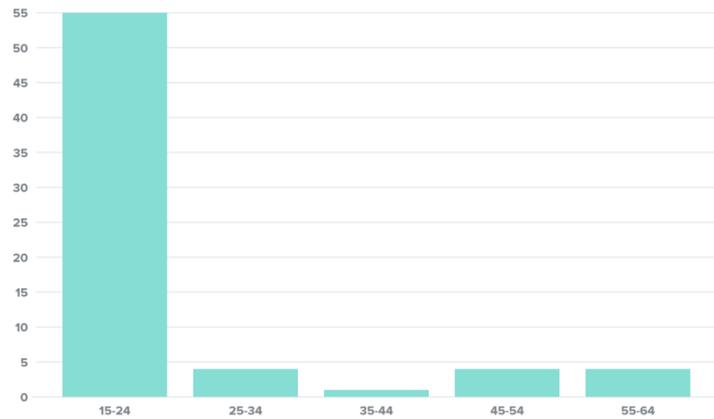


Figure 65: How often participants play video games.

Overall, the participants were quite familiar with interactive storytelling. Only eight people had never played a video game (P.13, P.14, P.26, P.38, P.39, P.58, P.61, P.64) (twenty-one said they played rarely) and 6.8 % of participants had never seen an interactive film (P.1, P.9, P.11, P.14, P.16, P.21, P.22, P.35, P.42, P.64).

Additional details that can be relevant to note for the results are the fact that only four participants did not use social media (P.39, P.51, P.61, P.67), and nine of the participants have children (P.1,

P.11, P.35, P.39, P.53, P.61, P.64, P.67). Some of the participants are French and their responses were translated by me in this thesis (see sentences followed by translation in brackets). They watched the film in English, with French subtitles and French texts on the second-screen experience.

3.1.c) The Procedure

The online screening and survey is composed of both open-ended qualitative questions and psychometric PX measures (See Appendix 6). All measures consist of 6-point Likert scales ranging from strongly disagree (1) to strongly agree (6), unless noted otherwise. While these values differ between participants - based on their experience, expectations, and preferences - the resulting mean score gives an indication of the overall rating of an artefact with regard to its persuasive quality. In addition to this quantitative measurement, participants are asked in a series of qualitative questions to elaborate on their experience and the meaning it had for them. Analysis of the data revealed underlying patterns of a meaningful experience.

Here is how screenings proceed: Users join live sessions hosted on Twitch where the process is directly explained to them. They are told the devices they need and how the experience works. The anonymous nature of the survey is explained before being shared with participants. Upon clicking the survey link, participants are introduced to the study and asked for consent. Next they are asked about their emotional state (affect) using the Positive and Negative Affect Schedule (PANAS) by Watson, Clark, and Tellegen.²³⁵ To see what users themselves perceive as emotionally challenging, an approach similar to the study by Johnson et al.²³⁶ is used, asking participants to bring to mind and write about a previous interactive experience that was emotionally challenging. No definitions or examples are provided, in order to see how participants themselves understand the term “emotionally challenging.” They are also asked to indicate how long ago their experience had taken place. The “care” moral foundation of Moral Foundations Theory is measured using the subscale developed by Graham et al.²³⁷. This subscale consists of six items in total. The first three items

²³⁵ D. Watson, L. Clark, and A. Tellegen, ‘Development and validation of brief measures of positive and negative affect: the PANAS scales’ in *Journal of personality and social psychology*, 54.6, (1988), pp. 1063–1070.

²³⁶ Daniel Johnson, Lennart Nacke, and Peta Wyeth, ‘All About That Base: Differing Player Experiences in Video Game Genres and the Unique Case of Moba Games’, In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, (2015), pp. 2265–2274, <<http://dx.doi.org/10.1145/2702123.2702447>>, [Accessed 5 September 2020].

²³⁷ J. Graham, and others, ‘Mapping the moral domain’ in *Journal of Personality and Social Psychology*, 101.2, (2011), pp. 366–385, <<https://doi.org/10.1037/a0021847>>, [Accessed 13 November].

assess the relevance of certain considerations for judging an action as right or wrong (e.g., “Whether or not someone cared for someone weak or vulnerable”). For the last three items, participants can indicate their agreement with statements (e.g., “One of the worst things someone could do is hurt a defenceless animal”). The resulting variable will be referred to from here on as care morality.

The next questions are pretty straightforward, asking the participants’ ages, whether they have children because the subject of bullying might have a bigger emotional effect on parents who care about their children’s wellbeing in school, and asking about their experience with video games and social media, to see if the interactive content inspired by social media in *Butterfly* is complicated to grasp for people who are not active on their phones or with video games. The screening then begins. How to use the app is explained to users vocally, and also with the graphic on the left:



Figure 66: Guide to watch the interactive film.

To give participants the most immersive experience possible, the film was then shown in full-screen mode, with no details that could distract viewers, such as the host's face in a corner or any graphics. During the screening participants voted (to see/not see a photograph of the main character, as explained earlier in Chapter 2) and the result of the vote affected the story's ending.

After the screening, participants answer more questions in the survey. They fill out the PANAS test again. They are asked to say which ending they voted for, if it had been chosen by the majority during the screening, and how they feel about that. Then, to assess their "eudaimonic appreciation", the scale on aesthetic pleasantness and eudaimonic appreciation created by Christian Roth and adapted from Rowold²³⁸ and Cupchik and Laszlo²³⁹ is used. This subscale consists of 5 items relating to how much the film made them think ("The experience made me think about my personal situation") and inspired them ("The experience moved me like a piece of art"). The maximum score is 30.

To test how immersed the film made participants feel, part of the Sensory and Imaginative Immersion component scale²⁴⁰ (Items 3, 14, 20, 21, 30, and 33) was used, taken from the Core Game Experience Questionnaire (GEQ). The maximum possible immersion score is 36.

The next questions focus on the interactive experience in itself. The International Organization for Standardization defines usability as a construct consisting of three dimensions: effectiveness, efficiency and satisfaction²⁴¹. This can be tested with the System Usability Scale created by Christian Roth²⁴² (SUS-3, adapted from Brooke²⁴³). The maximum possible usability score is 35.

To see if the interactivity immersed users more or less in the story, the Spatial Presence Scale (Short scale, adopted from the MEC Presence questionnaire, Spatial Presence Self-Localization

²³⁸ J. Rowold, 'Instrument Development for Esthetic Perception Assessment' in *Journal of Media Psychology*, 20.6, (2008), pp. 35–40.

²³⁹ G. C. Cupchik and J. Laszlo, 'The Landscape of Time in Literary Reception: Character Experience and Narrative Action', in *Cognition & Emotion*, 8.4, (1994), pp. 297–312.

²⁴⁰ K Poels, Y. A. W. de Kort and W. A. IJsselstein, *D3.3: Game Experience Questionnaire: development of a self-report measure to assess the psychological impact of digital game*, (Eindhoven: Technische Universiteit Eindhoven, 2007), p. 45, <https://pure.tue.nl/ws/portalfiles/portal/21666952/Fuga_d3.3.pdf>, [Accessed 17 October 2020].

²⁴¹ ISO, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 11: Guidance on usability*, (Switzerland: ISO, 1998).

²⁴² Christian Roth, 'Experiencing Interactive Storytelling', (PhD, University of Amsterdam, 2015)

²⁴³ J Brooke, 'SUS-A quick and dirty usability scale' in *Usability Evaluation in Industry*, ed. by Jordan, P. W., Thomas, B., Weerdmeester, B. A., and McClelland, A. L., (London: Taylor & Francis, 1995), pp. 189–194.

dimension; Vorderer et al²⁴⁴) was combined with the flow scale (component of the Core GEQ Module²⁴⁵). The maximum immersion score is 54. The survey ended with open-ended questions on the purpose of interactivity in this film and in films in general, how *Butterfly* could be improved, and the best conditions to view interactive films. Finally, participants were able to leave an opinion or additional remark.

3.2 - Results

3.2.a) Measurements

To test the emotional effect *Butterfly* had on viewers, the Positive and Negative Affect Schedule (PANAS) was used. This comprises two mood scales, one that measures positive affect (PA) and the other negative affect (NA). Ten descriptors are used for each PA and NA scale to define their meanings. Participants in the PANAS are required to respond to a 20-item test using a 5-point scale that ranges from very slightly or not at all (1) to extremely (5). By comparing the mean positive and negative affect of users before and after watching the film, it was possible to determine whether or not the interactive film had an effect on users emotionally. The PANAS scores were also compared for different demographics (participants with children, participants who had never seen an interactive film, etc) to see if the emotional effect varies depending on specific factors.

The “care” moral foundation from Moral Foundations Theory was measured using the subscale developed by Graham et al.²⁴⁶ This subscale consists of six items in total, assessed by a 6-point Likert scale. The sum of the scores assigned by participants to the 6 different items gives a “care morality” score of up to 36 maximum. The care concept was used to compare the results of people with, respectively, high and low care morality to see if the interactive experience has a stronger effect on people with a higher care morality.

²⁴⁴ P Vorderer, and others, ‘MEC Spatial Presence Questionnaire (MEC SPQ): Short Documentation and Instructions for Application’, in *Report to the European Community*, (2004), <<http://www.ijk.hmt-hannover.de/presence.>>, [Accessed 21 August 2020].

²⁴⁵ K Poels, Y. A. W. de Kort and W. A. IJsselstein, *D3.3: Game Experience Questionnaire: development of a self-report measure to assess the psychological impact of digital game*, (Eindhoven: Technische Universiteit Eindhoven, 2007), p. 45. <https://pure.tue.nl/ws/portalfiles/portal/21666952/Fuga_d3.3.pdf>, [Accessed 17 October 2020].

²⁴⁶ J. Graham, and others, ‘Mapping the moral domain’ in *Journal of Personality and Social Psychology*, 101.2, (2011), pp. 366–385. <<https://doi.org/10.1037/a0021847>>, [Accessed 13 November].

To calculate the System Usability Scale (SUS) score, three calculations are required. For positive items (“The system was easy to use”), the score is the scale position minus 1. For negative items (“it was hard to use”), the score is 5 minus the scale position. To calculate the overall SUS score, the sum of the negative and positive score is multiplied by 2.5.

To understand the results of all the other scales present in the survey, such as the Spatial Presence Scale, the flow scale and the scale on aesthetic pleasantness and eudaimonic appreciation, a simple calculation is required. The sum of the scores assigned by participants to the different items indicates the level of flow, presence and eudaimonic appreciation of the audience.

3.2.b) Results

In order to clearly analyse the effect of the film, the results will not be presented in the order they were presented to the participants.

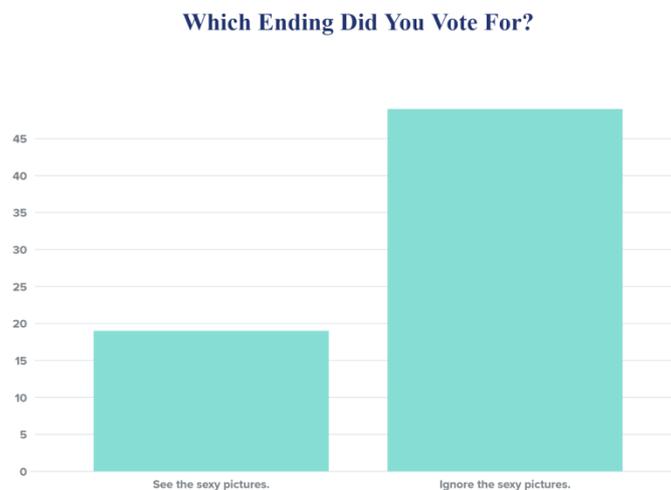


Figure 67: Number of votes for the two possible endings of *Butterfly*.

During the film, 49 participants voted to ignore the controversial sexy pictures of Lisa, and 19 participants voted to see them. This was done over 10 screenings with a variety of attendees, from 1 to 13 participants simultaneously.

This result is quite surprising given that in prior tests in 2019, 75% of the participants (27 out of 36) had voted to see the sexy pictures. The main difference between the two sets of tests is the screening conditions. In 2019, people voted in a cinema environment surrounded by many people, whereas in 2020 they were voting in their own homes with a smaller group. One explanation for this choice of vote could be that participants might think the small online attendance of 13 people maximum would reveal what they voted for, pressuring them to vote for the “good” answer.

Interestingly, more people hesitated when their final vote was the majority vote (19 people) than people choosing the minority vote (10 people). This seems to indicate that most participants tend to follow the first votes. This all indicates that choices in interactive films may have more to do with the social context than users' personal opinion. This seems to be confirmed by the fact that 19 people

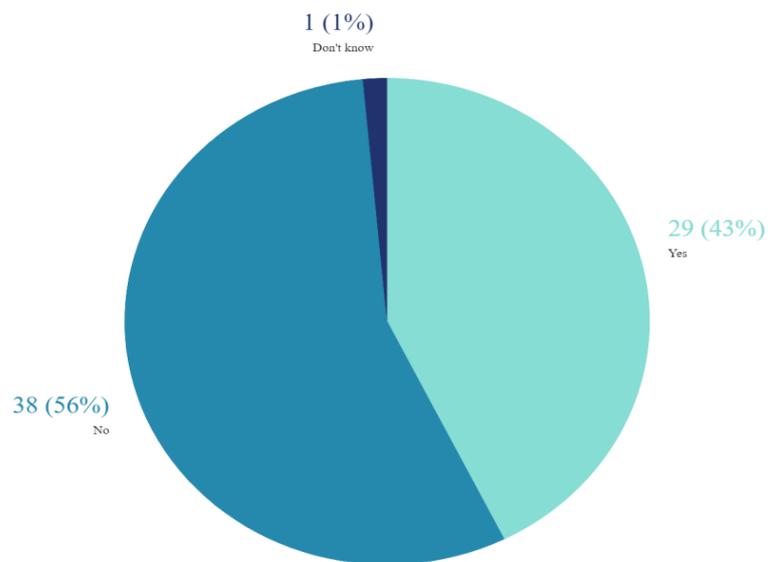


Figure 68: Hesitation before voting. When asked if they had hesitated before voting, 43% of participants said “yes”.

argued that interactive films are best watched alone, because of the absence of social pressure when playing alone. This indicates that group experiences might lead users to make the choice they think is expected of them by following what everyone else is doing or by choosing what is most likely to be the right decision (in *Butterfly's* case, to ignore the sexy pictures). These results are in line with the findings of Granic et al.,²⁴⁷ and Greitemeyer²⁴⁸ who found that intergroup collaboration in multiplayer video games, whether violent or not, reduces prejudice and bias and increases empathy towards the outgroups. The presence of others influences the attitude and choices of users. These findings indicate that in a didactic context such as in a classroom, hiding the votes or creating fake anonymous negative votes might be necessary to show users they can really vote as they wish.

²⁴⁷ I. Granic, A. Lobel, and R. C. Engels, 'The benefits of playing video games', in *American Psychologist*, 69.1, (2014), p. 66.

²⁴⁸ T. Greitemeyer, 'Playing video games cooperatively increases empathic concern' in *Social Psychology*, 44.6, (2013), pp. 408-413, <<https://doi.org/10.1027/1864-9335/a000154>>, [Accessed 9 January 2020].

Emotional Response

Out of the 68 participants, 22 did not get to see the ending they voted for because they were part of the minority. When asked how they felt about the chosen ending, less frustration was expressed than expected. Only three out of twenty-two people expressed frustration or disappointment: “I’m frustrated” (P.5), “I feel excluded” (P.54), “I would have liked to know what the alternative ending was” (P.21).

More negative feelings were expressed by the participants who did see what they voted for. This was particularly true for people who had voted for the negative ending. Some people felt cheated because the film did not actually show any “sexy pictures” (“Frustré on a pas vu les photos”, [“Frustrated we didn’t get to see any pictures”]) (P.27), others felt guilty (“[I feel] Bad, the goal was not to offend the protagonist but to be curious. If I could go back I would surely change my mind to help Lisa” (P.41); “when I understood the consequence, I felt guilty” (P.45)) or sad (“I’m sad for Lisa” (P.29)). 15 commentaries showed a strong connection with the film through the strong words used about the subject of the film matter: “intolerable” (P.67); “F*#k popular kids, they are sheep” (P.42); “HAPPY!” (P. 35); “relieved” (P.25); “I was very emotionally invested in Lisa’s character and felt awful seeing how everyone treated her” (P.12) .

By comparing the results of the Positive and Negative Affect Schedule (PANAS) before and after the screenings, the emotional effect *Butterfly* has on participants can be analysed in more detail. The PANAS revealed that the mean positive affect of participants was 30.23 before watching the film and went down to 27.09 after watching the film. The negative affect, on the contrary, rose from 15.48 to 19.48 (see below).

| User Experience | Pre-Screening Condition | Post-Screening Condition | Change Between Before and After | |
|-----------------------------|-------------------------|--------------------------|---------------------------------|-------------|
| Interested | 3.92 | 3.94 | + | 0.015 |
| Sad | 1.75 | 2.54 | + | 0.794 |
| Excited | 3.07 | 2.29 | - | 0.779 |
| Troubled | 1.86 | 2.5 | + | 0.632 |
| Powerful | 2.82 | 2.41 | - | 0.411 |
| Guilty | 1.61 | 1.97 | + | 0.352 |
| Scared | 1.35 | 1.80 | + | 0.455 |
| Hostile | 1.28 | 1.69 | + | 0.411 |
| Enthusiastic | 3.5 | 2.60 | - | 0.897 |
| Proud | 2.72 | 2.22 | - | 0.5 |
| Annoyed | 1.66 | 1.82 | + | 0.161 |
| Alert | 2.32 | 2.61 | + | 0.294 |
| Ashamed | 1.36 | 1.73 | + | 0.367 |
| Inspired | 2.87 | 2.67 | - | 0.191 |
| Nervous | 1.76 | 1.68 | - | 0.88 |
| Determined | 2.9 | 3.65 | - | 0.264 |
| Careful | 3.14 | 3.05 | - | 0.088 |
| Hysterical | 1.66 | 2.70 | + | 0.044 |
| Lively | 2.87 | 2.56 | - | 0.338 |
| Anxious | 1.88 | 2.03 | + | 0.114 |
| Mean Positive Affect | 30.23 | 27.03 | | -3.2 |
| Mean Negative Affect | 16.13 | 19.48 | + | 3.35 |

Table 1: Emotional affect before and after watching *Butterfly*

Before the screening the Negative Affect (NA) items (in grey in the table) that had the highest mean score were “Troubled” with 1.86 and “Anxious” at 1.88. After the screening they were “Hysterical”, “Sad” and “Troubled.” The PANAS test indicated a rise in users’ negative affect and a decrease in their positive affect before and after the screening. This seems to indicate that the film does have an effect on viewers, and as *Butterfly* tells a sad story, the rise in negative feelings after the film suggests the film is effective in its goal. More information is needed to explain the changes in each emotion such as information on the users. The PANAS results are therefore examined for more specific groups below.

The emotional effect seems stronger in people who voted to ignore the sexy pictures.

| | Pre-screening Condition | | Post-Screening Condition | | Difference | |
|--------------------------------------|-------------------------|----------------------|--------------------------|----------------------|-------------------------------|-------------------------------|
| | Mean Positive Affect | Mean Negative Affect | Mean Positive Affect | Mean Negative Affect | Difference in Positive Affect | Difference in Negative Affect |
| Voted to see sexy pictures | 30.63 | 17.10 | 26.05 | 18.47 | - 4.58 | + 1.37 |
| Voted to ignore sexy pictures | 30.08 | 15.75 | 27.40 | 19.87 | - 2.68 | + 4.12 |

Table 2: Emotional affect before and after watching *Butterfly*, by vote.

For participants who voted to ignore the sexy pictures, the negative affect increased by 4.12, more than twice as much as in participants who voted to see the pictures. This is surprising, as in the former case the ending of the story is much more positive. This seems to prove Bandura’s theory on behavioural modelling: change is more likely to occur when people witness the behaviour being rewarded with a positive outcome, versus being punished with a negative outcome.²⁴⁹ In Bandura’s

²⁴⁹ Albert Bandura, ‘Social Cognitive Theory of Mass Communication’, in *Media effects: Advances in theory and research*, 2nd ed., ed. By Bryant J. & Zillman D, (Hillsdale, NJ: Erlbaum, 2002) pp. 121–153.

opinion, happy endings could encourage charitable behaviour, even though the story's positive outcome does not directly relate to the charitable acts. This possibility concurs with lessons learned in pro-social behaviour research indicating that helpfulness often occurs in the wake of a positive experience.^{250 251}

As part of the survey, the participants were tested on the “care” moral foundation from the Moral Foundations Theory. The maximum care score is 36 and the mean for all the participants was 29. For further analysis, the respective emotional changes for those with a care morality score below 20, between 21 and 30 and more than 31 were compared (see below).

| Care morality category | Pre-screening Condition | | Post-Screening Condition | | Difference | |
|---|-------------------------|----------------------|--------------------------|----------------------|-------------------------------|-------------------------------|
| | Mean Positive Affect | Mean Negative Affect | Mean Positive Affect | Mean Negative Affect | Difference in Positive Affect | Difference in Negative Affect |
| Participants with Care morality below 20 | 30.6 | 16.4 | 30.4 | 14 | - 0.2 | - 2.4 |
| Participants with Care morality between 20 and 30 | 28.17 | 16.44 | 24.82 | 18.47 | - 3.35 | + 2.03 |
| Participants with Care morality above 31 | 32.59 | 15.72 | 29.03 | 21.62 | - 3.56 | + 5.88 |

Table 3: Emotional affect before and after watching *Butterfly* by care morality score.

The results indicate that the higher the care morality, the higher the difference between

²⁵⁰ George, J. M., ‘State or trait: Effects of positive mood on prosocial behaviors at work’, in *Journal of Applied Psychology*, 76, (1991), pp. 299–307, <[676c89b5eb8c6c3d6ad83241f101c2cd7653.pdf](https://www.semanticscholar.org/paper/676c89b5eb8c6c3d6ad83241f101c2cd7653.pdf) (semanticscholar.org)>, [Accessed 26 May 2020].

²⁵¹ A. M. Isen., & A. F. Levin, ‘Effects of feeling good on helping: Cookies and kindness’, in *Journal of Personality and Social Psychology*, 36, (1972), pp. 1–12, <[93706d0c21b5ca09e8f43a3ce01e03a2138c.pdf](https://www.semanticscholar.org/paper/93706d0c21b5ca09e8f43a3ce01e03a2138c.pdf) (semanticscholar.org)>, [Accessed 28 May 2020].

positive and negative affects before and after screening of the interactive film. People with the lowest care morality scores show a decrease in negative affect instead of an increase. Their positive affect barely changes.

These results indicate that users with a high care morality score have a bigger emotional response to the interactive film than user with a low morality score. This finding leads to question whether interactive narratives can have a strong emotional effect on everyone or only those already inclined to feeling care and empathy. The many flaws of *Butterfly* noted by users in the survey (very short runtime, subtitles for French people, limited interactivity) might however also explain this lack of emotional response in certain users. The negative ending was very impactful in the emotional responses it triggered (“[I feel] Bad, the goal was not to offend the protagonist but to be curious. If I could go back I would surely change my mind to help Lisa” (P.41); “when I understood the consequence, I felt guilty” (P.45); “I find it [the ending] intolerable” (P.67) “Sad” (P.55); “F*#k popular kids, they are sheep” (P.42)) because it was shot as a dramatic and intense scene with close ups on the crying character, dark lighting and sad music. This reveals that when creating an educational interactive film, there should be a focus on creating drama and developing a strong connection between the character and the audience through various techniques such as relatable dialogue, dark cinematography, close ups and dramatic acting.

9 of the participants were parents, and while they all had very different morality care scores (ranging from 15 to 36), Their combined emotional affect showed a bigger decrease in Positive Affect before and after the screening than all the categories of people previously seen (see table below).

| | Pre-screening Condition | | Post-Screening Condition | | Difference | |
|-----------------------------------|-------------------------|----------------------|--------------------------|----------------------|-------------------------------|-------------------------------|
| | Mean Positive Affect | Mean Negative affect | Mean Positive Affect | Mean Negative Affect | Difference in Positive Affect | Difference in Negative Affect |
| Participants with children | 31.11 | 15.66 | 26.44 | 18.55 | - 4.67 | + 2.89 |

Table 4: Emotional affect before and after watching *Butterfly* in participants with children

The results seem to indicate a higher emotional affect in parents. Even though the number of participants in this category is low, more research would be useful to determine if educational interactive films aimed at parents could be of interest, to give them a better understanding of the problems their children can face.

Interestingly, one factor that linked all these parents was that they never or rarely played video games. Consequently, further analyses were conducted to see if gaming frequency could affect the emotional impact of interactive films.

| | Pre-screening Condition | | Post Screening Condition | | Difference | |
|----------------------------------|-------------------------|----------------------|--------------------------|----------------------|-------------------------------|-------------------------------|
| | Mean Positive Affect | Mean Negative affect | Mean Positive Affect | Mean Negative Affect | Difference in Positive Affect | Difference in Negative Affect |
| Play video games often/every day | 28.28 | 16.28 | 27.19 | 19.42 | - 1.09 | + 3.14 |
| Play video games sometimes | 32.55 | 16.68 | 27.42 | 18.31 | - 5.13 | + 1.63 |
| Never/rarely play video games | 30.21 | 15.34 | 25.72 | 19.62 | - 4.49 | + 4.28 |

Table 5: Emotional affect before and after watching *Butterfly*, by gaming frequency

People who are not used to video games seem to have a bigger increase in their negative affect and decrease in their positive affect than those who play often. This could be due to the novelty of interactivity for participants who had never played video games. Regular gamers are more familiar with interactive narrative techniques designed to create an impactful situation. This could mean that

interactive films are more transformative for first-time users than others. This in turn leads to the question of whether interactivity can be efficient in a didactic context in the long term.

Immersion

Immersion in the story was tested using the Sensory and Imaginative Immersion component scale²⁵² (Items 3, 14, 20, 21, 30, and 33) taken from the Core Game Experience Questionnaire (GEQ). The mean eudaimonic appreciation is 29.4 out of 54. This is more than 50%, but from the user comments it seems that immersion was not truly successful. The item with the lowest average rating was “I felt imaginative” which has 3.75 out of 6. The highest-scoring item was “I found it impressive” which could be taken to mean “the accomplishment of the film and system is impressive”, rather than meaning the story world is considered impressive.

48 people thought the film dealt with bullying very realistically: “It felt realistic and it presented the issues accurately” (P.3); “[it presents the problem] very well, goes into the finer details of how the stages of bullying do get worse and the after-effects it has on people and the things it makes them do” (P.9). 19 participants linked the second-screen experience with this realistic representation of bullying: “the overwhelmingness of the notifications was very effective!” (P.4); “I think this was the strong part of the screening” (P.6), “I certainly think having Flickr running alongside made a difference to the social media” (P.59); “being updated during the film added another dimension that I knew well growing up during the social media era” (P.22).

When asked how the film represents cyberbullying, 19 people noted issues with the naive storyline: “felt surface level” (P.24); “the narrative is a little shallow” (P.7); “very frontal” (P.21); “A bit exaggerated, especially for a school the size of a corridor” (P.63); “Some situations were too stereotypical, or nearly absurd (the student running away from the teacher for example)” (P.46). The fact that the last two commenters noticed specific non-realistic details and took time to write about them indicates that it disrupted their immersion. 5 people commented that the film was too short. Its shortness is a problem that was constantly cited in responses to the next questions concerning interactivity. Even when the number of negative responses is smaller than the positive responses, the negative insights given can help interactive storytellers to note elements that can

²⁵² K. Poels, Y. A. W. de Kort, W. A. & IJsselstein, ‘D3.3: Game Experience Questionnaire: development of a self-report measure to assess the psychological impact of digital games’, (Eindhoven: Technische Universiteit Eindhoven, 2007), p. 45, <https://pure.tue.nl/ws/portalfiles/portal/21666952/Fuga_d3.3.pdf>, [Accessed 17 October 2020].

disrupt the transformative potential of interactive films: the non-realistic narrative elements that took people out of the story, and the shortness of the film. Some participants noted an awareness of storytelling that may indicate a risk that interactivity can break the suspension of disbelief: “Conflict drives story so I thought it [i.e. voting to see the pictures] would make for a more interesting ending” (P.3); “I feel like I made the wrong choice because I was too conscious of having a choice. Occam’s razor and all that!” (P.47). [J’ai l’impression d’avoir fait le mauvais choix parce que j’étais trop conscient d’avoir un choix. Le rasoir D’Occam et tout ça !”]

The Interactive Interface

Butterfly had a mean System Usability Scale (SUS) score of 25.69 out of a maximum possible of 35 which is quite a high score considering the fact that users had never used the interface of *Butterfly* before.

| | Less than 40 years old | 40 years and older | All Participants |
|------------------|------------------------|--------------------|------------------|
| System Usability | 26.7 | 17.44 | 25.69 |

Table 6: SUS score by participant age.

However when testing the SUS score on people over 45, the mean score was 17.44 which is significantly lower. In comments on how to improve the film, the people who asked for the film to be slower were generally more than 45 years old. The SUS score for people aged under 45 was 26.7, slightly higher than when the older participants were included. The System Usability Scale (SUS) seems to reveal that the interactive interface is considered complicated to use for participants aged over 40. The small sample of participants in this age group means the validity of these results is not confirmed, but it might be interesting to consider the user’s age when creating interactive projects. A solution to this possible problem can be to create a guide or a demo to allow all users to truly understand and enjoy the interactive film.

| | Never/Rarely Play video games | Sometimes play video games | Play Video Games very often/ Every Day |
|-------------------------|-------------------------------|----------------------------|--|
| System Usability | 24.48 | 27.76 | 24.76 |

Table 7: SUS score by gaming frequency. This scale reveals that people who play video games often or rarely judged the interface as more complicated than those who only play video games from time to time.

The close similarity between scores given by those who play every day, and those who never play is surprising, but might indicate that *Butterfly* was too simple compared to complex existing video games but too complicated for people who are not used to interacting with stories and using multiple devices simultaneously. These results indicate how complicated it is to produce interactive films that will be fluid and easy to use for a large number of people, perhaps explaining why most existing interactive films simply rely on branched storylines, a device users are accustomed to.

4 people had significant internet issues that disrupted their experience.

When asked how interactivity is best experienced, 19 said alone (28%), 12 said in a group (18%), 36 said both (53%) and one person gave no answer. This question was not specific to *Butterfly*, leading to the idea that people would be willing to engage with this type of media content in different situations.

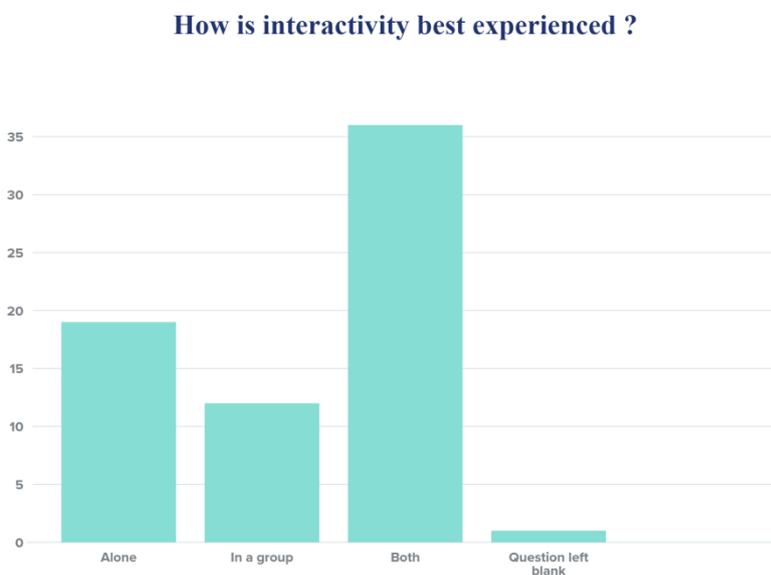


Figure 69: Users' opinion on best interactive conditions.

The participants who believed interactivity is best experienced alone said that would avoid any peer pressure felt in a group, indicating that decisions might have been taken differently at collective screenings because of social compliance. 17 participants described this in their own words: “Being alone allows me to think more without being influenced by other points of view, it means I can focus on my own experience and feelings” (P.4); “On your own, there’s less social compliance I think”; “For example, I voted quite happily knowing my choices were in line with the majority of votes already registered” (P.51). 7 participants (P.10, P.14, P.28, P.36, P.52, P.67, P.68) noted that being alone is also better to stay in focus: “I don’t want to be disturbed while watching the film” (P.67), [“Je ne veux pas qu’on me dérange quand je regarde un film”]. This was all perfectly summed up by the following comment from one participant: “I think being completely alone allows you to focus so much more on the immersive storytelling. There is also a lack of peer pressure. You don’t feel obliged to do the right thing because people are around you - you have to wrestle with that question internally, which is far more powerful” (P.10). To avoid issues linked to peer pressure, *Butterfly* could have been designed with invisible votes, but as the film criticises group bullying and bystanders, showing the number of votes growing was a deliberate narrative choice to create empathy with the main character while she sees people’s negative opinion of her increasing in real time. The question of whether to hide people’s choices and votes needs to be considered when creating an experience.

For people who thought both individual and collective experiences of interactivity were good, most comments can be summed up in this one statement: “alone, the experience is more personal, in a group it can lead to interesting debates” (P.42). The idea of debating with others was cited multiple times. The idea of fun was cited by 5 participants (P.5, P.8, P.25, P.45, P.66) “being amongst other people creates a much more fun environment” (p.8).

People who would rather experience interactivity in a group said such experiences were more “insightful” (P.5), and would stimulate “debates” (P.26, P.54, P.50, P.57, P.42) “to create dialogue beyond the film” (P.20). Being with others was also good for those who “needed help!!” as one participant over 56 years said (P.13). These comments suggest there may be critical value in staging interactive film screenings as a prompt for group discussion.

Transformation

The scale on aesthetic pleasantness and eudaimonic appreciation was quite low (18.8 out of 36). The lowest-scoring item was “This project made me think about my personal situation” (3.25) and “told me something about life” (3.29). The highest score was for “This project was inspiring” (4.42/6).

The reasons why the eudaimonic effect was so low can be found in the question asking participants how the project could be improved. Many people said the film shares too much information in too little time. 21 people wanted the film to be slower. One participant perfectly summed up the 21 statements on the subject: “My only criticism is that sometimes when I was reading the texts, it felt like I was missing out on what was happening in the film. In such a fast-moving story, I was worried that I was missing something important. I didn't always know which to focus on - the film or the new text. Maybe, providing a bit of 'breathing space' in the film where we see how the character reacts to the message, rather than racing on to the next day, might have helped me with this” (P.13). The fact that some participants were French might have had an influence on these comments. The film was in English with subtitles, making it a complicated screening for the French participants as they had to read both on the main screen and on their phone simultaneously. The demand for “more breathing space” reveals an important element to consider for second-screen experience design. Slow-paced moments must be planned and built into the film so that users can look down at their phones and process the information without missing anything on the main screen.

25 participants said the film would be better if it was longer, more complex and offered more options. All these issues are perfectly encapsulated in the following comment by one participant: “More interactive elements would be nice. Maybe being able to upload or react via the social media element would be engrossing. Additionally I think a longer piece would give more opportunity to engage with the story. Finally, more choices in the narrative would be satisfying” (P.10). A few participants expressed confusion at the role of the interactivity. “I wasn't fully convinced that the ending of 'seeing the pictures' translated exactly into the ending of the film that we saw” (P.5); “the voting was nice and if it had a more tangible effect on things throughout the story its impact would be more noticeable” (P.6). More interactivity might be valuable, but as the first prototype proved, it would have to be limited and controlled to avoid users being distracted, especially as it is aimed at a teenage audience (see appendix 4).

The low aesthetic pleasantness and eudaimonic appreciation score reveals *Butterfly* will probably not have a transformative effect on most users. This seems to be due to flaws relating to *Butterfly* itself more than interactive films in general. Commentaries in the survey seem to indicate the film was indeed too short, too fast and not complex enough in how it approached the theme of bullying to immerse and interest viewers.

3 people (P.43, P.56, P.64) noted that for an educational context, it might be interesting to have information about the project on separate documents or slides to go deeper into the subject of the film. Framing *Butterfly* as an exercise on critical reflection on cyberbullying, complete with informative documents, would certainly support the informative aim of such a project. It could be a good way to create a more complex approach to the theme without creating a story that would not be understood by a young audience. To explore the subject further, a post-screening collective discussion could also be beneficial. It would allow users to focus on the subject and reflect on the interactive experience.

To see if the personality of participants might influence their transformation, the eudaimonic appreciation was calculated for groups with different care morality score.

| | Morality care below 20 | Morality care between 20 and 30 | Morality care above 31 | All participants |
|--------------------------------|-------------------------------|--|-------------------------------|-------------------------|
| Eudaimonic Appreciation | 16.6 | 17.81 | 20.35 | 18.88 |

Table 8: SUS score by care morality score. These numbers indicate that the film affected people with higher care scores

This might indicate that transformation is more effective with people who would already be inclined to help others. In an educational context this might therefore show that interactive films could not create transformation for those who do not care about the subject of the story. However the fact that when asked to bring to mind and write about a previous interactive experience that was emotionally challenging, 43 people (63% of participants) cited video games, interactive books and films that touched them and 21 people (31% of participants) talked about experiences that had happened more than 1 year ago show that interactive experiences do make a memorable impression on users. This

might be due to the rarity of such stories or it might be because of interactivity's unique ability to trigger emotions. Only time will tell.

When asked if they would watch *Butterfly* again, 54 participants (80%) agreed, which suggests there is an appetite for this kind of experience and a curiosity to see all possible endings of *Butterfly*. If users are inclined to watch informative interactive experiences multiple times, the possibility of them remembering the narrative and information shared seems more positive than if they only watched the content once. In this regard, interactive storytelling can be a useful tool for storytellers attempting to inform or educate users.

3.3 - Limitations

3.3.a) The Survey

Regarding the survey method, using self-reported measures to examine an artefact has many limitations. Participants' responses can be strongly influenced by external factors such as their mood, exaggeration, a desire to please the researcher, selective memory and telescoping (mixing memories of other events with the one in question when recalling), attribution (attributing positive events and outcomes to one's own agency and negative events and outcomes to external forces).²⁵³ To limit these potential issues, ambiguous items (confusing or vague wording), leading items (wording that influences the participant), double-barrelled items (multiple questions in one item), and double negative items ("I'm not unhappy") were avoided.

However, even when measures are taken to counter these limitations of the self-reporting method, participants may not be aware of a feeling or of what they feel exactly. This suggests future directions for research could be to measure unconscious affective processes. This can be done by implicit measurements, and physiological measurements.

Regarding the survey sample, the study presented in this thesis had a small sample size (68 people, recruited informally with no attempt to ensure representativeness of the general population) is likely to increase the bias and the likelihood of inflated effects based on chance.²⁵⁴ Studies with small

²⁵³ S. T. Fiske and S. E. Taylor, *Social cognition*, 2nd ed., (New York: McGraw-Hill, 1991).

²⁵⁴ M. Bakker, A. van Dijk and J.M. Wicherts, 'The Rules of the Game Called Psychological Science' in *Perspectives on Psychological Science*, 7, (2012), pp. 543–554.

sample sizes lack the statistical power to find significant effects even when there is a genuine effect that exists in the population.

It is likely that different individuals respond differently to interactive stories. The study by Soto-Sanfiel, Aymerich Franch, and Romero,²⁵⁵ for instance, found moderate effects of personalities on the experience of interacting with a film. One particularly interesting result in that study was that interactivity seemed to weaken the influence of personality on the user experience of narrative content. In the *Butterfly* research project, consideration was given to the influence of different personalities and personal habits (e.g. use of social media, experience with video games and interactive films). The participants were asked questions to measure the baselines of traits and states, such as affect or curiosity, as this can be useful to gain insights into mood changes in subjects.²⁵⁶

One final limitation is that most participants were personal acquaintances of the researcher. This is important as some positive feelings in the PANAS test are “Proud” and “Enthusiastic”. Some people may have interpreted that as “proud or enthusiastic for my friend” and rated them higher on the Likert scale than they would have without this context.

3.3.b) The Online Screening

Originally, the intent was to screen *Butterfly* in a cinema or classroom in front of groups of people, with a host present to make sure the process ran smoothly and everyone understood how to use the “app”. Sadly because of external constraints, the film was shown live on the internet through *Twitch*. Many issues occurred with this form of screening. The main issue was the requirement of a good wifi connection for the film to work. A strong connection was needed, and a relocation from Normandy to another town with better wifi was necessary to show the film without any hitches. Some users were unable to finish the screening because of their connection and nothing could be done about that. There were other internet-related difficulties. Common video chat softwares did not work such as Zoom and Skype when presenting the film to multiple people. Twitch worked the best, but it required users to create an account to interact with the host via its chat function. This

²⁵⁵ M. Soto-Sanfiel, L. Aymerichfranch, and E. Romero, ‘Personality in interaction: how the Big Five relate to Interactive Narrative Reception’, in *Communication & Society / Comunicación y Sociedad*, 27.3, (2014), pp.151–186.

²⁵⁶ Christian Roth, ‘Experiencing Interactive Storytelling’, (PhD, University of Amsterdam, 2015).

complicated the process, as some people could not report their problems to the host and the host could not be sure everyone was ready when the film began. The older participants found the process particularly troublesome - one gave up and left in the middle because it was all too much. Finally, the internet affected the film itself. Everyone had a different time lag affecting how long it took for the film to start and the information to appear on their phones. Some people noted that they received the second-screen information too early compared to the film. The time needed for the final vote was also extended due to these technical issues from 15 seconds, which was more than enough for a live screening, to 25 seconds and even 40 seconds. This affected the results, as some people had enough time to change their mind. It is therefore important to note the final results could have been different in different conditions.

Ideally the film should be seen by users on a big screen. This was the case for a few participants who screened it on their TV, however most people watched *Butterfly* on their computers and some even watched both the main film and the second-screen experience on a phone. This may have affected the results, specifically about the sense of immersion, which would of course have been better in cinema conditions.

3.3.c) Transformation

The results surprisingly revealed that social pressure might have affected the participants' choices in spite of the anonymous nature of the project. In the design of the second-screen app, the number of people who voted for each decision could be seen. This feature might need to be deleted to create a truly transformative experience. As *Butterfly* is about cyberbullying, the decision to show the number of votes makes narrative sense because it echoes the experience of being bullied online. Lisa sees all the mean comments and “dislikes” on her phone, and the users get to see them with her.

Adding a feature for developers to see if users change their mind could be interesting to understand the social aspect of public voting on such a film with a clear “good” and “bad” choice.

The screenings also seem to indicate that the number of participants might affect the results. The fewer people there are, the more pressure to conform there is.

The second screen app allowed people to change their vote as many times as they wanted to. This visibly resulted in people changing their votes to align with the most popular choice. This feature might have also affected the analysed results.

The best setting for *Butterfly* and other interactive films would be a classroom, judging by the number of participants who defended the positive effects of experiencing interactive films in a group (71%). However, some recent studies on video games have found that the presence of others in a game generally increases affect and enjoyment^{257 258} and physical arousal,²⁵⁹ and these effects seem to be even stronger when playing with friends rather than strangers.²⁶⁰ The strong enjoyment such an experience could bring might affect the potential for transformation, unless there is a discussion following the experience. Many papers defend the idea that discussion is crucial to stimulate reflection and achieve transformation²⁶¹ proving that the transformative potential of interactive films might be perfect in the context of a lesson in a classroom. Another issue concerning group experience that was raised in the audience testing is the possibility of user's choices being influenced by the presence of others as indicated by the findings of Granic et al.,²⁶² and Greitemeyer.²⁶³ A simple solution to this is to make votes anonymous and invisible which was not the case for *Butterfly*.

²⁵⁷ Brian J. Gajadhar, Yvonne A. W. de Kort and Wijnand A. IJsselsteijn, 'Shared Fun Is Doubled Fun: Player Enjoyment as a Function of Social Setting', in *Fun and Games, Second International Conference, Eindhoven, The Netherlands, October 20-21, 2008*, 5294, ed. by Markopoulos P., de Ruyter B., IJsselsteijn W., Rowland D., (Berlin: Springer: 2008), pp. 106-117, <https://doi.org/10.1007/978-3-540-88322-7_11>, [Accessed 19 September 2020].

²⁵⁸ David Weibel and others, 'Playing online games against computer- vs. human-controlled opponents: Effects on presence, flow, and enjoyment', in *Computers in Human Behavior*, 24.5, (2008), pp. 2274-2291, <<https://doi.org/10.1016/j.chb.2007.11.002>>, [Accessed 21 September 2020].

²⁵⁹ Niklas Ravaja and others, 'Spatial Presence and Emotions during Video Game Playing: Does It Matter with Whom You Play?', in *PRESENCE: Virtual and Augmented Reality*, 15.4, (2006), pp. 381-392, <<https://doi.org/10.1162/pres.15.4.381>>, [Accessed 21 September 2020].

²⁶⁰ Niklas Ravaja and others, 'Spatial Presence and Emotions during Video Game Playing: Does It Matter with Whom You Play?', in *PRESENCE: Virtual and Augmented Reality*, 15.4, (2006), pp. 381-392, [Accessed 21 September 2020].

²⁶¹ Elissa Lee, Laura Leets, Persuasive Storytelling by Hate Groups Online: Examining its effects on Adolescents, in *American Behavioral Scientist*, (2002), <<https://www.researchgate.net/publication/254074625>>, [Accessed 8 July 2020].

²⁶² Granic, A Lobel, and R. C. Engels, 'The benefits of playing video games', in *American Psychologist*, 69.1, (2014), p. 66.

²⁶³ T. Greitemeyer, 'Playing video games cooperatively increases empathic concern' in *Social Psychology*, 44.6, (2013), pp. 408-413, <<https://doi.org/10.1027/1864-9335/a000154>>, [Accessed 9 January 2020].

3.3.d) Additional Thoughts

This film was screened to some French participants with subtitles. This resulted in a very complicated process for them. They had to watch the film, read the subtitles and read the second-screen experience (which was in French). Interactive films require you to read possible choices, and in the case of *Butterfly* users are even required to read the additional posts arriving on their phones. As a result, the main film should ideally be understandable from listening alone. An interactive film of this kind would therefore need to be dubbed rather than subtitled to be effective in other languages.

All in all *Butterfly* was much too short and did not involve enough choices to truly immerse users. As a result transformation might not be achievable in short interactive films. Transformation is only beneficial if it has a long-term effect, something that can only be assessed with follow-up tests.

CONCLUSION

Though interactive film is a recent medium, it is slowly becoming more popular and developing its own codes, such as an association with gaming and its unique ability to play with narrative possibilities that is exciting creators all around the world. The idea of using interactive film to educate seems rare even though, as demonstrated in this thesis, it has real potential for mirroring society in order to create understanding on specific subjects, creating emotions in viewers and possibly even transforming users' attitudes and behaviours in the long term. In an attempt to prove this, a study was conducted using the original interactive film *Butterfly*. The creation of this second-screen interactive short film was discussed to reveal which decisions and actions are required when designing an educational interactive film. Finally test screenings of *Butterfly* were organised with a survey inspired by existing psychological tests in order to see the emotions, immersive and transformative effect of the interactive film on users. For the audience testing to be deemed successful, the question being explored must be examined in the light of the audience's answers. The question was:

- How can interactive film be used to create an informative and transformative experience for the user?

The test screenings of *Butterfly* prove that interactive film does affect viewers emotionally and mentally. The survey participants' fascination with the second-screen experience that was created for this research project is encouraging for creators potentially interested in exploring this unique aspect of interactive film. The results do however indicate that transformation might be more achievable for particular personality types such as people who would already be inclined to help others. The familiarity of users with video games and phones also seemed to impact the experience, revealing that interactive films might have a bigger transformative potential for first-time users of interactive interfaces than others. This in turn leads to the question of whether interactivity can be efficient in a didactic context in the long term.

The creation of *Butterfly* proves that interactive cinema is demanding to write and code, expensive

to produce and complicated to screen. Using an interactive film to raise awareness on a topic would probably only be effective for a specific topic of relevance to a specific target audience, because the technology needed restricts its impact and influence to the people who physically interact with the narrative. A film can be shown in a cinema to hundreds of people at a time, who can all enjoy and share the experience equally, but with films such as *Butterfly*, if it is impossible to interact with viewers as intended, then the appeal is lost.

From the limitations of the research project discussed in this thesis, some design solutions to create a better persuasive interactive experience can be noted. For example, ‘breathing space’ could be built into the film to allow attention switching between screens without having to miss any essential information. In *Black Mirror: Bandersnatch*, users are given 10 seconds for each choice. In *Butterfly* there is often a gap of just 3 seconds between a post and important dialogue happening on screen and this was problematic. Persuasive interactive storytelling might therefore be more efficient in longer formats than *Butterfly* to allow breathing space and a complex story to unfold. Seamless transitions between scenes, without a countdown would be beneficial to create an immersive experience.

Regarding the interactivity itself, it was noted multiple times that the experience could benefit from hiding the voting results. This would allow users to make choices without feeling any peer pressure. More complex interactivity would be appreciated but as the first prototype of *Butterfly* proves, a fine balance of freedom and control for the user must be created to avoid distraction. In the context of a second-screen app imitating social media such as *Butterfly*, the possibility for users to click on “like” or “dislike” buttons could be a good solution for users to influence the story. Another solution might be to have them choose between pre-written text boxes imitating the aesthetic of social media comments. These potential solutions would work for an experience about bullying or social media but different interactive solutions would have to be invented for different topics.

Regarding screening conditions, to avoid issues with users struggling with the interactive system and ensuring they reflect on the topic of the film, a classroom type environment might be considered with a tutorial of the interactive system explained by a host before the screening and educational documents about the topic of the film shared to users after the screening. Post-screening debates could also be very valuable to ensure users understood the film and to make them reflect on it once the screening is over.

To conclude, the strong emotional involvement that the interactivity created in the audience of *Butterfly* reveals that interactivity could serve the purpose of engaging people with a subject. This would be especially useful for a young audience that is easily distracted and is comfortable with digital multi-tasking. The fact that after seeing the experimental film, 80% of participants said they would like to watch *Butterfly* again, despite its many flaws, is encouraging as it proves this type of content awakens curiosity and creates engagement. The results found in the user study seem to reveal that an efficient, engaging and transformative interactive experience might be achieved by removing distractions and unnecessary features in order to create a specific, simple and limited interactive system that could be adapted to the subject and the audience.

However, because of the small number of participants in this study and the limited timescape, further experiments of this kind and more psychological analysis would be needed to see whether the feelings generated by interactive screenings can have a lasting impact on people's actions in real life once the film is over.

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Filmography

Adgas Interactive Live Action dir. by *Unknown* (Myriad Global Media, 2019)

A Journal of Insomnia, dir. by Bruno Choinère (National Film Board of Canada, 2013)

Alma: A Tale of violence, dir. by Miquel Dewever-Plana & Isabelle Fougère (Arte, 2012)

App dir. By Bobby Boermans (Just Film, 2013)

A Short History of the Highrise, dir. by Katerina Cizek (National Film Board of Canada, 2013)

Black Mirror: Bandersnatch dir by. David Slade (Netflix, 2018)

Brooke Leave Home, dir. by unknown (DC Labs, 2020)

Carmen Sandiego: To Steal or not To Steal, dir. by Jos Humphrey & Kenny Park (Netflix, 2020)

Carne y Arena, dir. by Alejandro González Iñárritu (Fondazione Prada, 2017)

Chef Brooke's Interactive Recipes dir. by *Unknown* (Eko, 2020)

Choice of the Deathless dir. by Max Gladstone (Choice of Games, 2013)

Deadpool dir. by Tim Miller (Marvel Entertainment, 2016)

Death Stranding dir. By Hideo Kojima (Kojima Productions, 2020)

Deloitte - Interactive Video, dir. by Unknown (Little Sisters Film, 2014)

Dragon's Lair dir. by *Don Bluth* (Cinematronics, 1983)

Elephant dir. by Gus Van Sant (HBO Films, 2003)

Five Minutes dir. by *Maximilian Niemann* (Unit 9, 2014)

Fleabag dir. By Phoebe Waller-Bridge (Two Brothers Pictures, 2016-2019)

Gaza/Sderot dir. by Meron Rapoport (Arte, 2015)

Girl, Talk dir. by Seow Yun Rong, Dawn Kwan, Danelia Chim & Heather Seet (Hiverlab, 2019)

Her Story, dir. by Sam Barlow (Sam Barlow, 2015)

I'm Your Man, dir. by Bob Bejan (InterFilm Technologies, 1992)

- In Limbo* dir. by Leo Bridle & Leo Powell (Full Circle Interactive, 2013)
- Instagramification*, dir. by unknown (BBC R&D, 2019)
- Journey* dir. by Jenova Chen (thatgamecompany, 2012)
- Karen*, dir. by unknown (Blast Theory, 2015)
- Kinoautomat*, dir. by Raduz Cincera (Ladislav Kalas, 1967)
- Late Shift*, dir. by Tobias Weber (CTRLMovie, 2016)
- Lifesaver* dir. by Martin Percy (Unit 9, 2015)
- Life is Strange* dir. by Raoul Barbet & Michel Koch (Dontnod Entertainment, 2015)
- MOA My Own Assistant* dir. by Charles Ayats, Franck Weber, Alain Damasio & Frédéric Deslias
(France Télévisions, 2020)
- Mosaic* dir. by Steven Soderbergh (HBO, 2018)
- Mr Payback: An Interactive Movie*, dir. by Bob Gale (InterFilm Technologies, 1995)
- Mr Sardonicus* dir. by William Castle (William Castle, 1961)
- Netwars* dir. by Lena Thiele (Miiquo Studios UG, 2014)
- Night Trap* dir. by unknown (Digital Pictures, 1992)
- One Day on Earth* dir. by Kyle Ruddick (One Day on Earth LLC, 2012)
- Ordesa* dir. by Nicola Pelloile-Oudart and Frédéric Jamain (Arte, 2020)
- Parks and Recreation* dir. by Greg Daniels & Michael Schur (Deedle-Dee Productions, 2009-2020)
- PBS American Portrait* dir. by unknown (PBS, 2020)
- Possibilia*, dir. by DANIELS (Eko, 2014)
- Puss in Book: Trapped in an Epic Tale*, dir. by Roy Burdine, Johnny Castuciano (Netflix, 2017)
- RIOT 2.0*, dir. by Karen Palmer (Karen Palmer, 2017)
- Simulacra* dir. by unknown (Kaigan Games, 2017)
- Sorcery!* dir. by Unknown (inkle Ltd, 2016)
- Stainsbeaupays* dir. by Simon Bouisson & Elliot Lepers (France Télévisions, 2013)

Swipe Night dir. by Karena Evans (Tinder, 2020)

Take This Lollipop, dir. by Jason Zada (Little Monster, 2011)

Telling Lies, dir. By Sam Barlow (Sam Barlow, 2020)

Tender Loving Care, dir. by David Wheeler (Aftermath Media, 1998)

The Lizzie Bennet Diaries, dir. by Bernie Sue (Bernie Sue & Stuart Davis, 2012)

Trenches dir. by Digifish (National Army Museum, 2015)

Trylife dir. by Paul Irwin (Trylife, 2012-present)

Unbreakable Kimmy Schmidt: Kimmy vs. the Revenant dir. by Claire Scanlon (Netflix, 2020)

Until Dawn dir. by Will Byles (Sony Computer Entertainment, 2015)

Wei or Die dir. by Simon Bouisson (France Télévisions, 2015)

Welcome to Pine Point dir. by Paul Shoebridge & Michael Simons (ONF, 2011)

Zork dir. by Tim Anderson, Marc Blank, Bruce Daniels & Dave Lebling (Infocom, 1980)

Bibliography

A

Agarwal, R., Karahanna E., 'Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage' in *MIS Quarterly*, 24, (2000), pp. 665-694. <<https://doi.org/10.2307/3250951>>, [Accessed 18 February 2020].

AlloCiné, *6 Trucs à Savoir sur BLACK MIRROR BANDERSNATCH*, online video recording, *YouTube*, 19 March 2019, <<https://www.youtube.com/watch?v=TKXyH4dMFzk>>, [Accessed 27 November 2021].

Aristotle, *Poetics*, (Newburyport: Open Road Media, 2020).

Armstrong, Mike and others, 'Taking Object-Based Media from the Research Environment Into Mainstream Production', in *SMPTÉ Motion Imaging Journal*, 129.5, (2020), pp. 30-38.

B

Bakker, M., van Dijk, A., and Wicherts, J. M., 'The Rules of the Game Called Psychological Science' in *Perspectives on Psychological Science*, 7, (2012), pp. 543–554.

Bal, Mieke, 'Mise en Abyrne et Iconicité', in *Littérature*, 29, (1978), pp. 116-128, <https://www.persee.fr/doc/litt_0047-4800_1978_num_29_1_2090>, [Accessed 22 November 2021].

Balme, Christopher B, *The Cambridge Introduction to Theatre Studies*, (Cambridge University press, 2008).

Bandura, Albert, 'Social Cognitive Theory of Mass Communication', in *Media effects: Advances in theory and research*, 2nd ed., ed. by Bryant J. & Zillman D, (Hillsdale, NJ: Erlbaum, 2002), pp. 121–153.

Bartsch, Anne and Hartmann, Tilo, 'The Role of Cognitive and Affective Challenge in Entertainment Experience', in *Communication Research*, (2015), <<http://dx.doi.org/10.1177/0093650214565921>>, [Accessed 8 September 2020]

Bartsch, Anne and Oliver, Mary Beth, 'Appreciation as Audience Response: Exploring Entertainment Gratifications Beyond Hedonism', in *Human Communication Research*, 36.1, (2010), pp. 53– 81.

Basaraba N., Conlan O., Edmond J., Arnds P., ‘User Testing Persuasive Interactive Web Documentaries: An Empirical Study’ in *Lecture Notes in Computer Science*, 12497, ed. by Bosser AG., Millard D.E., Hargood C., (Switzerland: Springer, 2020) <https://doi.org/10.1007/978-3-030-62516-0_7>, [Accessed 21 February 2020]

Bates, J. ‘The Role of Emotion in Believable Agents’, in *Communications of the ACM*, 37.7, 1994, pp. 122–125.

BBC, ‘Almost half of UK internet users ‘harmed’’, *BBC.co.uk*, 18 September 2018, <<https://www.bbc.co.uk/news/technology-45519507>>, [Accessed 25 January 2019].

BBC, ‘Anti-bullying week’, *BBC.com*, <<https://www.bbc.co.uk/cbbc/curations/anti-bullying-week>>, [Accessed 19 January 2019].

Belman, Jonathan and Flanagan, Mary, ‘Designing Games to Foster Empathy’, in *International Journal of Cognitive Technology*, (2010), <<https://tiltfactor.org/wp-content/uploads2/cog-tech-sig4g-article-1-belman-and-flanagan-designing-games-to-foster-empathy.pdf>>, [Accessed 23 April 2019].

Bernhaupt, Regina, ‘User experience: Evaluating User Experience in Evaluation in entertainment’, in *Evaluating User Experience in Games*, (London: Springer, 2010).

Boal, Augusto, *Games for Actors and Non Actors*, (New York: Routledge, 2003).

Bogost, Ian, *Persuasive Games: The Expressive Power of Videogames*, (Cambridge: MIT Press, 2007).

Bonino, F. *Is interactivity in interactive documentaries exploited at its full potential*, (MA, London College of Communication, 2011), <[final dissertation Filippo-Bonino.pdf \(interactivedocumentary.net\)](#)>, [Accessed 03 March 2020]

Bopp Julia Ayumi, Opwis, Klaus, Mekler, Elisa D, ‘“An Odd Kind of Pleasure”: Differentiating Emotional Challenge in Digital Games’, in *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, (New York: Association for Computing Machinery, 2018).

Bowman Nicholas David, ‘Video Games as Demanding Technologies’, in *Media and Communication*, 7.4, (2019), <<https://www.cogitatiopress.com/mediaandcommunication/article/view/2684>> [Accessed 28 June 2020]

Brenton Harry, Marco Gillies, Daniel Ballin, David Chatting, ‘The Uncanny Valley: does it exist?’, in *Proceedings of conference of human computer interaction, workshop on human animated character interaction*, (2005), [Accessed 25th November 2021].

Brooke, J., ‘SUS-A quick and dirty usability scale’ in *Usability Evaluation in Industry*, ed. by Jordan, P. W., Thomas, B., Weerdmeester, B. A., and McClelland, A. L, (London: Taylor & Francis, 1995), pp. 189–194.

Browne, Tom, *Breaking the Fourth Wall: Direct Address in the Cinema*, (Edinburgh: Edinburgh University Press, 2012).

Buckley, K. E & Anderson C. A., 'A Theoretical Model of The Effects and Consequences of Playing Video Games', in *Playing Video Games - Motives, Responses and Consequences*, ed. by P. Vorderer & J. Bryant, (2006), pp. 363-378.

Buschow, Christopher, Schneider Beate and Ueberheide Simon, 'Tweeting television: Exploring communication activities on Twitter while watching TV' in *Communications – European Journal of Communication Research*, 39.2, (2014), pp. 129-149.

Buselle, Rick, Bilandzic, Helena, 'Measuring Narrative Engagement' in *Media Psychology*, 12.4 (2009), pp.321-347. <<https://doi.org/10.1080/15213260903287259>>, [Accessed 18 February 2020].

Byrd Matthew, 'Video Games Changed because of Controversy', *ScreenRant*, 5 May, 2017, <<https://screenrant.com/controversial-video-games-that-were-changed-tracer-pose/>>, [Accessed 4 September 2020].

C

Cairn Paul and others, 'Measuring and Defining the Experience of Immersion in Games' in *International journal of human-computer studies*, 66.9 (2008), pp. 641–661, <<http://dx.doi.org/10.1016/j.ijhcs.2008.04.004>>, [Accessed 9 February 2020].

Cavazza, M., and others, 'The IRIS Network of Excellence: Integrating Research in Interactive Storytelling', *Interactive Storytelling: First Joint International Conference on Interactive Digital Storytelling*, (Heidelberg: Springer, 2008), pp. 14–19.

Chee Siang, Panayiotis Zaphiris, Stephanie Wilson, 'An Activity theoretical Model for social interaction in computer games', in *HCI International 2007 conference*, (2011).

Clements Ryan, 'Journey Review, We walk until this path is done', *Ign.com*, 1st September 2016, <<https://www.ign.com/articles/2012/03/01/journey-review>>, [Accessed 2nd April 2021].

Cohen, J., 'Defining identification: A Theoretical Look at The Identification of Audiences with Media Characters' in *Mass Communication & Society*, 4, (2001).

Cole, Tom, Cairns, Paul, and Gillies, Marco, 'Emotional and Functional Challenge in Core and Avant-garde Games' in *CHI PLAY '15: Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, (New York: Association for Computing Machinery, 2015), pp. 121-126, <<http://dx.doi.org/10.1145/2793107.2793147>>, [Accessed 5 February 2020].

Concannon, Shaune and others, 'Brooke Leave Home: Designing a Personalized Film to Support Public Engagement with Open Data', in *Proceedings of the ACM CHI 2020 Conference on Human Factors in Computing Systems*, (University of York: Association for Computing

Machinery, 2020), pp. 1-14 <[https://pure.york.ac.uk/portal/en/publications/brooke-leave-home\(63f8ecd1-f822-4279-8d20-016a1a9a5cc4\).html](https://pure.york.ac.uk/portal/en/publications/brooke-leave-home(63f8ecd1-f822-4279-8d20-016a1a9a5cc4).html)>, [Accessed 15 June 2019].

Cox, Anna, Cairns, Paul, Shah, Pari, and Carroll, Michael, 'Not doing but thinking: the role of challenge in the gaming experience' in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, (2012), pp. 79–88 <<http://dx.doi.org/10.1145/2207676.2207689>>, [Accessed 15 September 2020].

Craig, W. M., Pepler, D., & Atlas, R, 'Observations of Bullying in the Playground and in the Classroom', in *School Psychology International*, 21, (2000).

Crawford Chris, *Chris Crawford on Interactive Storytelling*, (San Francisco: New Riders, 2013).

Csikszentmihalyi, Mihaly, *Flow: The Psychology of Optimal Experience*, (New York: HarperCollins, 1990).

Cupchik, G. C. and Laszlo, J. 'The Landscape of Time in Literary Reception: Character Experience and Narrative Action', in *Cognition & Emotion*, 8.4, (1994), pp. 297–312.

D

Daly, K, 'Cinema 3.0: The interactive-image', in *Cinema Journal*, 50.1, (2010), pp. 81–98, <https://www.researchgate.net/publication/239858896_Cinema_30_The_Interactive-Image>, [Accessed 13 July 2020].

Darvasi Paul, 'Empathy, Perspective and Complicity: How Digital Games can Support Peace and Education and Conflict Resolution', (Phd, York University, 2016), <https://www.academia.edu/29961691/Empathy_Perspective_and_Complicity_How_Digital_Games_can_Support_Peace_Education_and_Conflict_Resolution?email_work_card=thumbnail>, [Accessed 6 September 2020].

Davenport, G. and Bradley, B, 'The Care and feeding of users', in *IEEE Multimedia*, 4.1, (1997).

Davidovitch, Nitza, Roman Yavich, 'The Effect of Smart Boards on the Cognition and Motivation of Students', in *Higher Education Studies*, 7.1, (2017).

Demetriou, Chrysanthi, 'Aelius Donatus and His Commentary on Terence's Comedies', in *The Oxford Handbook of Greek and Roman Comedy*, (New York: Oxford University Press, 2013), <[10.1093/oxfordhb/9780199743544.013.041](https://doi.org/10.1093/oxfordhb/9780199743544.013.041)>, [Accessed 09 January 2020].

Denisova, Alena, Guckelsberger, Christian, and Zendle, David, 'Challenge in Digital Games: Towards Developing a Measurement Tool' in *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, (2017), pp. 2511–2519, <<http://dx.doi.org/10.1145/3027063.3053209>>, [Accessed 26 August 2020].

Dillman, Francesca R., Carpentier, Ryan P. Rogers & Lisa Barnard, 'Eliciting Behavior From Interactive Narratives: Isolating the Role of Agency in Connecting With and Modeling Characters', in *Journal of Broadcasting & Electronic Media*, 59.1, (2015), pp. 76-93, <<https://www.tandfonline-com.libproxy.york.ac.uk/doi/full/10.1080/08838151.2014.998222>>, [Accessed 27 May 2020].

Diver, Mike, 'Late Shift is an Intriguing Failure of an Fmv Game', *Vice.com*, 19 April, 2017, <https://waypoint.vice.com/en_us/article/kbvzzz/late-shift-is-an-intriguing-failure-of-an-fmv-game>, [Accessed 28 April 2019].

Dusenberry, Lisa, Terry, Robert, 'Serious Interactive Fiction: Constraints, Interfaces, and Creative Writing Pedagogy' in *Journal of Creative Writing Studies*, (RIT Scholar works, 2018).

E

Ermi, Laura and Mayr, Frans, 'Fundamental components of the gameplay experience: Analysing immersion', in *Worlds in play: International perspectives on digital games research*, 37.2, (2005).

F

Farokhmanesh, Megan, 'Late Shift Is Another Step Towards the Merging of Movies and Video Games', *theverge.com*, 15 October 2017, <<https://www.theverge.com/2017/10/15/16360964/late-shift-interactive-movie-films-as-video-game-s-chady-eli-mattar-interview>>, [Accessed 5 February 2019].

Feingold, Ken, 'OU: Interactivity as Divination as a Vending Machine', *Leonardo*, 28.5, (1995), pp. 399–402, <www.jstor.org/stable/1576224>, [Accessed 28 September 2020]

Ferguson, C. J., Garza, A., Jerabeck, J., Ramos, R., and Galindo, M. 'Not worth the fuss after all? Cross-sectional and prospective data on violent video game influences on aggression, visuospatial cognition and mathematics ability in a sample of youth', in *Journal of youth and Adolescence*, 42.1, (2013), pp. 109–22.

Feshbach & Feshbach, 2009 in Kidd, Jenny 'Gaming for Affect: Museum Online Games and The Embrace of Empathy', in *The Journal of Curatorial Studies*, 4.3, (2015), pp. 414-432.

Field, Syd, *Screenplay: The Foundations of Screenwriting*, (New York: Delta Trade Paperbacks, 2005).

Fiske, S. T. and Taylor, S. E., *Social Cognition*, 2nd ed, (New York: McGraw-Hill, 1991).

Flynn, Kerry, 'Tinder created an interactive show. Gen Z loves it', *CNN Business*, 23 October 2019, <<https://edition.cnn.com/2019/10/23/media/tinder-interactive-show-swipe-night/index.html>>, [Accessed 30 October 2019].

Frome Jonathan, 'Eight Ways Video Games Generate Emotion', in *Proceedings of the 2007 DIGRA International Conference*, <<http://www.digra.org/wp-content/uploads/digital-library/07311.25139.pdf>>, [Accessed 6 May 2019].

G

Gansing, Kristoffer, 'The Myth of Interactivity or the Interactive Myth?: Interactive Film as an Imaginary Genre', in *Proceedings of the Fifth International Digital Arts and Culture Conference*, (2003), p. 48, <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.577.6981&rep=rep1&type=pdf>>, [Accessed 24 May 2020].

Gaudenzi, Sandra, 'The Living Documentary: from representing reality to co-creating reality in digital interactive documentary' (PhD, University of London, 2013), <http://research.gold.ac.uk/id/eprint/7997/1/Cultural_thesis_Gaudenzi.pdf>, [Accessed 31 April 2021].

Gee, J. P. *What Video Games Have to Teach Us About Learning and Literacy*, (New York: Palgrave Macmillan, 2003).

Gentile, D. A. & Gentile J.R, 'Violent Video Games as Exemplary Teachers: A Conceptual Analysis', in *Journal of Youth and Adolescence*, 9, (2008), pp. 127-141.

George, J. M, 'State or trait: Effects of positive mood on prosocial behaviors at work', in *Journal of Applied Psychology*, 76, (1991), 299–307, <[676c89b5eb8c6c3d6ad83241f101c2cd7653.pdf](https://doi.org/10.1037/a0021847) (semanticscholar.org)>, [Accessed 26 May 2020].

Girina, Ivan, *Cinematic games: the aesthetic influence of cinema on video games*, (PhD, University of Warwick, 2015).

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H., 'Mapping the Moral Domain', in *Journal of Personality and Social Psychology*, 101.2, pp. 366–385. <<https://doi.org/10.1037/a0021847>> [Accessed 13 November].

Granic, A. Lobel, and R. C. Engels, 'The benefits of playing video games', in *American Psychologist*, 69.1, (2014).

Green, M. C. & Jenkins, K. M. 'Interactive Narratives: Processes and Outcomes in User Directed Stories.' *Journal of Communication*, 64.3, (2014)

Greimas, Algirdas Julien, *Structural Semantics: An Attempt at a Method*, (Nebraska: University of Nebraska Press, 1984).

Greitemeyer, T. 'Effects of Prosocial Media on Social Behavior: When and Why Does Media Exposure Affect Helping and Aggression?' in *Current Directions in Psychological Science*, 20.4, (2011), pp. 251–255. <<https://www2.psych.ubc.ca/~schaller/308Readings/Greitemeyer2011.pdf>>, [Accessed 19 February 2021].

Greitemeyer, T., 'Playing Video Games Cooperatively Increases Empathic Concern' in *Social Psychology*, 44.6, (2013), 408-413, <<https://doi.org/10.1027/1864-9335/a000154>> [Accessed 9 January 2020]

Gunning, Tom, 'The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde', in *Early Cinema, Space. Frame, Narrative*, (London: British Film Institute 2006).

H

Hagler, Marion O. , Marcy, William M., 'The legacy of PLATO and TICCIT for learning with computers' in *Computer Applications in Engineering Education*, 8.2, (2000), pp. 127-131.

Hales, Chris, 'Interactive Cinema in the Digital Age', in *Interactive Digital Narrative History, Theory and Practice*, (New York: Routledge, 2015).

Hanzl, Rafal, 'Ways of Expression: The Impact of VFX Techhnolgy on modern storytelling in film and interactive media production', (PhD, Inland Norway University of Applied Sciences, 2019), <https://brage.inn.no/inn-xmlui/bitstream/handle/11250/2596989/Ways_of_expression.pdf?sequence=1 p 30>, [Accessed 23 November 2021].

Hartmann Tilo 'Media Entertainment as a Result of Recreation and Psychological growth', in *The International Encyclopedia of Media Studies*, (2013) <<http://dx.doi.org/10.1002/9781444361506.wbiems112>>, [Accessed 30 August 2020].

Haugtvedt, Curtis P., Kasmer, Jeff A., 'Attitude change and persuasion' in *Handbook of Consumer Psychology*, (New York: Routledge, 2008), <<https://doi.org/10.4324/9780203809570>>, [Accessed 23 November 2019].

Hoguet Benjamin, *Le Pouvoir Narratif des Interfaces*, (Paris: Dixit, 2016).

Hook, J. 'Interaction Design for Live Performance', (PhD, Newcastle University, 2013).

Hunt, Kristin, '10 Documentaries That Actually Made a Difference', *Mental Flow*, 3 July, 2019, <<https://www.mentalfloss.com/article/79947/10-documentaries-actually-changed-things>>, [Accessed 19 October 2020].

I

IJsselsteijn and others, 'Characterising and Measuring User Experiences in Digital Games', in *Journal of Applied Mechanics-transactions of The Asme*, 1, (2007).

Isbister Katherine and Schaffer Noah, *Game Usability: Advancing the Player Experience*, (Burlington: CRC press, 2008).

Isen, A. M., & Levin, A. F., 'Effects of Feeling Good on Helping: Cookies and Kindness', in *Journal of Personality and Social Psychology*, 36, (1972), pp. 1–12. <[93706d0c21b5ca09e8f43a3ce01e03a2138c.pdf](https://www.semanticscholar.org/paper/93706d0c21b5ca09e8f43a3ce01e03a2138c) (semanticscholar.org)>, [Accessed 28 May 2020].

ISO, *Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs) – Part 11: Guidance on Usability*, (Switzerland: ISO, 1998).

Iten, Glena, H., Steinemann, Sharon T. and Opwis, Klaus, 'Choosing to Help Monsters: A Mixed-Method Examination of Meaningful Choices in Narrative-Rich Games and Interactive Narratives', in *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, (New York: Association for Computing Machinery, 2018).

J

Jeeyun Oh, S. Shyam Sundar, 'How Does Interactivity Persuade? An Experimental Test of Interactivity on Cognitive Absorption, Elaboration, and Attitudes' in *Journal of Communication*, 65.2, (April 2015), pp. 213–236, <<https://academic-oup-com.libproxy.york.ac.uk/joc/article/65/2/213/4082299>>, [Accessed 11 November 2019].

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J., *Confronting the Challenges of Participatory culture: Media Education for the 21st century*, (Chicago: MacArthur, 2009).

Johnson, Daniel, E, Nacke, Lennart, and Wyeth, Peta., 'All About That Base: Differing Player Experiences in Video Game Genres and the Unique Case of Moba Games', in *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, (2015), pp. 2265–2274, <<http://dx.doi.org/10.1145/2702123.2702447>>, [Accessed 5 September 2020].

K

Kalyanaraman, Sriram, Sundar, S. Shyam, 'The Psychological Appeal of Personalized Content in Web Portals: Does Customization Affect Attitudes and Behavior?' in *Journal of Communications*, 56.1, (2006), pp. 110-132.

Kegel, L. C et al, 'Dynamic human and avatar facial expressions elicit differential brain responses' in *Social Cognitive and Affective Neuroscience*, 15.3, (2020), pp. 303-317, <<https://doi.org/10.1093/scan/nsaa039>>, [Accessed 15 November 2021].

Kidd, Jenny, 'Gaming for Affect: Museum Online Games and The Embrace of Empathy', in *The Journal of Curatorial Studies*, 4.3, (2015), pp. 414-432.

Klarkowski, Madison and others, 'Operationalising and Evaluating Sub-Optimal and Optimal Play Experiences through Challenge-Skill Manipulation' in *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, (2016), <<http://dx.doi.org/10.1145/2858036.2858563>>, [Accessed 28 June 2020].

Koenitz Hartmut., 'Thoughts on a Discipline for the Study of Interactive Digital Narratives', in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, (Switzerland: Springer International Publishing, 2018).

Koenitz, Hartmut, M. P. Eladhari, S. Louchart and F. Nack. 'INDCOR white paper 1: A shared vocabulary for IDN (Interactive Digital Narratives)', in *ArXiv*, 10135, (2020).

Koster, Raph, *Theory of Fun for Game Design*, (London: O'Reilly Media, 2004).

Kostkova, Patty and Molnar Andreea, 'Learning through Interactive Digital Narrative', in *Interactive Digital Narrative History, Theory and Practice*, ed. by Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Didem Sezen and Tonguç øbrahim Sezen, (New York: Routledge, 2015).

L

Landow, George, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology*, (Baltimore: The John Hopkins UP, 1997).

Lange, Patricia G., 'Informal Learning on YouTube', in *The International Encyclopedia of Media Literacy*, (Hoboken: John Wiley & Sons, 2019), pp. 1-11, <<https://doi.org/10.1002/9781118978238.ieml0090>>, [Accessed 13 November 2020].

LATE SHIFT - Your Decisions Are You, *1001 Late Shifts – The making of an interactive movie, online video recording*, YouTube, 10 June 2016, [Accessed 15 March 2019].

Lazzaro, Nicole, 'Why We Play Games: Four Keys to More Emotions Without Story', in *Player Experience Research and Design for Mass Market Interactive Entertainment*, (Oakland:

XEOdesign, 2004) <www.xeodesign.com/xeodesign_whyweplaygames.pdf>, [Accessed 3 September 2020].

Lin, J.-H., 'Do Video Games Exert Stronger Effects on Aggression than Film? The Role of Media Interactivity and Identification on the Association of Violent Content and Aggressive Outcomes.' in *Computers in Human Behavior*, 29, (2013), pp. 535–543, <<https://doi.org/10.1016/j.chb.2012.11.001>>, [Accessed 18 Jan 2020].

Lin Jih-Hsuan, Sung Yongjun, Chen Kuan-Juc, 'Social television: Examining the antecedents and consequences of connected TV viewing' in *Computers in Human Behavior*, 58, May 2016, pp. 171-178.

Liu Yuping & Shrum, L.J, 'A Dual-Process Model of Interactivity Effects' in *Journal of Advertising*, 38.2 (London: Taylor & Francis, Ltd, 2009), pp. 53-68, <https://www.jstor.org.libproxy.york.ac.uk/stable/27749635?seq=1#metadata_info_tab_contents>, [Accessed 28 August 2020].

Lodge, Sally, 'Chooseco Embarks on Its Own Adventure', *Publishers Weekly*, 18 January, 2007, <<https://web.archive.org/web/20071009094529/http://www.publishersweekly.com/article/CA6408126.html>>, [Accessed 9 May 2019].

M

MacDonald, Keza, 'Journey – Review', *theguardian.com*, 13 March 2012, <<https://www.theguardian.com/technology/gamesblog/2012/mar/13/journey-ps3-review>>, [Accessed 2nd April 2021].

Main, Samy, 'Why Interactive Ads Are Becoming the Norm for Streaming Platforms', *adweek.com*, 21 April, 2017, <<https://www.adweek.com/tv-video/why-interactive-ads-are-becoming-the-norm-for-streaming-platforms/>>, [Accessed 24 April 2019].

Mandell Jonathan, 'Will Future Storytelling Include Live Theatre', *Howlround Theatre Commons*, 15 November 2017, <<https://howlround.com/will-future-storytelling-include-live-theatre>>, [Accessed 10 August 2020].

Manovich, Lev., *The Language of New Media*, (Cambridge, Mass: MIT Press, 2001).

Marsh, Calum, 'The Rise and Fall of The Interactive Movie', *thedissolve.com*, 3 October 2014, <<https://thedissolve.com/features/exposition/775-the-rise-and-fall-of-the-interactive-movie/>>, [Accessed 13 February 2019].

Martinez, Sophie '11 Films that Inspired Social Change', *Moviemaker.com*, 1 August, 2020, <<https://moviemaker.com/11-films-that-inspired-social-change/>>, [Accessed 20th April 2021].

Mayer, David 'Acting in Silent Films: which legacy of the theatre?' in *Screen Acting*, (London: Routledge, 1999), p. 10.

McMillan, Sally J., Hwang, Jang-Sun, 'Measures of Perceived Interactivity: An Exploration of the Role of Direction of Communication, User Control, and Time in Shaping Perceptions of Interactivity' in *Journal of Advertising*, 31.2 (2013), pp. 29-42, <<https://doi.org/10.1080/00913367.2002.10673674>>, [Accessed 16 April 2020].

Miller Handler Carolyn, *Digital Storytelling: A Creator's Guide to Interactive Entertainment*, (Oxford: Focal Press, 2004).

Moran Dominic, 'Borges and the Multiverse: Some Further Thoughts', in *Bulletin of Spanish Studies Hispanic Studies and Researches on Spain, Portugal and Latin America*, 89, (2012), <<https://www.tandfonline.com/doi/abs/10.1080/14753820.2012.712326>> [Accessed 3 May 2019].

Moriarty Brian, *Two-Minutes Hate: Siskel & Ebert on Interactive Movies (1995)*, online video recording, *YouTube*, 25 November 2015, <<https://youtu.be/xB3-ypalMS8>> [accessed 28 March 2019].

Murray, J.H., *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, (New York: The Free Press, 1997).

Murray, J.H., *Inventing the Medium: Principles of Interaction Design as a Cultural Practice*, (Cambridge: MIT Press, 2012).

Murray, J.H., 'Research into Interactive Digital Narrative: A Kaleidoscopic View' in *Interactive Storytelling. ICIDS 2018. Lecture Notes in Computer Science*, ed. by Rouse R., Koenitz H., Haahr M, 11318, (Switzerland: Springer International Publishing, 2018).

O

O'Malley, Donica, 'From Redhead to Ginger: Othering Whiteness in New Media', (PhD, University of Pittsburgh, 2018).

P

Parrott, S., Carpentier, F.R.D., Northup, C.T., ‘A Test of Interactive Narrative as a Tool Against Prejudice’ in *Howard Journal of Communications*, 0, (2017), pp. 1–16.

Peng, W., ‘The Mediational Role of Identification in the Relationship Between Experience Mode and Self-efficacy: Enactive Role-playing Versus Passive Observation’, in *CyberPsychology & Behavior*, 11, (2008), pp. 649–652, <<https://doi.org/10.1089/cpb.2007.0229>>, [Accessed 28 April 2020].

Peng, W., Lee, M., & Heeter, C., ‘The effects of a serious game on role-taking and willingness to help’ in *Journal of Communication*, 60, pp. 723–742, <<https://doi.org/10.1111/j.1460-2466.2010.01511.x>>, [Accessed 11 November 2019].

Petralito, Serge, Bruhlmann, Florian , Iten Glenna, Mekler Elisa D. , & Opwis Elisa D., ‘A Good Reason to Die: How Avatar Death and High Challenges Enable Positive Experiences’ in *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, (2017), pp. 5087–5097 <<http://dx.doi.org/10.1145/3025453.3026047>>, [Accessed 12 November 2020].

Poels, K., de Kort, Y. A. W., & IJsselsteijn, W. A., ‘D3.3: Game Experience Questionnaire: development of a self-report measure to assess the psychological impact of digital game’ (Eindhoven: Technische Universiteit Eindhoven, 2007), p. 45, <https://pure.tue.nl/ws/portalfiles/portal/21666952/Fuga_d3.3.pdf>, [Accessed 17 October 2020].

Pulver Andrew, ‘Sonic the Hedgehog Movie To Be Redesigned After Criticism of Trailer’, *The Guardian*, 3 May, 2019, <<https://www.theguardian.com/film/2019/may/03/sonic-the-hedgehog-movie-trailer-criticism>> [Accessed 3 September 2020]

R

Radesky, Jenny, ‘Digital Media and Symptoms of Attention-Deficit/Hyperactivity Disorder in Adolescents’, (Michigan: University of Michigan School of Medicine, 2018), <<https://jamanetwork.com/journals/jama/article/2687840>>, [Accessed 3 May 2019].

Ravaja, Niklas and others, ‘Spatial Presence and Emotions during Video Game Playing: Does It Matter with Whom You Play?’, in *PRESENCE: Virtual and Augmented Reality*, 15.4, (2006), pp. 381-392.

Reyes M.C, ‘Measuring User Experience on Interactive Fiction in Cinematic Virtual Reality’, in *Interactive Storytelling, 11th International Conference on Interactive Digital Storytelling, ICIDS*

2018, *Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. by Rouse R., Koenitz H., and Haahr M., (Switzerland: Springer International Publishing, 2018).

Rohloff, Tobias, Renz Jan, Bothe Max, ‘Supporting Multi-Device E-Learning Patterns with Second Screen Mobile Applications’, in *mLearn 2017: Proceedings of the 16th World Conference on Mobile and Contextual Learning*, 25, (2017), <<https://dl.acm.org/doi/pdf/10.1145/3136907.3136931>>, [Accessed 3 February 2020].

Roth, Christian, ‘Experiencing Interactive Storytelling’, (PhD, University of Amsterdam, 2015).

Roth, Christian, Koenitz Hartmut, ‘Evaluating the User Experience of Interactive Digital Narrative’, in *AltMM '16: Proceedings of the 1st International Workshop on Multimedia Alternate Realities*, (2016), pp. 31–36, <<https://doi.org/10.1145/2983298.2983302>>, [Accessed 13 November 2020].

Roussou, Maria, Efraimoglou, Dimitris, ‘High-end Interactive Media in the Museum’ in *Computer Graphics, ACM SIGGRAPH*, (1999).

Rowold, J., ‘Instrument Development for Esthetic Perception Assessment’ in *Journal of Media Psychology*, 20.6, (2008), pp. 35–40.

Rusel, Demaria, *The 7th Guest: The Official Guide*, Rocklin, (California: Prima Publishing, 1993).

Ryan, Marie-Laure, ‘Beyond Myth and Metaphor: The Case of Narrative in Digital Media.’ *International journal of computer game research*, 1, (2001), <<http://gamestudies.org/0101/ryan/>>, [Accessed 29 April 2019].

Ryan, Marie-Laure, ‘From Narrative Games to Playable Stories: Toward a Poetics of Interactive Narrative’ in *Storyworlds: A Journal of Narrative Studies*, 1, (2009).

S

Schneider, Edward F, Lang, Annie, Shin Mija, and Bradley, Samuel D, ‘Death with a Story: How Story Impacts Emotional Motivational, and Physiological Responses to First Person Shooter Video Games’, in *Human Communication Research*, 30.3, (2004), pp. 361-375.

Seaman, W. C., ‘Recombinant Poetics: Emergent Meaning as Examined and Explored Within a Specific Generative Virtual Environment’, (PhD, University of Wales, 1999).

Selmas, Thomas, ‘DIGITAL MEDIA IN MUSEUMS: A PERSONAL HISTORY’ in *Digital Heritage and Culture*, (London: World Scientific, 2014).

Siouzouli, Natasha, 'Precarious Presence in Contemporary Theater', in *Comparative Drama*, 48.1/2, <<https://www.jstor.org/stable/24615353>>, [Accessed 8 May 2020].

Six, Nicolas, 'Avec l'interactivité, Netflix va-t-il changer notre façon de consulter les vidéos ?', *lemonde.fr*, <[Slater. Mel and Steed Anthony, 'A Virtual Presence Counter', in *Presence: Teleoperators and Virtual Environments*, 9.5, \(2000\), pp. 413-434, < <https://doi.org/10.1162/105474600566925>>, \[Accessed 25th November 2021\].](https://www.lemonde.fr/pixels/article/2019/04/10/avec-l-interactivite-netflix-va-t-il-changer-notre-facon-de-consulter-les-videos_5448548_4408996.html#:~:text=d%27autres%20satisfactions.-,%C2%AB%20Le%20plaisir%20d%27%C3%AAtre%20bluff%C3%A9%20par%20une%20construction%20qu%27,il%20programme%20un%20jeu%20vid%C3%A9o.>, [Accessed 5th May 2021].</p>
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Smethurst, T. & Craps, S., 'Playing with trauma: Interactivity, Empathy, and Complicity in The Walking Dead video game' in *Games and Culture*, 10, (2015).

Soto-Sanfiel, M., Aymerichfranch, L., and Romero, E., 'Personality in Interaction: How the Big Five relate to Interactive Narrative Reception', in *Communication & Society / Comunicación y Sociedad*, 27.3, (2014), pp. 151–186.

Steinkuehler, C., & Duncan, S., 'Scientific Habits of Mind in Virtual Worlds' in *Journal of Science Education And Technology*, 17.6, pp. 530-5437.

Steinemann, S.T., Mekler, E.D., Opwis, K. 'Increasing Donating Behavior Through a Game for Change' in *CHI PLAY '15: Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, (New York: Association for Computing Machinery, 2015).

Steinemann, S.T., Iten, G.H., Opwis, K., Forde, S.F., Frasseck, L., Mekler, E.D. 'Interactive Narratives Affecting Social Change', in *Journal of Media Psychology*, 29, (2017), pp. 54–66.

Stern, A., 'Embracing the Combinatorial Explosion: a Brief Prescription for Interactive Story R&D', in *Lecture Notes in Computer Science*, 5334, (Heidelberg: Springer, 2008), pp. 1–5.

Stoll, Julia, 'Share of individuals who watched short video clips (such as on YouTube) in the prior week in the United Kingdom (UK) from 2016 to 2020, by age group', *Statista*, 26 January 2021, <<https://www.statista.com/statistics/506291/watching-and-downloading-short-online-videos-in-the-uk-by-age-group/>>, [Accessed 29 April 2021].

Streitfeld, David, 'Black Mirror Gives Power to the People', *The New York Times*, 28 December 2018, <<https://www.nytimes.com/2018/12/28/arts/television/black-mirror-netflix-interactive.html>>, [Accessed 17 April 2019].

Sundar, S. Shyam, 'Social psychology of interactivity in human-website interaction' in *The Oxford Handbook of Internet Psychology*, (2007), pp. 89-104.

T

Turkay, S., Hoffman, D., Kinzer, C. K., Chantes, P., & Vicari, C. 'Toward Understanding the Potential of Games for Learning: Learning Theory, Game Design Characteristics, and Situating Video Games in Classrooms' in *Computers in the Schools*, 31.1, (2014).

U

Ursu Marian F., and others, 'Authoring Interactive Fictional Stories in Object-Based Media (OBM)', in *IMX '20: ACM International Conference on Interactive Media Experiences*, (New York: Association for Computing Machinery, 2020).

V

V

VanArendonk Kathryn, 'Is Black Mirror: Bandersnatch the Dawn of Interactive TV?', *Vulture.com*, 28 December 2018, <<https://www.vulture.com/2018/12/black-mirror-bandersnatch-netflix-interactive-tv.html>>, [Accessed 7 February 2018].

Van Rooij, Julia, "Carefully Constructed Yet Curiously Real: How Major American Animation Studios Generate Empathy Through a Shared Style of Character Design", in *Animation*, 14.3, (2019), pp. 191-206, <<https://doi.org/10.1177/1746847719875071>>, [Accessed 26 November 2021].

Violet Kim, 'Kelly Marie Tran Is in Even Less of The Rise of Skywalker Than We Thought', *Slate*, 24 December 2019, <<https://slate.com/culture/2019/12/the-rise-of-skywalker-kelly-marie-tran-rose-tico-time-onscreen.html>>, [Accessed 3 September 2020].

Vorderer, P and others, 'MEC Spatial Presence Questionnaire (MEC SPQ): Short Documentation and Instructions for Application', in *Report to the European Community*, (2004), <<http://www.ijk.hmt-hannover.de/presence.>>, [Accessed 21 August 2020].

W

Watson, D., Clark, L. a., and Tellegen, A., ‘Development and validation of brief measures of positive and negative affect: the PANAS scales’ in *Journal of personality and social psychology*, 54.6, (1988), pp. 1063–1070.

Webster J., Chapman Peter, Selvarajah S., ‘Engagement in multimedia training systems’ in *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences*, (IEEE, 1999) <<https://doi.org/10.1109/HICSS.1999.772808>>, [Accessed 3 September 2020].

Weschler, Lawrence, *Why Is This Man Smiling? Digital animators are closing in on the complex system that makes a face come alive*, Wired.com, 6 January 2002, <<https://www.wired.com/2002/06/face/>>, [Accessed 23 November 2021].

Wong, Priscilla, Rigby Jacob M., Brumby Duncan P, ‘Game & Watch: Are “Let’s Play” Gaming Videos as Immersive as Playing Games?’, in *Proceedings of the Annual Symposium Computer-Human Interaction Play*, (New York: ACM, 2017).

Y

Yilmaz, Recep, Mehmet, Ciğerci Fatih , ‘A Brief History of Storytelling: From Primitive Dance to Digital Narration’ in *Handbook of Research on Transmedia Storytelling and Narrative Strategies*, (Hershey: IGI global, 2019), <<https://doi.org/10.4018/978-1-5225-5357-1.CH001>>, [Accessed 20 June 2020].

Appendix 1: TFTI Research Ethics Checklist



Department of Theatre, Film, Television and

Interactive Media Ethics Committee

RESEARCH ETHICS CHECKLIST

This checklist is to be used **ONLY** for research by TFTI staff and research students where the work can be considered low-risk from an ethical perspective.

Completed Research Ethics Checklists should be submitted to the TFTI Ethics Committee for review, by email to TFTI-ethics@york.ac.uk at least **TWO WEEKS** before the commencement of the research work for which ethics clearance is being sought, unless an alternative deadline has been agreed, in advance, in writing with the TFTI Ethics Chair.

All research student applications MUST be first discussed, reviewed and approved by their supervisor prior to their submission. Student applications should also copy their supervisor on the email submission.

Before completing this form, please consult the TFTI Research Ethics Guidelines, available on the TFTI Ethics VLE site and Research Ethics web pages.

SECTION 1: APPLICANT AND PROJECT DETAILS

| Box 1A: Applicant Details | |
|--|-------------------|
| ALL applicants must complete this box. | |
| Applicant Name | Rebecca Gallon |
| E-mail address | Rcg516@york.ac.uk |
| TFTI Staff or TFTI Student | TFTI Student |

| Box 1B: Programme Details | |
|--|---|
| STUDENT applicants must complete this box. | |
| Degree Programme of Study | Interactive Media |
| Supervisor name(s) and Email address(es) | Guy Schofield guy.schofield@york.ac.uk |

| Box 1C: Research Details | |
|---|--|
| ALL applicants must complete this box. | |
| Research Project Title | Lights, camera, interaction! Interactive film and its Transformative Potential. |
| Project Start Date | 01/10/2019 |
| Project Duration | Until December 2020 |
| Collaborator details (if applicable, names, email addresses and institutions) | |
| Funding source (if applicable) | XR Stories |

| | | |
|--|------------|-----------|
| <p>Box 1D: Other Ethics Reviews</p> <p>ALL applicants must complete this box.</p> | <p>YES</p> | <p>NO</p> |
|--|------------|-----------|

| | | |
|--|--|----------|
| <p>Has this project been submitted to any other ethics or compliance procedures?</p> | | <p>X</p> |
| <p>If YES, please provide details</p> | | |
| | | |

| | | | |
|--|---|------------|-----------|
| <p>Box 1E: Conflicts of Interest</p> <p>STAFF applicants must complete this box.</p> | | <p>YES</p> | <p>NO</p> |
| <p>1</p> | <p>Are any ethical concerns / conflicts of interest likely to arise as a consequence of funding source (with respect to your own work or that of other individuals/departments within in the University e.g. perceived or actual with respect to direct payments, research funding, indirect sponsorship, board or organisational memberships, past associations, future potential benefits etc...)</p> | | <p>X</p> |
| <p>2</p> | <p>Does the Principal Investigator or any other key investigators or collaborators have any direct personal involvement in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest?</p> | | <p>X</p> |
| <p>IF YES to either question please describe these possible ethical concerns or conflicts of interest.</p> | | | |
| | | | |

SECTION 2: RESEARCH SUMMARY

Box 2A: Research Outline

ALL applicants must complete this box.

| | |
|---|---|
| 1 | <p>Aims and objectives of the research Please provide the aims and objectives of the research, including the questions or hypotheses that will be examined.</p> |
| | <p>My thesis will ask the question: How can interactivity be used for more than entertainment?</p> <p>Through the creation of an interactive film with a second screen experience, my aim is to explore the emotional impact and engagement interactive storytelling can create within the viewer. I want to see if its educational potential is stronger than with “passive” storytelling such as books and films.</p> |
| 2 | <p>Methods of data collection and types of data Please outline how the data will be collected from or about human participants (e.g. face to face audio recorded interviews, anonymous online surveys hosted by Google Forms, telephone surveys etc.) Please give details of all proposed research activities and specify exactly what types of data will be collected for each activity (e.g. paper based notes, photographs, audio recordings etc.).</p> |
| | <p>Data will be collected through audio recorded interviews and anonymous surveys hosted by Google forms.</p> |
| 3 | <p>Research Outside of the UK Will you be conducting research outside of the UK? If so, specify where. Have you checked whether local ethical approval is required? Are there any different civil, legal, financial or cultural conditions that you need to be aware of? If so, please provide details of how you will ensure compliance with these conditions and/or regulations.</p> <p>See the University’s guidance on conducting research outside the UK for further details: https://www.york.ac.uk/staff/research/governance/research-policies/guidanceoutsideuk/</p> |
| | <p>I will be conducting research in France, my home country as well as the U.K.</p> |

SECTION 3: PARTICIPANTS

Box 3A: Participant Summary

ALL applicants must complete this box.

1 **Recruitment of Participants**

How many participants will take part in the research? How will they be identified and invited to take part in the study? Please give details for all activities described in Box 2A, Question 2.

It is sufficient to provide estimated numbers. But, please provide details for each of the research activities described in the previous box.

Around 100 participants will test my interactive film. They will be non-experts recruited through online Facebook posts. Most of them will be friends and colleagues.

2 **Anonymity**

Will the data you collect from participants be treated anonymously or non-anonymously in any outputs (e.g. reports, assessments, research papers etc.)? If you intend to treat your data anonymously in the outputs, how will you ensure that anonymity is maintained? If you intend to treat the data non-anonymously, please explain and justify why a non-anonymous approach is appropriate in this work?

Note that a “**privacy by design**” approach is required for **research activities**, whereby data is always treated anonymously in outputs unless there is a good reason to identify the participants.

The surveys will be anonymous but the interviews will be non-anonymous for me to be able to give some information about the interviewees and why their opinion matters in my dissertation.

3 **Payments, reimbursements and incentives**

If research participants are to receive any payments, reimbursement of expenses, or any other incentives or benefits for taking part in your research, please give details, indicating what and how much they will receive and the basis on which this was decided. Please also explain how you will ensure that you are complying with financial regulations.

No payments will be done for my research.

| | |
|---|---|
| 4 | <p>Obtaining Consent</p> <p>Please explain how voluntary informed consent to participate will be elicited from participants. If different groups are involved in the study (e.g. parents, children, staff), please describe the sequence of consent. Please give details for all activities described in Box 2A, Question 2.</p> |
|---|---|

| | | | |
|---|---|------------|-----------|
| | The participants will consent through a survey they will be given during screenings. | | |
| 5 | Information Sheets | YES | NO |
| | Please confirm that you will provide <i>all participants</i> with a Participant Project Information Sheet that is based on the template provided on the TFTI Research Ethics web pages. | X | |
| 6 | Consent Forms | YES | NO |
| | <p>Please confirm that you will take written Informed Consent from <i>all participants</i> using a form that is based on the template provided on the TFTI Research Ethics web pages.</p> <p>Note that it is expected that explicit written Informed Consent is taken from all participants, unless there is a good reason to use verbal consent.</p> | X | |

| | | | |
|---|--|------------|-----------|
| | If NO, please explain in what situations and contexts you will take verbal consent and how you will manage and record that verbal consent has been taken. | | |
| | | | |
| 7 | Feedback | YES | NO |
| | <p>Will you be providing the participants with any feedback on their involvement? E.g. providing them with access to research papers?</p> <p>Note that it is generally expected that participants will have the option to receive some form of feedback on the work.</p> | X | |
| | If YES, please explain how you will provide the relevant parties with feedback and when, e.g. by giving them access to the completed report by emailing them a pdf version of accepted conference papers. If NO, please explain why not. | | |
| | I will email a pdf of my research papers in 2021, once I have submitted my thesis. | | |
| 8 | Dissemination and Distribution | YES | NO |
| | Do you intend to disseminate or distribute your finished work anywhere? | X | |
| | If YES, please explain what you intend to do with the finished work? E.g. put on YouTube, submit to conferences etc. | | |

I am not sure yet, but I will probably submit my work to conferences.

SECTION 4: RESEARCH ETHICS CONCERNS

| Box 4A: Checklist of Research Ethics Questions | | YES | NO |
|---|--|------------|-----------|
| ALL applicants must complete this box | | | |
| 1 | <p>Will the project involve conducting work that would typically require NHS Ethics approval? That is, will you be working with any of the following as participants, if recruited specifically due to their involvement with the NHS:</p> <ul style="list-style-type: none"> -Patients and Users of the NHS, -Relatives or carers of patients and users of the NHS, -NHS staff? <p>OR will you be using or accessing NHS premises or facilities as part of the work?</p> | | X |

| | | | |
|---|--|---|---|
| 2 | <p>Will the project involve conducting work that would typically require Her Majesty's Prison & Probation Service Ethics approval? That is, will you be conducting research with staff and/or offenders in prison establishments, National Probation Service (NPS)/Community Rehabilitation Companies (CRC) regions or within Her Majesty's Prison and Probation Service (HMPPS) Headquarters? OR will you be conducting research on HMPPS premises?</p> | | X |
| 3 | <p>Will you be working with vulnerable participants (e.g. those under 18, people with learning disabilities, people with mental impairment due to health or lifestyle, people who are terminally ill or recently bereaved etc.)?</p> <p>Note that if you are unsure whether someone you would like to work with could be considered vulnerable under the circumstances, you are required to discuss your concerns with your supervisor and/or Ethics Chair. It is generally expected that any student working with vulnerable groups would submit a Full Research Ethics Clearance form.</p> | | X |
| 4 | <p>Will you be discussing sensitive or potentially upsetting or distressing topics with participants?</p> | X | |
| | <p>Is it reasonably foreseeable that the work could involve causing physical or emotional distress to participants or researchers?</p> | | X |

| | | | |
|--|---|--|---|
| | Is it reasonably foreseeable that the participants could disclose or discuss participation in illegal activities (e.g. drug use)? | | X |
|--|---|--|---|

| | | | |
|----|---|--|---|
| | Is it reasonably foreseeable that the participants could disclose confidential or sensitive information (e.g. financial data, sensitive organisational data)? | | X |
| 8 | Will you be deliberately misleading the participants in any way? | | X |
| 9 | Will you be filming or making recordings of people without their knowledge and consent (e.g. covert filming of people in non-public places)? | | X |
| 10 | Will you be researching or discussing issues relating to terrorism or political extremism as part of your work? | | X |
| | Will you be collecting online data that has been generated by human participants (e.g. social media data) from closed, restricted forums (i.e. from closed communities or those that require approved membership to view, e.g. restricted Facebook groups)? | | X |

| | | | |
|----|---|--|---|
| 12 | Will you be identifying anyone from online data that has been generated by human participants (e.g. social media data) from either open or closed forums (i.e. by including information that could make the individual identifiable, such as direct quotes or usernames)? | | X |
| 13 | Could the work involve potentially damaging property and/or the natural environment? | | X |
| 14 | Will the work involve animals? | | X |
| 15 | Is it reasonably foreseeable that the work could result in any anticipated university/institutional risk (e.g. adverse publicity or financial loss)? | | X |

If you have answered “YES” to ANY of the questions in Box 4A: Checklist of Ethical Research Ethics Questions:

This Research Ethics Checklist may be insufficient to accommodate the ethical risks of your proposed work. Some lower-risk ethical issues can be accommodated without further scrutiny by the TFTI Ethics Committee provided that you agree to follow a process that is considered appropriate. These situations and processes are described on the TFTI Ethics VLE site. IF there is a suitable procedure to manage this ethics issue, please complete Box 4B to provide further details of how you intend to manage the ethical issues associated with your proposed work.

Box 4B: Further Details

Complete this box if you answered “Yes” to any question in Box 4A AND there is an identified procedure to manage the ethical risks in this situation.

Provide details of the nature of the ethical risks that you identified by answering YES to questions in Box 4A and describe the process that you will follow to minimise the risks.

My project talks about bullying. The subject can be upsetting for some people so I will warn the audience of the risks on the invitations for the screening as well as at the beginning of screenings.

Alternatively, the associated risks of your proposed work may be sufficiently low risk that an appropriate approach can be agreed with the TFTI Ethics chair without requiring submission of the TFTI Research Ethics Clearance form. Your supervisor/module convenor may contact the TFTI Ethics on your behalf to identify an agreed process on a case-by-case basis. If your supervisor has discussed your proposed work with the TFTI Ethics Chair via email, please

Box 4C: Case-By-Case Agreed Process

Applicants must complete this box IF they have answered “YES” to any questions in Box 4A AND there is no identified procedure to manage the ethical risks of the proposed work. Note, that most applicants will need to submit a TFTI Research Ethics Clearance form and this case-by-case process approach is ONLY suitable for work that can be considered low risk.

YES

NO

| | | | |
|--|--|----------|----------|
| 1 | Have you or your project supervisor discussed the proposed work and associated ethical risks with the TFTI Ethics Chair via email? | | X |
| | Were you or your project supervisor able to agree a process to manage the low risks associated with your proposed work? | X | |
| <p>IF YES to BOTH questions please provide further details of the anticipated risks of the proposed work and the process that was agreed with the TFTI Ethics chair. Please include dates of the email correspondence AND the name and email address of people involved.</p> | | | |
| <p> </p> | | | |

If the associated risks of your proposed work cannot be accommodated through an identified procedure or through a case-by-case agreed process, then you will need to submit an application to the TFTI Ethics Committee for review using the Research Ethics Clearance Form.

SECTION 5: DATA PROTECTION

| | | |
|---|-------------------|------------------|
| <p>Box 5A: Checklist of Data Protection Questions</p> <p>ALL applicants must complete this box</p> | <p>YES</p> | <p>NO</p> |
|---|-------------------|------------------|

| | | | |
|---|--|---|--|
| 1 | <p>Will you guarantee that you will inform all people whose personal and/or special category data that you are using:</p> <ul style="list-style-type: none"> ●What data you will be collecting and why; ●How you will be storing the data; ●The legal basis under which you are storing the data; ●When/if/how the data will be destroyed? <p>Please note that using a GDPR Compliant Project Information Sheet will ensure you meet these requirements.</p> | X | |
| 2 | <p>Will you guarantee that IF you use a portable device to collect electronic data you will transfer that data to your University Google Drive account or University Filestore as soon as possible after the interview AND delete it from your personal device?</p> | X | |
| 3 | <p>Will you guarantee that the data will ONLY be accessible to the project team AND that IF the project team extends beyond the University of York that you have consulted the University's IP and Legal team to ensure appropriate data protection safeguards are in place?</p> | X | |

| | | | |
|---|---|---|--|
| 4 | Will you guarantee that you will ONLY use Google Forms OR Qualtrics to host online surveys that collect personal and/or special category data? | | |
| 5 | Will you guarantee that you are collecting the MINIMUM amount of data necessary for the intended project? | X | |
| 6 | Will you guarantee that IF you are storing or accessing data from OUTSIDE the European Economic Area (EEA) you will access the data through your University of York Google Account connected to the University of York Virtual Private Network (VPN)? | X | |
| | Will you guarantee to destroy all physical AND electronic data EITHER after your module marks have been ratified by the Board of Examiners OR 10 years after last requested access? | X | |
| 8 | IF storing electronic data for 10 years after last requested access, will you guarantee to EITHER use a University Google Drive account OR an approved data repository service to store the data? | X | |

| | | | |
|---|---|---|--|
| 9 | Have you screened your project against the Data Protection Impact Assessment (DPIA) screening questions AND if required conducted a DPIA and submitted a copy to the Data Protection Officer for review? | X | |
|---|---|---|--|

| |
|---|
| <p>Box 5B: Further Details</p> <p>Complete this box if you answered “No” to any question in Box 5A.</p> |
| <p>Provide details of the nature of the data protection risks that you identified by answering NO to questions in Box 5A and describe the process that you will follow to minimise the risks. Please note that if you are not compliant with the agreed procedures above, this application will be referred to the University Data Protection Officer for advice.</p> |

SECTION 6: APPLICANT AGREEMENT

Please mark your answer to each question in Box 6A: Applicant Agreement with an “X” or a tick in the appropriate column. Please note that you **MUST NOT** begin contacting participants **UNITL** you have received a response from the Ethics committee.

If you are a research student, please also have your supervisor also complete Box 6B: Supervisor Agreement and provide their signature overleaf.

Once completed, submit the checklist for review by the TFTI Ethics committee by emailing the checklist to TFTI-ethics@york.ac.uk from the applicant’s University of York account. The Ethics Committee will accept a typed/digital signature from the applicant if the form is returned by email from the applicant’s University of York account, and similarly a typed/digital signature and responses to the supervisor questions if the supervisor is cc’d to that email.

| | | |
|---|--|--|
| <p>Box 6A: Applicant Agreement</p> <p>ALL applicants must complete this box.</p> | | |
|---|--|--|

| | | | |
|---|--|---|--|
| 1 | I will ensure that the research conducted for the above project will meet all the statements as expressed in this Research Ethics Checklist. | X | |
| 2 | I will ensure that all work related to the research will be guided by the University's ethical rules and regulations. | X | |
| 3 | I understand that I must not progress with this project until I have received confirmation from the TFTI Ethics committee that Ethics approval through this Research Ethics Checklist is appropriate for this project. | X | |
| 4 | I have included example Project Information Sheets and Participant Informed Consent Forms, as part of this Ethics application, if appropriate. | X | |
| 5 | I understand that I must adhere to the TFTI requirements for storing and using personal and special category data in compliance with the General Data Protection Regulation. Note that GDPR compliance guidance can be found on the TFTI Ethics VLE site. | X | |
| 6 | I agree to ensure that all payments made to personnel in relation to this project will comply with financial regulations. | X | |
| 7 | I agree to report any changes to the above as soon as is feasible to the Chair of the TFTI Ethics Committee. | X | |

| | |
|----------------|--------|
| Applicant Name | Gallon |
|----------------|--------|

| | |
|--------|------------|
| Signed | |
| Date | 16/07/2020 |

| Box 6B: Supervisor Agreement | | YES | NO |
|---|---|------------|-----------|
| STUDENT applicants must have their supervisor complete this box. | | | |
| 1 | I have reviewed this checklist in discussion with the student. | x | |
| 2 | I believe the Research Ethics Checklist is appropriate for this work and that no further Ethics approval is required. | x | |
| 3 | IF you have selected “No” in response to statement 2: I confirm that the student will submit either the Research Ethics Clearance Form for further ethical approval. | | |

| | |
|-----------------|------------------|
| Supervisor Name | Dr Guy Schofield |
| Signed | |
| Date | 08/09/2020 |

Appendix 2 : Participant Project Information Sheet (Anonymous Research) TFTI

Viewing of an Anti-bullying Interactive Film



**Department of Theatre, Film, Television and
Interactive Media Ethics Committee**

Participant Information Sheet –Anonymous Research

Project background

The University of York would like to invite you to take part in the following project: Viewing of an anti-bullying interactive film. Before agreeing to take part, please read this information sheet carefully and let us know if anything is unclear or you would like further information.

What is the purpose of the project?

This project is being performed by Rebecca Gallon (rcg516@york.ac.uk) who is a Mres Student in Interactive Media at the University of York. This research is being undertaken for her end of Master's thesis and is being supervised by Guy Schofield (guy.schofield@york.ac.uk) The work that is being performed for this thesis is being conducted according to restrictions that have been subject to approval by the TFTI Ethics committee. The Chair of the TFTI Ethics committee can be contacted on TFTI-ethics@york.ac.uk. For this research project, we are interested in researching the

educational potential of interactive storytelling. Your participation in this project will involve a 10 minute film screening of an interactive short film called *Butterfly* as well as a short survey before and after the screening where you will answer questions about yourself and the screening. The screening will also automatically collect anonymous data regarding the choices you have made during the film. Your entire participation in this project will last no longer than 40 minutes. Your survey answers might be cited in Rebecca Gallon's final thesis.

Please note that although there is no intention to discuss any distressing subject matter with participants, viewers may find the films subject upsetting. *Butterfly* is an anti-bullying short film in which the main character is bullied at school. If you have any concerns about the topics that may be covered in the research study, please raise these concerns with the researcher.

Your participation in this project is voluntary. If you wish, we will provide you with access to the thesis after our marks have been confirmed. If you would like to receive access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because we are aiming to recruit a diverse group of participants to understand if viewer's ages affects their understanding and appreciation of interactive storytelling.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to let the researcher know you wish to withdraw, and all your data will be deleted as soon as possible.

On what basis will you process my data?

Under the General Data Protection Regulation (GDPR), the University has to identify a legal basis for processing personal data and, where appropriate, an additional condition for processing special category data.

For further information and definitions of personal and special category data, please go to:

- <https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/key-definitions/>
- <https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/special-category-data/>

Special category data is personal data which the GDPR says is more sensitive, and so needs more protection. In this study, we will not be collecting any special category data. Research activities will only be undertaken where ethical approval has been obtained, where there is a clear public interest and where appropriate safeguards have been put in place to protect data. In line with ethical expectations and in order to comply with common law duty of confidentiality, we will seek your consent to participate where appropriate.

This consent will not, however, be our legal basis for processing your data under the GDPR.

How will you use my data?

Data will be processed for the purposes outlined in this notice.

Will you share my data with 3rd parties?

No. Data will be accessible to the project team and personnel associated with the Department of Theatre, Film and Television at the University of York only. Anonymised data may be reused by the research team or other third parties for secondary research purposes.

How will you keep my data secure?

The University will put in place appropriate technical and organisational measures to protect your personal data and/or special category data. For the purposes of this project

we will store data using secure University services provided by Google and the University Filestore. Information will be treated confidentiality and shared on a need-to-know basis only. The University is committed to the principle of data protection by design and default and will collect the minimum amount of data necessary for the project.

Will you transfer my data internationally?

Possibly. The University's cloud storage solution is provided by Google which means that data can be located at any of Google's globally spread data centres. The University has data protection complaint arrangements in place with this provider. For further information see,

<https://www.york.ac.uk/it-services/google/policy/privacy/>.

Will I be identified in any outputs?

No. Your participation in this research activity will be treated anonymously and you will not be identified in any outputs.

How long will you keep my data?

Data will be retained in line with legal requirements or where there is a business need. Retention timeframes will be determined in line with the University's Records Retention Schedule.

What rights do I have in relation to my data?

Under the GDPR, you have a general right of access to your data, a right to rectification, erasure, restriction, objection or portability. You also have a right to withdrawal. Please note, not all rights apply where data is processed purely for research purposes. For further information see,

<https://www.york.ac.uk/records-management/generaldataprotectionregulation/individualsrights/>.

Questions or concerns

If you have any questions about this participant information sheet or concerns about how your data is being processed, please contact the TFTI Ethics Chair (TFTI-ethics@york.ac.uk) in the first instance. If you are still dissatisfied, please contact the University's Acting Data Protection Officer at dataprotection@york.ac.uk. If you have any questions about the project itself, please contact the producer Rebecca Gallon at rcg516@gmail.com or project supervisor Guy Schofield at guy.schofield@york.ac.uk

Right to complain

If you are unhappy with the way in which the University has handled your personal data, you have a right to complain to the Information Commissioner's Office. For information on reporting a concern to the Information Commissioner's Office, see www.ico.org.uk/concerns.

Appendix 3: Participant Consent Form



Department of Theatre, Film, Television and Interactive Media Ethics Committee

Participant Consent Form

Thank you for your interest in this project. This research activity will be used to understand the educational potential of interactive storytelling as part of my Masters by Research in Interactive Media.

Please read the following statements carefully and tick the appropriate box:

| | YES | NO |
|---|------------|-----------|
| I have read the information sheet about this project | | |
| I agree to take part in this project | | |
| I consent to watching an interactive film in this research | | |
| I understand that the film contains subject matter relating to online bullying | | |
| I understand my right to withdraw and/or have my data destroyed from this project at any time | | |
| I understand that my participation in this project will be treated anonymously | | |
| I am over the age of 18 | | |

| | | |
|--|--|--|
| | | |
|--|--|--|

Participant Name:

Researcher Name:

Participant Signature:

Researcher Signature:

Date:

___/___/___

Date:

___/___/___

If you wish to be informed about the outcomes from this project, please provide your email address:

Appendix 4 : Original Interactive System for *Butterfly*

The original version of *Butterfly* was submitted as an individual research project for my Bsc in Film and TV Production at the University of York. This previous film was shorter, with fewer scenes and a different colour scheme. The educational potential of the film was researched by organising screenings of the film followed by a survey. This survey was very simple, composed of non-scientific questions such as “How did the bullying make you feel?” or “Have you already seen an interactive film?”. The number of participants (36) was also significantly smaller than in this study (72 participants). The study made for this research is based on previous psychological tests with psychometric measures. The answers to the previous survey were therefore not able to give as much insight on the question of the informative potential of interactive film than the study made for this Masters Project.

As well as the study, the interactive interface was developed very differently from in the Undergraduate version of *Butterfly*. The second-screen experience for *Butterfly* was originally created on Twitter. 50 social media accounts corresponding to 50 different fictional characters were created. For each of them pictures were uploaded. Each character followed pages appropriate to their personality on Twitter and they interacted with “Brampton Buzz” and the other characters. Every extra seen in the film had their own social media page, so the viewers could end up being one of the characters they would see in the film.

To make the experience as realistic as possible, signs revealing fake accounts were avoided:

- The absence of a profile picture – All the characters had one.
- The absence of a Twitter Bio – All the characters had one.
- No interaction with others – The characters interact with each other.
- No followers – All the fake accounts follow each other.

The final profiles looked like this (Image taken from a 2019 dissertation on the creation of the film):



Figure 5: Every character follows Twitter accounts that correspond to their personality.

Figure 6: Here is Josh's fictional profile



Figure 7: All the characters interact with each other and the gossip page.

To send the scheduled tweets a Twitter Bot was created using the open source cross platform Node.js.²⁶⁴ This platform uses JavaScript outside a browser. To allow the codes to link with Twitter, a twitter API was needed. An API allows you to access the features of Twitter without having to go through the website interface. This was done through Twitter’s developer platform by filling in a form to become a Twitter developer. The Twitter Bot was thus created to schedule tweets to be sent at set intervals, but having the same fixed time between each tweet did not suit the project because as the story progresses, Lisa is more intensely (and hence more frequently) harassed. It was decided to try using Google Sites and AppsScript²⁶⁵ to populate a page with Announcements using Time Based Triggers as the scheduling mechanism. In simple terms, a spreadsheet was created with all the tweets and the exact times that they should be sent, and linked to the twitter API (See image below).

²⁶⁴ Node.js, version 12.2 (Open Source: Ryan Lienhart Dahl, 2009).

²⁶⁵ Google AppsScript (Open Source, Google, 2009)

| | A | B | C |
|----|---|---|-----------------------|
| 1 | Content | Google Media ID | Publish Date |
| 2 | | | |
| 3 | Happy Monday! | https://drive.google.com/open?id=1CX87WqelLBoB... | 2019-05-11 6:30:47 PM |
| 4 | OMG Lisa must be so EMBARRASSED | https://drive.google.com/open?id=1bBzn0g6LhEXQ... | 5/11/2019 18:31:27 |
| 5 | Today is #britishheartfoundationday. Good luck to all the people running for the charity race! | | 5/11/2019 18:31:41 |
| 6 | Hottest dudes in Brampton school nominations are here! @joshwalker + @thibslinkinson + @Markhenson + @Johnnysence + @Oliverhames | | |
| 7 | Who will you vote for? | | 5/11/2019 18:32:24 |
| 8 | ☺☺ | https://drive.google.com/open?id=1eNbdUD9r89Z... | 5/11/2019 18:32:40 |
| 9 | To Leslie, you true beauty, will you go on a date with me? Roses are red, violets are blue,what's worse? Your hair or the fact that he left you? | | 5/11/2019 18:33:00 |
| 10 | Lisa don't you get that no one likes you? You're so ugly. Give us a break and leave Brampton! | | 5/11/2019 18:33:10 |
| 11 | When you see Lisa in the corridor | https://drive.google.com/open?id=1m67Pkkj6AKrA... | 5/11/2019 18:33:45 |
| 12 | Lisa is not as innocent as she seems. We got a picture to prove it. Wanna see it? #YESBBUZZ #NOBBUZZ | | |
| 13 | | | 5/11/2019 18:33:47 |

An Applet through the IFTTT was created to collect the viewer’s responses to the poll. . IFTTT is a web-based service that creates chains of simple conditional statements called Applets. I used the applet called “Save Tweets featuring specific content to a spreadsheet”. This gave me every tweet posted with the content I desired, in real time. I programmed it to count how many #YESBBUZZ were Tweeted so that I would see how many people in the room gave that response.

*Processing*²⁶⁶ was used to play the videos one after the other seamlessly.

| | A | B | C | D | E |
|----|-----------------|-------------------------------------|-------------------------|---|---|
| 1 | @BramptonBuzz | Lisa is not as innocent as it seems | May 11, 2019 at 06:33PM | | |
| 2 | @LeglandLucie | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 3 | @SimonJester15 | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 4 | @JuliaKassanov | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 5 | @LovegoodCeci | @Brampton Buzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 6 | @DannyPeck | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 7 | @JackJosh1325 | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 8 | @LilyCollins233 | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:33PM | | |
| 9 | @LebermanM | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 10 | @Gerogihanley | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 11 | @Leslie_ff | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 12 | @HactorMarc | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 13 | @Jamilie33 | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 14 | @MarieJ2 | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 15 | @Lauraghost | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 16 | @StephanieMon | @BramptonBuzz #YESBBUZZ | May 11, 2019 at 06:34PM | | |
| 17 | | | | | |
| 18 | | | | | |

²⁶⁶ Processing, version 3.5.3, (Open Source: GNU, 2001)

I used "Boolean" to be able to create conditions in the program.

I imported three different videos: one with the main story up to the decision point, and one for each ending.

```

sketch_3video (Processing 3.3.7)
-----
File Edit Shell Debug Tools Window Help
  File Edit Shell Debug Tools Window Help
  sketch_3video.pde
  Movie movie();
  float x0;
  float x1;
  int index = 0;
  boolean no = true;

  void setup() {
    size(1200, 1000);
    movie = new Movie[3];

    movie[0] = new Movie(this, "Main 3video.mp4");
    movie[1] = new Movie(this, "ending1.mp4");
    movie[2] = new Movie(this, "ending2.mp4");

    movie[0].mute();
    movie[1].mute();
    movie[2].mute();
  }

  void draw() {
    background(0);

    if (movie[index].available()) {
      movie[index].read();
    }

    imgui(movie[index], 0, 0);
  }

  void keyPressed() {
    if (key == 'a') {
      movie[0].play();
      index = 0;
    }
    if (key == 's') {
      movie[0].stop();
      movie[1].play();
      index = 1;
    }
    if (key == 'd') {
      movie[0].play();
      index = 2;
    }
  }

```

I imported a Processing library to play videos.

I wanted the videos to be played in the highest quality possible in Processing. That was in 1080p.

The "KeyPressed" commands allowed me to play the correct ending by either hitting the "a", "s" or "d" keyboard key.

Using a combination of three different solutions resulted in a very disjointed process that required a human in the middle. If a host was not present to check which ending the majority had chosen and then to play the right one, the interactive screening would be unsuccessful. For the viewers, the final experience was the same as it would have been with an ideal coding solution, but such a system could not easily be shared without having a screening moderator. This limits the possibility of raising awareness on any subject.

Appendix 5: Interactions by users during screenings of the original *Butterfly* prototype as submitted for a Bsc.



These three images indicate a fictional romance was created between two users (@Cecialovegood and @georges_sidney). The use of a meme and a mean joke can also be noted revealing the users are playing with the codes of social media and are actively participating in the experience by developing character personalities.

← Tweet

 **Lucie Legland**
@LeglandLucie

@GinaGre86998215 fight

 **Cecilia Lovegood** @Lovegood... · 11 mai 19

 **whooooonose**
Treat spiders the way you want to be treated

 **foryourhealth**
Killed without hesitation
Source: whooooonose
45,883 notes

19:51 · 11 mai 19 · Twitter for iPhone

1 Tweet cité

 **Gina Green** @GinaGre8... · 11 mai 19
En réponse à @LeglandLucie
Spider Lives Matter! 🕷️

Tweeter votre réponse 

It's our duty to make the world a better place

📅 A rejoint Twitter en mai 2019

13 Abonnements 12 Abonnés

Suivi par aucune des personnes que vous suivez

Tweets Tweets et réponses Médias J'aime

 **Gina Green** @GinaGre8... · 11 mai 19
Spider lives matter. 🕷️

 **Lucie Legland** @Leg... · 11 mai 19
@GinaGre86998215 fight

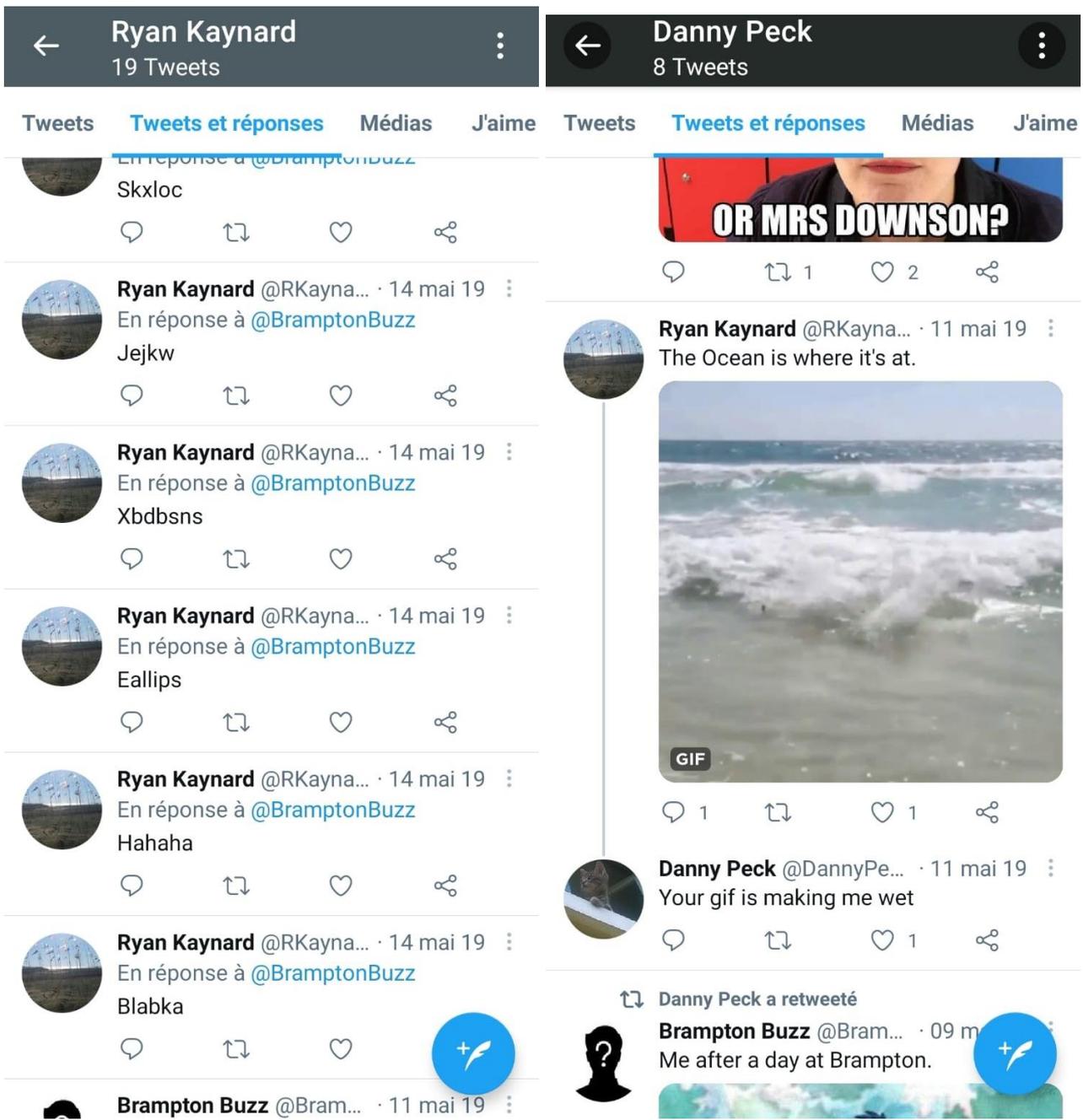
   

 **Gina Green** @GinaGre8... · 11 mai 19
Obsessed with @quick_kits . Honestly what a hot dude

  1  1 

A tension between two users was invented. It concerned other opposing points of views of their “avatars” on how to treat spiders. This is again a lighthearted interaction that reveals the playful mood the users had during the experience and their attempt at acting in line with their fictional character. Gina Green’s profile was full of positive, social messages and it would make sense that such a character writes “Spider lives matter”.

@quick_kits is the real Twitter account of one of the users that was watching Butterfly during that screening. This reveals that using Twitter, made people want to play with their possibility to blur fiction and reality instead of focusing on the story.



These two images reveal the limits of offering too much interactivity to users. They can actively attempt to sabotage the experience by filling users' feeds with pointless information or making dirty jokes.

Appendix 6: Coding of *Butterfly's* Interactive System

The code was organised in Four separate components

- 1) Film
- 2) Social component
 - a) Posts
 - b) poll

All these components were linked on the main app:

```

1  import React from "react";
2  import {
3    BrowserRouter as Router,
4    Switch,
5    Route,
6    Link
7  } from "react-router-dom";
8  import Film from './components/film/film.component'
9  import Social from './components/social/social.component'
10 import './App.css'
11
12 const firebase = require("firebase");
13 // Required for side-effects
14 require("firebase/firestore");
15 require("firebase/analytics");
16 export default class App extends React.Component{
17   state:any={
18     db:null
19   }
20   componentWillMount(){
21     // Initialize Cloud Firestore through Firebase
22     var firebaseConfig = {
23       apiKey: "AIzaSyCneyNK3x1N6qXauvHcVbccQBCU30Sc9nw",
24       authDomain: "interstory-butterfly.firebaseio.com",
25       databaseURL: "https://interstory-butterfly.firebaseio.com",
26       projectId: "interstory-butterfly",
27       storageBucket: "interstory-butterfly.appspot.com",
28       messagingSenderId: "853950320172",
29       appId: "1:853950320172:web:cd27db431688932fe4cb89",
30       measurementId: "G-HYPSYQKM06"
31     };
32     // Initialize Firebase
33     firebase.initializeApp(firebaseConfig);
34     firebase.analytics();
35
36     var db = firebase.firestore();
37     this.setState({db:db})
38
39   }

```

```

40   render(){
41     return (
42       <Router>
43       <div>
44
45         {/* A <Switch> looks through its children <Route>s and
46            renders the first one that matches the current URL. */}
47         <Switch>
48           <Route path="/film">
49             <Film db={this.state.db}/>
50           </Route>
51           <Route path="/social">
52             <Social db={this.state.db}/>
53           </Route>
54           <Route path="/">
55             <Home />
56           </Route>
57         </Switch>
58       </div>
59     </Router>
60   );
61   }
62 }
63 }
64
65 class Home extends React.Component {
66
67   render(){
68     return (
69       <div className="App">
70         <h1>Butterfly</h1>
71         <p>An interactive film experience</p>
72         <p className="instructions"> The Screening host clicks on the "Film" button.
73         Everyone else choose the "Social" button ideally through their mobile phones.
74         Wi-fi is required for the experience to work.</p>
75         <button className="deviceModeButton">
76           <Link to="/film">Film (Host Only)</Link>
77         </button>
78         <button className="deviceModeButton">
79           <Link to="/social">Social (All Participants)</Link>
80         </button>
81       </div>
82     );
83   }
84 }

```

Here is the social component:

```

1 import './social.css'
2 import React from 'react'
3 import Post from './post/post.component'
4 import Poll from './poll/poll.component'
5
6 export default class Social extends React.Component{
7   props:any;
8   state:any = {
9     posts:[],
10    currentTime:0,
11    showPoll:true,
12    ending1VoteCount:0,
13    ending2VoteCount:0
14  }
15  }
16  componentDidMount(){
17    this.props.db.collection("posts")
18    .onSnapshot((querySnapshot:any)=> {
19      var posts:any = []
20      querySnapshot.forEach((doc:any)=> {
21        posts.push(doc.data());
22      });
23      this.setState({
24        posts:posts
25      });
26    });
27    //subscribe to video time document
28    this.props.db.collection("sessions").doc("videoSession")
29    .onSnapshot((doc:any)=>{
30      var data = doc.data()
31      this.setState({
32        currentTime:data.time,
33        currentPart:data.part,
34        ending1VoteCount:data.ending1VoteCount,
35        ending2VoteCount:data.ending2VoteCount
36      });
37      console.log("Current data: ", doc.data());
38    });
39  }
40  render(){
41    var posts = this.state.posts.filter((post:any)=>{
42      return post.postedAt <= this.state.currentTime
43    }).sort((a:any,b:any)=>{return b.postedAt - a.postedAt})
44    return (
45      <div className="social-list">
46        <div className="nav">
47          <p>Flickr</p>
48        </div>
49        {this.state.currentPart > 1 && <Poll db={this.props.db} ending1VoteCount={this.state.ending1VoteCount} ending2VoteCount={this.state.ending2VoteCount}></Poll>}
50        {posts && posts.map((post:any,index:any)=>{
51          return <Post key={index} post={post}t></Post>
52        })}
53      </div>
54    )
55  }
56 }
57

```

Here is the poll component:

```

1 import './poll.css'
2 import React from 'react'
3 const firebase = require("firebase");
4
5 export default class Poll extends React.Component{
6   props:any;
7   state:any = {
8     chosenEnding:null
9   }
10  }
11  }
12  }
13  chooseEnding(endId:any){
14
15    this.setState({
16      chosenEnding:endId
17    })
18    if(endId === 1){
19      this.props.db.collection("sessions").doc("videoSession").update({
20        ending1VoteCount: firebase.firestore.FieldValue.increment(1)
21      });
22    }else{
23      this.props.db.collection("sessions").doc("videoSession").update({
24        ending2VoteCount: firebase.firestore.FieldValue.increment(1)
25      });
26    }
27  }
28  }
29  }
30  }
31  }
32  }
33  }
34  }
35  }
36  }
37  }
38  }
39  }
40  }
41  }
42  }
43  }
44  }
45  }
46  }
47  }
48  }
49  }
50  }
51  }
52  }
53  }
54  }
55  }
56  }
57  }

```

Here is the post component:

```

1 import './post.css'
2 import React from 'react'
3 import FirebaseImage from '../firebase-image/firebase-image'
4 export default class Post extends React.Component{
5   props:any = {
6     post:null
7   }
8   componentDidMount(){
9
10  }
11  render(){
12    var post = this.props.post
13    var profilePic = 'ProfilePic' in post? post.ProfilePic:null
14
15    return (
16      <div className="post">
17        <div className="header">
18          <div className="profilePic">{profilePic} && <FirebaseImage path={post.ProfilePic} downloadUrl={null} fadeIn={true}></FirebaseImage></div>
19          <p className="profileUsername">{post.username}</p>
20        </div>
21        <div className="image">{post.pic} && <FirebaseImage path={post.pic} downloadUrl={null} fadeIn={true}></FirebaseImage></div>
22        <div className="content">{post.text}</div>
23      </div>
24    )
25  }
26 }
27
28

```

Here is the code for the film component:

```

1 import './film.css'
2 import React from 'react'
3 import Poll from './social/poll/poll.component'
4 const firebase = require("firebase");
5 // Required for side-effects
6 require("firebase/firestore");
7 export default class Film extends React.Component{
8   videoRef:any = React.createRef()
9
10  props:any;
11  currentSec = 0
12  totalSec = 0
13  state:any = {
14    currentPart:1,
15    showSelectEndingScreen:false,
16    //CHANGE THIS VALUE BELOW TO CHANGE THE DURATION OF WAIT DURING THE POLL
17    selectCountDownInSec:40, // ITS IN SEC
18    voting:{
19      ending1:0,
20      ending2:0
21    },
22    videoSrc:"https://firebasestorage.googleapis.com/v0/b/interstory-butterfly.appspot.com/o/Main%20Video%20Export%2025th%20September.mp4?alt=media&token=44e7e458-7ffa-48e2-b198-8def8ba75955"
23  }
24  interval:any;
25  componentDidMount(){
26    this.videoRef.oncanplay = ()=>{
27      this.videoRef.play()
28    }
29    this.videoRef.ontimeupdate = (e:any)->{this.videoUpdate(e)}
30    this.videoRef.onended={()=>{
31      var currentPart = this.state.currentPart+1
32      this.updateTime(this.currentSec, currentPart)
33      this.setState({
34        currentPart:currentPart
35      })
36      if(currentPart === 2) this.startEndingSelection()
37    }
38  };

```

```
38     };
39     //reset video session on reload
40     this.updateTime(0,1)
41     this.resetSession()
42
43
44     //subscribe to videoSession document
45     this.props.db.collection("sessions").doc("videoSession")
46     .onSnapshot((doc:any) =>{
47         var data = doc.data()
48         this.setState({
49             voting:{
50                 ending1:data.ending1VoteCount,
51                 ending2:data.ending2VoteCount
52             }
53         })
54         console.log("Current data: ", doc.data());
55     });
56
57 }
58 async videoUpdate(e:any){
59     console.log(e,this.props.db)
60     var currentVideoTime = e.srcElement.currentTime
61     //send this to firebase here
62     //round the current second down to update less often not hit update limit in firebase
63
64     var nextSec = Math.floor(currentVideoTime)
65     if(this.currentSec === nextSec) return //if we are still on the same second exit
66
67     this.currentSec = nextSec
68     this.updateTime(this.currentSec,this.state.currentPart)
69
70     console.log(currentVideoTime)
71 }
```

```

71 }
72 startEndingSelection(){
73   //show decision screen
74   this.setState({
75     showSelectEndingScreen:true,
76   })
77   //start a countdown
78   //when over play ending with highest votes
79   this.interval = setInterval(()=>{
80     var countdown = this.state.selectCountDownInSec-1
81     this.setState({selectCountDownInSec:countdown})
82     if(countdown == 0){
83       clearInterval(this.interval)
84       //load the ending here
85       if(this.state.voting.ending1 > this.state.voting.ending2){
86         this.setState({videoSrc:"https://firebasestorage.googleapis.com/v0/b/interstory-butterfly.appspot.com/o/Butterfly%20Ending%201%20(October%202020).mp4?alt=media&token=98c4b411-ae27-4075-92a3-b3d291"}
87         this.videoRef.load()
88       }else{
89         this.setState({videoSrc:"https://firebasestorage.googleapis.com/v0/b/interstory-butterfly.appspot.com/o/Butterfly%20Ending%202%20(November%202020).mov.mp4?alt=media&token=64fd4f2-5f6e-459e-9d9a-c"}
90         this.videoRef.load()
91       }
92     }
93   },1000)
94 }
95
96
97 resetSession(){
98   this.props.db.collection("sessions").doc("videoSession").set({
99     time: 0,
100    part:1,
101    ending1VoteCount:0,
102    ending2VoteCount:0,
103  })
104
105 }
106 .then(()=> {
107   console.log("Document successfully updated!");
108 })
109 .catch((error:any)=> {
110   console.error("Error writing document: ", error);
111 });
112 }
113
114 updateTime(time:any,currentPart:any){

```

```
114 | updateTime(time:any,currentPart:any){
115 |     this.props.db.collection("sessions").doc("videoSession").update({
116 |       time: time + (currentPart === 2? 370:0),
117 |       part:currentPart
118 |     })
119 |   }
120 |   .then(()=> {
121 |     console.log("Document successfully updated!");
122 |   })
123 |   .catch((error:any)=> {
124 |     console.error("Error writing document: ", error);
125 |   });
126 | }
127 | render(){
128 |   return (
129 |     <div className="video">
130 |
131 |
132 |
133 |     /*
134 |     // @ts-ignore */
135 |     <video controls autoplay ref={ref=>this.videoRef = ref}>
136 |       <source src={this.state.videoSrc} type="video/mp4"/>
137 |     </video>
138 |     {this.state.showSelectEndingScreen && <div className="chooseEndingMessage">
139 |       <div className="message">
140 |         <h1>Vote for ending on the app</h1>
141 |         <p className="countdown">Will play highest voted option in {this.state.selectCountDownInSec} s</p>
142 |         <Poll minimal={true} db={this.props.db} ending1VoteCount={this.state.voting.ending1} ending2VoteCount={this.state.voting.ending2}></Poll>
143 |       </div>
144 |
145 |     </div>}
146 |
147 |   </div>
148 | )
149 | }
150 | }
151 | }
```

Appendix 7 : Interactive Screening Survey

Interactive Screening Survey

*Required

How have you been feeling today?

1 = this concept applies very little or not at all to me
2 = this concept applies a little to me
3 = this concept applies moderately to me
4 = this concept applies a lot to me
5 = this concept applies very much to me

How are you feeling these emotions today on a scale from 1 to 5? *

| | 1 (minimum intensity) | 2 | 3 | 4 | 5 (maximum intensity) |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Interested | <input type="radio"/> |
| Sad | <input type="radio"/> |
| Excited | <input type="radio"/> |
| Troubled | <input type="radio"/> |
| Powerful | <input type="radio"/> |
| Guilty | <input type="radio"/> |
| Scared | <input type="radio"/> |
| Hostile | <input type="radio"/> |
| Enthusiastic | <input type="radio"/> |
| Proud | <input type="radio"/> |
| Annoyed | <input type="radio"/> |
| Alert | <input type="radio"/> |
| Ashamed | <input type="radio"/> |
| Inspired | <input type="radio"/> |
| Nervous | <input type="radio"/> |
| Determined | <input type="radio"/> |
| Careful | <input type="radio"/> |
| Hysterical | <input type="radio"/> |
| Lively | <input type="radio"/> |
| Anxious | <input type="radio"/> |

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Please read the following sentences and indicate your agreement or disagreement: *

| | Strongly disagree | Moderately disagree | Slightly disagree | Slightly agree | Moderately agree | Strongly agree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Compassion for those who are suffering is the most crucial virtue. | <input type="radio"/> |
| One of the worst things a person could do is hurt a defenseless animal | <input type="radio"/> |
| It can never be a good thing to kill a human being. | <input type="radio"/> |

How old are you?

- 15-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

Do you have any children?

- Yes
- No

Do you have social media?

- Yes
- No

If yes, do you use it more than 1 hour per day?

- Yes
- No

Do you play video games?

- Never
- Rarely
- Sometimes
- Often
- Every Day



Interactive Screening Survey

*Required

Emotional Response

- 1 = this concept applies very little or not at all to me
- 2 = this concept applies a little to me
- 3 = this concept applies moderately to me
- 4 = this concept applies a lot to me
- 5 = this concept applies very much to me

After viewing the film, how would you rate your emotions on a scale from 1 to 5?

| | 1 (minimum intensity) | 2 | 3 | 4 | 5 (maximum intensity) |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Interested | <input type="radio"/> |
| Sad | <input type="radio"/> |
| Excited | <input type="radio"/> |
| Troubled | <input type="radio"/> |
| Powerful | <input type="radio"/> |
| Guilty | <input type="radio"/> |
| Scared | <input type="radio"/> |
| Hostile | <input type="radio"/> |
| Enthusiastic | <input type="radio"/> |
| Proud | <input type="radio"/> |
| Annoyed | <input type="radio"/> |
| Alert | <input type="radio"/> |
| Ashamed | <input type="radio"/> |
| Inspired | <input type="radio"/> |
| Nervous | <input type="radio"/> |
| Determined | <input type="radio"/> |
| Careful | <input type="radio"/> |
| Hysterical | <input type="radio"/> |
| Lively | <input type="radio"/> |
| Anxious | <input type="radio"/> |

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Google Forms

Watching Butterfly

Which Ending did you vote for?

- I voted to see the naked pictures
- I voted to ignore the naked pictures

Did you hesitate before choosing your answer?

- Yes
- No
- I don't know

Was your choice chosen?

- Yes
- No

How do you feel about that?

Your answer

React to these statements: *

| | Strongly disagree | Moderately disagree | Slightly disagree | Slightly agree | Moderately agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would watch Butterfly again. | <input type="radio"/> |
| This film made me think | <input type="radio"/> |
| This film made me think about my personal situation | <input type="radio"/> |
| This film told me something about life | <input type="radio"/> |
| This film was inspiring | <input type="radio"/> |
| This film moved me like a piece of art | <input type="radio"/> |
| I was interested in the game's story | <input type="radio"/> |
| It was aesthetically pleasing | <input type="radio"/> |
| I felt imaginative | <input type="radio"/> |
| I felt that I could explore things | <input type="radio"/> |
| I found it impressive | <input type="radio"/> |
| It felt like a rich experience | <input type="radio"/> |



Interactive Screening Survey

*Required

Watching Butterfly

Which Ending did you vote for?

- I voted to see the naked pictures
- I voted to ignore the naked pictures

Did you hesitate before choosing your answer?

- Yes
- No
- I don't know

Was your choice chosen?

- Yes
- No

How do you feel about that?

Your answer _____

React to these statements: *

| | Strongly disagree | Moderately disagree | Slightly disagree | Slightly agree | Moderately agree | Strongly agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I would watch Butterfly again. | <input type="radio"/> |
| This film made me think | <input type="radio"/> |
| This film made me think about my personal situation | <input type="radio"/> |
| This film told me something about life | <input type="radio"/> |
| This film was inspiring | <input type="radio"/> |
| This film moved me like a piece of art | <input type="radio"/> |
| I was interested in the game's story | <input type="radio"/> |
| It was aesthetically pleasing | <input type="radio"/> |
| I felt imaginative | <input type="radio"/> |
| I felt that I could explore things | <input type="radio"/> |
| I found it impressive | <input type="radio"/> |
| It felt like a rich experience | <input type="radio"/> |

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Interactive Screening Survey

Discussion

How do you feel the story deals with the topic of bullying?

Your answer

Do you think the interactivity helped this story? Develop your answer

Your answer

How could this interactive film be improved?

Your answer

Some people argue interactivity only works in video games. What do you think of this statement?

Your answer

How is interactivity best experienced?

- Alone
- In a group
- Both
- Neither, I don't see the point

Please develop your answer

Your answer

To finish do you have any remark or additional thought you would like to share?

Your answer

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