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Understanding and Improving Agency in Black Mirror's Bandersnatch and Other Interactive Digital Narrative Works

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In partial fulfilment of the requirements for the degree of

Master of Science Interactive Digital Media

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Abstract

This paper explores the concept of agency in different Interactive Digital Narratives (IDNs) in order to identify promising design recommendations for increased agency in highly restrictive, nonlinear, branching structure films that would not jeopardize the narrative momentum. To that end, Black Mirror's interactive episode Bandersnatch (2018) is examined as a representative of the format and through a juxtaposition to the interactive drama game Heavy Rain (2010) and the simulation game The Sims 4 (2014) alternative design choices for agency are identified and assessed regarding their suitability for Bandersnatch's format. The methodology for the comparative analysis of these different IDN works is Hartmut Koenitz' SPP model as well as its extension, including the hermeneutic strip, which is applied to determine the experienced agency. The final reflection on alternative design recommendations for Bandersnatch demonstrates that, by implementing features of invisible agency, the overall feeling of control of the player could be boosted whilst maintaining the narrative momentum. This can be achieved by maintaining state of the behavioural tendencies (e.g. risk-taking behaviour) of the audience in their decision-making process and screening plotlines or endings that match their assessed tendencies. Furthermore, Koenitz' SPP model is discussed with regards to its versatility across different formats of IDN. While the SPP model works well for pre-scripted top-down IDNs, it does not seem suitable for the analysis of emergent systems.

Keywords: Interactive Digital Narrative, IDN, Interactive Narrative Design, Agency, Narrative Momentum, Paidia, Ludus, Playable Story, Narrative Game, Invisible Agency, Interactive Film, Video Game, SPP Model, Hermeneutics, Hermeneutic Strip, Bandersnatch, Heavy Rain, The Sims

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List of Abbreviations

IDN	Interactive Digital Narrative
SPP	System, Process and Product

1. Introduction

The computer game for all practicality *can not* tell stories – the computer game is simply not a narrative medium. In actuality we are facing a conflict between game and narrative: They are two separate phenomena that in many cases rule each other out.¹

In his Master thesis, Jesper Juul famously ignited the dispute in video game studies between Ludology and Narratology, though the conclusion he came to, namely that games, which by nature are interactive, cannot tell stories, had been reached by various scholars of his time and some before him as well.

After having claimed that a "combination of games and narratives risks ruining both"₂, in 2003, four years after sparking the debate in the gaming world with his famous thesis, Jesper Juul apologized on his blog for being partially responsible for video game studies becoming reduced to the feud between Ludology and Narratology.₃



Figure 1 Screenshot of Jesper Juul's apology blog post

Over the years interactive narrative has become increasingly popular, mainly as an experimental and not yet fully developed field of research. There are two main genres to focus on: The playable story and the narrative game. Both of them have a narration, both of them are interactive, thereby facilitating an exchange of the two disciplines that scholars had warned not to blend. Their main difference is that in the narrative game the story enhances the game, whereas in the playable story, the game produces the story. However, it would be an oversimplification to view the playable story and the narrative game as two polar opposites rather than two points on a spectrum, as their attributes are not mutually exclusive.

¹ Jesper Juul, "A Clash Between Game and Narrative" (Master thesis, University of Copenhagen, 1999. Translated by Jesper Juul in 2001), 1.

² Juul, "Clash Between Games," 3.

³ Jesper Juul, "Apology," The Ludologist, May 30, 2003, https://www.jesperjuul.net/ludologist/page/95/.

In December 2018, the online streaming platform Netflix published its first interactive production aimed at adults with Black Mirror's *Bandersnatch* film. The episode offers its viewers the choice between two options during many key scenes, mimicking the structure of a Choose Your Own Adventure (CYOA) book. Some choices lead to dead ends, with the protagonist saying, "I should try again", similar to the video game trope of "Game Over", where the player has to respawn. The nature of this film allows it to be understood as both a playable story, as the user's input influences the narrative, but also as a narrative game, as the overarching story is there to begin with and some choices lead to dead ends, where the film (or in this case, game) can actually be lost and the user is prompted to try again. Therefore, *Bandersnatch* falls somewhere in the middle of the spectrum. For this reason, in this paper the interactors with *Bandersnatch* will be referred as both audience as well as players.

The popularity of Bandersnatch has brought interactive stories to a large audience; however, the format of this genre is subject to severe limitations in terms of agency. After the success of Bandersnatch, Netflix is currently aiming at producing more interactive titles aimed at a mature audience, such as *Unbreakable Kimmy Schmidt: Kimmy vs. the Reverend* (2020).4 Moreover, production companies like CrtlMovie are dedicated to creating interactive films such as *Late Shift* (2016).5 It is evident that interactive films are on the rise, therefore a discussion on how the format could be improved is equally important and constructive.

Therefore, the objective of this paper lies in finding a way to increase audience agency in *Bandersnatch* without jeopardizing the narrative momentum of the film. Here, *Bandersnatch* is chosen as a representative of its subgenre of interactive film. To that end, *Bandersnatch* will be analysed with regards to agency and the "free will" it gives to its players in their choices. The reason behind the quotation marks is that the overarching plot of the interactive viewing experience revolves around the protagonist's free will, ultimately leading him to lose his sanity in several plotlines, as he feels controlled by the audience in his actions. In this comparative analysis with *Bandersnatch* as the main focus, *Bandersnatch* will be considered a representative of the nonlinear, highly restrictive, branching structure film. The paper will pay particular attention to methods for potentially increasing audience agency or boosting

⁴ River Donaghey, "Netflix Is Going to Make a Lot More Weird, Interactive Movies Likes 'Bandersnatch',"

Vice Magazine, March 12, 2019, https://www.vice.com/en_us/article/7xnq3a/netflix-more-interactive-movies-like-bandersnatch-rom-coms-todd-yellin-interview-vgtrn.

^{5 &}quot;Experience," CrtlMovie, accessed May 18, 2020, https://www.ctrlmovie.com/#experience.

interactivity in interactive films by comparing and contrasting them with the videogame *The Sims 4* (2014) – a popular simulation game – as well as the interactive drama game *Heavy Rain* (2010), both of which have quite distinct features that facilitate agency and ultimately generate interactive narratives. By observing and understanding different ways of creating agency across multiple formats, new designs for free will can be inspired and developed in order to be implemented in *Bandersnatch*.

Furthermore, it must be considered that increased interaction may lead to a decrease in the narrative momentum. If the audience is in charge of the story, they might get stuck at certain plot points, thereby not allowing to story to unfold or develop in any meaningful way. Therefore, these risks have to be taken into consideration when suggesting ways to increase interaction in storytelling.

2. Interactive Digital Narrative

Interactive narrative stands for stories that do not have a singular plotline but instead allow the plot to move forward along various different paths subject to the audience's input, potentially resulting in multiple different endings. Non-digital examples of nonlinear narration are CYOA books in which once certain plot points are reached, the readers get to make decisions on how they want to see the story unfold and turn to the page on which the chosen chapter would commence. In cinema an early example from 1967 is *Kinoautomat*. In this interactive experience the action of the film would stop at several points and a moderator would ask the audience to choose between two scenes, screening the popular vote in return.⁶ In the early examples of nonlinear storytelling, the interaction was facilitated by the people involved in the interactive experience itself, i.e. the reader of the CYOA books by skipping to the respective chapter, or the moderator of the *Kinoautomat* format.

In this research paper, the pieces that will be examined are digital and have computer programmes that facilitate the interaction with the user. Thus, the focus of this paper lies in a subcategory of interactive storytelling, namely interactive digital narratives (IDNs).

2.1 Top-down and Bottom-up Systems

Literary scholar Marie-Laure Ryan differentiates between two approaches in interactive narrative: The bottom-up, emergent systems that create stories on the fly, and the top-down systems that rely on pre-scripted content. Examples of bottom-up systems are simulation games like *The Sims*, where, as Ryan explains, "the player's selection counts as the performance in the fictional world of the action described by words on the menu[...] The succession of choices writes the life story of the Sims family."7 Here, the system has to react to the player's behaviour in real time and offer meaningful consequences to them. Another, extreme and more sophisticated example of emergent systems would be something comparable to the fictional Holodeck machine from the television franchise Star Trek. The Holodeck is a stage that allows

⁶ Ian Willoughby, "Groundbreaking Czechoslovak Interactive Film System Revived 40 Years Later," *Radio Prague International*, June 14, 2008, http://www.radio.cz/en/article/92388.

⁷ Marie-Laure Ryan, "From Narrative Games to Playable Stories: Toward a Poetics of Interactive Narrative," *Storyworlds: A Journal of Narrative Studies 1.1* (2009): 50, http://www.marilaur.info/poetics.pdf.

users to engage with virtual environments and where every single input affects the environment and thereby the narrative. Since it would not be possible to store all the storylines created by the user's input in advance, the only way for such a complex system to work would be to compute the effects in real time.

In contrast, in top-down systems like *Bandersnatch* all the scenes that can be unlocked by the user have been produced in advance. This means that while the audience is given some agency over the narration, they cannot truly *create* different endings but only unlock what is already there. The resulting difference between these two approaches is that while the emergent system can be run multiple times, creating multiple outcomes, the top-down approach does not renew itself, even if it offers some different narratives.8

A drawback pointed out by Ryan concerning the bottom-up approach, however, is the potential lack of closure, as she argues that without the authorial control from the topdown approach it is impossible to create the Aristotelian curve of rise and fall of tension, or even just a resolution and end of events.⁹ An interactive drama to counter Ryan's concerns about the bottom-up approach is *Façade* (2005) by Michael Mateas and Andrew Stern. It was considered a breakthrough piece, as it calculates the player's input in real-time to tell a coherent and compelling story while also maintaining a dynamic narrative through AI-driven characters.¹⁰

Ultimately, it is important to note that the top-down and bottom-up approach are not mutually exclusive and should also be treated as two ends of a spectrum, as bits and pieces of both systems can be merged. Sometimes in *The Sims 4*, the game takes control and adds pre-scripted scenarios to the simulation, e.g. alien abductions. While the game cannot control the state the user has put the virtual world in, these plot twists add some momentum to the simulation. This is an attempt to drive the game and the story it tells forward, even if simulation games like *The Sims 4* do not necessarily require an overarching story.

9 cf. Ryan, "Narrative Games," 52.

⁸ cf. Ryan, "Narrative Games," 51.

¹⁰ cf. Noam Knoller and Udi Ben-Arie, "The Holodeck is all Around Us–Interface Dispositifs in Interactive Digital Storytelling," in *Interactive Digital Narrative*, ed. Hartmut Koenitz et al. (New York: Routledge, 2015), 56.

2.2 Paidia and Ludus

As mentioned, Jesper Juul famously stated that video games cannot tell stories and found many supporters for his position. In video game studies, people who believe that narrative and game cannot exist together, or should at the very least be studied separately, are known as *ludologists*. On the other side of the argument, however, there are scholars that argue for the contrary; they are narratology-informed researchers. One scholar who attempted to find a way to allow games to tell stories is Marie-Laure Ryan. In her view, ludologists have a definition of narratology that allows it to be denounced as inapplicable to computer games due to the fact that they are excluding mimetic forms of narrative. Therefore, she introduced to the debate the differentiation made by French sociologist Roger Caillois between two kinds of play, namely *paidia* and *ludus*, as a potential solution. She defines paidia as the type of make-believe game that requires participants to act out a role and thereby actively use their imagination, create belief and immerse into the game world.11

These games do not aim at a specific goal, and they do not lead to losing or winning. The pleasures of paidia reside in the free play of imagination, in adopting foreign identities, in forming social relations, in building objects, in exploring an environment, and above all in creating a representation: paidia games are fundamentally mimetic activities.¹²

Meanwhile, ludus is used for games that are played in a competitive spirit, commonly seen in racing or sports games or with the main intention of solving problems. Ryan sees ludic games as *narrative games* – a format in which the story enhances gameplay, while categorizing paidias as *playable stories*, in which gameplay is meant to produce a story.

Furthermore, in ludic games she differentiates between the abstract game, like soccer or chess, where "the goals of the players are only made desirable by the rules of the game"₁₃ and the narrativized video game, like *Grand Theft Auto*, which takes place in concrete fictional worlds that include recognizable objects and individual characters and the player's goals resemble those a person might pursue in real life or at least in their fantasies.

¹¹ cf. Hartmut Koenitz, "Towards a Specific Theory of Interactive Digital Narrative," in *Interactive Digital Narrative*, ed. Hartmut Koenitz et al. (New York: Routledge, 2015), 94.

¹² Ryan, "Narrative Games," 46.

¹³ Ryan, "Narrative Games," 46.

Meanwhile, in the playable stories there is no state of winning or losing; in contrast, the whole purpose is the experience of immersing into another world and observing the development of a story. One obvious genre that allows for playable stories are simulation games, which include *The Sims 4*, as the players are in control of the lives of the characters and can be creative in the scenarios they wish to see.

Ryan adds that the bottom-up approach is commonly implemented for playable stories, the top-down approach is more typical for the narrative game. In a bottom-up system, the user's input can alter the state of the fictional world, as seen in *The Sims 4*. The game world's passing from one state to another is what tells the story. Meanwhile in the narrative game, like adventure games, the narrative progression is a journey along an already existing path leading to either one or more fixed destinations, something that can be attributed to typical top-down systems.14

By creating these methodological tools, and especially by introducing the concepts of paidia and ludus as subcategories of video games, Ryan creates a terminology that potentially reconciles narrative and games.

2.3 Interactivity and Agency

One essential element of interactive stories is audience agency. Janet H. Murray, professor at the School of Literature, Media, and Communications at the Georgia Institute of Technology describes agency as "the satisfying power to take meaningful action and see the results of our decisions and choices" 15. If players of a tabletop boardgame are given increased means of interactions like throwing dice and spinning dials, they might get the sense of having an influence on the experience. However, their actions are neither chosen by them, nor do their effects mirror the intentions of the players. This is where Murray draws the line between *activity* and *agency*. She explains that a game of chess offers a high degree of agency even though it only offers few actions. That is because all actions are "highly autonomous, selected from a large range of possible choices, and wholly determine the course of the game" 16. Murray defines agency in her glossary as follows:

14 cf. Ryan, "Narrative Games," 52.

¹⁵ Janet H. Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, 2 ed. (Cambridge and London: MIT Press, 2017), 159.
¹⁶ Murray, *Hamlet on the Holodeck*, 161.

When the behavior of the computer is coherent and the results of participation are clear and well motivated, the interactor experiences the pleasure of agency, of making something happen in a dynamically responsive world.¹⁷

An important form of agency, as Murray adds, mainly in relation to open-world video games is the spatial navigation, which offers players the freedom to move and explore virtual landscapes.

In order to allow for agency in a narrative, the narrative requires not only multiple paths, but also oftentimes multiple endings. Depending on how complex the story is meant to be, these formats often may not resort to the win/lose simplicity of classic video games, but rather have multiple ending scenarios that can be understood as the consequence of the player's input – whether these outcomes are the direct effects of certain actions or are reached through a chain of uncontrolled scenarios kicked off by the player's input (similar to the butterfly effect, a metaphorical example of how a tornado can be influenced by something as minor as the flapping of a butterfly's wings months earlier).

There are various different structures to interactive narratives, each of which branches out differently and in different degrees, thereby allowing different degrees of agency. Sam Kabo Ashwell created an extensive list of possible structures, some of which are the following:

The Time Cave is the most obvious kind of branching structure, where each decision point offers a new forked pathway, thereby having the plot branch out exponentially. This structure strongly encourages replay, as different walkthroughs tend to be substantially different in content and overall experience.¹⁸

¹⁷ "Glossary," Janet H. Murray Humanistic Design for Emerging Medium, accessed May 15, 2020, https://inventingthemedium.com/glossary.

¹⁸ cf. Sam Kabo Ashwell, "Standard Patterns in Choice-Based Games," *These Heterogenous Tasks*, March 25, 2020, https://heterogenoustasks.wordpress.com/2015/01/26/standard-patterns-in-choice-based-games/.



A less production-heavy alternative is the Gauntlet structure. This structure is defined by its relatively linear thread that has several branches which lead to either dead ends, backtracking, or a re-joining with the central thread. Overall, this structure tells one main story, which can either be enhanced with optional content or cease prematurely if a dead end is chosen.



Figure 3 Gauntlet Structure

The Branch and Bottleneck structure branches out at times and comes back together for key plot points. Agency is facilitated in this structure by the implementation of state-tracking, meaning that even though the player ends up at a certain plot point, regardless of the previous choices, these previous choices and the underlying behavioural pattern of the player are stored in the system and later influence the way the story moves forward (i.e. only certain endings become a possibility once a certain path was taken). Here, oftentimes players do not notice the agency – in this case the agency is somewhat invisible.



Figure 4 Branch and Bottleneck Structure

3. Methodology

The purpose of this chapter is to define the analytical framework for this research paper. In order to examine interactive digital narratives, their nature has to be understood first. In traditional storytelling, i.e. literature or theatre, the constituent part of the analytical framework one is confronted with is the author, the writing/production, and a static output. However, IDNs have different building blocks. According to Nick Montfort, professor of digital media at MIT, "a work of IF [interactive fiction] is not itself a narrative; it is an interactive computer program"₁₉. Therefore, he considers interactive digital narrative artefacts as computer programs which output narratives that are not fixed. This results in an inability of using a purely semiotic approach designed for texts to analyse interactive stories, even if all potential storylines were to be examined as texts, as this method would still ignore the nature of interactive narratives. In short, as design researcher Gabriele Ferri summarises, "an IDN must be understood together with a dynamic, algorithmic system that precedes the enunciation of any output."₂₀

Ferri's approach is to conceptualise IDN as interactive matrices, a matrix being a system that can change its appearance in real time and give meaningful outputs to the user's input by executing algorithmic rules. He formalises matrices as semiotic devices that create a "multiplicity of single textual occurrences", meaning that interactive digital narrative systems (i.e. playable stories and narrative games) can be considered matrices of possibilities that end up generating a single audio-visual text when the user interacts with it. In short, he defines a matrix as "a semiotic agglomerate existing before the formation of any single output and containing all the semantic, narrative and figurative resources that could possibly be actualised during its activity"₂₁.

Hartmut Koenitz agrees that a theoretical framework for interactive narratives cannot be output-centred. Instead, he stresses the importance of recognising the elements that comprise IDN – the computer system as well as the participatory process (Figure 5).

²⁰ Gabriele Ferri, "Narrative Structure in IDN Authoring and Analysis," in *Interactive Digital Narrative*, ed. Hartmut Koenitz et al. (New York: Routledge, 2015), 82.

¹⁹ Nick Montfort, "Toward a Theory of Interactive Fiction," *IF theory reader* (2011): 25, quoted in Koenitz, "Towards a Specific Theory," 95.

²¹ Ferri, "Narrative Structure," 82.



Figure 5 Koenitz' SPP model

The advantage of this concept is that it views IDN as a generative system, where the output is the instantiated product. In this figure, *system* – a similar concept to Ferri's matrix – is used to describe the interactive program itself, including both the software and hardware required for the interactive experience. The *process* is the user's interaction with the system, which ultimately results in a *product*, a singular storyline based on the user's input, which would be different if the user's input was to change. The product is therefore an instantiated narrative.22

However, to investigate interactive narratives thoroughly, Koenitz goes a step further, introducing three further terms: *Protostory, narrative design*, and *narrative vectors*. Protostory is the space of potential narratives, "containing the necessary ingredients for any given walkthrough". It stands for both the code and the interactive interface of the system, and thereby captures the "artistic intent that enables a participatory process of instantiation resulting in the realisation of potential narratives [...] The term narrative design describes the structure within a protostory that describes a flexible presentation of a narrative." In other words, the narrative design deals with the sequencing of elements and their connection in the narrations. A substructure of narrative design are the narrative vectors, as they provide specific directions for the story. They have to be understood as substructures as they work in connection with the preceding and following parts of any narrative. Their purpose, as Koenitz states, is "to convey important aspects to the interactor, to prevent an interactor from getting lost and to aid authors in retaining a level of control". A narrative vector could, for

22 cf. Koenitz, "Towards a Specific Theory," 97-98.

instance, be a sudden event in the plot that shapes the development of the story and can be compared to plot points in linear narratives.



IDN System

Figure 6 Extension to SPP model offering further terminology for the analysis of IDNs

One thing that is not covered by Koenitz' SPP model is the idea of agency. However, in a paper by Christian Roth, Tom van Nuenen and Koenitz himself an extension to the model was introduced, namely the hermeneutic strip or double-hermeneutic circle. This strip aims at illustrating the player's narrative meaning-making process. It reviews both the interpretation of the system overall, i.e. the players' reflection on what the system may allow and which freedoms or agency they have, but it also considers players' interpretations of already instantiated narratives.



Figure 7 The additional extension by the double-hermeneutic circle offers a methodological toolkit for the analysis of experienced agency

It is key to understand that this extension to the model bears in mind that a player's behaviour and interaction with a system is shaped by previous experiences made in the interactive narrative. In short, past and present events influence a user's future behaviour. As this extension will help evaluate agency from a user's perspective at predefined points of the story, these key points must be identified first.₂₃

For this paper, Koenitz' framework and its extension will be used to analyse Bandersnatch and put it in relation to the other pieces that will be examined, namely *Heavy Rain* and *The Sims 4*. By examining the protostory, all assets of the pieces, as well as all components that make up any storyline and the interface will be laid out. Going into more detail, the narrative design will define the segmentation of different scenes and the choices that connect them. By thoroughly analysing the narrative vectors the level of control of the producers will be understood, as these plot points are the orientation points that hinder the audience/players from getting lost and losing the narrative momentum. The extension to Koenitz' SSP model will help evaluate the agency in each of these pieces from a user's perspective at predefined points. Therefore, all pieces analysed in this paper will be examined at key points with the hermeneutic strip, in an attempt to provide a clearer idea about their levels of experienced agency. It is important to add that the authors of this extension used it in the context of a quantitative analysis of players' reactions based on Let's Play videos found online, where they examined reactions at a predefined key scene. Due to time and space constraints, in this paper an analysis based on the range of possible reactions will be chosen rather than a study of actual reactions.

Furthermore, in this paper, Koenitz' analytical framework will be tested with a view to ascertaining its versatility, as in theory it should work for any kind of IDN. Differences between the very nature of the interactive systems, i.e. top-down or bottom-up systems, are not taken into consideration in this framework. The adaptability of Koenitz' framework in the realm of IDNs will be put to test by analysing three titles of different formats with it: *Bandersnatch*, a pre-scripted example of IDN, *The Sims 4*, a simulation and example for an emergent system, and *Heavy Rain*, a game that lies in the middle of the spectrum of playable stories and narrative games. Furthermore, the idea of the double-hermeneutic circle will be tried out as a method to evaluate agency in an IDN.

²³ cf. Christian Roth, Tom van Nuenen and Hartmut Koenitz, "Ludonarrative Hermeneutics: A Way out and the Narrative Paradox," in *Interactive Storytelling: 11th International Conference on Interactive Digital Storytelling, ICIDS 2018, Dublin, Ireland, December 5–8, 2018, Proceedings*, ed. Rebecca Rouse, Hartmut Koenitz and Mads Haahr (Cham: Springer, 2018), 6-7.

4. Case Studies

In this chapter, the three pieces of IDNs *Bandersnatch*, *Heavy Rain* and *The Sims 4* will be analysed with the previously introduced framework by Hartmut Koenitz and its extension.

4.1 Bandersnatch

Black Mirror's *Bandersnatch* (2018) was marketed as the first interactive narrative aimed at a mature audience on the streaming platform Netflix. Similar to other Black Mirror episodes, *Bandersnatch's* plot has an introspective view on technology. One major difference though was that the critical view was on the technology used by the audience rather than by the characters of the story. In this case, this technology was the interactive experience itself that was referred to in the plot of the film. This is done by one of the overarching themes of the film, which is agency or, as it is called in the film, control. According to Christian Roth and Koenitz, in *Bandersnatch*, these are both "explored in parallel – in the diegetic world and the interactive narrative experience"²⁴. The parallelism for control can, for instance, be seen in the protagonist, Stefan, losing his mind and even asking which outside force is controlling him in one of the plotlines, as he feels that he is becoming someone's (the viewer's) puppet.

4.1.1 Bandersnatch: Plot

The plot is set in June 1984 in England where a programmer, Stefan Butler, is trying to adapt a CYOA book called 'Bandersnatch' into an adventure video game with the same name. The game has choice points at which the player has to choose which path to take – thereby mimicking the viewing experience of the *Bandersnatch* film itself. Stefan presents his demo version to Mohan Thakur, CEO of the video game company Tuckersoft that has sold various innovative video games, mainly designed by famous game creator Colin Ritman. Stefan captures Mohan's interest and is offered his own production team in the company to finish producing his game. This is where the first influential choice can be made by the viewers: They can either accept or decline the offer.

²⁴ Christian Roth and Hartmut Koenitz, "Bandersnatch, Yea or Nay? Reception and User Experience of an Interactive Digital Narrative Video," in *Proceedings of the 2019 ACM International Conference on Interactive Experiences for TV and Online Video*, (New York: Association for Computing Machinery, 2019), 249.

If the offer is accepted, Colin looks at Stefan and says "Sorry, mate. Wrong path.". The story is fast forwarded to a scene in which a video game critic on TV claims the game seems to have been "designed by committee". In response, Stefan says to himself that he should try again. The film then returns to the day of the offer, all scenes up until the decision point are rushed and the viewer is prompted to choose again whether to accept or decline the offer. The scenes that are repeated contain nods to the repetitive nature of this viewing experience. For instance, the second time the audience sees the scene of Stefan being introduced to Colin, Colin says "we've met before", while Stefan, who is a big fan of Colin, says "no" – indicating that (at least for Stefan) everything in the plot has gone back to square one. Another example is that, as Stefan explains that his game is based on the CYOA book Bandersnatch, Colin says that the book's author has killed his wife, something Mohan did not know before. The second time around it is Mohan who shares this information and Colin calls the author a visionary, nevertheless. It can be argued that Black Mirror's viewing experience is trying to play around with parallel realities with these inconsistencies in the rewinds.

If Stefan declines the offer of working with a team on the game and chooses to program it by himself, he becomes increasingly stressed over the weeks leading up to the date on which he is expected to deliver the finished product. He visits his psychologist, Dr Haynes, and the viewer is given the option of exploring the story behind Stefan's mother's death. She had died when he was five years old when a train derailed. Stefan feels partially guilty but also blames his father, Peter, for her death, as he had confiscated Stefan's stuffed rabbit and Stefan refused to leave with his mother before having found his rabbit, causing her to end up taking a later train by herself and dying in an accident as a result.

Later, Stefan can choose to accept an invitation to Colin's apartment where he is introduced to his girlfriend Kitty and their baby Pearl. Stefan is offered hallucinogens; however, if the viewer chooses to not let Stefan take them, Colin spikes Stefan's drink anyway. What follows are drug-induced talks by Colin about secret government mind-control programs and parallel or alternate realities. He stresses that no choice has a real impact and that one of them might as well jump off the balcony and makes Stefan

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decide via the viewers who it should be. Stefan jumping leads to a dead end, Colin jumping leads to the entire encounter being a dream, as Stefan wakes up right afterwards inside a car. However, Colin will be absent from then onwards.

The events that follow become increasingly forked, and previous choices start having an influence on which paths can be taken in the future, as the program maintains state. For instance, based on whether or not Stefan has followed Colin into his apartment before, the choices of passwords he can input to open his father's safe to retrieve a book are different. Each choice of passwords then leads to a different scene which then comes together again in a more general scene, except for the password choice "TOY" which results in Stefan going back in time and getting on the train with his mother and therefore dying alongside her.

With the due date for his video game coming closer and the program still not being error-free, Stefan starts to think that he might be controlled by outside forces. He finds parallels between his life and the author of the Bandersnatch book Davies' life, as he starts seeing the recurring imagery of a branching pathway, which is precisely what had led Davies to lose his sanity and behead his wife. Stefan tries to find the force that has agency over his life and is controlling his actions. Here, the viewer has multiple explanations for Stefan, one of which involves breaking the fourth wall, and explaining to him that he is being watched on Netflix and the audience is making decisions on his behalf. He then meets his psychologist, who questions the logic of him being controlled by the entertainment platform Netflix, saying his life lacks the action to be entertaining. What follows is a fighting scene between Stefan and the psychologist, and based on how the fight goes, either Stefan is then seen on a filming set with a director yelling cut – revealing that the entire thing was an act, or Stefan's father enters and starts fighting his son.

In another storyline Stefan ends up killing his father. Depending on the choices made before and after this act, the viewers end up with either an ending where Stefan is in jail, or another one where his game was a huge success but taken off the shelves due to controversy after it had been discovered that he had killed his father. This path concludes with a present-day adult Pearl finding inspiration in Stefan's story and trying to program it into an interactive viewing experience for Netflix. She starts seeing a recurring imagery of a branching structure previously seen by Davies and Stefan and encounters a coding error, which leads her to destroy her computer, something Stefan does in one of the storylines, too.

4.1.2 Bandersnatch: System, Process and Product

Bandersnatch is an interactive film that allows its audience to choose between two possible paths at certain predefined choice points against time. If after ten seconds no choice is made, the system defaults to one of the presented options. This feature allows what Roth and Koenitz called "passive consumption"₂₅. The structure of the narration, as seen in figure 8, resembles that of a Gauntlet, as the overall thread is close to linear with some dead ends, backtracking and re-joining branches.



Figure 8 Structure map of Bandersnatch

25 Roth and Koenitz, "Bandersnatch, Yea or Nay?," 249.

Furthermore, the system relies on maintaining state, as after different paths re-join, some options are only unlocked at decision points if the respective path had been taken previously.

Analysing *Bandersnatch* using Koenitz' framework, where the system is the combination of software and hardware, the hardware is the viewer's device which is compatible with the interactive film. The interactive film can be viewed on multiple devices such as smart TVs, mobile devices, laptops, and game consoles. If the user attempts to view the film on an incompatible device, a short apology clip is presented, asking the user to switch to a different hardware. On compatible devices a badge on the film banner is displayed, see figure 9.



Figure 9 Film banner with the badge indicating that the device is compatible

Part of the system is also the interface, which is explained in the beginning, followed by a question asking whether the viewer has understood it. This is the first instance in which the viewer interacts with the interface by choosing between two options presented as textual prompts. A horizontal line represents the remaining time to make a choice, the length of which decreases with time and disappears entirely after ten seconds.

Furthermore, the virtual assets of the film are contained in the system as well. In this case these are the scenes and displayed choices as well as the program that outputs narratives according to the viewer's input. The system maintains state, as previous user inputs can be influential further down the line.

In *Bandersnatch,* the process is created by the user's actions as well as the opportunities provided by the system, in this case the two options at each choice point.

Therefore, according to Koenitz the resulting product is "a single walkthrough"₂₆. While this might be true for most IDNs, *Bandersnatch's* Gauntlet structure with multiple dead ends, which prompt the audience to go back and make a different decision at a previous choice point, results in audiences sharing a very similar or even common viewing experience, as even when official endings are reached, the system asks the viewers if they want to go back in order to explore different paths. In short, the longer the viewers choose to interact with the work, the more plotlines they unlock, ultimately resulting in them having watched all of them. Therefore, the instantiated product here seems to be at odds with Koenitz' idea that "very different narrative products can originate from the same system – any concrete product represents only one particular instantiation"₂₇, as the *Bandersnatch's* Gauntlet structure defeats the concept of a single walkthrough covering only one storyline. However, a major difference between the viewer's walkthroughs might always be found in the sequence in which they see the events or different storylines unveil.

4.1.3 Bandersnatch: Protostory, Narrative Design and Narrative Vectors

For the protostory in *Bandersnatch*, the content can be defined as scenes. The interface, as previously introduced, consists of the two textual options and the visual timer. The code is what allows the right scenes to be displayed in accordance with the viewer's input. Furthermore, the code maintains state of previous choices for future development. Another part of the protostory is the interface of Netflix, which allows viewers to fast forward or backward ten seconds, pause, change the language or add/remove subtitles. It is important to note that in *Bandersnatch* viewers can only fast forward up until the next choice point, where a decision must be made. Furthermore, for this viewing experience, Netflix uniquely added the feature of rewinding to previous choice points, as seen in the screenshot in figure 10.



Figure 10 Additional feature to the Netflix interface that allows users to jump back to previous choices

²⁶ Koenitz, "Towards a Specific Theory," 98.²⁷ Koenitz, "Towards a Specific Theory," 98.

Due to the Gauntlet structure of *Bandersnatch*, the narrative design is quite straightforward as the overall thread is close to linear. For *Bandersnatch* these are bundles of scenes which work together, as neither their connection nor sequence is flexible. However, these bundles are added to the story in a flexible manner, for instance when the viewer reaches the end of one storyline and chooses to explore another.

The narrative vectors are mainly the scenes that are revisited after respawning from a dead end – but also the respawn function itself, as the new information – namely that the previously chosen option led to a dead end, helps the viewers figure out which way they are meant to go if they wanted to explore the story further without impacting the narrative momentum. It can be argued that the narrative vectors in *Bandersnatch* work in a way that facilitates the consumption of the majority, if not all, storylines that exist.

4.1.4 Bandersnatch: Double-Hermeneutic Circle and Agency

To evaluate *Bandersnatch* with the double-hermeneutic circle in an attempt to understand the agency in the interactive film, key scenes that are to be analysed must be chosen first. Due to *Bandersnatch's* structure and the option of deciding when the experience should end (as upon reaching any official ending, viewers can either explore other paths or just quit), it makes sense to first investigate a scene that all players would encounter. Therefore, this scene will be the one in which Mohan Thakur offers Stefan a job. Up to this point players will have had two uninfluential decisions, namely the one where they decide which cereal Stefan should have for breakfast as well as the one where Stefan chooses the song he listens to on his way to Tuckersoft. The job offer is therefore the third decision point in the film and presents a stark contrast to the previous two decision points, as the presented options of either accepting or declining a job offer seem like they would result in very contrasting storylines.

When analysing the upper hermeneutic circle, where the user reflects on what the system may allow and which narrative could be generated, it can be argued that this decision point suggests that there will be two very distinct branches in the narrative

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structure from this point moving forward. Looking at the bottom hermeneutic circle, in which the user reflects on and interprets the instantiated narrative, users at this point might be unsure whether or not their input can have plot-altering impacts due to the lack of immediate impact seen from previous choices, thereby doubting their agency altogether. Instead they might think that the influence of their input will only be seen later or they might even also expect the film to not move forward in the selected manner, by having, for instance, something getting in the way, thereby hindering the chosen option from happening and resulting in the other option anyway.

Interestingly, if the option of accepting the job offer is chosen, the game reaches a dead end and allows users to go back to the same decision point. The second time around however, the upper hermeneutic circle becomes different in the sense that while the dead-end option prompted a scene that would otherwise not have been accessed, the only real option for the user is to decline the job offer in order to allow the plot to move forward. In this case, players learn from their mistake due to the repetitive nature that allows for something equivalent to a respawn and they get to choose the option they are actually meant to choose.

Another interesting scene worth shedding light on is the decision point at which Stefan can either destroy his computer or throw tea over it. In this case, it does not seem like the audience has any say in what is about to happen, in short, it seems like all sense of agency is lost. As it is Stefan's goal to create a successful computer game, both options seem at odds with it, therefore the users are arguably unable to identify with either of the choices given; however they end up surrendering to the limitations they are confronted with in order to drive the film forward. What is experienced here is a violation of the narrative contract through the removal of agency, as the objective of the protagonist Stefan is to create a successful game, and both presented options would sabotage just that and cause irreparable damage.

It is only **after** this decision point passes that Stefan refuses to destroy his computer in a plot twist where he realizes that he is being controlled by an outside force. Of course, the audience cannot know that Stefan would end up refusing to take commands, as all previous inputs – even if insignificant – resulted in respective outputs by Stefan, who is the character the user gets to control. The audience is confronted with an almost identical scene in one of the endings, showing a frustrated grown-up Pearl who is trying to program an interactive film for Netflix but faces errors. Again, the user has to choose between either pouring tea over the computer or destroying it. If looking at the upper hermeneutic circle, where players reflect on what they might be able to do, but also by looking at the bottom hermeneutic circle, where the instantiated narrative is interpreted, players might be tricked into believing that this too is just an instance in which the character will end up ignoring the command given. However, Pearl actually ends up destroying her computer or throwing tea over it – depending on which option is chosen.

To sum up the degree of agency given to the audience in *Bandersnatch*, at each decision point – which appear at pre-scripted points in time – two options are presented to the audience. At a small number of decision points, only one option is given, for instance in a flashback where Stefan's mother asks him if he was coming with her. Here the only option is "No", nodding to the idea that things in the past cannot be changed. As previously explored, sometimes the two options provided are essentially the same, as in the scenes where Stefan or Pearl want to destroy their computers.

Bearing in mind that agency is defined by Murray as "the power to take meaningful action and see the results of our own choices"₂₈, the logic behind the outcomes of the audience's input is debatable. For instance, Stefan's choice of password to input to open his father's safe results in several entirely different scenes, which seems quite extreme as the only difference in action is a different input of password. It can be argued that this design choice was made to encourage players to unlock the storylines behind the remaining password options as each of them transfer Stefan into very distinct storylines that refer back to the chosen password. Other choices seem to unleash a butterfly effect as they cause a series of events to happen – all of which are entirely out of control of the audience. The most obvious example for that is when Stefan accepts the job offer and the film immediately fasts forward to a scene months later where *the* game's poor rating is revealed. Therefore, it cannot be said that all

²⁸ Murray, Hamlet on the Holodeck, 159.

consequences of the user's input seem meaningful or logical as in the *Bandersnatch* universe sometimes small changes in a user input can result in very different storylines.

4.2 Heavy Rain

Heavy Rain (2010) is an adventure video game in which the story resembles an interactive drama. The game is divided into chapters, each one of which centres on one of the game's four protagonists who can be controlled by the player. They are all involved with the murders associated with the Origami Killer. The player can choose from a set of options to perform which are displayed on screen. In some cases, the game prompts its players to perform quick time events as well. The narrative output is then based on the player's decisions and performance during the game.

4.2.1 Heavy Rain: Plot

The game starts with the family life of Ethan Mars on his son Jason's tenth birthday. Later, the family goes to a mall where Jason walks off and ends up getting hit by a car and dying. The plot fasts forward to two years after his death: Ethan and his wife, Grace, are now divorced and he is starting to experience blackouts and wanders off to random places while he is experiencing them. While at the park with his other son, Shaun, Ethan blacks out again. Upon waking up, he realizes that Shaun has gone missing. It is later revealed that Shaun was abducted by the infamous Origami Killer who kills young boys by drowning them in manholes that fill up with rainwater unless they are saved by their fathers.

Meanwhile, private investigator Scott Shelby is reaching out to parents who have lost their children to the Origami Killer in the past in an alleged attempt to solve his cases. FBI agent Norman Jayden is called to a crime scene of the most recent victim of the serial killer and eventually becomes active in the search for Shaun. Based on the weather patterns involving heavy rainfall, Norman concludes that Shaun, who is stuck in a manhole, would only have three more days before drowning.

Ethan receives clues from the Origami Killer involving five dares he has to undergo in order to get the address of where his son is being held. The dares include driving on

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the highway against traffic, cutting off the tip of a finger and drinking poison. Grace and Ethan's psychologist reveal information that points at Ethan being the Origami Killer but being oblivious to it, as they argue that he takes on this persona during his blackouts, thereby making him the police's prime suspect in the case. Ethan teams up with Madison, a journalist who eventually falls in love with him. The final endings can differ, based whether the player chooses to allow or not allow a romance to evolve between them.

Overall, the way the endings come together is based on several key details, starting with the question of which characters controlled by the player survive. However, minor details can also have substantial impacts on the ending of the story, like the mentioned romance between Ethan and Madison.



Figure 11 Structure map of Heavy Rain

4.2.2 Heavy Rain: System, Process and Product

In *Heavy Rain* most of the story has a linear structure regarding the chapters featuring major events, as seen in figure 11. However, the game allows for some additional scenes to be unlocked in-between, which can change the plot drastically. For instance, if Madison accepts a drink at the doc's house, he spikes it and she wakes up cuffed in his basement, where he attempts to kill her. Based on how well the player defends Madison, she can either survive or die. If she declines the offered drink, the whole basement scene does not occur at all.

The virtual assets that the system of *Heavy Rain* holds are all the chapters including the character's thoughts that can be accessed by the players to give them ideas on which action they are supposed to perform. In confrontational situations, these thoughts are replaced by speech options, which turn into actions upon selection, as seen in the example where Madison accepts a drink. The system also maintains state, as smaller actions midway can be highly influential when it comes to which ending will be unlocked. For the hardware part, the game is compatible with PlayStation 3 and 4 and their respective controllers, as well as Windows PCs.

The process is determined by two main things in *Heavy Rain*: Choices as well as performance in quick time events. Overall, the game has an almost linear structure with some Gauntlet as well as Branch and Bottleneck elements, as additional scenes end up re-joining the main thread, and the final playable scene, at the warehouse where Shaun is being held, is where all different storylines come together just to output different endings. Due to the fact that some choices are not very decisive, slightly different playthroughs can result in the same scenes being unlocked. In combination with choices that have substantial weight in the instantiation of the final product, *Heavy Rain* offers overall 17 different endings. There are, for instance, endings for the eventuality of any of the four protagonists dying, endings for a wrongful conviction of Ethan as well as endings for Shaun dying before being saved.

4.2.3 Heavy Rain: Protostory, Narrative Design and Narrative Vectors

For the protostory, *Heavy Rain's* content can be viewed as chapters. Here it makes sense to differentiate between the main chapters seen in figure 11 and additional scenes that are not always accessed. The interface consists of textual prompts which appear when the user hits a certain key (L2-button on PS3 for instance). However, selecting these prompts either results in the character expressing his thoughts to

nudge the player into a direction or they may actually provoke an action by the character. Furthermore, the programming code maintains state, thereby allowing for different endings even though all streams lead to the same final playable scene at the warehouse.

Heavy Rain's narrative design is quite linear due to its predominantly Gauntlet-type structure. The main chapters are played in a fixed sequence and the player can only unlock additional scenes between them. However, some tweaks in the main chapters can be observed, depending on optional actions that might have occurred previously, e.g. a character dying will result in them not being present in the following chapters.

The narrative vectors in *Heavy Rain* point to the next chapter that is queued up. However, some elements inside each chapter help the player maintain the narrative momentum, for instance the textual prompts that lead to the character's thoughts which provide hints for the player on which action to perform next. If the player is meant to go to a certain place, or pick something up, after some time the screen is split in half and the object or location that should be accessed is displayed on the second half of the screen to help the player find it faster. Furthermore, during quick time events the buttons that should be pressed on the used controller, as well as the required motions, are displayed on screen.

4.2.4 Heavy Rain: Double-Hermeneutic Circle and Agency

In order to evaluate the double-hermeneutic circle for *Heavy Rain*, key scenes have to be identified first. The two chapters that will be evaluated are *The Mall* and *On the Loose*. The first chapter chosen is particularly interesting, as none of the choices made by the player have any impact on what happens to Jason – it is essential to the game that he dies in this chapter and this cannot be avoided. *On the Loose* is also quite unique, as a seemingly unsubstantial choice ultimately leads to different endings being unlocked: Here the player chooses if Ethan and Madison kiss or not (provided Madison is still alive at this point). If the player decides for the kiss and both of them are able to save Shaun, they start off a new life as a family. If the player decides against it, there is no prospect for a romantic relationship between the two in the end.

Looking at the upper hermeneutic circle, it is evident that the players can never really know how much impact their choices will end up having or if certain outcomes were unavoidable or the result of their actions. In *The Mall* none of Ethan's actions can prevent his son's death and in *On the Loose* a kiss can lead to a future relationship. The bottom hermeneutic circle, which invites a reflection of the already instantiated narrative, can only allow for a hindsight perspective on whether or not chosen options proved to be the right choice. This can be the case for the scene where Madison is offered a spiked drink that makes her end up in a life-or-death scenario: The game tricks new players, as they cannot know how influential their choices are on the story.

It is important to point out that *Heavy Rain* has a quite special position as an interactive film, due to the fact that the player makes decisions on behalf of four different characters, whose stories are confusingly intertwined and whose goals pose a conflict of interest. Only close to the end it is revealed that Scott is the Origami Killer, even though at this point Ethan as well as the police (and thereby reluctantly Norman) think it is Ethan due to his blackouts, and Shelby pretends to be investigating the killer. The players learn in the end that they were never in complete control over Scott, as in chapter *Manfred*, in which the player controls Scott, the screen focuses on Lauren, a mother of a boy killed by the Origami Killer, for a moment during which Scott walks into the back room and murders Manfred without the player noticing. Following this event, the player regains control over Scott who pretends to be shocked that Manfred was killed. Only at the end it is revealed via flashbacks that it was indeed Scott who had committed the murder when the player had thought to be in control of him.

Furthermore, there are scenes featuring two of the playable characters. Again, in these scenes it might come to a conflict of interest. One example is chapter *Fugitive* in which the police and Norman raid the motel in which Ethan is staying. The player is controlling Ethan and trying to escape while the game controls Norman whose goal is completely at odds with the player's.

Within each chapter the game offers a certain degree of spatial navigation as the player may explore the scene freely, although this is different to open-world games as it is not possible to wander off the scene and therefore the constraints in agency regarding navigation are made quite obvious.

In conclusion, *Heavy Rain* offers the player multiple ways to shape the story – either by making decisions or by performing well during quick time events. However, the impact certain choices have can vary greatly, making it difficult for the players to assess their level of agency while playing – it can only be assessed in hindsight or by replaying the game. Having agency over four characters poses a challenge given that they are working towards contradictory goals. Therefore, here the game takes control over them when the player is unaware and makes them perform their clandestine acts that are only revealed towards the end.

4.3 The Sims 4

The Sims is a franchise of life simulation games published by Electronic Arts. For this paper, the currently latest version, *The Sims 4* (2014), will be examined. The basic principle of the game is that players create Sim characters and control their lives. Each Sim has a personality, traits, talents and ambitions, and it is up to the player's input how scenarios end up playing out. While the game has no overarching plot, as it mimics everyday life, there are some internal as well as player-created challenges that can be completed. Moreover, certain features in the game can only be unlocked once certain milestones have been reached – it is up to the players how they wish to achieve these milestones.

4.3.1 The Sims 4: System, Process and Product

The software part of the system in *The Sims 4* contains the virtual world, the virtual people (Sims), the algorithms that are used to calculate outputs to the user's input, all assets such as money, furniture, real estate, clothing, physical appearance as it can be tweaked when creating a new Sim, activities, needs, personality traits and jobs. Furthermore, the interface falls under this category, as well as the different gameplay modes, such as the building mode in which houses can be rearranged as well as the Sims mode in which the individual Sims can be controlled. The game can be extended with various add-ons. Furthermore, the game contains social features that facilitate an exchange of assets across players. As for the hardware side, *The Sims 4* can be played on Windows, macOS, PlayStation 4, and Xbox One, therefore the controls are adapted to the respective devices.

Since *The Sims 4* is an example of a bottom-up, emergent system, the process in this game is the real-time calculation of outputs to the user's input. For instance, in a social situation in which the player makes Sim A crack a joke in front of Sim B, Sim B's computed reaction can be based on factors such as their personality, previous opinion of Sim A and overall mood.

This ultimately results in the instantiated products, which is the life stories of the Sims told through the succession of the player's choices. Due to the nature of emergent systems, different playthroughs would result in potentially entirely different products. The product is determined by the player's creational as well as behavioural choices for a Sim.

4.3.2 The Sims 4: Protostory, Narrative Design and Narrative Vectors

The protostory in *The Sims 4* holds all options that the player can ultimately choose from, starting from the shape of a Sim's eyebrows up to the decision of whether they should pick a fight with a stranger on the street. The content could be segmented into all possible pre-coded outcomes that are made available based on the user's current input as well as the current state of the virtual world.

Due to the lack of an overarching plot in *The Sims 4*, the narrative design is highly individualistic, as it adapts to the goals the player wishes to reach. The game itself, however, contains aspirations for Sims that are teenagers or older. In order to realize said aspirations, it requires multiple milestones to be reached first; therefore this is arguably what can be considered the narrative design. It is up to the players how exactly they want to reach said milestones as they only serve as loose guides that can be pursued or discarded but still can offer something that resembles a structure to this emergent system.

Similarly to narrative design, the concept of narrative vectors is difficult to apply to an emergent system like *The Sims 4* because the overarching plot is non-existent and the simulation adapts to the user's input. Instead, players of the game define their own narrative vectors in their minds which they realize by manipulating the story to output

their desired stories. However, in some instances the game takes control over the plot, for example with random alien abductions – a famous feature in *The Sims* that exists in various editions of the game, including *The Sims* 4. In these instances, the system's input changes the story that is being constructed by the player, forcing the player to adapt to the new situation. Furthermore, in *The Sims* 4 the individual Sims have their own agenda and will go after their own needs and go to their jobs on time, unless hindered by the player (see figure 12).



Figure 12 Each Sim in The Sims 4 can pursue their own agenda

4.3.3 The Sims 4: Double-Hermeneutic Circle and Agency

When looking at the double-hermeneutic circle it is important to identify key chapters first. However, in a simulation game like *The Sims 4* that does not contain any pre-scripted chapters, this approach requires adaptation. Instead of analysing actual chapters, the creation of a new Sim will be looked at more precisely, as this is a gameplay mode every player is confronted with. When creating a new Sim, the player has to choose aspirations for the virtual character. Additionally, the Sim is assigned three different traits.

SEL	ECT ASPIRATI		SELECT TRAITS		
Athletic	Creativity	Deviance	8		572
~	80		Active	Cheerful	Creative
Family	Food	Fortune	- 19	(F)00	- 25
100			Genius	Gloomy	Goofball
		1		e	
Inowledge	Love	Nature	Hot-Headed	Romantic	Self-Assured
816					
ropularity					

Figure 13 Screenshots. Left: Selection of aspirations. Right: Selection of traits

When considering the upper hermeneutic circle, a new player with no previous experience with *The Sims 4* might not know that picking an aspiration and certain traits will affect the lives of their Sims. It can be argued that, while the player might assume that these characteristics will play a role in the simulation, the level of importance cannot be known in advance.

The bottom hermeneutic circle is where the character reflects and interprets the instantiated narrative. After having created a Sim and navigating through their virtual life, the player becomes familiar with the rules of *The Sims 4* world as well as the impact their input can have and which actions might occur randomly and are outside of their control, for instance a guest coming over and tossing the trash can across the ground.

Since *The Sims 4* is a simulation game, the players take control over their virtual personas and can navigate their lives, thereby maximizing the level of agency within the virtual open world and its internal constraints. Players can control multiple Sims, each one at a time. In this way, when two Sims interact with each other, the player can only ever control one of them, whilst the system computes the reactions of the other Sim. Several assets of the game can only be accessed once they are unlocked, therefore requiring milestones to have been reached before – this can be understood as a way for the game to create challenges and add momentum to the unfolding of events. Furthermore, one of the game's internal economies is money, therefore in

order to purchase items, sufficient funds have to be available – if not, the respective Sim has to work and earn money first.

Another part of the game's internal economy is the well-being of each Sim, as they become moody once the well-being has sunk to a certain level. In some instances they might resort to doing socially unacceptable things, such as falling asleep on a bench during their own wedding or taking food out of the fridge at someone else's house. In these instances, their actions can be met with dismay from the other characters present. As each Sim has their own agenda, the computer takes over them – sometimes even while the player is controlling them – and gives them activities and tasks that arguably reflect their needs and personalities better according to the system. This means, that the groom who falls asleep during his own wedding might be doing so because the system decided this because it noticed that he was tired and his need for sleep had to be satisfied at all costs.

5. Reflection on Replayability, Narrative Momentum and Agency

After having analysed the three pieces in question, *Bandersnatch*, *Heavy Rain* and *The Sims 4* with Koenitz' SSP model and its extension, this chapter will evaluate the replayability, narrative momentum, as well as agency in the three pieces of IDNs.

As established, both *Bandersnatch* and *Heavy Rain* are structured around a main thread having mainly features typical for the Gauntlet structure. The main difference is that *Bandersnatch* is structured in a way that encourages viewers to go through most of the content in one single viewing session as the narration can go back in time, while *Heavy Rain* does not allow for this feature, meaning that players who want to unlock alternative scenes and endings are required to start the game from the beginning once more. However, replaying Heavy Rain inevitably forces players to go through several scenes and chapters that they have already experienced all over again, unless the players had previously saved a game at a crucial chapter they wished to return to later in order to decide a future choice differently. The interface in Bandersnatch allows viewers to jump back to their previous choices and alter them, and even once an official ending has been reached the film prompts its audience to decide if they want to go back and explore a further storyline that had not been unlocked yet. While this approach might be less frustrating in comparison to *Heavy Rain*, where players have to go back on their own terms and potentially replay the entire game to unlock different scenes and endings, Bandersnatch's fine-grained perscene replayability reduces its overall replayability (i.e. the replayability of the entire title) because the entire content can be consumed at once. In this way, we could say Bandersnatch trades per-title replayability for per-scene replayability. Meanwhile in The Sims 4 most of the events that unfold are responses to the player's input and can be highly adapted according to the player's wishes, giving it a very high replayability.

In *Bandersnatch*, the narrative momentum is not influenced by the player's input, as on the surface it is a film with extra features that allow interactivity. Choices have to be made within ten seconds during which the scene where the character on whose behalf the player is making a choice (Stefan mostly, with one exception in the future where the player chooses on behalf of Pearl) is shown to be reluctant about what to do next. If the player does not make a decision by then, the film defaults to one of the options. In *Heavy Rain*, which is a video game, the player is required to navigate through chapters with one of the playable characters and find clues, solve riddles or beat quick time events. During these playable scenes, it is up to the player's proficiency how much time is spent on them, though hints are offered if the player has spent too much time on a challenge, therefore the only way the narrative momentum of the experience can be negatively influenced in *Heavy Rain* is when the player gets stuck. As established, in The Sims 4 the concept of narrative momentum as part of the work does not fully apply because the narrative vectors are not in the game itself but rather in the player's mind, as they decide in which direction they want events to develop. Certain features of the game create temporal constraints like a Sim's work schedule, creating a loose structure for the narrative momentum. Moreover, in order to reach any milestones (defined by the game or the player likewise) the Sim's activities have to be manipulated accordingly to allow for the desired event or relationship to form organically. However, here again the game leaves it up to the players at which pace they wish to go, and seldom interferes randomly (e.g. by setting a Sim on fire and killing them). To sum up, as Ryan had warned, emergent systems usually contain the drawback of lacking an Aristotelian curve of rise and fall of tension as they give too much control to the audience29. Therefore, the simulation game The Sims 4 lacks the typical narrative momentum that can be observed in the top-down, pre-scripted interactive narrations Bandersnatch and Heavy Rain, although players can attempt to create momentum on their own terms.

The upside of emergent systems, however, is that they allow for more agency, as in this case of *The Sims 4* with its real-time calculation of meaningful and interesting responses to the user's input, which is not confined to a prepared set of options but to the game world, its systems and all its assets.

When taking a deeper look at *Bandersnatch*, the interaction is facilitated by two textual prompts that lead to different actions of the protagonist and thereby change the plot. However, as previously discussed there is a decision point at which Stefan refuses to follow through what he is being ordered to do by the audience and breaks the fourth wall by confronting the force that he thinks is controlling him – an act that according to

²⁹ cf. Ryan, "Narrative Games," 52.

Roth and Koenitz also breaks the viewer's identification with Stefan and encourages a reflection on agency₃₀. In this twist of events, the plot develops in a direction that is independent of the user's input, and what follows are streams of unexpected events, one of the streams involves Stefan killing his father – a significant act that is out of the audience's control in some storylines, while in other playthroughs the player gets to choose to either kill the father or back off during the same scene. Close to one of the endings, the audience can see Stefan proudly talking about his video game to his psychologist Dr Haynes and saying that he had finally finished it by reducing the amount of agency given to the player: "Now they only have the illusion of free will, but really I decide the ending." This quote by Stefan seems to go hand in hand with the structure of the interactive film, as multiple different paths can lead the audience to the same ending and some paths seem rather forced, like the one where Stefan unexpectedly kills his father.

Furthermore, the gravity of some of the decisions that the audience can make in *Bandersnatch* is not held to the same level throughout the film, as some choices can be entirely ignored by the system and manoeuvred around to have the same output as the not chosen option, such as when Stefan decides against taking LSD but his tea is spiked anyway. Other decision points offer two very similar options that would result in the same consequence but bring it about differently, which goes against the notion of agency and thereby further limits the perception of it. As scholar Sercan Şengün explains, "Forcing a choice and constraining the alternatives or presenting inconsistent alternatives may thwart instead of support the feeling of freedom."₃₁ Some decision points let the player make rather trivial decisions while others can become a matter of life and death. However, the trivial decisions can bring about unforeseen consequences in a butterfly effect or by immersing the audience into the parallel realities that this interactive film is trying to fabricate.

Similarly, in *Heavy Rain* some choices can also lead to an unexpected chain of events. However, this video game adds in the element of quick time events and therefore the more worthwhile outcomes are reached by making the right decisions as well as

³⁰ cf. Roth and Koenitz, "Bandersnatch, Yea or Nay?," 249.

³¹ Sercan Şengün, "Silent Hill and Curious Case of Invisible Agency," in *Interactive Storytelling: 6th International Conference, ICIDS 2013 Istanbul, Turkey, November 2013 Proceedings,* ed. Hartmut Koenitz et al. (Cham: Springer, 2013), 184.

having good motor skills and reaction times. *Heavy Rain* works with state tracking, as for instance if a player refuses to complete one of the dares to save Ethan's son (or fails at completing them), then this ends up influencing a later chapter in which Ethan is trying to figure out his son's exact location without all the hints, as every completed dare would give him additional hints. Meanwhile in *Bandersnatch*, state tracking is observed, as the system determines which paths have been taken already and depending on which path led to certain decision point, different options to choose from might be offered.

5.1 Improved Design Recommendations for Bandersnatch and its Format

As stated in chapter 1, an objective of this paper is to identify promising design recommendations that would allow for increased agency and more than just the illusion of it in *Bandersnatch*, as an example for a nonlinear, highly restrictive, branching structure film. Therefore, in this chapter a respective model will be presented and discussed.

The issues raised with *Bandersnatch's* agency revolve around the limits due to the binary choices, as well as further restrictions at several decision points that force the interactor to go a certain way. Additionally, some consequences to the audience's input seem arbitrary – a critique that could be understood and discarded as a stylistic choice but which, however, should still be addressed in the development of an improved model. Due to the fact that *Bandersnatch* is a recorded interactive film and the viewers are therefore not controlling a virtual character through a virtual world or setting, agency in the form of spatial navigation as seen in *Heavy Rain* and *The Sims* 4 cannot be applied to this format. *Heavy Rain* allows the players to make decisions on behalf on multiple characters, although their interests are in conflict as is revealed in the end. While Bandersnatch briefly allows the players to make one choice on behalf of Pearl, this is done after a time jump, therefore eliminating any conflicts of interests between her and Stefan. While exploring the possibility of having multiple characters to control in *Bandersnatch* might be interesting in theory, this would require multiple additional scenes and plotlines that would have to be cleanly intertwined. Furthermore, it seems that Bandersnatch might have tiptoed around the idea of adding one quick time event in the scene where Stefan starts fighting his psychologist and then his father, as the player can choose between two options that would make him perform different attacks. Provided the devices compatible with the film allowed it, this scene could be redesigned or even elaborated by allowing the more impactful attack only if the player acted faster or succeeded at inputting a specific key-combination shown on screen. In Bandersnatch both attacks trigger the same follow-up scene. However, implementing quick time events – even if they must be highly restrictive for this format - can be an interesting feature in interactive film, especially if they lead to different succeeding scenarios.

On reflecting on characteristics in *The Sims 4*, an interactive film like *Bandersnatch* could borrow the concept of internal economies, but run it in the background in order to maintain state of, for instance, the behavioural patterns of the players which could later become the basis for the system to calculate which storylines can be unlocked. When looking back at Murray's quote on what agency is, namely "the satisfying power to take meaningful action and see the results of our decisions and choices"32 it can be derived that every narrative choice is made "consciously and visibly and the outcome is instantly associated with it"33 as Sengün states. This is where a different and rarely explored kind of agency, the so-called invisible agency, becomes interesting. In this form of agency, the user is not prompted to make apparent choices, like the binary textual ones in *Bandersnatch*. Instead, the system employs an obscured method to read the player's intentions. This form of agency was used in the 2001 video game Silent Hill 2, in which the game assessed the players' psychological states based on their tendencies and behaviour while playing by maintaining state and then ultimately unlocked the different endings accordingly.34 In short, as Sengün explains, "the choices the player makes are actually projected tendencies and they accumulate results in the long run"35.

In *Bandersnatch*, invisible agency could be implemented by assessing the intentions of the audience based on which of the options they choose. However, according to Sengün it is not advisable to base the assessment on criteria such as ethics and morality, as options offered might either be on opposite sides of a spectrum and

33 cf. Şengün, "Silent Hill," 180.
34 cf. Şengün, "Silent Hill," 181-183.

³² Murray, Hamlet on the Holodeck, 159.

³⁵ Şengün, "Silent Hill," 183-184.

therefore not subtle enough or be too similar and result in a moral dilemma that in turn creates a challenge in assessing the player's intentions.

Bearing this in mind, one criterion to base the evaluation on would be the willingness to take risks or be self-destructive, as this can be clearly identified at various decision points. Examples would be the decision point at which Stefan is offered to take LSD or the choice of whether or not Stefan should destroy the computer if the alternative would have been to only hit the desk instead. By coming up with a measuring unit for the behavioural pattern that is to be assessed and maintaining state and ultimately displaying later scenes that are meaningful consequences to the audience's intentions, *Bandersnatch* would no longer seem arbitrary in the causality of its events, but instead the limited agency of the interactive film format would be increased, as meaningful results for the audience's input would be observed.

This design strategy would require an overall restructuring of the film's scenes in order to respond well to the user's input. It can be entirely up to the designers at which point the evaluated intentions and risk-taking behaviour of the audience would bear consequences – the least invasive alteration would probably occur if these consequences are displayed in the final fifth of the film. The consequences can be shown in the actions that occur in the unlocked scenes, but they could also influence the presented options at decision points in said scenes.

By using this form of obscured agency to create a more meaningful chain of causality, the sense of agency can ultimately be enhanced, however the oblivious audience would not notice it. Being oblivious is necessary as players who are aware that the title has invisible agency are likely to try to manipulate the film into a certain direction once they know that their psychological state is being evaluated. In doing so, the unlocked ending would no longer reflect a psychological profiling of them. Therefore, it adds to the level of indulgence not to be aware of the invisible agency when playing through the interactive film for the first time. Once the players are aware of this additional layer of agency, they might become more likely to replay the film in order to manipulate it – thereby the per-title replayability of *Bandersnatch* would also benefit from this alteration.

In order to facilitate a well-functioning form of invisible agency, the juxtaposed options at each decision point should not be obvious choices on opposite sides of a spectrum, as this would take away any possible challenge for the aware audience. By evaluating the risk-taking behaviour in percentages rather than with the polar question of yes/no at each decision point, the assessment can be conducted in a more precise and sophisticated manner. These percentages can then be accumulated to calculate the right outcome just before it is to be screened.

Ultimately, the narrative momentum as previously discussed cannot be influenced in *Bandersnatch's* format as the audience has to make a decision within a defined amount of time even if the features of invisible agency were to be added.

5.2 Reflections on Hartmut Koenitz' SPP Model for Analysing IDN

Hartmut Koenitz' SPP model as well as his and others' extension to the model provide a solid basis for the analysis of IDN and agency. However, whilst analysing The Sims 4, which is an emergent system, the concepts of narrative design and vectors seemed not to apply fully and therefore it can be argued that Koenitz' methodology is primarily designed for top-down, pre-scripted interactive systems rather than bottom-up systems that work with responses calculated in real-time according to the user's input and therefore lack an overarching story and an Aristotelian curve of rise and fall of tension. In this paper, the narrative design of *The* Sims 4 was evaluated as highly individualistic with some pointers to give the players orientation which can either be followed or disregarded completely. The narrative vectors were not considered as part of the system itself, instead in this paper it was argued that they can be made up by the players and are therefore in the players' minds as they are trying to manipulate their virtual universe to output the story they wish to see unfold. The only instances in which the concept of narrative vectors within the system applies is when the game takes control and does unexpected things to a Sim or the environment.

In conclusion, Koenitz' model is not versatile across all forms of IDNs and the terms narrative design and narrative vectors require a broader definition that is more sensitive towards emergent systems. One solution specifically for emergent systems might be to differentiate between the narrative design and vectors of the system and of the players' minds, i.e. their plan of where the story should go. Another solution would be to come up with a new analytical framework for emergent systems altogether, however, the resulting downside would be the difficulty to make comparisons between top-down and bottom-up systems if they are being investigated differently.

6. Conclusion

Creating a choice for the sake of creating a choice inside a video game may not always support the agency. Forcing a choice and constraining the alternatives or presenting inconsistent alternatives may thwart instead of support the feeling of freedom. ³⁶

It is evident that only increasing the instances during which the player can interact with a system does not necessarily increase the player's agency. Instead, the instances during which interaction is offered must be designed in a fashion that would allow for meaningful outcomes that give the player the feeling of being in control of or responsible for the narrative.

Looking at the case studies allows the format of *Bandersnatch* to be understood better. It has become evident that it has potential for improvement and this paper illustrates how: For a nonlinear, highly restrictive, branching structure film, like *Bandersnatch*, agency can be boosted without jeopardizing the narrative momentum and without requiring an unreasonably high increase in the production resources. As established, employing invisible agency to evaluate any given condition of the player, such as risktaking behaviour or tendencies towards defined psychological states, can contribute to offering more meaningful generated narratives that reflect the player's intentions better.

Looking at the decision points in *Bandersnatch* it becomes evident that some of them do not have any impact on the story, such as when the protagonist chooses which cereal to eat, while other decisions offer two similar options that would have the same result, for instance, when the player chooses how to destroy the computer. This design choice might have been made in an attempt to increase interactivity, although as Şengün states, offering these kinds of choices tends to "thwart instead of support the feeling of freedom".

While in the past the concept of invisible agency has been scarcely used, implementing it in interactive films like *Bandersnatch* would contribute to creating a more meaningful sequence of events in the instantiated narratives in accordance with the audience's input and thereby the overall felt agency or "free will" would be

³⁶ Şengün, "Silent Hill," 184.

increased. Provided that the audiences of interactive films can be assumed generally to be aiming for a certain narrative outcome, adding the layer of invisible agency would offer an additional challenge for players – especially if they are replaying the entire film or are aware of the invisible agency feature – as they would try to manoeuvre the choices carefully to get their desired result. In combination with this challenge, this solution could prove itself promising in navigating the fine line between narrative and game successfully and invisibly.

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