Short-form interactive experiences, exploring the potential of concise gameplay and its game design specifics

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Abstract

This research is focused on the critical and practical exploration of the concept of short-form interactive experiences, doing so by taking the idea to the extreme and attempting to recognize potential ways for designing games that last less than 3 minutes in terms of their duration. Specifically, the main focus of this research falls on better understanding the restrictive nature of short-form gameplay and what design mentalities should be inhabited when creating game worlds set in such time-restricted spaces, with a specific emphasis being put on emotion, meaning and focus.

Although supported by existing examples of interactive media, the methods employed by this research are highly experimental, involving multiple prototypes of short-form games based on the stimulus of a specific set of emotions. A strong understanding of basic game design principles is also applied to the area of study, encompassing theories of flow, temporality and aesthetics, among others. While open, the outcomes of this research aim to contribute towards better understanding short-form interactive experiences and whether those can be considered as viable forms of interactive media.

1. Introduction

1.1 Topic overview

From a broader perspective, this research explores game design from the perspective of creating meaningful experiences, taking those findings and then discussing the possibility for games to exist as short-form works. Mainly due to an apparent lack of focused research into such specific types of interactive media, this project experiments a lot with typical and well-known game conventions and studies, making focused attempts at finding out how players can get immersed and invested in short interactive segments while looking at theories related to emotion, pacing, simplicity and progression in video games. By borrowing from such existing knowledge, this project also attempts to suggest possible ways for shaping extremely concise gameplay driven by mechanics and systems suitable for such short interactive segments.

Apart from taking existing theories and notable works in the fields of psychology, play and game design into consideration, various relevant short-form games have been analysed critically from the spectrum of temporality, mainly in order to better understand ways in which current game creators shape short-form interactive experiences. The aforementioned research has also been put into practice through the development of several small digital prototypes that aim to successfully showcase the possibilities of short-form play existing in various different forms. Those prototypes were created throughout the evolvement of this project while focusing on a specific pre-set range of emotions, those being used as guiding points for understanding how certain feelings can affect the design of a short game concept, and whether emotions are integral to providing meaningful play in time-constricted durations.

1.2 Aims and objectives

To summarize the points above, four key research objectives have been recognized:

- Explore and analyse current examples of short-form interactive media, defining their strengths and weaknesses, emotional values and temporal characteristics;
- Establish the specifics of short experiences in games by developing several small prototypes, each aimed at specific emotions;
- Analyse how people respond during time-restricted frames and how strong of an emotional reaction is developed;
- Summarize findings based existing theories and suggest key aspects inherent to designing short-form games;

1.3 Reason for choosing the topic

With short-form works being prevalent throughout the history of other types of media such as film and literature, there is a distinct lack of video games falling under such a category (especially in relation to longer, more fleshed-out titles). This is one of the main reasons for this body of research, as such a specific absence could be a telling factor for the state of game design in current times and whether it's evolved enough for creators to be able to

create successful short-form games – ones that are both “worth” players’ time and also financially viable in today’s video game market.

Another motivating factor for this research is the recent phenomenon of independent game development and the rising possibilities for open experimentation with unorthodox game concepts, many of which can be categorized as short-form. This rising success has mainly inspired this project’s developed games to be works suggestive of gameplay concepts and development methods which might make short-form games more than niche experiences, potentially elevating them into commercially viable products. Finally, this research argues that short-form interactive experiences may also be used as a way to introduce people to games and the various unique characteristics they possess, in a manner that does not intimidate or appear to be too time-consuming or technically challenging.

1.4 Desired outcomes and conventions

This research should hopefully suggest a number of important aspects to consider when creating short-form interactive experiences, doing so by recognizing key points from current game design studies which focus on the experiential state of play. The presented digital prototypes, along with their strengths and pitfalls, should also provide valuable insights on the specifics of designing mechanics and unique pacing for short-form games, hopefully giving inspiration to current and future game developers interested in critically evaluating game design and breaking out of various pre-conceptions towards this interactive medium that they might have been formed in the past.

It must be noted that for the specifics of this dissertation, the term “short-form games” and any derivatives involving interactivity have been categorized as “gameplay that requires less than three minutes to complete on average”. Although this convention is developed mainly as a way to look at short-form games in their most extreme sense, this research also includes examples of interactive media that might not fully fit this category - this being the case mostly due to those examples’ validity in understanding the nature of time-restricted gameplay, despite their length being slightly longer than the one described in the categorization above.

2. Literature Review

In order to fully understand the specifics of short-form video games, there must be a certain existing strive to critically explore and evaluate such a concept to begin with. While there have been attempts to recognize the potential of such types of interactive media in specific cases like socializing and dating *(Chen, 2009)*, there has been little academic research focused on the notion of video games existing as short interactive pieces in a more general sense, this lack also translating to the exploration of the potential for designing around time-constricted interactivity in general. As a direct comparison, short films already have dedicated journals that analyse specific elements of works which fall under the category: for example, Linetzki looks at a singular trunk used as a metaphor throughout the duration of a short film called "Matka", managing to directly analyse the medium by dissecting it to its core elements. *(Lefebvre-Linetzky, 2014)* Furthermore, short films are even defined by the Academy Awards as “an original motion picture that has a running time of 40 minutes or less”. *(The Academy Awards [no date])*

If we are to define short-form games, on the other hand, we would have to look at existing definitions and summarizations of games while recognizing what they have in common and how they might relate to interactive experiences that are short-form. For example, Jesper Juul *(2005)* defines a game to be “a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, **the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome,** and the consequences of the activity are optional and negotiable.“ Although this definition contains elements that can easily be discussed on their own and in great length, its key focus on emotional attachment proves how important it is for games to possess valuable outcomes that result in an emotional response. Focusing on the emotional values of decisions within games, Juul’s definition also supports Salen & Zimmerman *(2004)* and their statement that "the focus of a game designer is designing game play, conceiving and designing rules and structures **that result in an experience for players**."

With experience and emotion clearly being key factors for designing quality games, those are arguably even more important when players are presented with a limited duration of gameplay time. In addition, the ways in which those can be achieved in short interactive form might not fully relate to typical game design conventions. For example, in Rules of Play Salen & Zimmerman *(2004)* say that a game’s “magic circle” contains systems aimed at both seducing players into entering a game and seducing players to continue playing, both being different challenges to design altogether. However, mechanics that seduce players into longer play durations might not be so important when looking games that are designed to be time-restricted, especially since such types of mechanics often include repetitive or twitch-based interactions which artificially lengthen games and their duration. Instead, it would arguably be more beneficial for short-form games to craft meaningful experiences that linger in players’ minds after they’ve been finished, almost forcing them into thinking about what they’ve played after a finished play-through, which would then potentially justify additional playing sessions.

2.1 Meaning

If we are to look at meaningfulness in specific, its merging with interactivity dates back to the famous work of Johan Huizinga. Focusing on the idea of play, Huizinga (1949) said in Homo Ludens that "all play means something", further emphasizing the idea of play being able to transcend immediate needs and give meaning to life. While one could argue that a game like StarCraft *(Blizzard Entertainment, 1998)* is meaningful in the sense of self-improvement and achieving mechanical enjoyment out of the systems at play, the situation is different when it comes to short-form games. For example, if a player is given less than five minutes to complete an interactive experience from beginning to end, then as a consequence we would have to look at meaning in the context of provocative interactivity that challenges critical thinking, or at very least offers interesting choices that are not purely mechanical. Coincidentally, this goes in line with Sid Meier's definition of games being "a series of interesting decisions". *(Rollings & Morris, 2004)*

As such, meaning in game design has many forms. Games can be viewed as being meaningful when they teach players valuable lessons, with "fun" being just another word for learning. (Koster, 2013) Such games can be described as persuasive, taking the previous concept a step further by putting the emphasis of those relying on the expressive power of the interactive medium and the way interactive works can "produce discourse in the general sense". *(Bogost, 2007)* Persuasive games, as described by Bogost, also rely on procedural rhetoric to create meaning, mostly due to games' unique rule-based and process-oriented nature. When explained in such a way, games would then have to contain mechanics that create meaning through the way those are constructed through their rules – for example, Paolo Pedercini's short game Every Day The Same Dream *(Molleindustria, 2009)* portrays the inevitability of working a monotone, day-to-day job by using highly repetitive mechanics which pace the experience appropriately for the game's intended design message.

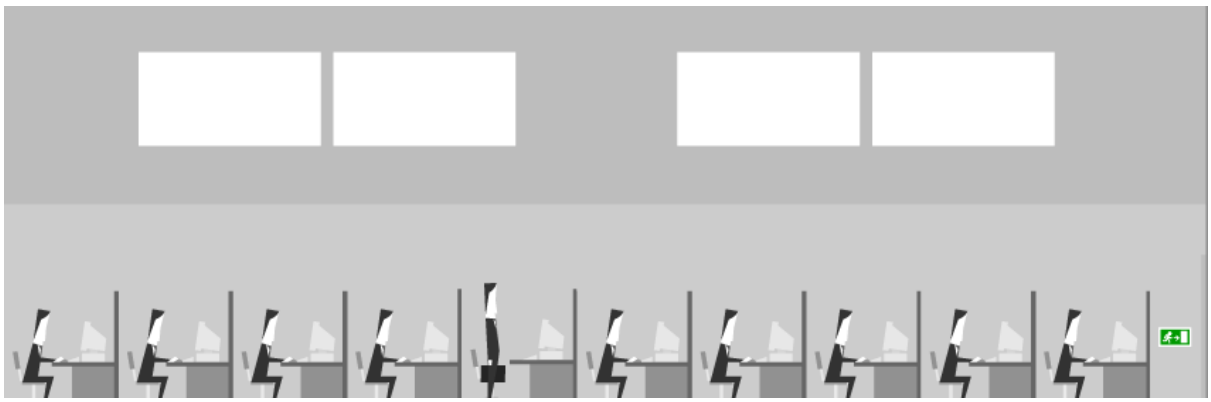


Figure 1 - Every Day the Same Dream

However, while completely valid to short-form games, this point of view also seems to only focus on the cognitive capacities of interactive experiences, essentially limiting games to tools which simply teach patterns to their players. Every Day The Same Dream might create meaning through its mechanics, but they would make less sense if it weren't for the aesthetic and fictional qualities of the experience. For instance, according to Jesper Juul *(2011)*, games are both rules *and* fiction, with setting providing important added meaning to

an experience. When it comes to time-constricted interactivity, it is of particular importance to recognize the best ways in which visuals and audio can be used for the realization of any particular experience. On one hand, abstract aesthetics might prove beneficial for games with deeper meaning, or a more stylized approach might be more appropriate in enhancing the underlying meaning of a short-form game. To support this, Niedental *(2009)* argues that "game aesthetics is an expression of the game experienced as pleasure, emotion, formgiving, etc." while drawing analogies with Hunicke's MDA framework *(2004)* of developing games, where the term "aesthetics" is described as "the desirable emotional responses evoked in the player". The relation between emotion and meaning is therefore rather clear, and as such it should be a goal for short-form games to implement those aspects deeply into their design instead wasting time on gameplay elements that might not be essential for their intended player experience.

2.2 Focus/Elegance

If short-form games are to deliver meaningful experiences, then they should also attempt to do so in a focused way. Although time might be seen as a restriction to design around, such a limitation can also be a useful tool to help designers in coming up with concise, well-thought out interactive experiences that present a cohesive package of mechanics and aesthetics. Zagal and Mateas' methodology of analysing games through their usage of temporality *(2007)*, for example, can be crucial for recognizing how time functions within games. Such a methodology might further benefit the design of short-form games, as it allows for identifying different ways in which time can affect gameplay and its pacing, in addition to providing ways for creating focused meaning within time-restricted interactivity. As we've already discussed, meaning in games should also be carefully designed and focused on a specific pre-set idea, with short-form examples simply being opportunities to unlock such potential. For example, designing with specific constraints in mind from the beginning of a project can lead to better games which follow a certain integrity in terms of main ideas being central to an experience. *(Dini, 2009)* David Sirlin *(2010)* also recognizes this importance by talking about subtractive design, specifically giving an example with Fumito Ueda's Ico (Team Ico, 2001) and how it was created with the core concept of it being a platforming puzzle game about a boy and a girl, with all extraneous aspects being removed in favour of achieving an emotional impact through an environment that supports the core idea. Taking Ico's example further, Sirlin also describes a specific moment in which the game's designer talked about a simple environmental object like a chair getting in the way of the overall scenery of a room, ultimately resulting in it being removed. Crucially, this shows the importance of designing elegant experiences instead of ones filled with "clutter" that would be unessential for a game's main goal. With short-form games, such elegance can be detrimental to the process of designing a space that delivers nothing more than what's necessary.

Taking cues from aesthetic studies and traditions, we can also look at Browne's studies on elegance in game design *(2012)* and how he draws parallels to shibui – a Japanese term referring to aesthetic simplicity and "hidden depth". While elegance and shibui are not exactly the same, both have similar touching points in the sense of demonstrating how

important focus and clarity are for designing interactive experiences, be it visually-driven ones or mechanically-driven ones. For example, if a game's mechanics were elements of a room that needs to be ordered in a simple "shubui" way, then those mechanics would only have to serve the game's overall meaning and the desired player experience. In the same time, it is crucial to note that for short-form games simplicity should mainly focus on the clarity of the designed experience and its ability to convey a clear message, as opposed to using minimalism (although that can also be a useful tool during the design process).

Crucially, Thomson *(2000?)* says that although elegant games can be both good and bad, it is not important whether they can be learned in a minute, but whether they reward play for a lifetime. As such, this is a key viewpoint that should be considered when designing short-form games, especially as we've already discussed how important it is for such interactive experiences to be meaningful in some way, whether this be abstract or clear. In a way, this further proves the idea of meaningful games, especially time-constricted ones, needing to have the capacity to tell emotional stories which linger in players' minds long after a play-session is over.

2.3 Emotions and fun

In that case, should short-form games be "fun"? Although this research has already suggested that addicting and twitch-based mechanics might not be essential when it comes to time-restricted interactive experience, it is also important to note that such games should at least be enjoyable, or captivating throughout their duration. Perhaps the aspect of having fun while playing a game is seeded into the way we describe the activity to begin with. Bogost *(2008)* explains this well with an analogy of a school environment where the word "play" is used in the context of students going in recess (which only comes after the time of "learning" during class). In that way, most people consider play as a children's activity that distracts from more serious pursuits such as doing work, or getting educated about certain aspects of life. From that spectrum, it isn't surprising that playing video games is mostly associated exactly with having fun. Undeniably, defying fun, what's enjoyable and implementing that into a video game is also something most designers strive to achieve every day, but in the same time an interactive experience should not be pure fun all the time.

In fact, the aspect of fun is not so linear to begin with. Different types of fun result in different emotions, as described by Lazzaro's classification of the word. *(2010)* In specific, it recognizes four types of fun – easy fun (involving role playing and control enjoyment), people fun (involving social bonds formed through playing), hard fun (involving the sense of challenge and accomplishment) and serious fun (involving meaningful gameplay that purposefully challenges how players think and behave). *(Figure 2)* Out of those, focusing on serious fun should perhaps be most central to short-form games, as it is the only type that does not rely on a long game duration to be successful. Crucially, Lazzaro describes serious fun as the moment when "purposeful play changes how players think, feel, behave, or make a difference in the real world, in addition to listing "zen focus" as one of the key emotions inherent to serious fun.

Figure 2 - Lazzaro's "4 Keys 2 Fun"

Keeping players focused and emotionally invested in a short-form game would also be, in theory, relatively easier to achieve in comparison to longer games lasting multiple hours. The idea of flow fits well with this idea, as it originates from Csikszentmihaly's *Flow Theory* (1990) which describes the positive psychological state of users (players) when they are focused, concentrated and enjoying a particular experience. Jenova Chen is perhaps one of the most notable proponents of applying this idea to game design, saying that "assuming the content and premise are inherently appealing to the audience, designing any interactive experience, including video games, centers on how to keep players in the Flow throughout its duration." *(Chen, 2007)* Ultimately, keeping players in a state of flow throughout the duration of a short-form game should be of utmost importance when attempting to bring some sort of emotional response out of a game's participants, as that would only strengthen whatever emotion designers are attempting to elicit.

2.4 Summary

Finally, by combining meaning, elegance and emotion, we can come up with a potential model for designing short-form games that can help us create more engaging time-constricted experiences:

“Through maintaining a sense of flow and pacing an interactive experience right, designers can create meaningful short-form games that engage players on an emotional level by the means of elegant and focused design.”

It is important to note that this summarization is solely based on taking existing game design research that is applicable to a wide variety of games, and then applying it to the concept of games existing as short-form works. Taking this existing knowledge into consideration, the following portions of this research purpose potential practical research that can lead to understanding short-form games better, mostly by exploring different ways in which gameplay can be paced through time. Thus, the following portions of this project will focus on more practical attempts at studying how time-constricted interactive experiences work, more specifically through the creation of such works and by investigating existing games that might fall under such a category.

3. Methodology

3.1 Overview

In general, this research project takes a highly experimental approach to understanding an area of games that is, for the most part, rather unexplored and broad. As a whole, the established theoretical assumptions of this dissertation have been tested by employing two different approaches.

The first focuses on looking at six existing short-form games via case studies aimed at understanding their temporal aspects, which was done mainly by borrowing the previously mentioned temporal frames analysis method by Zagal & Mateas *(2015)*. This specific approach was chosen mainly in order to understand the various ways in which short-form games pace their experiences through subtle changes in gameplay events in time.

The second approach, on the other hand, focuses on the actual creation of three short-form games, each lasting less than 3 minutes on average and being driven by a distinct desired emotional response. As such, these games have been designed with the idea of them being rather experimental and different to one another in terms of duration, ambiguity and pacing, with player responses and feelings being collected through the use of anonymous questionnaires.

3.2 Case studies

3.2.1 Analysis method

In order to understand possible ways in which short-form games pace gameplay within time-constricted environments, this research uses case studies based on Zagal and Mateas' temporal frames analysis method. *(2015)* In summary, the framework mainly focuses on recognizing ways in which games flow through time, particularly by merging temporal studies with game design concepts related to time. The result is a systematization of four distinct temporal frames containing key relevant terminology (as shown in *Figure 3*).

Frame	Definition	Relevant Concepts
Real-world	Real-world time is established by the set of events taking place in the physical world around the player.	Cycle, duration, countdown, trigger
Gameworld	Gameworld time is established by the set of events taking place within the represented gameworld.	Cycle, duration, countdown, trigger
Coordination	Coordination time is established by the set of events that coordinate the actions of multiple players (human or AI) and possibly in-game agents.	Rounds, turn-taking, tick-based, action points
Fictive	Fictive time is established through the application of socio-cultural labels to a subset of events.	Temporal schemata, socio-cultural labels, Story time, narrative time, discourse time

Figure 3 - Illustration from Zagal and Mateas' framework (2015)

In addition to structuring time into distinct temporal frames, this framework also uses three key terms for describing the various possible anomalies and interactions between frames:

- Temporal bubble – an anomaly describing situations in which one temporal frame ticks while another appears stagnant. For example, an event triggering player death

in a multiplayer game pauses the gameworld temporal frame but keeps the coordination temporal frame active.

- Temporal warping – an anomaly which occurs when several temporal frames co-exist, but time plays out differently in each one. For example, in some games day-night cycles take less time than they should in real life, while other tasks such as shooting or driving advance in the same way they would in real-world time.
- Non-uniform temporality – when time passes unevenly between two or more temporal segments (this being the case mostly for coordination temporal frames). For example, 10 rounds last 5 minutes and the next 10 last only 2 minutes.

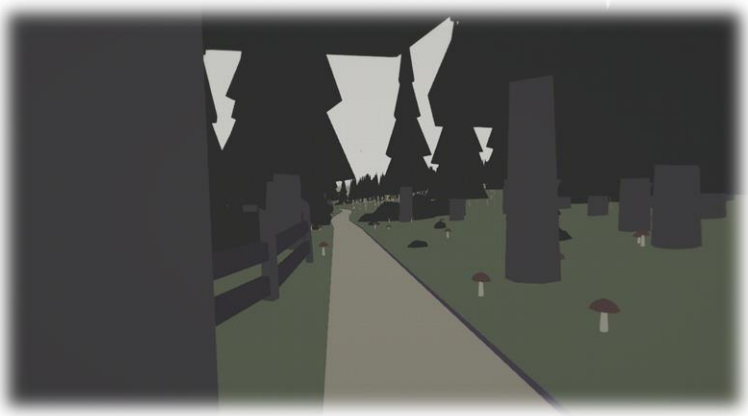
The described temporal anomalies mainly represent ways in which games guide players throughout their duration, offering a systematic approach to evaluating player experience and maintaining flow within a single play-through. With short-form games being particularly reliant on time and pacing, the focus of the following case studies is mainly to distinguish efficient ways in which designers can handle time within time-constricted games, depending on what player experience goals are being set.

In addition to observing temporality in each case study, a brief analysis on each game's user interface has also been conducted, with as an attempt to recognize the pluses and minuses of diegetic and non-diegetic HUD systems in short-form games. This added piece of analysis was mainly used to supplement Zagal and Mateas' description of coordination temporal frames, which in particular relies on representing coordinative concepts such as rounds and progress through the means of user interface systems.

3.2.2 Analysed games

Case studies have been written based on six short-form games in total. The main criteria for choosing these specific games were their duration and aesthetic uniqueness, with the main aim being to dissect concepts which are different in terms of how they present meaningful stories within time-constricted spaces. Following is a list containing each analysed game:

- **Red Amazon** – a first-person thriller presenting players with an unexpected encounter in the woods. This game was chosen due to the way it breaks suspense mid-way throughout its duration, beginning as a static, slow-paced experience and ending with a surprising, suspense-filled conclusion.



- **The Plan** – a side-scrolling game in which players must navigate a fly towards the sky. The game's main appeal and potential for analysis lies in its almost continuous flow of time from beginning to end, the focus falling on the subtle temporal anomalies at play and how a slowly developing experience can remain exciting in short interactive form.

- **Passage** – an experimental abstract game about the representation of life and the inevitability of time. This game was chosen in order to recognize the temporal aspects and anomalies behind short-form games which aim to portray a longer time-period by condensing it into only a few minutes.

- **The Mammoth: A Cave Painting** – a top-down experimental game about the life of a mammoth and her children. Although it's somewhat familiar to Passage in terms of presenting a long story into a condensed timeframe, this particular game was chosen because of its constant (and obvious to players) jumps in time, presenting a different way of portraying a long story throughout a short interactive segment.

- **Port of Call** – a first-person narrative-based game about the afterlife. This game was chosen because of its fictional representation of time, giving an opportunity to analyse temporal frames which appear deliberately inconsistent.

- **WarioWare, Inc.: Mega Microgames!** – a twitch-based party game in which gameplay is split into several mini-games, each lasting for 3 seconds on average. The main reason for analysing this game was to recognize the various ways in which it manages to give meaning to extremely short interactive segments, in addition to being inherently different in its nature to most short-form games due to its reliance on player failure and skill-based challenges.

3.3 Experimental short-form games

As this research has already suggested the significance of creating emotion within meaningful short-form games, three prototypes have been developed based on constraints having to do with three distinct emotional outcomes, with a key focus being put on designing mechanics that fit those pre-defined emotional goals. In addition, the three prototypes vary in their length, mostly in order to attempt to recognize how players react to differently timed interactive segments. With that being said, each prototype focuses on three different types of emotion: worry, thrill and sadness.

3.3.1 Prototypes

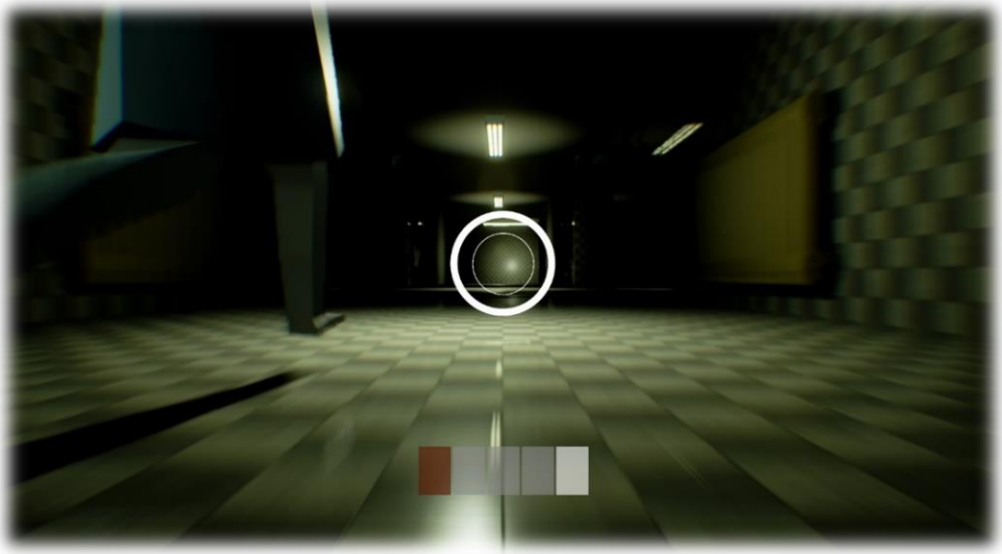
Guests (Worry)

Duration: 2-4 minutes

Gameplay: Guests attempts to represent worry by placing players in an apartment containing various interactions, all while a stranger is knocking on the entrance door. The experience can last anywhere between one and three minutes on average, with player interactions with the environment shaping different kinds of endings. The overall experience was designed to test how players react to situations containing multiple choices within in a time-constricted environment. Crucially, maintaining a sense of pressure was the main goal of the experience, which was mainly introduced by a constantly audible sound of door knocking and the way in which the game repeats an identical scene, with only slight nuances and changes in the overall visual design being apparent.

Paranoia (Thrill)

Duration: 40 seconds – 2 minutes



Gameplay: This game attempts to represent thrill by placing players in a situation which forces them to run through a hospital maze. Contrary to the previous game, interactivity is limited to turning left or right, pressing a key to breathe in-sync with on-screen indications and holding down a button to sprint. As such, this game was developed to be very abstract in its meaning, with mechanics such as sprinting having no difference in terms of end outcomes, mostly in order to portray the inevitability of the situation at hand. To support this, the ending of the game is also identical each time. As the game usually lasts less than a minute (depending on how long players last while running), the overall experience was designed to test the potential difficulties of delivering meaningful outcomes and achieving an emotional response when restricting duration to the extreme.

Edo (Sadness)

Duration: 2-3 minutes on average

Gameplay: Edo is a narrative-driven first-person game which was developed with two challenges in mind - adapting an existing short story into a short-form interactive experience, and introducing said story through focused puzzle-based interactions. In specific, the game is based on Lefcadio Hearn's A Dead Secret (2006), with the story being told through notes stored within a locked chest which gradually opens with each completed puzzle. Crucially, the game attempts to tell a tragic story within the time-frame of two to three minutes, using puzzle-based interactions as a main imposed challenge on the overall design. Edo's concept has been further enforced by an attempt to deliver focused simplicity and minimalism through gameplay, mostly via an environment which only contains items that are essential to the delivery of the game's story.

3.3.2 Playtesting

A small group of ten people familiar with video games was used to test said prototypes, this being the case due to the games' experimental nature and the benefits in gathering qualitative data based on that very aspect. Player experience has been evaluated through questionnaires, which have been filled anonymously by participants after playing through each game.

In particular, the questionnaires focus on recognizing levels of emotional investment while attempting to quantify how immersed players were while playing. As such, key questions focus on participants having to guess what types of emotions they were exposed to in each prototype, whether they saw the interactive experiences as works that can exist as stand-alone short-form experiences and how enjoyable they found each game, among more general questions related to participants' preferences to games in general.

4. Results and evaluation

4.1 Case Studies

4.1.1 Temporal Observations

Overall, each case study presents different ways in which temporality can be used to pace an interactive experience. **Red Amazon** (Appendix A), on one hand, presents a constant temporal bubble within its gameworld temporal frame, essentially splitting the experience into two timelines, with the first one characterized by peaceful exploration through the woods and the second one being triggered by a sudden distant sound hinting towards danger. *(Figure 4)* Essentially, the game manages to use its beginning serenity as a way to strengthen the eventual emotional impact of an event hinting at incoming danger. **The Plan** (Appendix B), on the other hand, shows a different approach by portraying a continuously flowing experience, doing so by presenting carefully designed moments of temporal warping aimed at adjusting the game's experience and pace dynamically. For example, player movement and game duration are directly tied to the duration of a music track playing in the background, ultimately resulting in a carefully paced experience that always presents a well-timed ending.

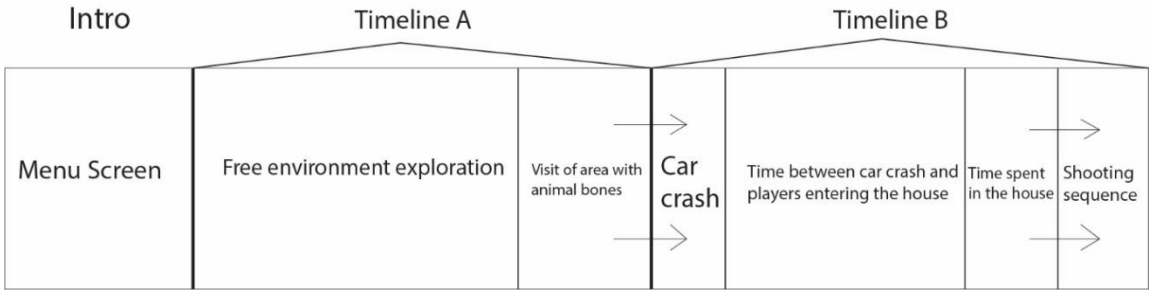


Figure 4 – Red Amazon's subtle time changes represented by two distinct timelines

Passage (Appendix C), on the other hand, uses visual elements as tools for its coordination temporal frame, essentially visualizing time passing by via subtle aesthetic changes such as player avatars aging, their movement speed slowing down and overall visual fidelity changing throughout time. *(Figure 5)*

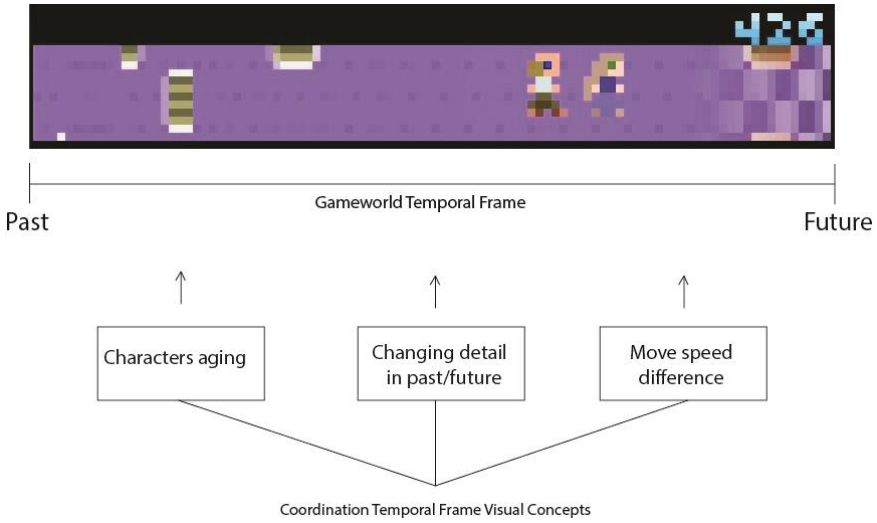


Figure 5 – A visualization of Passage's coordination frame representing time passing by

This is in stark contrast to The Mammoth: A Cave Painting (Appendix D), which instead shows the duration of time through narration and long jumps in time, essentially managing to tell a story encompassing many real-time years seamlessly in several minutes. *(Figure 6)* Crucially, although Passage and The Mammoth are similar in terms of telling long stories in short periods of time, both are very different in terms of how they pace their experiences - the first game presents a continuous, consistent timeline, while the second game opts for a more disjointed approach relying on time jumps and narration.

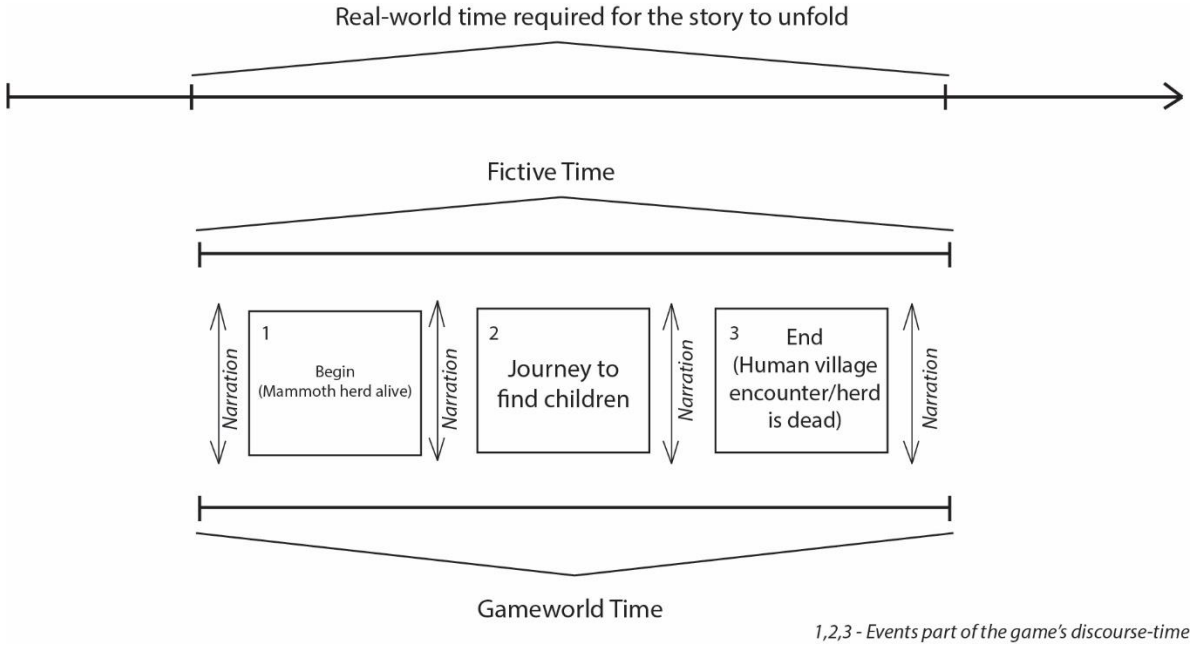


Figure 6 – The Mammoth's story told through key events in the game's timeline

Finally, **Port of Call** (Appendix E) and **WarioWare** (Appendix F) are good examples of games which use fiction as a way to bolster their heavy reliance on temporal anomalies. For example, due to the fact that Port of Call is set in a place resembling the afterlife, it creates the illusion of time being paused and not functioning properly, essentially giving further meaning to moments such as game objects appearing behind players in a matter of seconds, or entire areas of the world appearing as if out of nowhere in an unreasonable amount of real-world time. *(Figure 7)*

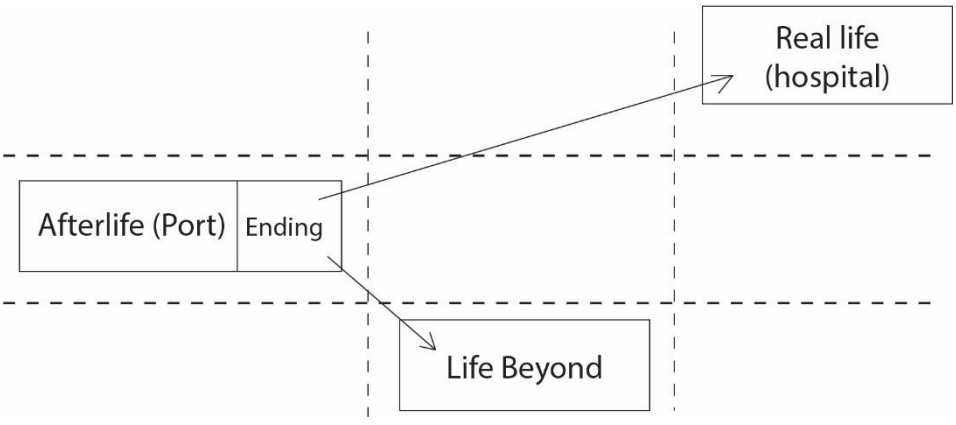


Figure 7 – Port of Call's fictive representations on its temporality

WarioWare**,** on the other hand, takes this concept to the extreme by giving meaning to its fast-paced nature via a plethora of concepts relevant to its coordination temporal frame. Because mini-games exist within technological interfaces rendered within the game (such as televisions and mobile phones), elements like round rounds, timers and ticking bombs only manage to strengthen that important feeling of urgency. *(Figure 8)*

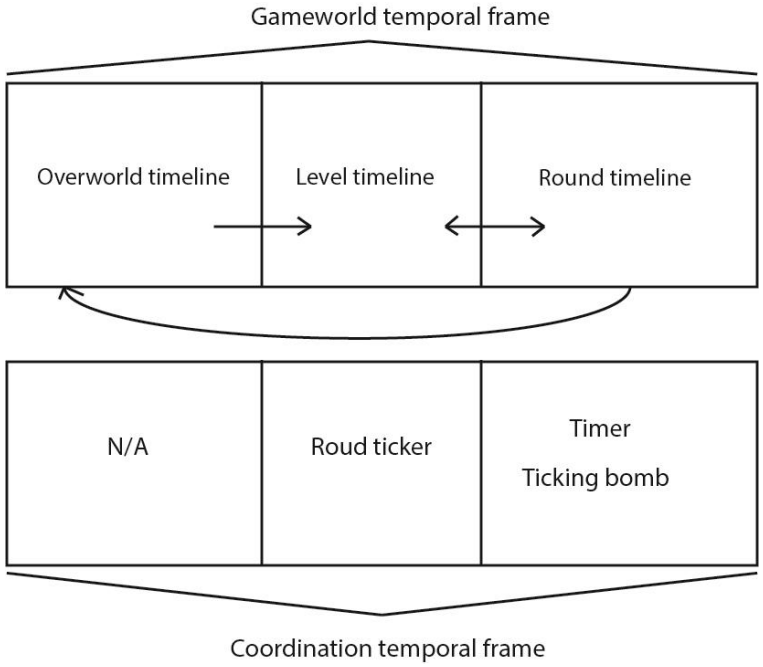


Figure 8 – WarioWare's coordinative concepts and their importance in portraying time

4.1.2 Differences in pacing

Based on the previously outlined temporal phenomena of each game, there seem to be three distinctly different ways in which the games examined in the case studies handle their pacing.

The first way can be observed in **The Mammoth: A Cave Painting** and **Passage**, those being examples of games which portray a significantly lengthy portion of real-world time being compressed into a short gameworld duration. For example, The Mammoth shows the extinction of a whole herd in about five minutes, whereas Passage even goes a step further and warps one's full path through life into four minutes and forty-five seconds. Primarily, those games use temporal warping to their advantage the most, ultimately resulting in players not realizing how fast time is passing by.

The second way, on the contrary, can be observed in **The Plan** and **Red Amazon**, where the gameworld temporal frame is instead almost entirely static, with most temporal phenomenon occurring through the use of temporal bubbles. For example, The Plan flows almost effortlessly from beginning to end, with the only temporal frame discrepancy being slightly visible towards the end, specifically when player movement is adjusted to the pace of the music. Red Amazon also presents a continuous timeframe that is mostly in-sync with the real-world temporal frame, mainly relying on temporal bubbles used to separate

gameplay into distinct, hidden “scenes” aimed at adjusting the game’s pacing into something more dynamic and sudden, ultimately creating specific narrative beats within the timeline.

Finally, the third (and most complex) way can be observed in **WarioWare, Inc.: Mega Microgames!** and **Port of Call**. In specific, those games feature both temporal warping and temporal bubbles throughout their durations. Although WarioWare is not a typical short-form game, it does present a dynamic aspect by presenting players with constantly changing mini-games. In the same time, Port of Call also handles time very differently as it spawns and teleports game objects constantly throughout its duration, with apparent visual scene changes happening in an otherwise stagnant-looking temporal situation.

4.2 Prototypes

Structurally and thematically, the questions used for the testing of each developed game can be split into three separate areas worth analysing, those being:

- **Time**, and how it affected players throughout the experience;
- **Emotional response,** and whether players recognized emotion(s) same as the ones intended by the game’s design;
- **Focus and clarity** in terms of mechanics and story delivery;

With that being said, most questions asked participants to rate certain aspects for each game on scales from 1-5, with 1 being low, 3 being medium and 5 being high. Other types of questions include closed ones with several choices, in addition to open ones aimed at additional comments on the given games.

4.2.1 Guests (Worry)

First and foremost, it’s important to note that the main goal of this game was to give players the feeling of being pressured by time, this being a focused attempt designed through a recurring sound of door knocking and an overall repetitive way of resetting the game to an almost identical state. Inspired by the idea of presenting a constantly repeating dream, user testing reflected this overall approach with 85.7% stating that they felt restricted by time. This success is also supported with 42.9% of respondents describing the game’s duration to be “just right”, while the remaining 57.1% described the experience as “just right”. It is interesting to note that a big portion of players showed an initial hesitance to opening the door, showing anxiety and doubts towards what would ultimately happen, which essentially sums up the notion of worry portrayed within the game.

Consequentially, with 5 specific emotions being given as options in a multiple-choice question, 71.4% of respondents picked worry as the main portrayed emotion. With this being the overall highest recognized emotion among other options (including Mystery, Sadness, Regret, Worry and Depression), the experience appeared to resonate with players in a way similar to what was intended throughout the game’s design. This positive response is also supported by respondents rating immersion as medium to high. It is of particular

importance to note that most players attributed this immersion to the game's vagueness in telling players what the story behind the portrayed situation was, leading to the conclusion that some short-form games would benefit from an indirect approach of storytelling through atmosphere and subtle hints, instead of presenting a clear to follow experience without much deviation.

This point is only strengthened by results concerning the game's vagueness in terms of its meaning and story, with those being mixed and spanning almost all levels of vagueness, this also being translated into how vague the game's objectives were. Due to the fact that Guests was designed to be a repeating experience with no "correct" endings or interactions, such results are rather normal and descriptive of the game's intended goals. However, despite having such a repetitive and open nature, 71.4% of respondents stated that they can envision Guests as a standalone experience with a longer duration. On one hand, this last result is represented by some testers stating how interested they were in the potential development of the game' story; however, this might also be a representation of the actual mechanics of the game and its overall gameplay structure allowing for longer durations of gameplay.

4.2.2 Paranoia (Thrill)

With Paranoia being a more extreme attempt at understanding how players respond to time-restricted games, it is interesting to see results being rather mixed in terms of players feeling restricted by time, with almost equal numbers being observed across all answers related to the question. In addition, 71.4% of respondents thought that the game's duration was "just right", with the remaining percentage holding the opinion that the experience was too short. In retrospect, perhaps this is a result of the ambiguous nature of the game and its general concept of representing the feeling of being chased. In a way, this also shows that a game's setting can be enough of a factor in justifying a shorter duration, especially if its context is being represented by the appropriate mechanics (which, in the case of Paranoia, were strictly based on the act of running).

However, Paranoia also showed an overall failure at portraying thrill, with only 28.6% of respondents choosing this option. With participants being given five emotions as alternatives (those including mystery, sadness, thrill, insanity and worry), insanity was instead the most picked option (57.1%), which is understandable given the game's environment resembling an empty hospital. In the same time, when it comes to players being immersed, results are once again mixed, with only one respondent rating the experience as highly immersive. In a way, this might be a case of the overall experience being too short, perhaps proving how hard it is for players to get a sense of flow in such extreme cases of time-restrictiveness.

Crucially, this might also be explained by the overall response towards the game's mechanics, with most players describing those as somewhat overwhelming to follow at first. Despite Paranoia's initial tutorial-like segment being aimed at introducing the game's breathing mechanic, having an experience end in less than a minute can ostensibly be a big challenge for explaining gameplay interactions and mechanics, especially if those are somewhat rhythm-based and fast-paced like in Paranoia. However, contrary to the lack of clarity in Paranoia's mechanics, the game's meaning and narrative seemed to have been better realized. In specific, all participants recognized the game's attempt to show a person being chased. Furthermore, most respondents also guessed that the game portrays a potential case of insanity, with one answer describing Paranoia being exactly about a "patient with mental illness, or having a panic attack in a hospital". This further reflects how vague players found the game's meaning and story, with more than half of the questionnaire's respondents pointing towards medium-low vagueness. As such, these results could arguably be a representation of the Paranoia's fictive characteristics, showing how an environment can be crucial in giving further meaning to short-form experiences which are otherwise abstract in their meaning and heavily constricted by time.

4.2.3 Edo (Sadness)

Edo is perhaps the one prototype that deviates from the rest when it comes to how players reacted to its time restrictions. As it stands, the game lasts about three minutes, contains relatively simple puzzles and does not pressure players with any external factors, instead offering a calm environment based on a sad love story. Yet, despite these characteristics, all respondents stated that they felt restricted by time, with the same number of people envisioning Edo as a standalone game with a longer duration. In the same time, most respondents also described Edo's story as "interesting" and captivating, which would lead to the suggestion that the game's short duration restricted the presented narrative by giving it little time to develop and grow.

When it comes to the actual types of emotions experienced by players, there is also a distinct discrepancy between respondents' answers and the ones that were intended by design. In specific, only 20% of players chose sadness, with overall results being mixed almost equally among the rest (those being worry, regret, fright, thrill and other). With that being said, it's important to note that some players seemed to be somewhat worried about a ghost appearing during their play-throughs, possibly due to a piece of text mentioning a ghost in the very beginning of the game's level. Therefore, this false sense of alertness was perhaps a reason for them to disregard sadness as a possible emotion, once again showing the power of short-form games' fictional values in affecting players and their perceptions. In the same time, these results might also suggest how much more difficult it is to portray sadness in such a short time-frame, with worry and thrill being easier to achieve through mechanics without requiring a story to unfold through a longer period of time.

As a direct correlation, results having to do with how vague Edo's story was are also mixed, with almost identical numbers spanning each level of vagueness. While this might be another potential reason for players not recognizing sadness throughout the game, the same indecisiveness can also be seen in the way players responded to the more technical

challenges of the game. Mainly because most mechanics focus on puzzle solving and mental challenge, these fluctuating results are rather normal, leading to the assumption that short-form games would always convey difficulties in the implementation of puzzles. This argument can be particularly valid when looking at the way such mechanics evolve through longer interactive experiences, good examples being adventure games that rely on developing visual patterns and hidden rules for hours on end.

5. Conclusion

5.1 Key findings

Structurally, short-form games are almost identical to interactive experiences that would normally last more than a few minutes - their mechanics aren't unique, and their gameplay concepts can span almost all types of pre-conceived genres. However, in relation to current understandings of game design, many discrepancies can be seen between current norms of design and what actually works in short interactive form. When characterized as experiences constricted to only a few minutes, concepts such as meaning and flow suddenly become more pivotal, turning other traditional gameplay elements related to keeping players interested for longer durations into less essential ones. Furthermore, designing simple to understand mechanics that are central to the intended player experience becomes a key factor for getting the most out short-form games, mainly due to the risk of overwhelming players with too many interactions.

With time being a crucial element of short-form games, an importance on pacing must also be established, particularly when looking at ways in which meaning and emotion can be portrayed within time-constricted durations. As suggested by the six case studies explored in this project's research, short-form games can be paced in numerous ways, mostly depending on whether their design is focused on the use of temporal warping, temporal bubbles or both. In specific, continuously flowing timelines of gameplay focused on short real-world segments can be drastically different to condensed interactive segments representing longer periods of real-world time, with key pauses in a game's main timeline allowing for potential accentuation of tension and suspense. Ultimately, recognizing various types of temporal phenomena within short-form games can result in a better understanding of how different mechanics work, and how games can be paced in a more efficient and controlled way during their development process.

Similar conclusions could be seen in the testing done for this project's three developed games, mainly through explorations of differently-timed interactive segments and how those were perceived by players. Crucially, results showed that achieving deeper, more complex emotions such as sadness can be challenging to do within short time-frames, especially if this involves telling stories involving character and story development. Fiction and setting have also proven to be crucial in giving emotional meaning to short-form games, with both concepts being directly connected to the ways in which mechanics and interactions are perceived within time-restricted interactivity. The usage of puzzle-based interactions and more challenging mechanics, for example, can potentially be detrimental to achieving a sense of flow, mostly due to players having a restricted time to learn those through gameplay. Finally, based on testing results this research would suggest that designing short-form games intentionally is almost impossible, as their existence would always be feasible in longer form as well.

5.2 Proposition for further research

From a theoretical point of view, short-form games can greatly benefit from future research focused on more specific examples of game design in relation to the topic at hand. Although we've already mentioned the lack of existing research when it comes to the viability of time-

constricted games in general, perhaps a better approach would be to narrow down research to specific genres of games, or even base all theoretical assumptions through the spectrum of singular existing design studies on topics such as repetition, abstractness and flow. More extreme focused approaches might be even better, such as designing procedurally generated short-form games that might have the potential to exist as truly unique playing experiences with each new play-through. In general, there is particular potential in researching short-form games and their ability to exist as opportunities for technically-challenging content that would otherwise be difficult to implement on a bigger scale – those including ideas opening possibilities for multiple branching paths existing within only a few minutes, or experimentation with adaptive artificial intelligence.

Such ideas can then relate to different practical ways in which short-form games can be explored. One particularly promising way would be by creating critical games specifically aimed at being instrumental rather than autotelic, as described by Stefano Gualeni *(2013)*. Even now, most critical games can already be classified as short-form (mainly due to their academic purpose), without them being specifically focused on studying time-restricted interactivity. This would be in stark contrast to the games developed for this project, which can be better described as interactive pieces attempting to recognize aspects important for designing autotelic games used for entertainment purposes.

5.3 Broader significance

Based on the points raised in this research, analysing short-form games shows exactly how important it is for interactive experiences to possess focused and meaningful design, no matter their length. In the same time, by restricting games and their length designers can come up with more efficient ways of presenting emotionally significant stories to players. More importantly, all of this shows the potential impact of constraints and how those can be beneficial in the process of creating engaging games containing mechanics and concepts that are only essential to their intended experience. While this research does not offer a definitive answer to the question of short-form games existing as commercially viable products, it does suggest that designing short-form games can allow for more focused and creative ways of portraying emotion and meaning through gameplay.

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Appendices

Appendix A – Red Amazon

Red Amazon

Case Study on the Game's Temporal Frames and Pacing

Genre: First-person exploration

Platform: PC

Brief Summary: A thriller in which players find themselves in a house in the woods. Atmosphere being calm and idyllic, the overall goal is to collect a gun and find all the bullets, both being scattered throughout the surrounding forest and fields. Subsequently, when players reach a certain area of the game a sound of a moving car triggers, followed by the sound of a distant crash which can be heard near the house players started the game in. Going back to investigate results in a meeting with an unknown figure pointing a gun at you, resulting in a split-second decision involving the case of who shot first.

Game duration: 5-10 minutes depending on player action. Unrestricted.
User Interface: non-diegetic, in the form of hollow rectangles in the bottom right corner of the screen representing collected bullets.

User Interface

In terms of the game's menu, it presents a "fake" state of the gameworld temporal frame being paused, with player input resetting the scene and starting the action in the beginning of a house. Although a direct resume function panning the screen downward and towards first-person view might've been more beneficial, this is still a good way to start such short experiences as opposed to a stand-alone, distanced menu.

Use of temporal frames

There is a distinct temporal bubble that can be observed throughout Red Amazon. In specific, the game's temporal characteristics are interesting in the sense that the experience it presents can essentially be split into two separate timelines, both existing within the global gameworld temporal frame – one taking place from the very beginning when players begin inhabiting the game world **(timeline A)**, and another taking the place of the first timeline as soon as players visit a particular area of the game's world **(timeline B)**.

Timeline A can last forever as long as players don't stumble on the specific part of the world that triggers timeline B. This timeline can be characterised as "the calm before the storm" ***(Figure 1)***, as players have the free will to explore their surroundings in order to find the objects they are ultimately looking for – a gun and four bullets. Apart from that, this timeline sets the scene by giving players subtle environmental hints on the potential story behind this experience, with objects such as animal skulls and stashed stacks of money interrupting the otherwise calm and idyllic-looking surrounding space and giving the whole experience an added dose of environmental context.

Timeline B triggers as soon as players visit a specified area of the game, this being a secluded part characterized by animal skulls and bones strewn on top of what looks like freshly dug-up dirt, or mud. More notably, this exact moment always triggers the sound of a car rushing off somewhere in the distance and then crashing. It must be noted that the duration of this event is about 3 seconds in

length, this being *too fast* if thinking in the sense of real-world time (this only being based on observation as there are no coordinative measurements set in-game). In a way, this form of temporal warping gives the game a sudden moment of suspense accompanied by worry and curiosity.

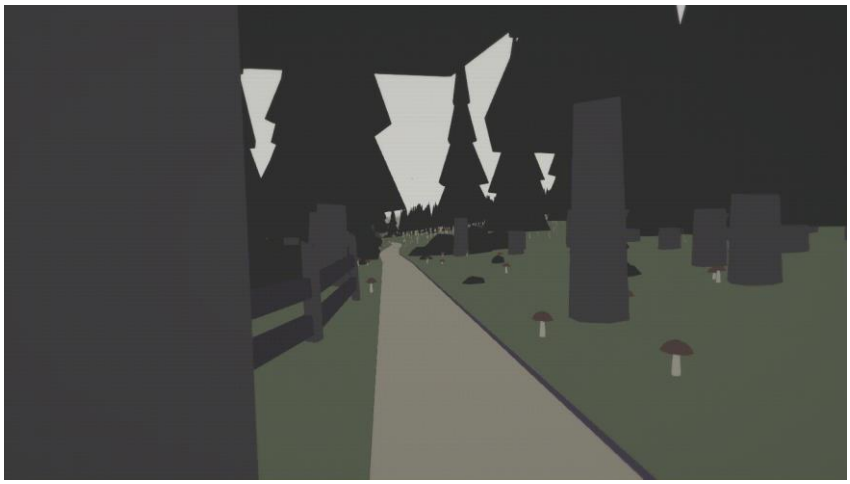


Figure 1

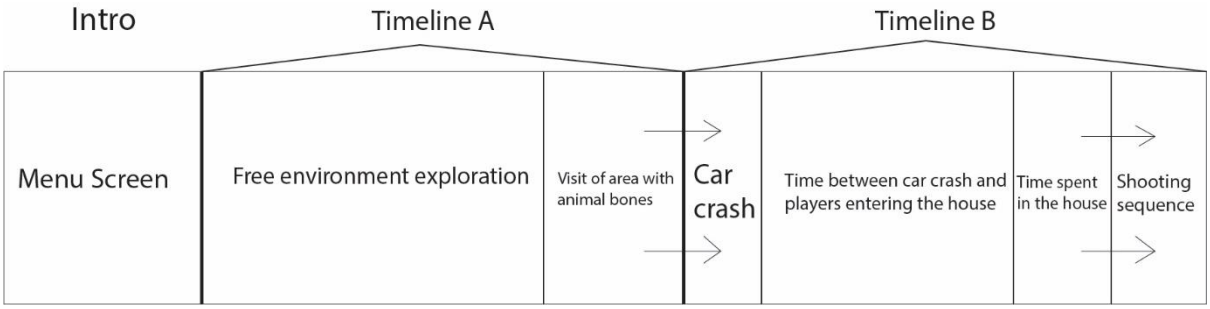
That being said, the first timeline is almost like a representation of a confining place in which the "preparation phase" takes place, this being players exploring their surroundings in search of a weapon and ammo with which they can protect themselves. In a way, this sets the overall scene and makes it almost as if players are anticipating the encounter they are about to have, giving added meaning to what's happening instead of simply presenting a random scenario.

Another temporal phenomenon happens when players decide to go back to the house and investigate, the scene now being changed to showing a car parked next to the house, with smoke coming out of the vehicle. More specifically, the final encounter with the mysterious driver always happens after players enter and then exit the house. If players stay within the house, the "enemy" does not show up, this being another temporal bubble represented by the difference between time inside the house and time in the woods. When players do end up meeting the mysterious driver the gameworld time slows-down drastically for about 2 seconds, followed by a complete time freeze indicating the appropriate ending of the game depending on whether players shot first. ***(Figure 2)*** This quick change of pace does well in wrapping up the suspenseful return to the house.

Figure 2 – Final shooting encounter

In summary, the temporal phenomena mentioned above work towards creating a dynamically scripted sequence of events aimed at creating suspense and, ultimately, delivering a final tense moment of resolve.

As such, timelines A and B consist of separate, independent sub-sections that present individual secluded time segments which interplay together into shaping a well-timed short-form interactive experience. *(Figure 1)*



Appendix B – The Plan

The Plan

Case Study on the Game's Temporal Frames and Pacing

Genre: 2.5D Sidescroller

Platform: PC (Steam)

Brief Summary: The Plan is a game in which you play as a fly ascending towards a lightbulb. Although at first it seems like players are moving up towards the sky, it is only towards the end that users realize where they're headed. As such, the game offers an interesting and rare perspective of the life of a fly, arguably presenting players with the unique viewpoint of a creature and its understandings of the world surrounding it. When it comes to temporality, most notable aspects of the game's time involve interplay between the timing of various arbitrary game obstacles appearing on screen, in addition to music and effects dictating the overall pace of the game.

Game duration: 3-5 minutes (unrestricted)

User Interface: non-diegetic, in the form of start/pause game menu screens.

User Interface

The menu presented at the very moment when players boot up the game doesn't stop gameplay, but simply shows the fly (player avatar) performing menial tasks - thus creating the illusion of time passing by normally (the same case applying to opening the pause menu). Even after clicking START, the only visual change happening is the menu disappearing, with the rest of the scene remaining exactly the same. This type of temporal warping creates the illusion of the gameworld time continuing to pass on even when players pause the game, when in reality it's in fact paused. Arguably, this also strengthens the feeling of players direct taking control of the fly, stripping it away from whatever it's doing at the current moment and guiding it to its ultimate destiny. In that way, responsibility for player actions is subtly enforced through the artificial representation of the gameworld time running, even though players are not allowed to cause gameworld events.

Use of temporal frames

Moving on with the actual game taking place, events such as wind howling and leafs passing by (both of which directly affect player movement speed and trajectory) are triggered whenever players go past specific, pre-defined trigger points. Therefore, gameworld time is not continuous and does not represent real-world time directly, but bends to the actions of the player when it comes to visual obstacles. It is worth noting that while the element of invisible triggers seems to be integral for most games, this way of handling game events presents a temporal bubble between player movement and environment events. More specifically, mechanics like wind beginning to howl are paused, while player movement is continuously running. The only time in which movement is completely halted is during one moment towards the beginning in which players are rendered immobile due to getting caught in a spider web. Although this does not pause the gameworld time, it is worth noting that there is no real visual representation popping-up on the screen, leaving it up to players to figure out how to escape.

Figure 1 – Wind disrupting player trajectory

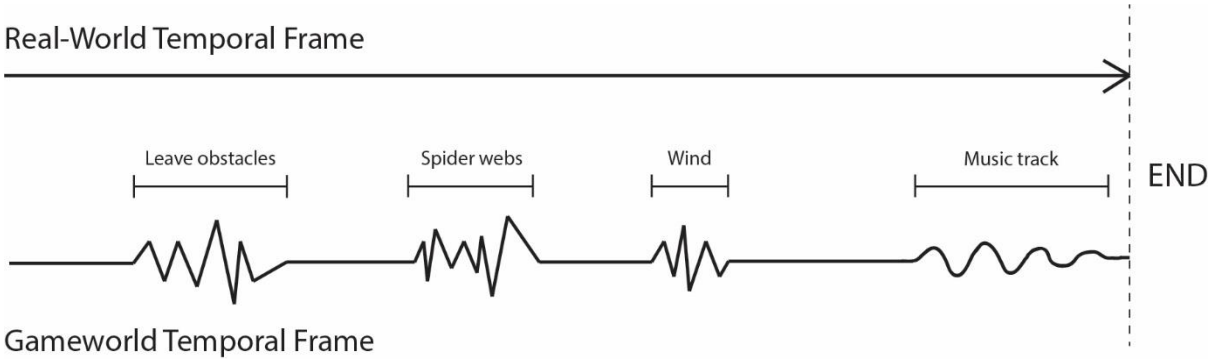
Crucially, it is the build-up of obstacles such as leaves, wind and spider-webs that leads to (arguably) the most emotionally-engaging part of the game. In specific, the game's main music track triggers when about 70% of the game has been completed (as in players have reached a certain pre-set altitude). However, after this point in time player movement is slightly adjusted in a way so the music track would always finish in the exact same length. This is an interesting aspect worth noting, mainly because in most games music adjusts happen depending on player actions – e.g. The Legend of Zelda: Skyward Sword's adaptive music changes when players enter the marketplace, with different songs starting to play depending on the current store players are in (this being a change that crucially happens dynamically via fade-ins/fade-outs). However, in the case of The Plan music adjusts the gameworld time, warping it and slowing down player movement where necessary in order for the game to end on a specific bar of the track that is being played.

By utilizing such self-adjusting temporal frames, both of which are within the gameworld frame, the game paces itself dynamically in order to achieve a "perfect ending" in all cases – and this works well because The Plan is an extremely simple game when it comes to its mechanics, with not a lot of elements being there to control in the first place. Of course, this is arguably at the cost of each playthrough being almost entirely identical, but in the same time this manages to strengthen the impact of the final moment of the game. And yet again, the adjustment of player movement to be slower than normal is key at this specific portion of the game, creating the illusion of slower

advancement through a larger space dictated by all gameworld events appearing slower than normal.

Ultimately, perhaps the most important thing to note is the fact that The Plan never uses any coordination or fictive temporal frames. Throughout the majority of the game, real-world and gameworld time flow continuously and what this manages to achieve is a direct and non-intrusive experience.

Below is an illustration of the described subtle temporal phenomena:



Appendix C - Passage

Passage

Case Study on the Game's Temporal Frames and Pacing

Genre: Top-down 2D exploration game

Platform: PC, Mac, iOS

Brief Summary: Passage is an experimental game aiming to portray the inevitability of life. It always takes 4 minutes and 45 seconds to complete, representing the life of a man through a screen that changes as time goes on. Players have the option to explore the world alone or do so after marrying a female NPC in the beginning of the game, which ultimately restricts access to certain areas that would otherwise be navigable. Even if players decide to remain idle, character position slowly shifts to the right until it reaches the edge of the screen, ultimately resulting in a tombstone replacing their body. As such, Passage portrays sophisticated aspects of life and death through its mechanics.

Game duration: 4 minutes and 45 seconds.

User Interface: non-diegetic, in the form of a single timer displayed in the top right corner of the screen. The number increases with each step players take towards the right-hand part of the screen, displaying the score of the game.

User Interface

Similar to the game's aesthetics, its UI is very minimalistic, consisting only of a timer counting up and rendered in the top-right portion of the screen. Its only functionality is to represent players and their advancement through the world, with the timer increasing by steps of 1 if players are walking alone and in steps of 2 if they've encountered and married a female NPC in the beginning of the game. The number also increases by 100 in several cases where players activate certain objects within the game's world.

It is important to note that the number does not in fact represent time, since characters on the screen appear to age regardless of whether it ticks or not. For example, you might end the game at a score of 690, or 590, or even 0. Therefore, the number represents nothing but the passage itself, perhaps how “efficiently” players have used up their time in the sense of an arbitrary score. It is interesting to observe that this efficiency is also directly related to whether players decide to meet with their love in the very beginning of the game, since many areas of the world are only accessibly only by one character and obstructed if two attempt to pass.

It is also important to note that this timer advances only if players walk to their right hand-side.

Use of temporal frames

Time is perhaps the element most inherent to Passage, which would make sense since the game is mostly a metaphor for one’s journey through life. As such, in Passage time is inevitable because it passes regardless of what players do, a potential ending even being one where no movement is involved. With every single playthrough taking exactly 4 minutes and 45 seconds to complete, Passage’s ending always involves the player character(s) slowly aging and subsequently dying (this being represented by the appearance of a tombstone after time has fully passed).

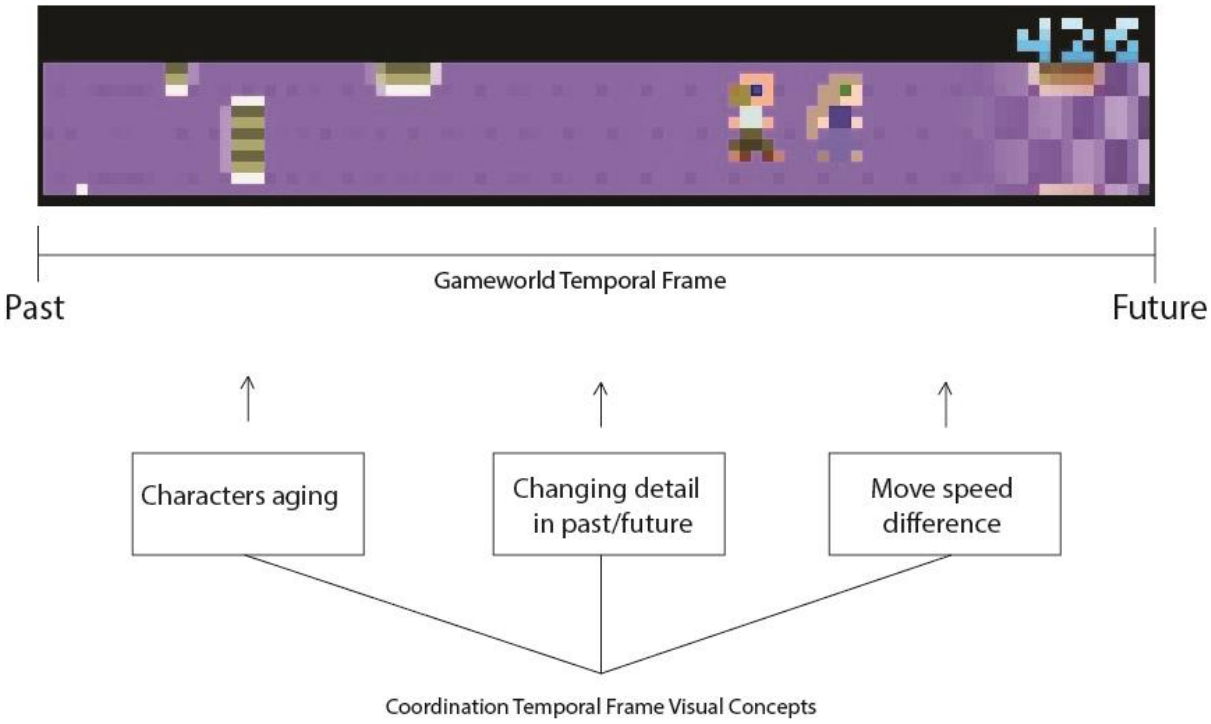
Crucially, the fact that every playthrough lasts the same duration means that the gameworld temporal frame is consistent and undisrupted throughout the game, while also being exclusively hidden to players. This concealment is crucial to portraying the inevitability of time, despite the obvious temporal warping that is at display (as in, you can’t portray a whole lifetime using real-world temporal time).

Although time progression in the coordination temporal frame is not represented in any obvious UI form, it is instead subtly visualized by several visual techniques. For example, the beginning minutes of the game show the future (right portion of the screen) blurrier than the present (left portion of the screen). However, as time goes by the present becomes the past, more distant and harder to comprehend aesthetically compared the future, which now appears as the present since players have slowly advanced towards the right-most side of the screen. In a way, the screen is in fact a timeline representing, with the end naturally meaning death.

Another visual technique has to do with the player characters themselves and the way they age with each passing second (this being tied to the constant clock ticking in the background). Jason Rohrer himself acknowledged that this was intentionally designed to be a slow process in order to replicate the real-life phenomenon of aging and how it can be unnoticeable to one’s self. (Thompson, 2008)

Finally, movement speed is the third visual phenomenon that indicates a change of pace, showing time advancing without it being apparent to players. On one hand, this strengthens the feeling of characters aging, and on the other hand it directly restricts how fast the game’s score advances (that being the number in the top right part of the screen).

As such, these three visual phenomena can safely be categorized as variants of coordination temporal frame concepts, an idea that is visualized below:



The Mammoth: A Cave Painting

Case Study on the Game's Temporal Frames and Pacing

Genre: Top-down 2D exploration game

Platform: PC, Mac, Android, iOS

Brief Summary: A game in which you play as a mammoth mother looking for her children. After going away from your herd and find your children you realize that the herd is gone, resulting in a short search leading you to spear-wielding humans hunting your small ones. In defending them you reach a human settlement, with your only options being to either destroy all dwellings (essentially turning into the hunter) or succumb and die. At the end, you see the remains of your herd. All of them were killed.

Game duration: 3-5 minutes

User Interface: Diegetic, rendered as static elements appearing as parts of the gameworld. There are also some non-diegetic elements

User Interface

The Mammoth: A Cave Painting's UI can be seen both as diegetic and non-diegetic.

From a narrative sense, one could argue that all UI is strictly diegetic due to the whole game being meant to represent a dynamic cave painting with stylized visuals reminiscing ancient drawings (which often used to depict short stories). With that being said, specific UI elements acting as tutorials are drawn as parts of the level that players traverse, mostly being rendered on the ground as scribbles indicating the game's controls.

In the same time, there are prompts in the top corners of the screen showing current essential interactions. Crucially, those appear more as static HUD elements which aren't connected to the game level itself. Therefore, those might be classified as non-diegetic elements as opposed to the previously described tutorial pieces that are part of the levels themselves.

However, the most important thing to note is that The Mammoth's UI appears cohesive with the environment and works well with the game's narrative, appearing cohesive and non-intrusive in relation the game attempting to portray a cave painting. ***(Figure 1)***

Figure 1

Use of temporal frames

The main noticeable temporal phenomenon in The Mammoth: A Cave Painting is **temporal warping**, which occurs due to the gameworld frame and the real-world frame appearing inconsistent. This is mostly due to the fact that the game starts out by showing players being surrounded by a herd of mammoths and ends with the whole herd shown dead (represented by their skeletal remains scattered on the fields). ***(Figure 2)*** As such, it is unreasonable to think that such an occurrence would be possible to unfold in the manner of 3-5 minutes from the perspective of the real-world time, hence why temporal warping is present.

Figure 2 – The game's ending scene

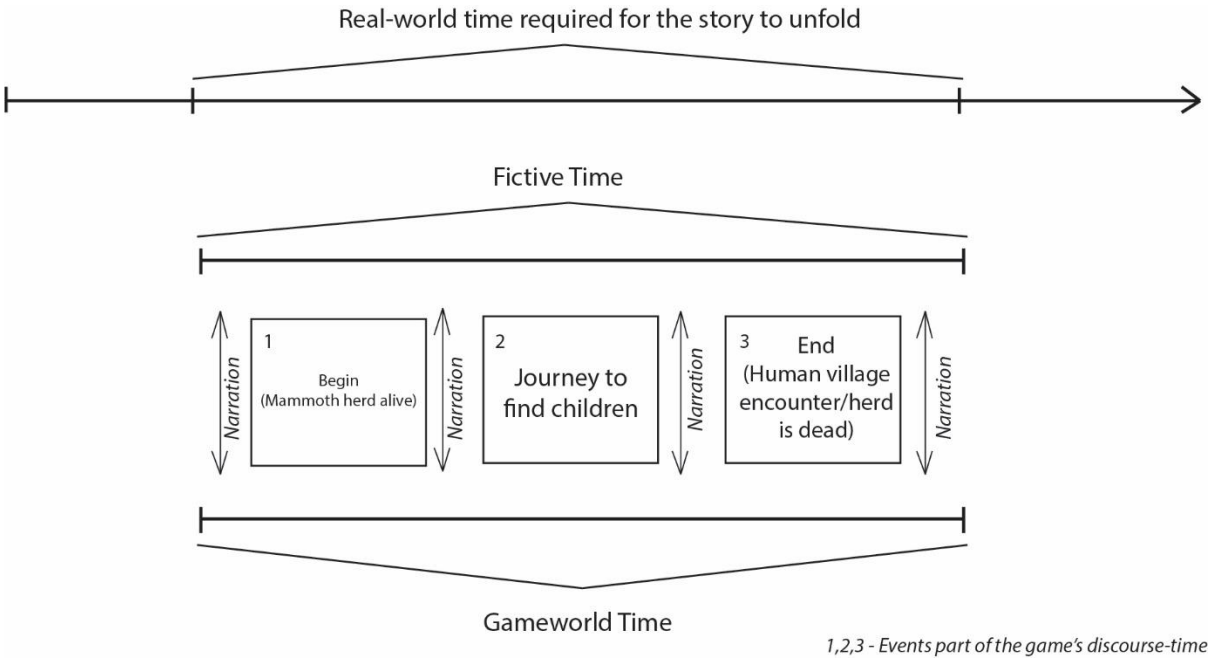
Apart from temporal warping, narration plays a key part in dictating The Mammoth's overall timeline. In specific, narration gives specific meaning to the game's fictive temporal frame by adding an explanation to the subset of events that are taking place. The discourse time and narrative time are therefore being summarized in real-time, with different lines being played depending on player actions. In a way, this manages to give the game's pacing a more dynamic nature ruled by cause and effect.

Crucially, this manages to successfully create the feeling of the game simply being a representation of a short portion of real-world time in which players are listening to a tale that's being told to them by another person. Although players are also agents and affect the gameworld and its story directly through their actions, this angle can provide a different and more interesting look at the relation between the gameworld and real-world temporal frames. In specific, from this point of view we can begin to observe a consistent flow of events that are in sync with the pace of which the narrator presents the story, which would indicate to a synchronization between the gameworld and real-world time from that point of view.

This relation is unique to the case of games which contain adapting commentary, but what all of this achieves is a semi-false sense of agency for players, making them feel as if they are the ones who shape the outcome of the story that is being told.

In summary, there are two ways in which we can look at the relation between the gameworld and real-world temporal frames, both of which are dictated by The Mammoth's narration, which is a tool of the fictive temporal frame.

A visual illustration can be seen below:



1,2,3 - Events part of the game's discourse-time

Port of Call

Case Study on the Game's Temporal Frames and Pacing

Genre: First-person exploration

Platform: PC

Brief Summary: Players step in the shoes of Marcus, in an abstract spiritual world which resembles the afterlife. With Port of Call being mostly set in the premises of a boat docked in a port, the game's main task involves players collecting tickets from boat passengers, those being given as objectives by the ship's captain. Those mostly involve talking to NPCs and learning their stories. After some time players begin realizing that they were key participants in each of those stories, the passengers being close ones to Marcus that have died in the past. In the end, the game presents players with a branching choice between staying in the afterlife and returning to being alive.

Game duration: Roughly 30 minutes

User Interface: Non-diegetic

User Interface

Port of Call's user interface is solely non-diegetic, both in terms of the introductory menu and the in-game HUD elements such as conversation texts.

An obvious moment when multiple temporal frames intertwine is when players initiate a conversation with any NPC, with the event triggering a text-based conversation system appearing on the screen. This moment of gameplay can safely be summarized with gameworld time appearing as if it's paused, with gameplay then jumping into interface time in which players have unlimited real-world time to make their conversation choices.

Use of temporal frames

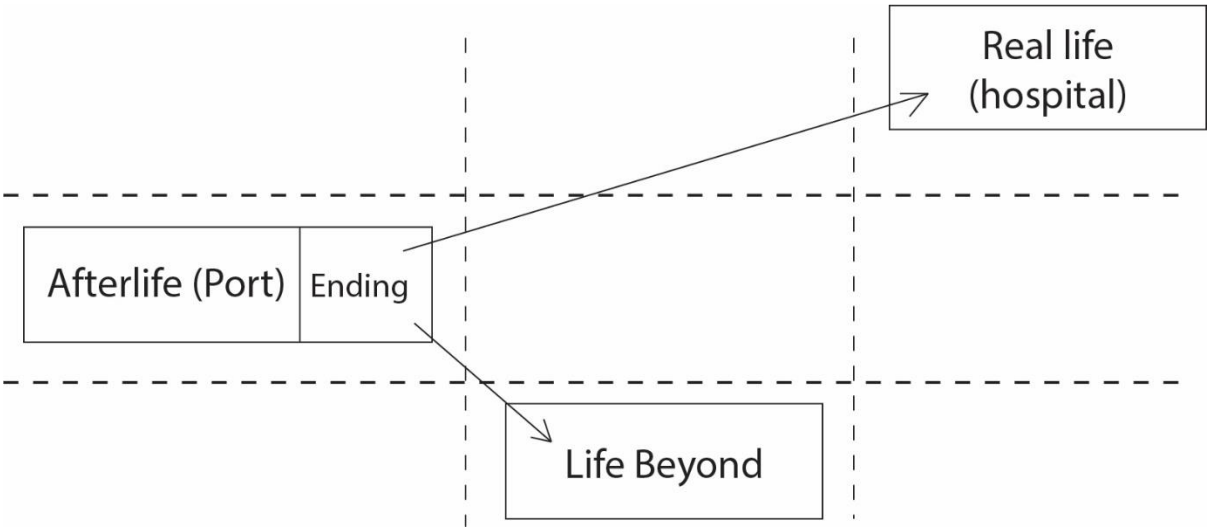
As Port of Call takes place in the afterlife, there are various visual and gameplay elements that result in time appearing inconsistent and staggered. For instance, throughout the game objects constantly appear and disappear behind players' backs. Good examples are the very beginning of the game (which consists of players walking on a solitary dock amidst the sea) and the way a female silhouette spawns twice in the vicinity of players while they are turned towards the opposite direction, in addition to a whole ship appearing behind players' backs. ***(Figure 1)*** Another example is when interactive objects of interest spawn at places where they weren't visible/active before, such as the ship's elevator gaining a "down" button after players talk to a certain in-game NPC. There is also the case of NPCs slowly fading out in front of players' vision, which further maintains the gameworld's otherworldly atmosphere and feel.

Although often small in significance on their own, those are intentionally designed moments that add up to achieve a certain sense of irregularity in the temporal frames of the surrounding world. It's safe to say that they essentially present temporal warping between the real-world and the gameworld temporal frames, as the very idea of a ship appearing behind players in the matter of seconds would not be feasible in a real-world sense.

Figure 1 – Ship appearing on the docks

It is also important to note that from a narrative sense the game implies that the place players inhabit is in fact a stagnant timeline that exists separately from the real world. From a narrative sense then, these described moments of temporal inconsistency appear to be contained within this void space. The game gives further context to this idea with its ending – a moment in which players must choose to either go back to the painful real world or travel to a place "beyond" where they can reunite with their deceased beloved ones. If players choose to return to the real world, the game then indicates a successful path by playing a beeping heart-rate monitor, indicating that players are back to being alive and potentially now situated in a hospital (all of this being suggested by the narrative discourse throughout the game).

Therefore, we could summarize that the world of Port of Call in fact represents a paused state of its own fictive "real-world" time. The choices presented during the game's ending only give two options to players – to either un-pause time and go back to the so called fictive "real-world" time, or to stop living in intermission and move on to some place beyond that would potentially contain its own unique temporality.



WarioWare, Inc.: Mega Microgames!

Case Study on the Game's Temporal Frames and Pacing

Genre: Party game/ rhythm action puzzler

Platform: Game Boy Advance, Nintendo Game Cube, Nintendo 3DS, Wii U

Brief Summary: WarioWare, Inc.: Mega Microgames! is a collection of mini-games based on real-life sports and activities, puzzles and popular Nintendo franchises. Players are pitted against various enemies (Wario and his friends), with each opponent representing a level containing at least 15 mini-games that take about 3-5 seconds to play through. Failure is instantaneous and restarts any progress tied to the specific level, with players being able to choose opponents and replay rounds at faster speeds.

In the same time, there are several boss battles throughout the game in which mini-games are not present and there is no time limit. Apart from those, WarioWare, Inc.'s gameplay is constantly repeating and based on failure, often meant to be misleading by presenting players with different scenarios that break normal rules and conventions.

Game duration: mini-games lasting between 3 and 5 seconds, the overall duration of the game can add up towards several hours.

User Interface: almost exclusively diegetic, being rendered within in-game objects such as television sets and handheld consoles. In the same time, non-diegetic UI is also present with some text pop-ups and gameplay indications appearing within the aforementioned "interface within interface" systems.

User Interface

Almost everything in the game is dictated by its user interface (UI), since most interactive sequences consist of mini-games that take place within various in-game interfaces resembling real-life objects. That being the case, user interface appears to be almost exclusively diegetic due to most HUD elements being placed within various hardware pieces rendered on the screen; the main menu that is used to navigate the gameworld and to initiate rounds is a resemblance of a PC desktop, while each set of mini-games is visualized through interfaces such as in-game television sets, handheld consoles, virtual reality visors, mobile phones and so on.

As for the WarioWare's non-diegetic UI, the best example comes at the start of each round when gameplay is preceded by a quick text pop-up appearing on the screen, indicating as to what players must do – this text usually displays strings such as "attack", "dodge" or "jump". Usually it's only one word, and as such this brief, yet rapid tutorial proves to be immensely valuable for giving quick meaning to the upcoming three seconds worth of gameplay that each round possesses. These non-diegetic UI elements also visualise the coordination temporal frame, coordinating player input in different stages represented by timed rounds.

Without the presence of these non-diegetic Ui elements, arguably it would be much more difficult for players to understand the context behind each mini-game due to the extremely short amount of time the nature of the game allows for any kind of tutorian and exposition. Instead, these

coordinative temporal concepts (rounds, timers) provide just enough guidance for players whenever they encounter an interaction for the first time. A good example of this is a mini-game involving players controlling a car on a football field, with two footballs rolling around. The text preceding the round states “flee”, and by doing so it manages to state the clear goal of the upcoming short scenario. If there wasn’t any text, then most players would instead go towards the balls instinctively – with that resulting in a failed round and a triggered restart.

Use of temporal frames

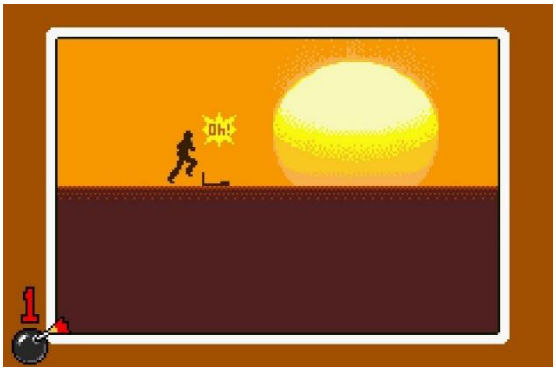
Concepts related to the coordination temporal frame are very apparent throughout WarioWare Inc., as each game “level” is represented by Wario and his friends and is being split into at least 15 distinct rounds, each lasting only a few seconds. The arrival of those rounds is indicated by a number appearing on-screen in various forms depending on the level players are in. In addition, each round has a separate timer ticking from 3 to 0 in various speeds, indicating when the particular mini-game will end. This manages to visually segment gameplay into key stages, all of which indicate the beginning and end times of several temporal frames co-existing together (but never at the same time.

For example, the gameworld temporal frame can essentially be split into three sections:

1. Game overworld time – encapsulates the timeline containing the area in which players select levels, challenges and various areas in the world.

2. Level time – encapsulates the timeline of each enemy (Wario and his friends) and their distinct screens containing micro-games.

3. Round time – encapsulates the timeline within each separate round (mini-game).



While the game does not show this visually with any coordinative methods, it can also be concluded that each sub-section of the gameworld temporal frame is paused whenever another one is active, and then resumed only when the main focus goes back to it. In other words, a temporal bubble is present throughout the game, its elements being the three sections described above.

That being said, temporal warping is present both in the level and round timelines, with the only static frame being game over-world one. During the level frame, time plays out differently depending on how many rounds players have succeeded in going through, this being visible due to the UI showing prompts saying messages like “SPEED UP!” which narrow down the time between the activation of each round. In this way, the game creates additional tension in players by restricting the down-time between each mini-game – a restriction that can create quite intense situations when players are down to their final life. (Each level gives players 4 lives, those representing the maximum number of failed games allowed during said level segment.) The same type of temporal warping translates to time within each round, as an equal reduction of time can be seen there, too.