Temporal Agency and Timeplay in Video Games

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ABSTRACT

This paper examines temporal agency in video games, referred to as the player's ability to manipulate time within the game world, to make decisions, and to observe their consequences. Building on existing scholarship about ludic agency and ludic temporality, this paper utilizes analytical formalism to examine how games with time manipulation, particularly those with recursive temporal mechanics, shape gameplay experience. The analysis identifies four key forms of Timeplay (gameplay with time): Adaptive, Strategic, Ethical, and Reflective, each emphasizing a unique aspect of the player's relationship with time. By analyzing selected games, this paper demonstrates how each form of Timeplay provides players with distinctive forms of temporal agency, deepening our insights into the interplay between time, choice, and the gameplay experience. This paper offers a framework for understanding and analyzing the multifaceted ways players engage with time in video games, expanding the existing analyses of ludic temporality and broadening our understanding of ludic agency.

Keywords

temporal agency, ludic agency, game time, time manipulation, time loop, replay

INTRODUCTION

Temporal agency[1] in video games refers to the player's ability to control and manipulate time within the game world to shape their experiences and outcomes. Unlike the uncontrollable flow of time in real life, games offer a structured environment where players can experiment with time, make decisions, and observe their consequences. This paper explores how, with their intricate rules, dynamic environments, and diverse challenges, video games offer a contemporary space to play with time and practice temporal agency in diverse ways.

The human fascination with predicting and managing uncertainty has deep historical roots, evidenced by the long tradition of games of chance and divination. From ancient divination rituals to modern artificial intelligence, individuals have sought

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ways to understand and influence the course of events. Ginzburg's (1992) work on the "evidential paradigm" examines how ancient hunters developed the skill to "record, interpret and classify" infinitesimal traces—such as tracks, broken branches, and scents—to reconstruct the movements of their prey. This act of inferring a narrative that could not be directly observed from seemingly insignificant signs demonstrates a fundamental exercise in temporal agency. Ginzburg highlights how the invention of writing revolutionized the interpretation of traces in Mesopotamian divination, allowing diviners to record and analyze signs over time. By systematically observing patterns and refining their methods, diviners could exercise temporal agency, building a predictive framework grounded in accumulated knowledge.

Games of chance, like divination, offer a structured way to navigate the inherent uncertainties of human experience. Csikszentmihalyi and Bennett (1971) discuss how games evolved from ritualistic divination practices intended to seek guidance from unpredictable forces. While earlier divination methods aimed to influence the uncontrollable forces of nature (unstructured uncertainty), games of chance gave individuals temporal agency over uncertainty by creating a controlled environment (structured uncertainty) where personal skill could be tested within a system of defined rules and limited outcomes. Dice, for instance, replaced the unpredictability of natural phenomena with a manageable framework for confronting uncertainty. This allowed players to experience and respond to randomness in a way that felt more within their control. Similarly, ancient board games such as Senet, Hounds, Jackals, and Go were deeply intertwined with spiritual meaning, often incorporating rituals and elements of chance to engage with fate and the supernatural (Flanagan 2009, 68).

In the context of video games, designing for uncertainty has been explored extensively (e.g., Costikyan 2013; Deterding et al. 2022; Kumari et al. 2019; Kumari 2021). By allowing players to interact with complex, dynamic systems where the consequences of their actions are not always predictable, video games provide a contemporary space for fostering a deeper sense of temporal agency. Scholars highlight how games offer a platform to explore various forms of agency, enabling players to step into diverse roles, environments, and scenarios. Nguyen (2020) argues that "games are a method for capturing forms of agency," emphasizing that they function as a "library of agencies," providing a range of pre-designed agential experiences for players to engage with and internalize.

Galloway (2006, 2) contrasts video games with static photographs and films, asserting that "video games are actions." Building on this idea and drawing from earlier theories[2] of ludic agency, Mukherjee (2015, ch. 7) argues that ludic agency is a dynamic, temporal process of "becoming" that challenges traditional, static models which view player agency as a function of predefined possibilities set by the game designer. Mukerjee offers a more fluid understanding of player agency, describing the game space as a "zone of becoming"—a temporal space where player actions and game mechanics interact, creating a collaborative and evolving experience. This highlights how ludic agency is constantly in flux and never fully realized. Bódi (2022) further analyses how different design contexts and production histories shape player agency, adding another layer to our understanding of how agency functions within games.

Exploring temporal agency as the subset of ludic agency offers new insights into how players engage with and shape their experiences in video games. This paper will explore the various ways players exercise temporal agency in video games by

examining their interactions with time manipulation mechanics. The analysis will draw upon existing theories of ludic agency and ludic temporality, particularly the concepts of “temporal frames” (Zagal and Mateas 2010) and “temporal recursion” (Hanson 2018). By examining various games that utilize time-manipulation mechanics with analytical formalism (Mitchell and Van Vught 2023), this paper aims to provide a deeper understanding of how temporal agency shapes the player experience and offers a typology of gameplay with time. Through an initial analysis of how time is incorporated into gameplay, a selection of games was chosen for a more detailed examination. This analysis identifies and discusses four distinct forms of Timeplay—Adaptive, Strategic, Ethical, and Reflective—and illustrates how each timeplay emphasizes a unique aspect of the player's temporal agency within virtual worlds. The paper will conclude by suggesting that broadening the scope of timeplay to incorporate additional dimensions of gameplay can deepen our understanding of time and agency in video games.

TEMPORAL AGENCY

Temporal Frames and Temporal Manipulation

Several studies have explored the concept of time, as well as time perception and cognition, in video games (e.g., Aarseth 1999; Atkins 2006, 2007; Hitchens 2006; Juul 2004; Lainema 2010; Lindley 2005; Nitsche 2007; Stamenković and Jaćević 2015; Tychsen & Hitchens, 2009; Wolf 2001). In their paper on game temporalities, Zagal and Mateas (2010) introduce the concept of temporal frames as a framework for analyzing how time functions within video games. They identify four primary temporal frames—real-world time, gameworld time, coordination time, and fictive time—and explore their dynamic interactions. The authors investigate how games offer opportunities for time manipulation by analyzing how the relationships between different temporal frames are altered when players interact with and control time within the game.

Zagal and Mateas explore various game mechanics that manipulate time, such as the option to skip turns in turn-based games like *Power Grid* (Friese 2004) or the respawn delays in team-based shooters like *Team Fortress 2* (Valve 2007) and *Wolfenstein: Enemy Territory* (Splash Damage 2003). These mechanics introduce a temporary “loss of turn,” which disrupts a player's ability to act and impacts the game's flow. This disruption is described as an alteration of coordination time, which concerns the synchronization of actions among multiple players or in-game agents. Such manipulations affect players' perception of the game's pacing and influence their strategic decisions.

In many action-adventure games, like *Max Payne* (Remedy Entertainment 2001) and *Prince of Persia: Sands of Time* (Ubisoft Montreal 2003), time manipulation mechanics allow players to slow down or rewind time for tactical advantage. Similarly, simulation games such as *SimCity 4* (Maxis 2003) give players control over the game's pacing. The authors refer to these forms of time manipulation as alterations of gameworld time, which governs the passage of time within the virtual world. By adjusting this temporal frame, players can control the speed at which in-game events unfold.

In racing games, ghost racers represent a player's past performance, acting as virtual markers of improvement without directly affecting the current race. This allows players to compete against their own previous times without impacting the current

race. Similarly, in games like *Cursor*10* (Nekogames 2008), players interact with their own "ghosts," where past actions influence current gameplay. This form of temporal manipulation is referred to as an alteration of gameworld time, where multiple temporal frames overlap, creating a dynamic interplay between past and present.

In narrative-driven games like *Chrono Trigger* (Square 1995) and *Shadow of Memories* (Konami 2001), time travel is a central mechanic that allows players to alter past events to shape the future, creating a web of cause-and-effect relationships that deepen the storyline. This type of time manipulation is referred to as an alteration of fictive time, which pertains to the narrative and sociocultural context of the game. Through these manipulations, players engage with the game's story in a more interactive and meaningful way, influencing the events within the game and how the narrative unfolds.

Game Time and Temporal Recursion

In *Game Time* (2018), Hanson examines how video games offer players a distinctive form of temporal control, enabling them to manipulate time within the game world. This power to pause, rewind, slow down, or fast-forward events is deeply embedded in the computational structure of games, which function as "state machines." In these systems, the game world exists as a sequence of discrete "game states" that change in response to player actions, creating an interactive feedback loop. Hanson argues that the development of time-manipulating features such as pausing and saving has significantly enhanced player agency, allowing individuals to exert control over time in ways that are not possible in traditional media. Hanson traces the evolution of these mechanisms, noting that early gaming consoles like the Fairchild VES introduced the concept of pausing with a "Hold" button, which allowed players to halt gameplay temporarily. Later consoles like the Mattel Intellivision moved this functionality to the controller for increased accessibility. Today, most video game controllers feature a dedicated pause button, enabling players to stop gameplay for strategic reflection or simply to take a break. While pausing can disrupt the flow and immersion of gameplay, Hanson points out that some games, like *flOw* (Thatgamecompany 2006), have adjusted the pause system to minimize this interruption. Multiplayer games like *Destiny* (Bungie 2014) restrict pausing to maintain fairness in competitive play, while games like *Desert Bus* (Absolute Entertainment 1990s) eliminate pausing altogether, offering an uninterrupted, continuous experience.

Pausing allows players to reflect on narrative choices, adding depth to player-driven storytelling. Alongside pausing, save mechanisms have played a pivotal role in shaping the temporal experience of games. In *Introduction to Game Time* (Juul 2004), Jesper Juul describes "save games" as manipulations of game time, allowing players to save the game's state at a particular moment and later resume from that point. Reflecting on his experience with *Half-Life* (Valve Software 1998), Juul highlights how the "save-try-reload" cycle becomes crucial, as replaying entire levels after a mistake would be frustrating. Similarly, Hanson traces the development of save mechanisms, observing that early games like *Colossal Cave Adventure* (Crowther, 1976) lacked save functionality, mainly due to their short duration. However, as games became more complex, the need for save systems grew essential. The introduction of battery-powered cartridges, such as those in 1986's *The Legend of Zelda* for the Nintendo Entertainment System (NES), enabled more intricate save mechanisms, enabling players to continue their progress in larger, more detailed worlds (Tobin 2016). Although some games limit saving to increase difficulty, save systems have become a

foundational feature in modern gaming, giving players more agency and allowing for richer, more dynamic experiences.

Hanson discusses the concept of temporal recursion—the player's ability to control time in more sophisticated ways. While repetition has historically been used to extend gameplay and boost profitability (Hanson 2014), temporal recursion adds a layer of interactivity and strategic depth. Games like *Prince of Persia: The Sands of Time* (2003) and *Blinx: The Time Sweeper* (Artoon 2002) allow players to rewind or slow time to correct mistakes or gain advantages, adding a new dimension to gameplay. *Braid* (Number None 2008) takes this concept even further by weaving time manipulation into its narrative, with each level offering new ways to interact with time. These mechanics challenge traditional ideas of immersion and flow, as players are constantly aware of their ability to influence time, making repetition not merely a tool for skill improvement but a complex, engaging element of the game.

Some games, like *Life is Strange* (Dontnod Entertainment 2015), take temporal manipulation as a core mechanic, using time-rewinding to let players explore different outcomes and reflect on the consequences of their choices. This feature allows players to engage with complex and challenging issues, such as sexual violence, in ways that would be impossible in real life. On the other hand, games like *A Dark Room* (Doublespeak Games 2013) use time-based systems that initially restrict player actions with cooldown timers. Over time, players gain greater control, highlighting a shift from limitation to agency. This tension between restriction and freedom is central to the player's experience of time, revealing how the constraints of the game shape the player's role and interaction within it.

Temporal Agency & Timeplay

Zagal and Mateas (2010) provide an analysis of temporal manipulation in video games by examining how different temporal frames are altered when a player controls or manipulates time within the game. Their study highlights the temporal manipulation through shifts in the game's temporal frame. However, their analysis does not fully explore the concept of player agency in relation to these temporal alterations. It does not discuss how the manipulation of time changes the player's sense of control over the temporal dimensions of the game and how such control might foster unique player experiences tied to their ability to shape time.

Similarly, Hanson's (2018) work on temporal recursion focuses on games with time manipulation mechanics, particularly those involving active temporal manipulations, emphasizing how these mechanics can offer players greater control over their interaction with the game world. However, Hanson's analysis does not investigate the nuanced sense of temporal agency that arises from engaging with different recursive temporal structures in relation to the game world. While this work highlights the empowering effects of temporal manipulation, it does not delve into how these temporal mechanisms cultivate a distinct form of agency that may offer players a more intricate and varied experience of navigating temporal possibilities.

We believe we can complement these works with a more focused examination of how temporal manipulation in games—particularly recursive time mechanics—contributes to the development of a player's sense of temporal agency. The study will analyze foregrounded temporal devices in video games and categorize them into four key forms of Timeplay. By exploring how players can actively shape and influence time

within the game world, the paper seeks to provide a deeper understanding of how these temporal dynamics foster unique, player-driven experiences of control and agency.

METHODOLOGY

Analytical Framework

Our methodology draws primarily from analytical formalism (Mitchell and Van Vught 2023), an approach to studying video games as systems or texts, emphasizing the aesthetic functioning of games and the types of player responses they generate. This methodology examines how a game's formal elements interact to produce an aesthetic experience without delving into the author's intent or the player's interpretation of meaning. Other formal analysis approaches, such as Lankoski and Björk's (2015) formal analysis of gameplay, break down games into—components, actions, and goals—to study how these elements drive dynamic gameplay. While this approach provides valuable insights into a game's mechanics, it does not explicitly address how they contribute to the broader aesthetic experience or influence the player's sense of temporal agency.

Clara Fernández-Vara's (2019) three-part analytical framework offers a structured method for analyzing game design by examining its formal elements, such as rules, mechanics, and dynamics. This approach systematically breaks down a game's components, providing a solid foundation for understanding its overall structure. In contrast, the current study adopts a different analytical orientation. Rather than focusing on structural decomposition or systemic mapping, it explores the relationship between various temporal elements and the ways players experience and exercise temporal agency. For this purpose, analytical formalism (Mitchell and van Vught, 2023) offers a more focused approach, emphasizing how the interaction of formal elements—particularly through foregrounding and defamiliarization—shapes a game's dominant aesthetic effects. This perspective is especially well-suited to the current study, as it prioritizes the analysis of temporal elements that are foregrounded within gameplay. These elements provide a nuanced lens for understanding how temporal agency is constructed and experienced by players. Accordingly, the analysis will focus on how temporal devices are foregrounded and defamiliarized to shape the player's experience of time and sense of agency over it.

Game Selection

From the discussions on 'temporal frames' and 'recursive temporality,' a set of criteria was developed to identify games in which time manipulation is a central mechanic. This study compiled a list of games (though not exhaustive) based on these criteria, drawing from the reviewed literature, internet searches, and "Let's Play" videos:

- Games must include mechanics that allow players to manipulate time through actions such as rewinding, looping, pausing, or revisiting gameplay.

- Games must allow players to make choices that affect the game's narrative or gameplay based on their interactions with time manipulation mechanics.

- The selected games should represent a variety of temporal engagements, including strategic manipulation of time, time loops, replayability, and choices that affect moral or narrative outcomes.

The initial selection of games and their specific time manipulation mechanics are presented in the Appendix Section.

Several key themes of temporal mechanics were identified from this initial list, including:

- Rewind/Undo Mechanics, such as those found in *Prince of Persia: The Sands of Time* (2003) and *Braid* (2008).

- Replicate Clones/Ghosts, as seen in games like *Super Time Force* (Capybara Games 2014) and *The Misadventures of P.B. Winterbottom* (The Odd Gentleman 2008).

- Time Loops/Time Travel is a prominent feature in games like *Majora's Mask* (Nintendo EAD 2000) and *Outer Wilds* (Mobius Digital 2019).

- Temporal Choices allows players to rewind specific moments and explore alternate outcomes, as exemplified by *Life is Strange* (2015).

Using this classification of temporal mechanics, the following games were selected for detailed analysis: *Prince of Persia: The Sands of Time (2003), Mario Kart 8 Deluxe (2017)*, *The Misadventures of P.B. Winterbottom (2008), SUPERHOT* (Superhot Team 2016), *The Entropy Centre* (Stubby Games 2022), *The Forgotten City* (Modern Storyteller 2021) *Undertale* (Toby Fox 2015), *Twelve Minutes* (Luís António 2021), *Slay the Princess* (Black Tabby Games 2023), *The Life and Suffering of Sir Brante* (Sever 2021), *The Stanley Parable* (Galactic Cafe 2013), and *The Best Amendment* (Molleindustria 2013).

Data sources and Methods of Engagement

The study employed the following data sources and methods of engagement to conduct this analysis:

Gameplay Analysis: The games selected for in-depth analysis were played using the "Playing the Right Way" strategy (Mitchell and Van Vught 2023, 134), which involves engaging with the game's mechanics as intended by the designers. This approach focuses on understanding how the game's formal elements, including temporal mechanics, guide the player's experience and shape their understanding of the game's intended meaning. This strategy involved paying close attention to the game's internal logic, analyzing how time is constructed, and how the game encourages players to interact with its temporal framework. The "Playing the Right Way" approach helps reveal the underlying player experience the game seeks to evoke by examining how the design structures temporal mechanics and allows the player to manipulate time.

Let's Play Videos: Let's Play videos were reviewed to observe how other players interacted with the time manipulation mechanics, providing insight into common strategies, challenges, and player responses to time-based gameplay. This method offered additional perspectives on how players approach the games, what decisions

they make when playing with time, and how they experience the game's temporal systems.

Game Reviews: Various game reviews were analyzed to understand how critics and players perceived the role of time manipulation mechanics in each game. This analysis helped determine the significance of these mechanics to the overall gameplay experience and how they were received by the gaming community.

Through a detailed examination of gameplay sessions, Let's Play videos, and critical reviews, this study identified several foregrounded temporal devices—time manipulation mechanics that are made prominent within the game's structure. Drawing on analytical formalism, these devices are analyzed in terms of how their foregrounding (making certain formal elements salient) and defamiliarization (rendering familiar gameplay or temporal conventions strange) work together to shape each game's dominant aesthetic principle.

The analysis focuses on three interconnected dimensions:

- Foregrounded Temporal Devices: the key recursive temporal mechanics that actively influence gameplay.

- Defamiliarized Aspects of Time and Gameplay: how these mechanics disrupt or challenge players' expectations of temporal flow and conventions.

- Distinctive Aesthetic Experiences: the unique emotional, cognitive, or philosophical effects evoked by these temporal manipulations.

Emphasis is placed on how these temporal mechanics influence the player's experience of time and their sense of temporal agency. From this analysis, the concept of Timeplay was developed to categorize the various ways players engage with and exercise agency over time within games. The following section will present an analysis of selected games exemplifying each Timeplay category.

TIMEPLAY ANALYSIS

Based on the analysis, four key forms of Timeplay are identified, and these will be expounded upon in the following section, with a refined definition offered at the end.

1. Adaptive Timeplay—Players use time manipulation to rewind, replicate, and refine gameplay.

2. Strategic Timeplay—Time manipulation becomes a tool for planning and optimizing outcomes.

3. Ethical Timeplay—Players explore the moral consequences of their choices across repeated play cycles.

4. Reflective Timeplay—Players engage with profound questions about free will, determinism, and the nature of time.

Adaptive Timeplay

Adaptive Timeplay allows players to manipulate time to refine and enhance their gameplay experience. Games such as *Prince of Persia: The Sands of Time (2003), Mario Kart 8 Deluxe (2017)*, and *The Misadventures of P.B. Winterbottom (2008)* incorporate features like time rewinds, time clones, and racing against ghost versions of oneself to improve their skills, leading to a more engaging and rewarding experience.

Prince of Persia: The Sands of Time is an action-platformer that features the Dagger of Time, a unique time manipulation mechanic that allows the protagonist to control time in various ways. The most notable feature is the ability to "rewind" time, allowing the player to reverse time by up to ten seconds to undo mistakes, such as falling off ledges or losing in combat. This mechanic functions like an integrated "save and replay" feature within the game world, reducing frustration and encouraging experimentation, as players can explore different approaches to challenges without fear of permanent failure. As the game progresses, players can unlock offensive Sand Powers by filling special "power tanks" in the Dagger. These powers include slowing time around or freezing time for a single enemy to attack enemies at high speed while they remain motionless.

In *Mario Kart 8 Deluxe,* one of the popular racing games in recent years, the "ghost" feature enhances time trials by letting players race against recorded runs, called "ghost cars." These ghosts replicate the player's best performance or that of others, mirroring speed, path, and racing lines. Racing alongside a ghost helps players analyze their performance, identify areas for improvement, and refine techniques to achieve faster times. This feature provides a visual comparison, enabling adjustments in racing strategy, smoother cornering, and better lap times. Ultimately, ghosts offer a data-driven way to sharpen skills while adding replayability and competitive depth to the game.

The Misadventures of P.B. Winterbottom is a puzzle platformer starring a pie-stealing thief as the protagonist. The game features time manipulation mechanics, allowing players to record Winterbottom's actions and create "time clones" that loop through the recorded movements. These clones assist by performing tasks like jumping on each other's heads or activating switches to clear obstacles and collect pies. As the game advances, the puzzles become more complex, with players managing multiple clones simultaneously. To succeed, players must record and coordinate their clones with precise timing and in a specific order, ensuring each action contributes to solving the puzzle.

As exemplified by these games, Adaptive Timeplay enhances player agency by allowing players to rewind time, interact with ghost versions of themselves, and refine their skills. This mechanic fosters a more engaging and rewarding experience where players are encouraged to learn from their mistakes and strive for improvement.

Strategic Timeplay

In Strategic Timeplay, manipulating time becomes a tool for strategic planning and achieving desired outcomes. Games such as *SUPERHOT* (Superhot Team 2016), *The Entropy Centre* (Stubby Games 2022), and *The Forgotten City* (Modern Storyteller 2021) demonstrate how players can harness time to strategize, optimize actions, and solve puzzles.

SUPERHOT introduces unique mechanics to the first-person shooter (FPS) genre by adapting the "pause and strategize" mechanic from real-time strategy with pause (RTSWP) games. In *SUPERHOT*, the forward flow of time is directly linked to the player's movement—when the player stands still, time comes to a halt, freezing enemies in place. This unique mechanic requires careful planning and precision, enabling players to dodge bullets and devise strategies as they navigate increasingly complex levels. As the player moves, time resumes slowly, creating a tense, choreographed action sequence. The game's minimalist aesthetic amplifies its time-based mechanics and strategic depth, highlighting the careful choices players must make. After completing each level, the game replays the player's actions in a seamless, real-time sequence, emphasizing the split-second decisions that shaped the outcome.

The Entropy Centre revolves around innovative time manipulation mechanics, where players use a device called the "Entropy Gun" to reverse or fast-forward the decay of objects in the environment to solve puzzles in creative ways. By rewinding objects to an earlier state, players can restore destroyed items, alter their positions, or fast-forward them to a previous moment in time. This ability offers a wide range of puzzle-solving strategies, requiring careful timing and spatial awareness. The game's narrative is deeply intertwined with these mechanics, as manipulating time isn't just a gameplay tool but a crucial element in unraveling the story and uncovering its mysteries.

The Forgotten City is a narrative-driven adventure set in a city inspired by ancient Rome, where players are caught in a mysterious time loop. Central to the story is the "Golden Rule": if anyone in the city commits a sin, everyone dies. When this rule is broken, the player is sent back to the start of the loop but retains all their knowledge and experiences. This time-travel mechanic allows players to approach challenges strategically—actions like stealing an item or making a pivotal decision can carry over into the next cycle. As players interact with the city's inhabitants, investigate clues, and experiment with different choices, they must unravel the truth behind the Golden Rule. The game explores themes of morality and sin and offers a strategic gameplay experience where time manipulation plays a key role in uncovering the mystery.

These games showcase how Strategic Timeplay empowers players to manipulate time as a resource, enabling them to plan, optimize actions, and solve puzzles in innovative ways. By mastering the strategic use of time, players can achieve their objectives with greater efficiency and precision.

Ethical Timeplay

Ethical Timeplay appears when players encounter the moral implications of their choices through repeated or revisited play cycles. Games like *Undertale* (Toby Fox 2015), *Twelve Minutes* (Luís António 2021), and *Slay the Princess* (Black Tabby Games 2023) utilize time loops and branching narratives to confront players with the consequences of their actions, prompting reflection on ethical responsibility and the complexities of morality across time.

In *Undertale*, players navigate an underground world of monsters, where the game defamiliarizes the typical approach to confronting enemies by allowing players to decide whether to spare or fight the monsters they encounter. This decision directly impacts the path the player takes. While the game doesn't explicitly label its routes, players have categorized them as Neutral, Pacifist, Genocide, and True Pacifist paths.

In the Neutral Route, players make a mix of decisions—sometimes sparing monsters, sometimes fighting them—which influences the tone of the story and character reactions. The Pacifist Route requires players to resolve all the conflicts without violence, leading to an ending where enemies become allies. The Genocide Route, marked by relentless killing, creates a darker, tragic atmosphere. After other playthroughs are completed, the True Pacifist Route offers redemption through additional actions. By foregrounding this choice-based temporality, *Undertale* encourages players to replay the game with different choices, allowing them to experiment with various paths and experience the full depth of its narrative.

Twelve Minutes is a narrative-driven, top-down thriller set in an apartment shared by a husband and wife. Players control the husband, trapped in a 12-minute time loop where each death or attempt to escape the apartment resets the cycle. Each loop offers the opportunity to gather clues, interact with objects, and slowly piece together the mystery. Initially, players use the time loop strategically, gathering information to uncover the truth behind the events. As the loops progress, the revelation of complex character relationships foregrounds itself, raising the stakes and compelling players to reconsider their choices to resolve the situation in a way that benefits everyone involved. With each cycle, players experiment with different decisions—whether deceiving others, confronting guilt, or seeking forgiveness. This temporal loop empowers players but also burdens them with the responsibility to make choices that determine the protagonist's fate and their relationships.

Slay the Princess is a horror visual novel that revolves around a recurring moral dilemma: whether to kill a mysterious princess imprisoned in the basement of a cabin. The game's innovative time loop structure forces players to face this critical decision repeatedly, with each iteration revealing new layers of the story and shifting the ethical stakes. The game defamiliarizes traditional decision-making by overwhelming players with a vast array of choices, accompanied by conflicting voices of the Narrator and the Hero, which at first seems like the player's internal monologue but gradually shifts into third-person commentary. These voices continually offer contradictory guidance and influence, forcing players to question their motivations and the very nature of their choices. Through this disorienting interplay of voices and choices, Slay the Princess transforms decision-making into the heart of its gameplay, compelling players to navigate uncomfortable moral grey areas, question their instincts, and grapple with the consequences of their decisions.

As seen in these games, Ethical Timeplay utilizes time loops and branching narratives to confront players with the moral consequences of their choices, encouraging them to explore different outcomes and grapple with ethical dilemmas. This form of Timeplay fosters critical reflection on the impact of player decisions and the complexities of morality in dynamic environments.

Reflective Timeplay

In Reflective Timeplay, time manipulation mechanics encourage players to contemplate philosophical questions about free will, determinism, and the nature of time. Games like *The Life and Suffering of Sir Brante* (Sever 2021), *The Stanley Parable* (Galactic Cafe 2013), and *The Best Amendment* (Molleindustria 2013) demonstrate how manipulating time can challenge perceptions of reality and choice, leading to more profound reflections on the player's agency within the game world.

The Life and Suffering of Sir Brante is a narrative-driven, text-based RPG set in a medieval society governed by the rigid "Lot" system, where social class determines an individual's fate. Players assume the role of Sir Brante, born into the "Commoner Lot," a lower class destined to suffer and must navigate his life through morally complex decisions. Unlike traditional RPGs, the game challenges the notion of free will by presenting Brante as a character constrained by forces beyond his control. The game's unique temporal mechanics allow players to foresee the potential consequences of their choices, adding a reflective layer to decision-making. The ability to replay chapters and explore alternate paths underscores the tension between player agency and predetermined fate. Each choice reveals the weight of the societal structure shaping Brante's life, encouraging players to confront questions of destiny, asking whether Brante can truly shape his fate or if his life is irreversibly bound by the Lot he is born into.

The Stanley Parable interrogates the nature of choice and free will by exploring the relationship between players and game creators. The player controls Stanley, an office worker who finds his coworkers mysteriously missing. The game's structure revolves around the player's decisions, which are guided by a narrator's comments, who guides and often challenges the player's actions. Depending on the choices made, players will encounter multiple possible endings before the game eventually resets, returning Stanley to his office to start the journey anew. The narrator's voice becomes the foregrounded element in the game, disrupting the familiarity of the player's relationship with both the game creator and the voice that typically serves to guide players in more conventional games. Instead of simply offering direction, the narrator often subverts this role, questioning and even mocking the player's choices, forcing them to confront the limits of their agency within the game world.

In *The Best Amendment*, the game's unique mechanic—where enemies appear as the player's own ghosts from previous playthroughs—offers a compelling exploration of time and consequence. As players progress, their past decisions, whether cautious or reckless, are reincarnated as enemies that replicate every action, from movement to bullet trajectory. This creates a recursive feedback loop where death is no longer just a failure but a reflection of earlier choices that compels players to reconsider their strategies. By defamiliarizing the conventional enemies, the game turns every action into a temporal echo, forcing players to confront how their earlier decisions shape their present experience. By integrating this recursive temporal mechanic, *The Best Amendment* critiques gun culture and challenges players to think critically about their actions, both within the game and in the real world.

These games highlight how Reflective Timeplay encourages players to confront philosophical questions about free will, determinism, and the nature of time. As players progress, they are encouraged to reflect not only on the immediate consequences of their actions but also on broader existential themes, particularly the tension between agency and predestination.

Synthesizing the Timeplay Framework

The following table synthesizes the analyses presented above (see Table 1). It highlights the key foregrounded temporal devices, the defamiliarized aspects of time and gameplay, and the distinctive aesthetic experiences they create. This consolidated overview provides a comparative lens for understanding how temporal agency is articulated and experienced in these games.

Timeplay Type	Game Title & Foregrounded Temporal Device	Defamiliarized Gameplay Aspects	Aesthetic Experience with Temporal manipulation
Adaptive	*Prince of Persia: The Sands of Time* (2003) – Rewind, Slow Motion, Freeze Time	Failure is defamiliarized as reversible and non-punitive, transforming trial-and-error into playful experimentation.	Empowerment through experimentation; reduced frustration; playful engagement with causality.
	Mario Kart 8 Deluxe (2017) – Ghost Racing (Time Trial Replay)	Competition is defamiliarized as a reflective, asynchronous encounter with past performances—self or others.	Skill refinement through comparison; competitive motivation; data-driven performance analysis.
	The Misadventures of P.B. Winterbottom (2008) – Time Clones (Record and Repeat Actions)	Singular control is defamiliarized by fragmentation into multiple coordinated selves, requiring players to strategize with echoes of their own actions.	Playful layering of past actions; players refine their skills by coordinating multiple time clones to solve puzzles.
Strategic	*SUPERHOT* (2016) – Time Moves Only When Player Moves	Real-time combat is defamiliarized as turn-based strategy, reframing motion as a tactical decision rather than mere reflex.	Tactical decision-making; tense, slow-motion, choreographed player actions.
	The Entropy Centre (2022) – Object Time Reversal and Fast-Forward	Object permanence is defamiliarized, enabling interaction with past and future states of objects in real time.	Creative spatial thinking; strategic puzzle-solving with foresight; satisfaction from restoring or altering object states.
	The Forgotten City (2021) – Knowledge-Retaining Time Loop	Narrative progression is defamiliarized as recursive and accumulative, reframing choice and consequence across repeated timelines.	Strategic mastery of temporal loops; solve problems through trial, error; and optimized planning across timelines.
Ethical	*Undertale* (2015) – Branching Time Loops and Moral Routes	Combat is defamiliarized as an ethical decision, where repeated playthroughs expose the enduring consequences of violence or mercy.	Emotional resonance of moral choice; guilt, empathy, and replay-driven ethical reflection.
	Twelve Minutes (2021) – Repeating 12-Minute Loop	Linear storytelling is defamiliarized through recursive moral investigation, where time loops deepen emotional and ethical complexity.	Psychological intensity; iterative ethical decision-making; burden of moral responsibility.
	Slay the Princess (2023) – Recursive Moral Dilemma with Shifting Narration	Narrative authority is defamiliarized through contradictory voices and evolving motivations, rendering moral clarity elusive.	Disorientation and moral ambiguity; tension between instinct, narration, and ethical judgment.
Reflective	*The Life and Suffering of Sir Brante* (2021) – Foreknowledge and	Life choices are defamiliarized by the interplay of foreknowledge and repetition, destabilizing clear	Contemplative engagement with systemic constraint; emotional resonance with

	Replayable Life Chapters	boundaries between agency, fate, and systemic constraint.	predestined suffering and limited autonomy.
	The Stanley Parable (2013) – Narrative Loops with Reactive Narrator	Player choice is defamiliarized as a performative illusion, with the narrator actively subverting autonomy and destabilizing narrative control.	Satirical critique of choice; existential reflection on agency; ironic engagement with game logic and structure.
	The Best Amendment (2013) – Recursive Ghosts of Past Selves as Enemies	Past actions are defamiliarized as recurring enemies, transforming personal history into a hostile and morally charged space.	Self-confrontation through gameplay; moral entanglement of violence; heightened awareness of cyclical consequence.

Table 1: Overview of Timeplay Types: Foregrounded Temporal Devices, Defamiliarized Gameplay Aspects, and Aesthetic Experiences.

Defining Timeplay

Based on the analysis, a refined definition of the four forms of timeplay has been developed:

- Adaptive Timeplay lets players control time, allowing them to rewind past mistakes, seize missed opportunities, or explore multiple versions of themselves through various scenarios. Players can return to a point before failure—be it death, poor decisions, or missed chances—and replay it or create alternate selves to explore multiple timelines. This evolves the traditional "save and replay" mechanic into a dynamic time-control system, enhancing player agency to refine the gameplay experience.

- Strategic Timeplay treats time as a resource, allowing players to proactively manipulate it to optimize outcomes. Players use time manipulation to plan, anticipate challenges, and set up ideal conditions for success. This can be understood as an improvised extension of the "pause and play" mechanic, integrated into the game world, allowing players to step back, plan, and refine their strategy, shaping future outcomes with precision.

- Ethical Timeplay explores the moral implications of player choices, particularly when these decisions are revisited or repeated across different play cycles. By manipulating time, whether through resets, loops, or repeated dilemmas, players gain a unique form of agency, revisiting and reflecting on their decisions. This intertwining of time manipulation and moral decision-making enhances player engagement and emphasizes the weight of player choices, creating opportunities to confront the consequences of their actions and explore the complexities of morality.

- Reflective Timeplay invites players to explore profound questions about the nature of time, free will, and determinism. Through temporal mechanics it encourages reflection on reality, choice, and consequences. Rather than focusing on the moral implications of specific decisions, Reflective Timeplay prompts a deeper inquiry into whether players are truly free to choose or if

their actions are predetermined. This form of timeplay challenges players' perceptions of reality and the nature of choice within the game world.

Each timeplay emphasizes different aspects of temporal control. Adaptive and Strategic Timeplay share similarities in learning from previous actions and optimizing future ones. However, they differ significantly in their focus and application. In Adaptive Timeplay, time is used to recover from mistakes and improve outcomes by reacting to past events. In contrast, in Strategic Timeplay, time becomes a tool for foresight and planning, allowing players to shape future outcomes with precision. On the other hand, Ethical Timeplay and Reflective Timeplay explore the consequences of time manipulation, but from different angles. Ethical Timeplay delves into themes of responsibility, moral choice, and the consequences of actions within a time loop or manipulated timeline. Reflective Timeplay, however, moves into deeper existential territory, questioning the nature of free will and the nature of time itself. While both utilize time manipulation to examine choice, Ethical Timeplay is rooted in the direct impact of those choices. In contrast, Reflective Timeplay interrogates the very possibility of choice in a world where time may be fluid, cyclical, or nonlinear.

Together, they provide a comprehensive lens through which to understand the varied ways time manipulation shapes player experience and decision-making in video games. The ability to manipulate and experience time in virtual worlds not only enriches gameplay but also offers opportunities for critical reflection on the complex interplay between time, choice, and the gameplay experience. It is important to emphasize that these categories are not necessarily mutually exclusive or discrete. Instead, they can function as overlapping layers or dimensions of temporal engagement within a single game, often intertwining to create richer and more nuanced player experiences.

DISCUSSION

This paper explored the concept of temporal agency through Timeplay framework, focusing on how time manipulation mechanics enhance player experiences and deepen our understanding of the relationship between time, choice, and gameplay. Building on existing scholarship on game temporalities—particularly the concepts of “temporal frames” and “temporal recursion”—this paper expanded the examination of temporal manipulation and its contribution to the development of a player's sense of temporal agency. It introduced four distinct forms of Timeplay—Adaptive, Strategic, Ethical, and Reflective—demonstrating how time manipulation can create diverse player experiences. Each form reveals a unique interaction between the game’s temporal frames: Gameworld Time, Real-World Time, and Fictive Time frame.

Adaptive and Strategic Timeplay emphasize the player's direct control over Gameworld Time in relation to Real-World Time. Whether rewinding past mistakes or pausing time for tactical advantage, players manipulate temporal flow to optimize outcomes, highlighting both the mechanical and experiential dimensions of temporal agency. Hansen, in the discussion of recursive temporality, argues that the ability to control and rewind time complicates traditional notions of player immersion and flow (2018, 152). Instead of being absorbed in continuous forward progression, players become acutely aware of their agency and the temporal affordances available to them. This heightened temporal awareness supports the analysis of Ethical and Reflective Timeplay. Ethical Timeplay explores the moral consequences of actions across timelines, while Reflective Timeplay prompts players to confront philosophical

questions of determinism and free will through complex temporal structures. These forms engage deeply with the Fictive Time frame, using temporal control not merely as a mechanic, but as a means of meaning-making. They emphasize how time manipulation transforms not only gameplay but also narrative significance and player self-reflection.

Through this analysis, it became evident that temporal agency in video games extends beyond merely controlling the flow of the game. It influences strategic decision-making, narrative comprehension, and ethical reflection. This framework provides a more nuanced view of how time manipulation mechanics shape player engagement, showing that they not only enhance gameplay experience but also explore complex themes of choice, morality, and the human condition.

To deepen this understanding, the Timeplay analysis can be expanded by incorporating Harrell's three-part framework of "agency play"—Agency Scope, Agency Dynamics, and Value System (2013, ch. 7). This enables a more granular perspective on how temporal constraints redefine player capabilities, how their actions evolve over time, and the underlying values those actions express. Furthermore, integrating Sicart's ethics framework (2011) can illuminate how time-based pressures and outcomes complicate moral agency and ethical reflection in gameplay. Expanding this framework further to include other temporal structures like entropic temporality (e.g., *Frostpunk*, 11 Bit Studios, 2018), non-human temporality (e.g., *Spore*, Maxis, 2008), and multiplayer dynamics (e.g., *Quantum League*, Nimble Giant Entertainment, 2021) can enrich our understanding of how diverse temporal structures interact with and shape player experience.

A phenomenological approach, exemplified by Husserl's concept of inner time-consciousness, distinguishes between protention—the passive, background sense of the immediate future—and anticipation—the active, conscious planning and decision-making. This distinction helps us gain a clearer understanding of how players engage with time both intuitively and intentionally (Zahavi, 2020, p. 66). Finally, cognitive models like Predictive Processing (Clark, 2023) open new pathways for examining how temporal agency is shaped by the brain's anticipatory mechanisms and its ability to revise expectations based on sensory input. Together, these interdisciplinary approaches suggest promising directions for future research into the cognitive, affective, ethical, and experiential dimensions of temporal agency in video games.

CONCLUSION

This paper introduced a framework for understanding and analyzing the multifaceted ways players engage with time in video games. Building on existing scholarship on ludic temporality and agency, it identified four categories of Timeplay—Adaptive, Strategic, Ethical, and Reflective. This framework illustrates how time manipulation mechanics influence various aspects of gameplay, from strategic decision-making to moral reflection. The Timeplay framework contributes to game studies by (1) offering a new conceptual lens for analyzing time as an expressive design element; (2) providing a typological mapping of various way players practice temporal agency and (3) suggesting the potential for a design-oriented perspective through which game designers can craft time-based systems to evoke specific aesthetic and emotional experiences. By broadening our understanding of how temporality functions in games, this study repositions time not as a background system but as a central site of meaning-making—one that shapes narrative, choice, and agency within digital play.

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APPENDIX

List of Video Games and their Time Manipulation Mechanic(s)

1. *Chrono Trigger* (Square 1995)—Time Travel via "Time Gates"
2. *The Legend of Zelda: Ocarina of Time* (Nintendo EAD 1998)—Time Travel with "Song of Time"
3. *The Legend of Zelda: Majora's Mask* (Nintendo EAD 2000)—Three-Day Cycle, Time Travel with "Song of Time"
4. *Animal Crossing* (Nintendo EAD 2001)—Real-Time Clock and Time Manipulation via System Settings
5. *Max Payne* (Remedy Entertainment 2001)— "Bullet Time," Time Slows to Aim and React
6. *Shadow of Memories* (Konami 2001)—Time Travel (Multiple Time Periods)

7. *Blinx: The Timesweeper* (Artoon 2002)—Time Control (Pause, Rewind, Fast Forward, Record)
8. *Prince of Persia: Sands of Time* (Ubisoft Montreal 2003)—Time Rewind with "Sands of Time"
9. *Assassin's Creed* (Ubisoft 2007)—Relive Ancestor's Memories with "Animus"
10. *Timeshift* (Saber Interactive 2007)—Ability to Pause, Slow Down, Rewind Time
11. *Braid* (Number None 2008)—Time Rewind Mechanics to Solve Puzzles
12. *The Misadventures of P.B. Winterbottom* (The Odd Gentleman 2008)—Record Actions and Replicate Clones to Solve Puzzles
13. *Steins;Gate* (5bp and Nitroplus 2009)—Time Travel via "D-Mail" and "Time Leap Machine"
14. *Singularity* (Raven Software 2010)— "Time Manipulation Device" to move objects in time
15. *Dishonored* (Arkane Studios 2012)— "Bend Time" that Slows or Freezes Time
16. *BioShock Infinite* (Irrational Games 2013)—Time and Dimensional Shifting (Parallel Universes)
17. *The Stanley Parable* (Galactic Cafe 2013)—Narrative-driven Choice Based Looping
18. *The Best Amendment* (Molleindustria 2013)—Enemies are the player's own ghosts replicating actions from previous stages
19. *Super Time Force* (Capybara Games 2014)—Time Rewind and Play along with Ghost from Previous Play
20. *The Talos Principle* (Croteam 2014)—Time Recording of Actions to Create a Clone
21. *Life is Strange* (Dontnod Entertainment 2015)—Time Rewind Ability and Alter the Course of Events.
22. *Undertale* (Toby Fox 2015)—Replay with Varying Choice and Outcome
23. *Quantum Break* (Remedy Entertainment 2016) —Time Manipulation Powers: Time Stop, Time Rush, Time Blast, Time Shield, Time Dodge, Time Vision, Time Echoes
24. *SUPERHOT* (Superhot Team 2016)—Time Moves Only When Player Move
25. *Titanfall 2* (Respawn Entertainment 2016)—In the "Effect and Cause" level, players shift between past and present timelines to solve puzzles
26. *Nier: Automata* (PlatinumGames 2017)—Respawn and Resurrect the Previous Dead body as a Temporary Ally
27. *Mario Kart 8 Deluxe* (Nintendo 2017)—Race against "Ghost" of recorded player's best performance or that of others.
28. *Prey* (Arkane Studios 2017)—Multiple Endings Based on Choices.

29. *The Sexy Brutale* (Cavalier Game Studios 2017)—Time Loop – 1 day, Use Past Knowledge to Change Events.
30. *Detroit: Become Human* (Quantic Dream 2018)—Rewind for Alternate Choice and Branching Narrative.
31. *Minit* (JW, Kitty, Jukio, Dom 2018)—Time Loop (60 seconds)
32. *One Hour One Life* (Jason Rohrer 2018)—Time-based Lifespan and Generational Progression.
33. *Outer Wilds* (Mobius Digital 2019)—Time Loop (22-minute Cycle, Exploration and Discovery).
34. *Quantum League* (Nimble Giant Entertainment 2021)—Create "time clones" across different time loops to outmaneuver opponents in multiplayer real-time combat.
35. *Twelve Minutes* (Luis Antonio 2021)—Time Loop, 12-Mins, Use Acquired Knowledge to Solve Mystery.
36. *Returnal* (Housemarque 2021)—Time Loop (Reliving Cycles of Death and Discovery).
37. *The Forgotten City* (Modern Storyteller 2021)—Time Loop, Use Acquired Knowledge to Solve Mystery.
38. *The Life and Suffering of Sir Brante* (Sever 2021)—A Branching Life Path Based on Choice.
39. *Crankin's Time Travel Adventure* (Uvula 2021)—Control the Character's Movement Reverse, Pause, Speedup.
40. *Deathloop* (Arkane Lyon 2021)—Time Loop (1 day), Assassinate 8 target Visionaries Before the Loop Ends.
41. *Not For Broadcast* (NotGames 2022)—Decision-Making, Editing Broadcasts, Choosing Sides with Multiple Endings.
42. *The Entropy Centre*(Stubby Games 2022)—Reverse the Entropy (or Decay) of Objects to Solve Puzzles.
43. *Slay the Princess* (Black Tabby Games 2023)—Decision Making, Multiple Choice, Multiple Endings.

ENDNOTES

1 In sociology temporal agency refers to the actions individuals take to control, manipulate, and customize their own experience of time, or that of others, driven by the desire to shape how time is perceived and experienced. This manifests in various contexts, such as striving for social conformity, the effort to balance roles, the manipulation of narratives, the maintenance of relationships, or as a coping mechanism (Flaherty 2020).

2 Ludic agency frameworks, such as Janet Murray's (1997) notion of "embedded agency," conceptualized player choices as operating within the boundaries set by the game's design, positioning the player's agency as a function of the possibilities predefined by the designer. In this model, agency is bounded by time, as players' actions unfold within temporal parameters defined by the game's structure. Susana Tosca's (2005) analysis of the *Blade Runner* game argues that the game's AI actively shapes the player's experience, suggesting that player agency emerges through the interaction between the player and the game system.