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Echo: A Psychological AI Interaction World Where Actions Become Future Memories

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Abstract. Digital games increasingly allow players to make choices that shape their experiences over time, yet many game systems still emphasize immediate responses to actions. This paper examines Echo, a proposed two-stage psychological horror and puzzle game, as a design case for connecting player behavior, emotional adaptation, and persistent world change. Echo1 uses a semi-open world to investigate supernatural phenomena associated with human emotions, while Echo2 expands into an open world in which players help build a civilization. The proposed Symmetrical Delayed Resonance Model records an action and allows a later, contextually similar event to produce a different consequence. A psychological AI system would use initial questionnaire responses and subsequent gameplay behavior to adjust selected encounters within a shared world. Cooperative play and later player participation extend these systems beyond individual sessions. Through a review of relevant work and an analysis of the proposed design, the paper argues that delayed consequences and bounded adaptation could make player choices feel consequential across time. These are design propositions rather than results of a tested implementation; further prototyping and player studies are required to evaluate their effects.

Keywords: psychological horror, adaptive game design, delayed consequences, player behavior, cooperative play

1. Introduction

Echo is a proposed psychological horror puzzle game that examines how emotions, player actions, and interactive environments might influence one another. Many interactive experiences respond to a choice immediately or follow a fixed narrative path. Echo instead proposes a world that records actions and may use them to shape later events. Its central design mechanism, the Symmetrical Delayed Resonance Model, connects a recorded behavior with a later event that resembles it but occurs under different conditions. This delayed relationship allows an earlier choice to acquire a new meaning without predetermining a single future outcome.

The design also brings together psychological AI, adaptive storytelling, cooperative play, and long-term world development. Its proposed AI system uses players' initial answers and subsequent behavior to tailor selected encounters while preserving a common setting and core storyline. Echo1, the semi-open-world stage, concerns supernatural phenomena associated with negative emotions and the investigation of their origins. Echo2, the open-world stage, explores how players might move

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from surviving in that world to contributing to a civilization within it. This paper analyzes how these mechanisms could work together, identifies their practical constraints, and offers a design framework for studying delayed consequences and emotional adaptation in games.

2. The Symmetrical Delayed Resonance Model

The Symmetrical Delayed Resonance Model is Echo's proposed mechanism for linking actions across time. In many games, an input produces a visible and immediate outcome: pressing a button, for example, opens a door [1, 2]. Echo retains immediate feedback where it is needed for clarity but also records selected choices for possible use in later encounters. A player action is stored with its context; after a delay, a similar behavior may occur in a changed environment, prompting a new consequence. The earlier action therefore creates a possibility rather than a predetermined future event. When players recognize the relationship between the two moments, they may reinterpret both their past decision and the present scene.

Consider a player who turns off a room's light before leaving. The world records the action and its circumstances. Later, another person or group makes a similar movement, but a changed location, timing, or social context gives it a different consequence. Recognition of the earlier action can make the present event feel connected to a past choice. The design depends on making that connection legible to players while retaining uncertainty about when or how a recorded action will matter.

3. Psychological AI system and dynamic player experience

Echo's proposed psychological AI system aims to vary individual experiences within a shared game world. Rather than controlling only dialogue or enemy behavior, the system would interpret selected player choices and adjust encounters accordingly [3]. Before play, seven introductory questions would provide provisional information about emotional preferences, decision tendencies, and responses to fear [4]. The questions are a design instrument, not a validated psychological assessment, and their answers would never determine a player's entire experience [5]. Observed behavior during play would update the provisional profile, allowing adaptation to respond to what players do instead of relying solely on what they say at the beginning.

During gameplay, the system would consider character and dialogue choices, exploration habits, puzzle-solving approaches, reactions to supernatural events, and relationships with NPCs. It could then select or modify encounters within defined narrative boundaries. A player who investigates hidden details might see additional exploration events; one who favors emotional interactions might encounter more NPC stories; and one who seeks challenges might receive a harder variation of a puzzle. These adjustments would alter the emphasis and emotional texture of encounters while retaining the same core world and progression for all players. The proposal requires careful design so that adaptation remains understandable, fair, and compatible with cooperative play.

The same system could generate small-scale memories, conversations, or discoveries related to a player's earlier choices. An NPC's reaction, for instance, might reflect a previous interaction, and a hidden scene might appear because of a particular exploration pattern. Such events are intended to give actions emotional continuity rather than to function only as rewards. Their effectiveness would need to be tested with players, particularly to determine whether they notice the connection and find it meaningful.

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4. Echo1: the birth of echo-psychological horror and human emotion

Echo1 begins in a modern setting where negative emotions accumulate beneath an apparently ordinary life. Fear, regret, loneliness, and hatred can become supernatural phenomena called Echoes. In this fiction, a creature is a manifestation of the emotion that produced it, so investigating its source matters more than simply defeating it. When the boundary between reality and the Echo World breaks down, some people are pulled into the other dimension. The world observes their behavior and presents situations that challenge their psychological limits. Players investigate these events, infer the rules governing each mystery, and seek to return trapped people to reality. Extended absence carries the narrative risk that people in reality begin to forget them. If a phenomenon is not resolved within its time limit, it may persist into Echo2, connecting the two stages through the consequences of play.

5. Multiplayer structure and social interaction

Echo supports individual play with AI teammates as well as cooperative play with human teammates. Its proposed five-person team reflects the contrasting personalities and perspectives of the principal characters. Players could choose an AI-assisted team, a mixed team, or a team of human players. In matchmaking, the number of human participants may vary, while AI teammates would have distinct personalities and communication patterns. This flexibility is intended to make cooperation accessible to players with different social preferences. The design must also communicate clearly which teammates are controlled by AI, so that players can make informed choices about interaction and trust.

Human teammates could communicate through voice and text, continue cooperating after an event, or add each other as friends. These options allow relationships to develop through shared experiences without requiring permanent team membership. The proposed Time-Space Drop event connects cooperative play to the SDR Model: when teams in the same world reach comparable progress, a collapse in time may cause one player to fall from the current layer into a historical layer associated with another team's events. The original teammates witness the disappearance, while the displaced player encounters the other team's traces and may join its members for a story segment. A later return and limited communication window could allow the teams to reconnect. The event remains a design proposal, and its timing, fairness, and narrative clarity require prototyping.

6. Echo2 from survivors to creators

Echo2 develops the setting from investigation and survival toward creation. Once players complete their Echo1 journey, they enter an open-world civilization space that remains visually connected to the earlier world. A transparent platform allows players to see historical or continuing layers below, emphasizing that earlier events still matter. Players may build personal spaces, form communities, and participate in new events. Contribution-based ranking would recognize solving mysteries, discovering hidden branches, completing side stories, and building trust with NPCs rather than rewarding completion speed alone. This structure aims to give careful exploration and cooperation a continuing role after the main storyline.

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7. Human NPC system: players becoming part of the world

Echo2 also proposes more direct player participation in the world. Experienced players could temporarily take on NPC-like roles, guiding newcomers, providing assistance, or introducing challenges within rules set by the designers. A contribution-based vote among leading teams could select an ACE, a player with limited authority to organize guilds, propose challenges, and influence smaller events. In an annual MVP-ACE competition, several ACE players would respond to designed supernatural scenarios and be assessed on problem-solving, creativity, world understanding, and player feedback. These roles would require moderation and clear limits on authority so that player-created encounters remain fair and consistent with the game's story. Together, the human NPC and ACE systems extend Echo2's premise that players can help shape experiences for others.

8. Conclusion

This study aimed to examine how delayed consequences, psychological adaptation, and cooperative me can connect earlier choices to later experiences within a persistent world. The analysis suggests that the SDR Model supplies a structure for recording actions and reintroducing them in changed contexts, while bounded psychological AI can vary emotional encounters without abandoning a shared narrative. This research contributes a conceptual framework for discussing delayed player effects alongside adaptive game design, a combination that the design literature often treats as separate concerns; it does not claim to demonstrate a measured player response. The proposed framework has practical significance for designers seeking to make choices feel meaningful across sessions and to support varied experiences in cooperative settings. This study is limited by its reliance on literature review and design analysis rather than a playable prototype, player sample, or behavioral data, which prevents conclusions about effectiveness, accessibility, or generalizability. Future research should prototype the recording and resonance rules, test whether players recognize delayed connections, and compare emotional responses and fairness across individual and cooperative play. Overall, Echo offers a testable account of how a game's memory of player actions might support continuing emotional and social experiences.

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