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Exploring Replay Value: Shifts and Continuities in User Experiences Between First and Second Exposure to an Interactive Story

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Abstract

While replay value is a common term in interactive entertainment, psychological research on its meaning in terms of user experiences is sparse. An exploratory experiment using the interactive drama "Façade" was conducted ($n = 50$) to examine shifts and continuities in entertainment-related user experiences between first and second exposure to the same system. A questionnaire with brief scales measuring various user-experience dimensions (interaction-related facets such as usability, flow, and presence, as well as narrative-related facets such as suspense and curiosity) was administered after the first and the second round of exposure. Findings suggest that replay produces gains in action-related experience components such as presence and effectance, whereas narrative-related experiences such as curiosity and suspense remain stable across exposures. Implications for theorizing on interactive entertainment experiences are discussed.

Research Problem

A defining attribute of interactive entertainment media, and specifically of digital games, is that user decisions affect the events displayed.[1] The same game can therefore evolve very differently when different players interact with it. Also, a repeated interaction of the same player with the same game can result in very different events, story outcomes, and game progress.[2] It is likely that this between-session variation in game content is a key factor in players' replay motivation. Game companies aim for a high replay value by enticing players to experience the effects of alternative decisions, strategies, or story paths on the game's outcomes.

However, while game companies and players alike seem to agree on the benefits of high replay value, research in media psychology has so far not devoted much attention to the actual experience of repeated game play. The current paper therefore explores shifts and continuities in user experiences when exposure to an interactive entertainment medium is repeated, asking: How can specific user experiences be related to a game's replay value?

Conceptual Background

According to recent research in interactive entertainment,[3–5] the fun of using interactive entertainment emerges from various parallel or combined experiential processes that result from in-game elements such as story, characters, audiovisual presentation, and game mechanics, as well as from players' active role in the gaming process (e.g., experiences of impact and agency[6]).

Thus far, conceptual knowledge on the fun of repeated game play is virtually nonexistent. In television research, studies on repeated viewing of serial programs mostly focused on audience loyalty to successive episodes rather than on viewing the same content several times.[7] One important exception is Tannenbaum,[8] who argued that repeated TV viewing seems to be motivated by the desire to prolong or re-enter desired states of enjoyment, and by the desire to reduce uncertainty about what to expect from a television program. Risk-free elicitation of desired enjoyment experiences thus seems to be an important factor explaining repeated consumption of noninteractive entertainment.

This explanation cannot be applied to the case of repeated interactive entertainment use, however: experiencing specific enjoyable events in a game does not guarantee the occurrence of precisely the same events during the next round of exposure.[2] Below, we discuss in brief some speculative notions that may help to explain repeated consumption of interactive entertainment, and will form the basis of our exploratory study.

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- As a result of repeated exposure, players may become more familiar with the handling of an interactive entertainment medium. More effective handling and fewer errors will result in better *usability* experiences, and thus more positive *affect*, less negative affect (e.g., frustration), and greater levels of flow.[9,10]
- Repeated exposure could evoke greater *curiosity* in players, because once they have become acquainted with the (story) content of a game, they will be able to develop more elaborate ideas about alternative and/or more interesting and effective means of interaction. Alternatively, repeated exposure could also reduce curiosity, as players will inevitably come across narrative content or action possibilities they are already familiar with from prior game use.
- Repeated exposure may allow players to become better in finding ways to influence the game according to their intentions. As a consequence, players may feel higher levels of agency (*effectance*[6]), *satisfaction*, and *enjoyment*. However, one may also speculate that replay merely prolongs prior levels of such action-related fun experiences, since perceived improvements (e.g., greater player impact on the game narrative) will not occur automatically.
- With repeated involvement in a game environment, immersive experiences such as *presence*[11] and *identification*[12] may increase. Alternatively, increased familiarity through repeated use may also undermine presence and identification experiences, because users may develop a better understanding of game mechanics and technical limitations of the game software. This more distanced type of experience would result in weaker immersion.

In short, based on anecdotal evidence and observations, various and partially competing ideas on the psychological qualities of replay value may be formulated. These ideas served as input for the exploratory study described below.

Method

A within-subjects experiment on repeated use of Façade was conducted (available at www.interactivestory.net[13]). Façade is a conversation-based interactive drama about a relationship conflict between two virtual autonomous characters. Through dialogue input, users can participate in the conversation. They can wait until they are directly asked for their opinion or try to interrupt the dialogue between the virtual couple. While the drama unfolds, the couple's relationship problems become more obvious, secrets are revealed, and the player is repeatedly asked to take sides. The system is known as a milestone of technological evolution in interactive storytelling.

A total of 50 university students (17 males, 33 females; average age $M = 19.8$ years, $SD = 1.73$ years) with a moderate degree of computer game literacy ($M = 1.78$, $SD = 0.71$ on a scale from 1 to 3) participated in the study. Three participants were excluded from the data analysis because of implausible response patterns. Only a minority of participants ($n = 10$) had played Façade before. Upon arrival in the laboratory, participants interacted with Façade for 20 minutes (first exposure). Next, they completed a questionnaire that included demographical questions, as well as questions relating to 13 user-experience dimensions derived from research on video games and interactive storytelling[14]: curiosity, suspense, flow, aesthetic pleasantness, enjoyment, affect, role adoption (identification with the player character), perceived system usability, user satisfaction, character believability, effectance, presence, pride, positive affect, and negative affect. All scales were construed as five-point rating questions, had been used successfully in pilot studies, and comprised two or three items per dimension. The full questionnaire and detailed reliability information is available from the authors.

After filling out the questionnaire, participants proceeded to interact with Façade for another 20 minutes (second exposure), after which they completed the same questionnaire once again (excluding the demographical questions). Subsequently, participants received 15 € as compensation and were debriefed.

A reliability analysis found almost all user experience scales to perform to a satisfying degree following both rounds of exposure, with α values ranging between 0.66 and 0.89 ($n = 50$). The only exception was the reliability for the negative affect subscale following the first exposure ($\alpha = 0.57$). Reliabilities of scales with only two items (satisfaction, character believability, effectance, suspense, enjoyment, and role adoption) were assessed using Pearson's correlations, and were also deemed acceptable, with r ranging between 0.35 and 0.85. The data analysis focused on within-participant mean comparison (t-tests for dependent samples, two-tailed) between experience ratings after the first and after the second exposure to Façade to detect shifts and continuities in entertainment experiences.

Results

Relevant increases after replay were observed for perceived system usability, presence, effectance, and flow (see Table 1). Nearly significant decreases occurred for character believability and negative affect. Roughly speaking, replay shifted mostly interaction-related experiences, but left experience aspects related to story and narrative unchanged: Continuity between exposure rounds was found for curiosity, suspense, enjoyment, and role adoption/identification, which are all narrative-driven modes of enjoyment.[15]

Discussion

The investigation of replay experiences with Façade revealed several interesting insights. First of all, because participants gained competence in handling the interaction modalities through replay, system-usability experiences increased. Next and more importantly, a group of experience dimensions emerged that displayed an upward shift from initial to second exposure, namely presence, effectance, and flow. These dimensions primarily relate to players' experience of agency. Players perceived their game-related actions to have the intended impact (effectance) and to run more smoothly (flow). This resulted in more immersive experiences (presence). Replay-value is, according to these findings, driven by increases in agency-based experiences. Users benefit from replay through more gratifying feedback on their actions.

In contrast, a second group of dimensions remained stable between first and second exposure. These dimensions relate to game narrative: curiosity, suspense, and identification. Although replay allows trying out different story elements, the core facets of narrative experience did not benefit from

Table 1. Users' Rating on Examined Experience Dimensions

	First exposure			*Second exposure*			
	M	*SD*	*Rel.*	*M*	*SD*	*Rel.*	p
Perceived-system usability	3.66	1.00	$\alpha = 0.85$	3.99	0.79	$\alpha = 0.83$	0.001*
Correspondence with user expectations	2.89	0.94	$r = 0.57$	2.99	0.80	$r = 0.46$	0.46
Presence	3.25	0.80	$\alpha = 0.76$	3.41	0.75	$\alpha = 0.87$	0.06†
Character believability	3.68	0.61	$r = 0.35$	3.49	0.80	$r = 0.37$	0.13
Effectance	3.00	1.09	$r = 0.82$	3.41	0.97	$r = 0.61$	0.03*
Curiosity	3.48	0.65	$\alpha = 0.76$	3.46	0.78	$\alpha = 0.84$	0.87
Suspense	3.53	0.91	$r = 0.47$	3.50	0.81	$r = 0.57$	0.86
Flow	2.86	0.69	$\alpha = 0.72$	3.22	0.65	$\alpha = 0.73$	0.001*
Aesthetic pleasantness	2.45	0.93	$\alpha = 0.83$	2.45	0.88	$\alpha = 0.86$	0.96
Pride	2.38	0.96	$\alpha = 0.89$	2.57	0.98	$\alpha = 0.84$	0.24
Enjoyment	3.15	1.11	$r = 0.84$	3.20	1.15	$r = 0.85$	0.69
Affect:positive	2.71	0.80	$\alpha = 0.82$	2.76	0.91	$\alpha = 0.87$	0.64
Affect:negative	2.77	0.77	$\alpha = 0.57$	2.60	0.87	$\alpha = 0.70$	0.11
Role adoption/identification	2.97	0.96	$r = 0.37$	2.88	0.99	$r = 0.66$	0.55

*Significant difference at $p < 0.05$.
†Marginal difference at $p < 0.1$.

this opportunity. Possibly, more positive experiences induced during second exposure by trying out new story opportunities were balanced by more negative experiences resulting from experiencing fixed story elements once again. Recordings of actual game play during first and second exposure would be informative in this regard, to see whether the continuity of narrative-related player experiences across game repetition occurred in spite of players doing things differently, or whether players performed similar actions during both sessions.

The observed profile of experience shift from initial to second exposure thus seems to revolve around action-related dimensions: Replay feels different (and more enjoyable) in terms of agency and task involvement; at the same time, it seemed to produce continuity in terms of narrative engagement. Notably, the overall enjoyment measure also remained stable across both rounds of exposure, indicating that the increase in agency-related experience does not result in an upward shift of the entertainment experience at large.

Conceptually, this pattern of results suggests that replay value in interactive entertainment integrates the advantages of repeat-viewing linear messages—prolonged narrative engagement such as suspense and identification[9]—with a new facet of perceiving improvement in efficacy, flow, and immersion (presence). Replay value can thus be construed as a mixture of continuity and variability in experience—playing an active part works better with repeated exposures, whereas (pleasurable) narrative engagement stays stable over time.

A methodological limitation of the current study is that intensities in self-reported user experiences were examined, but not experience qualities. Possibly, the focus of curiosity or the reasons for suspense shifted substantially between first and second exposure to Façade, yet the applied measures would not reflect such changes. Qualitative methods could therefore greatly contribute to the current research. Interviews or in-depth observations could allow finding out how player actions changed across sessions.

Further research should build on the present results by expanding the focus to long-term repeated use. Especially, interactive stories like Façade could offer high-multisession replay value by revealing new aspects of a story, and by giving more insight in relations between characters, and their backgrounds, across numerous sessions. Shifts and stabilities of user experiences may differ from the current findings when, for instance, 20 or 50 game sessions are observed. Likewise, as a few of the current study's participants were already familiar with the system before the first experimental session, future research should also approach the question of true initial (compared to subsequent) exposure with more rigor. Replications with other types or genres of interactive entertainment, such as multiplayer games that do not include strong narrative content, for example, First Person Shooters[4] or Massively Multiplayer Online games,[6] would be helpful in revealing the core meaning of replay value, and in improving generalizability of results beyond particular systems. The present study has already narrowed the research gap on repeated exposure to interactive entertainment. It suggests that action-related and narrative-related components of experience are affected differently by repeated exposure. This finding represents an interesting building block for a psychological model of repeated interactive entertainment use that can complement existing, static or single-use approaches in theories of interactive entertainment.[5,12]

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