Exploring Inaction Inertia and Proactive Procrastination among MMORPG Players

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ABSTRACT

Understanding the behavioral dynamics of players in and outside of games is essential for game designers, marketers, and researchers in psychological and behavioral assessment fields. This study examines variations in inaction inertia and proactive procrastination among players of the acclaimed MMORPG Final Fantasy XIV, focusing on the disparities between clearly defined "hardcore" and "casual" players' behaviors during gameplay and in their daily lives. We employ a questionnaire-based approach — drawing on both self-constructed items about in-game engagement and established scales for out-of-game behavior - to determine (1) whether inaction inertia and proactive procrastination manifest differently across these player groups within the gaming context and (2) whether those same tendencies transfer to real-life situations. Our results confirm that hardcore players exhibit significantly stronger inaction inertia during gameplay than casual players, whereas both groups increase proactive procrastination when engaging with content they deem familiar. However, neither inaction inertia nor proactive procrastination observed in-game corresponds directly to patterns seen outside the game, indicating that separate mechanisms underlie in-game versus real-world behaviors. We discuss possible reasons for this divergence—such as the role of avatar identification, immersion as a form of "conscio us simulation," and the notion of a "digital double life" - and outline directions for continued research to map boundary conditions between virtual and real-world selfregulation strategies.

Keywords

player behavior \cdot MMORPG \cdot inaction inertia \cdot proactive procrastination \cdot avatar identification

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INTRODUCTION

The digital revolution has profoundly reshaped the entertainment industry, with video gaming emerging as a dominant cultural, social, and economic force. The global gaming market surpassed \$200 billion in 2023, reflecting the scale and influence of this medium. Among diverse gaming genres, Massively Multiplayer Online Role-Playing Games (MMORPGs) have gained particular prominence due to their immersive worlds, complex social dynamics, and opportunities for sustained, long-term player engagement. Titles such as *World of Warcraft* and *Final Fantasy* series have become expansive digital ecosystems in which millions of players simultaneously interact, collaborate, and compete, offering rich environments to explore human decision-making and behavioral patterns within both structured and emergent scenarios (Ducheneaut et al., 2006; Zhang & Zhu, 2019).

MMORPGs as Platforms for Psychological Exploration

MMORPGs differ significantly from other gaming genres such as action-adventure (ACT), real-time strategy (RTS), and first-person shooters (FPS) through their unique focus on comprehensive worldbuilding, extensive character progression, and deep community engagement (Wu, 2015; Song et al., 2020). These characteristics produce highly consistent and immersive environments that enable researchers to observe complex behaviors over extended periods. The depth and duration of player engagement in MMORPGs provide unique opportunities to investigate decision-making processes, social interaction, and self-regulation in dynamic, ecologically valid contexts. Since their origins in the late 1980s with games like *Island of Kesmai*, MMORPGs have continuously evolved, incorporating increasingly sophisticated narratives, intricate gameplay mechanics, and thriving online communities, thus effectively mirroring real-world social systems.

Although MMORPGs were not initially designed explicitly as tools for psychological research or assessment, their interactive, goal-driven, and socially rich environments have rendered them invaluable for empirical psychological exploration (Xu & Li, 2021). Researchers have leveraged MMORPG data to gain insights into personality traits, cognitive processes, and decision-making patterns, highlighting the potential for such platforms to offer scalable, ecologically valid psychological assessments (Peng et al., 2010; Wen et al., 2019).

While MMORPGs differ fundamentally from serious games—explicitly created for educational, skilldevelopment, or psychological assessment purposes—they share similar design features, such as role-playing components, task management, and immersive scenarios. This common ground suggests MMORPGs can similarly serve as valuable platforms for studying psychological phenomena, bridging entertainment and psychological research through immersive digital simulations (Peng et al., 2010; Wen et al., 2019).

Player Groups and Behavioral Diversity

Within MMORPG communities, players exhibit diverse engagement styles influenced by their personality traits and underlying motivations (Ducheneaut et al., 2006; Graham & Gosling, 2013). Researchers commonly distinguish player types by combining objective in-game behavioral data—such as quest completion rates, preferred activities, or social interaction patterns — with supplementary qualitative methods like surveys and interviews. Such multimethod approaches facilitate reliable player categorization, linking gaming preferences to personality dimensions. For example, hardcore players, who predominantly engage in high-difficulty combat content, often exhibit behaviors aligned with conscientiousness, competitiveness, and goal orientation. In contrast,

casual players, typically preferring narrative-driven or leisure-oriented content, are more closely associated with openness, agreeableness, and flexibility (Zhang & Zhu, 2019).

These different play styles influence how players respond to specific game mechanics, challenges, and reward structures. For instance, hardcore players may demonstrate heightened sensitivity to performance pressure, deadlines, and strategic content engagement. Casual players, conversely, approach game tasks with greater spontaneity and less immediate performance pressure. Recognizing these distinct behavioral strategies is critical for designing tailored gaming experiences that accommodate diverse player needs and preferences (Graham & Gosling, 2013; Ducheneaut et al., 2006).

Behavioral Phenomena in Gaming: Inaction Inertia and Proactive Procrastination

Two psychological phenomena, inaction inertia and proactive procrastination, have notable implications for understanding MMORPG player behavior and game design strategies. Inaction inertia, initially described by Tykocinski, Pittman, and Tuttle (1995), refers to the tendency to avoid subsequent opportunities after missing out on a more attractive previous opportunity. Cognitive dissonance, regret, and self-perception significantly influence this phenomenon, often modulated by factors such as the attractiveness of alternatives and temporal proximity (Chen et al., 2010; Cui et al., 2016). Within MMORPG contexts, inaction inertia may manifest as a reluctance to reattempt challenging content following an initial failure or missed opportunity, paralleling real-world scenarios such as an investor avoiding new investment opportunities after missing better earlier ones.

Proactive procrastination, defined by Chu and Choi (2005), describes the intentional delay of tasks to enhance enjoyment or optimize performance under increased pressure. In gaming environments, players may strategically delay tasks, such as quests or seasonal events, to heighten the challenge or enjoyment derived from completing them. This form of procrastination correlates positively with mindfulness and self-efficacy, reflecting a deliberate approach to time management and task prioritization (Lu et al., 2021).

Examining these phenomena within MMORPG settings provides valuable insights into broader psychological theories, highlighting how virtual environments might foster unique behavioral and decision-making strategies. However, an important question concerns the transferability of these in -game behaviors to real-life contexts. Players often experience MMORPG participation as a form of conscious simulation or digital "visit," leading to distinct psychological states and self-perceptions during gameplay that may differ significantly from their everyday behaviors (Klimmt, Hefner, & Vorderer, 2009; Peng et al., 2010). Addressing this boundary condition remains critical for understanding the extent to which MMORPG-derived psychological observations reflect stable real-world traits versus context-dependent behaviors.

Research Objectives and Hypotheses

Launched in 2013, *Final Fantasy XIV* has amassed a stable and substantial player community, exceeding 27 million registered users globally as of October 2022. This MMORPG's success, underscored by accolades such as IGN's "Best Ongoing Game of 2022" and The Game Awards' "Best Ongoing Game" and "Best Community Support," makes it particularly suitable for exploring player behaviors such as inaction inertia and proactive procrastination.

This study investigates these two psychological phenomena among distinct player groups within *Final Fantasy XIV*, explicitly distinguishing between hardcore players — those primarily engaged in high-difficulty combat content — and casual players — those predominantly involved in leisurely or non-combat activities. Although the game developers consistently provide updates for both gameplay styles, the approaches adopted by these groups differ significantly. Hardcore players typically display proactive behaviors, such as setting self-imposed deadlines to swiftly explore newly released content, driven by a desire to maximize their gaming experience. If they miss these self-imposed deadlines, they often experience inaction inertia, subsequently avoiding the content altogether. Conversely, casual players prefer less challenging, lower-pressure experiences and generally progress at their own leisurely pace, exhibiting lower levels of inertia but greater proactive procrastination by intentionally delaying engagement with content until personally convenient. Employing a questionnaire-based methodology, we aim to ascertain whether these distinct behavioral patterns clearly manifest within the gaming environment and whether similar patterns carry over into players' real-life behaviors, exploring the potential influence of gaming style on broader behavioral strategies.

Guided by these observations, we put forward the following hypotheses:

Hypothesis 1: Hardcore player groups exhibit a higher degree of inaction inertia in gameplay than casual player groups.

Hypothesis 2: Casual player groups demonstrate more proactive procrastination behavior during gameplay.

Hypothesis 3: The inertia and proactive procrastination behaviors manifested by various player groups in their daily lives align with those observed in-game.

In summary, this research aims to explore the presence and potential transferability of inaction inertia and proactive procrastination behaviors from MMORPG contexts to real-world settings. By evaluating these phenomena across clearly defined player groups, this study not only enriches theoretical understandings of virtual and real-life psychological continuity but also offers practical guidance to game developers seeking to optimize player experiences. Moreover, it provides a foundation for developing novel psychological assessments and personality profiling techniques based on game-related behavioral data.

METHODS

Participants

Chinese players of "Final Fantasy XIV" exhibiting an adept understanding of the game and demonstrating native Chinese language proficiency were recruited for the study. All participants, having engaged in either high–difficulty or casual content, were capable of comprehending the survey items. Using in–game and player community recruitment, along with an online survey conducted via the "Wenjuanxing" platform, we accrued 628 responses. After excluding incomplete or swiftly completed surveys, we were left with 537 valid questionnaires, constituting an 86% response rate. Of these respondents, 176 (32.80%) were identified as hardcore players, 174 (32.40%) as casual players, while the remaining 187 (34.82%) were recognized as mixed–type players and excluded from subsequent analysis.

Research Tools

The study adopts a survey questionnaire approach, blending self-constructed questions with adapted scales to measure the key constructs. The questionnaire was constructed based on interviews and research undertaken within the game, player communities, and official announcements from the game's Chinese distributor, SHENGQU Games, and the developer, SQUARE ENIX. The survey was formulated and disseminated utilizing the online survey platform "Wenjuanxing." Details in the questionnaire design are as follows:

We first identified the respondent's group affiliation based on their answer to question 1. Respondents who did not fit into these categories were excluded from subsequent analyses. Additionality, we used question 8 to identify whether respondents answered the questionnaire earnestly, dismissing any questionnaire that did not select option 2 as invalid.

To address player behavior in the game, we identified several prevalent game contents in *Final Fantasy XIV* by employing a series of strategies — analyzing the game's achievement system, inquiring about players' main gaming activities in the community, and summarizing content from various game updates while retaining past contents. The common game contents discerned were then used to develop questions 1 to 13 of the survey to scrutinize the intensity and nature of respondents' engagement in these activities and analyze their in–game behavior, including inaction inertia and proactive procrastination.

For assessing inaction inertia outside the game, we adopted a scenario–based approach, where a narrative is presented followed by investigative questions. We used a scenario material adapted from Li and Zhou's (2013) study, substituting their context with a related scenario for gamers about using a mobile app to order food delivery. This material was utilized in question 14 of the survey to examine respondents' inactive behavior outside the game.

To assess procrastination behavior outside the game, we referenced and adopted the proactive procrastination scale (NAPS) by Choi and Moran, localized into Chinese by Ni et al. (2011). We also referenced the Short General Procrastination Scale (SGPS) by Sirois et al., localized into Chinese by Zhang Yali et al. (2020), using selected items as questions to examine respondents I general procrastination behavior outside the game.

The full question items and their purposes are presented in *Table S1* at the end of this paper.

Research Design

Questionnaire Distribution

Data collected from multiple sources, such as the game, the NGA forum, and Sina Weibo. During the questionnaire distribution period, we recruited participants in the game during active player hours (12:00–13:00 during lunchtime and 19:00–21:00 in the evening) and posted recruitment information on popular game forums (such as the NGA forum section) and game–related Weibo accounts that players frequently follow. We distributed the questionnaire to players who were willing to participate in the survey, in order to ensure that the participants had experience and understanding of the game.

Before the participants filled out the questionnaire, we clearly informed them that the data collected would be completely anonymous and used only for research purposes. We also explained that there were no right or wrong answers, and that they should choose based on their true thoughts without overthinking. In addition, we explained the reward that could be obtained after completing the questionnaire (a randomly selected participant would receive either a set of game outfits or 128 Chinese *yuan* in cash). We also explained the method for collecting the reward (by replying to the designated post on the forum and showing a screenshot of completing the questionnaire).

Data Analysis

IBM SPSS 25.0 was used as the statistical software for this study. Using player group (hard–core players and casual players) as the group variable, we used the scores of inaction inertia and proactive procrastination both inside and outside the game as the test variables. We conducted independent sample *t*–tests to analyze the differences in the levels of inaction inertia and proactive or general procrastination exhibited by different player groups in the game and outside the game.

Ethical Review

The protocol of the current study was approved by the Ethics Review Committee of School of Psychology, Fujian Normal University (Protocol No. 2022102003). The participants provided their written informed consent to participate in this study.

Player Groups

Table 1 illustrates the intensity of various game content participation by different player groups. Notably, hardcore players participate more intensively in high-difficulty content, while casual players engage more in leisure content. Yet, for the common content where most players participate, the intensity of participation does not significantly differ among player groups.

Player Groups	High-difficulty	Leisure Content	Normal Content
	Content Intensity	Intensity	Intensity
Hard-core Players	3.40 (0.63)	2.36 (0.79)	2.99 (0.71)
Casual Players	2.24 (0.72)	2.78 (0.83)	2.9 (0.68)
Casual Players	2.24 (0.72)	2.78 (0.83)	2.9 (0.68)

Table 1. Participation Intensity of Different Player Groups in Different Game Contents

Note: The numbers in parentheses are standard deviations.

Inaction Inertia

Based on the independent sample *t*-test analysis presented in *Table 2*, it is evident that compared to the casual player group, the hardcore player group exhibits more in–game inert behavior (t = 2.04, p < 0.05). However, no significant difference was found in inert behavior between the two groups outside the game.

Table 2. Inac	tion Inertia	among	Different	Player Groups
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Player Groups	In-Game	Out-of-Game
Hard-core Players	3.36 (0.05)	3.45 (0.09)
Casual Players	3.21 (0.05)	3.65 (0.08)
t	2.04*	-1.65

Note: *p < 0.05. The numbers in parentheses represent standard errors.

Proactive Procrastination

As shown in *Table 3*, independent samples *t*-tests were performed to analyze the differences in proactive procrastination between different player groups. The results indicate that, in-game, compared with casual players, hardcore players are more likely to employ proactive procrastination when engaging in combat-related normal content (t = 5.08, p < 0.001). On the other hand, casual players are more likely to use proactive procrastination when participating in non-combat-related normal content compared to hardcore players (t = -2.68, p < 0.01). However, no significant difference was found in overall in-game proactive procrastination behavior between the two player groups.

The Cronbach's α coefficient for the proactive procrastination section outside the game was 0.66, while for the general procrastination section it was 0.60. *Table 4* illustrates the average scores of different player groups in these two parts. Independent samples t-tests were performed to analyze differences in procrastination behavior outside the game between different player groups, revealing no significant differences.

Player Groups	Combat-Related Normal Content	Non-Combat- Related Normal Content
Hard-core Players	0.30 (0.03)	0.13 (0.03)
Casual Players	0.09 (0.02)	0.24 (0.03)
t	5.08 ^{***}	-2.68 ^{**}

Table 3. Proactive procrastination Behaviors in Different Player Groups Within theGame.

Note: **p < 0.01, ***p < 0.001. The numbers in parentheses represent standard errors.

Table 4.	Proactive procrastination	n Behaviors in	Different Pla	ayer Groups (Outside the
		Game.			

Player Groups	Proactive procrastination	General Procrastination
Hard-core Players	16.35 (0.21)	16.51 (0.24)
Casual Players	16.18 (0.25)	15.64 (0.24)
t	1.83	0.56

Note: The numbers in parentheses represent standard errors.

DISCUSSION

Hypothesis Verification

1. In-game inaction inertia (H1)

Consistent with Hypothesis 1, hardcore players exhibited significantly stronger inaction inertia during gameplay than casual players. In practice, after failing or missing a challenging dungeon, hardcore players were more likely to continue avoiding related content—even when the developers introduced limited-time incentives or appearance-only rewards rather than attribute upgrades. This pattern may reflect both the design of high-difficulty content and the prevailing community culture among hardcore cohorts, who place a premium on peak-performance runs and "first clears" (Ducheneaut et al., 2006; Zhang & Zhu, 2019).

Despite the implementation of non-reducible difficulty dungeons, alternative limited-time events, and rotating rewards intended to mitigate inertia, most hardcore players still treated each "special" dungeon as fresh content linked to a specific version update. Once that initial window passed, they reverted to avoidance. Laboratory research on inaction inertia suggests that offering multiple simultaneous reference points (e.g., overlapping reward windows) can weaken the regret associated with missing a superior opportunity, thereby reducing avoidance (Su et al., 2013). Translating this insight to *Final Fantasy XIV*, developers could concurrently open several early-game dungeons—each featuring slightly distinct reward tracks—and rotate them regularly. Doing so would provide simultaneous, equally appealing alternatives, potentially reducing the strength of inaction inertia among hardcore players.

2. In-game proactive procrastination (H2)

Contrary to the expectation that casual players alone would exhibit proactive procrastination, both hardcore and casual players selectively employed this strategy in their domains of expertise. Specifically, hardcore players showed proactive procrastination behavior—deliberately delaying engagement—when approaching routine combat content (e.g., daily roulettes or normal dungeons) that they knew they could handle efficiently. Conversely, casual players displayed proactive procrastination when tackling non-combat content (e.g., seasonal events or life-skills content such as crafting and gathering).

This selective pattern aligns with research linking proactive procrastination to self-efficacy and mindfulness (Lu et al., 2021). When confronted with familiar tasks—where players feel confident in their ability to meet deadlines—they are more likely to postpone until the perceived "optimal" moment, thereby enhancing engagement under pressure. By contrast, in unfamiliar content areas, both groups refrained from strategic delays, likely due to lower confidence in performance.

To support proactive procrastination in areas of expertise, game designers could provide clearer time forecasts and break down new content into well—defined, stage-by-stage tasks (e.g., pre-event quests, partial unlocks, incremental rewards). Maintaining stable, fulfilling version updates while offering detailed patch roadmaps would help players plan their play sessions more effectively, encouraging them to engage at their own preferred "prime time" without inadvertently slipping into counterproductive avoidance.

3. Transfer to real life (H3)

Hypothesis 3 anticipated that inaction inertia and proactive procrastination patterns observed ingame would mirror off-game behaviors. However, no significant differences emerged between player groups on general or active procrastination outside the game. This divergence suggests that self-regulation strategies within an MMORPG environment operate via mechanisms distinct from those in everyday contexts. One explanation is that avatar identification temporarily alters players' self - perception, creating a "virtual self" that behaves according to in - game norms rather than participants' stable offline personalities (Klimmt et al., 2009). When players immerse themselves in their avatars—especially during high-stakes, high-difficulty content—they may experience a form of "episodic depersonalization" in which real-life self-awareness is temporarily reduced (Cohen, 2006). Consequently, their in - game decisions reflect avatar - driven motivations—such as social standing within a raid team or reputation in a dedicated forum—rather than offline standards of time management and goal pursuit. Thus, the behavioral disparities between hardcore and casual players during gameplay do not translate directly to real-world procrastination or inertia.

Potential Limitations

This study offers initial evidence for the dynamics of inaction inertia and proactive procrastination in MMORPG contexts, but several limitations should be acknowledged.

First, the conceptual distinction between casual and hardcore players, though grounded in observed gameplay patterns and existing community discourse, may still be subject to ambiguity. While the study defined hardcore players as those primarily engaged in high-difficulty combat content and casual players as those involved in leisurely or non-combat activities, the boundaries between these categories can be fluid. Player self-identification, in-game behavior tracking, and questionnaire responses may not always align perfectly, and the classification may be influenced by both player self -perceptions and the structure of the survey instrument. Additionally, as the segmentation process relied partly on self-reported and behavioral cues, the possibility of leading questions or preemptive classification cannot be fully excluded. Future research should consider using a combination of objective behavioral logs and longitudinal data to triangulate player typologies and reduce ambiguity.

Second, while the intent to examine inaction inertia and proactive procrastination draws upon both psychological theory and ongoing debates in game design — such as how to structure content to encourage early engagement or optimize player motivation — the relationship between these constructs and design principles was not fully disentangled in this study. As a result, while game-based evaluation provides valuable ecological validity, additional work is needed to clarify how such psychological traits are shaped by, or feedback into, specific design choices.

Third, the assertion that MMORPGs and serious games share important features—such as structured challenges, social learning, and behavioral assessment — was intended to highlight the research potential of MMORPGs. However, the present study did not empirically test the extent of this overlap or provide a comparative analysis. Future studies could more rigorously examine the boundary conditions between entertainment- and assessment-oriented digital environments.

Fourth, the caution about discrepancies between in-game and real-life behaviors is based on the finding that self-regulation strategies and behavioral patterns within virtual environments do not necessarily translate to offline contexts. This study relied primarily on self-report questionnaires rather than online ethnography or direct observation, which may limit the richness and reliability of the behavioral data. In particular, without detailed ethnographic or behavioral-log data, it is challenging to parse whether the observed discrepancies are a function of measurement method (interview vs. observation) or a deeper divide between digital and real-life identities.

Finally, the findings concerning the non-alignment of in-game and real-life patterns (especially for Hypothesis 3) suggest that immersion in digital environments may foster a temporary, alternative self-concept — a phenomenon sometimes described as a "double life." This raises important questions about the authenticity of behaviors observed in each domain and complicates any attempt to generalize from game-based data to broader psychological theory.

Future Directions

Given these limitations, several future directions are recommended to advance understanding in this domain.

First, ongoing collection and analysis of behavioral data — both in-game and out-of-game — are essential to deepen and clarify the theoretical links between digital behaviors and real-life tendencies. Longitudinal studies employing behavioral logs, rather than solely relying on self-report, could help establish more robust connections or distinctions between gaming and everyday life.

Next, to address the ambiguities in player typology and segmentation, future research should combine self-report with unobtrusive tracking of in-game behavior (e.g., time spent in various activities, actual engagement with high-difficulty vs. leisure content). This multi-method approach could provide a clearer, data-driven foundation for differentiating player groups, and might allow for the emergence of naturally occurring clusters rather than imposed categories.

Further conceptual work is also needed to examine how avatar identification and immersion affect self-perception and behavioral authenticity. Experimental studies could, for example, manipulate the degree of avatar immersion or the salience of the player's "real" vs. "virtual" identity to directly test the mechanisms underlying the "double life" phenomenon. Mixed-methods approaches — including interviews, online ethnography, and physiological measures — could enrich the understanding of how and why in-game strategies diverge from real-life tendencies.

Moreover, the potential for MMORPGs to serve as platforms for psychological assessment and intervention should be further explored. Comparative studies contrasting MMORPGs and serious games could clarify the extent to which features such as structured challenges, cooperative tasks, and adaptive feedback promote transferable skills or traits. In parallel, collaboration with game developers to design interventions or content updates based on psychological insights could allow for real-time testing of strategies to reduce inertia or encourage healthy procrastination.

Finally, researchers should articulate more explicitly how the study of inaction inertia and proactive procrastination is informed by, and contributes to, contemporary design debates. By making the theoretical and practical motivations for studying these constructs clearer, future work can better bridge the gap between psychological science and game design, benefiting both disciplines.

CONCLUSION

Drawing on a sample of *Final Fantasy XIV* players categorized as hardcore (combat-focused) or casual (leisure-focused), this study examined inaction inertia and proactive procrastination both within the game and in real-life contexts. Our main conclusions are:

(1) The group of hardcore players exhibits a significantly stronger inaction inertia during the gaming process compared to the group of casual players.

(2) Players are more willing to adopt a proactive procrastination strategy when participating in gameplay they are more familiar with. During combat–related normal content, hardcore players use proactive procrastination strategies more than casual players. During non–combat–related normal content, casual players use proactive procrastination strategies more than hardcore players.

(3) The inaction inertia and proactive procrastination behaviors exhibited by different player groups outside the game are not directly related to whether they exhibit inaction inertia and proactive procrastination behaviors in the game.

Collectively, these results highlight the importance of context-specific design considerations in MMORPGs: inaction inertia and proactive procrastination should be addressed not merely as universal traits but as behaviors modulated by content familiarity, social norms, and design structures. For developers, implementing simultaneous alternative challenges, transparent patch roadmaps, and personalized incentive systems could reduce inaction inertia for hardcore players and optimize proactive procrastination for deeper engagement for different player groups. For researchers, these findings recommend caution when extending game - based assessments to broader psychological constructs, emphasizing the need for mixed - methods approaches that integrate behavioral logs, real-time ethnography, and physiological measures. Ultimately, understanding the nuanced interplay between virtual and real - world self - regulation offers promising avenues for both enriching player experiences and advancing theories of decision making.

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REFERENCES

- Cao, M., Xie, H., Sun, L., Zhang, D., Kong, F., & Zhou, Z. (2021). Processing advantage of embodiment reference in online games: Evidence from behavior and ERPs. Acta Psychologica Sinica, 53(6), 639–650.
- Chen, T., & Wang, L. (2010). Inaction inertia effect. Economic Research Guide, (36), 270-271.
- Chen, W. W., Tsai, D. C., & Chuang, H. C. (2010). Effects of missing a price promotion after perceived price unfairness, negative purchasing on emotions, and behavioral responses. *Social Behavior and Personality*, *38*, 495–508.
- Chu, A. H., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *Journal of Social Psychology*, *145(3)*,245–264.
- Cohen, J. (2006). Audience identification with media characters. In J. Bryant & P. Vorderer (Eds.), *Psychology of Entertainment (pp. 183–197)*. Mahwah, J: Erlbaum.
- Cui, N., Xu, L., & Xie, W. (2016). To do or not to do: The effect of self-regulation mode on inaction inertia. *Acta Psychologica Sinica*, *48*(4), 423.
- Ducheneaut N, Yee N, & Nickell E, Moore R J. (2006). Building an MMO With Mass Appeal: A Look at Gameplay in World of War–craft. *Games and Culture*, 1: 281–317.
- Graham, L.T., Gosling, S. D. (2013). Personality Profiles associated with different motivations for playing World of Warcraft. *Cyberpsychology Behavior & Social Networking*, *3*, 189–193.
- Huang, S. (2009). The influence of online game consciousness on online game behavior: An example of adolescent netizens. *Journalism & Communication Studies*, *2*, 59–68.
- Klimmt, C., Hefner, D., & Vorderer, P. (2009). The video game experience as "true" identification: A theory of enjoyable alterations of playersI self–perception. *Communication Theory*, *19*, 351–373.
- Li, X., & Li, X. (2012). The causes, conditions, and applications of inaction inertia. *Advances in Psychological Science*, 20(4), 584–591.
- Li, X., & Zhou, Q. (2013). The regulatory mechanism of inaction inertia in response to the number of previously missed options. *Advances in Psychological Science*, *21*(2), 205–210.
- Lu, C., Pan, F., & Fang, F. (2021). The relationship between active and passive procrastination and mindfulness and self–efficacy in college students. *Journal of Shandong University* (*Medical Edition*), 59(10), 108–113.
- Munn N. J. (2012). The Reality of Friendship Within Immersive Virtual Worlds. *Ethics and Information Technology*, *1*, 1–10.
- Ni, S., Li, H., Xu, J., & Choi, J. N. (2011). Revision and validity test of the Proactive procrastination Scale among Chinese college students. *Chinese Journal of Clinical Psychology*, *19*(4), 462–465.
- Peng, W., Lee, M., & Heeter, C. (2010). The effects of a serious game on role-taking and willingness to help. *Journal of Communication*, 60, 723-742.

- Song, H., Yi, D. J., & Park, H. J. (2020). Validation of a mobile game–based assessment of cognitive control among children and adolescents. *PLoS ONE*, *15(3)*, 1–18.
- Stănescu, D. F., IoniŢĂ, C., & IoniŢĂ, A. M. (2020). Game-thinking in personnel recruitment and selection: Advantages and disadvantages. *Postmodern Openings / Deschideri Postmoderne*, 11(2), 267–276.
- Su, S., Chen, R., & Huang, J. (2013). The regulation of inaction inertia: A multi- reference point perspective based on "looking forward". *Acta Psychologica Sinica*, *45*(12), 1393-1409.
- Sun, X., Li, J., & Fu, Z. (2018). Predicting students' reasoning ability and math achievement using game log-file: The application of machine learning. *Acta Psychologica Sinica*, *50*(7), 761-770.
- Tykocinski, O. E., Pittman, T. S., & Tuttle, E. E. (1995). Inaction inertia: Foregoing future benefits as a result of an initial failure to act. *Journal of Personality and Social Psychology*, *68*(5), 793 –803. https://doi.org/10.1037/0022-3514.68.5.793
- Wen, Y., Fu, Y., & Huang, B. (2019). Review of electronic game assessment. *Computer Knowledge and Technology*, *15*(8), 184-186.
- Wu, Y. (2015). An analysis of the development of serious games in China. *Science and Technology Vision*, *10*, 135+227.
- Xu, J., & Li, Z. (2021). Game-based psychological assessment. *Advances in Psychological Science*, *29*(3), 394-403.
- Yang, Z., & Sun, Y. (2015). Gamification recruitment: A new way of talent selection. *Human Resource Development of China*, 342(24), 47-52.
- Zhang, Y., Li, S., & Yu, G. (2020). Reliability and validity of the brief version of the General Procrastination Scale among Chinese college students. *Chinese Journal of Clinical Psychology*, 28(3), 483-485.
- Zhuge, D. (2019). The dynamic mechanism of emotional cohesion and cultural identity in game communities. *Modern Communication (Journal of Communication University of China)*, 2, 102-108.
- Zhang, Y., & Zhu, D. (2019). Factors influencing online gaming behavior: A literature analysis. *Journal of Lanzhou University (Social Sciences Edition)*, 47(1), 134-142.

Item Order	Item	Relevant purposes
oraci	Choices (1-2-3-4-5)	
1	I tend to participate in this type of game content more:	To differentiate
	1. Only participate in casual gameplay	player groups
	2. Participate more in casual gameplay than challenging content	
	3. Have equal exposure to both casual and challenging gameplay	
	4. Participate more in challenging content than casual gameplay	
	5. Only participate in challenging content	
2	The highest difficulty of the current version's raid that I have completed:	High-difficulty
	1. Main storyline 4–player raid	intensity
	2. 24–player raid or other side raids	
	3. Ultimate (Extreme) difficulty	
	4. Ultimate (Savage) difficulty	
3	The first time I encountered raid gameplay:	
	1. 6.x or have not encountered it yet	High-difficulty
	2. 5.x version	content intensity
	3. 4.x version	
	4. 3.x version	
	5. 2.x version	

Table S1. Design purposes for questionnaire items.

4	For earlier versions of high-difficulty raids, I am more inclined to:	Inaction inertia	
	1. Lowest gear level clearing	(in-game) for	
	2. Level sync clearing	content	
	3. Clearing with restrictions lifted	intensity	
	4. Lying down with restrictions lifted		
	5. No intention of participation		
5	For Gold Saucer related gameplay such as Triple Triad, Chocobo Racing, and Lord of Verminion, I am more inclined to:		
	1. No participation	Inaction inertia	
	2. Rarely participate	(in-game) for	
	3. Participate as needed	intensity	
	4. Actively participate		
	5. Grind intensively until achievements or goals are completed.		
6	For fishing-related gameplay, such as Fish King (Emperor) collection and updates to sea fishing, I am more inclined to:		
	1. No participation	Inaction	
	2. Rarely participate	inertia	
	3. Participate as needed	(in-game) for leisure content	
	4. Actively participate	intensity	
	5. Grind intensively until achievements or goals are completed.		
7	For previous versions of other content, such as ancient weapons, soul weapons, old treasure map achievements, etc., I am more inclined to:		
	No plans to eligage A participate infrequently		
	3 Depends on the situation	Inaction inertia	
	4 Actively participate	(in-game) for leisure content	
	5 Will make time to catch up on eventthing	intensity	
	J. with make time to catch up on everything.		

8	For this question, please choose "2": 1-2-3-4-5	Attention checker
9	After the update of the main quest, I prefer to play in the following way: 1. Not finished with the previous version 2. Gradually complete	Combat-related normal content intensity
	3. Depends on the situation	
	4. Finish as soon as possible	
	5. Complete on the day of the update.	
10	When the 6.2 "Island Sanctuary" content was updated, I choose to play it in the following way:	Proactive
	1. Have not tried it yet	procrastination
	2. Participate slowly, mainly waiting for daily experience from workshop/ranch	(In-game) for non-combat- related normal
	3. Participate more casually, as the mood strikes	intensity
	4. Play as quickly as possible to get to the new content	
	5. Play intensively and grind until reaching max level and getting rewards.	
11	Regarding the upcoming Shiladaha Waterway gameplay (6.25), my level of preparation is:	
	1. No plan to participate	
	2. Not in a hurry, will participate if there is a chance	Proactive procrastination
	3. No plan to prepare, will participate directly	(in–game) for combat-
	4. Already prepared in advance	related normal
	5. Plan to prepare in these few days before the update.	intensity
	During seasonal events such as ValentioneIs Day and Little LadiesI Day, I am more inclined to play in this way:	
12	1. Not very interested, it doesnlt matter if I forget	.
	2. 2. Not in a hurry, as long as itls completed before the end of the event	Non-combat- related normal
	3. Depending on the situation, I may or may not participate	content Intensity
	4. Complete it as soon as possible	

	5. Complete it on the day the event is updated	
	During operational events such as Call to Arms, Moogle Treasure Trove, or Limited Time Discounts, I tend to participate in the following way:	Non-combat- related normal content
13	1. Don't really care, it is okay to forget	intensity
	2. Not in a hurry, can complete it before it ends	
	3. Depends on the situation	
	4. Complete it as soon as possible	
	5. Complete it on the same day it updates	
14	One day, you open a food delivery app and want to order some snacks for yourself. As usual, you browse your favorite store and notice therels a promotion with no delivery fee, so you carefully choose the snacks you want to order. However, before you can pay, you receive a message from a friend and spend some time chatting with them. When you switch back to the food delivery app, you realize that the promotion has ended and youll have to pay the delivery fee. What is your willingness to pay?	Inaction inertia (out– of–game)
	1. Strongly unwilling	
	2. Somewhat unwilling	
	3. Neutral/Undecided	
	4. Somewhat willing	
	5. Strongly willing	

15–1	When tasks are nearing the deadline, my performance doesn't get worse.	15–1 to 15–5
15–2	Once I start working on a task, I always feel that it's hard to complete.	Proactive Procrastination
15–3	I intentionally procrastinate some tasks in order to use my time	(out-of-game)
	more efficiently.	15-2 (R) 15-5 (R)
15–4	Even if I complete a task at the last minute, I am still satisfied with	
	the result.	
15-5	I often fail to achieve the goals I set for myself.	
		15-6 to 15-10
15-6	I often plan to do things days before I actually do them.	General
15-7	Even for necessities, I usually wait until the last minute to buy.	procrastination
15-8	When preparing for a deadline, I often waste time doing other things.	(out-of-game)
15-9	I usually complete everything I have planned for the day.	15-9 (R) 15-10(R)
15-10	Refore indulging in leisure activities at night. Lusually take care of	
	all the tasks that need to be completed	
	1. Strongly disagree	
	2. Somewhat disagree	
	3. Neutral/Undecided	
	4. Somewhat agree	
	5. Strongly agree	