


Entrapment in games: Reframing persistence in the I-PACE framework

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VIEWPOINT



ABSTRACT

This paper introduces entrapment as a socio-cognitive pathway of gaming persistence that complements the gratification–compensation sequence in the I-PACE framework. Drawing on escalation-of-commitment theory, identity maintenance, sunk-cost reasoning, and social obligations, we argue that contemporary game architectures, especially gacha systems, transform cumulative investments of time, money, and identity into barriers against disengagement. Empirical signals, including sunk-cost effects, gaming-contingent self-worth, loss aversion, and amotivation, indicate that after initial gratification, persistence may become decoupled from enjoyment and remain both measurable and clinically relevant. Entrapment is not a universal endpoint but an optional trajectory, clarifying why some players continue “without joy” and underscoring implications for assessment, intervention, and responsible design.

KEYWORDS

entrapment, I-PACE framework, gaming disorder, gacha games, sunk-cost effect

INTRODUCTION

In recent years, the landscape of digital gaming, particularly in gacha-based systems, has become fertile ground for observing a curious behavioral phenomenon: players who no longer find the game enjoyable or rewarding, yet continue to log in day after day (Frommel & Mandryk, 2022). Also in game studies literature these have been identified as inauthentic players, who become dependent on extrinsic rewards and “appear to be working for the game” (Möring & Leino, 2016). Such persistence may, in some cases, be related to disordered gaming (i.e. perceived by players as conflicting or harmful), but it is difficult to ignore that the mechanism underlying this course of action differs from the reinforcement-based processes typically emphasized in addiction models.

GACHA GAMES AS A PARADIGM CASE

Gacha systems provide a particularly transparent case of this phenomenon. Their structural features, such as randomized rewards, pity systems, daily login schedules, and cumulative progression, systematically increase the perceived costs of disengagement (Woods, 2022). Beyond gambling-like reinforcement, gacha also transform time into a currency through grinding, where players “gamble” with effort and persistence rather than money alone (Paul, 2018; Woods, 2024). Developers further sustain retention via algorithmic governance, using events and timed rewards to anchor daily routines (Lassila, 2022). In addition, players often form affective bonds with collectible characters, which heightens the psychological cost of quitting (Nowak & Fox, 2018). Finally, opaque selling strategies and hidden probabilities

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(Cao, Zhang, & Sun, 2024; Chen & Fang, 2023) amplify sunk-cost reasoning and reinforce commitment. While gacha games make these mechanisms unusually visible, we regard them as an illustrative use case of a broader phenomenon that cuts across many genres of digital play.

Like most digital games, gacha systems also employ traditional reinforcement mechanisms: randomized rewards and escalating schedules can provide bursts of pleasure (positive reinforcement), while daily quests and login bonuses often alleviate fear of missing out or social exclusion (negative reinforcement). Yet the phenomenon of “playing without joy” does not easily fit traditional framework. Players frequently describe such engagement as rationalized decision (Frommel & Mandryk, 2022), a perceived obligation toward significant others, including, in some cases, family commitments (Linnemann, Breinberg, Ergin, Nielsen, & Lundedal Nielsen, 2025), or tied to prior investment (Gibson, Griffiths, Calado, & Harris, 2023) rather than to expected enjoyment or relief.

AN UNDEREXPLORED TRAJECTORY IN I-PACE

This indicates a potential gap in existing explanatory models, including the influential I-PACE framework (Brand, Young, Laier, Wölfling, & Potenza, 2016, 2019, 2024, 2025). The I-PACE model was originally developed to explain Internet-use disorder, and it primarily emphasizes gratification- and compensation-driven pathways. At the time of the model development, games based on gacha mechanics were only beginning to emerge globally (Woods, 2022). Since then, they have gained widespread popularity and refined their mechanisms. While I-PACE conceptualizes the trajectory of engagement as moving from gratification-driven to compensation-driven use, it has given less explicit attention to strategic, cognitively mediated persistence observable in many contemporary gaming patterns.

What makes gaming distinctive, and why entrapment requires theoretical recognition, is the architecture of progression and cumulative investment (Griffiths & Nuyens, 2017; King, Delfabbro, & Griffiths, 2010). Unlike other behavioral addictions, such as binge-watching, gaming embeds users in systems where time, money, social status, and identity accrue as capital over years (Consalvo, 2019; Korkeila, Dashiell, & Harviainen, 2023). It is precisely these game-specific investments, absent from most other online behaviors, that make withdrawal psychologically costly. In this sense, the “playing without joy” phenomenon is less about reinforcement and more about avoiding the recognition of accumulated losses.

COGNITIVE ENTRAPMENT: A DISTINCT PATHWAY OF ENGAGEMENT

To address this gap, we propose the concept of *entrapment* as a distinct, cognitively mediated pathway of gaming

engagement. In line with classic theorization, entrapment has always been framed as a cognitive process (Staw, 1976; Teger, 2013); our contribution lies in applying it to gaming, where progression systems and cumulative investments make it especially salient. Drawing on Teger’s (Teger, 2013) theorization of entrapment and the broader escalation-of-commitment literature (Brockner, Shaw, & Rubin, 1979; Staw, 1976; Staw & Fox, 1977; Staw & Ross, 1987), we conceptualize entrapment as the persistence in play despite diminished gratification or relief. This persistence is sustained less by anticipated rewards than by mechanisms such as sunk costs, strategic miscalculation, obligations toward others, and concerns about self-identity. In line with escalation frameworks, the crucial factor is not reinforcement but the perceived costs of disengagement and strategic reasoning about past investments, which make withdrawal appear more costly than continuation. Importantly, entrapment is not inherently maladaptive: while it can stabilize problematic gaming trajectories, it may also occur in non-pathological engagement, for instance in long-term commitment to hobbyist communities.

We suggest that recognizing entrapment alongside gratification and compensation enriches the explanatory power of the I-PACE model by capturing the evolving dynamics of contemporary digital play. This refinement aligns with the model’s explicitly dynamic and provisional character. As Brand et al. (Brand et al., 2025, p. 2) note, ‘*our current theories and models within behavioral addiction research (or addiction research more broadly) are all not final, likely generic, and speculative at some points, and therefore may be considered most appropriately as preliminary suggestions as to which processes might contribute to behavioral addictions.*’ Such acknowledgment underscores that extending I-PACE to phenomena like entrapment is not a departure from its assumptions, but a continuation of its intended flexibility. Entrapment therefore represents a persistence trajectory that I-PACE implicitly left open but did not formalize, one uniquely illuminated by the structural affordances of digital games. Notably, an early comparative structural analysis already discussed entrapment (alongside the near-miss phenomenon) in MMORPGs, concluding that these mechanisms were present but comparatively weak relative to social engagement and competition (Karlsen, 2011). The limited uptake of that proposal likely reflected the design landscape of the time, when architectures that systematically loaded disengagement with cumulative costs were far less widespread than in today’s gacha-style ecosystems.

SOCIO-COGNITIVE MECHANISMS SUSTAINING ENTRAPMENT

Entrapment in gaming is not a by-product of simple reinforcement. It emerges when socio-cognitive processes reweight the decision calculus so that stopping feels costlier than carrying on, even when hedonic returns have faded. Several well-established processes illustrate why disengagement can feel more costly than ongoing play.

Sunk-cost reasoning and self-justification

Once time, effort, or money has been invested, players may experience strong pressure to rationalize continuation. The sunk-cost effect (Arkes & Blumer, 1985) and cognitive dissonance theory (Festinger, 1962) converge here: stopping would force the individual to admit wasted effort, whereas continuing helps preserve coherence. Escalation of commitment research shows that such justification can occur even in objectively failing trajectories (Aronson, 1969; Brockner et al., 1979). An empirical indication comes from Phillips (2021), who found that stronger feelings of prior investment were associated with lower willingness to disengage from mobile game. A more robust evidence comes from experimental work by Chiou and Wan (Chiou & Wan, 2007), who showed that adolescents perceiving higher prior costs of online gaming were significantly less willing to reduce their play than peers in lower-cost conditions. These findings suggest that sunk-cost dynamics and cost justification may anchor players to games, even when enjoyment has faded; it highlights the plausibility of sunk-cost dynamics in games and underscores the need for systematic empirical research.

Identity maintenance

Games frequently embed status, roles, or long-term identities (“backer”, “founder”, “gamer”). Abandoning them is not only a behavioral choice but also an identity threat. Identity theory highlights that social roles stabilize behavior by linking it to self-concept (Stryker & Burke, 2000). Yin (*Identity Construction in Digital Youth Culture: A Case Study of Mobile Games in China, 2024*) shows how players integrate in-game achievements and roles into their broader sense of self, illustrating how gaming can shape identity continuity. Complementing this, Beard and Wickham (2016) provide quantitative evidence through the Gaming-Contingent Self-Worth scale, demonstrating that personal value can become tethered to in-game achievement, with higher scores predicting stronger symptoms of Internet Gaming Disorder. Taken together, this evidence indicates that when identity value is tied to gaming achievements, disengagement becomes psychologically costly.

A separate element of identity maintenance can be distinguished as storyworld impact on subjectivity (Gualeni & Vella, 2020; Thon, 2014). The sense of belonging to a game world is anchored in its specific aesthetics, narrative or gameplay. The entrapment lies in the constant obligation to maintain this knowledge or expertise about the storyworld. In case of gacha games, the storyworld is often offered in small, transmedial fragments, with an ever expanding horizon of its exploration.

Loss asymmetry and strategic miscalculation

Prospect theory emphasizes that losses loom larger than gains (Kahneman & Tversky, 2012). In gacha contexts, this produces a “just one more cycle” dynamic: quitting now

means realizing sunk costs as a loss, whereas continued play offers at least the hope of recovery. This asymmetry biases players toward persistence, even when rational evaluation suggests disengagement. Romão et al. (2020) found preliminary evidence of loss aversion in video games, as players showed greater sensitivity to losses than gains. Their results resonate with industry churn models, which show that players who have already spent money in free-to-play ecosystems are markedly less likely to quit (Bertens, Guitart, & Periañez, 2017; Fernández Del Río, Guitart, & Periañez, 2021; Periañez, Saas, Guitart, & Magne, 2016). While churn models target retention prediction rather than psychological theory, they indirectly confirm that perceived accumulated losses (temporal or financial) discourage exit. Such converging evidence supports loss asymmetry as a plausible mechanism in gaming entrapment.

Social visibility and obligations

Digital games embed individuals in guilds, achievements, leaderboards, and cooperative routines. Therefore, in digital gaming, entrapment is not only cognitive but also socio-cognitive, as persistence is sustained through both internal justifications and external obligations. Quitting may carry reputational costs or be perceived as abandoning teammates, thus layering social penalties on top of the individual costs of disengagement outlined earlier. In laboratory studies, public commitments have been shown to exacerbate escalation tendencies (Ronay, Ostrom, Lehmann-Willenbrock, & Van Vugt, 2017), and multiplayer mechanics replicate this effect at scale. For some gamers, the weight of obligation to others outweighs their own lack of enjoyment. Evidence from MMORPG studies suggests that participation and identity processes can foster stronger team commitment (Liao, Pham, Cheng, & Teng, 2020), highlighting how social visibility and obligation may sustain persistence even when enjoyment wanes. Consistent with this, Park et al. (Park, Cha, Kwak, & Chen, 2017) found that as players’ careers lengthen, social bonds increasingly outweigh achievement as predictors of retention, suggesting that obligation to teammates becomes a progressively stronger anchor of long-term engagement. Similarly, Guegan, Moliner, and Buisine (Guegan, Moliner, & Buisine, 2015) demonstrated that guild membership in MMORPGs shapes players’ social identity, reinforcing in-group favoritism and identification processes. This illustrates how identity mechanisms discussed earlier intertwine with social bonds, reinforcing persistence through the combined weight of self-concept and group belonging.

Taken together, these mechanisms demonstrate entrapment represents an optional persistence pathway that can branch from initially gratification-driven engagement, alongside the compensation pathway outlined in I-PACE. The mechanisms discussed (sunk-cost reasoning, identity maintenance, loss asymmetry, and social obligations) show how engagement may follow one of two routes: compensation (sustained mainly by affect regulation) or cognitive entrapment (sustained mainly by accumulated investments, identity concerns, and perceived exit costs). Framing

entrapment in this way underscores its compatibility with I-PACE while clarifying that it is not a universal endpoint but an additional pathway, most visible in contemporary game architectures. This perspective aligns with the WHO definition of gaming disorder, which stresses impaired control and continuation despite negative consequences as perceived by players themselves. Entrapment illustrates precisely this paradox: play sustained not for pleasure or relief, but because stopping is construed as more costly than continuation.

POSITIONING ENTRAPMENT WITHIN I-PACE

Entrapment enriches the I-PACE framework by specifying an optional persistence pathway that branches after initial gratification, in parallel to the compensation pathway. Unlike compensation, which is maintained by expected affective relief, entrapment is maintained by cognitively mediated exit costs and self-justifying decision processes.

Within the I-PACE framework, the cognition (C) component predominantly captures affect-linked expectancies and stimulus-response associations that support gratification and compensation, reflecting a specific subset of cognitive processes oriented toward reward anticipation and affect regulation. We propose that entrapment reflects a distinct subset of cognitive processes within the same C component, namely strategic and self-referential appraisals centered on accumulated investments, identity maintenance, and perceived exit costs. In this cognition-dominant configuration, persistence is sustained less by anticipated reward or relief and more by the perceived irreversibility of prior commitments.

Conceptually, this implies two alternative post-gratification persistence configurations within I-PACE. In compensation-driven persistence, affective dysregulation and relief expectancies dominate the A–C interaction, with behavior maintained primarily through reinforcement. In entrapment-driven persistence, by contrast, strategic cognition within C becomes dominant: players continue primarily because stopping is construed as more costly than continuing, due to sunk investments, identity concerns, or social obligations. While both pathways may dynamically co-occur within the same individual over time, they remain mechanistically distinct configurations of persistence, grounded in different dominant processes.

Since the I-PACE model is flexible, leaving space for context-dependent pathways of persistence (Brand et al., 2025), our proposal does not contradict this orientation but extends it by formalizing a socio-cognitive route to persistence that becomes particularly visible in cumulative, progression-based game architectures. Importantly, entrapment is not a late-stage inevitability but an optional pathway compatible with I-PACE. It highlights persistence sustained by socio-cognitive barriers, complementing rather than replacing the compensation pathway.

This distinction is reinforced by existing psychometric constructs. Amotivation, as operationalized in the Gaming Motivation Scale (Lafrenière, Verner-Filion, & Vallerand, 2012)

and the Gaming Motivation Inventory (Király et al., 2022), identifies players who, after a period of initially rewarding play, continue gaming while reporting little or no enjoyment, value, or purpose, precisely the experiential profile of entrapment. These tools demonstrate that persistence without gratification or compensation is not merely anecdotal but systematically measurable, providing an empirical bridge between theoretical mechanisms and observed player behavior.

Finally, it is useful to distinguish entrapment from habit formation. Habit explains persistence through automaticity and stable contextual cues (Ouellette & Wood, 1998), and evidence shows it operates in gaming as well (Jiang, Kaur, Adnan, Turner, & Goh, 2021). Entrapment, by contrast, highlights persistence driven by conscious rationalizations, perceived obligations, and the miscalculation of costs. While both mechanisms may co-occur, their foundations are distinct: habit reflects behavioral inertia, whereas entrapment captures socio-cognitive evaluations that render disengagement more costly than continuation.

IMPLICATIONS

Assessment

Recognizing entrapment as a distinct phase underscores the need for diagnostic tools that go beyond hedonic and compensatory motives. Existing instruments for gaming disorder tend to capture symptoms of dysregulation or motivational style, but they rarely assess the subjective perception of irreversibility that characterizes entrapment. A promising reference point comes from research on depression, where Gilbert and Allan (Gilbert & Allan, 1998) introduced the Entrapment Scale to measure feelings of being trapped in inescapable situations. Drawing inspiration from this approach, future work should develop and validate an entrapment-specific instrument for gaming. Such a tool could include items targeting the perceived inability to stop playing, beliefs in irreversible investment (time, money, identity), or fears of losing valued social roles. Establishing such a measure would allow researchers and clinicians to distinguish between ordinary high engagement and entrapment-like persistence, helping to identify individuals at elevated risk for gaming disorder.

Intervention

Entrapment dynamics may also require tailored therapeutic strategies. For players whose persistence is driven by sunk-cost reasoning, cognitive restructuring techniques can help reframe past investments as irrelevant to present decisions. For those with identity-contingent self-worth, interventions aimed at role diversification and self-concept broadening may reduce reliance on in-game validation. Importantly, the presence of entrapment does not necessarily equal Gaming Disorder, but it may act as a risk amplifier, escalating the likelihood of maladaptive use if left unaddressed.

Policy & design

From a preventive perspective, game design and policy can mitigate entrapment by reducing punitive features that artificially raise the cost of disengagement. Transparency in drop rates, “cool-off” mechanisms in pity systems, and less rigid streak-based rewards could lower structural pressures that make quitting costly. Design features that promote voluntary disengagement, such as session reminders, account detachment options, or reflective prompts, can provide players with opportunities to reassess their engagement. Monitoring behavioral data for markers of inertial use (e.g., repetitive login without meaningful interaction) could further support early detection. In this way, recognizing entrapment not only advances clinical theory but also sets benchmarks for responsible design.

CONCLUSION

This paper has argued that entrapment represents a distinct, socio-cognitive pathway of gaming persistence that complements rather than replaces the gratification–compensation dynamics emphasized in the I-PACE model. By synthesizing evidence from sunk-cost reasoning, identity maintenance, loss asymmetry, and social obligations, we have shown how contemporary game architectures, particularly progression-based systems such as gacha, make withdrawal feel disproportionately costly. Importantly, entrapment is not a universal endpoint, but an optional trajectory that some players follow when cumulative investments and obligations outweigh declining enjoyment. Recognizing this phenomenon has implications for theory, assessment, clinical practice, and responsible design: it highlights why some players continue to play “without joy,” and why gaming disorder cannot be fully understood without accounting for socio-cognitive barriers to disengagement. In this sense, entrapment brings conceptual clarity to a paradox long acknowledged in clinical descriptions of gaming disorder: the persistence of play not for reward or relief, but because stopping seems more painful than carrying on.

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responsibility for the integrity of the data and the accuracy of the data analysis.

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