

Psychological Mechanisms of Engagement and Immersion in Mobile Gaming: A Case Study of Eggy Party

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Abstract: *Eggy Party*, a popular casual competitive game developed by NetEase, has rapidly gained a massive player base since its launch, encompassing dozens of game register record in specific. This paper explores the psychological factors influencing player engagement and immersion in games, focusing on and referring to theoretical frameworks such as Flow Theory, Self-Determination Theory (SDT), and Reward Sensitivity Theory. By analyzing the dynamic design of skill-challenge matching in games, this study demonstrates how Flow Theory can enhance player immersion through balanced difficulty adjustments, such as personalized matchmaking systems and progressive challenges in multi-round competitions; examines the role of uncertainty in driving player cognitive engagement, emphasizing elements like exploration-based gameplay, random rewards, and dynamic competition mechanics; and highlights how these game design features leverage psychological concepts to sustain players' interest and motivation. Furthermore, practical suggestions are provided to optimize gameplay experiences, including the integration of adaptive difficulty mechanisms, multi-dimensional leaderboard designs, and personalized reward structures. This analysis aims to contribute to the understanding of effective game design strategies and their psychological underpinnings, offering valuable insights for enhancing player experience and satisfaction.

Keywords: *Eggy Party*, Flow Theory, Self-determination Theory, Game Mechanics

1. Introduction

Eggy Party, developed by NetEase, is a fashionable, casual, competitive mobile game that has captured the attention of millions since its release in 2022. Its Chinese version commenced public testing on all platforms in mainland China on May 27, 2022, and the international version conducted a trial operation and was launched on the Google Play Store in the Philippines on April 21, 2023. With over 500 million registered players and a peak daily active user base of 40 million during the 2023 Lunar New Year holiday, the game has become a cultural phenomenon [1]. According to "China Game Industry Report 2023," the number of Chinese game users is 668 million, which is equivalent to three out of every four players have played *Eggy Party* [2].

The game's core gameplay combines classic competitive mechanics with engaging social interaction. In the game, players will transform into dainty, lovable "eggs" and challenge various diverting and piquant levels and game modes with their chums. By leveraging frequent updates and brand collaborations, *Eggy Party* has maintained its appeal. This study employs psychological theories, including but not limited to self-determination theory, reward sensitivity theory, and

immersion and flow, to explore how *Eggy Party* fosters player engagement and immersion, analyzing its strengths and limitations to offer recommendations for improvement. This paper will chiefly investigate the following questions: What are the core thoughts of the preceding theories? How do they affect the players, and why? How does *Eggy Party* apply these theories to meliorate its gameplay? The objective of this case study is to delve into the mechanisms of immersion in games and to relate them to specific specimens to enhance understanding.

2. Overview of game mechanics

Eggy Party features diverse game modes such as classic mode (peak and leisure mode), amusement park, grange, farm, rescuing troublemakers, hide-and-seek, and crazy brawl, offering players a variety of experiences.

Default Page: Before starting a game match, players will emerge near the fountain in the main city of Eggy Island. Players in this session can engage in activities in multiple areas of Eggy Island, experience various interactive mechanisms within the zone, use ultimate combat skills and newly refreshed items in the map, and socialize with others. Some regions in the main city will be refreshed and replaced after every season of the game [3]. At the same time, the Egg Party will periodically collaborate with organizations such as games and movies, and will set up related collaboration sceneries and Eggy skins. In addition to the Eggy Island, there are other elaborately devised sub-islands for players to amuse and relish from.

Classic Mode is the core gameplay mode of Egg Boy Party. Each inning has an initialized number of players (32) and will sift and scrutinize the performance of each player through implementing racing, survival, and points competitions to determine who can enter the next level after completing the requirements through racing, survival, and points competitions. Eventually, merely 8 players will be selected and accede to the final round of slaughter, where players will try to bump off others in an arena. After all other players are eliminated, the only one left will win the triumph. The classic mode is divided into two sections: peak party and casual party. In the peak party (qualifying race), players' performance results, such as their number of kills, will be recorded and exchanged for different points accordingly, which form the player's rank. Players who rank high enough can obtain the opportunity to reach a vacancy on the leaderboard.

Basic Movements and Operation: Players can perform the following actions: move, jump, scroll, and pounce. Rolling can accelerate the player's speed and has the ability to collide and wound others; similarly, pouncing also has the function of injuring people, and if used in conjunction with jumping, players can achieve a further distance of locomotion.

3. Game theories in relation with the mechanisms to impact player's emotions

3.1. Self-determination theory

Self-Determination Theory (SDT) is a framework for understanding human motivation, particularly how intrinsic motivation is influenced by psychological needs [4]. According to SDT, individuals are naturally driven to fulfill three fundamental needs: autonomy (having a sense of volition and choice), competence (feeling mastery over tasks and challenges), and relatedness (forming meaningful social connection) [5]. In the light of SDT, the game utilizes the presence of the preceding critical mental aspiration of its players to stimulate their intrinsic motivation, and thus eventuate immersion among them.

Inspecting the application of Autonomy in *Eggy Party*, it is conspicuous that the game empowers the players with the ability to move in miscellaneous ways that can be triggered by multifaceted desires. Not only can the players transfer from place to place autonomously, the players can also, for instance, gesticulate ideas via delicate movement to more vigorously articulate their contemporary

emotions and thoughts, customize their tacit setting page, and change their avatar [3]. Enabled with such freedom, a person experiences his or her behavior as self-organized and endorsed, for he or she will perceive a higher sense of control aligning with less resentment due to stringent disciplines. Autonomous behavior is not only intentional but also volitional—one fully assents to engaging in the actions; the fact that players are capable of executing stimulus and actions that commensurate with what they can do in reality and even surmount their ability in real life encourages them to continue playing the game, which attributes to the upshot of being enchanted by the game.

The sense of competence—feeling skilled and accomplished—is a key factor in sustaining player engagement. *Eggy Party* fosters competence through challenging gameplay: players ought to engage in different game modes and encounter surreptitiously more arduous tasks as they level up; each gameplay comprises its unique leaderboard presenting the rankings worldwide and provincially, respectively. As the benchmark of those achievements is preferably challenging whilst not overly strenuous to a degree that infuriates grudges, the players will be satisfied and invigorated to endeavor more configurations of the game, pulling them into “flow.”

Relatedness—the need for social connection—is strongly emphasized in *Eggy Party*. Many of the game’s modes require or encourage multiple player interactions, such as cooperative gameplay in rescuing troublemakers and competitive modes like hide-and-seek. Players can add game friends and interact and communicate freely with strangers that are on the same initial island as them as well as their intimate game friends without commencing an official game.

Compared to the omnipresent designs of approaches of relatedness, *Eggy Party* insists simultaneously on other unique methods: players can also set common goals and complete them together to boost the yielding of their terminal awards, which also raises their motivation as their teammates act as a reminder for them to progress—when one player feels lethargic to complete a task in the game, his or her buddy can rejuvenate the player to become active. This mutual comportment serves a role to keep players playing the game. Boosted by teamwork and companionship, these mechanisms mentioned above, based on SDT, can motivate the players to be more involved and immersed in the game, uplifting their intrinsic motivation.

The core player experience of *Eggy Party* is shaped by the combined effects of autonomous choice freedom, achievement experience of competence, and social interaction of relationship needs [6]. By meeting these psychological needs comprehensively, games can continuously attract players and stimulate their intrinsic motivation.

3.2. Reward sensitivity theory

Reward Sensitivity Theory (RST) exploits human propensity and reactivity to approach and react to reward-related stimuli. In this regard, the taxonomy developed by Hallford & Hallford is the most prevalent of contemporary systems for bestowing rewards in video games. There are four categories of game rewards suggested by this taxonomy: access, facility, sustenance, and glory rewards. The player's efficacy, specifically, in the game state is increased via facility rewards. Unlocking a new weapon or magic spell in an adventure game is one example. Video game prizes that are measurable in the game or meta-game and do not affect gameplay in real time are referred to as rewards of glory [6].

Virtual rewards play an indispensable role in providing incentives and fortifying participation for players. By rewarding players with badges, achievements, and other fictitious elements that symbolize their accomplishment, the game can motivate the player to actively engage, achieve goals, and ultimately drive desired behaviors [7]. In *Eggy Party*, there are a variety of accolades that a player can acquire by simply abiding by the objective of certain activities and putting in efforts. For example, the game may reward players with an “invincible phoenix” badge for players with the foremost outstanding ranking. On the contrary, for those who are not accelerating at game skills, the system

proffers other specialized awards like “good sister” which investigates the players’ ability to socialize and even waggish awards that give credits for clumsy and fatuous behaviors. These rewards are as if they were salary for a worker, enticing the players to endure the long hours of cramming through their “tiresome workload.”

The ranking list, which *Eggy Party* has incorporated, functions as an incentive for many players to engage in games as well. Skillful players are usually promoted to participate in games more actively since they have a higher rank, while less skillful players who are less likely to be left behind might endeavor to catch up. It is, however, also arguable that a bad rank may generate polarized results for which players may also be discouraged to input further effort. Fortunately, *Eggy Party* set up multiple scales of ranking where players can be put into a managerial tournament worldwide, nationwide, and provincewide so that more people can appear on and receive a remark on the ranking list.

3.3. Immersion and flow in *Eggy Party*

Proposed by psychologist Mihaly Csikszentmihalyi, flow experience refers to a state of complete immersion and enjoyment that an individual experiences while focusing on a particular activity by which individuals will, in this state, forget about time and self and be engrossed in their current task [8]. The core of the streaming experience lies in the balance between skills and challenges: if the challenge is too low, players will feel bored; if the challenge is too high, players will feel anxious; when the challenge matches the skill level, players are most likely to enter the streaming state. In other words, a well-balanced difficulty level will allow players to develop their adroitness and maneuver, albeit the calamity of the game for the hardness is tolerable yet adventurous [8]. Perceiving the importance of balancing skills and challenges and precluding the change to stultify the players, *Eggy Party*, in this scenario, attentively arranges players of the same level to engage in the same inning of a game; if a player at phoenix rank is playing the classic mode, for instance, the player would only encounter players who are also around the former level. As the aptitude of the player increases, the difficulty of the game catches up accordingly. Furthermore, if a player is always losing the game, the system will assign the player a robotic inning to help incentivize the player’s courage and return to their original ranking. These mechanisms, all in all, if worked correctly, would track the players and ensure that they are in a satisfied mode/comfort zone (“flow”) by which the hardness of the game they withstand does not distressfully bog them down and neither does it feel overly wearisome. Regrettably, according to Csikszentmihalyi, to hoist utility received by the players, the game should also assign conspicuous goals, which *Eggy Party* is devoid of [8].

Uncertainty is one of the crucial factors that attract players to participate, as it can stimulate their curiosity and desire to explore, thereby fortifying their cognitive engagement. Combined with streaming experience theory, uncertainty can further allure players to immerse themselves by instigating the sense of unknowns and difficulty changes in tasks [9]. In *Eggy Party*, there is a considerable ingredient of chance and sense of the unknown amidst the gameplays: each inning, whether it’s the classic mode, rescue the troublemaker mode, or hide-and-seek, can turn out to have subversively distinct endings based on the strategies and critical thinking by which each player employs; many modes in the game, such as rescue the troublemaker, additionally, involve the concept of decrypting, leading to a greater sense of immersion and jubilation as the players probe and attempt to unveil the underlying truth of a pitfall. Apparently, if the denouements and results of a game are furnished before the players start to play the game, the overall experience would be fatiguing and uninteresting.

4. Conclusion

The study examined *Eggy Party* through the lens of three psychological theories: Self-Determination Theory (SDT), Reward Sensitivity Theory (RST), and Flow Theory. SDT suggests that human motivation is driven by three key psychological needs—autonomy, competence, and relatedness—which *Eggy Party* fulfills by offering a high degree of player freedom, fostering competition, and enabling social interactions. RST, which explores individuals' responsiveness to reward-related stimuli, is reflected in *Eggy Party*'s well-structured reward system. Meanwhile, Flow Theory refers to a state of complete immersion and enjoyment that an individual experiences while focusing on a particular activity, which balances the players' skill and the corresponding challenges. The integration of these psychological principles contributes to *Eggy Party*'s appeal, making it an engaging and dynamic experience. The game's design encourages continued participation by offering a high allowance of freedom, stimulating competition, promoting group play and social connectivity, and offering virtual awards and badges. These strategies make *Eggy Party* a striking and spectacular game, which collectively allows the player's interest for the game to burgeon. Nevertheless, this study acknowledges several limitations. It can be improved by further examining the drawbacks and defects that *Eggy Party* has, including more historical and psychological backgrounds pertaining to the theories, and referencing academic literature beyond online material. Future studies may explore *Eggy Party*'s effectiveness in achieving player immersion through empirical methods, such as questionnaires or player interviews, to gain more nuanced insights into its impact on motivation and engagement.

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