

The Application of Flow Theory in the Interactive Design of Action Role-Playing Games

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Abstract. Research on flow theory in the field of psychology has already reached a high level of maturity. While there is relatively little research that utilizes flow theory to discuss Action Role-Playing Games (ARPGs). This paper mainly analyzes practical cases of Action Role-Playing Game genres based on flow theory. The four main sections include the basic definition of flow theory, the fundamental definition of ARPG games, and case studies of ARPG game design. By examining existing examples from different aspects of ARPG games, this study aims to identify a more rational design direction grounded in flow theory. The design approach of ARPG games can be deconstructed using flow theory, and applying this theory to break down and explore more rational and formulaic design principles can provide developers with better design guidance in an era where ARPG games have become mainstream.

Keywords: Flow theory, Interaction design, Role-playing games, Game design

1. Introduction

Research on flow theory in the field of psychology has already reached a high level of maturity. It has been effectively applied across numerous domains such as management, entertainment, and education, providing these fields with more advanced solutions and offering practitioners more efficient and systematic working methodologies. However, there is relatively little research that utilizes flow theory to discuss ARPG games. The potential for applying flow theory to various aspects of ARPG games remains substantial. This paper mainly focuses on analyzing existing game cases through the lens of flow theory, linking the design of these cases with the fundamental elements of the theory, and aims to provide a reference for deeper future research in this area.

2. Flow theory

2.1. Overview of the flow theory

The Flow Theory was proposed by psychologist Mihaly Csikszentmihalyi in 1975, describing the psychological state where an individual is completely immersed in an activity and experiences a sense of pleasure. This state is characterized by high concentration, reduced self-awareness, a sense of satisfaction and loss of time perception. Flow is more likely to occur when there are clear rules in

place [1]. This theory has been widely applied in various fields such as psychology, consumer behavior analysis, and human-computer interaction [2]. Csikszentmihalyi summarized eight core features of the flow experience: (1) A Challenging Activity That Requires Skills; (2) The Merging of Action and Awareness; (3) Clear Goals; (4) Clear Feedback; (5) Concentration on the Task at Hand; (6) The Paradox of Control; (7) The Loss of Self-Consciousness; (8) The Transformation of Time [3].

The flow experience can be divided into three stages, shown in Table 1.

Table 1. Characteristics of different flow experience phases [2]

Phase of Flow Experience	Characteristics of Flow Experience
Antecedent Phase (Conditional Factors)	Clear and specific goals; Immediate and valuable feedback; Balance between challenge and skill
Experiential Phase (Experiential Factors)	Merging of action and awareness; Complete concentration; Sense of control over the activity
Consequent Phase (Outcome Factors)	Loss of self-consciousness; Distorted sense of time; Autotelic experience (intrinsic enjoyment of the activity)

2.2. The significance of the flow theory in game design

The flow experience is a significant motivation for gamers. Challenges, fantasies, and curiosity attract players to engage in gaming behaviors. The elements of flow theory, such as "The Merging of Action and Awareness", "Clear Goals", "A Challenging Activity That Requires Skills" and "Clear Feedback" can amplify players' feelings of gaming motivation. Therefore, once players enter the flow state, they tend to continue their gaming behaviors. This is the reason why players are so addicted to games with high immersion and high difficulty [4]. In the direction of game design, clearly defining the design ideas based on the flow state can better enhance players' immersion and experience, thereby increasing player stickiness. The flow theory provides key theoretical guidance for game production and operation.

3. Action Role-playing Game (ARPG)

3.1. Overview of action role-playing games

Action role-playing games (ARPGs), as a hybrid game genre that combines the narrative depth of role-playing games with the real-time operation features of action games, hold a significant position in the contemporary gaming industry. This type of game creates a unique experience that is both strategic and operationally thrilling by integrating the traditional RPG elements of character growth systems, equipment collection, and story-driven plots with the real-time combat mechanics of action games. The core characteristics of ARPGs are reflected in the demands placed on players' operational skills by the real-time combat system, such as precise attacks, dodges, and combo sequences, while providing long-term pursuit goals through character attribute growth, skill tree development, and equipment enhancement systems, thus fostering a deep interaction between combat feedback and character cultivation.

4. ARPG game design case based on the theory of flow

4.1. Action system

The design of the combat system mainly follows three elements: a challenging activity that requires skills, concentration on the task at hand and the Paradox of Control. Some existing products also adhere to these three elements. In *Black Myth: Wukong*, before each boss challenge, players defeat the minions on their way. Each time they defeat these minions, they earn gold coins to enhance their numerical combat power. That is to say, the more times players challenge the boss, the stronger their numerical combat power will be. The core of the flow theory lies in the balance between challenge and skill. When the difficulty of the task matches an individual's ability, it is most likely for the person to enter the state of flow [5]. This dynamic difficulty can meet the pursuit of difficulty for players of different levels, which is "A Challenging Activity That Requires Skills".

Similarly, games like "*Sekiro™ Shadows Die Twice*" usually have simple combat systems. Blocking is the core operation of this game. Players need to press the blocking button within 0.3 seconds after the Boss's attack to defend against the damage. In the case of the Boss's high-frequency attacks, players need to focus on observing the Boss's moves to perform blocking. To emphasize the importance of the blocking system, characters usually can only withstand a few attacks from the Boss. This makes the passive blocking more cost-effective compared to active offense. The blocking system can greatly enhance the player's sense of interaction and also meets the requirement of "Concentration on the Task at Hand".

In "*Sekiro™ Shadows Die Twice*", the rhythm of the combat is actually controlled by the player. During a perfect block, in addition to allowing the player to defend against the enemy's attack, an equally important function is that it can increase the enemy's stance (after the enemy withstands a certain number of blocks, the Boss will enter a passive state and be vulnerable to the player's attack). This means that while the player is concentrating on defense, they are also attacking the enemy to gain an advantage, and after performing several perfect blocks, the player enters their offensive turn. This "offensive suppression - perfect block - offensive suppression" combat cycle keeps the player in an offensive state all the time. This design blurs the traditional boundaries between offensive and defensive actions. The player is actually consciously or unconsciously controlling the rhythm of the combat, unrestrainedly releasing their desire for offense. As shown in Figure 1, the positive feedback that players obtain during battles varies greatly across different games. It is evident that "*Sekiro™ Shadows Die Twice*" has a more regular control over the positive feedback for players, and the positive feedback players receive in it is significantly higher than that in traditional games. This is why "*Sekiro™ Shadows Die Twice*" can maintain the player's high-intensity flow of offense [6]. At the same time, the perfect counterattack also evenly distributes the positive feedback of "*Sekiro™ Shadows Die Twice*" combat to the high-frequency operations, which is significantly different from most traditional games' combat. This player's control over the combat rhythm precisely satisfies "The Paradox of Control".

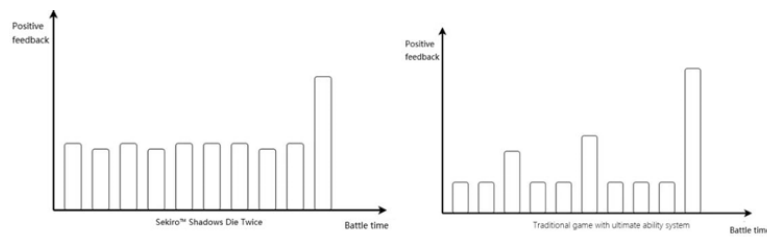


Figure 1. Positive feedback in the combat cycle: obtaining contrast (a) Sekiro™ Shadows Die Twice; (b) Traditional game with ultimate ability system [6]

4.2. Sound effect feedback

Sound is one of the important senses besides vision. In some game environments, players need to rely on sound to obtain information and feedback. Therefore, good sound effect feedback can better immerse players in the game. Good sound effect feedback usually has the element of clear feedback. After players complete a core operation, there should be clear sound effect feedback to tell them whether they have completed the operation or not. For example, in Sekiro™: Shadows Die Twice, when players complete the core operation of blocking, there will be a very clear and pleasant sound of metal clashing. This crisp sound effect can enhance the positive feedback when players complete a core operation and also convey information in complex game environments, allowing players to react more quickly to the next step. This precisely meets the element of clear feedback.

4.3. Map design

The behavioral characteristics of exploratory players are mainly reflected in their structured exploration of the virtual space and the continuous pursuit of narrative puzzles. Such players often demonstrate a deep need for immersion in the game's world structure, and their motivation for participation stems from the inherent cognitive drive of human beings - the satisfaction of constructing knowledge through environmental exploration [7]. The element of flow, concentration on the task at hand, can be utilized in the design of the map. For example, in the New Londo Ruins scene of "DARK SOUL" (Figure 2), POIs (Points of Interest) are densely placed throughout the entire map. POIs can serve not only as tools to guide players in exploration, but also as independent variables to control the game's rhythm, because with their dense placement, the exploration speed of players will slow down. Players need to go to every corner to collect these POI-related resources. The placement of traps is also dense. At every corner, there may be traps or small monsters. Due to the vulnerability of the protagonist, any attack may cause death. Due to the narrow and complex nature of the map, the effects of these two designs are greatly magnified. In this situation, players need to slowly explore the corners of the complex terrain while remaining fully focused to prevent sneak attacks from behind or from corners. This significantly increases the difficulty of the game's tension.

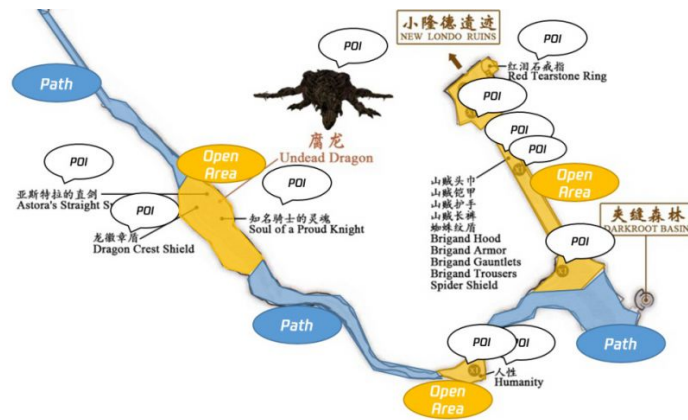


Figure 2. Map of new londo ruins [8]

As can be seen from Figure 3, the map design of "DARK SOUL" is extremely complex. Different levels are connected by passages and one-way doors. Since this game did not have a teleportation mechanism in its early stage, players had to rely on their memory to move between levels. Therefore, players needed to spend a lot of time repeatedly exploring to memorize the complex relationships between the levels. However, memorizing the levels was not the main goal of the players' repeated exploration. The players' repeated exploration was actually carried out passively due to the difficulty of exploration. The repeated exploration was not without gains. During the process of repeated exploration, players could discover hidden content such as hidden doors. These hidden contents could also drive players to continue the repeated exploration, so that players' actions were not completely driven by difficulty. Under such repeated exploration, players could easily remember the complex routes between the levels without even realizing it. When players had to rely on their memory to retrace these paths again due to the change of game goals, they would gain a great sense of achievement because they could find the correct path by relying on their memory. And in this situation, the exploration of players would have a sense of control, because their exploration no longer relied on POI guidance, but was driven by their own memory and will to advance actively. This situation precisely satisfies the element of "The Merging of Action and Awareness".

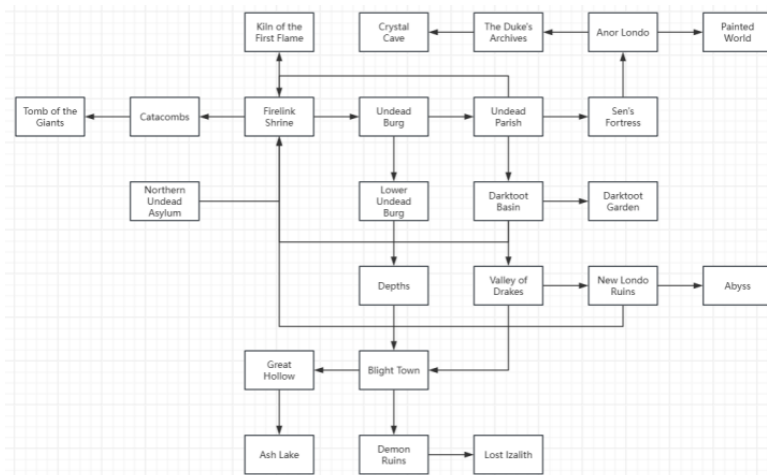


Figure 3. Map of "DARK SOUL"

4.4. Visual guidance design

Vision, as the primary sense of humans, acquires a lot of information through the eyes. Visual guidance, as the name suggests, is to make the player's line of sight focus on a specific target through differences. This provides game designers with a lot of design space. A good visual guidance system can keep players constantly aware of the goal and also provide assistance for map design. In "ELDER RING" (Figure 4 and Figure 5), from the very beginning of the game, players can see a huge, luminous tree standing in the center of the scene. This tree is also the ultimate goal of the game. In any subsequent levels, players can look up and see this huge object, which is constantly suggesting to the player his goal. The distant feeling of the huge object also gives the player the motivation to move forward. All these exactly meet the "Clear Goals" element.



Figure 4. Erdtree in "ELDER RING"



Figure 5. Erdtree in "ELDER RING"

Good visual guidance can also assist in map design, preventing players from getting lost in complex environments. This does not mean that the difficulty and depth of the map will decrease; instead, it eliminates much unnecessary negative feedback. For example, in the "DARK SOUL" game, the "Blight Town" scene has a complex vertical depth, which means there are a large number

of ladders in the three-dimensional structure. In a high-pressure exploration environment, it is difficult for players to carefully explore every place. Players will spend a lot of unnecessary time and energy searching for these ladders. However, in this dark scene, a torch is placed next to each ladder, and the torch is very conspicuous in the dark environment. Players can immediately locate the target in an instant, greatly improving the exploration experience of players in complex maps.

5. Conclusion

These seven elements of flow theory can be effectively applied to different aspects of game design. The action design is in line with the "Paradox of Control" as it is based on the dynamic combat rhythm of the players; players need to remember the paths in the complex map and rely on their own memory for multiple explorations, thus satisfying the "Merging of Action and Awareness"; the sound effect design can provide strong feedback for each player's operation, so it meets the "Clear Feedback" criterion; and the visual guidance design can provide clear goals in the map and provide appropriate guidance in the complex environment, thus conforming to the "Clear Goals" principle. Although this paper incorporates elements of flow theory into various aspects of ARPG design and illustrates how existing game cases align with the theory—thus providing a reference for future research—it does not offer a psychology-based analysis of how these elements are integrated. Nor does it closely combine psychological principles with game design or provide actionable solutions grounded in flow theory. As a result, the content of this study cannot be directly used as a reference for game design. Future research can further leverage psychological expertise and employ more research methods to explore the internal mechanisms by which flow enhances player experience, identify the underlying logic of how ARPG games trigger flow, and thereby more systematically integrate the flow theory with game design, constructing a more instructive design framework and providing more inspiration and ideas for future game product design.

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