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IJSSAI International Journal of Social Sciences and Artistic Innovations

ISSN 2737-5293
Volume 5, Issue 2
https://ijssai.iikii.com.sg
International Journal of Social Sciences and Artistic Innovations

Article

Empathy in Game Scene Design

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Received: Sept 21, 2024; **Revised:** Oct 10, 2024; **Accepted**: Oct 10, 2024; **Published:** June 03, 2025

Abstract: Empathy, as a significant perspective in aesthetic design, has profoundly and enduringly influenced human feelings since its inception in psychological research in the 19th century. Western and Eastern cultures have interpreted empathy from various perspectives. Based on Western empathy theory and the aesthetics of Zhu Guangqian, we theoretically defined empathy in terms of a psychological mechanism and aesthetic appreciation. Based on the manifestation of empathy in physiology, emotion, and logic, we explored how to apply empathy in game design to create the atmosphere of game scenes, spatial construction, and the design of objects. Empathy reevaluates the impact of game scene design on the player's experience.

Keywords: Game Scene Design, Empathy, Experience Design, Emotion Design

1. Introduction

Empathy refers to the emotional experience that occurs when one's own emotions resonate with those of others through the conveyance and sharing of an emotional atmosphere (Liu, 2006). The concept of empathy was introduced by German aesthete Fischer, and later refined by German aesthete Lipps in his book "Aesthetics of Space", where he elaborated on the theory of empathy (Yue, 1994). In China, Zhu Guangqian integrated Lipps's "empathy" with Gullus's "internal mimicry" (Zhu, 2009) and combined them in traditional Chinese aesthetics to propose the idea of "unity between the object and the self." Zhu asserted that empathy is bidirectional, involving "from object to self" and "from self to object" processes.

Lipps believed that there are two types of empathy: practical and aesthetic empathy. The former involves an emotional experience, while the latter is a form of pleasure derived from appreciating an aesthetic object. Discussions on empathy in Western culture have contributed to the formation of the empathy theory system. Wang Zhao summarized three key psychological mechanisms involved in the Western empathy theory: isomorphism perceived through the five senses, sympathy triggered by recalling similar situations and emotions, and symbolic empathy, where the emotional connection to an intermediary object is transferred to the target object through logical reasoning (Wang, 2008). When people appreciate artworks, the psychological mechanism leads to empathy. As artistic media evolve, how empathy occurs also depending on the medium through which the design of artworks is appreciated or experienced.

In the literary narrative, Wang Jiaming discussed how the narrative theory helps understand the social relationships of characters, where empathy enables one to view others as the subject to better understand the social relationship between the self and others (Wang, 2024). In audiovisual installations, Zeng Yiguo and Fan Tingting (2023) discussed how empathy evokes viewers through the audiovisual system using empathetic films and the cultural memory of audiences. A common factor in empathetic experiences across different media is the ability to immerse oneself in the roles depicted, leading to a profound understanding of the narrative and a more memorable experience.

Narrative-driven game designs aim to craft game experiences that allow players to engage more in the story with unique feelings and experiences. By designing a psychological mechanism to trigger emotional changes in players and incorporating aesthetic elements to provide an enjoyable experience, designers enable players to immerse themselves in the game's narrative. In discussing the body-mind unification mechanism in virtual reality (VR) painting, Su Xin mentioned how people perceive art in the virtual space. In a VR environment, immersion is achieved through the interweaving mutual influence of spaces and scenes, allowing for an understanding of the emotion conveyed in the virtual scene (Su, 2021). This concept is similar to game design: designers create multiple layers of interaction and sensory feedback to gradually draw players into the game as they progress through levels. The game, as a carrier of interactive mechanisms and an aesthetic object for atmosphere creation, subconsciously immerses players into the narrative through empathy. In this process, the player's "virtual" body resides in the space constructed in the game environment, where the first layer of information they encounter is the game scene.

Based on empathy theory and the summary of empathy in different media, empathy in game experiences is categorized into physiological, emotional, and logical levels. When the player interacts with the scene in the interactive system, the muscle movements generated through the input and output devices and the rhythm and rhyme of the picture are felt through the visual level, which evoke the player's memory of making the same movements in reality. This memory is triggered by the creation of new neurons and neuromuscular inertia at the physiological level of isomorphic reflection. Game scenes, combined with the game's narrative, evoke emotional memories in players. These emotional memories are feelings that are different from simple neural connections. Players perceive the emotional atmosphere of the scene and respond emotionally by experiencing empathy, sympathy, or stress related to individual pressures. Particularly, emotions such as fear have a "fast track" (Liu and Zhou, 2008) in the human brain, which is detected easily. Emotional empathy is influenced by the attributes of the object as well as by the player's mood. Game scenes containing meaningful information serve as a medium for conveying symbols or messages that are decipherable by players with relevant experiences and knowledge. The resonance of these messages is stronger for players who share similar thoughts and cultures, as the information triggers similar associations and emotions (Gou, 2018). Empathy induced by logical reasoning often links to personal experiences, so significant individual differences are observed. Therefore, when designing symbols, designers must comprehend the symbolic meanings and consider the audience's ability to decode symbols; otherwise, it is challenging to trigger empathy at the logical level. When designers aim to elicit empathy between the audience and objects, they must consider the audience's perception and memories, and their associations triggered, and ensure that the empathy influences the overall experience.

2. Game Scene Design

2.1. Definition and Function of Game Scene

Game design is a kind of player experience design. When designers design games, they pay attention to the emotional change curve and aesthetic experience brought by the game (Schell, 2008). Game scene design is an important part of overall game design. The word "scene" was originally applied to theatre, referring to a certain action scene occurring in a specific time and space. As a spatial concept, scene limits the range of movement and visual scope, assuming the role of conveying information and symbols (Tao, 2023). With the development of technology, the design of game scenes carries diverse functions. The design of game scenes must present the background culture and period characteristics of the game. Since the scene occupies most of the game screen, the art style of a game is mainly determined by the scene design. Analyzing the aesthetic activities and psychological changes of players in the scene and exploring the application of empathy in the scene requires exploring the ability to improve the game experience. The space in a game scene is either a discrete or continuous bounded area. According to the different responsibilities of the scene, the game scene space is classified into functional and aesthetic spaces (Tao, 2023). In the functional space, the scene undertakes the player's interactive behavior, restricting the range of movement. In the aesthetic space, the scene undertakes player interaction and limits the range of movement, presenting the design outside the movable boundary, often as the background to expand the player's visual space and as the focus of the player's aesthetic appreciation. The aesthetic space determines the overall art style of the game.

2.2. Empathy Design in Game Scene

The emotions triggered by players in gaming are diverse, including sensory emotions caused by sensory organs' stimulation, which leads to physiological changes and emotions resulting from complex reasoning and combined social experience through aesthetic, moral, and rational senses (Liu, 2006). The external context is the source of emotional arousal. When playing the game, individuals project themselves into the game scenes, generating emotions based on the changes in the game scenes. In the game experience, players respond and act through emotional reflection in the scene. The player's interactive response makes the game story presented smoothly; and in the atmosphere built with various symbols and objects in the scene, continuous interactions and feedback between people and scenes enable the player to pour emotions into or from things based on memories or isomorphisms, thus achieving the effect of empathy (Gou, 2018). The emotional communication of "from object to me" and "from me to object" enables the player to empathize with the scene, enhance the player's sense of immersion, and further optimize the game experience. In game scene design, empathy is realized through the scene's atmosphere, space construction, and object design.

2.2.1. Scene Atmosphere

An excellent atmosphere in a scene increases player immersion and prepares players for emotional empathy. The creation of the atmosphere in the game necessitates the combination of visuals, sound, music, and game mechanics (Schell, 2008), using the static visual representation of the scene and the dynamic interactive feedback. This is particularly important in game playing. The main tone of the static visual representation of the scene is influenced by colors and lighting.

In game scene design, colors influence the atmosphere of the entire scene and guide players through the game flow. Through empathetic resonance, the emotional aspect of colors affects players' overall impressions of the scene. The brain reacts differently to signals of different colors, and different associations with colors evoke different empathetic responses. Table 1 lists the specific associations and emotional responses commonly evoked in players by different colors. Therefore, an appropriate arrangement of color distribution, position, and proportion maximizes the resonance between players and the scene.

Table 1. Colors and their corresponding objects and emotions.

Color	Associated Object	Emotion
Red	Flames, blood	Passion, tension
Yellow	Sunlight, autumn leaves	Warmth, happiness
Green	Plants	Safety
Blue	Sky, water	Freedom, calmness
Black	Night	Ominous, mysterious
White	Clouds, cotton	Sacred, purity

Different colors are often used to provide cues to players without disrupting their immersion. For instance, interactive objects are marked with distinct colors to differentiate them from the background and other objects, serving as reminders to guide players through the game's progression. In "Resident Evil 4: Remake," boxes containing supplies are designed with a coat of yellow paint. These cues tend to avoid being out of place; if not, it affects the empathy that occurs between the player and the character. Lighting also plays a crucial role in the visual game design as a primary element for creating atmosphere and a means of emotional expression and information conveyance. How lighting affects emotional engagement in actual game environments is illustrated in Table 2.

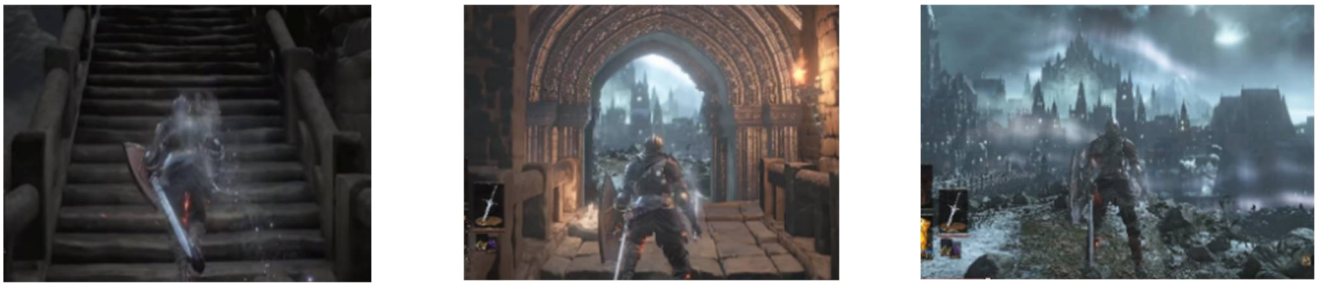
Table 2. Lighting and its corresponding functions and emotions.

Light	Function	Emotional Engagement
Natural light	Time indication	Aids players in quickly establishing their in-game avatar's position, triggering emotional engagement through logical deduction, and guiding subsequent actions.
	Visual guidance	Changes in the temporal and geographical context of the game space, prompting players to relate it to their own experiences, evoke personal emotions, and foster emotional engagement.
Artificial light	Visual guidance	Serves as guidance to direct player actions, for instance, players instinctively move toward light sources in darkness, leveraging physiological aspects of emotional engagement.
	Interactive cues	Shapes the player's visual perception without disrupting immersion, signaling interactable objects.
	Atmosphere crafting	Strategically placed beams of light contribute to atmosphere development, inducing stress and emotional transference.

2.2.2. Space Construction

Game space construction is conducted in space series construction and individual space creation. Different from ordinary artworks, the design of a game space must be created for the viewer's all-around observation of the scene, with the perception of movement. When designers organize a space and sequences, they need to ensure that the viewer can feel the beauty of rhythm and rhyme along designated routes (Peng, 1998). In Gestalt psychology, there is a similarity between the structure of the movement of objects and the psychological structure of human beings, in which they are pulled by a certain force. When the force has similarities to the psychological structure, it triggers a psychological isomorphism (Liu, 2006). The aesthetics of rhythm and rhyme brought about by spatial variation is in line with the psychological tension, thus enabling the player to evoke the corresponding emotion.

In the organization of spatial sequences, important spaces are highlighted through layers of padding, leading the player to an emotional climax. In this condition, the state of mind is greatly changed, which significantly affects the player's empathetic behavior. For example, in Dark Souls 3, after the player passes through several dark and narrow dungeon levels, a ceremonial staircase appears, and then the player passes through a small door to reach an open area with an excellent view. Such an aesthetic experience greatly influences the state of mind of the player, as if the body and mind are liberated from the dungeon, and the emotional outpouring reaches a crescendo (Fig. 1).



(**a**) (**b**) (**c**)

Fig. 1. Spatial sequence arrangement in "Dark Souls 3". (**a**) A continuous staircase; (**b**)A narrow doorway passage with limited visibility; (**c**)An open scene with a wide field of view.

Within a single space, different spatial configurations can elicit different feelings from the player. Therefore, the construction of a single space affects the player's emotion, which is often determined by the size and shape of the space (Table 3).

Table 3. Influence of spatial structure on emotional engagement.

Influencing Factor	Influence Mode	Effects on Emotion	Example
Spatial volume	Excessive volume	Overly grand scenes make one feel small	Oversized boss battle scenes compared to the character make the player feel small.
	Limited volume	Creates a sense of tension and oppression	In "Resident Evil 2," crawling through sewers leads to psychological stress.
Spatial shape	Regular shape	Evoke a sense of ceremony	In "Outer Wilds," the final rooms are shaped as massive ellipses.
	Unique shape	Imply a unique spatial context	In "What Remains of Edith Finch," the rooftop attic where memories are read has a distinctive shape.

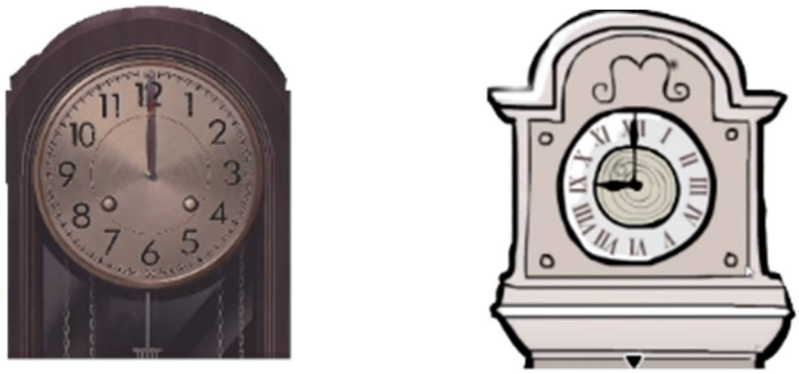
2.2.3. Scene Object Design

As a medium for spreading information or transmitting symbols, the scene becomes a symbolic code shared by people in a common cultural system to effectively communicate emotionally and resonate when they grasp the meaning of the symbols (Guo, 2018). People with a common thought and judgmental perception have similar affections for symbols that are identified and remind many memories and emotions. Therefore, it is important to consider the messages conveyed by each item in the scene in the scene design. The items in a scene often form a system (Yu and Guo, 2021) that works together in the plot and game mechanism to create a realistic world. For interactive Items, their various functions within the game's interaction mechanisms can trigger different emotional mechanisms in players. In contrast, non-interactive items typically serve to create atmosphere and convey information. Table 4 presents the emotional mechanisms elicited by different types of items, along with corresponding examples.

Table 4. Emotional impact of props in scene.

Type	Function	Affection Mechanism	Example
Interactive Items	Props required for gameplay	Align with real-world interactive behaviors	The need to spin a wheel to call an old phone in Rusty Lake
	Response to player actions	Provide realistic feedback, enhancing scene realism and increasing immersion.	In "Hollow Knight," the protagonist's blade can shatter lampposts, offering a realistic response to player actions.
Non-interactive Items	As a background, the structure of aesthetic space	Contribute to the atmosphere and aesthetic appreciation, invoking aesthetic emotions.	In "Dark Souls 3," the background features humanoid butterflies dancing about.
	Used for conveying information	Convey visual information, evoking logic-based emotions	In "Dark Souls 3," a battered suit of armor at the roadside serves as a harbinger of impending warfare.

When a scene expresses the style of a particular era, appropriate objects allow the player to understand this symbol. Important objects in the scene become key plot props. When they reappear in subsequent scenes, they carry the previous emotions felt by the players in the previous play to bring more emotional feedback to the players. For example, interactive objects in the scenes of two horror puzzle games, Rusty Lake and Paper Wedding, are clocks commonly used in Chinese folklore (Fig. 2). The objects generate empathy from people living in China, while the clock in Rusty Lake becomes a key piece of information throughout the game, and the player unconsciously puts emotions on the clock after observing it repeatedly. Such a use of empathy is cleverly integrated into the scene in the game's narrative to create an emotional experience, emotional infection, and empathy of the player.



(**a**) (**b**)

Fig. 2. Clocks in puzzle games; (**a**) Paper Marriage; (**b**) Rust Lake.

3. Conclusion

We reviewed psychological methods in the empathy theory and the role of empathy in people's appreciation of art through different media. Based on the methods, we discussed how empathy enhances the user experience in game processes through various means. Game environments serve as a reminder of a player's experience and have become vital tools to evoke the player's emotions. Establishing the foundation of emotional engagement through immersive atmospheric creation, stimulating players' physiological emotional engagement through spatial alterations, and transferring emotions "from self to objects" through scene item design contribute to multi-layered enhancements of a player's emotional experiences in the game. By reevaluating game scene designs using emotional engagement theory, the emotional transformations that scene design offers occur, which is translated from the perspective of psychological mechanisms and aesthetic experiences.

Author Contributions: Conceptualization, D. Wu.; methodology, D. Wu; formal analysis, D. Wu; writing—original draft preparation, D. Wu; writing—review and editing, Y. Chu; supervision, Y. Chu. All authors have read and agreed to the published version of the manuscript.

Funding: This research did not receive external funding.

Conflicts of Interest: The authors declare no conflict of interest.

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