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Psychological Mechanisms of Online Violent Game Addiction: An Integrated Model

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Abstract. Internet Gaming Disorder (IGD), particularly in the context of online violent games, poses a significant global mental health challenge. This paper proposes an integrated psychological model to elucidate the development and maintenance of online violent game addiction. By synthesizing the I-PACE model, Self-Determination Theory, Moral Disengagement Theory, and insights from research on the online disinhibition effect and the bystander effect, this model delineates a multifaceted psychological process. It posits that addiction originates from the interaction between individual susceptibility and real-life stressors, is primarily driven by escape motivation, and is sustained through behavioral reinforcement via game design, cognitive changes such as moral disengagement, and the unique social dynamics of online environments. A systematic review of literature confirms the roles of unmet psychological needs, arousal regulation, moral cognition, and the attenuation of helping behavior in virtual groups. The study concludes by proposing targeted intervention strategies at the individual, game design, and societal levels, offering a comprehensive framework for future research and clinical practice.

Keywords: online violent games, game addiction, escape motivation, moral disengagement, bystander effect

1. Introduction

The pervasive popularity of online violent games has been paralleled by a rise in Internet Gaming Disorder (IGD), raising substantial public health concerns. Empirical evidence indicates that a majority of popular online games contain violent content, which is associated with increased aggression, desensitization, and addictive patterns of use [1]. While existing theories offer partial explanations, a comprehensive model integrating motivational, cognitive, and social psychological perspectives remains lacking.

This study aims to address this gap by constructing an integrated framework that combines the I-PACE model, Self-Determination Theory, Moral Disengagement Theory, the online disinhibition effect, and the bystander effect. This paper analyzes the addiction mechanisms related to violent games by drawing on existing literature. It explores the onset of addiction—what factors trigger it, the core of addiction—what sustains it, and the intensification of addiction—factors that exacerbate addictive behaviors. In addition, based on relevant materials and information, this paper offers recommendations for intervention.

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The significance of this research lies in its holistic approach, which bridges disparate theoretical domains to provide a nuanced understanding of online violent game addiction. By identifying key psychological processes and their interconnections, this model establishes a foundation for developing multi-level interventions, contributing to both academic discourse and practical mitigation efforts.

2. The onset of addiction: risk factors and initial attraction

2.1. Individual risk factors

Individuals vary significantly in their susceptibility to addiction to violent video games. Core differences stem from pre-existing psychological risk factors that significantly increase the likelihood of addiction [2]. Research shows that psychological characteristics such as anxiety tendency, low self-esteem and underdeveloped coping mechanism are common risk factors of violent games, gambling and substance addiction. Their essence is not mere preference, but individual susceptibility characteristics formed at neurological and psychological levels.

In terms of specific mechanism, anxious individuals experience long-term stress overload. Violent games temporarily block negative emotional experiences by constructing closed virtual scenes, forming a strong emotional buffer effect; Individuals with low self-esteem lack value recognition in real social interaction and activities, while immediate and concrete positive feedback (such as "task achieved" prompt) after the task is completed in the game can provide scarce ability verification in reality; Those with immature coping mechanisms lack effective strategies to deal with real problems, and the substitution of reality by game construction can realize immediate compensation at the psychological level and temporarily dispel the sense of existence of real difficulties.

Combining with the theory of self-determination [3], satisfaction of individual's needs for competence, autonomy and belonging is the core psychological requirement, but the above-mentioned high-risk individuals are difficult to balance these three needs in real scenes: lack of competent experience in their studies or work, inability to independently control the pace and environment of life, and difficulty in establishing deep connection in interpersonal relationships, thus forming a persistent psychological gap. When violent video games can fill this gap efficiently and multi-dimensionally, and satisfy the three psychological needs simultaneously, their appeal increases significantly. These risk factors do not exist in isolation, but collectively construct a state of psychological deprivation, which greatly shortens the transformation path from game entertainment to pathological dependence.

2.2. Initial attraction of games

First, games can provide positive feedback for individuals' sense of efficacy. In real life, the relationship between effort and reward is uncertain. Game constructs a clear "input-reward" mechanism: instant feedback such as defeating the leader of the level, winning the game reward, and realizing the level promotion, which can provide a clear and controllable performance experience for individuals who lack efficacy in reality [4].

Second, game gives individuals a high degree of autonomous control. In real life, individuals are often constrained by social norms, responsibilities, obligations and expectations of others. In the virtual narrative space of games, individuals can independently control roles, formulate strategies

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and guide the development of virtual worlds. This sense of control can effectively compensate for the psychological needs of individuals experiencing strong powerlessness in reality.

Finally, games can build community connection and sense of belonging. Although violent games are often criticized, guild cooperation and team tasks in such games often require deep social interaction, which can enable individuals with social adaptation difficulties to quickly gain group acceptance and role recognition. This kind of immediate and low social cost community integration has become their important psychological support.

In essence, when individuals face difficulties in adapting to reality, games are no longer a leisure choice, but are regarded as a compensatory "demand satisfaction mechanism". Their core attraction is not the element of violence itself, but the compensatory satisfaction of realistic defects; However, this instant compensation is easy to induce behavioral inertia, which ultimately increase the risk of game dependence.

3. The crux of addiction: escape motivation and reinforcement

3.1. The heart of darkness: escape motivation

The core driver of the transformation from game behavior to addiction is the individual's escape motivation. Although the potential reward and social connection constitute the initial attraction, the key factor that makes gaming irresistible is a strong demand to escape reality.

In real life, negative experiences such as anxiety, stress and burnout are common, and some individuals who lack a healthy coping mechanism will use violent online games as coping strategies. Psychologically, this behavior is maintained through negative reinforcement: the game can temporarily paralyze or relieve psychological distress. Repeated escape behavior conditions the brain to recognize games as a "solution" to problems" [5,6].

The narrative and immersion experience of the game can lead to a state of "flow of mind", which makes the individual completely involved in the virtual world and forget the real problems; Meanwhile, the anonymity and disinhibition of the network environment free individuals from the shackles of negative emotions and real identity. The instant psychological relief from this multi-dimensional escape eventually form an uncontrollable addiction return motivation.

3.2. Layered reinforcement: conditioning and behavioral training

The development of game addiction does not stop with compensatory psychological repair, but will solidify into compulsive habits through a hierarchical behavior strengthening mechanism, which stems from the precise use of human psychology by game design.

At the behavioral level, game uses variable ratio reinforcement programs (such as random drop rewards) to trigger repetitive behaviors, and combines long-term reward system with sunk cost effect (such as losing the "work" results of investment), supplemented by ritualized design such as daily login and time-limited activities, so that the game behavior is gradually automated and embedded in daily life [7].

At the neurobiological level, continuous reward stimulation will enhance the release of dopamine, reshape the reward circuit of the brain, make individuals regard games as the core way to gain pleasure, relaxation and self-esteem, and even unconsciously start game behavior when they are depressed or bored. Under this mechanism, escape motivation, as the initial trigger, maintains the continuous activation of addictive behavior alongside progressive reinforcement cycle [8,9].

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3.3. The pathological cycle of gaming addiction: from escape to self-perpetuating entrapment

The harm of game addiction is no limited to "excessive screen exposure". It causes synergistic damage to psychology, social relations and physiology, forming a self-strengthening cycle that is difficult to break through [10-13].

Psychologically, gmes originally used to escape negative emotions (anxiety, depression, stress, etc.) has become a new source of distress: the stress reaction caused by the failure of the game, the sense of guilt during withdrawal, and the decline of pleasure in daily activities and the damage of attention and self-regulation caused by the remodeling of the reward circuit of the brain, which continue to erode the sense of self-efficacy, and then induce secondary psychological trauma such as shame and low self-esteem.

Socially, addiction leads to the continuous shrinking of real social connection: individuals actively alienate relatives and friends to prolong the game time, or ignore the real responsibility to cause conflicts, leading to the collapse of social support networks; The negative consequences (dropping out of school, unemployment, etc.) caused by the deterioration of academic/work performance (such as absenteeism and task delay) strengthen the cycle of "escape-play-more serious real damage" [14].

Physiologically, long-term game behaviors lead to sleep deprivation (caused by blue light exposure and excessive excitement) [15], eating disorders (junk food dependence and energy drink abuse), repetitive strain injuries (e.g., "player's thumb") and visual impairment, which further impair psychological and social functions [16].

Ultimately, games evolved from an "escape tool" to the unity of the root cause of the problem and the compensatory solution: Individual lose the channel for venting realistic emotions and social support, forcing them to rely on games to relieve distress, thus locking in the pathological cycle of "problem generation-escape behavior-aggravation of damage", which eventually led to the complete collapse of real function [17].

4. Comprehensive intervention strategies

4.1. Dual-path intervention for gaming addiction

The intervention of game addiction should adopt the dual-path framework of individual's internal intervention and external environment reconstruction: At the internal level, cognitive behavioral therapy (CBT) is the core intervention method, which can identify and challenge addicts' rational cognition (such as moral dissociation of game behavior), enhance their awareness of unconscious triggering behavior, and cultivate stress management and emotional adjustment skills in real scenes to reduce their compensatory dependence on games; CBT also enhances the self-regulation of addicts and enhance their resistance to desensitization effect of game violence content [11].

Externally, family system intervention needs to transform the family environment of addicts from "promoting/conniving" to "restraining/supporting": Adopting non-accusatory communication (such as "I noticed that you are tired after staying up late playing games") to reduce power conflicts; Negotiate and implement clear game duration limits, and provide alternative activities to satisfy addicts' sense of competence (such as learning musical instruments and programming), autonomy (such as leading personal projects) and relevance (such as regular family activities and offline socialization); Active reinforcement of real-life achievements helps rebuild the brain's reward circuitry. Educating parents on addiction mechanisms also reduces family conflicts and stigma [17].

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4.2. Game design and social responsibility

From a design perspective, ethical game development is paramount. This includes reducing predatory features such as endless play loops and loot boxes, incorporating "healthy gaming" reminders, and designing pro-social game mechanics that reward cooperation rather than solely aggression. Socially, improving and enforcing game rating systems, along with promoting media literacy education for parents and players, foster informed consumption [13]. Public awareness campaigns can also educate the public about the bystander effect and encourage collective responsibility in online communities.

5. Conclusion

This study reveals that the addiction to violent online games is not caused by a single factor, but by a multi-stage psychological cascade reaction. It originates from the unsatisfied psychological needs of individuals (such as lack of competence, autonomy and relevance) and the realistic adaptation dilemma (such as anxiety, loneliness and powerlessness). Initially, as a compensation tool to escape negative emotions, games form initial attraction by satisfying core psychological needs.

On this basis, the variable ratio reinforcement and continuous reward mechanism of the game solidify escape motivation into compulsive behavior, triggered neural circuit remodeling, and make individuals rely on the game to get dopamine reward; Meanwhile, long-term exposure to violent content will induce moral dissociation, empathy decline and emotional desensitization, further weakening the ability to adapt to reality. Ultimately, psychological, social and physical damage caused by addiction will aggravate the real-life distress, forming a recursive cycle of "escape-damage-more escape". Games thus shift from a "solution" to a source of problems.

Effective intervention for violent game addiction requires multi-dimensional collaborative strategies: At the individual level, cognitive behavioral therapy (CBT) is used to enhance the ability of emotional regulation and realistic adaptation; At the family level, supportive environments are reconstructed, and alternative activities are provided to meet core psychological needs.; At the social level, ethical reforms in the gaming industry (e.g., limiting predatory designs) are promoted, media literacy education is improved, and collective responsibility is strengthened through public advocacy.

Future research should combine longitudinal tracking and neuroscience technology to verify the dynamic process of the cascade model. It should also explore the social influence mechanism such as the bystander effect in online social environment, so as to provide empirical basis for cross-disciplinary cooperation in addressing game addiction.

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