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Original Article

Proposed Gaming Addiction Behavioral Treatment Method^{*}

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Abstract

This paper proposes a novel behavioral treatment approach using a harm-reduction, moderated play strategy to treat computer/video gaming addiction. This method involves the gradual reduction in game playtime as a treatment intervention. Activities that complement gaming should be reduced or eliminated and time spent on reinforcing activities competing with gaming time should be increased. In addition to the behavioral interventions, it has been suggested that individual, family, and parent counseling can be helpful in supporting these behavioral methods and treating co-morbid mental illness and relational issues. The proposed treatment method has not been evaluated and future research will be needed to determine if this method is effective in treating computer/video game addiction.

Keywords

Internet addiction • Internet Gaming Disorder • Video game addiction • Computer gaming addiction • MMORPG

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Video games have become extremely popular worldwide; it is estimated that the global video game industry is now over \$100 billion in yearly sales and will continue to grow at nearly a 9% rate annually (DFC Intelligence, 2016). There are approximately two billion gamers worldwide, including those who play mobile games on tablet computers and smartphones.

Although there were published reports of computer addiction reported as early as 1980 (Zimbardo, 1980), it was not until Nick Yee's online survey of players of massively multiplayer on-line role playing games (MMORPG) in 2003 (Yee, 2006) that evidence of large-scale online gaming addiction appeared. In his online survey, 50% (n = 3,166) of the players self-reported being "addicted" to their game (Everquest). Further, 70% reported playing continuously for 10 h or more and 18% reported that playing online caused financial, health, relational, or work problems. Varying with age and gender, between 4.8% and 30% of those surveyed stated they have "attempted to quit the game but were unsuccessful."

Players reported playing an average of 23 hours per week.

However, apart from the online survey conducted by Kimberly Young in 1999 (Young, Pistner, O'Mara, & Buchanan, 1999) and the study conducted by this researcher in 2003/2004 (Woog, 2004), little information is known regarding mental health professional's exposure to problematic computer use and treatment in the United States. In this researcher's postcard survey of mental health professionals in the United States (n = 229), two-thirds (67%) of clinicians reported seeing a client with issues related to problematic computer use within the past 12 months. The average number of patients seen by clinicians related to problematic computer use was three adults per year and in the age group 11–17 years of age, clinicians reported seeing less than one client (0.7 avg.) per year. Respondents endorsed gaming as the most problematic computer use for 11-17 year olds. It is evident that clinicians in the United States are seeing patients experiencing problems related to excessive computer use. The online directory for Psychology Today (psychologytoday.com) now includes "Internet Addiction" as an "issue" of treatment that clinicians can endorse on their online profile. A search of mental health professionals in, or nearby, zip code 92630 (same as this clinician's office) returned 78 individuals. Of these, 10 (including this researcher) endorsed the "Internet Addiction" issue in their profile.

Despite widespread public press concerning the problem of excessive Internet use over the past decade, there still is no approved mental health classification or criteria for diagnosing any form of computer or internet dependency in the United States. Debate continues as to whether this problematic use is a distinct disorder or simply a symptom of other problems (Pies, 2009). Notwithstanding this debate, many assessment instruments have been proposed (Laconi, Rodgers, & Chabrol, 2014)

and in 2014, the American Psychiatric Association published the *Diagnostic and Statistical Manual DSM-5* and included preliminary diagnostic criteria for “Internet Gaming Disorder” in the section recommending further study (American Psychiatric Association, 2013). Although “Internet” is a part of the title of the proposed disorder, it is the opinion of this researcher that the term should be renamed “Gaming Disorder” to reflect that using the internet for gaming is not a requirement, just as it would not be in pathological gambling. While not common, this researcher has treated individuals with problematic gaming that were not playing online. This clarification would further reduce the confusion over other potential forms of problematic technology or Internet use, which may have very different presentations and treatment methods.

In addition to not having an agreed-upon distinct mental health diagnosis, there is very little research support guiding treatment for “Gaming Disorder.” Effective cognitive-behavioral methods for treating gaming addiction have been reported (King, Delfabbro, Griffiths, & Gradisar, 2010); however, the quality and quantity of this research has been limited. Clearly more research is warranted. This paper proposes a direction toward future research in treating problematic and addicting gaming using behavioral methods.

Etiology of Gaming Disorder

Although the mechanisms causing problematic videogame play and addiction are not fully known, there are some indications. For those individuals that have been seen by this researcher over the past decade, almost all play, or would play, more than 30 h per week if allowed and most have had a long history of extensive game playing. Indeed, it is most often the case that these players were able to manage a lifestyle of school and gaming for years. The majority of individuals seeking treatment have experienced serious life consequences and many suffer from anxiety and/or depression. The types of games played vary; however, the majority of players are addicted to online role-playing games. Ten years ago, few sought treatment for game play with console systems like Sony® PlayStation® or Microsoft® Xbox®. Today this is common. It is the view of this researcher that both the amount of weekly play and number of months playing are factors in the progression of the disorder. Further, the nature of the game itself plays a role. In fact, some games seem to be more addictive than others.

Several patterns that are common across the majority of patients suffering from gaming addiction have been identified by this researcher. Parents of these clients reported becoming trapped in cycles of providing and withholding the computer or video game console in an attempt to change the child’s behavior. These cycles progress in phases from attempts to moderate daily use to removal of the computer or video game console for a period, and for some, a no-win power struggle erupts between the child and parent.

These attempts have all failed to effectively moderate use and allowed gaming excesses to continue over an extended period, often for years.

The most recent theories of addiction (National Institute on Drug Abuse, 2014) implicate the effects of multiple neurotransmitters in various portions of the brain, but most notably, dopamine within the reward (pleasure sensing) regions of the brain. It has been suggested that gaming addiction is a form of behavioral addiction, similar to gambling addiction, and that the same neuropathways are involved as in other forms of addiction, including substance use (Grant, Potenza, Weinstein, & Gorelick, 2010). If this is true, then game play can be conceptualized as providing positive reinforcement to the reward center and negative reinforcement to other regions of the brain related to withdrawal/negative effects and craving/preoccupation. This suggests that gaming addicts would experience withdrawal, craving, and preoccupation symptoms when unable to play. This conceptualization is consistent with this researcher's clinical experience.

The mechanisms of reward center activation presumably serve to direct an individual to a pleasurable and satisfying life direction. Yet, when powerful successes (reward center activation) occur within the context of computer gaming, this will not necessarily translate into real-life success. When driven to repeat the behavior at the expense of other important responsibilities, negative life outcomes are likely.

It is theorized by this researcher that gaming addiction occurs when, *because of game play, sufficient reinforcement is applied to the reward center and other brain regions*. A net combination of individual differences (age, gender, genetics, co-occurring mental illness, or life experiences) and *competing/complementary* reward systems within the individual's environment determine what amount of reinforcement is "sufficient," and ultimately who becomes addicted and who does not.

For those that play excessively, this researcher further theorizes, similar to substance addictions, dopamine receptor changes in the reward regions reduce their availability, resulting in tolerance effects and the elevation of the pleasure-sensing threshold. This elevation would likely result in the reduction of pleasure associated with other previously enjoyed activities and the pleasure associated with the *anticipation* of these activities. This is consistent with the majority of clients this researcher has seen in clinical practice. These individuals need to play for hours to maintain a stable mood and they have lost motivation to engage in other activities.

Since the theory proposed in this document suggests that behavioral addiction involves changes in the brain's reward center and other regions, stopping the addictive behavior alone will not undo these changes. The conclusion here is that abstinence alone will not *cure* gaming addiction.

The opiate blocker Naltrexone has shown effectiveness in treating gambling addiction (Kim, Grant, Adson, & Shin, 2001) and has been suggested as a possible treatment for gaming addiction (Grant et al., 2010). Presumably, this drug would limit activation in the reward pathways during play. While this treatment approach seems to target the brain regions implicated in addiction, this researcher has concerns over the use of this medication on children, adolescents, and young adults for this purpose. Specifically, there is no way for the midbrain to distinguish between game rewards and real-life rewards. This may have serious clinical consequences when attempting to guide a young person toward a successful real-life direction.

Alternatively, a strategy is proposed to target the same brain regions behaviorally without limiting reward center activation for other activities. Behavioral treatment methods may be preferred over other strategies for individuals brought to treatment by their parents and remain in denial regarding their addiction. It has been this researcher's experience that these individuals are particularly challenging as they are resistant to establishing a therapeutic clinical relationship and do not wish to be in treatment in the first place.

Proposed Behavioral Treatment Strategy

Gaming addiction appears to be caused by excessive game play with "sufficient" reinforcement to the reward center and other brain regions. It is hypothesized that to break the addiction, these same regions must be the target of change to mediate the effects of the previous reinforcement. It is proposed that by reducing the amount of allowed game play, natural consequences of this reduction will result in significantly reduced rewards of play. While continuing to play with a constantly lowering perception of reward and pleasure, it is hypothesized that changes to the brain's reward center will ultimately result in a reduction in the individual's motivation to play. Other non-gaming, reinforcing activities would substitute for the time taken from gaming and coping skills would be enhanced through counseling. Rather than a reduction in gaming time seen as a treatment goal, it would be conceptualized as a treatment intervention. The three treatment steps suggested for this intervention are:

1. Reduce the amount of available game time gradually. The net rewards from the game play will reduce naturally.
2. Reduce/limit activities that offer game-complementary reinforcement.
3. Introduce competing, non-gaming activities that provide reinforcement and fill time made available from the decline in allowed gaming time.

Reduce Play Time and Time Online

While moment-to-moment game play may be exciting and have reinforcing value, other reinforcement comes from the actual end-rewards of play. This includes gaming level, rank, loot, armor, power, and prestige. While the clinician cannot alter the game's reward system (rewarding aspects of play) or the environment (i.e., other players or new exciting updates) of the game, the amount of playtime can be controlled.

By reducing the amount of game play, the quantity of moment-to-moment reinforcement is obviously reduced as well. However, more importantly, even a modest reduction in the amount of game play can significantly lower the game's net rewards. This occurs in three ways. First, many games reward the amount of time played with the team (participation points) as a way to determine who gets the most "loot" or highest ranking. Second, since play is competitive, a player is likely to see his or his team's rank decline as playtime is limited. He may even be forced to change to a lower ranking team that can accommodate a more limited play schedule. Lastly, reductions in time online will likely limit online socializing or engaging in "pseudo-play" (activities related to gaming), thus lowering the reinforcement of these activities. Examples of pseudo-play include watching others play through streaming or "eSports," researching game tricks/cheats, visiting websites, and participating in forums discussing the game play.

Continued play with gradually reducing rewards will presumably lower the gamer's expectation of rewards and lower the individual's motivation for play. Motivational interviewing, supportive counseling, and cognitive behavioral techniques can be used to enhance alternate coping methods. It is believed that if this reduction is done gradually, the individual can acclimate to the change without serious abreactions. The rate of change and the starting and ending point (hours of play per day/week, etc.) should be carefully considered for each individual. Obviously, usage amounts should be realistic for the lifestyle chosen by the client and not leave the client at continued risk of addition. Further, the limits should be imposed for as long as possible to ensure long-term treatment benefits.

This treatment strategy can be particularly challenging. Simply recommending a client monitor and limit their own game playtime will likely be ineffective for children and defiant adolescents or for those truly addicted. For children and adolescent clients, parents must be willing and able to enforce time limits on play and to reduce the allowed amount gradually. For adult clients, this is more complicated. Logically, the overwhelming majority of adult patients presenting for treatment in this researcher's office continue to be supported financially by their parents or other family members. This suggests an opportunity for parents to assert their authority and to establish and enforce play limits agreed upon in treatment. If adult clients that live independently

are motivated for treatment, they may authorize a third party to set and maintain the limits for them.

It is likely that attempts to limit playtime in the past have failed, and parents will require counseling and technical support to achieve success during subsequent attempts. Unfortunately, operating system and gaming console parental controls are often not effective in stopping an adolescent or adult gaming addict as they are too easily bypassed. Since the young person is often more technically knowledgeable than their parents, parents are at a disadvantage when attempting to enforce limits. Currently, the best option for limiting online game play is to use a physically secure network router with parental controls. Additionally, all substitute devices, such as tablet computers and smartphones, must be limited or removed to enforce the game play and online limits. While limits on gaming time in the home does not limit use outside the home, it will likely still result in reductions in playtime.

As a result of the challenges posed by this treatment strategy, this researcher developed a specialized hardware device, the PC Moderator, to help monitor and limit game playtime when moderated limits could not be maintained otherwise. Approximately 1,000 devices were sold from 2005 to 2015. Specifically, the device locks on the desktop computer and can be used to monitor how much time is spent on the computer and to set hardware-enforced time limits. Since the device reduces the amount of computer time directly, the reduction in gaming time was seen as a successful treatment outcome. However, no data was collected on its long-term effectiveness. Follow-up with a limited number of cases suggested that use for an extended time (>12 months) resulted in positive outcomes (self, parent, and clinician reports of remission from gaming addiction). Nevertheless, since the outcomes cannot be directly linked to treatment, this must be viewed cautiously. Due to compatibility issues and evolving technology, the product was discontinued in 2015. Although based on the experience with this device, a new device - an entire small form factor gaming computer - is currently under development. This new device provides far more capabilities than the PC Moderator, allowing remote limit-setting configuration and use data collection. It is hoped that research conducted using this computer will help answer whether moderated gaming be used to treat gaming addiction.

Reducing Complementary Rewards

There are a number of complementary rewards associated with computer game play and often these complementary rewards are derived from the technology itself. Parents would be counseled to not buy new or better gaming equipment, or allow their child to build their own computer or purchase new accessories related to gaming (i.e., advanced controllers). Parents would be encouraged to inform other family members as well.

Increasing Competing Rewards

As less time is available for gaming and more time is spent on competing activities (e.g., homework, employment, or socializing), it is hoped that these activities will become sufficiently rewarding (i.e., improved grades). Parents would be counseled to find new enrichment activities for their child. If necessary, limited extra computer/video game time can be used to motivate the *initiation* of competing activities. It is likely that preference for alternate activities would not be immediate and it may take time to see increases in certain behaviors. Career assessment/counseling, individual, family, and marital counseling are but a few ways to help clients through this life transition. Older gaming addicts must find meaning and purpose in their life through the pursuit of new or revived passions that, over time, will offer more significant rewards than gaming.

Declaration of Interest

The author is part owner of Sentinel Gaming Systems, the firm developing the computer system described in this article. The device is intended to be used for treatment and research related to the behavioral treatment approach presented in this paper.

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