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Emotion Regulation and Internet Gaming Disorder

Christopher B. Davison, Ball State University, IN
Sherif Attallah, Ball State University, IN
Evangelia Argyriou, Ball State University, IN

Davison, Ph.D., is an Assistant Professor in the Department of Information Systems and Operations Management; Attallah, Ph.D., is an Assistant Professor in the Department of Construction Management and Interior Design; Argyriou is a graduate student in the Department of Psychology.

Abstract

The authors of this research article correlated emotional regulation with Internet gaming activity. Students from a large, Midwestern research and teaching university were sampled. Respondents self-reported their emotion regulation behavior as well as their Internet gaming behavior. Two emotion regulation strategies (reappraisal and suppression) were evaluated for their relation to Internet Gaming Disorder (IGD).

Introduction

Internet gaming is one of the most popular indoor activities, especially among the youth. Internet use for playing games is generally not considered harmful, however, a large number of individuals engage in uncontrolled gaming behavior (Grant, Potenza, Weinstein, & Gorelick, 2010; Gentile, 2009) and some research suggests (Mandryk & Birk, 2017) excessive gaming behavior is correlated to depression. This uncontrolled Internet use can take the form of excessive preoccupation with Internet gaming behavior, with withdrawal symptoms, tolerance, loss of interest for other activities, and a risk for jeopardizing social relationships and employment (American Psychiatric Association [APA], 2013; Pontes & Griffiths, 2015). The maladaptive use of the Internet can take the form of Internet Gaming Disorder, characterized by persistent and recurrent use of the Internet playing games.

In this research project, the authors investigated any correlation between emotion regulation and uncontrolled Internet gaming. The purpose of the current study is to assess how generally adaptive and maladaptive strategies of emotion regulation are linked to a greater tendency to demonstrate IGD symptomatology. To this end, two widely researched emotion regulation strategies, reappraisal (mostly related to adaptive emotion regulation) and suppression (mostly related to maladaptive emotion regulation) were investigated as predictors of IGD. The moderating role of gender and age was also assessed.

Literature Review

IGD is likely to be related to emotion dysregulation. Consulted literature reveals that every form of psychopathology, both internalizing and externalizing, include emotion dysregulation problems as a central characteristic (Yen, Yeh, Wang, Liu, Chen & Ko, 2018; Gross & Thompson, 2007). For example, disturbances of varying types in emotion regulation have been implicated in depression and anxiety disorders (Campbell-Sills &

Barlow, 2007; Mennin, Holaway, Fresco, Moore, & Heimberg, 2007; Nolen-Hoeksema, 2008) as well as in alcohol abuse and addiction (Tice, Bratslavsky, & Baumeister, 2001). Revealing a positive association between IGD and the maladaptive use of emotion regulation strategies could provide evidence for the legitimacy of IGD as disorder.

Internet Gaming Disorder

Individuals suffering from IGD are preoccupied with Internet gaming and their Internet use for this purpose is persistent and recurrent (APA, 2013). This preoccupation with Internet gaming results in clinically significant impairment or distress (APA, 2013). Although Internet addiction was studied in the literature for about a decade, IGD, focusing specifically in addictive behaviors related to gaming, was introduced in the DSM-5 for the first time in 2013 as a disorder warranting additional study (APA, 2013; Petry & O'Brien, 2013).

IGD is specifically limited to gaming and is one of the “main types of Internet disorders” (Billieux, Deleuze, & Griffiths, 2017, p. 1515). While the term Internet is used and most often involved a specific online game, the DSM-5 does allow for non-Internet electronic games as well. IGD does not include other Internet utilization such as chat, gambling, or pornographic websites. Nine criteria were generated for this disorder (APA, 2013). These are the following:

1. Preoccupation - thinking about gaming during times of non-play.
2. Tolerance – increasing gaming time to achieve desired effects.
3. Withdrawal – unpleasant feelings when gaming is not occurring.
4. Persistence – inability to stop or reduce game play.
5. Escape – utilizing gaming to escape from negative mood or other problems.
6. Problems – gaming that creates negative life consequences for the gamer.
7. Deception – lying about gaming behavior.
8. Displacement – gaming dominates other activities.
9. Conflict – substantial problems with relationships or employment.

A limited number of studies have used the DSM diagnostic construct to study IGD (Dong & Potenza, 2014; Lemmens, Valkenburg, & Gentile, 2015). In the DSM-5, IGD is classified as a behavioral addiction, although several researchers have argued that it should be classified as an impulse control disorder (Dong & Potenza, 2014). The debate for the most appropriate classification of IGD as either an impulse control disorder or a behavioral addiction has not been resolved yet. Additionally, there are some neurobiological studies that have shown many similarities between IGD and other addictions.

From a neurobiological perspective, a recent meta-analysis conducted by Meng, Deng, Wand, Guo, and Li (2015) demonstrated the importance of the dysfunctional prefrontal lobe in the neuropathological mechanism of IGD. Impairments in this brain region have been implicated in dysfunctions of the reward and self-regulatory system, which are thought to play an important role in substance use disorders (Meng et al., 2015). Dong, DeVito, Huang, and Du (2012) have found and studied cerebral cortex abnormalities in Internet gaming addicts as well. Relatedly, Chun et al. (2017), in their research on smartphone users and altered brain activity, found certain brain regions experienced neural deactivation in excessive smartphone users

Dong and Potenza (2014), adopting a behavioral addiction conceptualization of IGD, propose a cognitive-behavioral model for IGD. According to these researchers, IGD involves deficits in three main domains in correspondence with other addictions (Dong & Potenza, 2014). The first domain involves motives driven from reward-seeking and stress reduction. Specifically, individuals with IGD have been found to demonstrate increase reward sensitivity and decreased loss sensitivity in winning and losing tasks (Dong, Huang, & Du, 2011; Dong, DeVito, Huang, & Du, 2012), which may be related to heightened need to gaming (Dong, & Potenza, 2014). The second domain involves decision-making, with IGD individuals presenting difficulties in weighing pros and cons for

engaging in the desired behaviors. The last domain involves deficits in executive control related to difficulties in resisting cravings and limit excessive Internet gaming. The last two domains are related to the maladaptive use of the different emotion regulation strategies (Cohen, Daches, Mor, & Henik, 2014; Sheppes et al., 2014).

Emotion and emotion regulation

Emotions are thought to have been developed through human evolution to prepare for action in response to environmental stimuli (Kring, 2008). They are generated through stages, including attending to a situation, giving a valenced meaning, and responding experientially, behaviorally, and physiologically (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Sheppes, Suri, & Gross, 2015). Emotions generally are adaptive in nature and enable different inter- and intra-personal functions (Kring, 2008). However, emotional valence, emotional intensity, and disconnection disturbances can make them maladaptive. Nevertheless, that can be adjusted through emotion regulation processes (Berenbaum, et al., 2003). Gross (1998) defined emotion regulation as the “processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (p. 275). The role of emotion regulation in the development of psychopathology has been emphasized in the literature, with previous studies focusing attention on the use of regulatory strategies by individuals with psychopathology (Sheppes, Suri, & Gross, 2015).

Over the years, different theoretical models have highlighted different specific strategies as adaptive or maladaptive (Aldao, Nolen-Hoeksema, & Schweizer, 2010). A number of theories suggest that psychopathology can result from the inability to downregulate negative emotions through strategies such as reappraisal (i.e. finding benign or positive attributions or interpretations of an event to prevent or reduce negative mood about the event), acceptance, problem-solving, or attentional redeployment (i.e. diverting one’s attention to positive or benign stimuli to change one’s mood; Nolen-Hoeksema, 2012). Thus, inability to use adaptive strategies to down-regulate negative emotions is thought to lead in negative emotionality. Moreover, the use of maladaptive strategies that involve engagement in processes that exacerbate and prolong negative emotions is thought to be related to more negative emotions, which are uncontrollable, severe, and chronic, likely developing into psychopathology (Campbell-Sills & Barlow 2007; Nolen-Hoeksema, 2012).

Methods

Participants

The study participants were sampled from a population of 20,503 graduate and undergraduate students at one large Indiana research and teaching university. Participants were recruited via several campus mass-emails over the course of 2016. The entire population was invited to participate. In order to be included in the study, potential participants had to be older than 18 years old and enrolled at the university. Part-time and full time students, as well as graduates and undergraduates were solicited to participate. The response rate of participation was .7 percent, with 141 students electing to participate in the survey. This study was cleared through the Ball State University IRB office and the study procedures were cleared as “Exempt” under federal regulations. The assigned protocol number is: 892545-1.

Non-response bias was an aspect addressed in the methodology of this study. Armstrong and Overton (1977) offer several suggestions to overcome non-response bias in surveys. These researchers’ work dealt with regular postal mail, however, their techniques can be successfully adapted to modern email surveys. Their extrapolation method was deployed in this research study. That technique involves several “successive waves” (p. 2) of email invitations to participate in the survey being sent out to the entire population. Resulting from each wave of participation request emails were large spike of participants followed by a period of no survey participation.

Armstrong and Overton (1977) also suggest that “subjective estimates” of nonresponse bias is a useful tool to estimate its effect. However, a clear technique to subjectively estimate non-response bias appears to be elusive. As the results of the survey for this research article are quite similar to the results of the survey upon which this article is based (Conole, Latt, Dillion, & Darby, 2006), there is a strong subjective indicator that the sample is valid.

Materials

Internet Gaming Disorder

IGD was measured with the Internet Gaming Disorder Scale – Short Form (IGDS9-SF; Pontes & Griffiths, 2015). The items of this psychometric scale were developed based on the nine proposed criteria from the DSM-5 for the diagnosis of this disorder. This scale was constructed to assess the severity and harmful effects of IGD. Online or/and offline gaming activity over the course of the last 12 months is evaluated. Participants’ degree of agreement to each item is recorded on a 7-point Likert scale from 1 (never) to 7 (very often). This scale is scored by summing the answers in all the questions. Participant scores can range from 9 to 45. IGDS9-SF has demonstrated good psychometric properties (Pontes & Griffiths, 2015). The internal consistency of the scale was found to be high (Cronbach’s alpha = 0.87) and confirmatory factor analysis confirmed a single-factor structure of IGD.

Emotion Regulation

Emotion regulation was measured with the emotion Regulation Questionnaire (ERQ; Gross & John, 2003). This measure consists of two scales assessing reappraisal (6 items) and suppression (4 items). Participants are asked to record the degree to which they agree or disagree with statements involving emotional experience and emotional expression. Participant ratings range between 1 (strongly disagree) and 7 (strongly agree). An example item for reappraisal is: “when I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about”, and for suppression: “when I am feeling positive emotions, I am careful not to express them.” This scale has shown good internal consistency as well as test retest reliability (Gross & John, 2003).

Procedures

Data collection was conducted through the utilization of an online survey. Students were invited to participate through several campus mass-emails over the course of 2016 (April through August). The questionnaire was created in Qualtrics and hosted online in the Qualtrics system. The instrument was closed in August and the data was then downloaded into the R software for statistical analysis.

Statistical analysis

Initially, descriptive statistics were obtained for all the variables of the study. Proper graphical tests (P-P plots) were used to evaluate the assumption of a normal distribution in IGD and emotion regulation scores. No significant deviations from normality were observed. Consequently, any further analysis was based on parametric statistical methods that are associated with higher statistical power compared to non-parametric methods. In order to estimate the association between emotion regulation and IGD, while adjusting for potential confounding effects of age and gender, multiple linear regression analysis was conducted. All statistical procedures were performed using the R statistical software.

Results

The following descriptive statistics were obtained from the sample. The means and standard deviations of the continuous variables, and the frequencies and percentages of the categorical variables are: IGD (Mean=18.97/SD=6.58), ER Strategy Reappraisal (Mean=29.8/SD=5.66), ER Strategy Suppression (Mean=15.51/SD=4.94), Age (Mean=22.66/SD=7.27), Female (N=74), Male (N=62).

Results from the multiple regression analysis evaluating the association between reappraisal and suppression with IGD controlling for potential confounders are presented here. Reappraisal was negatively related to IGD ($b = -0.26$, $t = -2.37$, $p = 0.019$), while controlling for suppression, gender, and age. Suppression was positively associated with IGD ($b = 0.32$, $t = 2.50$, $p = 0.014$), while controlling for potential confounders. Unlike most other studies in this domain, there was no evidence for an effect of gender ($b = -1.67$, $t = -1.33$, $p = 0.186$) or age ($b = -0.07$, $t = -0.86$, $p = 0.390$) on IGD, while controlling for other covariates.

Of note in this regression analysis is the $R^2 = 0.11$. The R^2 value indicates that the goodness of fit of the sampled data points to the regression model. A small R^2 value is not necessarily problematic and can be due to a large variability in the sample.

Discussion

The purpose of this work was to assess the relationship between two emotion regulation strategies and IGD. The results of this study showed that reappraisal which is generally considered as an adaptive emotion regulation strategy was related to decreased IGD symptomatology. On the other hand, suppression a strategy which is implicated in less successful regulation of emotion, was linked to increased IGD symptomatology. In this study, Gender and age were not associated with IGD which is contrary to most literature that demonstrates that “men are more likely to become addicted to online video gaming” (Andreassen et al., 2016, p. 253) as well as young people being more susceptible to addictive Internet behavior (Kuss & Griffiths, 2012) and “IGD scores with differences according to gender” (Laconi, Pirès, & Chabrol, 2017, p. 652).

The findings of this research are in line with previous research demonstrating a negative association between maladaptive regulatory strategies and different forms of psychopathology. Disturbances of different type in emotion regulation, one type of which is maladaptive suppression, are thought to be in the core of disorders with depression and anxiety-related features (Campbell-Sills & Barlow, 2007; Mennin, Holaway, Fresco, Moore, & Heimberg, 2007; Nolen-Hoeksema, 2008). Additionally, such disturbances have been implicated in alcohol abuse and addiction (Tice, Bratslavsky, & Baumeister, 2001) which appears to share common features with IGD (Argyriou, Davison, & Lee, 2017). Similarly, the finding that reappraisal is linked to less IGD symptoms aligns with research showing that adaptive emotion regulation enhances well-being and is related to lower levels of psychopathology symptoms (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

In this study age and gender were not correlated to IGD. These findings are not congruent with most empirical research that suggest age and gender are both risk factors for Internet addiction and IGD. This may have to do with the fact that the sample population in this study was obtained from a similar age group (college age students). With regard to age, a follow up study is suggested in order to investigate this anomaly.

Limitations

One limitation of this study is that the sample came from a Midwestern (east, central Indiana) research and teaching university which makes it geographically bounded and reduces the generalizability of the findings. Another limitation is that the current study is a cross-sectional study and, thus, causal relationships cannot be substantiated. Therefore, it is not certain whether emotion regulation precedes the development of IGD or it is a result of the disorder.

Additionally, since participants were invited to participate to the study through emails there is the possibility of nonresponse bias, as discussed above. Finally, although the effect of the two emotion regulation strategies was statistically significant, the R^2 was relatively

small. This indicates that the covariates in the model did not explain a large portion of the variability in IGD.

Conclusions

In this paper, students from a large Midwestern research and teaching university were sampled for emotion regulation and Internet gaming behavior. The results of the survey were analyzed for any correlations between two emotion regulation strategies (reappraisal and suppression) and IGD. The results of this study showed that reappraisal was correlated to decreased IGD symptomatology. Relatedly, suppression was linked (positively correlated) to increased IGD symptomatology among the sample population. Finally, Gender and age were not associated with IGD which is inconsistent with most other studies on Internet gaming and addictive behavior.

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