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Is resilience a protective factor of internet addiction?

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ABSTRACT

Extensive research has focused on risk factors that increase an individual's likelihood of internet addiction. This paper intends to examine protective factors that may reduce the likelihood of an individual to suffer from internet addiction, focusing on the role of resilience. A total of 240 online participants completed a questionnaire that measured general internet addiction, resilience levels, and addictive behavior for online games and Facebook. Hierarchical regression analyses were performed while controlling for age, gender, social class, and hours spent online. It was found that, overall, the higher the level of the participants' resilience, the lower the level of their internet addiction. The same relationship was seen in online game addiction but not in Facebook addiction. Future directions for research on how to experimentally test the effectiveness of resilience on internet addiction were discussed.

1. Introduction

Internet addiction (Young, 1998) has been a topic of research interest for decades. It has also been called pathological internet use (Davis, 2001), problematic internet use (Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000), and compulsive internet use (van Rooij, Schoenmakers, van de Eijnden, & van de Mheen, 2010). Internet addiction can be defined as a maladaptive and persistent use of the Internet that can have a detrimental influence on any or all facets of an individual's life (Chou, Condron, & Belland, 2005; Young, 1998).

1.1. Forms of internet addiction

Internet addiction has been studied not only as a general addiction but also in specific forms such as online gaming, online gambling, or cyber pornography (Ng & Wiemer-Hastings, 2005). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) recently has included online gambling addiction within the disorder gambling (American Psychiatric Association, 2013). The DSM-5 is the classification manual for mental disorders which is used for the diagnosis and research of aforementioned mental disorders.

Online gaming addiction is relatively well established in the internet addiction literature (Ng & Wiemer-Hastings, 2005). It has received more interest than other forms of internet addiction and has been included in Section 3 of the DSM-5 as an area for further research (American Psychiatric Association, 2013). A number of people have died or lost their marriages due to online gaming addiction. One incident occurred in Taiwan wherein a gamer died playing *World of Warcraft* in an internet café. Oblivious to the other gamers within the café, even 10-h after the gamer had died from a heart attack, the other patrons continued to use the internet while the police investigation took place (Cheng & Wu, 2012). Online games also have been found to cause financial, workplace, and relationship issues (Lianekhammy & van de Venne, 2015). In addition, players of massively multiplayer online roleplaying games such as *World of Warcraft* have been found to spend significantly more time playing games than offline gamers (Ng & Wiemer-Hastings, 2005). 45% of the online gamers played over 21 h a week while 84% of offline gamers played less than 6 h a week.

Recently researchers have started to examine Facebook addiction (Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Kuss & Griffiths, 2011). Facebook addiction is also known as Social Networking Sites (SNS) Addiction (Kuss & Griffiths, 2011). In a survey of psychology students, 78% used social networks, and of those, 57% used it every day (Subrahmanyam, Reich, Waechter, & Espinoza, 2008). Research has shown that individuals between

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the age of 13–19 use SNS more often than adults over the age of 60 (Kuss & Griffiths, 2011). Given the increasing use of Facebook, Facebook addiction has been found among users and it is defined as a persistent and maladaptive use of a social networking site (Kuss & Griffiths, 2011). Two studies (Zhou, 2010;; Wan, 2009) have examined Facebook addiction rates in Chinese college students, with one study finding that 24% of students were addicted while the other found that 34% were addicted.

The current article takes the theoretical perspective of uses and gratifications (e.g., LaRose & Eastin, 2004; Ruggiero, 2000) to examine online gaming addiction and Facebook addiction in particular, in addition to the study of internet addiction in general. The approach of uses and gratifications is a dominant paradigm in the field of communications, emphasizing on explaining media uses from diverse needs and gratifications of users than from various features of media technologies. This perspective has been widely adopted in Internet behavior research (Song, Larose, Eastin, & Lin, 2004; Urista, Dong, & Day, 2009; Young, 1998). Stafford, Stafford, and Schkade (2004) specified three key dimensions of the Internet use, process gratifications, content gratifications, and social gratifications. Raacke and Bonds-Raacke (2008) found that the vast majority of college students are using Facebook and other social network sites for making new friends and locating old friends. A study of internet addiction indicates that internet addicts tended to use chat rooms or multiplayer games predominately for the real-time communication whereas non-addicts tended to use the World Wide Web or emails primarily for information gathering (Young, 1998).

1.2. Protective factors of internet addiction

Internet addiction, like other forms of addiction such as alcohol and gambling addiction, have factors that either increase the risk of addiction or reduce the likelihood of addiction. Extensive research has found various risk factors associated with internet addiction, such as negative relationships with friends and family or an individual's belief about their locus of control (Koo & Kwon, 2014). On the other hand, internet addicts use the internet more often as a coping mechanism in stressful situations (Whang, Lee, & Chang, 2003). Some research has found that internet addicts used the internet to escape from reality when they were stressed (Tang et al., 2014; Whang et al., 2003).

Resilience can be broadly defined as the ability to adapt to adverse situations in a positive manner (Lussier, Derevensky, Gupta, Bergevin, & Ellenbogen, 2007). It varies with a number of factors, from an individual's culture, age, ethnicity, or even the context of the stressor (Connor & Davidson, 2003). When individuals encounter a stressful situation, they can give up, recover but to a diminished capacity, recover to baseline, or recover and thrive beyond the baseline to cope with the stress (Steinhardt & Dolbier, 2008).

There has been research examining the relationship between resilience and other addictions. High risk adolescents who are more resilient were found to be less likely to suffer from gambling addiction (Lussier et al., 2007). It has also been found that the level of alcohol consumed by college students is negatively correlated with their resilience (Johnson, Dinsmore, & Hof, 2011). However, there has been little research directly examining resilience and internet addiction.

The article follows the framework of positive psychology (Seligman & Csikszentmihalyi, 2000) and focuses on the protective factors that can reduce internet addiction rather than the risk factors of internet addiction. Positive psychology's goal is not to focus on the causes of a disorder but to improve individuals' quality of life and to find factors that prevent or reduce disorders (Seligman & Csikszentmihalyi, 2000). Positive psychological interventions have been found to be effective in reducing depressive symptoms as well as increasing well-being by focusing on protective factors that make individuals stronger rather than risk factors which make individuals more susceptible to a disorder (Sin & Lyubomirsky, 2009). Protective factors of internet addiction can be separated into interpersonal and intrapersonal aspects.

1.3. Research questions

The present study aimed at addressing two research questions: (1) Is resilience a protective factor for internet addiction? (2) Is resilience a protective factor for online gaming addiction and Facebook addiction? Based on both the theoretical perspectives of users and gratifications and positive psychology and the existing literature linking stress and internet addiction as well as the previous research on resilience being a protective factor for other forms of addiction, we hypothesized that (1) individuals who have a higher level of resilience will have fewer symptoms of general internet addiction and (2) individuals who have a higher level of resilience will have less symptoms of online gaming and Facebook addiction.

2. Method

2.1. Participants

A total of 240 individuals participated in the study. They were drawn from an online convenience sample. Participants were recruited both from a posting on a website for online psychology research (socialpsychology.org) and through an advertisement placed on a prominent comedy website (somethingawful.com). The only requirements for participants was that they have access to the Internet, read English and were over the age of 18 when completing the survey. Among the participants, 65% were male and 35% were female. The ethnic distribution of the participants was 77% Caucasian, 6% Hispanic, 6% Asian, 2% African American, and 9% other ethnicities. The participants' ages ranged from 18 to 61 years. 89% of participants were between the ages of 18–30 years with a mean age of 25.05 years. The socioeconomic status of the participants was self-reported as 46% middle class, 26% working class, 18% upper middle class, 7% lower class, and 3% upper class.

2.2. Instruments

2.2.1. Internet addiction

The study used the Internet Addiction Test (Young, 1998) to measure internet addiction. It contains 20 questions with a 6 point Likert scale (0 = not applicable and 5 = always). Participants could receive a score from 0 to 120. Based on Young (2010), a score from 0 to 30 is normal, from 31 to 49 is mild internet addiction, from 50 to 79 is moderate internet addiction, and from 80 to 100 is severe internet addiction.

2.2.2. Online gaming addiction and facebook addiction

The questionnaire of gaming addictive behavior (Young, 2010) was used to measure online gaming addiction. It is a 10 question scale utilizing a 4 point Likert scale (1 = never and 4 = very often). The questionnaire for gaming addictive was modified to assess Facebook addiction by replacing the words “gaming” and “online game” with the word “Facebook”.

2.2.3. Resilience

The Conner Davidson Resilience scale (Connor & Davidson, 2003) was used to measure resilience. It is a 25 item

questionnaire on a 5 point Likert scale (0 = not true at all and 4 = true nearly all of the time). Possible scores range from 0 to 125 and the higher a participant's score the higher their resilience level. The scales Cronbach alpha was found to be 0.89 for the entire scale and items correlations varied from 0.30 to 0.70. The scale also was found to have test-retest reliability and also convergent validity when compared to Kobasa's hardiness scale. The scale has been validated with a number of populations, the general population, primary care patients, psychiatric outpatients, and individuals with generalized anxiety disorder and PTSD.

2.2.4. Demographic questions

Brief questions were asked regarding age, gender, ethnic background, socioeconomic status (SES), and weekly hours spent using the Internet, online games, and Facebook.

2.3. Procedure

This study was reviewed and approved by the Institutional Review Board. The data collection was conducted through a web-based survey that was created and hosted on surveymonkey.com. After being directed to the survey website, all participants were provided with an informed consent. After they received and completed the survey, they were directed to a debriefing form that contained some informational sources on internet addiction.

3. Results

As shown in Table 1, participants on average spent 38.65 h on the internet, 8.95 h playing online games. Of the hours spent playing online games, 2.65 h on average were spent playing Massively Multiplayer Online roleplaying games.

As shown in Table 2, the majority of participants were found to have some form of internet addiction, 51% had mild internet addiction, 43% had moderate internet addiction, and 2% had severe internet addiction. Only 5% of participants did not have any internet addiction.

3.1. Resilience and types of addiction

Correlations were examined for resilience and each of the types of internet addiction. Resilience was found to be significantly negatively correlated to both internet addiction, $r\,(238) = -0.360$, $p < 0.001$, and online gaming addiction, $r\,(193) = -0.403$, $p < 0.001$, but not Facebook addiction, $r\,(224) = 0.012$, *ns*.

3.2. Resilience and internet addiction

As shown in Table 3, the hierarchical multiple regression analysis indicates that Model 3 is the best model, $\Delta R^2 = 0.10$, $\Delta F\,(1{,}224) = 27.52$, $\Delta p < 0.001$. The model explains 19% of the variance in internet addiction, $R^2 = 16$, $F\,(5, 224) = 10.63$, $p < 0.001$. Resilience ($\beta = -0.32$, $p < 0.001$) was a significant predictor of internet addiction, along with the significant impact of the control variable of Hours Online ($\beta = 0.22$, $p < 0.001$).

Table 1
Demographic information of Participants (N = 240).

Measures	M	SD
Age	25.05	6.27
Internet Usage[a]	38.61	24.82
Online Game Usage[a]	8.95	12.73
Facebook Usage[a]	8.08	12.89

[a] Indicates that the items are measured in hours a week.

Table 2
Percentage distribution of internet addiction (N = 240).

Degree of Addiction	Frequency (%)
Normal	9 (4%)
Mild	123 (51%)
Moderate	104 (43%)
Severe	4 (2%)

3.3. Resilience and online gaming addiction

The hierarchical multiple regression, as shown in Table 4, indicates that Model 3 is the best model, $\Delta R^2 = 0.04$, $\Delta F\,(1{,}187) = 14.27$, $\Delta p < 0.001$. The model explains 42.2% of the variance in internet addiction, $R^2 = 0.422$, $F\,(5, 187) = 27.34$, $p < 0.001$. Resilience ($\beta = -0.23$, $p < 0.01$) was a significant predictor of online gaming addiction, along with significant impact of the two control variables of Gender ($\beta = -0.15$, $p < 0.05$) and Hours Online Gaming ($\beta = 0.47$, $p < 0.001$).

3.4. Resilience and Facebook addiction

A multiple hierarchical regression was also used to examine the relationship between resilience and Facebook Addiction, as seen in Table 5. The regression model for Facebook was not significant at step 3 when resilience was added. Two control variables were found to be significantly associated with internet addiction, Hours on Facebook ($\beta = 0.4$, $p < 0.001$) and Gender ($\beta = 0.16$, $p < 0.001$).

4. Discussion

This study examined the relationship between resilience and internet addiction. Overall, while controlling for gender, age, SES, and hours spent online per week, resilience significantly predicted the participants' level of internet addiction and online gaming addiction but not Facebook addiction. The higher resilience, the lower their internet addiction and online gaming addiction levels were.

The primary findings of this study support the first hypothesis. Resilience is a strong protective factor for internet addiction even after controlling for a number of demographic variables. This finding is consistent with the findings in a meta-analysis study (Koo & Kwon, 2014) and supports previous research that resilience is a protective factor for both youth gambling (Lussier et al., 2007) and addiction in general (Fadardi, Azad, & Nemati, 2010). This might be explained by the fact that resilience is an individual's ability to cope with stress, and stress has been found to be linked to addiction and relapse in drug addicts (Cleck & Blendy, 2008).

Nevertheless, the study partially supports the second hypothesis. Resilience was found to be a protective factor for online gaming addiction, but not Facebook addiction. These results suggest that using the Internet and playing online games are both used as coping mechanisms for stress, but not Facebook. Regarding online game addiction, Blinka and Smahel (2010) found that the more addicted online gamers became, the more importance they placed on their online relationships. In fact, they found that online role-playing gamers who separated their online and real life friends were more addicted than players who did not separate them. Regarding Facebook addiction, it could be speculated that Facebook users use Facebook primarily for social gratifications while online gamers play games mainly for process gratifications (Stafford et al., 2004; Raacke and Bonds-Raacke, 2008). As a result, resilience could help coping online game addiction but does not have a mechanism to cope Facebook addiction perhaps because users use online

Table 3
Model fit and parameter estimation of hierarchical multiple regression using internet addiction as the outcome and demographics, hours online, online friends and resilienceas predictors (N = 230).

	Model 1		Model 2		Model 3	
	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]
ParameterEstimation						
Step1						
Gender	−3.36, (1.6), −0.14*	[−6.52, −0.21]	−2.30, (1.57), −0.10	[−5.39, 0.80]	−1.23, (1.5), −0.05	[−4.18, 1.73]
Age	−0.13, (0.13), −0.07	[−0.37, 0.12]	−0.15, (0.12), −0.08	[−0.39, 0.09]	−0.15, (0.11), −0.08	[−0.37, 0.08]
SES	−0.06, (0.84), −0.01	[−1.73, 1.60]	0.29, (0.82), 0.02	[−1.33, 1.91]	0.54, (0.78), 0.04	[−0.99, 2.07]
Step2						
HoursOnline			0.12, (0.03), 0.26***	[0.06, 0.18]	0.10, (0.03), 0.22***	[0.05, 0.16]
Step3						
Resilience					−0.24, (0.05), −0.32***	[−0.33, −0.15]
ModelFit						
R^2	0.03		0.09		0.19	
F	1.97		5.73***		10.63***	
ΔR^2			0.07		0.10	
ΔF			16.61***		27.52***	

$p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$.

Table 4
Model fit and parameter estimation of hierarchical multiple regression using online gaming addiction as the outcome and demographics, hours in online games, online friends and resilience as predictors (N = 193).

	Model 1		Model 2		Model 3	
	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]
ParameterEstimation						
Step1						
Gender	−3.93, (0.94), −0.29***	[−5.78, −2.07]	−2.22, (0.8), −0.16**	[−3.8, −0.63]	−1.96, (0.78), −0.15*	[−3.5, −0.42]
Age	−0.08, (0.07), −0.08	[−0.22, 0.06]	−0.11, (0.06), −0.11	[−0.22, 0.01]	−0.11, (0.06), −0.11	[−0.22, 0]
SES	−0.2, (0.46), −0.03	[−1.11, 0.71]	−0.24, (0.38), −0.04	[−1.00, 0.52]	−0.07, (0.37), −0.01	[−0.81, 0.67]
Step2						
HoursOnlineGaming			0.25, (0.03), 0.54***	[0.20, 0.31]	0.22, (0.03), 0.47***	[0.17, 0.28]
Step3						
Resilience					−0.09, (0.02), −0.23***	[−0.14, −0.04]
ModelFit						
R^2	0.1		0.38		0.42	
F	6.83***		28.59***		27.34***	
ΔR^2			0.28		0.04	
ΔF			84.76***		14.27***	

$p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$.

Table 5
Model fit sand parameter estimation of hierarchical multiple regression using facebook addiction as the outcome and demographics, hours on facebook, online friends and resilience as predictors (N = 220).

	Model 1		Model 2		Model 3	
	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]	b, (SE), β	[CI for b]
ParameterEstimation						
Step1						
Gender	2.92, (0.8), 0.24***	[1.35, 4.49]	1.95, (0.75), 0.16***	[0.48, 3.43]	2.04, (0.76), 0.17**	[0.55, 3.53]
Age	−0.12, (0.06), −0.13*	[−0.24, 0]	−0.09, (0.06), −0.1	[−0.2, 0.02]	−0.09, (0.06), −0.1	[−0.2, 0.02]
SES	0.25, (0.42), 0.04	[−0.58, 1.08]	0.1, (0.39), 0.02	[−0.66, 0.86]	0.12, (0.39), 0.02	[−0.64, 0.89]
Step2						
HoursOnFacebook			0.18, (0.03), 0.4***	[0.12, 0.23]	0.18, (0.03), 0.4***	[0.12, 0.23]
Step3						
Resilience					−0.02, (0.02), −0.05	[−0.06, 0.03]
ModelFit						
R^2	0.07		0.22		0.22	
F	5.40**		15.02***		12.13***	
ΔR^2			0.15		0.002	
ΔF			40.89***		0.67	

$p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$.

games and Facebooks for different purposes and needs, as suggested in Young's study (1998).

In addition to resilience as the primary focus of study, two demographic variables, Gender and Hours Online, are found to be significantly associated with internet addiction. There two variables are used as the control variables in the regression analyses and further confirm the significant predictive power of resilience on internet addiction as the main finding of the study. Meanwhile, this

additional finding suggests that the relation between resilience and internet addiction (including game addiction and Facebook addition) is not simple and could be potentially moderated by various other variables such as gender and time spent online.

4.1. Limitations and directions for future research

There are a number of limitations to this study. First, in the study, all participants were self-selected and nearly 100 participants dropped out after completing the demographic questionnaire. In addition, since all the data was collected online, the participants could be more likely to be Internet Addicted as they found the survey online via one of the two recruitment methods. Second, the ethnic distribution of participants was mostly Caucasian so this data may not be able to be generalized to other ethnic groups (Smith, 2012). Wallace et al. (2003) found that in 8th, 10th and 12th graders in the United States, Native Americans in general had the highest substance use, followed by Caucasians, Hispanics, African Americans, and then Asian Americans. Third, the majority of participants were in their twenties and from the middle class. This is not unexpected as 18–29 year olds are the group that has the highest percentage of internet use (Perrin & Duggan, 2015). Also, only 74% of households making less than $30,000 dollars a year use the Internet while 97% of households making over $75,000 dollars a year use the Internet. Future research should collect data from diverse groups to have a more representative sample of the general population.

4.2. Implications

The finding that resilience is a protective factor against internet addiction can be incorporated into prevention treatment for individuals, specifically adolescents who are at risk of internet addiction. But this prevention treatment would only be effective if the adolescents were not at risk for Facebook addiction, as resilience was not a protective factor for it. Incorporating resilience into training would be beneficial as it would not only help with internet addiction, but also it has been found to be negatively linked with other forms of addiction including alcohol and gambling addiction (Fadardi et al., 2010). Resilience training would also help train people to be able to handle stress more effectively in general, which is a part of everyday life for people. This study has also found that certain groups are in more need of resilience training than others. For instance, men had lower resilience than women, and men with lower resilience were significantly more addicted to online games. Interventions specifically designed for this demographic could help. Research into ethnic differences in internet use and differences in the benefits of resilience should be further explored to design effective prevention and intervention programs training resilience.

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