Predictory Role of Impulsitivity and Loneliness on Internet Gaming Addiction among Missionary Secondary School Students in Nsukka

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Abstract

The study looked at the impact of impulsivity and loneliness on internet gaming addiction in missionary secondary school students. Four hundred and fifty (450) participants (192 males and 258 females) were drawn from two secondary schools in Nsukka, Enugu State, Nigeria. Participants were drawn using a systemic random sampling technique. Participants' ages ranged from 14 to 21 years old. The Barratt Impulsivity Scale, the UCLA Loneliness Scale, and the Gaming Addiction Scale were used to collate data for the study. The study adopted a cross-sectional design. A hierarchical multiple regressions was used to test the hypotheses of the study. Results of the study revealed that the attention facet ($r =.25, p .01$), and motor facet ($r =.24, p .01$) dimensions of impulsivity were positively correlated with internet gaming addiction. The planning facet domain of impulsivity did not predict internet gaming addiction ($r =.10, p > .05$). Loneliness did not predict internet gaming addiction ($r =.10, p >.05$). The need for social skills training, which may be beneficial in training students by providing opportunities to address a number of factors that might be associated with problematic behavior for all genders, was discussed in the study.

Keywords: Impulsivity**,** internet, loneliness, gaming, addiction

1. INTRODUCTION

The digital revolution has transformed how we communicate, educate, and entertain ourselves, as well as how we behave as individuals in society due to the rapid growth of electronic devices. As technology has become an ever-increasing part of our daily lives, the line between excessive and functional internet gaming use remains hazy. Despite the fact that internet gaming is a legitimate leisure activity all over the world, it has also been reported as a source of lucrative business all over the world, generating an estimated profit of more than $12 billion in China alone (Kuss& Pontes, 2019; Kuss, 2013). Previous research has shown that internet gaming has the potential to become an addiction (Young, 2009), and that it is more common among young people in their late teens and early twenties (Kuss& Griffiths, 2012). In documented cases of internet gaming addiction

(IGA), the bulk of the research included more male teenagers and young adults (Bass, 2015; Kuss, 2013; Lee & Kim, 2017; Li & Wang, 2013). It is a serious and growing public health problem that is probably not being talked about or taken seriously enough in clinical practice (Bass, 2015).

Adolescents' continued usage of the internet has resulted in an increase in addiction and other compulsive disorders, including but not limited to continuous theft, gambling, betting, and internet networking (Young, 2017), all in order to get money resources for internet gaming subscriptions. Digital technology has a detrimental influence on children and teenagers in a number of ways, including reduced real-life interactions; disdain for self-care; sleep deprivation; poor nutrition; lower school and work performance; low self-esteem; loneliness; increased aggressiveness and hostility (Bass, 2015; Kuss, 2013). It was obvious that teenagers played more often over the week (i.e., an inverse association between age and frequency of gaming), but adults played longer in a single gaming session (Hussain, Griffiths, & Baguley, 2012; Li & Wang, 2013). Long periods of sitting with little or no breaks raise the risk of muscular tension and postural problems, which can contribute to persistent back and joint discomfort (Young, 2009). According to research, impulsivity, in combination with other maladaptive personality traits (Schimmenti et al., 2019), is a major risk factor for developing internet gaming addiction (Blinka, kaupová, &Mitterova, 2016; Ryu et al., 2018; González-Bueso et al., 2020). Positive affective associations (Hu, Zhen, Yu, Zhang, & Zhang, 2017), self-control (Safarina&Halimah, 2019), social motivation (Blinka &Mikuska, 2014), loneliness (Tras, 2019), and social media usage are additional psychopathological elements that some research have found to be predictors of internet gaming addiction (Savci, Akat, Ercengiz, Griffiths, & Aysan, 2020). Social anxiety (Leo, Kewitz, Wartberg, & Lindenberg, 2021; Musetti, Terrone, & Schimmenti, 2018), a dysfunctional parent-adolescent relationship (Wang et al., 2018), a lack of social support (Mazzoni, Baiocco, Cannata, & Dimas, 2016), and difficulty with emotion regulation (Tokunaga, 2015) were not exceptions. Higher levels of sensation seeking have also been connected to internet gaming addiction (e.g., Lin & Tsai, 2002; Mehroof& Griffiths, 2010), which is significantly correlated with impulsivity and has several commonalities, such as disinhibition (Steinberg, Albert, Cauffman, Banich et al., 2008).

ADDICTION TO INTERNET GAMING AND IMPULSIVITY

Meanwhile, impulsivity is defined as the proclivity to act with little or no thought, without contemplation or consideration of the consequences. Existing research clearly shows a relationship between impulsivity and internet gaming, with the bulk of studies concentrating on early adulthood and college or university populations (Safarina&Halimah, 2019). According to some of this research, the more impulsive a person gets, the more likely he or she may become addicted to gaming (Choi et al., 2014). Higher impulsivity was revealed to be a risk factor for becoming a pathological gamer in a longitudinal study done by Gentile, Choo, Liau, Sim, et al. (2011). According to LiLiau, Neo, Gentile, Choo, et al. (2015), gaming addiction is connected with impulsivity and poor self-regulation.

According to Dong and Potenza's (2014) cognitive behavioral model of addiction, seeking immediate gratification despite long-term negative

consequences is central to Internet Gaming Addiction (IGA). The decision-making style is thought to interact with motivation-seeking (craving), which includes the desire to experience pleasure as well as the desire to reduce negative affective states. There is evidence that those who have IGA have poorer inhibitory control (Argyriou, Davison & Lee, 2017). Based on a cognitive behavioral model of addiction, it is easy to comprehend how people's impulsive behavior to engage in immediate reward activities such as gaming, despite the negative consequences, leads to their addiction to internet gaming. As a result, the researchers in this study felt it was important to explore deeper using these variables in order to determine how much of the attentional, motor, and planning element aspects of impulsivity in gamers are uniquely explained by their young age. On the other hand, literature has demonstrated that loneliness is a significant issue to consider when examining characteristics of Internet addiction (Song, Zmyslinski-Seelig, Kim, Drent& Victor, 2014; Demir&Kutlu, 2016). Even while some studies have found a relationship between loneliness and internet gaming addiction (Tray, 2019), there are also opposing findings (Boylu, Gunay, & Erdoy, 2019), and this may call for more research in this area.

LONELINESS AND INTERNET GAMING ADDICTION.

However, loneliness is a subjective psychological sensation that arises when a person sees a gap between desired and actual levels of communication and a lack of meaningful interpersonal relationships. (Ditommaso, Brannen-Mcnulty, Ross, and Burgess, 2003). It is also an uneasy sensation of being different from others, which leads to a range of behavioral disorders such as

melancholy, rage, despair, and withdrawal (Salehi& Saleyf, 2012). Loneliness is a psychological state induced by a lack of both qualitative and quantitative social connections. A person feels lonely when he or she does not experience enough closeness or excitement in his or her interactions, regardless of age.

People get addicted to gaming, according to Griffiths' (2005) component theory of addiction, because they first make gaming so essential in their lives that it becomes a primary factor in whether they are happy, depressed, or even lonely. If this behavior (gaming) is the source of the person's bad mood, he or she should deal with it. In that case, the individuals involved will almost certainly increase the number of hours they engage in this gaming activity to avoid the negative feelings they experience when they stop playing, and they will also continue to increase the duration of their gaming activity to experience more positive feelings, if that is what they get from playing this game. Perhaps as a result of this, the individual will become entirely addicted to gaming activities. Based on earlier study, the researchers came to the conclusion that loneliness contributes to Internet gaming addiction because lonely people feel compelled to partake in online social activities that offer them with the sense of community, camaraderie, and communication they are lacking. It is intended that students would choose and utilize the internet to distract themselves from genuine issues and emotions of boredom, helplessness, worry, and sadness.

THE CURRENT STUDY

In one way or another, most research has looked at the link between the factors of interest in this study. Existing research has discovered a substantial and positive link between teenage online gaming addictions and other characteristics such as sensation seeking and pleasant emotional associations with online games (Hu, Zhen, Yu, Zhang, & Zhang, 2017). In the literature, loneliness and internet gaming addiction have also been related (Boylu, Gunay, &Klc, 2019). It also shows that several of these studies had contradicting results, demonstrating no or a modestly negative association between IGA, impulsivity, and loneliness (Elona Hasmujaj, 2016). Based on previous research, most studies on impulsivity, loneliness, and online gaming disorders or addiction were done in Asian contexts, with the remainder conducted in European nations and/or the United States (Salvarli, & Griffiths, 2019). According to research, the majority of studies on computer gaming addiction that have been undertaken to date have focused on male participants rather than females and instead of using clinical samples, use adult samples, student samples, or general population samples. (Salvarli, & Griffiths, 2019). Thus, researchers wish to investigate the association between these variables and internet gaming addiction with the hope of contributing to the existing literature on internet gaming addiction with a diverse sample from diverse cultural, religious, and orientation backgrounds such as Nigeria to enhance external validity and generalizability of the findings. We are convinced that, aside from students from government or private secondary schools, students in missionary secondary schools also fit into this category. There is likelihood that factors such as belief systems of the individuals involved, religious affiliation, level of spirituality, values, ethics, and

cultural context could also be major contributors (Odo et al., 2021). They believe that their widely collectivist practices, religious belief systems and practices, cultural values and norms, and acceptable gender roles were all strongly considered to be a part of their existence, which could affect their cognition and behavior. Meanwhile, there could be variations in results as a result of different cultural and religious orientations.

For example, it has been established that African adolescents are considered to be more conservative in terms of exposure than their Western counterparts (Nwufo, Nweze, Ugwoke, Odo, & Chukwuorji, 2021). However, the researchers identified three higher-order factors that they claim reflect the various components of impulsivity, which is consistent with the propositions of Patton, Stanford & Barratt (1995). This includes attentional impulsiveness (the ability to focus on the tasks at hand and cognitive instability), motor impulsiveness (acting on the spur of the moment and perseverance), and non-planning (self-control and cognitive complexity).

According to previous research, it is expected that impulsivity and loneliness will positively predict internet gaming addiction among secondary school students. The study aimed at establishing and identifying the specific components of impulsivity (e.g., attentional factor, motor factor, and planning factor) implicated in internet gaming addiction, rather than impulsivity as a composite score, as was obtained in most studies. See figure 1 for the conceptual model of the predictive relationship between impulsivity and loneliness on internet gaming addiction among missionary secondary school students. The current study also tries to assess if these assumptions hold true in a

modern African setting, where adolescent access to social media technology has not only empowered them, but also placed them on par with their western counterparts in terms of social media exposure.

HYPOTHESES

Using past studies as a guide, the following hypotheses were tested:

H_1: The attention factor of impulsivity will positively predict internet gaming addiction.

H_2: The motor factor of impulsivity will positively predict internet gaming addiction.

H_3: The planning factor of impulsivity will positively predict internet gaming addiction.

H_4: Loneliness will positively predict internet gaming addiction.

2. METHOD

Participants and procedures

Four hundred and fifty students were drawn from two missionary secondary schools in Nsukka, namely; St. Catherine's College Nsukka (n = 258)and Anglican Grammar School (n = 192), and were sampled in the study. A random sampling method was employed in selecting the two schools whose participants were sampled. Using the class register, a systemic random sampling was used to draw the participants for the study. Participants were drawn from senior secondary class one and class two, respectively. Participants sampled in the study were comprised of 192 males and 258 females, aged 14 to 21, with a mean age of (M = 16.20; SD = 1.30). With the permission of both schools' principals, the researchers introduced themselves to the various classes and were assisted by some teachers as research assistants. Prior to that, their parents were notified and their informed consent was obtained,

which they provided in the form of written letters for their children to participate in the study. Only those whose parents provided informed consent for them participated in the study. Participants were also informed that the study was voluntary and that no reward was attached as it was only for academic purposes. After eliciting informed consent from them, they were made to understand that their responses would be highly confidential as they were required to give an honest response. Four hundred and fifty copies of the questionnaire were distributed to the students and to those who agreed to participate individually in their classrooms. The questionnaire was collected immediately after being filled out.

INSTRUMENTS

Data collection was done using three instruments, including the Barratt Impulsitivity Scale (BIS), which was developed by Patton, Stanford, and Barratt (1995). It is a 30-item self-response scale designed to assess a person's level of impulsiveness. The instruments consist of three sub-scales: (a) the attentional facet, (b) the motor facet, and (c) the planningfacet. The attentional facet has eight items on its sub-scale and assesses good attention span, cognitive stability, and the quality of non-impulsivity. The motor facet has eleven items on its sub-scale and it measures the ability to make a quick and yet not impulsive decision. The planning facet also has eleven items on its sub-scale, and it measures the ability to focus on the present decision and not be distracted by the prospects of future profits or an out of proportion fear of past or future losses in an asset. The instrument is rated on a 4-point rating scale format. Examples of items on the scale are; "I do things without thinking", "I act on the spur of the moment". On each item, the respondent

reported how much they act on impulse behaviors. Rarely/Never = 1, Occasionally = 2, Often = 3, to Almost/Always = 4. The following items were revered: 2, 4, 19, 20, 21, 22, 23, 24, 26, 27, 30, 31. Higher scores indicate impulsiveness within the respective dimensions. Patton et al. (1995) recorded a good internal consistency with a Cronbach's alpha of.78 for the three sub-scales. In this study, the reliability coefficient for general impulsivity was.74, and the reliability coefficients for the three dimensions were.69,.61, and.67, respectively. The second scale was the Ucla Loneliness Scale developed by Russell et al. (1980). It is a 20-item scale with a four-point rating scale format, ranging from I often feel this way to I never feel this way. Examples of items on the scale include "I feel completely alone," and "I feel isolated from others." The item scores range from 20 (i.e. low level of loneliness) to 80 (i.e. high level of loneliness), showing that the higher the score, the more the individual experiences loneliness. High internal consistency has been reported with a coefficient alpha of.96 (Kanat, 2019), while in the curse of the research we also obtained a reliability coefficient of.89. The third scale was the gaming addiction scale developed by Leemens, Valkenburg, and

Peter(2009). It is a 7-item scale rated on a 5-point scale format of Never = 1, Rarely = 2, Sometimes = 3, Often = 4 and Very often = 5. Examples of items in the scale include: How often during the last six months did you feel addicted to a video game? How often during the last six months did you have arguments with others about your time spent on games? Lemmens et al. (2009) categorized monothetic gamers (pathological gamers) as those who scored "sometimes" or more on all seven items, whereas polythetic gamers were those who scored "sometimes" or more on at least half of the items (four to six of the seven items) (excessive gaming). In a validation study conducted by the researchers in the current study, we found a reliability coefficient of.71.

DESIGN/STATISTICS

The study adopted a cross-sectional design. The data in the study was analyzed using multiple hierarchical regression analysis in Special Packages for the Social Sciences (SPSS) version 23. The correlation coefficient was also examined in order to evaluate the link between the predictors and the outcome variables.

3. RESULTS

Table 1:Means, Standard Deviations, and Correlations among the Study Variables

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1	Gender	—	—	—								
2	Age	16.15	1.32	-.38[**]	—							

#	Variable	M	SD	1	2	3	4	5	6	7	8
3	Class	1.45	.49	-.19**	-.40**	—					
4	Religion	1.00	.04	-.05	.03	.05	—				
5	Attention Factor	18.74	4.50	.01	.01	-.07	.01	—			
6	Motor Factor	25.11	5.58	-.10*	.13**	.09*	.03	.29**	—		
7	Planning Factor	23.84	5.49	-.17**	.18**	-.01	.01	.09*	.15**	—	
8	Loneliness	29.04	11.88	.03	.06	.05	.02	.15**	.15**	.24**	—
9	Int. Gaming addiction	19.86	6.77	-.04	.06	-.00	-.01	.25**	.24**	.10*	.10*

Note: $N = 450$, $^* = p < .05$ (two-tailed), $^{**} = p \leq .01$ (two-tailed). $p=$ *Probability level* , M= Mean, SD= Standard deviation, Gender was coded 1 = male, 2 = female; class was coded 1 = SS1, 2 = SS2; age was coded in ranges, such that higher scores represent older age. Int. Gaming addiction = Internet gaming addiction.

Results in Table 1 indicated that none of the variables added as control (e. g. age gender, class and religion) correlated with internet gaming addiction. Result showed that attention factor ($r = .25$, $p < .01$), motor factor ($r = .24$, $p < .01$) and planning factor ($r = .10$, $p < .05$)dimensions of Impulsivity positively correlated with internet gaming addiction respectively. It was also ascertained that attention factor ($r = .15$, $p < .01$), motor factor ($r = .15$, $p < .01$) and planning factor ($r = .24$, $p < .01$) positively correlated with internet gaming addiction, indicating that there is relationship that exist between them. Loneliness was also found to be positively correlated with internet gaming addiction ($r = .10$, $p < .05$).

Table 2: *Hierarchical multiple regression for predictors of internet gaming addiction*

Variable	Step 1 β	Step 2 β
Predictors		
Attention Factor	.19**	3.89**
Motor Factor	.17**	3.61**
Planning Factor	.04	.76
Loneliness		.90
Adjusted R^2	.08	.08
ΔR^2	.31	.32
ΔF	15.43**	.82

Note: * = $p \leq .05$, ** = $p < .01$. β = Standardized regression coefficient; p= *Probability level;* ΔR^2 Adjusted R square: ΔF =F square change.

The results of the hierarchical multiple regressions in Table 2 indicated that attention, motor and planning factors of impulsiveness in Step 1 of the equation as predictors, contributed to 8% variance in internet gaming addiction. It was also indicted that attention ($\beta = .19$, $p <.01$) and motor factors ($\beta = .17$, $p <.01$) of impulsiveness significantly predicted internet gaming addiction whereas the planning factor did not. Addition of loneliness in Step 2 of the equation as predictor contributed additional 8% variance in internet gaming addiction, over and above that of the previously entered variables, although loneliness did not predict internet gaming addiction ($\beta = .90$, $p > .05$).

4. DISCUSSION

The current study looked at the impact of impulsivity and loneliness on internet gaming addiction in missionary secondary school students. Literature today demonstrates that excessive Internet use is common, particularly among adolescents and young people. (Boursier& Manna, 2018). However, we discovered that impulsivity (the motor and attention facets) significantly predicted internet gaming addiction while the planning facet did not. Meanwhile, the present findings were consistent with those of Ryu et al. (2018), who discovered a positive relationship between impulsivity and internet gaming disorder. Although several studies have found that many factors can contribute to internet gaming addiction, including students' perceptions of the need for satisfaction and the need for frustration at school, Buzzai, Filippello, Costa, Amato, and Sorrenti 2021). Likewise, teachers' autonomy support has also been established as an important predictor of adolescent problematic online game use, whereby basic psychological needs satisfaction and school engagement could act as boundary conditions in such an association (Yu, Li, & Zhang, 2015). Tan (2019), noted that students' becoming addicted to the internet could be as a result of academic stress due to other expectations and self-expectations. It happens that altered neurobiological structures and power of

addiction in impulsive participants may explain some of the relationships between impulsivity and internet gaming addiction (Salvarli & Griffiths, 2019), probably because they are typically more exposed to risky and addictive behaviors due to their active psychosocial and personality development (Stavropoulos et al., 2018). Nowadays, young people's major concerns seem to be focused on how to make it big or engage in online activities to the extremes without due consideration of the consequences attached. Because of the power of addiction, they are frequently incapable of breaking free from the habit because it has become an integral part of their existence.

On the other hand, loneliness did not predict internet gaming addiction among the sample participants. However, the present finding supported the findings of Boylu, Gunay, and Ersoy (2019), which established a negative relationship between students' loneliness and the amount of time they spend on the internet. Previous research has found a link between loneliness and excessive internet use, internet abuse, and addiction. It has been established in literature that lonely individuals are drawn to some forms of interactive activities online because of the possibilities of connectedness, companionship, and community they offer (Morahan-Martin, 1999; Nowland, Necka, & Cioppo, 2018). It can be seen in

this study that it is not all the time people seem to be lonely that they are liable to be addicted to internet gaming. In this case, there might be other underlying mechanisms that may be implicated for loneliness not predicting internet gaming addiction that are yet to be uncovered. For instance, most studies seem to focus on negative affective states without considering the individual's ability to regulate such states (Spada, Nikevi, Moneta & Wells, 2008). It seems that people may use the Internet to escape reality and exert more control over unfavorable thoughts and feelings compared to real-life settings when other, more flexible emotional regulation tools are not accessible. (Casale, Caplan, & Fioravanti, 2016). Emotion regulation and school orientation appear to be taken into account in this regard. Despite being lonely, students' ability to manage their emotions and cognitive thoughts may likely be a major factor that prevents them from becoming addicted, especially when they devote their time to reading their books or practicing other devotions such as prayer and meditation. Being a missionary school where they are constantly influenced to practice positive behaviors could also be a factor.

Summary

There are several restrictions on this study that must be addressed. The study's design might make it more difficult to formally test for causal effects. The complexity of the association between feelings of loneliness, impulsivity, and internet gaming addiction was only partially addressed. The sample size is small, and likewise, the research was based solely on data collected from two missionary secondary schools in Nsukka, Enugu, Nigeria. On the other hand, participants were only drawn from one out of the six geopolitical zones in Nigeria, with different ethnic backgrounds and cultures, which may likely limit the generalizability of results. When compared to other secondary schools in Nigeria, the result should be viewed with caution and consideration, taking into account school orientation and cultural differences. Further research should endeavor to increase the population size in order to achieve a more profound generalization of findings. Efforts should be made to include, compare, and contrast other variables such as school locality and ownership (for example, private, federal, and state schools), as this would allow the researcher to arrive at a more holistic result and provide a more meaningful analysis. There are several restrictions on this study that must be addressed. The study's design might make it more difficult to formally test for causal effects. The complexity of the association between feelings of loneliness, impulsivity, and internet gaming addiction was only partially addressed. Research are required to examine the moderating and mediating effects of associated factors, such as emotion control, on impulsivity, loneliness, and other traits and Internet gaming addiction, especially among adolescents and not only among young adults. Also, longitudinal design should be employed instead of cross-sectional design because it would be more effective. Based on the findings of this study, it can be inferred that Internet gaming addiction can predispose people to cravings and tolerance, as well as make them less sensitive to natural rewards like food and sex. Internet gaming addiction has been established in the literature as a significant predictor of poorer academic performance, depression, anxiety, and social phobia (Sim, Gentile, Bricolo, Serpelloni, & Gullamoydeen, 2012). Tripathi (2017) opined that internet gaming addiction can also lead to many personality and psychiatric disorders, including low self-esteem,

impulsivity, poor sleep quality, mood disorders, and suicide.

Conclusion

Given that addictive habits formed during this period are likely to persist into adulthood, the findings of this study may have major consequences for parents, psychologists, school counselors, social workers, educators, and students as well as the general public (Coffey, Carlin, Lynskey, Li, & Patton, 2003). For instance, if a functional parent-adolescent relationship represents the most important source of social support for their adolescent's child, the family-based therapeutic approach might be useful for problematic Internet use or internet gaming addiction prevention. The results might also have important practical implications for implementing health prevention and promotion programs. Internet gaming addiction might be prevented by improving

emotion regulation skills among adolescents and young adults. There is a need for public education to help people understand both the physical and psychological consequences attached to it. There is also a need for the government to incorporate teachings on these into the school curriculum to reduce the negative effects of internet gaming on students drastically.

ETHICS APPROVAL AND INFORMED CONSENT

All procedures followed were under the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. We obtained informed consent from all principals and students of the sampled schools.

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