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## Relationship between Self-Esteem and Internet Addiction: The Moderating Role of Shyness

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### Abstract

*This study explored the relationship between self-esteem and internet addiction, and the indirect effect of shyness or self-doubt on internet addiction. We utilized two-wave design that consisted of 232 undergraduates from southeastern Nigeria with mean age of 20.89 years (SD = 2.75). The participants responded to three instruments – a 20-item Internet Addiction Test, a 25-item Index of Self-esteem scale and a 14-item Revised Cheek-Buss Shyness Scale. The hypotheses were tested using Process Macro. The result of the study supported mediating role of shyness in the relationship between self-esteem and internet addiction. Our finding suggests that self-esteem activated by shyness increases internet addiction. Identifying students who have low self-esteem and helping them handle the discomfort they experience as a result of being shy would reduce the reliance on the internet to connect with the real world.*

**Keywords:** *Self-esteem, Internet usage, Undergraduates, shyness, addiction*

### Introduction

Revolution witnessed greatly in the area of information technology has made the world more of a global village. Rapid development and innovations in technology made this possible. One technological innovation that has not only aided easy communication but has also revolutionized peoples' lives is the internet (Qadri, Esmaili & Ahmad, 2014). Internet is a global system of interconnected computer networks that use the internet protocol suite to link devices worldwide. Internet is frequently used for on-line purchases, data collection, chatting, communication, academic research, entertainment and other exchange of information (Ogbomo, 2016; Bahrainian, Alizadeh, Raeisoon, Gorji, & Khazae, 2014). This means that internet serves a wide range of people in different profession including students. It helps the students in areas of research, assignments and other academic exercises. Although internet offers many advantages by facilitating easy access to information, its improper or excessive use can produce negative consequences (Odaci & Celik, 2013). The excessive use of the internet in uncontrolled manners is what scholars referred to as internet addiction (Young & Abreu, 2011; Young, 2004).

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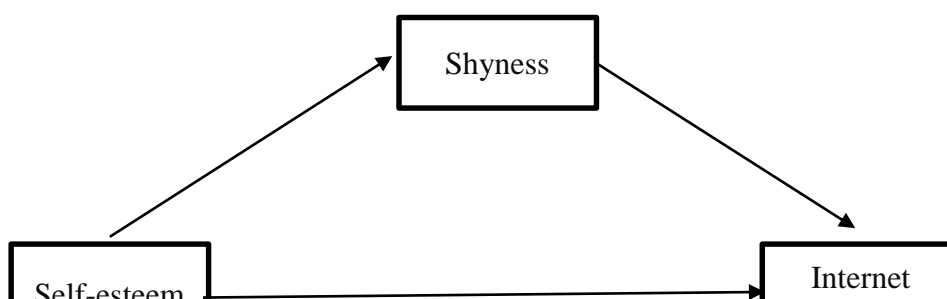
For researcher Hartney (2019) internet addiction is a behavioral addiction in which a person becomes dependent on use of the internet, or other online devices, as a maladaptive way of coping with life stress. It is an uncontrollable desire to use the internet, the devaluation of time spent without connecting to the internet, intense nervousness and aggression in the event of deprivation, and progressive deterioration of social and family life (Young, 2004). Researchers have also revealed that internet addiction is a psychosocial disorder, the features of which include lack of patience, symptoms of isolation and emotional disorder and interruption of social relationship (Aydin & Sari, 2011; Mossbarger, 2008 Young & Case, 2004).

Excessive internet use is more evident among young people (Mossbarger, 2008) who turn to the internet as a means of exploring the world and identity identification. They do this without regard to possible psychological and behavioural consequences it might have on them. Such consequences include the emergency of possible behavioural alterations, loss of control, school failure, social isolation and increase in family conflict (Holzt & Appel, 2011). Most scholars have associated young peoples' beliefs and perception about themselves and the degree at which they use the internet (Bozoglan, Demirer & Sahin, 2013; Aydin & Sari, 2011; Kim & Davis, 2009; Sheeks & Birchmeier, 2007).

Excessive Internet use is seen in different cultures (Cao & Su, 2007) and it is stated that adolescents group is at highest risk (Mossbarger, 2008; Yen, Yen, Chen, Chen & Ko, 2008). Adolescents' beliefs and perceptions about themselves reflect in their behaviour characteristics when using the Internet, and this closely associated with their self-esteem levels. Self-esteem means what an individual think about himself or as put by Burger, it's about how an individual evaluate her/his self-concept (Burger, 2006). The symptomatic characteristics of internet addiction indicate a likely relationship between it and self-esteem. For example, studies by Greenberg, Lewis and Dodd (1999); Sobell (2007) have revealed the relationship between internet addiction and self-esteem levels. Studies have also revealed that adolescents tend to appear different from what they are when expressing themselves in dating sites, social networking sites and gaming sites (Madell & Muncer, 2006; Ross, Orr, Sisic, Arseneault, Simmering, & Orr, 2009; Sheeks & Birchmeier, 2006; Voluse, Körkel & Sobell, 2007). Notably, previous studies relating self-esteem and internet addiction have shown that self-esteem alone may not trigger internet addiction but the relationship may be mediated by variables such as shyness. Hence, it is believed that individuals' self-esteem level is transmitted through shyness to determine internet addiction.

## Mediating role of Shyness

Shyness is the propensity of being dissatisfied, awkward with oneself in the presence of others and restraint self from normal social behaviours because of the anxiety of meeting people or their impression of oneself, and the avoidance of feeling embarrassed in interpersonal situations (Lemyre, Gauthier-Legare & Belanger, 2018; Buss, 1980; Henderson & Zimbardo, 1998). As an extremely self-conscious behaviour, shyness influences one's thoughts, feelings, and perception of the world around (Saunders & Chester, 2008). It may lead to social ineptitude and even overall reticence in variety of circumstances. Researchers have suggested that shyness as a prevalent feeling affecting a wide range of individuals may have serious psychological effects and may decrease well-being (Chen, Li, Wang, Li & Gao, 2018; Liu, Cheng, Hsu, Liu & Yu, 2018). For instance, Zhao, Tan, Gao and Wang (2019) in an extant study found that shy people's incorrect evaluation of themselves leads to low social interaction and eventually receive less social support than their peers. The finding of Findlay et al. (2009) indicated that shyness was also correlated with social anxiety, positive effect and negative effect; and in a very nascent study associated with pathological internet use (Gao, Guo, Tian, Si & Wang, 2018; Huan, Ang, Chong & Chye, 2014). The implication is that as shy people engage in excessive unhealthy behaviours, the relationship between self-esteem and internet addiction cannot be described as linear but with shyness playing mediating role. This is so because most people who have low self-esteem are shy, hence they indulge in excessive internet use as an escape from physical relationships. Gao, Guo, Tian, Si, & Wang (2018) indicated that Shyness predicted internet addiction through self-esteem. Following this, the present study is of the view that in the presence of shyness, individuals of low self-esteem are most likely to engage in internet addiction.



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*Figure 1: conceptual framework of the mediating role of shyness on the relationship between self-esteem and internet addiction.*

### **Hypotheses**

The following hypotheses were tested:

1. Self-esteem will significantly predict internet addition among university undergraduates.
2. Shyness will significantly predict internet addition among university undergraduates.
3. Shyness will significantly mediate the relationship between self-esteem and internet addiction.

### **Method**

#### **Participants**

The participants of the study were two hundred and thirty-two (232) undergraduate students drawn from 3 universities in South East Nigeria., namely University of Nigeria, Nsukka (UNN), EnuguState University of Science and Technology (ESUT) and Ebonyi State University (EBSU). Participants' ages ranged between 16 and 35 years with mean age of 20.89 (SD =2.75). Participants comprised 109 males (46.98%) and 123 females (53.02%). Information on age and gender were obtained and were controlled for because they are related to internet addiction (e.g., Dufour, 2016).

#### **Instruments**

Three instruments were used in this study. They are: Internet Addiction Test (IAT) (Young 1998), Index of Self-esteem (ISE) (Hudson, 1982), and Revised Cheek-Buss Shyness Scale (RCBS) (Crozier, 2005).

### *Internet Addiction Test (IAT) (Young 1998)*

The 20-item IAT questionnaire developed by Young (1998) measures characteristics and behaviours associated with compulsive use of the Internet that include compulsivity, escapism, and dependency. Questions also assess problems related to personal, occupational, and social functioning stemming from Internet use. Participants respond to each statement with a number between 1 and 5, representing a Likert scale continuum, indicating the extent to which they endorse that particular behavior. The scale was created by adapting DSM-IV criteria for pathological gambling to pertain to Internet use and is a modification of the earlier 8-item scale, Young's Internet Addiction Diagnostic Questionnaire (IADQ). For the adopted scale, reliability coefficient Cronbach alpha was calculated as 0.90 and Spearman Brown value was calculated as 0.86. Exploratory factor analysis was used to confirm the construct validity; and confirmatory factor analysis used to determine whether the factor model was correct. As a result of this analysis, it was determined that 20 items were grouped under 4 factors. Cronbach  $\alpha$ , internal consistency coefficient for the first factor was 0.91; second factor was 0.87; third factor was 0.89; fourth factor was 0.90; and for the whole scale was 0.90. Spearman Brown value for the scale was 0.86. Guttman Split-Half value for the scale was 0.85. These calculated coefficients were all in the acceptable range, and these suggested that the test and each factor had internal reliability. Validity and reliability analysis were reviewed about the adoption of Internet Addiction Test and it was concluded that the results that were found was in the acceptable ranges.

### *Index of Self-esteem (ISE) (Hudson, 1982)*

This is a standardized psychological assessment instrument developed by Hudson (1982) and validated for use with Nigerian samples by Onighaiye (1996). The instrument contains 25 items designed to measure the self-perceived and evaluation component of self-concept, which is the sum total of self-perceived views of the self-held by a person. The scoring key ranges from "rarely" (1) to "most times" (5). Items 1, 2, 8, 9, 10, 11, 12, 13, 16, 17, 19, 20, 24, are scored direct, while items 3, 4, 5, 6, 7, 14, 15, 18, 21, 22, 23, 25 are scored in a reverse order. The ISE has been used in both clinical practice and research with Nigerian samples and has been shown to be a reliable and valid instrument. Hudson (1982) reported a coefficient alpha of .93 and a two-hour test-retest coefficient of .92. Onighaiye (1996) reported concurrent validity of .46 by correlating ISE with the Interpersonal Sensitivity Scale of the SCL-90 (Derogatis, Lipman, & Covi, 1972). In addition, Onighaiye obtained concurrent validity of .38 by correlating ISE with the Depression Scale of the SCL-90.

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### *Revised Cheek-Buss Shyness Scale (RCBS) (Crozier, 2005)*

The original scale (Cheek & Buss, 1981) comprised 9 items and four revisions have been produced, with 11, 13, 14 and 20 items, respectively. Despite the existence of alternative measures of shyness, for example, the Social Reticence Scale (Jones, Briggs & Smith, 1986) and the interaction Anxiousness scale (Leary, 1983), the scale has become the most widely utilized measure. The 14 item RCBS was produced by Crozier (2005). His paper reviewed previous studies of the scales reliability and presents a fresh item analysis of the 14-item version (hereafter called the Revised Cheek–Buss Shyness scale, or RCBS, in line with recent practice in the literature). It also investigated gender differences in responses to the scale, as there has been inconsistent evidence of gender differences in shyness (Leary, 1983), with men scoring somewhat higher on the RCBS in one study (Cheek & Melchior, 1990) and lower in another study (Marcone & Nigro, 2001). Participants respond to each statement with a number between 1 and 5, representing a 5 point Likert scale continuum, indicating the extent to which it is characteristic of their feelings and behaviour. Item-total scale correlations ranged from 0.31 to 0.67 and four of the five lowest correlations were associated with the items with reversed scoring. Coefficient alpha for the Scale was 0.86. Inter-item correlations ranged from 0.09 to 0.58, with a mean of 0.30 (standard deviation = 0.11). The observed range of total scores, 14–70, corresponds to the minimum and maximum possible scores. T-tests showed that only two items differed significantly in mean scores, with females obtaining higher mean scores in each case. For item 8 (I feel nervous when speaking to someone in authority), mean (SD) males = 2.56 (1.16), females = 2.92 (1.07),  $t = 3.76$ , d.f. = 316.62,  $P < 0.001$ . For item 14 (During conversations with new acquaintances, I worry about saying something foolish) mean (SD) for males = 2.55 (1.21), females = 2.92 (1.12),  $t = 3.67$ , d.f. = 318.99,  $P < 0.00$ . Item analysis shows that the RCBS has sound psychometric properties and that all 14 items contribute effectively to the scale.

## **Procedure**

Participants were approached at the university cafeterias of the schools selected for the study. A cordial relationship was created with participants before administering the questionnaire to participants that volunteered to participate in the study. Participants were given necessary information they needed to know about the questionnaire, the research and the researchers, and to guide them on the proper way of responding to the items. The essence of this was to help reduce abnormalities in filling the data. Participants were also informed that their responses will be treated with utmost confidentiality; and that participation in the study

was voluntary. This is to avoid violation of ethical principle which recommends that participation in research should be voluntary without force or coercion to participants. Those who volunteered equally gave out their emails or phone numbers for the second-wave follow-up. Afterwards, a total number of 240 copies of questionnaires were distributed to the participants in the 3 universities and for the online participants. The questionnaires were distributed to the participants within two-week interval. Returned questionnaires were properly cross-checked in order to ensure they are properly filled and that no item is left un-responded to. At the end of data collection, two hundred and thirty-two (232) questionnaires were properly filled and returned while eight (8) copies were not returned. The 232 returned data were used for the data analysis. Participants were debriefed, and thanked for contributing to knowledge.

### Design/Statistics

The study employed two-wave longitudinal design. To test the hypotheses and the overall mediation model shown above, a mediation following Hayes (2009) was conducted controlling for age and gender. Figure 2 depicts the partial chains within the model.

### Results

The study made use of hierarchical multiple regression analysis statistics. Based on the analysis, the following findings were made.

**Table 1: Descriptive Statistics and Zero Order Correlation**

Variable	M	SD	1	2	3	4	5
1 Internet addiction	49.48	13.23	1				
2 Gender			-.22*	1			
3 Age	20.89	2.75	-.13	.01	1		
4 Self-esteem	60.29	12.73	.21*	.01	.05	1	
5 Shyness	40.32	6.30	.33*	.02	-.10	.18*	1

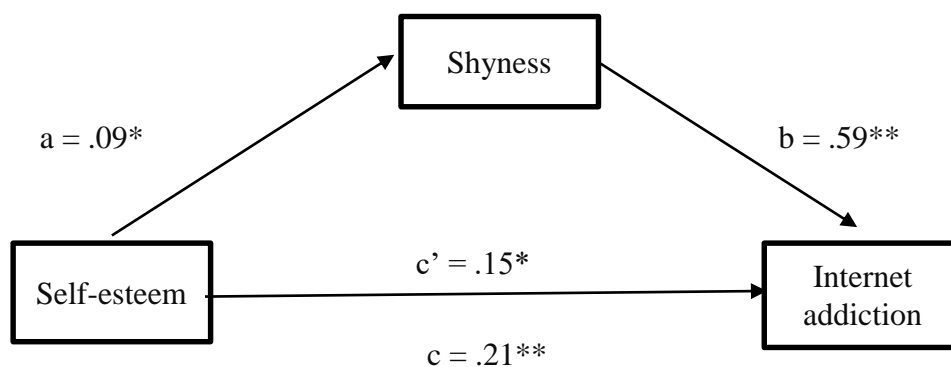
Notes: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ;  $N = 232$  Gender (0 = Male, 1 = Female)

From the table, participants had the mean score of 49.48 and standard deviation of 13.23 on internet addiction. On self-esteem, the participants had the mean score of 60.29 and standard deviation of 12.73; And for shyness, the participants had the mean score of 40.32 and standard deviation of 6.30. The table also showed that gender had a significant relationship with Internet addiction, and that males were more addicted to internet than the females ( $r = -.22$ ,  $p < .05$ )



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Age had no significant relationship with internet addiction. Self-esteem had a significant relationship with internet addiction ( $r = .21, p = .05$ ). From the scoring, high scores above 30 indicates low self-esteem and scores below 30 indicates normal and high self-esteem. This, therefore means that people who scored higher than 30 in the test, had low self-esteem and a large number of the participant scored above 30, therefore, have low self-esteem. From the result, those with low self-esteem were shown to have higher internet addiction. Shyness had a significant relationship with internet addiction ( $r = .32, p = .05$ ). This showed that those who indicated high level of shyness experienced higher internet addiction.



**Figure 2: the mediating effect of shyness in the relationship between self-esteem and internet addiction.**

Note: \*  $p < .05$ , \*\*  $p < .001$ ; All presented effects are unstandardized;  $a$  is effect of self-esteem on shyness;  $b$  is effect of shyness on internet addiction;  $c'$  is direct effect of self-esteem on internet addiction;  $c$  is total effect of self-esteem on internet addiction.

Results from a simple mediation analysis indicated that self-esteem is indirectly related to internet addiction through its relationship with shyness. As can be seen in Figure 2, participants with low self-esteem reported high shyness ( $a = .09, p = .012$ ), and high shyness was subsequently related to higher internet addiction ( $b = .59, p = .001$ ). A 95% bias-corrected confidence interval based on 10,000 bootstrap samples indicated that the indirect effect ( $ab = 0.053$ ) was entirely above zero ( $CI = .014$  to  $.101$ ). However, students reported lesser internet addiction after taking into account self-esteem indirect effect through shyness ( $c' = 0.15, p = .028$ ).

## Discussion

The study aimed at investigating whether self-esteem is a predictor of Internet addiction. The findings indicate that self-esteem predicts internet addiction among university undergraduates. The result explains that low self-esteem has an influence on internet addiction and a large number of undergraduate students who participated suffered low self-esteem resulting to internet addiction among them. The finding implies that people who have low self-esteem engage in internet addiction more than those with moderate self-esteem. The findings of this study are consistent with Self-determination theory of Deci and Ryan (1985). The theory explained that people engage in internet addiction as a need to enhance their self-worth or their self-esteem. People who see the need to enhance their self-esteem do that because they feel they are not good enough and that they do not meet up to the standard of others. In order, to upgrade their societal standards, they engage in frequent use of the internet. According to the theory, some others engage in internet use to gain some reward or avoid some negative contingency. People who have low self-esteem look down on themselves and most times, feel like they have no place in the society. According to Leung (2003), the internet offers an alternative for people to gratify their social and emotional needs, which might be unmet in their traditional offline networks (Leung, 2003). In order to gain the gratification they desire they choose the internet in place of the physical society. This result is consistent with the earlier research work of Bahrainian and Khazae (2014) who found significant positive relationships between Facebook addiction and low self-esteem.

Shyness was also found to have predicted internet addiction among university undergraduates. This may be because shy individuals often desperately want to connect with others, but don't know how or cannot tolerate the anxiety that comes with human interaction and then turn to social networks as an alternative means of satisfying their social and emotional desires. People who are shy have difficulties in relating with their immediate environment. Shy individuals prefer social interaction in text-based virtual environments online than in their offline lives and, as a result, are unable to develop a range of physical relationships. We all know that the internet does not detect a shy person therefore, it is a more conducive and reliable place for shy people. The findings can also be explained using sociometer theory (Leary, 1990) which emphasizes the degree to which individuals regard his/herself in relationship with others. Those who feel shy to approach or be approached by others seem to satisfy their social emotion through social network where there is less physical contact with the other person. The relationship between shyness and internet addiction is also evident in the earlier studies by Baker and Oswald (2010), Huan, Ang, Chong and Chye (2014); Chen, Liang, Wang, Li and Goa (2018) and Setter, Baldwin, Zava, Baungartner and Coplan (2019). These studies

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established strong relationship between shyness and internet addiction. Hence, self-esteem and shyness are good predictors of internet addiction among undergraduate students.

The third hypothesis that shyness will mediate the relationship between self-esteem and internet addiction was confirmed. Shyness significantly mediated the relationship between self-esteem and internet addiction. A further confirmation that shyness is the feeling of discomfort and discontent in social relations (Zee & Roorda, 2018; Asendorpf, 2000; Cheek & Buss, 1981; Saunders & Chester, 2008), fueling the feeling of low self-esteem. These collective feelings manifest in hiding behind the internet where people engage in all sorts of behaviors without having physical contact with others and consequently resulting in addiction.

## **Practical Implication of the Findings**

The study has some practical implications for the society. Self-esteem predicted internet addiction among university undergraduates, with emphasis that undergraduates with low self-esteem were shown to have higher internet addiction. This implies that undergraduates who have poor self-evaluation of themselves, cannot confidently express themselves or relate with peers or opposite sex resort to internet as a hiding place, where they can freely relate and express themselves. Instead of been bold to face challenges, they take revenge by getting addicted to internet. Hence, they can be victims of internet bullying, as they lack morale to relay their fears and actions with other people. It may also make them to engage in suicidal ideation if the internet they resort to is no longer friendly to them, and expression of self-worth can't be achieved again.

Undergraduates who are dissatisfied with self, awkward with oneself in the presence of others and restraint self from normal social behaviours or their impression of oneself, and the avoid feeling embarrassed in physical interpersonal situations found internet as safe place to do all the opposites for themselves. For example, they can easily post pictures online, talk to people online, and say their minds or relate freely with opposite sex online and perceive themselves with high self-worth. They rather express their mind on internet than do it physical, hence addiction.

For undergraduates who have poor self-evaluation of themselves in the presence of self-dissatisfaction and feeling of embarrassment in physical interpersonal situations, everything is better done via internet where they are confident. They would easily prefer activities such as dating, sexual discussions, meetings of peers, etc., done through internet where they can confidently relate or participate. They see internet as a way of making up for their lack, thereby becoming highly prone to internet addiction.

### **Limitations and suggestions for further research**

Some shortcomings are of concern in the current study and should guide future research. First, we adopted self-report measures only with its associated dangers of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Usually, this has the possibility of artificially inflating scores of examined constructs. But correlations among the assessed constructs and the estimates are not so high as to expect that this is a serious threat in the present result. Second, the current study focused on students in the southeastern part of Nigeria. These raise questions on the generalizability of our results to wider students' population. Future studies may consider using more diverse student population to broaden the inference of results generated, which also increases its appeal of wider spectrum of audience. The study recommends steady and series of workshops on internet, its advantages and disadvantages on the part of students, society and quality life in our educational or youth related institutions to help minimize the exacerbation of addiction related societal challenges especially among young people. Undergraduates or young people should be enlightened that internet may make or mar their lives; that getting addicted with internet does not replace counseling or therapy that can solve their problems when they perceive themselves as having low self-esteem.

### **Conclusion**

There is an overwhelming empirical support that internet addiction is on the increase, and that self-esteem predicts internet addiction, with the present study adding a novel idea about its indirect relationship with shyness. Students with low self-esteem may have higher internet addiction, while the indirect effect of shyness makes it worse. The finding which could be described as nascent calls for a proactive intervention to help students understand factors that lead to their shyness and low self-esteem, consequences, and ways of improving on them which could have a positive reverse effect on their internet addiction.

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