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ADDICTION TOWARDS INTERNET: EMPIRICAL EVIDENCE IN HIGH SCHOOL STUDENTS: A PARAMETRIC ANALYSIS

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Abstract
The aim of the study is to evaluate the behavior of high school students regarding the use of the internet, to determine if there is an underlying structure of variables that explain the existence of some addiction features towards the internet. The key informant was a high-school student enrolled in the institution CBTI and the extracted sample is non-probabilistic type. Two-hundred and three students between 14 and 18 years old were surveyed. To get data, the Internet Addiction Test (IAT) of Young (1997) was used. For measurement data, exploratory factor analysis with component extraction was used. The findings showed a large percentage of students are not in the range of internet addiction. The most important contribution identified was that the scale obtained six factors, which allows seeing ambiguity in the use of factorial techniques for its measurement.

Keywords: Internet; addiction; network users

Introduction

Statement of the phenomenon under study

Three decades ago, the emergence of the internet and its later evolution brought great advances in practically every field (Delgado, 2019). The numerous benefits have been impressive but it has also brought disorders among people.

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This study aims to prove how internet addiction has become present among students, impairing their academic performance. Initially, the invention of the telephone, radio, telegraph and the computer, establish the bases to integrate informatics and communications to a new worldwide broadcasting tool, according to Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts, and Wolff (1997).

Internet has become one of the most successful human inventions and alongside it; a permanent commitment has been consolidated in the field of research and information development. In fact, the scientific community has found a quick and effective manner to divulge knowledge and all kind of information to benefit users. At the same time, computers have emerged, allowing an open platform for the universal and above all, reliable interchange of all sorts of structured documents. In this way, governments, industry, academy and society have come together for the development of this thrilling new technology (Delgado, 2019).

In the face of this success that had been already visualized as a historical and relevant invention due to its applicability, Morahan-Martin (1997) and Morahan-Martin and Schumacher (2000) pointed out that internet could have negative effects on users; particularly this could affect the younger and more vulnerable population, since it is harder for them to control their feelings.

Addiction is an apparent activity that provides pleasure but damages the person, since voluntary or not, he/she acquires an inability to regulate the activity, having a persistent need to participate in it. Denial of the addiction is an interpersonal expression used by the individual as defense against the conflict in his/her mind so that without denial, addiction would not be possible (Johnson, 1993). On this subject, Griffiths (1995) was the first to define technological addictions as those where there is an excessive use of the technology.

Along these lines, the works by Young (1998) are considered as referents in the field of internet addiction. In his study, Young (1998) discovered that 396 students dependent on internet use showed personal, family and occupational problems. Specifically, it was identified that they were not able to control internet use, since they presented difficulties in completing assignments, studying or getting enough sleep to be alert for class the next day, resulting in low grades and even expulsion from school.

In the same manner, Young found that lonely people or those who feel misunderstood may keep virtual relationships in order to have feelings of

wellbeing and comfort. Additionally, people dependent on internet use tend to hide or lie about spending a lot of time online, which causes distrust in the people around them.

On the other hand, Davis (2001) classifies internet addiction as follows. Primary are those computer addictions encompassing online fame, information search for a long time and addiction to keep virtual relationships, while secondary are those impulses to buy online, participate in gambling games, be in the stock market and addiction to porn and virtual sex. In another study carried out by De Gracia et al. (2002), 1664 users answered a questionnaire distributed online. Among the findings, they identified recurring thoughts to keep connected to internet, guilt and anxiety feelings when not online, loss of control, low direct social interaction which caused them to access chat or porn websites and the time dedicated to these websites leads to academic or work related problems.

Definitely this data produce awareness and in a way, justify this study since this behavior has been noticed by teachers among students, raising questions such as: is internet addiction really present among high-school students in Veracruz? Is this behavior different in relation to gender? These questions are posed again after the literature review that follows.

Literature review

Internet origin and evolution

As the variable object of study, the focus will be to discuss the state of the art about the origin, evolution and empiric evidence that has been developed regarding internet and it implications, following a debate about what has been called clinical disorders and arrives to addiction caused by internet among people.

Regarding the emergence of the internet, it happened three decades ago in an attempt to share information, which brought other requirements, such as information storage. This need had to be addressed, which is why at the end of the 1960s the ARPA*net* (Advanced Research Projects Agency) was created by the National Science Foundation, who made the analog network NSF*net* available to the scientific community (Delgado, 2012, 2019).

Later in the 70s, the *Transmission Control Protocol/Internet Protocol* (TCP/IP) appeared for internet services and electronic mail. During the eighties, the developed standards were passed along to the Defense Communication Agency in the Defense Department of the United States, which became its

guardian until they moved to the *Internet Architecture Board* when internet boom was born.

In the late 1980s the number of users grew markedly and from there, its globalization detonated but identifying and located specific information was a difficult task so the possibility of connecting all the worldwide networks was considered, which caused the need to store a great amount of data. Finally, it was Tim Berners-Lee who devised the way to store this data and hence, the Web was created (Delgado, 2019).

Jiménez and Pantoja (2007) refer that it is during the 90s when the impact of the web became evident, which made it one of the best existing proposals regarding connectivity and virtual reality.

Related studies

In the literature review several studies on internet addiction were found. For example the work by Chak and Leung (2004), who used a sample of 722 people online, found that the greater the need to be connected online, the shyer the respondents were, the less faith they have, the firmer belief they hold in the irresistible power of others and the higher trust they place on chance in determining their own course of life. Additionally, they discovered that full-time students are more likely to be addicted to internet because they have free unlimited access and flexible schedules.

On the other hand, Cruzado, Matos and Kendall (2006) carried out a study in 30 patients diagnosed as internet addicts. They found that people who are online for more than six hours a day, most of that time playing online, showed suicidal ideas or attempts, antisocial behavior, irritability, affective disorders. Some had dysfunctional families; others showed lung tuberculosis and low academic performance. This last trait matches the data from Sánchez-Carbonell et al. (2008), as well as some similar traits found by Rial et al. (2015) about family dysfunction and low academic performance.

Regarding excessive online presence, there is a study by Castillo et al. (2008), who applied questionnaires to 392 students, mostly women (73.9%). The findings showed that the surveyed population remains online for an average of 84.81 minutes a week and the distinct traits of those who spend more time connected to the web are related to introversion, avoiding direct social relationships.

Definitely, the use of internet allows people to show themselves as they are, as long as it is from anonymity (Cruzado, Matos, & Kendall, 2006; Jiménez & Pantoja, 2007; Balaguer, 2008; Beranuy et al., 2009; Echeburúa, 2016; Caro & Plaza, 2016), as well as establishing or keeping virtual relationships in a fluid manner, which involves spending more time online than considered (Young, 1998; Luengo, 2004; Sánchez-Carbonell et al., 2008; Balaguer, 2008; Beranuy et al., 2009; Carbonell et al., 2012; Pérez del Río, 2014; Puerta-Cortés & Carbonell, 2014; Araujo, 2016; Caro, 2017; Marín-Cipriano, 2018).

In the review of the state of the art, studies were identified that showed differences between genders, being men the ones who used internet more (Yang, 2001; Muñoz-Rivas, Navarro, & Ortega, 2003; Beranuy et al., 2009; Fargues et al., 2009; Matalinares et al., 2013; Shek & Yu, 2016; Marín-Cipriano, 2018); however, Puerta-Cortés and Carbonell (2014) found the opposite, being women the ones who used internet more as well as using mobile phones to communicate emotions (Mante & Piris, 2002; Ling, 2002; Beranuy et al., 2009; Fargues et al., 2009).

According to Lam-Figueroa et al. (2011), addiction to internet is characterized by the lack of control of its use, which depending on their personal needs, may lead to people showing discomfort, exhaustion or distress. These researchers developed the Lima internet addiction scale (EAIL for its acronym in Spanish), where two dimensions are evaluated: 1. Symptomatological: salience (concern over using internet), tolerance, abstinence as well as lack of control and relapse; 2. Dysfunctional: related to school, family and interpersonal problems.

The EAIL questionnaire was applied to 248 students of an average age of 14 years old, finding that dimension 1 is related to the male gender, regarding weekly use time, background of indiscipline and lack of future plans, while dimension 2 was associated to indiscipline, lack of future plans and school truancy without cause. This proves that both family and social environment can be a factor that affects internet addiction.

Another study by Carbonell et al. (2012) showed that young people addicted to internet have a higher probability of suffering from insomnia, social isolation, anxiety, depression and negative thoughts, while those who used their mobile phones excessively showed depression, anxiety, insomnia, as well as excessive use of alcohol and cigarettes. On the other hand, Berner and Santander (2012) highlight two cases where internet affected people´s health. The first was

a South Korean couple who spent so much time online that they did not feed their daughter, who died of malnutrition. The other was a young Chinese man who died after playing online for seven days straight. Next there are some warning indicators about internet addiction stated by Berner and Santander (2012) in their study:

- Insomnia from being connected to internet excessively.
- Forgetting family, school, work and social events, even hygienic cleaning.
- People who constantly complain about their family member or friend who spends too much time connected to internet.
- Having recurring thoughts of accessing internet or getting upset if they are being kept from connecting online or if the connection is slow.
- There is isolation from the environment.
- They are evasive about the real amount of time they are connected to internet.
- Wanting to reduce the hours on internet and failing.
- Presenting a sensation of wellbeing when they are connected to internet.

In the same line of thinking, Marco and Chóliz (2013) showed that internet addiction appears with the abuse and lack of control when interacting with technology, aggravating the relations kept by the individual with family, society and organization. This creates an emotional maladjustment, disturbs adaptive behavior and manifests in the need to keep using internet, even knowing that this is prejudicial, which reflects a behavior dependent on technology.

Additionally, the correlation between aggression and internet addiction has being studied. Matalinares et al. (2013) discovered that they were related and that men tend to be more aggressive both physically and verbally while women may be wrathful and hostile; therefore, the more aggressive behavior shown by teenagers, the higher the tendency to become addicted to internet.

A research carried out in the Netherlands by Vink et al. (2016), found that men spend more time playing online while women spend more time on social networks. Other investigations match these findings (Muñoz-Rivas, Navarro, & Ortega, 2003; Tsouvelas & Giotakos, 2011; Matalinares et al., 2013; Puerta-Cortés & Carbonell, 2014). The results regarding women were the same in the research carried out by Ling (2002) and the data obtained by Marín-Cipriano (2018); however, they differ from the study by Araujo (2016) where there were significant findings regarding men, who showed a higher level of obsession about staying connected to social networks.

On the other hand, Caro and Plaza (2016) point out that internet addiction is not just the excess of hours spent online, but also interaction with web pages containing violence, information, social interaction, games and pornography, which can have repercussions in the development of people exposed to them. This can affect their behavior and social, family, academic and work relationships; other studies arrived at the same conclusions (Yang, 2001; Wang, 2001; Chak & Leung, 2004; Cruzado, Matos, & Kendall, 2006; Echeburúa, 2010; Li, Garland, & Howard, 2014; Chóliz, Marco, & Chóliz, 2016; Caro, 2017; Marín-Cipriano, 2018; Terán, 2019).

In order to say that a behavior is addictive, Caro (2017) clarifies that it must be an activity considered pleasant by the person. But, the interesting part of the situation is that the individual loses control of the chosen activity, doing it repetitively because in the first stages it is desirable, pleasant (Chóliz, Marco, & Chóliz, 2016), it is enjoyed and it causes tension release. This is when one loses sight of the consequences caused over time to the social environment.

Internet addiction as clinical disorder

In relation to the subject of internet addiction, several studies have defined this concept as a "clinical disorder", which necessarily makes it a problem related to health. These kinds of disorders are added to others present in human beings. An example of this is how in the 90s some phenomenon were reported, like watching television excessively (Kubey & Csikszentmihalyi, 1990; McIlwraith, Jacobvitz, Kubey, & Alexander, 1991), excessive dependence on the use of computer (Shotton, 1991), compulsive sexual activity (Goodman, 1993), addiction to videogames (Keepers, 1990), compulsive gambling (Mobilia, 1993) or eating disorders and psychoactive substances consumption (Lesieur & Blume, 1993).

Moreover, it is possible to add to these addictions the use of drugs and alcohol, which are so detrimental to human beings (Brady, 1996; Murphey, 1996) and technology should not be overlooked either, since it has also caused addictions (Griffiths, 1996).

Internet addiction (IA) has being recognized as a worldwide problem that affects society, possibly due to impulsivity, which is the reason people are vulnerable to addiction (Chambers, Taylor, & Potenza, 2003). Several studies have already reported interesting findings that have brought this phenomenon to the academic field of study, as it is evident with the pioneering work of Young

(1997, 1998), Young and Rodgers (1998), as well as the studies by de Kraut et al. (1998), Ko et al. (2008), Yen, Ko, Yen, Chen, Chung, and Chen (2008), Sánchez-Carbonell, Beranuy, Castellana, Chamarro, and Oberst (2008), Stieger and Burger (2010), Henderson (2011), Carbonell, Fúster, Chamarro, and Oberst (2012), Villafuerte and Mainé (2013).

The internet addiction test designed by Young (1998) has been applied to clinical groups of young people and adults (Kim & Chun, 2005; Liberatoe, Rosario, Colon-De Martí, & Martínez, 2011; Tonioni, D'Alessandris, Lai, Martinelli, Corvino, Vasale et al., 2012), using social media (Jelenchick, Becker, & Moreno, 2012) and e-mail (Aboujaoude, 2010; Korkeila, Kaarlas, Jääskeläinen, Vahlberg, & Taiminen, 2010; Jelenchick, Becker, & Moreno, 2012).

Sometimes, there is a tendency to consider that the word addiction implies the consumption of substances; however, when it concerns the use of technology, addiction entails an activity, specifically, a compulsion to use internet excessively (Balaguer, 2008).

Excessive use of internet, specially social networks, has created certain personality traits (Marín-Cipriano, 2018), such as neurosis (Castillo et al., 2008; Müller et al., 2013; Kuss et al., 2014; Wang et al., 2015; Caro, 2017), extraversion, narcissism, low emotional stability, low responsibility (Caro, 2017); depression (Padilla & Ortega, 2017) and feelings of loneliness (Ryan et al., 2014; Caro, 2017).

Furthermore, we must consider that with the development of technology, new fears and anxieties have appeared, such as not being able leave the house without the mobile phone, losing the mobile phone, not having enough battery, not having a signal and feeling isolated from family and society, bosses demanding from employees' availability at all times or having the need to check the mobile phone continuously for notifications or see what other people are doing (Caro, 2017).

One population that has been analyzed frequently is students (Korkeila, Kaarlas, Jääskeläinen, Vahlberg, & Taiminen, 2010; Jelenchick, Becker, & Moreno 2012), where participation has been more representative for women (Widyanto & McMurran, 2004; Khazaal, Billieux, Thorens, Khan, Louati, Scarlatti et al., 2008; Korkeila et al., 2010).

Among the reasons why students tend to be internet addicts, Marín-Cipriano (2018) highlights that family is a fundamental factor to increase addiction, because if the teenager does not keep a close communication with

parents, lacks affection or family harmony, meaning that there are signs of violence or abuse or if the parents are separated, those can be factors that may lead to excessive use of internet resulting in addiction. This has being found to match other research on the subject (Cruzado, Matos, & Kendall, 2006; Echeburúa, 2010; Barrera & Duque, 2014; Li, Garland, & Howard, 2014; Aponte, Castillo, & González, 2017).

Other studies that have used Exploratory Factor Analysis (EFA) in particular for measurement have identified diversity in the extracted factors, meaning that there does not seem to be a consensus in the number of factors or main components extracted using this measurement technique, since there are studies where it has been possible to identify six factors (Widyanto & McMurran, 2004), or five factors (Alavi, Eslami, Marac, NajaÞ, Jannatifard, & Rezapour, 2010). However, there are studies where only two factors were identified (Khazaal, Billieux, Thorens, Khan, Louati, Scarlatti et al., 2008; Jelenchick, Becker, & Moreno, 2012; Barke, Nyenhuis, & Kröner-Herwing, 2012) and three factors (Chang & Law, 2008; Widyanto, Griffiths, & Brunsden, 2011), so it is interesting to see how many factors can be found in this empirical study using EFA.

Another research subject can be the one concerning the average age where internet addiction presents itself. Some studies have proven that the range is between 14 and 24 years old (Echeburúa, 2010; Rial et al., 2014; Araujo, 2016; Shek & Yu, 2016; Padilla & Ortega, 2017; Marín-Cipriano, 2018; Terán, 2019).

Interest in the issue of technology, internet and mobile phone addiction has arisen in Mexico as well. Research has been developed in the topic of internet addiction, such as the study by García-Piña (2008), who highlights the dangers to which children are exposed, since the use of computers is easier and thus, the access to different communication channels offered by the web. The former has exposed children and young people to imminent danger, since the network allows them to visit websites with inappropriate content such as violence, drugs and pornography, among others, and as a result, create an affinity to this kind of information, probably caused by curiosity, leading to an addiction to these contents and internet.

Similarly, Hernández, Ponce and Casteñeda (2015) carried out a study among high-school students. Their findings proved that 9% of young people obtained a score which makes them vulnerable to TAI syndrome since this score is above average according to the aforementioned scale by Young (1998). They

conclude pointing out that it is necessary to take precautions because health issues may start to appear and must be accordingly attended by health professionals.

Based on the previously stated arguments, the question is: what is the level of internet addiction that high-school students have? Hence, the aim of the study is to determine if high-school students are addicted to the internet and identify if there is an underlying structure of latent variables that explain internet addiction. Also, as a specific objective, is to identify if internet addiction can be explained at least by one factor. Thus, the hypothesis to prove is:

Ho: $|R| = 1$ The data matrix is an uncorrelated matrix

H1: $|R| \neq 1$ The data matrix is a correlated matrix

Method

Participants

The sample in this study is high-school students from a *Centro de Bachillerato Tecnológico Industrial y de Servicios* (CBTI) center located in the city of Veracruz. The sample is non-probabilistic by convenience, since the aim is to survey all the current groups when applying the questionnaire. The inclusion criterion was: regular students enrolled in a semester at the moment of the survey application and who wish to collaborate in the study. Regarding the age of the students, the higher percentages are concentrated in the following ages: 15 years old were a 31.7% and 17 years old is 32.9%, between both of them we have a 64.6%, while the predominance of the male gender is slightly higher with a 51.8% versus 48.2% female.

Instrument

For the empirical study, the Internet Addiction Test designed by Young (1998) was used, consisting in a scale of 20 items that measure the presence and severity of internet dependence among adults[1]. Each item is graded in a 5 point scale ranging from 0 to 5 (0=Not Applicable, 1=Rarely, 2=Occasionally, 3=Frequently, 4=Often, 5=Always). The top score is 100 points. The survey uses Likert scale questions in order to facilitate a response from the respondents when

[1] The author of the Internet addiction test (IAT) is Dr. Kimberly Young, a professor at St. Bonaventure University and director of the Center for the Recovery of Internet Addictions. Developed the IAT to assess the symptoms of Internet addiction and compulsivity in A variety of test environments.

answering. In this regard, Young (1998) has suggested a score that allows the measurement of internet addiction: 20-49 points is for an average online user, the person seldom browses the internet but sometimes does it too much, though the person is still in control; 50-79 points is a user with occasional or frequent problems derived from internet addiction and finally, from 80-100 points are the users with important problems in their life.

Procedure

For the data analysis, the statistics program SPSS v.23 was used for the Exploratory Factor Analysis (EFA) and polychoric correlations matrices, looking to determine the level of internet addiction among the students under study.

Data analysis

The first step is to perform the tests of reliability and internal consistency of the questionnaire. Instrument reliability rates for this study were very good, with α=.774 with 22 indicators for the total sample (N=164), which according to the theoretical criteria by Hair, Anderson and Tatham (1979) is acceptable (>.7), as well as for George and Mallery (2003) who consider a α>.900 as excellent and a α>.700 acceptable. Thus, it is possible to confirm the high variability and internal consistency of the data, which makes the instrument viable and reliable. Afterwards, the correlation matrix was calculated to develop the EFA. Table 1 show the correlations matrix, which indicates that it is a data base suitable for empiric analysis, especially since it is not an identity matrix.

Table 1. Correlations matrix ([a])

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	1	.308	.174	.152	.249	.198	.134	.082	.038	.235
X2		1	.148	.053	.323	.08	.258	.127	.227	.119
X3			1	.236	.194	.065	.062	.164	.271	.084
X4				1	.173	.182	.069	.177	.215	.198
X5					1	.051	.144	.213	.204	.112
X6						1	-.019	-.03	-.041	.169
X7							1	.125	.229	.044
X8								1	.142	.206
X9									1	.088
X10										1

	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X11	1	.211	.246	.458	.272	-.079	.184	.319	.237	.096
X12		1	.288	.460	.409	-.063	.186	.165	.276	.140
X13			1	.333	.484	.077	.169	.121	.279	.330
X14				1	.464	-.019	.107	.285	*.527*	.229
X15					1	.042	.262	.314	.329	.261
X16						1	.130	.064	*.025*	.123
X17							1	.089	.103	.050
X18								1	.304	.272
X19									1	.231
X20										1

Note: Determinant=.012

The correlation coefficients shown on table 1 range between .025 and .527, which allows the assumption about the coefficients being statistically significant. Moreover, the value close to zero of the determinant provides a basis for this statement, considering that the theoretical criteria establishes that this value is between 0 to 1 and the closer it is to 0 the more evidence of an acceptable correlation matrix. In this particular case, indicator X16 is inversely correlated to items X11, X12 and X14, a fact that will be explained in the discussion of results.

Once the correlation matrix is verified, besides checking that it is not an identity matrix where correlated values are zeros and the diagonal are ones, the next step is to calculate Bartlett´s Sphericity test, KMO value, and measure of sample adequacy (MSA). If the KMO value is less than 0.5, this will indicate that correlations between variables cannot be explained by other variables, hence, exploratory factorial analysis is not appropriate for this data.

Once the correlation matrix is verified, the next step is to calculate the KMO and Bartlett´s Sphericity test. The values obtained were: KMO .780, Chi^2 683.155 with 190 *df* and p=.000 which indicate that the factorial analysis is appropriate for this data. The result provides evidence to reject the null hypothesis in the following terms: the KMO value 0.780 with p<.000 is considered acceptable according to Hair, Anderson and Tatham (1979). Also, the calculated value of Chi^2 (683.155 with 190 *df*) which is > than the maximum value of Chi^2 tables (with 100 *df* is 135.807 with p<.01 and 124.342 with p<.05), which is statistic evidence to justify the use of EFA with component extraction.

Additionally, the sample sufficiency measure by variable (MSA), which is in a range between 0.502 and 0.842, which are considered acceptable, since it should be higher than .50. Therefore, the rejection of the null hypothesis stands, that refers to the non-existence of a set of latent variables and that the phenomenon cannot be explained by at least one factor (*see* Table 2).

Table 2. *Matrix of sample sufficiency measure by variable*

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	*.821(a)*	-.154	-.079	-.05	-.112	-.136	.007	.059	.087	-.134
X2		*.832(a)*	-.013	.09	-.184	-.044	-.073	-.009	-.13	.004
X3			*.830(a)*	-.15	-.049	-.078	.073	-.013	-.165	.105
X4				*.716(a)*	-.087	-.127	-.009	-.065	-.103	-.161
X5					*.810(a)*	-.01	.008	-.085	-.122	.065
X6						*.550(a)*	.023	.057	.054	-.143
X7							*.765(a)*	-.019	-.128	.062
X8								*.842(a)*	-.003	-.098
X9									*.758(a)*	-.044
X10										*.743(a)*
	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X11	*.796(a)*	.049	-.111	-.32	.019	.101	-.111	-.236	.07	.072
X12		*.788(a)*	-.113	-.28	-.161	.088	-.099	-.049	.049	-.025
X13			*.785(a)*	-.03	-.326	-.064	-.009	.151	-.114	-.227
X14				*.799(a)*	-.115	-.024	.124	.118	-.359	.000
X15					*.826(a)*	.02	-.168	-.198	-.004	.06
X16						*.502(a)*	-.131	-.077	.017	-.101
X17							*.691(a)*	.035	-.043	.025
X18								*.720(a)*	-.186	-.198
X19									*.788(a)*	-.064
X20										*.769(a)*

In table 3 and figure 1 we observe six factors or extracted components that are higher than 1, which are in a range between 4.599 for the higher and 1.005 for the lower, the last one being a little above the suggested criteria (> to 1). These factors explain 56% of the total variance about internet addiction. Also,

the weight of the first factor is notorious in contrast to the other five factors, which is why it is considered necessary to orthogonally rotate the matrix using the Varimax method (*see* Table 4 and 5) in order to identify the highest weights of each factor that allows simplification in the interpretation of each component.

Table 3. Explained total variance and eigenvalues > to 1

Component	Initial eigenvalues			Extraction sums of square loadings		
	Total	% of variance	% accumulated	Total	% of variance	% accumulated
1	4.599	22.996	22.996	4.599	22.996	22.996
2	1.494	7.469	30.465	1.494	7.469	30.465
3	1.461	7.305	37.770	1.461	7.305	37.770
4	1.339	6.695	44.464	1.339	6.695	44.464
5	1.287	6.433	50.898	1.287	6.433	50.898
6	1.005	5.025	55.922	1.005	5.025	55.922

Note: Extraction method: Main components analysis.

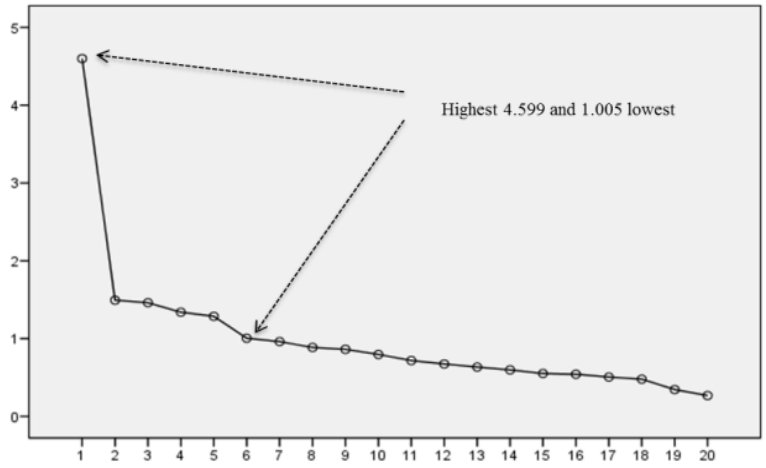

Figure 1. Eigenvalues greater than 1

Table 4. Rotated component matrix ([a])

Items	Component						Component					
	1	2	3	4	5	6	1	2	3	4	5	6
X12	*.78*	-.04	-.04	.07	-.05	.06	*.78*					
X14	*.68*	.34	.23	.23	-.06	-.05	*.68*					
X15	*.57*	-.02	.29	.43	.05	.20	*.57*					
X19	*.56*	.24	.31	.05	-.10	-.02	*.56*					
X8	*.52*	.26	-.10	.03	.01	.19	*.52*					
X10	.49	-.01	.11	.07	.40	-.22						
X11	.41	.41	.12	-.02	.26	.07						
X9	.02	*.76*	.10	.15	-.09	-.03		*.76*				
X18	.18	*.54*	.46	-.02	.02	.04		*.54*				
X3	.26	.48	-.16	.28	.07	.02						
X20	.14	-.07	*.73*	.14	.16	.07			*.73*			
X7	.01	.28	*.62*	.17	-.11	-.05			*.62*			
X13	.41	-.15	.41	.20	.23	.25						
X2	.05	.20	.22	*.73*	-.02	-.08				*.73*		
X1	.12	-.01	.11	*.64*	.34	-.03				*.64*		
X5	.19	.15	.02	*.60*	-.04	.43				*.60*		
X6	-.12	-.07	.04	.16	*.78*	-.04					*.78*	
X4	.07	.48	-.02	-.05	*.55*	.31					*.55*	
X17	.25	.07	-.10	-.01	.17	*.73*						*.73*
X16	-.20	-.06	.29	.06	-.26	*.62*						*.62*

Extraction method: Main component analysis. Rotation method: Varimax normalization with Kaiser.
[a] The rotation has converged in 14 interactions.

Table 4 shows six factors extracted with the Varimax rotation method (weights > 0.5) and in table 5 there are the items that make them up:

Table 5. Extracted components

Factor	Items	Factorial weights
Factor 1	X12.- How often do you fear that life without the Internet would be boring, empty, and joyless?	.78
	X14.- How often do you lose sleep due to being online?	.68
	X15.- How often do you feel preoccupied with the Internet when off-line, or fantasize about being online?	.57
	X19.- How often do you choose to spend more time online over going out with others?	.56
	X8.- How often does your job performance or productivity suffer because of the Internet?	.52

Table 5. Extracted components - *continued*

Factor	Items	Factorial weights
Factor 2	X9.- How often do you become defensive or secretive when anyone asks you what you do online?	.76
	X18.- How often do you try to hide how long you've been online?	.54
Factor 3	X20.- How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?	.73
	X7.- How often do you check your email before something else that you need to do?	.62
Factor 4	X2.- How often do you neglect household chores to spend more time online?	.73
	X1.- How often do you find that you stay online longer than you intended?	.64
	X5.- How often do others in your life complain to you about the amount of time you spend online?	.60
Factor 5	X6.- How often do your grades or school work suffer because of the amount of time you spend online?	.78
	X4.- How often do you form new relationships with fellow online users?	.55
Factor 6	X17.- How often do you try to cut down the amount of time you spend online and fail?	.73
	X16.- How often do you find yourself saying "just a few more minutes" when online?	.62

Finally, table 6 shows the percentages obtained according to the measurement scale by Young (1998).

Table 6. Addiction level according to Young´s scale

% by gender	Score						∑
	0-49		50-79		80-100		
Men	69		19		0		88
Women	16		60		0		76
Sums	85		79		0		164
% according to score	78.66%		21.34%		0.00%		100%
Men	81.18%	78.66%	24.05%	21.34%	.00%		0.00%
Women	18.82%		75.95%		.00%		

Discussion

The results of the empiric study provide interesting data that must be discussed and also leave areas of opportunity. Firstly, the instrument presented internal consistency and reliability, which gave certainty to the analysis. Afterwards, the measure of sample adequacy was determined with the purpose of evaluating the underlying dimensions of the scale that was used, obtaining a KMO value of .780; additionally, Bartlett's test of Sphericity gave a Chi^2 statistic value of 683.155 with 190 *df* which is > than the maximum value of the Chi^2 tables (with 100 *df* is 135.807 with p<.01 and 124.342 with p<.05) with significance p=.00, providing support and viability to carry out the EFA with component extraction.

These results have matched other studies such as the one by Puerta-Cortés, Carbonell and Chamarro (2013), whose instrument proved a high internal consistency and acceptable sample adequacy. In the matter of main components extraction, a matrix of six factors was obtained, which varies from other studies where two factors (Khazaal et al., 2008; Jelenchick et al., 2012; Barke et al., 2012), three factors (Chang & Law, 2008; Widyanto, Griffiths, & Brunsden, 2011; Puerta-Cortés, Carbonell, & Chamarro, 2013) and even five factors (Alavi et al., 2010) were identified.

Nonetheless, in this study, the data matrix allowed the extraction of six factors, as shown in tables 3 and 4, which is in accord with the work by Widyanto and McMurran (2004) who obtained six factors. What is interesting in this comparison is that factors were integrated by different indicators, providing evidence about the complexity and ambiguity given by factorial techniques used in empirical studies about this subject.

In the study mentioned above (Widyanto & McMurran, 2004), six factors were obtained, and their classification is the following:

Factor 1 Salience	Factor 2 Excessive use	Factor 3 Neglect work	Factor 4 anticipation	Factor 5 Lack of control	Factor 6 Neglect social life
X19, X13, X12, X15, X10	X2, X14, X20, X1, X18	X6, X8, X9	X11, X7	X17, X5, X16	X4, X3
Eigenvalue* and explained variance** by each factor					
7.17* 35.8**	1.8* 9.02**	1.3* 6.51**	1.2* 6.02**	1.11* 5.55**	1.04* 5.21**

In contrast, the factors obtained by this empirical study were classified as follows:

Factor 1 Salience	Factor 2 Excessive use	Factor 3 Neglect work	Factor 4 anticipation	Factor 5 Lack of control	Factor 6 Neglect social life
X12, X14, X15, X19, X8	X9, X18	X20, X7	X2, X1, X5	X6, X4	X17, X16
Eigenvalue* and explained variance** by each factor					
4.599* 22.99**	1.494* 7.47**	1.461* 7.31**	1.339* 6.70**	1.287* 6.43**	1.005* 5.03**

Taking as reference the study by Widyanto and McMurran (2004), we could say that there is only a match with the factors of F1 Salience (with the indicators X12, X15, X19) and F2 Excessive work (X18), while the rest of the factors are different, leading us to think that this finding confirms what other studies have stated about the ambiguity obtained in the results using this scale and the EFA technique.

Regarding the values shown in table 6, it is possible to state that a large percentage of users do not show signs of internet addiction, since 78.66% are in the range of a regular net user. Of this percentage, 81.18% are male and 18.82% are women. A 21.34% of students scored from 50 to 79 points, which according to Young (1998) means they are users who occasionally present internet addiction problems, 24.05% of them being men and 75.95% women.

Regarding the importance of the findings and the theoretical significance, we may say as follows: Based on the objective of the study about assessing the behavior of secondary school students regarding the use of the Internet, it was sought to determine whether there is an underlying structure of variables that explain the existence of some characteristics of Internet addiction. The results allow us to infer that the purpose was achieved, since the level of addiction presented by the students evaluated was identified, which is in the range of 0 to 49 points, 78.66% according to the scale proposed by Young (1988) (*see* Table 6).

In the same idea, to test the hypothesis, we calculate the sample adequacy measure KMO (0.780) and MSA (which is ranging between 0.025 and 0.527). Furthermore, the value of the determinant in the correlation matrix showed a value practically close to zero (see table 1), which allowed the use of the EFA.

For the hypothesis contrast, the Barttlet test of Sphericity is calculated with a Chi^2 value of 683,155 (df=190) and p=.000. These values allowed us to reject the null hypothesis that the matrix is an identity matrix, indicating the existence of significant interrelationships between the items of the scale.

This result leads us to think that there is no high level of addiction which should concern academic authorities. However, it is advisable to monitor this population through a survey after this study, to verify that this level does not increase and change range according to what Young (1988) points out.

Also, with the rotation of components, it was possible to extract six factors that are the basis for design the predictive model and explain 55.9% of total variance of the phenomenon under study. This finding has theoretical significance and adds to the results of Widyanto and McMurran, (2004), who demonstrated the existence of six factors on Young's internet addiction scale. Therefore, the most important contribution identified was that the scale led to obtaining six factors, which allows seeing ambiguity in the use of factorial techniques for its measurement.

Finally, it is concluded that the test designed by Young (1998) showed acceptable reliability and internal consistency ratings, which allows the measurement of internet addiction among net users, even though the results do not seem to be very consistent regarding the extraction of factors, meaning that the underlying dimensions do not seem to match other research about said the subject that has being mentioned previously.

It is important to keep using this scale in Latin countries, particularly in Mexico, in order to keep finding similarities or differences regarding the extracted factors that explain the variance of the internet addiction phenomenon.

Correspondingly, a suggestion is to add a didactic activity in the curriculum of high-school students that aids in the correct use of the network, thus, caring for the emotional and physical well-being of students affected by the use of internet.

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Appendix 1

INTERNET ADDICTION TEST

Name_____ Male_____Female _____
Age_____Years Online_____Do you use the Internet for work?_____Yes_____No_____

This questionnaire consists of 20 statements. After reading each statement carefully, based upon the 5-point Likert scale, please select the response (0, 1, 2, 3, 4 or 5) which best describes you. If two choices seem to apply equally well, circle the choice that best represents how you are most of the time during the past month. Be sure to read all the statements carefully before making your choice. The statements refer to offline situations or actions unless otherwise specified.

0 = Not Applicable
1 = Rarely
2 = Occasionally
3 = Frequently
4 = Often
5 = Always

1. ____How often do you find that you stay online longer than you intended?
2. ____How often do you neglect household chores to spend more time online?
3. ____How often do you prefer the excitement of the Internet to intimacy with your partner?
4. ____How often do you form new relationships with fellow online users?
5. ____How often do others in your life complain to you about the amount of time you spend online?
6. ____How often do your grades or school work suffer because of the amount of time you spend online?
7. ____How often do you check your email before something else that you need to do?
8. ____How often does your job performance or productivity suffer because of the Internet?
9. ____How often do you become defensive or secretive when anyone asks you what you do online?
10. ____How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?
11. ____How often do you find yourself anticipating when you will go online again?
12. ____How often do you fear that life without the Internet would be boring, empty, and joyless?
13. ____How often do you snap, yell, or act annoyed if someone bothers you while you are online?
14. ____How often do you lose sleep due to being online?
15. ___How often do you feel preoccupied with the Internet when off-line, or fantasize about being online?
16. ____How often do you find yourself saying "just a few more minutes" when online?
17. ____How often do you try to cut down the amount of time you spend online and fail?
18. ____How often do you try to hide how long you've been online?
19. ____How often do you choose to spend more time online over going out with others?
20. ____How often do you feel depressed, moody or nervous when you are off-line, which goes away once you are back online?