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# Facebook Addiction Scale: exploratory validity studies

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## Abstract

This paper intends to develop the first validity studies of a Portuguese version of Facebook Addiction Scale (AFS) by Koc and Gulyagci (2013). The study was carried out with a convenience sample (N=144), through a questionnaire made available online. Statistical analyzes of the results suggest that the scale has excellent psychometric properties, similar to those of the original scale. Analysis of the principal components, with varimax rotation, reveals the existence of a single factor, able of explaining 63,7% of the total variance, while the internal consistency analysis is .91 (Cronbach's alpha).

**Keywords:** Facebook Addiction Scale. Behavioral Dependencies. Behavioral Addiction. Internet attitudes. Social networks.

## Introduction

Nowadays the Internet is a widely disseminated technology in present-day societies (OSBURG; LOHRMANN, 2017). People use the Web to reach goals (acquiring knowledge, engaging in professional activities, purchasing products and services etc.) or to meet psychological needs (acknowledgment, sense of belonging, socialising, entertainment etc.) (HEW, 2011; PEMPEK et al, 2009; PONTES et al, 2016; RYAN et al, 2014; WILSON et al, 2012; YANG; BROWN, 2013). According to the Internet World Stats (2017), between 2000 and 2017, the growth rate of Internet users was 936%, reaching 3,7 billion users in the present year. On 31 March 2017, one in every two inhabitants was using the Internet, which accounts for a penetration rate of 49,7% in terms of the world population. Of these users, about 637 million are European, of which 7 million are Portuguese (the penetration rate in Portugal stands at 67,6%, which adds up to 7.015.519 users) (MINIWATTS MARKETING GROUP, 2017). As for the use of Facebook at a global level, statistics from March 2017 show that 1,28 billion people use Facebook on a daily basis (FACEBOOK, 2017). In Portugal, there are 5,6 million subscribers, that is, 54% of the Portuguese population are Facebook customers, which means that 79,8% of Internet users are Facebook customers<sup>1</sup> (MINIWATTS MARKETING GROUP, 2017).

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<sup>1</sup> According to the same source, in South America there are about 277 million Internet users, of which 139 million are Brazilian. Of the latter, 111 million are Facebook subscribers (30 June 2016) (MINIWATTS MARKETING GROUP, 2017).

In light of these figures, and in accordance with other sources, (GUEDES et al, 2016; PONTES; GRIFFITHS, 2014), a number of questions are raised. One of them refers to whether the extensive use of the Internet may or not be understood as a behavioural addiction (or dependence), with symptoms which are more or less similar to the symptoms of substance addiction (GRIFFITHS, 1996, 1999, 2000; GRIFFITHS; PONTES; KUSS, 2016, KUSS; LOPEZ-FERNANDEZ, 2016; KUSS; BILLIEUX, 2017; YOUNG, 1998). Another mentions some specific uses of the Internet, which may be regarded as behavioural addictions (or dependences), such as, videogames and online gambling (GRIFFITHS et al, 2017; GRIFFITHS; PONTES, 2015; NG; WIEMER-HASTINGS, 2005), smartphones (KUSS, 2017; VAN DEURSEN et al, 2015) or Facebook (RYAN et al, 2014; YOUNG et al, 2017).

In different cases, research has identified some prejudicial effects related with these behavioural addictions or dependences. For example, excessive use of Facebook is associated with the declining quality of students' daily activities (distractions and procrastination of more frequent school tasks), the experiencing of anxiety and stress, insomnia and depression, disturbance of interpersonal relations, isolation, hostility towards others, deteriorating social competences, mood changes etc. (EKIZOGLU; OZCINAR, 2011; ELGENDI, 2015; ELPHINSTON; NOLLER, 2011; GENCER; KOC, 2012; GRIFFITHS; PONTES, 2015; GUEDES et al, 2016; RYAN et al, 2014, 2016a, 2016b; VANNUCCI et al, 2017).

In view of this, it is pertinent to call for further research to be conducted on the attitudes to the use of information and communication technologies on the Internet. This may involve, for instance, the designing of new instruments for assessing attitudes or, alternatively, the translation and adaptation of existing instruments, with the corresponding validity studies associated to them.

## Objective

This study serves two purposes: translating into Portuguese the *Facebook Addiction Scale*, designed by Koc & Gulyagci (2013), and conducting some exploratory studies to assess the psychometric properties of the scale, with a view to providing an answer to the scarcity of papers in the field of studies into behavioural addictions to or dependences on Facebook (PONTES; GRIFFITHS, 2014).

## Instrument

The Facebook Addiction Scale was designed by Koc and Gulyagci (2013, p.280) based on the “analysis of research papers on Internet addictions”. According to the authors' analysis, the eight items of the scale are related with the assessment of the cognitive and behavioural symptoms of addictions, the assessment of the relevance and degree of conflict of these behaviours vis-à-vis other people or activities, mood changes and loss of

behavioural control, relapses, abstinence manifestations and the restoring of previously eliminated behaviours. Basically, the creation of this scale aimed to fill a gap in the research on new dependences, as the instruments for the recognition of addiction to or dependence on the new communication technologies were few and far between, and the studies on the validity of these instruments are scarce. In more recent years, with the growing widespread use of these technologies, the topic of addictions has gained visibility; hence the reason for exploratory studies about the phenomenon as well as for validity studies on the instruments aimed at assessing it.

All the items on the scale are written in the affirmative, and so the values corresponding to the answers may be added up to reach a total. The higher the value of the score resulting from the adding up of the answers to the eight points of the scale, the more marked the Facebook addiction will be. Since the scale has not been widely used in research studies, it will be pertinent to conduct exploratory studies to establish the psychometric properties of the scale and its validity.

## Sample

A sample of convenience was used<sup>2</sup>, made up of 144 voluntary participants, of which 46 are male (31,9%) and 98 are female (68,1%), with ages ranging from 15 to 35 years ( $M=21,94$ ,  $DP=3,41$ ). The data were compiled through GoogleDocs, using a questionnaire, during the months of April-June 2016.

## Procedures

The first part of the questionnaire includes questions for the characterisation of the sample: gender, age, occupation, years of professional activity, whilst the second is made up of the eight items of the Facebook Addiction Scale (KOC; GULYAGCI, 2013). The answers were coded on a Likert scale of seven points, from 1 – I strongly disagree to 7 – I strongly agree. All the items are written in the affirmative. This means the scale is additive, so that a higher score will correspond to the expression of a greater addiction to Facebook.

In order to keep the meaning of the sentences on the scale as close to the original as possible, the suggestion made by Hill and Hill (2008) was followed, that is to say, the scale was translated into Portuguese and, subsequently, translated into English again by another researcher. The differences detected between the two versions were then analysed and discussed. The final version was assessed by a group of five undergraduate students to identify possible problems of comprehension in the meaning of the items and thus avoid potential misunderstandings. At this stage, an alteration to the answers coding system

<sup>2</sup> The criterion for building the sample was convenience, which means this is a non-probabilistic sample as the subjects were selected based solely on their accessibility and availability to answer the questionnaire.

was introduced and a seven-point Likert scale was adopted (instead of the five-point original scale)<sup>3</sup>, as well as an alteration to the associated labels, which were changed from 1-I strongly disagree to 7-I strongly agree, instead of the original labels (1-*not true* to 5-*extremely true*)<sup>4</sup>. These alterations were discussed, and there was unanimous consensus that they gained in clarity.

The data were analysed using the Statistical Package for Social Sciences (SPSS, version 21)<sup>5</sup>. Nine subjects of the sample were disregarded (5,9%) for having answered only the characterisation questions of the first part of the questionnaire. No non-answers were detected.

## Results

On Table 1, the mean and standard deviation values of the scale items are shown. The total mean of the scale was 21,77 (DP=10.88), and no statistically significant differences in regard to gender were detected through test *t of student*. However, if an item per item analysis is conducted, statistically significant differences may be identified in item 4 (*O uso que faço do Facebook interfere com as minhas actividades sociais*)<sup>6</sup>, with a value of *t* (142)=2,148, *p*=.033. Male participants show a higher mean (M=3.15, DP=1.59) by comparison with female ones. (M=2.54, DP=1.59). As regards the remaining sociodemographic variables of the sample, no statistically significant differences were found in the mean values.

**Table 1:** Mean, standard-deviation and inter-items correlation of 8-item of Facebook Addiction Scale (N=144)

Scale items	Mean	SD	1	2	3	4	5	6	7	8
1.	3.18	1.68	-							
2.	3.15	1.97	.56	-						
3.	2.75	1.78	.68	.51	-					
4.	2.74	1.61	.52	.49	.61	-				
5.	2.58	1.76	.53	.47	.57	.62	-			
6.	2.72	1.86	.51	.50	.59	.61	.63	-		
7.	2.31	1.49	.55	.51	.67	.55	.61	.72	-	
8.	2.34	1.53	.55	.45	.65	.55	.68	.70	.75	-

Source: Prepared by the author.

3 The *Likert* scales are one of the most commonly used procedures to code the subjects' answers in a survey. In the case of this exploratory study, the answers format was extended to comprise seven levels in order to increase the range of possible answers.

4 The original labels ("It is not true" and "It is extremely true") were replaced with labels implying greater or lesser agreement with the meaning of the statements.

5 The SPSS is a computer programme for the statistical analysis of data, widely used in Social Sciences studies.

6 "My Facebook use interferes with doing social activities".

The lowest inter-item correlation is .45 (between item 2 and item 8), the highest is .75 (between items 7 and 8), with a correlation mean of .58. All the inter-item correlation values are significant ( $p < .01$ ). The correlation matrix determinant equals .006, which indicates the possibility of conducting a factorial analysis, a possibility which is also suggested by Bartlett's Test of Sphericity ( $\chi^2(28, N=144)=707.191$  ( $p<.000$ )) and Kaiser-Meyer-Olkin's index value (K.M.O.=.913)<sup>7</sup>.

**Table 2:** Corrected item-total correlations, squared multiple correlation and Cronbach's Alpha if Item deleted from Facebook Addiction Scale (N=144)

Scale items	Corrected item-total correlation	$R^2$	Cronbach's Alpha (if item deleted)
1.	.69	.54	.91
2.	.61	.41	.92
3.	.76	.63	.90
4.	.71	.53	.91
5.	.73	.57	.90
6.	.76	.63	.90
7.	.78	.67	.90
8.	.77	.67	.90

Source: Prepared by the author.

The conditions for the factorialisation of the correlations matrix having been checked, the method used will be that of the principal components analysis, with Varimax rotation, for an exploratory factorial analysis<sup>8</sup>. This analysis resulted in a solution with a single component with its eigen value higher than the unit (5.10), capable of accounting for a rather large part of the general variability of the answers given to the totality of the items on the scale (63.8%). The saturation indexes of all eight items are higher than .69 (Table 2).

The Cronbach<sup>9</sup> alpha value is .91, which suggests a high internal consistency in the scale's items, borne out by the analysis of the values of the multiple correlation square, which vary between .41 and .67. This indicates that the items share important percentages of their variance between them (Table 3). The alpha value decreases with the removal of any item from the scale, with the exception of item 2's elimination (*A primeira coisa de que me lembro quando acordo é ligar-me ao Facebook*<sup>10</sup>), whose removal maintains the alpha value constant.

<sup>7</sup> Bartlett's test of sphericity and the Kaiser-Meyer-Olkin index are two measures which enable the conditions required for a factorial analysis of data to be assessed (MARÔCO, 2018).

<sup>8</sup> The method of the principal components analysis corresponds to a statistical method for data analysis used to convert a set of observations of non-correlated variables into values with a statistical meaning (MARÔCO, 2018).

<sup>9</sup> The Cronbach alpha is a indicator of the degree of internal consistency of a psychological measure.

<sup>10</sup> "The first thing on my mind when I get up is log into Facebook".

**Table 3:** Factor loadings (principal components analyses method), commonalities, eigen values and variance explained of 8-items of Facebook Addiction Scale ( $N=144$ )<sup>11</sup>

	<b>Component 1</b>	<b><math>h^2</math></b>
07_Sinto-me ansioso quando não consigo aceder ao Facebook.	.85	.72
08_Já tentei gastar menos tempo no Facebook, mas não consegui.	.84	.70
06_A minha família e os meus amigos acham que eu gasto muito tempo com o Facebook.	.83	.69
03_Perco horas de sono por passar muito tempo no Facebook.	.83	.69
05_Quando estou em baixo, ligo-me ao Facebook para me sentir melhor.	.80	.64
04_O uso que faço do Facebook interfere com as minhas actividades sociais.	.78	.60
01_Tenho dificuldades em concentrar-me no meu trabalho académico por causa do uso que faço do Facebook.	.76	.58
02_A primeira coisa de que me lembro quando acordo é ligar-me ao Facebook.	.69	.48
Eigen values	5.10	
% of variance explained	63.7	

Source: Prepared by the author.

On the whole, these results suggest that the eight items of the Portuguese adaptation of the Facebook Addiction Scale designed by Koc and Gulyagci (2013) measure one single dimension, with excellent internal consistency.

## Conclusions

The main objective here was to develop exploratory studies for the construct validity of a Portuguese version of Koc and Gulyagci's (2013) Facebook Addiction Scale, with a view to making some means available for the research into the use of one of the most widespread technological tools: Facebook. Despite being a first study, with a limited convenience sample (which does not rule out the need for complementary validity studies to be carried out), it is certainly relevant to highlight some of its results. Firstly, the scale has a single-factor structure. The use of the principal components method, with Varimax rotation, allowed for the production of a solution with a single main component, which may account for 63,7% of the total variance and in which the totality of the items saturates above

<sup>11</sup> Items of Facebook Addiction Scale in English: 01) I have difficulties in focusing on my academic work due to my Facebook use; 02) The first thing on my mind when I get up is log into Facebook ; 03) I lose sleep over spending more time on Facebook; 04) My Facebook use interferes with doing social activities; 05) I log into Facebook to make myself feel better when I am down; 06) My family or friends think that I spend too much time on Facebook; 07) I feel anxious if I cannot access to Facebook; 08) I have attempted to spend less time on Facebook but have not succeeded.

.69 – with important communality values (above .48). This appears to reinforce the original factorial model of the scale's authors. Secondly, the fact that the alpha value found is very high (.91), associated with the circumstance that the removal of any item from the scale contributes to a reduction in that value, suggests a very good internal consistency.

Since a sample of convenience made up of relatively heterogeneous subjects was used, the conclusions are limited to the nature of the sample. Therefore, it will not be possible to suggest any type of association between the results obtained through the use of the scale and possible behaviours of addiction to or dependence on Facebook. Further studies will be needed to achieve this goal.

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