

DEVELOPMENT OF A NEW SCREENING TOOL FOR CYBER PORNOGRAPHY: PSYCHOMETRIC PROPERTIES OF THE CYBER PORNOGRAPHY ADDICTION TEST (CYPAT)

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Abstract

Objective: Internet pornography addiction typically involves viewing, downloading and trading online pornography or engagement in adult fantasy role-play. There are some well-validated inventories measuring perceived addiction to internet pornography but these instruments are often too long for a functional use and fast scoring. The aim of this study was to evaluate the psychometric properties of the cyber pornography addiction test (CYPAT), a new, brief, screening measure for assessing cyber pornography.

Method: Participants of this study completed the CYPAT, the CPUI, the TAS-20 and the FACES-IV. Descriptive statistics were calculated and Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were applied.

Results: Cronbach's alpha coefficient suggested excellent reliability of the measure. Results of this study revealed also good construct, convergent and divergent validity.

Conclusions: CYPAT is a brief self-report screening scale composed of 11 items scored on a five-point Likert scale with good psychometrics properties. The implications of these findings for future theoretical and empirical research in this field are discussed.

Key words: addiction, measurement, internet pornography, validity, assessment

Declaration of interest: none

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Introduction

In recent years, the use of internet pornography has increased (Griffiths 2012) and many studies have documented that this usage seems to be linked to some psychopathological features, including compulsive behaviors and, in some cases, internet pornography addiction (Bensimon 2007, Bostwick and Bucci 2008, Cooper et al. 2000, Delmonico and Miller 2003, Patterson et al. 2012, Spenhoff et al. 2013).

The literature defines cyber pornography addiction as a compulsive, uncontrolled form of the use of pornographic internet material; it has important consequences for the lifestyle of the individual (Spenhoff et al. 2013). Internet pornography addiction typically involves the compulsive viewing, downloading, and trading online of pornography, or engaging in adult fantasy role-play; this compulsive and excessive use of internet pornography generally is associated with interpersonal isolation, response to low mood or stress, and relational problems (Patterson et al. 2012). Furthermore, a deep involvement in internet pornography behaviors is linked to family dysfunction (Manning 2006), legal consequences (de Almeida Neto et al. 2011, Griffiths 2001) and psychological distress (Egan and Parmar 2013, Philaretou et al. 2005). When individuals feel that they are compulsive in their use of pornography, they describe a perceived lack of control over their pornography use, and report various severe

related consequences (Spenhoff et al. 2013).

One of the first models proposed to explain internet pornography addiction was the Triple-A, where the three "As" indicate accessibility/availability (there are millions of sites available 24 hours a day), affordability (there are many ways to access 'free' sex) and anonymity (people perceive their communications to be anonymous) (Cooper 1998, Cooper et al. 2000). Cooper (1998) suggested these factors that "turbocharge" online sexuality and aid our understanding of the power and attraction of the Internet for sexual pursuits (Griffiths 2004).

After that, Bensimon (2007) proposed a "two-phased" cyber pornography addiction model, in which the first step is characterized by a compulsive addiction to internet pornography, and the second is marked by repeated failures to break free from compulsive addiction, despite negative consequences. In the same line, Young (2008) viewed internet pornography addiction as a maladaptive cycle of discovery, experimentation, escalation and compulsion. Young (1998) also claimed to have developed a variant of the "Triple A Engine" which she called the "ACE model" (Anonymity, Convenience, Escape) (Griffiths 2004).

Both Bensimon (2007) and Young (2008), in their pornography addiction models, considered the role of the escalation of compulsive behavior and the inability to stop as central in this behavioral addiction. Other "attractive" factors outlined by Schneider (2000)

included the fact that cybersex is legal, available in the privacy of one's home, inexpensive, and does not put the user at risk of a sexually transmitted disease (Griffiths 2004).

Despite that the clinical implications of the intense use of internet pornography have recently been made clearer, there is no official diagnosis for this form of addiction and there is a lack of screening tools for understanding the impact of problematic use of internet pornography. However, on the one hand, some researchers have identified several negative aspects that could be associated with internet pornography addiction, as for example, spending too much time searching for pornographic material, or feeling guilty after watching pornographic material, or trying to suspend the pornographic enjoyment without success (Spenhoff et al. 2013), which suggest investigating if there is any need for a new diagnostic category. On the other hand, researchers have recently developed some well-validated measures for assessing aspects related to internet pornography addiction, like the Cyber-Pornography Use Inventory (CPUI; Grubbs et al. 2010), the Compulsive Pornography Compulsion (CPC; Noor et al. 2014), the Hypersexual Behavior Inventory (Reid et al. 2011), the Compulsive Sexual Behavior Inventory (Coleman et al. 2001), the Sexual Addiction Screening Test-Revised (SAST-R; Carnes et al. 2010), the Internet Sex Screening Test (Delmonico and Miller 2003), the Inventory of Problematic Online Experiences (Mitchell et al. 2009), and the Pornography Consumption Inventory (Reid et al. 2010). However, these instruments have been well-documented as useful for measuring general hypersexuality, and are much more broadly focused on that than on perceived addiction to Internet pornography specifically (Grubbs et al. 2010), except for the Cyber-Pornography Use Inventory (CPUI; Grubbs et al. 2010). Besides, these instruments are often too long for functional use and fast scoring. We aimed to develop an effective brief measure.

For these main reasons, we consider it important to develop an easily administered measure of perceived addiction to Internet pornography (CYPAT, Cyber Pornography Addiction Test) that can be used both in practice with clinical populations and as a screening tool with non-clinical populations. In the development of the measure we paid also attention to the criteria of sensitivity of the measure to detect maximum possible cases.

Despite all the items of the CYPAT are focused on Internet pornography specifically, instead of focusing on a wide range of online sexual behaviors, we developed this measure on the basis of the literature analysis that suggested the importance of various important components in the assessment of addictive behaviors: (1) inability to stop a behavior, (2) significant negative effects because of the behavior, and (3) a generalized obsession with the behavior (Delmonico and Miller, 2003). Furthermore, we considered some integrated models of addiction that highlight the role of variables such as impulsivity and alexithymia in the onset and maintenance of addictive behaviors (Caretto and La Barbera 2005, Craparo and Gori, 2015, Gori et al. 2016, Schimmenti and Caretti, 2016, Schimmenti et al. 2017). According to these researches people with an addiction generally suffer of a disorder of affect regulation (alexithymia), that prevents them to regulate and to contain internal and external tensions; that is because these subjects seem to be impulsively (impulsivity) driven towards altered states of consciousness and they are motivated to reduce uncomfortable states

through addictive behaviors. Following these aspects, in the development of the measure, we paid attention to consider these variables in the process of items formulation, as well as, the need to have a short instrument.

In this paper, we describe this new self-report screening instrument and examine the main psychometric properties of the CYPAT in an Italian sample.

Materials and Methods

Preliminary Study

In the first phase of the study, the authors developed a measure consisting of 56 items and tested the factor structure of this preliminary version. A convenience sample of 372 participants (192 women, 180 men; mean age = 27.76 years; SD = 2.53) completed this preliminary version. Exploratory factor analysis (EFA) suggested a one-factor solution for the measure, and in order to obtain a clear factor solution, we eliminated the items with communalities under 0.30 and reached a version with 11 items.

Participants and procedure

A sample of 201 subjects (119 female, 82 male), with a mean age of 27.43 (SD=9.2) volunteered for this study. All subjects who completed the Italian version of the CYPAT were university (31.2%) or high school (68.8%) students and provided information about age, sex, gender, education and professional activities. In addition to CYPAT, 72 participants completed other instruments described in the measures section. All tests were administered using the norms regarding privacy. Data were collected anonymously and with the permission of the participants, who all completed an informed consent. The study adhered to the latest version of the Declaration of Helsinki revised in Fortaleza [World Medical Association (WMA) 2013] with regard to ethical standards for research.

Measures

Demographics questionnaire. A brief demographic survey was administered, obtaining information on age, gender, area of residence, relationship status, sexual orientation, education, employment status and ethnicity.

Cyber Pornography Addiction Test (CYPAT). The CYPAT is a self-report scale composed of 11 items scored on a five-point Likert scale (from 1 = never to 5 = always) that helps screening if the subject has some problems related to pornography addiction (minimum=11, maximum=55, range=44).

Cyber-Pornography Use Inventory (CPUI; Grubbs et al. 2010). The CPUI is a 40-item self-report measure of cyberpornography use. The first item assesses whether the respondent has intentionally viewed Internet pornography during the past six months, and the other items assess the cyberpornography addictive patterns, the feelings regarding online pornography use, and online sexual behavior. An item example from the measure is, "When I am unable to access pornography online, I feel anxious, angry, or disappointed." CPUI scores can range from 0 to 39, with higher scores indicating a more severe level of cyberpornography use (Schimmenti and Caretti 2016). The CPUI was specifically translated into the Italian language for

this study, following the well-established guidelines for translating research measures (Brislin 1970). The CPUI has demonstrated acceptable reliability ($\alpha > .80$) (Harper and Hodgins 2016).

Twenty-Item Toronto Alexithymia Scale (TAS-20; Bagby et al. 1994a, 1994b). The TAS-20 is a 20-item self-report that assesses alexithymia. The rating scales have five response categories varying from “strongly disagree” (1) to “strongly agree” (5). The TAS-20 has a three-factor structure, as follows: 1. Difficulty Identifying Feelings (DIF); 2. Difficulty Describing Feelings (DDF); 3. Externally Oriented Thinking (EOT). Scores higher than 61 are categorized as indicating an alexithymic profile (Taylor et al. 1997). The TAS-20 has shown adequate validity and reliability ($\alpha = .81$; $r = .77$). The Italian version also demonstrates good internal consistency (Cronbach’s alpha of 0.75 and 0.82 in normal and clinical groups, respectively). In this study, we used the Italian version of the TAS-20 (Bressi et al. 1996).

The Family Adaptability and Cohesion Evaluation Scale (FACES IV; Olson 2011). The FACES IV was developed to tap the full continuum of the cohesion and flexibility dimensions from the Circumplex Model of Marital and Family Systems (Olson 2011). The measure is divided into six scales: two balanced scales, Cohesion and Flexibility, assessing central-moderate areas; and four unbalanced scales, Enmeshed, Disengaged, Chaotic, and Rigid, assessing the lower and the upper ends of Cohesion and Flexibility. Whereas the two balanced scales, Balanced Cohesion and Balanced Flexibility, are similar to previous FACES III scales, the four Unbalanced Scales, Enmeshed, Disengaged, Chaotic, and Rigid, represent a novel improvement. The six scales in FACES IV also were found to be reliable and valid in the Italian version used in this study (Cronbach’s alpha: Cohesion=0.73; Flexibility=0.68; Enmeshed=0.67; Disengaged=0.63; Chaotic; 0.69; and Rigid = 0.68) (Baiocco et al. 2012).

Data Analysis

Descriptive statistics for males and females were calculated, and Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were applied.

We first analyzed the Bartlett’s Test of Sphericity and the Kaiser-Meyer-Olkin’s (KMO) Measure of Sampling Adequacy to assess if the items were significantly correlated and shared sufficient variance to justify factor extraction. Maximum likelihood (ML) was selected as the method of factor extraction; eigenvalues greater than 1, the Kaiser criterion, and the scree test were checked for agreement (Giannini et al. 2011).

A confirmatory factor analysis was performed using maximum likelihood (ML) estimation procedures. To assess statistically the closeness of the hypothetical model to the empirical data, multiple goodness-of-fit indices were used, including the ratio of the chi-square to degrees of freedom (χ^2/df), the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). Bentler and Bonnet (1980) contended that values greater than .90 indicate good fit for the TLI (Hu and Bentler 1999) and indicated that CFI values greater than .90 are needed; and Byrne (1994) contended that a cutoff of .93 should indicate a good fit. SRMR and RMSEA values less than .08 (Browne and Cudeck, 1993), and ideally equal to or less than .05, are interpreted as indicating models that fit well (Di Fabio and Gori, 2016, Giannini et al. 2011, Schermelleh-Engel et al. 2003, Stieger 1990). The reliability of the scale was calculated using the Cronbach’s *alpha* coefficient (Cronbach 1951). Some aspects of concurrent validity were explored by a series of two-tailed Pearson linear correlations. Statistical analyses were conducted using SPSS 18.0 and AMOS 6.0.

Table 1. Summary of Means and SDs, reliability and factor loadings of the CYPAT (N = 201)

	<i>M</i>	<i>SD</i>	α	α_{iid}	R_{it}	<i>F. L.</i>
1) Sometimes, I feel unable to control the watching of porn sites.	1.27	.82		.95	.91	.942
2) I neglected my partner or my family because I had to watch porn sites.	1.18	.74		.95	.91	.910
3) I ignored my commitments to look at porn sites.	1.26	.85		.95	.90	.915
4) I told myself to stop using online pornography but I didn’t succeed.	1.30	.91		.95	.90	.937
5) I feel that online pornography is like a drug for me	1.33	.95		.95	.86	.877
6) I have continued watching porn sites despite some negative consequences.	1.27	.87		.96	.81	.867
7) Sometimes, I watch porn sites to forget circumstances or painful situations.	1.22	.66		.96	.85	.864
8) Porn sites make me feel less alone	1.27	.77		.96	.76	.774
9) I have lost some important relationships because of watching porn sites.	1.14	.61		.96	.77	.775
10) I watch porn sites in contexts where I should not (e.g. in other people’s home, at school or at work ...).	1.17	.62		.96	.65	.665
11) I get sexually aroused only when I watch online pornography.	1.17	.67		.96	.62	.613
CYPAT total score	13.59	7.26	.96			

Note. *M* = mean; *SD* = standard deviation; SK = Skewness; KU = Kurtosis; α = Cronbach’s α ; α_{iid} = α if item deleted; r_{it} = part-whole corrected item-total correlation (related to the total score).

Results

Descriptive statistics

Means and SDs of the CYPAT scores are shown in **table 1**. An analysis of variance with gender as the independent variable showed group differences $F(1, 199) = 44.07, p = .001$; males obtained higher scores than females.

Reliability

A Cronbach's *alpha* coefficient of .96 (see **table 2**) for the eleven items suggested excellent reliability. Item-total correlations showed very good values, ranging from .62 (item 11) to .91 (item 1 and item 2) (see **table 1**).

Construct Validity

An examination of the scree plot (Cattell 1966), and percentage of variance accounted for, revealed the presence of one factor. The exploratory factor analysis (EFA) showed a factor structure with one principal dimension (eigenvalue > 1; 7.9), with 72.7% of total variance explained.

The goodness-of-fit indices showed a good fit of the model to the data. Although the chi-square was significant ($p < .001$), the Normed-Fit Index (NFI), the Tucker-Lewis-Index (TLI), and the Comparative-Fit Index (CFI), confirmed a one-factor solution of the CYPAT. However, the value of the root mean error of approximation (RMSEA) indicated a poor fit (see **table 2**).

Convergent Validity

The CYPAT showed strong positive and significant correlations (see **table 3** and **table 4**) with the Cyber-Pornography Use Inventory (CPUI), and moderate and significant correlations with the Twenty-Item Toronto Alexithymia Scale (TAS-20) and some factors of the Family Adaptability and Cohesion Evaluation Scale (FACES IV).

Discussion

It is well known that excessive involvement in online activities can result in negative effects on the psychological and physical health of an individual (Aboujade 2010, Callea et al. 2016, Kuss et al. 2014, Schimmenti et al. 2015); and notably, a deep involvement in internet pornography is linked to family dysfunction, legal consequences, and psychological distress (de Almeida Neto et al. 2011, Egan and Parmar 2013, Griffiths 2001, Manning 2006, Philaretou et al. 2005).

The present study assessed the psychometric properties of the CYPAT, a new screening tools for internet pornography addiction, in a sample of young adults. We first observed a difference between ages in the distribution of the scores in CYPAT. This data may be explained by reading the internet pornography addiction as a predominantly male activity; however further studies are necessary to deepen this finding.

With respect to the main psychometric properties of the CYPAT, we found excellent internal consistency and a one-factor solution. The only two indices that indicated a poor fit of the model were the chi square and the Root Mean Error of Approximation (RMSEA). Although the chi square was significant, the Normed-Fit Index (NFI), the Tucker-Lewis-Index (TLI) and the Comparative-Fit Index (CFI) showed satisfactory values and confirmed the one-factor solution. Regarding the RMSEA result, while many researchers (Browne and Cudeck 1993, MacCallum et al. 1996) have used .01, .05, and .08 to indicate excellent, good and mediocre fit, respectively, other researchers consider that .10 could be a reasonable cutoff for good versus poor fitting models, if the other indices used to verify the model fit are good or acceptable, which was the case in this study (Di Fabio and Gori 2016). Also, the RMSEA may falsely indicate a poor fitting model when assessing the fit of the models with small *df* and small sample size (eg., Di Fabio and Gori 2016, Kenny et al. 2015).

The positive and significant correlations between the CYPAT and the CPUI, the other self-report measure used for the assessment of traits related to pornography addiction, offers support for the concurrent validity of this scale. Correlations between the CYPAT and TAS-20 showed a weak link between internet pornography

Table 2. Summary of fit indexes for the estimated unidimensional model of the CYPAT

Sample	GFI	NFI	TLI	CFI	SRMR	RMSEA
Total sample (N = 201)	.965	.954	.931	.955	.033	.113

Note. GFI = Goodness-of-Fit Index; NFI = Normed Fit Index; TLI = Tucker Lewis index (Non Normed Fit Index); CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation

Table 3. Summary of correlations among CYPAT, CPUI factors and TAS-20 factors (n=72)

	CPUI Compulsivity	CPUI Efforts	CPUI Distress	CPUI Total Score	F1 TAS-20	F2 TAS-20	F3 TAS-20	TAS-20 Total Score
CYPAT	.81***	.83***	.77***	.86***	.24**	.23**	.14*	.27**

Note $p < .001$ ***, $p < .01$ ** , $p < .05$ *

Table 4. Summary of correlations among CYPAT and FACES-IV (n=72)

	Cohesion	Flexibility	Enmeshed	Disengaged	Chaotic	Rigid
CYPAT	-.19*	-.08	.08	.19*	.17*	.06

Note. $p < .05$ *

activities and difficulty in analysing and expressing emotion. Although a link between alexithymia and internet addiction symptoms recently has been found (Schimmenti et al. 2017), in our opinion, this aspect need to be examined more deeply in relation to internet pornography behaviors. Correlations between the CYPAT and FACES-IV indicated a possible positive link between disengaged and chaotic family experience with internet pornography behaviors and internet addiction, in line with previous studies that analysed the impact of internet pornography on marriages and families (Manning 2006, Pace et al. 2014). Future researches are needed to deepen the link between dysfunctional families and internet pornography behaviours.

The major limitation of the present study was the relatively small number of participants. Moreover the sample is quite unbalanced between males and females. The absence of a clinical sample and the cross-sectional nature of the research are other limitations. We are aware that future research in this field needs several road maps that consider the need for longer tenable behavioral addiction research that shifts from a mere criteria-based approach toward an approach focusing on the psychological processes involved (Billieux et al. 2015). Future studies on the topic should follow this approach and make use of larger samples with strict selection of the clinical samples to be investigated. Moreover, in future research, the role of internet pornography addiction could be also examined in relation to alexithymia, impulsivity and family functioning, perhaps in cross-national studies (Laudani et al. 2014).

Despite these limitations, the results of the study are promising and indicate that this brief and easily administered instrument for screening for pornography addiction has good psychometric properties and can be of use to those working in clinical settings, to activate insight processes or to derive indications of clinical outcomes (Gori et al. 2010, 2015); and in other contexts where it is necessary to investigate internet pornography behavior.

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