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Assessing the psychometric properties of the Internet Addiction Test: A study on a sample of Italian university students

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ABSTRACT

The aim of the study was to assess the psychometric properties of the 20-item Internet Addiction Test (IAT) among a sample of 659 Italian university students enrolled in several degree courses in the same university. The data collected was subjected to exploratory and confirmatory factor analyses by using robust statistical models. Results from exploratory factorial analysis suggested removing items 4 and 7 of the IAT. The final 18-items of the IAT were covered by a two-factor model which demonstrated good psychometric properties, and fits well with the data. Pearson's correlation results indicated that the two-factor model satisfied the criteria of convergent and divergent validity. The present study confirms that the IAT is a valid and reliable instrument for measuring Internet addiction. At the same time, the study suggests that some items of the IAT needs to be improved. Practical implications for further studies are provided as a conclusion.

1. Introduction

The rapid and pervasive transformation of the Internet in recent years has provided an interactive social platform for millions of people. The popularity of Internet-related services has become a part of modern life, especially through communication via social networking sites, and in the areas involving recreational and academic activities. It has even pervaded everyday activities like playing games, watching movies, surfing for information, posting selfies, and reading the news. On the other hand, scientific evidence shows that overuse of the Internet may be associated with adverse and problematic behaviour and could even lead to addiction (Calvo-Francés, 2016; Kaess et al., 2014; Kuss & Lopez-Fernandez, 2016; Romano, Osborne, Truzoli, & Reed, 2013; Van Rooij & Prause, 2014; Weinstein, Curtiss Feder, Rosenberg, & Dannon, 2014; Wu, Lee, Liao, & Chang, 2015).

The issue of Internet addiction has received increased attention in the last few years, and among the studies related to this topic, the evaluation of its relevance and symptomatology still represents the core of much of the present scientific debate (Griffiths, Kuss, Billieux, & Pontes, 2016; Young, 2015). Recent results show that social isolation, low self-esteem, weak personality traits, interpersonal and intrapersonal problems, as well depression, compulsive behaviour, pathological gambling, compulsive online shopping, attention deficit and hyperactivity disorder can all be associated with Internet addiction disorder (Koo & Kwon, 2014; Lee et al., 2012; Mittal, Dean, & Pelletier, 2013; Quiñones-García & Korak-Kakabadse, 2014; Romano et al., 2013; Ryan, Chester, Reece, & Xenos, 2014; Servidio, 2014; Zhang, Brook, Leukefeld, & Brook, 2016; Zhang et al., 2015).

Furthermore, given the pervasiveness of the Internet, the risks of addiction is a growing global problem. Results obtained from different screening methods (e.g., self-report questionnaires, neurological analysis, clinical interview, etc.) reveal that adolescents—in particular, university students—are most at-risk for developing Internet addiction (Hsu, Lin, Chang, Tseng, & Chiu, 2015; Li et al., 2016). In relation to this, university students report higher levels of computer ownership, Internet connection per day and time spent per day (Jelenchick, Becker, & Moreno, 2012).

Internet addiction, as a disorder, however, has not yet been clearly and uniformly defined. The concept itself was introduced by Young (1998). Referencing Internet addiction with pathological gambling, Young (2004) described it as an impulse-control disorder not involving an intoxicant but fulfils a set of criteria indicating an excessive or uncontrolled use of the Internet that not only causes behavioural problems but also impairs normal daily functioning. Addicted subjects exhibit symptoms such as preoccupation with Internet use, having lower mood, spending excessive amount of time online, exhibiting lower performance at school or work,

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having conflictual relationship with family and friends and lying about its use (Young, 2015). From this original description, several other conceptualizations have been used to explain this type of problematic human behaviour (Israelashvili, Kim, & Bukobza, 2012; Weinstein et al., 2014).

Moreover, although official diagnostic criteria for Internet addiction has not yet been clearly defined, there is a general consensus in considering it as an impulse control disorder and as a behaviour addiction (Griffiths et al., 2016; Lee et al., 2013). In this regard, the recent Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) underlines the necessity of conducting further research in the field of Internet addiction before it may be considered for inclusion as a formal disorder (Floros, Siomos, Stogiannidou, Giouzepas, & Garyfallos, 2014).

With the need for further research in this area highlighted, it is no surprise that an instrument measuring Internet addiction like the Internet Addiction Test (IAT) has also received a lot of attention. In current literature, for example, the evaluation of the psychometric properties of IAT reveals that its factorial structure is not always clear and stable. To understand fully the effects of technological evolution on human behaviour, it is important to update and revise the psychometric properties of the assessment tools that measure the risk of Internet addiction, including the IAT. This methodological approach assures the application of more reliable instruments for exploring the prevalence of addiction among subjects (Zhang & Xin, 2013), in keeping also with the rapid technological changes that accompany societal challenges (Brunetti & Servidio, 2010). This present study looks to determine the best-fit factorial structure of the IAT to make it more effective and more reliable in assessing the risk of problematic Internet use.

2. The Internet Addiction Test (IAT)

The first version of the IAT was designed and developed by Young (1998) and was based on the DSM-IV criteria for pathological gambling (e.g., tolerance, withdrawal symptoms, mood modification or relapse). According to Young (1998), the IAT measures the subjective risk of using the Internet (e.g., trying to hide the time spent online) and covers the degree to which technological abuse affects daily routine, social life, school and work productivity, and even sleep quality.

The IAT is a 20-item questionnaire with each item rated on a 5-point Likert-type scale ranging from 0 (not applicable) to 5 (always). The final score, which could range from 0 to 100, is the sum of the score for each subject's answer. A higher score indicates higher severity of Internet disorder that could negatively affect the subject's life. In this regard, Young (1998) suggests an impairment index to assess the subject's Internet behaviour in terms of: a) no problem (0–30 points); b) mild problems because of Internet use (31–49 points); c) moderate problems when the subject experiences occasional or frequent problems due to the Internet (50–79 points); and d) severe problems due to Internet usage which impacts negatively on the subject's life (80–100 points).

Literature aimed at evaluating the risk of Internet addiction reveals that Young's IAT is one of the most popular assessment instruments to screen for problematic Internet usage, and has demonstrated a strong internal reliability across studies (Chang & Man Law, 2008; Laconi, Rodgers, & Chabrol, 2014; Panayides & Walker, 2012).

The IAT has been translated and validated in several European (Barke, Nyenhuis, & Kröner-Herwig, 2012; Faraci, Craparo, Messina, & Severino, 2013; Fernández-Villa et al., 2015; Ferraro, Caci, D'Amico, & Blasi, 2007; Fioravanti & Casale, 2015; Hawi, Blachnio, & Przepiorka, 2015), and non-European languages (Chong Guan, Isa, Hashim, Pillai, & Harbajan Singh, 2015; Karim & Nigar, 2014; Lai et al., 2013). Furthermore, a German short version of the IAT has been validated and proposed, which in turn, demonstrates the scientific interest towards this instrument (Mirko Pawlikowski, Altstötter-Gleich, & Brand, 2013).

Other studies have attempted to test the dimensionality of the IAT, but the first version, which was in the English language, as well as the Arabic version (Hawi, 2013), the French version (Khazaal et al., 2008), the Indian version (Dhir, Chen, & Nieminen, 2015a), the Finish version (Korkeila, Kaarlas, Jääskeläinen, Vahlberg, & Taiminen, 2010), the Greek version (Panayides & Walker, 2012), and the Portuguese version (Pontes, Patrão, & Griffiths, 2014) all contained only one factor.

All previous assessments of the IAT's psychometric properties exhibit a common consistent result as regards the different number of the factorial solutions, which have ranged from one-to-six (Laconi et al., 2014; Watters, Keefer, Kloosterman, Summerfeldt, & Parker, 2013, for a review). Moreover, when similar numbers of factors were extracted, differences were observed in the distribution of the items on the factors (Khazaal et al., 2015; Watters et al., 2013). This heterogeneity in the factorial structure of the IAT poses a major concern for studying Internet addiction disorder, not because of the number of factors itself, but because of the different names assigned to the same factors, which could potentially define the concept of Internet addiction in a different way (Dhir, Chen, & Nieminen, 2015b). We may posit several reasons for the difference among the factorial structure, which include mainly theoretical, socio-cultural and methodological reasons. There is a theoretical aspect because Internet addiction is a relatively new construct and so recent studies aim to discover the nature of this disorder (Jelenchick et al., 2012; Widyanto, Griffiths, & Brunsden, 2011). On the other hand, socio-cultural background, inasmuch as it may reflect different improvements in the subjects' life-styles and their use of new technologies, could affect not only the translation procedures, but also could impact the factorial structure. All these aspects make it complex to investigate the nature and prevalence of Internet addiction (Hawi et al., 2015; Servidio, 2014; Teo & Kam, 2014). Then, the factorial structure could also depend on the inter- and intra-personal dimensions of the subject's personality as well as other important psychosocial variables, which altogether, can concur to redefine the current combination of the items (Koo & Kwon, 2014). As regards methodological issues, the extreme variability of the sample size, and the statistical techniques used to assess the psychometric properties of the IAT may also affect its factorial structure. Nevertheless, most of the current studies adopt statistical methods based on the idea of following a “me too” approach. This result could affect both the item distribution and the number of factors useful to explain how maladaptive Internet usage can lead to addiction for its users (Van Rooij & Prause, 2014).

A study aimed at examining the psychometric properties of the IAT in Chinese adolescents found satisfactory convergent and divergent validity with the Revised Chen Internet Addiction Scale (CIAS-R), amount of time spent online per day, and academic results (Lai et al., 2013). Another recent research found a good convergent validity of the IAT with depressed subjects (Lee et al., 2013). Other studies reported convergent validity of the IAT with time spent online by the subjects, and specific Internet usage (Ngai, 2007), as well as the subject's frequency of being engaged in online activities (Ha et al., 2007). A previous study has verified the convergent and divergent validity of the IAT and its association with other pathological behaviour like gambling (Northrup, Lapierre, Kirk, & Rae, 2015). Similarly, the IAT has also been used for studying the relationship between Internet misuse and gambling disorder in adolescents (Kuss & Lopez-Fernandez, 2016; Lee et al., 2012; Parker, Summerfeldt, Taylor, Kloosterman, & Keefer, 2013; Parker, Taylor, Eastabrook, Schell, & Wood, 2008; Tonioni et al., 2014).