



Cross-cultural adaptation and evaluation of the psychometric properties of the Brazilian version of the Video Game Addiction Test



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ABSTRACT

Background: A recurring complaint in psychological and psychiatric clinics involves problems associated with the use of video games. The aim of this research was to assess the translation and back-translation of the Video Game Addiction Test (VAT), its construct and convergent validity, its reliability based on internal consistency and retest methods of the instrument.

Material and methods: Fifty-five subjects were recruited for the cross-cultural and semantic adaptation of the VAT. For the evaluation of the psychometric parameters, 384 students were recruited to complete the VAT, the Internet Addiction Test (IAT), the Liebowitz Social Anxiety Scale (LSAS), the Beck Depression Inventory and the Game Addiction Scale (GAS). A subgroup of participants ($n = 76$) took part in a follow-up study and completed the scale twice to determine its test-retest stability.

Results: The process of the verbal understanding analysis emphasized the ease of understanding for the participants. The scale demonstrated excellent internal consistency (Cronbach's $\alpha = .92$) and a strong positive correlation with the GAS ($r = .883$).

Conclusion: In the Brazilian Portuguese context, the VAT was observed to have good semantic understanding, internal consistency and psychometric validity.

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1. Introduction

Video games allow players to engage in multiple possibilities of virtual narratives. In addition, the scope of these games has remarkably changed in recent years; they have become more complex, diverse, realistic, aesthetically developed and social (Guitton, 2012, 2015). According to Pessoa et al. (2014), video games may have a variety of goals. Cognitive games prioritize activities that involve attention, memory and movement skills. Some of these types of games are focused on movement-skills tasks, while others offer the possibility of social interaction. This access to cyberculture has been broadly distributed and utilized, as demonstrated by the existence of numerous console, computer and mobile games (Lemos, Abreu, & Sougey, 2014).

Problematic/addictive use of video games has been mentioned

more recently, although games have been studied for decades in relation to other topics in user behavior such as aggression/violent content, education and therapeutic use (Lemos et al., 2014). The dissemination of video games has been accompanied by numerous, recurring complaints in psychological and psychiatric clinics such as social isolation, excessive use, low self-esteem, frequent mood swings and withdrawal signs, which are associated with the pathologic use of these games (Jäger et al., 2012; Le Heuzey & Mouren, 2012). Video games are also associated with a potentially desensitizing nature in which players become accustomed to and more accepting of violence and aggression in real life and are therefore less bothered by or less empathic toward it (Ferguson et al., 2015).

This subject is considered to be an important research topic considering that many people display signs of this mental illness. Researchers have made efforts to treat this topic as a possible psychiatric disorder (King & Delfabbro, 2014; Kuss, 2013; Yau, Crowley, Mayes, & Potenza, 2012), and the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) has categorized this recent phenomenon in Session III of the manual titled "Internet Gaming Disorder" (APA, 2013) as an illness whose psychopathology

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is still under study (Lortie & Guitton, 2013).

The pathologic use of video games has been associated with lower psychosocial functioning, lower academic performance, and the use of alcohol, nicotine and marijuana (Van Rooij et al., 2014). It has been suggested that technological addictions should be studied utilizing a multidimensional landscape that examines biology (heredity), mental vulnerability, maladaptive learning (negative reinforcement in childhood) (Jäger et al., 2012; Le Heuzey & Mouren, 2012) and the presence of comorbidities (e.g., major depression, social anxiety disorder, internet addiction and substance use disorder) (Lemos et al., 2014; Rehbein, Mößle, Arnaud, & Rumpf, 2013). Other risk factors include personality traits (e.g., neuroticism and hostility) and structural characteristics of video games (e.g., online games are considered to be more addictive) (Kuss & Griffith, 2012).

With regard to epidemiological statistics, measures vary according to the country studied, the methods used in collecting and analyzing the data and the instruments used to examine the intended population (i.e., when analyzed by age and/or the number of participants). The prevalence of video game addiction in European countries varies between .9% and 3.3% for adolescents and adults; however, the prevalence is noted to be even higher in children (Beutel, Hoch, Wölfling, & Müller, 2011; Haagsma, Pieterse, & Peters, 2012). The land area of Brazil encompasses over 8.5 million square kilometers, occupying just under one-half (47%) of the South American continent; furthermore, the population of Brazil includes approximately 204 million people (IBGE, 2015). Despite its size and population, there is only one Brazilian epidemiological research study on this subject. This study was conducted in São Paulo and showed that 15.8% of 100 users that were interviewed had problematic video game usage (Suzuki, Matias, Silva, & Oliveira, 2009).

Although there are several new studies on video game addiction, there is still a lack of knowledge related to its etiology, epidemiology and measurement, particularly in Brazil. Research focused on problematic video gaming has greatly increased over the last decade, and several screening instruments have been developed in order to identify such behaviors (Lopez-Fernandez, Honrubia-Serrano, Baguley, & Griffiths, 2014). One possible strategy for identifying video game addicts is to validate a Brazilian version of the Video Game Addiction Test (VAT) (Van Rooij, Schoenmakers, Eijnden, Vermulst, & Mheen, 2012). A tool that serves this purpose may contribute to a better understanding of this addiction in affected adults among mental health professionals and improve their evaluations of the disorder.

The VAT is a test that was developed from The Compulsive Internet Use Scale (CIUS), which was chosen based on its high level of internal consistency (Cronbach's $\alpha = .93$). The instrument has a strong correlation with the Game Addiction Scale (GAS) ($r = .74$) and a moderate correlation with time spent on various types of video games ($r = .40$), specifically online games ($r = .37$). It has 14 items distributed among five criteria (loss of control, conflict, preoccupation/salience, coping/mood modification and withdrawal) and uses Likert-type responses (0, never; 1, seldom; 2, sometimes; 3, often; and 4, very often).

The original study included Dutch adolescent students from 171 classes ($n = 4.074$, mean age = 14.3 years, $SD = 1.0$). The survey's response rate was 92%, and 1.180 subjects were excluded because they did not play video games. The final sample included 2.894 students (62% male). The instrument proposed a one-dimensional measurement of video game addiction. The original VAT demonstrated a root mean square error of approximation (RMSEA) of .048 and a confirmatory fit index (CFI), a consistency indicator, of .961. The test defines this phenomenon as a behavioral addiction characterized by loss of control over the game, interpersonal and

intrapersonal conflict, concern about video games, the use of video games to change one's mood or escapism and withdrawal symptoms when the person is forced to stop playing (Van Rooij et al., 2012).

Technological devices, such as video game consoles and computers, are less prevalent in rural homes in Brazil. Schoolchildren who reside in urban areas spend more time with screen devices (e.g., televisions, video games and computers). While the present study was not performed on children, little is known about adult gamers in Brazil; therefore, it is possible to use children's behavioral preferences towards technology as a benchmark for adult behavior (Andrade Neto, Eto, Pereira, Carletti & Molina, 2014).

In a developing country such as Brazil, a Digital Generation currently exists, at least within a specific social stratum, who exhibits an almost ubiquitous deployment of digital technologies, perhaps not unlike what one observes in more developed nations (Souza, Silva & Roazzi, 2010). A Brazilian research study regarding gaming habits found that, among 302 medical students, 37 percent reported regular gaming and that male students played games 4.4 times more often than female students (Diehl, de Souza, Gordan, Esteves, & Coelho, 2014). Another Brazilian research study was conducted on a sample of 18,512 respondents from 13 States; The Brazilian Institute of Public Opinion and Statistics (IBOPE) published that in 35.1 million internet users, 54% have the habit of playing online (IBOPE, 2012). Despite this study's findings, little is known about games habits among Brazilians, especially those habits that are related to video game addiction. Even in a developing country, the VAT is useful in epidemiological and clinical studies and can also be used as a tool to understand the maladaptive habits of these gamers.

The aim of this research study was to assess the translation and back-translation of the VAT, its construct and convergent validity, and its reliability by internal consistency and retest methods.

2. Methods

Cross-cultural adaptation is an important consideration, as the meaning of game addiction may vary across different cultures and contexts. It is essential to ensure that all items formed in the new language are equivalent in terms of meaning to what was proposed in the original instrument. This procedure is used to describe a process that encompasses both language (translation) and cultural adaptation issues in the process of preparing a questionnaire for use in another setting (Beaton, Bombardier, Guillemin, & Ferraz, 2000). For the cross-cultural and semantic adaptations, the following procedure was performed to evaluate several types of equivalence (Reichenheim & Moraes, 2007): a) literature review involving the review of instruments related to video game addiction and discussing the importance of the theme and the instruments with both experts (five psychiatrists and five psychologists) and the target population (adults who use video games); b) translation of the original instrument, which was performed by two bilingual experts in addiction who were not familiar with the original instrument; c) back translation, which was performed by an American professor who was fluent in Portuguese; d) evaluation of the comprehensibility of the items, which was performed by a group of 12 experts; e) application of the instrument to 40 college students to evaluate their verbal understanding of the instrument; f) drafting of a new version of the instrument; and g) creation of final version of the VAT.

The participants evaluated the VAT using a verbal numeric scale based on the question, "Did you understand what was asked?" The answers were as follows: 0 (I did not understand at all); 1 (I understood a bit); 2 (I understood reasonably well); 3 (I understood almost everything, but I have doubts); 4 (I understood almost

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