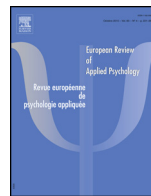




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Original article

## Psychometric properties of the Problem Video Game Playing scale in adults



### *Propriétés psychométriques de l'échelle Problem Video Game Playing chez les adultes*

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#### ABSTRACT

**Introduction.** – Internet Gaming Disorder (IGD) was introduced for the first time within the “conditions for further study” in the fifth edition of the Diagnostic and Statistical Manual of the American Psychiatric Association, and a systematic review has concluded that the only available instrument for its measurement is the Problem Video Game Playing scale (PVP). Nevertheless, this scale was presented as a diagnostic tool for adolescents, and to date no study has analyzed its properties amongst adults.

**Objective.** – The aim of the study was to analyze and compare the diagnostic and psychometric properties of the PVP in adult and adolescent gamers.

**Method.** – Two samples of adult ( $n = 525$ ) and adolescent ( $n = 384$ ) gamers completed a survey including patterns of play, PVP, Severity of Dependence Scale, and other measures of playing to excess.

**Results.** – Confirmatory factor analyses revealed that the scale presents a one-factor structure that is similar to that of the original version, both in adults and adolescents. Construct validity was supported by highly significant associations between the PVP and all alternative measures of playing to excess. On the other hand, reliability values were lower than in previous studies.

**Conclusions.** – The PVP scale's properties are appropriate for the measurement of problem video gaming in adults as well as in adolescents, but studies with clinical assessments are still needed before any cutoff value for diagnosis can be established.

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#### R É S U M É

**Introduction.** – Le trouble du jeu vidéo sur Internet (Internet Gaming Disorder [IGD]) a été introduit pour la première fois dans les « conditions pour une étude plus approfondie » dans la cinquième édition du *Manuel diagnostique et statistique des troubles mentaux* (DSM-5 ; American Psychiatric Association, 2013) et une revue systématique a conclu que le seul instrument disponible pour sa mesure est l'échelle Problem Video Game Playing (PVP). Néanmoins, cette échelle a été présentée comme un instrument de mesure pour les adolescents, et à ce jour aucune étude n'a analysé ses propriétés chez les adultes.

**Objectif.** – L'objectif de cette recherche était l'analyse et la comparaison des caractéristiques psychométriques de l'échelle PVP chez les joueurs adultes et adolescents.

**Méthode.** – Deux échantillons de joueurs adultes ( $n = 525$ ) et adolescents ( $n = 384$ ) ont rempli un questionnaire qui comprend les patrons de jeu PVP, Severity of Dependence Scale, et d'autres mesures liées au jeu excessif.

**Résultats.** – Les analyses factorielles confirmatoires montrent que l'échelle présente une structure à un facteur similaire à celle observée dans la version originale, à la fois chez les adultes et chez les adolescents. La validité théorique (*construct*) a été soutenue par des associations hautement significatives entre l'échelle et toutes les mesures alternatives de jeu excessif. Par ailleurs, les valeurs de fiabilité ont été plus faibles que dans les études précédentes.

##### Mots clés :

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*Conclusion.* – Les propriétés de l'échelle PVP sont appropriées pour la mesure du problème de jeux vidéo chez les adultes comme chez les adolescents, mais des études avec des évaluations cliniques sont nécessaires pour établir une valeur type permettant d'établir un diagnostic.

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Over the past decades, a growing number of voices have raised concerns about the potentially addictive nature of video games, but until the year 2013 such condition was excluded from the Diagnostic and Statistical Manual of the American Psychiatric Association. The fifth version of the manual (DSM-5; American Psychiatric Association, 2013) crossed the line when it introduced Internet Gaming Disorder (IGD) within the conditions for further study and defined it as a “persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinical impairment or distress” (American Psychiatric Association, 2013, p. 795). This new categorization has given rise to controversies regarding the confusion of the Internet and video games within a single classification (King & Delfabbro, 2012), the exclusion of offline video gaming from the disorder (Griffiths, Kuss, & King, 2012), and the possible consideration of IGD as an addictive disorder (Lopez-Fernandez, Honrubia-Serrano, Baguley, & Griffiths, 2014).

There is no doubt that IGD deserves further study, and one of the most necessary requirements for it is the availability of a valid and reliable tool for the measurement of the problems associated with video gaming. Recently, King, Haagsma, Delfabbro, Gradisar, and Griffiths (2013) presented a systematic review of the 18 instruments for the measurement of video game addiction presented between 1996 and 2012. Each tool's capacity to assess IGD as defined by the DSM-5 was examined, concluding that “only one instrument, the Problem Video Game Playing (PVP) Scale, demonstrated this capacity” (p. 338).

The PVP scale (Tejeiro & Moran, 2002), broadly utilized as a screening test for video game addiction in a variety of countries and settings (see Tejeiro, Gómez-Vallecillo, Pelegrina, Wallace, & Emberley, 2012), is a 9-item dichotomous questionnaire based on the criteria for substance dependence and for pathological gambling included in the DSM-4 (American Psychiatric Association, 1994), as well as on the literature on addictions. Psychometric analyses have shown that the PVP is one-dimensional, presents good internal consistency (Cronbach's alpha mostly from .69 to .79) and statistically significant relationships with clinical indicators and alternative measures of problem-gaming (King et al., 2013; Lopez-Fernandez et al., 2014) specified the correspondence of the PVP items with IGD symptoms: preoccupation (item 1), withdrawal (4), tolerance (2), loss of control (3 and 6), continued use despite knowledge of psychosocial problems (8), deception (7), escape (5) and conflict with relationships, job or school (9); loss of interest in previous hobbies is not explicitly addressed in the PVP but can be considered as implicit in item 9.

In their review, King et al. (2013) outlined a number of methodological issues affecting most of the tools analyzed. One limitation was the lack of specification of the ages for which 10 of the 18 instruments were deemed valid — two instruments were reported as being appropriate for those aged 8 years and over whereas five measures, including the PVP, specified a minimum age of 12 or 13 years. Specifically, the PVP was developed from a sample of 13 to 18 year olds and presented as a tool for the measurement of problem video game playing in adolescents, and to date no study has analyzed its properties in other age groups. Despite this, it has been utilized for the assessment of video game addiction in children as young as 9 (Arab et al., 2007) or in different groups of adults (Caillon, Bouju, & Grall-Bronnec, 2014; Icassati, Vieira, Araujo, & Magalhães, 2009; Skarphedinsson, Pálsdóttir, & Por Ólason, 2008).

The establishment of cutoff scores for the PVP constitutes another point for controversy. Although its authors presented it as a 9-point ordinal scale, several studies have utilized a range of cutoff values: three (Arab et al., 2007), four (Tejeiro et al., 2012), five (Adiele & Olatokun, 2014) and six (Lopez-Fernandez et al., 2014). Such proposals have not been justified with the procedures commonly used to assess diagnostic accuracy and to establish cutoff values — such as the receiver operating characteristic (ROC) curve —, probably due to the difficulty to obtain a gold standard or reliable diagnostic reference, especially in large samples. Further, Hart et al. (2009) found no support for the use of a cutoff score of any level with the scale.

Whilst video gaming has been most commonly associated with adolescence, as the cohorts of video gamers born in the 1990s and 2000s grow old — and as the industry expands and widens its target to ages before and after adolescence —, it can be assumed that the importance of this activity among adults will increase in future years. Therefore, knowing whether the PVP can be equally applied to adults becomes a question of prime importance. Providing an answer to this question constitutes the target of the present paper.

## 1. Method

### 1.1. Participants

The study surveyed two samples formed by adolescents ( $n=384$ ) and adults ( $n=525$ ). Adolescents were aged between 11 and 17 ( $M=14.9$ ,  $SD=1.50$ ), with 15.6% in the younger range (11–13 years) and 84.4% in the older range (14–17 years). They were distributed equally between males (49.7%) and females; there was no gender difference between older and younger adolescents. The majority (92.4%) had Spanish nationality, with 19 additional nationalities and 1 unreported. Adults' age ranged from 20 to 50,  $M=21.5$ ,  $SD=4.34$ ; 97.7% were young adults ( $\leq 35$  years). Females represented 64.8% of the sample; 95.2% were Spanish nationals, with the remaining distributed across 15 other nationalities. The adolescents were selected from a convenience sample of four high schools in the Spanish province of Alicante; adult participants were students following five undergraduate degree programmes at Universidad Miguel Hernandez in Elche. In both settings, a random sample of classrooms was first selected and then all students in those classrooms were invited to participate, with the only exclusion criterion that they must have played video games at least once in their lives. Although the participation rate was 100%, 23 surveys from adolescents and 16 from adults were discarded because more than 50% of the variables were missing. No data were collected regarding ethnic group or socioeconomic level in order to comply with school requirements, but the vast majority of both adults and adolescents were white (Caucasian) middleclass participants.

### 1.2. Materials

Three types of data were collected: socio-demographics (age, gender and nationality), use of video games during the previous year (frequency, mean and longest session, and use of offline or online video games) and potential problems associated with video gaming. The last aspect was measured with three sets of questions. First, the person's perceived control of video games during the past year was assessed with 3 items extracted from Tejeiro and Moran

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