



# The Impulsive Sensation Seeking (ImpSS): Psychometric properties and predictive validity regarding substance use with Spanish adolescents



S. Fernández-Artamendi <sup>a,\*</sup>, V. Martínez-Loredo <sup>a</sup>, J.R. Fernández-Hermida <sup>a</sup>, J.L. Carballo-Crespo <sup>b</sup>

<sup>a</sup> Addictive Behaviors Research Group, Department of Psychology, University of Oviedo, Spain

<sup>b</sup> Miguel Hernández University, Elche, Alicante, Spain

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## ABSTRACT

The study of impulsivity and sensation seeking in adolescence is crucial given its implication in multiple risk behaviors. The present study aims to analyze the reliability and factorial structure of the Impulsive Sensation Seeking (ImpSS) scale with a big sample of adolescents from the general population, calculating the convergent validity with the Barratt Impulsiveness Scale (BIS-11-A) and its predictive validity with the use of tobacco, alcohol, and cannabis, as well as intoxication episodes, binge drinking and problem drinking. A total of 1321 students participated in the study (mean age: 12.98 years old; 55.3% male). Results indicated that the ImpSS has high reliability ( $\alpha = .83$ ), as well as predictive validity regarding tobacco, cannabis and excessive alcohol use. No significant gender differences were found in the final ImpSS scores in our sample. Factorial analyses determined that a two-factor structure is the most adequate. Nevertheless, high correlation between subscales (.69) suggests an important second-order factor of Impulsive Sensation Seeking. Our results indicate that the ImpSS is a valid and reliable instrument to assess impulsive sensation seeking in adolescents, and it shows good predictive validity regarding substance use. Discussion of implications for the study of impulsivity and sensation seeking in adolescents is provided.

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## 1. Introduction

If there is a period in life typically associated with sensation seeking (SS), that is adolescence. Zuckerman (1979) hypothesized that sensation seeking increases from early childhood and peaks during adolescence, decreasing thereafter until the older ages. Accordingly, some recent studies have reported a significant increase in SS during early childhood and adolescence (Collado, Felton, MacPherson, & Lejuez, 2014; Romer & Hennessy, 2007), to remain stable or decrease steadily thereafter (Romer & Hennessy, 2007; Roth, Schumacher, & Brahler, 2005; Steinberg et al., 2008).

Zuckerman described SS as “a trait defined by the seeking of varied, novel, complex and intense sensations and experiences, and the willingness to take physical, social, legal and financial risks for the sake of such experience” (Zuckerman, 1994, p. 27). According to the notion of Optimum Level of Stimulation (OSL), each individual has a specific level of stimulation they feel most comfortable with. At this OSL, psychological pleasantness would be highest, and therefore if individuals fall below (or over) their optimum threshold, they will seek (or avoid) new stimulation in the environment (Zuckerman, 1994). In order to seek new stimulation, individuals would display different exploratory

behaviors, which include risk taking and variety seeking. Behavioral studies have confirmed that risk judgements of sensation seekers are biased toward the low end enabling them to take greater risks such as risky driving, playing dangerous sports or unprotected sexual practices (Zuckerman, 2007; Zuckerman & Aluja, 2015).

One recurrent exploratory behavior of adolescents aimed at seeking new sensations is substance use. Accordingly, the onset of drug use for the majority of the population in Western countries takes place during the age period comprised between 10 and 20 years of age (European Monitoring Centre for Drugs and Drug Addiction, 2014; Swendsen et al., 2012; United Nations Office on Crime and Drugs, 2012). Sensation seeking has been consistently linked to substance use (Roberti, 2004), and this association has been particularly confirmed in early and middle adolescents (Kong et al., 2013; Martin et al., 2002) and in young adults (González-Iglesias, Gómez-Fraguela, Gras, & Planes, 2014). SS has biological roots (Zuckerman & Kuhlman, 2000) that would make it a mediator in the relationship between puberty and drug use (Martin et al., 2002). At the same time, the relationship between SS and substance use would be mediated by associations with drug-using peers (Yanovitzky, 2005, 2006), positive attitudes toward substance use (Puente, Gutierrez, Abellan, & Lopez, 2008) and favorable affect associated with the activity (Romer & Hennessy, 2007).

The appropriate assessment of SS is crucial given its determinant role in the appearance of many risk behaviors such as substance use (Roberti, 2004), and more specifically during adolescence. Traditionally,

\* Corresponding author at: Office 316, Department of Psychology, University of Oviedo, Pza Feijóo s/n, 33003 Oviedo, Asturias, Spain.

E-mail address: [sfernandezartamendi@outlook.com](mailto:sfernandezartamendi@outlook.com) (S. Fernández-Artamendi).

the SSS-V (Zuckerman, Eysenck, & Eysenck, 1978) has been considered a standard method for the assessment of sensation seeking, and it has been widely utilized in multiple studies (Ferrando & Chico, 2001). Nevertheless it has been criticized for including items related to alcohol and drug consumption, sexual behaviors and physical activities that might limit its utility with different cultural and age groups. Arnett (1994) developed the Arnett Inventory of Sensation Seeking (AISS) as an alternative to overcome some of these limitations, excluding age-related items and specific questions regarding risk behaviors. The AISS measures essentially the same dimension as the SSS-V (Ferrando & Chico, 2001) but it has also received critics due to its low internal consistency (Roth, 2003; Zarevski, Marušić, Zolotić, Bunjevac, & Vukosav, 1998) and because some items might not be significantly contributing to the evaluation of the sensation seeking construct (Ferrando & Chico, 2001).

One robust alternative to measure sensation seeking in a broader framework that includes impulsivity is the Impulsive Sensation Seeking (ImpSS), a subscale of the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ, Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). The ImpSS scale includes 19 items and evaluates the preference for change and uncertainty as well as a tendency to act without thinking or planning. Eight of these items belong to the subscale labeled “Impulsivity”. The other eleven are part of the subscale evaluating “Sensation Seeking”; eight of which are adapted from the SSS-V. The ImpSS is a brief alternative measure to evaluate impulsive sensation seeking that has shown good reliability with Cronbach's  $\alpha$  ranging between .84 and .87 (McDaniel & Mahan, 2008). Moreover, the ImpSS has shown to have good convergent validity with the SSS-V and even a more favorable predictive validity than the latter regarding some high-risk behavioral correlates (McDaniel & Mahan, 2008).

Despite its strengths, the ImpSS is still underused by the research community when compared to other traditional instruments such as the SSS-V, which has a greater length and has shown lower reliability and some theoretical inconsistencies (McDaniel & Mahan, 2008). The ImpSS has been translated into Spanish as part of the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ-III) by Gutiérrez-Zotes, Ramos Brieva, and Saiz Ruiz (2001), and it has been used in several studies with Spanish samples thereafter (e.g. Aluja, García, & García, 2004; Goma-i-Freixanet & Valero Ventura, 2008; Gutiérrez-Zotes et al., 2001; Romero, Luengo, Gomez-Fraguela, & Sobral, 2002). In one of the scarce studies of the psychometrics of the ZKPQ with Spanish adolescents (Romero et al., 2002), the ImpSS subscale showed a good reliability of  $\alpha = .78$ . This is very similar to .77 (Robbins & Bryan, 2004) or .76 (Capone & Wood, 2009) found in other studies with English-speaking adolescents.

Given the promising role of the ImpSS as a robust assessment tool for impulsive sensation seeking, we considered necessary to conduct a thorough analyses of the structure and psychometrics of the scale. We carried out a factorial analysis of the structure of the Spanish version of the ImpSS in a sample of adolescents. Afterwards, we analyzed its reliability and predictive validity regarding a key risk behavior correlate of SS, namely substance use. Additionally, we included in this study the Spanish version (Cosi, Vigil-Colet, Canals, & Lorenzo-Seva, 2008) of the Barratt Impulsiveness Scale 11-A (BIS-11 A, Fossati, Barratt, Qcquarini, & Di Ceglie, 2002) to evaluate the convergent validity of the ImpSS.

## 2. Method

### 2.1. Participants

A total of 1321 students from the second course of 16 secondary schools in Asturias, Spain, participated in the study. Selection of schools was performed following a random stratified and incidental procedure. To control for age effects, only data from those adolescents between 12 and 14 years of age was utilized in the study. Eventually, 1236 participants were retained for the analyses. The Oviedo Infrequency Scale

(Fonseca-Pedrero, Paino-Piñeiro, Lemos-Giráldez, Villazón-García, and Muñiz, 2009) was used to discard those questionnaires with inconsistent responses or those completed in an erratic manner. Following the rules established by the authors, questionnaires from 53 participants were finally excluded. Therefore, the final sample was made up with 1183 participants (55.3% male), with a mean age of 12.98 years old ( $SD = 0.54$ ). Participation in the study was voluntary and none of the students refused to participate. The study was approved by the Ethics Committee of the Secretary of State of Research and Innovation, the local educational authorities and the participating schools.

### 2.2. Procedure

All questionnaires were computerized and adapted to an electronic tablet framework (Samsung Galaxy Tab2 10.1). The software allows for an automatic detection of blank responses, suggesting the participant to review them. It also prevents the system from presenting participants with unnecessary or incongruent questions based on previous answers. Participants were given guarantees of total confidentiality and anonymity.

Participants filled out the questionnaires during school time, in their own classroom and in a single session. Only a specifically-trained researcher supervised the session and no teaching staff was present.

### 2.3. Measures

#### 2.3.1. Sociodemographic information

The questionnaire included questions on basic sociodemographic data including age and gender.

#### 2.3.2. The Oviedo Infrequency Scale (INF-OV)

The Oviedo Infrequency scale (INF-OV) was used to detect questionnaires completed in an erratic manner or at random (Fonseca-Pedrero et al., 2009). A total of 12 items are mixed with other questions throughout the questionnaire asking about obvious questions such as ‘I know people who wear glasses’. Following the rules established by the authors, participants providing three or more wrong answers were excluded from further analyses.

#### 2.3.3. Impulsive Sensation Seeking (ImpSS)

The Spanish version of the Impulsive Sensation Seeking from the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ, Zuckerman et al., 1993) was used. This subscale has 19 true/false (false 0, true 1) items which provide a general score and two sub-scores: Impulsivity (Imp) and Impulsive Sensation-Seeking (SS). The scale evaluates the preference for change and uncertainty, as well as the tendency to act without thinking or planning. The questionnaire avoids using items related to specific behaviors that would limit its suitability for different contexts and cultures. The internal consistency of the ImpSS as a subscale of the ZKPQ was acceptable (Cronbach's  $\alpha = .78$ ) when used with Spanish adolescents (Romero et al., 2002). Subscales showed more moderate reliabilities ( $\alpha$  Imp = .62 and  $\alpha$  SS = .78).

#### 2.3.4. Barratt Impulsiveness Scale

The Spanish version (Cosi et al., 2008) of the BIS, version 11 (BIS-11-A, Fossati et al., 2002) was used. It includes 30 items with Likert-type responses on the frequency of several impulsive behaviors (1 if rarely or never, 2 if occasionally, 3 if often or 4 if almost always or always). The BIS-11-A consists of two subscales: general (BIS-g) and non-planning (BIS-np). Its validation with Spanish adolescents showed a good reliability with a Cronbach's Alpha of .87 (Martínez-Loredo, Fernández-Hermida, Fernández-Artamendi, Carballo-Crespo, & García-Rodríguez, 2015)

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