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ORIGINAL ARTICLE

# Adaptation of the Impulsive Sensation Seeking Scale to Turkish

**Sinan Yıldırım[1], Emre Bilgin[2], Yılmaz Yüksel[3], Gıyasettin Demirhan[2], F. Hülya Aşçı[4]**

[1]Pamukkale University, Faculty of Sport Sciences, Denizli, Turkey
[2]Hacettepe University, Faculty of Sport Sciences, Ankara, Turkey
[3]Hasan Doğan School of Physical Education and Sports, Karabük, Turkey
[4]Marmara University, Faculty of Sport Sciences, İstanbul, Turkey

**ORCID iDs of the authors:** S.Y. 0000-0002-0307-7922, E.B. 0000-0003-1300-3131, Y.Y. 0000-0003-1816-2916, G.D. 0000-0002-0758-3427, F.H.A. 0000-0002-6650-693118.

**Abstract**

The aim of this study was to examine the validity and reliability of the Impulsive Sensation Seeking Scale (ImpSS) for the Turkish sample. A total of 459 individuals (221 female and 238 males, mean age = 34.94 ± 10.52years) voluntarily participated in this study. The ImpSS, developed by Zuckerman et al. (1993), measures the sensation-seeking traits of individuals. It includes two subdomains, Impulsivity and Sensation Seeking, and 19 items. The exploratory factor analysis revealed that the 19 items were in a two-factor structure, and this result was also confirmed by confirmatory factor analysis. Cronbach's alpha for reliability of the Impulsivity and Sensation Seeking subscales, and the full scale, was 0.77, 0.78, and 0.84; 0.75, 0.73, and 0.80 in Kuder-Richardson formula (KR-21); and 0.75, 0.79, and 0.82 in test-retest, respectively. The Turkish version of the ImpSS is valid and reliable for measuring general sensation seeking.
**Keywords:** Impulsive sensation seeking, impulsivity, reliability, sensation seeking, validity

## Introduction

Sensation seeking, a biosocial dimension of personality, is defined as "the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1994, p27). People having high sensation-seeking traits may tend to involve themselves in risky activities such as dangerous sports and substance abuse (Beaton et al., 2014; Thomson et al., 2015). Sensation seeking is associated with different problem behaviors such as substance use and binge eating (Beaton et al., 2014), risk-taking behaviors (Crysele et al., 2013; Qu et al., 2020), alcohol and tobacco consumption in adolescents (Schepis et al., 2008), gambling (McDaniel & Zuckerman, 2003), and risky decision making (Lauriola et al., 2014). The Impulsive Sensation Seeking Scale (ImpSS) (Zuckerman et al., 1993) has been widely used in measuring these psychological structures.

A remarkable contribution to the assessment of sensation seeking has been made by Zuckerman and his colleagues. They carried out a series of studies for measuring sensation seeking. The Sensation Seeking Scale (SSS) was developed by Zuckerman and his colleagues in 1964 and the they revised it in subsequent studies in 1968, 1971, and 1978.The final version of the scale is called the Sensation Seeking Scale-Form V (SSS-V; Zuckerman et al., 1978) which comprises 40 items and produces an overall score, and scores on four subscales of thrill and adventure seeking, experience seeking, disinhibition, and boredom susceptibility. However, SSS-V contains questions about drinking, substance use, and sexuality, and is not suitable for use in all cultures (Zuckerman, 2015). For this reason, Zuckerman et al. (1993) developed the ImpSS, which is more suitable for measuring sensation seeking in different cultures, based on the SSS-V.

The ImpSS is part of a broader five-factor personality test of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ, Zuckerman et al., 1993). The ZKPQ also consists of Neuroticism-Anxiety, Activity, Sociability, and Aggression-Hostility

**Corresponding Author:**
Sinan Yıldırım
**E-mail:**
snysbf@gmail.com

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(Zuckerman et al., 1993) scales. The Zuckerman-Kuhlman Personality Scale was cross-culturally validated in different cultures such as Spain (Aluja et al., 2004; Herrero et al., 2001), Catalonia – Spain (Gomà-i-Freixanet et al., 2005), China (Wu et al., 2000), France (Rossier et al., 2008), Germany (Ostendorf & Angleitner, 1994), Italy (De Pascalis & Russo, 2003), Catalonia, Hungary (Surányi & Aluja, 2014), and Romania (Sârbescu & Neguţ, 2013). Furthermore, some researchers only used the ImpSS and tested its psychometric properties in Greece (Hyphantis et al., 2010), United States (Webster & Crysel, 2012), and Spain (Fernández-Artamendi et al., 2016). The ZKPQ was also used in studies in Turkey (Gönüllü & Dökmeci, 2007; Guliyeva & Yargıç, 2015), but no evidence was provided for its psychometric properties for the Turkish sample.

There have been a number of attempts to develop alternative measures of sensation seeking. For example, the Barratt Impulsivity Scale (BIS-11) (Patton et al., 1995), the Arnett Inventory of Sensation Seeking, (AISS, Arnett, 1994), and The Brief Sensation Seeking Scale, (BSSS-4, Hoyle et al., 2002). Each of these scales has its own advantages and disadvantages. The BIS-11 focuses on impulsivity and acting without thinking (Patton et al., 1995). There is no measurement of sensation seeking in this scale. The AISS focuses on the social dimension of excitement and does not include impulsivity (Arnett, 1994). The BSSS-4, on the other hand, consists of four items and one dimension, and falls short of evaluating different dimensions of sensation seeking. Moreover, there is no impulsivity dimension in the BSSS-4 (Hoyle et al., 2002). Although each of these measures has strengths, the ImpSS is a good alternative since it measures the impulsivity and sensation-seeking criteria together. The ImpSS has an advantage over other scales because it has a biological dimension which stems from impulsive inclinations, and the social dimension, which covers personal interests in sources of sensation. The ImpSS offers the advantage of widespread use (Zuckerman, 2007). Furthermore, the ImpSS does not describe activities such as alcohol consumption and sex, which makes it a good scale to use in different cultures (Zuckerman et al., 1993). With this feature, the scale can be used in some cultures that are against alcohol consumption and do not want to talk about sexuality. The scale can also be used in cross-cultural research. Compared to the other scales mentioned above, the ImpSS was preferred in this study due to its advantages such as being short, easy to apply, and suitable for the general population. In addition, the ImpSS continues to be used in public health-related issues such as substance use and gambling (Martínez-Loredo et al., 2019), depressive symptoms, lifetime stress (Mahoney et al., 2015), and risk-taking behaviors (Crysel et al., 2013). For this reason, introducing the ImpSS to Turkish culture may contribute to the research related to public health. The aim of this study was to examine the validity and reliability of the ImpSS for the Turkish sample.

## Methods

### Participants

Convenient sampling was used to select the participants. The sample size in this study was determined by considering 5, 10, and 20 times the number of items in the scale (Kline, 2016). The ImpSS has 19 items, and a sample size of 190 participants was sufficient according to Kline (2016). Two hundred twenty-one female (mean age = 36.36, SD = 10.88 years) and 238 male (mean age = 33.62, SD = 10.03years) (a total of 459) participants (mean age = 34.94, SD = 10.52 years – age range = 18 – 60) participated in this study. Two hundred forty participants' data (mean age = 36.11, SD = 11.25 years) were used for exploratory factor analysis, and the rest of participants' data ($n$ = 219; mean age = 33.68, SD = 9.62 years) were used for the confirmatory factor analysis. Of the participants, 63.4% were university students or graduates ($n$ = 291); 30.1% had a post-graduate degree ($n$ = 138), and 5.9% had a high-school diploma ($n$ = 27); 0.4% were secondary-school graduates ($n$ = 2), and 0.2% were primary school graduates ($n$ = 1).

### Data Collection Instruments

The ImpSS developed by Zuckerman et al. (1993) includes 19 items, and each item is responded to on a True (1) – False (0) scale. It consists of impulsivity (8 items), and sensation-seeking (11 items) subscales. Impulsivity involves acting spontaneously without making plans or considering the consequences (item example: I generally act on a whim). Sensation seeking refers to the desire to seek new experiences and excitement (item example: I enjoy new and exciting experiences even if they are a little scary, unusual, or illegal). The scale also yields a total score that ranges between 0 and 19. Items two and six are reverse-scored items. The higher scores obtained in the subscale and total scale indicate higher levels of impulsivity, greater pursuit of sensation, and higher sensation-seeking impulsivity.

### Data Collection Procedure

Permission was obtained from the Ethics Committee of Hacettepe University (Document Date: July 5, 2018, no. 82416169-755.02.06/00000132168). First, the permission was received from the developer of the scale via email. Subsequently, the back-translation procedures were carried out, according to Brislin (1986) and Beaton et al. (2000). The English version of the scale was translated into Turkish by three researchers from the exercise and sport psychology fields. Next, three specialists in exercise and sport psychology were consulted about the three Turkish forms. They compared the Turkish form items and identified common and suitable translations. Another linguist re-translated each of the translated items back to English. The back-translated version of the English scale was compared with the original one, and certain revisions were made based on expert's opinion. The final version of the scale was checked by experts' examination of the translated, back-translated, and original items together. Then, 30 participants completed the final version of the scale to test whether or not all items were clear and understood.

The data were collected using social networks (Facebook, etc.). No time limit was indicated for the participants to fill in the forms; they were requested to provide true answers. Instructions about how to complete the scales were given on the online forms. Participation in the study was on a voluntary basis. Since the forms were online, the participants and researchers would not come into direct contact, and there was no incentive or demand that could have increased the participation rate. For test-retest reliability, the scale was administered to 50 participants at two-week intervals.

**Data Analysis**

The construct validity of the scale was tested by using exploratory factor analysis and confirmatory factor analysis. Principal component exploratory factor analysis with varimax rotation was used to test factor structure. The lowest possible value for factor loadings was accepted as 0.30 (Çokluk et al., 2014). Confirmatory factor analysis was carried out on different samples to test the two-factor structure that was identified in the exploratory factor analysis. Fit indices such as RMSEA and CFI were used to validate the model and assess data fit in the confirmatory factor analysis. A quotient of Chi-Square and degree of freedom ($\chi^2$/df) smaller than three (Tabachnick & Fidell, 2007), and RMSEA and SRMR values smaller than 0.05 were considered to show perfect fit, whereas those smaller than 0.08 were considered to show acceptable fit (Browne & Cudeck, 1992). CFI and NNFI values greater than 0.95 show perfect fit, and those greater than 0.90 show acceptable fit (Hu & Bentler, 1999; Tabachnick & Fidell, 2007).

Cronbach's alpha coefficient and Kuder-Richardson (KR) formulas were used to assess the reliability of the scale. There are some conflicting results in the literature regarding the use of Cronbach's alpha coefficient in tests with a binomial distribution, such as true or false, yes or no. The Cronbach's alpha coefficient value was used in the adaptation of the SSS in different cultures (Fernández-Artamendi et al., 2016; Rossier et al., 2008; Webster & Crysel, 2012). For this reason, we preferred to use both Cronbach's alpha coefficient and the KR-21 to compare our results with other culture studies. The test-retest reliability of the scale was also examined by Pearson correlation coefficients. The level of significance was accepted 0.05 in all the analyses.

For data analysis, IBM SPSS 23.0 was used to calculate the internal consistency coefficients and for exploratory factor analysis. LISREL 8.80 was used for confirmatory factor analysis, and jMetrik statistical software was used to compute the Kuder-Richardson 21 (KR-21) formula.

## Results

The skewness and kurtosis values of this study are between 0.221 and 1.353 in the subscales; and between −0.311 and 0.695 for the whole scale. The obtained values were within the acceptable ranges of +1.5/−1.5 (Tabachnick & Fidell, 2007). The skewness and kurtosis were analyzed to evaluate the data fit for normality distribution.

## Validity Results

**Exploratory Factor Analysis Results**

The Kaiser – Meyer – Olkin (KMO) test value of 0.847 indicated high adequacy. Bartlett test results (×2 = 1285.435, df = 171, $p <$ .001) were also significant. These values show that the sample size and data were appropriate for exploratory factor analysis.

The exploratory factor analysis supported the two-factor structure and both factors had eigenvalues greater than 1 (Table 1). Two factors explained 38.75 % of the total variance. Items 8 and 10 were not loaded on the intended factor. Item 8 in the impulsivity subscale was loaded on sensation seeking, on the other hand, item 10 in sensation seeking was loaded on the impulsivity subscale.

Table 1.
*Exploratory Factor Analysis Results for the Impulsive Sensation Seeking Scale*

| Items | Sensation Seeking | Impulsivity |
|---|---|---|
| 16 | 0.711 | |
| 19 | 0.706 | |
| 5 | 0.657 | |
| 11 | 0.633 | |
| 14 | 0.560 | |
| 7 | 0.460 | |
| 8 | 0.445 | |
| 9 | 0.436 | |
| 13 | 0.422 | |
| 12 | 0.413 | |
| 15 | 0.311 | |
| 2 | | 0.759 |
| 6 | | 0.719 |
| 3 | | 0.675 |
| 1 | | 0.635 |
| 4 | | 0.619 |
| 18 | | 0.613 |
| 17 | | 0.531 |
| 10 | | 0.474 |
| Eigenvalue | % of variance explained | Cumulative % |
| 3.718 | 19.571 | 19.571 |
| 3.645 | 19.184 | 38.755 |

**Confirmatory Factor Analysis Results**

The result of the confirmatory factor analysis supported the two-factor structure obtained in exploratory factor analysis (Figure 1). Factor loadings were between 0.35 and 0.64.

The model has acceptable goodness of data fit ($\chi^2$/df < 3, RMSEA and SRMR < 0.08, and CFI, NNFI, IFI > 0.90). The detailed fit indices are given in Table 2.

**Reliability Results**

The internal consistency of scale was calculated by using all data sets (Table 3). On the other hand, test-retest reliability analysis was carried out on 50 participants who were selected out of all participants. Cronbach's alpha reliability coefficients were 0.84 for the total scale, 0.77 for impulsivity, and 0.78 for sensation seeking. The KR – 21 reliability was between 0.73 (sensation seeking) and 0.80 (total scale). The test-retest reliability coefficients based on two-week intervals were as follows: 0.75 (impulsivity subscale), 0.79 (sensation seeking subscale), and 0.82 (the entire scale).

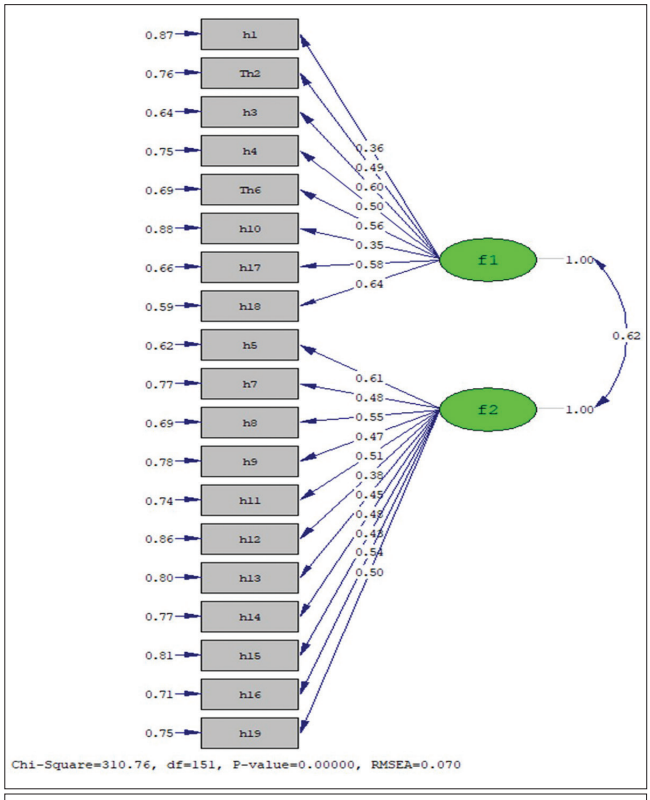


Figure 1. Confirmatory factor analysis results.

Table 2.
*Goodness of Fit Values for the Impulsive Sensation Seeking Scale*

| Fit Indices | Scale Values | Threshold Value | Perfect Fit Value |
|---|---|---|---|
| CFI | 0.91 | ≥0.90 | ≥0.95 |
| NNFI | 0.90 | ≥0.90 | ≥0.95 |
| SRMR | 0.075 | 0.050 – 0.080 | 0.000 – 0.050 |
| RMSEA | 0.70 | 0.050 – 0.080 | 0.000 – 0.050 |
| Chi-square | 310.76 | $\chi^2/df < 3$ | |
| SD | 151 | | |
| Chi-square/SD | 2.05 | | |

Source: (Browne & Cudeck, 1992; Hu & Bentler, 1999; Tabachnick & Fidell, 2007).

Table 3.
*Internal Consistency Coefficients (n = 459) of the Impulsive Sensation Seeking Scale and Test Re-Test Correlations (n = 50)*

| | ImpSS Cumulative | Impulsivity | Sensation Seeking |
|---|---|---|---|
| Cronbach's alpha | 0.84 | 0.77 | 0.78 |
| KR-21 | 0.80 | 0.75 | 0.73 |
| Test-retest (*r*) | 0.821** | 0.753** | 0.790** |

$p < .001$**

## Discussion

This study aimed to test the validity and reliability of the Turkish version of the ImpSS. Exploratory and confirmatory factor analyses were used to test the construct validity of the scale. Both exploratory and confirmatory factor analyses supported the two-factor structure and the original factor structure reported by Zuckerman et al. (1993). All items were loaded on the intended factor except items 8 and 10. These two items were cross-loaded. Item 8 in impulsivity was loaded on sensation seeking, item 10 in sensation seeking was loaded on impulsivity.

In line with the finding of the present study, Fernandez-Artamendi et al. (2015) found that items 8, 10, and 17 were not loaded on the intended factor in the Spanish sample. Similarly, item 10 was loaded on another factor in the Webster & Crysel (2012) study. When the meanings of item 8 and 10 are examined, it is seen that the statement in item 10 (I tend to change my interests frequently) evokes the impulsivity dimension. This tendency might be linked with more biological acts that are committed spontaneously without thinking. Thus, item 10 may be loaded on the impulsivity subscale in Turkish form. Furthermore, the statement in item 8 (I enjoy getting into new situations where you can't predict how things will turnout) was associated with the sensation-seeking dimension. Enjoying entering new environments is closely related with the search for new experiences and excitement. This may be the reason for cross-loading of item 8 and 10.

The factor structures that were obtained in exploratory factor analysis were cross-validated in another sample by using confirmatory factor analysis. The confirmatory factor analysis indicated good data fit of the two-factor structure. RMSEA, SRMR, CFI, and NNFI values showed that the model meets the criteria for acceptable goodness of fit. These results are very similar to the factor structure in the original study (Zuckerman et al., 1993). The previous researches also indicated acceptable fit indices for the ImpSS in different cultures, such as French (Rossier et al., 2008), and Spanish (Fernández-Artamendi et al., 2016). These findings also support the factor structure of the Turkish version.

The reliability evidence of the ImpSS was determined by using Cronbach's alpha in most of the cultural studies. When Cronbach's alpha values obtained in this study are compared with the previous studies, the obtained results are seen to be in line with studies in the Spanish, (Fernandez-Artamendi et al., 2016), American (McDaniel & Mahan, 2008; Webster & Crysel, 2012), and Greek (Hyphantis et al., 2010) samples. Besides, both KR-21 and Cronbach's alpha for internal consistency of the Turkish version of scale were above the 0.70 mark proposed by Nunnally & Bernstein (1978). Moreover, the test-retest reliability value of the scale was found to be above 0.80. In a similar study conducted in Catalonian—Spanish culture, the test-retest reliability of the scale was found to be above 0.90 (Gomà-i-Freixanet et al., 2005). According to these results, it can be said that the IMPSS is a reliable scale.

In conclusion, the exploratory and confirmatory factor analyses revealed a structure with 19 items, and two subscales emerged, which is quite similar to the original scale. The reliability of the scale was verified by Cronbach's alpha, KR-21,

and test-retest analyses. This emerging structure has also been supported by studies from different cultures. It can be concluded that the IMPSS-Turkish Form is a valid and reliable to assess sensation-seeking in the Turkish sample. With its short and easy-to-apply structure, the scale can be used in different populations.

The study has some implications for health professionals. As reported in studies, sensation seeking is an important personality variable which is closely related with risky and unhealthy behaviors such as alcohol, tobacco, and drug usage (Beaton et al., 2014; Schepis et al., 2008). In this case, the scale can be used by healthcare professionals and educators to predictively identify individuals prone to these unhealthy behaviors and to direct them to different activities where they can control their search for excitement and prevent them from turning to unhealthy and risky behaviors. The health professionals may also use the SSS for pre-detecting and planning the rehabilitation of individuals who have a tendency toward risky behaviors such as substance use or fast driving.

The findings of this study should be interpreted by considering its limitations. The participants of this study were university or post-graduate students or graduates between 18 and 60 years old. The study involved a wide range of age groups. In future studies, the psychometric properties of the scale could be tested on different age and educational groups such as high school students. The construct validity of the scale was tested by using exploratory factor analysis and confirmatory factor analysis in this study. In future research, different statistical approaches such as the Item Response Theory and the Rasch model could be used to test the properties of the scale. The divergent and convergent validity of the scale could also be tested in future studies.

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