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Cross-Cultural Adaptation of a Farsi Version of the Impulsive Behavior Scale-Short Form in Iran

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Quantitative Study

Abstract

Background: The aim of the present study was to investigate psychometric properties of the Impulsive Behavior Scale-Short Form (IBS-SF) among undergraduate Farsi-speaking Iranian students. In this study, 201 individuals (95 men, 106 women) answered to the IBS-SF and the Problematic and Risky Internet Use Screening Scale (PRIUSS).
Methods: The confirmatory factor analysis and internal consistency methods were used to compute the factorial validity and reliability of the IBS-SF, respectively. In order to examine the construct validity of the IBS-SF, the correlation of different dimensions of IBS-SF with PRIUSS was determined.
Results: The results of confirmatory factor analysis showed that a 5-factor structure of the negative urgency, lack of perseverance, lack of premeditation, sensation seeking, and positive urgency was replicated in the Iranian sample. The IBS-SF convergent validity was confirmed by a correlation between different features of impulsivity trait and problematic and risky internet use behavior. The internal consistency of the different subscales of impulsivity trait ranged from 0.67 to 0.80.
Conclusion: The present study revealed that the IBS-SF is a valid and reliable scale for measuring impulsivity trait among undergraduate Farsi-speaking Iranian students.
Keywords: Confirmatory factor analysis, Impulsive Behavior Scale-Short Form (IBS-SF), Problematic and risky internet use behavior, Validity, reliability, Iranian students

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Introduction

The undeniable explanatory power of impulsivity construct, as a personality trait, in different conceptual domains has attracted the attention of researchers in educational, clinical, and health studies (An et al., 2012). The correct predictions of the impulsivity construct have made it important in a wide range of individual/social harms. These harms include aggressive behaviors (Gagnon, McDuff, Daelman, & Fournier, 2015; Heinz, Makin-Byrd, Blonigen, Reilly, & Timko, 2015; Piko & Pinczes, 2014), risky online behaviors (Dalbudak et al., 2013; Floros et al., 2015; Li, Dang, Zhang, Zhang, & Guo, 2014), risky sexual behaviors (Birthrong & Latzman, 2014;

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Dir, Coskunpinar, & Cyders, 2014; Fulton, Marcus, & Payne, 2010), risky driving (Pearson, Murphy, & Doane, 2013), problematic use of mobile phones (Billieux, Van der Linden, & Rochat, 2008), tendency toward substance abuse (Mokri, Ekhtiari, Edalati, Ganjgahi, & Naderi, 2008), risk of violence toward intimate partner (Derefinko, DeWall, Metze, Walsh, & Lynam, 2011), cognitive functional deficit (Nejati & Maleki, 2012), and even suicidal and self-damaging behavior (Ammerman, Kleiman, Uyeji, Knorr, & McCloskey, 2015; Dvorak, Lamis, & Malone, 2013). Moreover, the important role of impulsivity in clinical psychology is undeniable. It provides realistic interpretations for some disorders like borderline personality disorder (BPD) (Diagnostic and Statistical Manual of Mental Disorders (DSM-5®), 2013), antisocial personality (Lijffijt et al., 2012; Sargeant, Bornovalova, Trotman, Fishman, & Lejuez, 2012), substance abuse (Kaynak et al., 2013), alcohol abuse (*DSM-5®*, 2013; Jones, Chryssanthakis, & Groom, 2014; Rubenking & Lang, 2015), pathologic gambling (*DSM-5®*, 2013; Pascucci et al., 2015), and attention-deficit/hyperactivity disorder (ADHD) (*DSM-5®*, 2013; Fossati et al., 2015; Lopez, Dauvilliers, Jaussent, Billieux, & Bayard, 2015). Therefore, it is essential to develop a reliable and validated scale in order to measure the impulsivity. In this regard, different instruments have been recently developed. First, for self-report measurements, the two methods of organized interview and questionnaire have been used. A clinician mainly applies organized interviews to analyze behavioral history and expression capacity of individuals in terms of impulsive behaviors. In the organized interview, it is essential to use checklists like the Psychopathy Checklist-Revised (PCL-R) (Hare, Hart, & Harpur, 1991) and Impulsivity Rating Scale (IRS) (Lecrubier, Braconnier, Said, & Payan, 1995) to reduce interviewer error. The interviewer can also use a questionnaire. Some of the most famous pen and paper measurement instruments for measuring impulsivity trait are the Eysenck Personality Questionnaire (EPQ) (Eysenck & Eysenck, 1985) (was developed according to the evolved theory of personality traits and measures the 3 factors of risk taking, impulsivity, and sympathy by 54 items), Zukerman's Sensation Seeking Scale (SSS) (Zuckerman, 2007) (includes 40 items and measures the 4 factors of adventure seeking, boredom susceptibility, disinhibition, and experience seeking), Barratt Impulsiveness Scale (BIS-11) (Barratt, Stanford, Kent, & Felthous, 1997) (includes 30 items and measures cognitive impulsivity, motor impulsivity, and non-planning), Dickman Functional and Dysfunctional Impulsivity Instrument (Dickman, 1990) (includes 24 items and measures the 2 factors of dysfunctional impulsivity and functional impulsivity), State Impulsivity Scale (Iribarren, Jimenez-Gimenez, Garcia-de Cecilia, & Rubio-Valladolid, 2011), Richmond Compulsive Buying Scale (Ridgway, Kukar-Kinney, & Monroe, 2008), and Impulsive Behavior Scale-Short Form (IBS-SF) (Lynam, 2013). Second, experimental behavioral scales are used for impulsivity measurements. These scales include Roger's Decision Making Task (Ekhtiari, Rezvanfard, & Mokri, 2008a), Gehring's Task (Ekhtiari et al., 2008b), the Iawa Gambling Task (Ekhtiari & Behzadi, 2001), Delay Discounting Task (Ekhtiari, Behzadi, Jannati, & Moghimi, 2003a; Ekhtiari, Behzadi, & Mokri, 2005), Time Perception Task (Ekhtiari, Jannati, Parhizgar, Behzadi, & Mokri, 2004), and Balloon Analogue Risk Task (BART) (Ekhtiari, Jannati, Moghimi, & Behzadi, 2003b). These tasks were developed with the goal of reducing the dependency of measurements on language factors, placing a person in actual situation of risk-taking decision making, and independency to Reduction of self-awareness. Third, the evoked potential method is applied to measure impulsivity. This method records individuals' brain electrical activity during a task which a researcher has asked them to

perform. Fourth, functional and structural brain imaging are used to analyze activities of brain areas that are important in impulsive decision making.

The psychometric properties of different instruments which measure impulsivity have been studied and analyzed by many researchers (Candidoa, Ordunaa, Peralesa, Verdejo-Garciab, & Billieux, 2012; Cyders, Littlefield, Coffey, & Karyadi, 2014; D'Orta et al., 2015; Ekhtiari et al., 2008b; Gao, Zhang, & Jia, 2011; Javid, Mohammadi, & Rahimi, 2012). Javid et al. (2012) performed psychometric analysis on the BIS-11. They analyzed the main components of BIS-11 through a varimax rotation and showed that the factor structure of the impulsivity scale consists of the 3 factors of non-planning, motor impulsivity, and cognitive impulsivity. In this study, the internal consistency coefficient of BIS-11 universal factor was 0.81. Moreover, the reliability of the Farsi version of BIS-11 was obtained as 0.77 using test-retest method. Ekhtiari et al. (2008b) studied the validity and reliability of the Farsi versions of the EPQ, BIS-11, Dickman Functional and Dysfunctional Impulsivity Instrument, and SSS in two groups of healthy individuals and opiates users. The qualitative pattern of joint variance between different subscales of the inventories empirically supported their validity. In addition, internal consistency coefficient of different subscales of the inventories confirmed their reliability. Cyders et al. (2014) analyzed the psychometric characteristics of IBS-SF-English version (EV) among a group of students. The confirmatory factor analysis of the IBS-SF-EV showed that the factor structure of the IBS-SF-EV consists of the 5 factors of negative urgency, positive urgency, lack of perseverance, lack of premeditation, and sensation seeking. In the English version, the internal consistency coefficient of multiple factors ranged from 0.74 to 0.85. Moreover, the same variance between IBS-SF-EV subscales and wide ranges of self-damaging behaviors, like alcohol abuse, substance abuse, gambling, and risky sexual behaviors, empirically supported the construct validity of the IBS-SF. D'Orta et al. (2015) analyzed the psychometric characteristics of the IBS-SF-Italian version (IV). The confirmatory factor analysis of the IBS-SF-IV provided the same results as the IBS-SF-EV. The internal consistency coefficients of the IBS-SF-IV ranged from 0.73 to 0.84. A correlation between subscales of the IBS-SF-IV and addictive behaviors and depression symptoms empirically supported the construct validity of the IBS-SF. Candidoa et al. (2012) analyzed the psychometric characteristics of the IBS-SF-Spanish version (SV). The confirmatory factor analysis of the IBS-SF-SV also provided the same results as the IBS-SF-EV. The internal consistency coefficients of the IBS-SF-SV ranged from 0.61 to 0.81. In this study, correlation between subscales of IBS-SF-SV and emotion regulation strategies empirically supported construct validity of the IBS-SF.

Considering the above explanations, the inaccessibility of necessary information about psychometric properties of the Farsi version of the IBS-SF can be observed. Thus, the aim of the present study was to develop a Farsi version of the IBS-SF. For the first time, the factor structure of the IBS was investigated among a group of 18-25-year-old, undergraduate Farsi-speaking, Iranian students. The confirmatory factor analysis method and internal consistency were used to compute the factorial validity and reliability of the IBS-SF, respectively. In order to examine the construct validity of the IBS-SF, the correlation between different dimensions of IBS-SF and problematic and risky internet use behavior was determined.

Methods

Participants and procedure

In this study, 201 undergraduate, Farsi-speaking, Iranian students (95 men, mean age: 22.71 ± 2.96, age range: 18-30;

106 women, mean age: 21.22 ± 2.29, age range: 18-28) were chosen through available sampling method. Among the students, 42 (21.4%), 48 (23.9%), 52 (25.9%), and 59 (29.4%), respectively, studied at the School of Educational Sciences and Psychology, the School of Chemistry, School of Electrical and Computer Engineering, and School of Literature and Humanistic Sciences of Shahid Beheshti University, Tehran, Iran.

In this study, back translation method was used to prepare the IBS-SF-Iranian version (IBS-SF-IrV). The IBS-SF-EV was translated into Farsi, and then, back-translated into English by a bilingual person, aiming for comprehensive and linguistic equivalence. Subsequently, the differences between the original English and back-translated versions were decreased to an acceptable minimum through iterative review process by two translators. Finally, some faculty members evaluated and confirmed the content validity and cultural equivalence of this inventory.

Measurement instruments

Impulsive Behavior Scale-Short Form: In this scale, the 5 factors of positive urgency (including items 3, 10, 17, and 20), negative urgency (including items 6, 8, 13, and 15), lack of perseverance (including items 1, 4, 7, and 11), lack of premeditation (including items 2, 5, 12, and 19), and sensation seeking (including items 9, 14, 16, and 18) were measured by 20 items. In the IBS-SF (Lynam, 2013), participants score items on a 4-point scale ranging from 1 (completely agree) to 4 (completely disagree). Items 1, 4, 7, 5, 12, and 19 are reversely scored. The results of studies by Cyders et al. (2014), Billieux et al. (2012), and Candidoa et al. (2012) have empirically supported the technical characteristics of the English, French, and Spanish versions, respectively.

Problematic and Risky Internet Use Screening Scale: Jelenchick et al. (2014) developed the Problematic and Risky Internet Use Screening Scale (PRIUSS) to prevent and screen problematic and risky use of internet among American teenagers and youth aged between 18 to 25 years. Based on the findings of Jelenchick et al. (2014), the PRIUSS consists of the 3 factors of social harms (including items 1-6), sensation harms (including items 7-11), and impulsive internet use (including items 12-18). Participants score each item on a 5-point scale ranging from 0 to 4; never = 0, rarely = 1, sometimes = 2, often = 3, and always = 4. The respondents are asked to record their internet use in last 6 months. In the PRIUSS, the problematic and risky internet use score increases as the general score increases. Shokri (2015) conducted a study on a group of students in order to investigate the factor validation of the Farsi version of the PRIUSS. The results of the confirmatory factor analysis of the PRIUSS showed good agreement between multiple structures of the PRIUSS (including emotional damage, social harm, and impulsive internet use) and the data. In the study by Shokri (2015), the internal consistency coefficient of emotional damage, social harm, and impulsive internet use was 0.85, 0.83, and 0.81, respectively. In the present study, these values were, respectively, 0.84, 0.85, and 0.86.

Rationale for data analysis

In this study, data analysis was based on Classical Test Theory (CTT). The items of the IBS-SF were retained or eliminated based on the statistical characteristics of factor analysis. In this study, in order to use confirmatory factor analysis, maximum likelihood for estimating model method was used. Moreover, based on the Hu and Bentler model (1999), the χ^2 index (a non-significant value corresponds to an acceptable fit), χ^2 to degrees of freedom (df), the comparative fit index (CFI), the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), and the root mean square error of approximation (RMSEA) were used to present a comprehensive evaluation of model regression.

Results

Descriptive statistics

Table 1 shows descriptive statistics of mean

(M), standard deviation (SD), correlation of every item with total score, and internal consistency (Cronbach's alphas) with the assumption of deleting every item. In this study, Cronbach's alphas were used in order to estimate the reliability of the IBS-SF-IrV. The Cronbach's alphas for negative urgency, positive urgency, lack of perseverance, lack of premeditation, and sensation seeking subscales were 0.80, 0.74, 0.73, 0.67, and 0.76, respectively. The correlation coefficient between total score and each item ranged between 0.34 (item 2) and 0.64 (item 6) (Table 1).

In the present study, before data analysis and through the confirmatory factor analysis statistical method, the univariate normality assumptions and the multivariate normality and desultory measures were tested, respectively, by estimating skew and kurtosis levels, and through Mahalanobis distance and missing data methods (Kline, 2005; Meyers, Gamst, & Guarino, 2006). In addition, questionnaires with missing data were not taken into account (based on the expectation maximization method). The 5-factor model of IBS-SF was tested by AMOS (version 18) and confirmatory factor analysis (Cyders et al., 2014; D'Orta, et al., 2015; Candidoa et al., 2012; Lynam, 2013).

Table 1. Mean, standard deviation, correlation of every item with total score, and Cronbach's alphas with the assumption of deleting every item

Items	Mean ± SD	Corrected item-total r	Cronbach's α if item deleted
Negative urgency (α = 0.80)			
6. When I feel bad, I often do things I later regret in order to make myself feel better now.	2.78 ± 1.06	0.64	0.72
8. Sometimes when I feel bad, I cannot seem to stop what I am doing even though it is making me feel worse.	3.06 ± 1.15	0.63	0.71
13. When I am upset, I often act without thinking.	3.10 ± 1.11	0.59	0.74
15. When I feel rejected, I often say things that I later regret.	2.88 ± 1.23	0.53	0.77
Lack of perseverance (α = 0.73)			
1. I generally like to see things through to the end.	4.24 ± 0.70	0.52	0.67
4. Unfinished tasks really bother me.	4.01 ± 0.94	0.56	0.64
7. Once I get going on something, I hate to stop.	4.06 ± 0.82	0.57	0.63
11. I finish what I start.	3.85 ± 0.86	0.44	0.71
Lack of premeditation (α = 0.67)			
2. My thinking is usually careful and purposeful.	3.92 ± 0.85	0.34	0.67
5. I like to stop and think things over before I do them.	4.06 ± 0.87	0.55	0.53
12. I tend to value and follow a rational, "sensible" approach to things.	4.15 ± 0.78	0.39	0.64
19. I usually think carefully before doing anything.	3.84 ± 0.90	0.53	0.55
Sensation seeking (α = 0.76)			
9. I quite enjoy taking risks.	3.07 ± 1.13	0.54	0.71
14. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	3.50 ± 1.06	0.62	0.67
16. I would like to learn to fly an airplane.	3.25 ± 1.26	0.54	0.71
18. I would enjoy the sensation of skiing very fast down a high mountain slope.	3.07 ± 1.25	0.52	0.72
Positive urgency (α = 0.74)			
3. When I am in a great mood, I tend to get into situations that could cause me problems.	2.90 ± 1.18	0.36	0.71
10. I tend to lose control when I am in a great mood.	3.17 ± 1.07	0.62	0.57
17. Others are shocked or worried about the things I do when I am feeling very excited.	3.15 ± 1.05	0.56	0.61
20. I tend to act without thinking when I am really excited.	2.98 ± 1.08	0.47	0.67

SD: Standard deviation

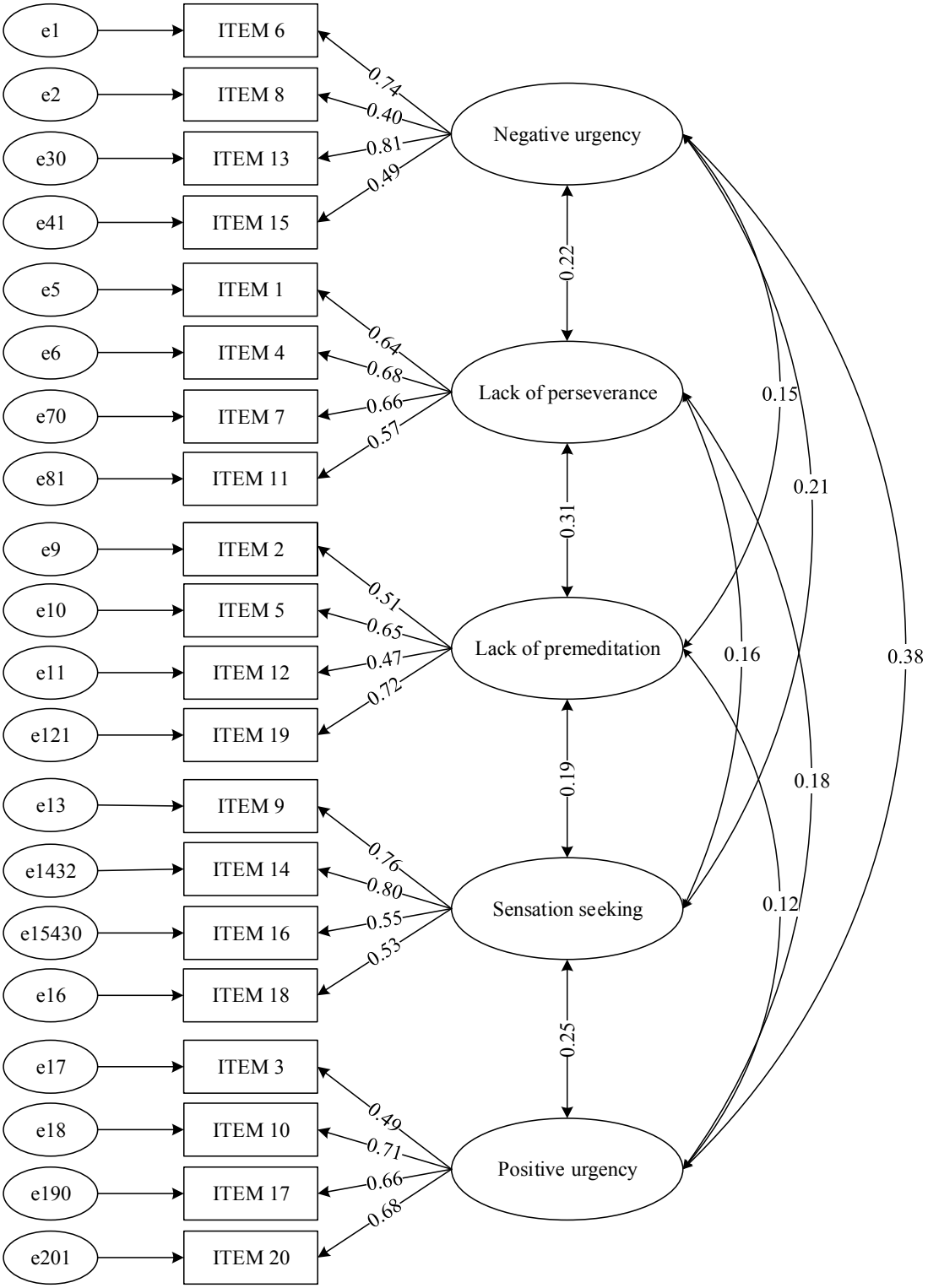

Figure 1. The results of regression indices for the 5-factor structure of Impulsive Behavior Scale-Short Form (IBS-SF) among Iranian students

In figure 1, the results of regression indices for the 5-factor structure of IBS-SF of Hu and Bentler (1999) among Iranian students were presented as χ^2 = 425.36, df = 160, χ^2/df = 2.66, CFI = 0.84, GFI = 0.81, AGFI = 0.79, and RMSEA = 0.09.

Numerical values of χ^2/df > 2, RMSEA > 0.06, and the indices of AGFI, GFI,

and CFI < 0.90 are essential to the evaluation of the regression of the Hu and Bentler model (, 1999) with the present data. As can be observed in figure 1, these conditions were not appropriately satisfied and made the correction of the model essential. Evaluating the regression of the Hu and Bentler model (1999) with the present data by choosing the proposed corrections shows that with decreasing 10 units in df of the corrected model, the value of χ^2 showed a 173.621 units decrease. This was carried out by creating covariance between the remaining levels of item errors in items 13 and 6, and 15 and 8 in positive urgency, 4 and 1, and 11 and 4 in lack of perseverance latent factor, 19 and 5 in lack of premeditation latent factor, 16 and 9 in sensation seeking latent factor, and 10 and 3, and 20 and 10 in positive urgency latent factor. Then, covariance was created between the remaining levels of item errors for item 9 in lack of premeditation latent factor and item 9 in sensation seeking factor. Eventually, covariance was created between the remaining levels of item errors for item 16 in sensation seeking latent factor and item 3 in positive urgency latent factor.

Figure 2 shows latent factor of IBS-SF for students after creating covariance between levels of item errors in different factors. For this model, the values of goodness of fit indices were acquired as χ^2 = 251.74, χ^2/df = 1.67, CFI = 0.94, GFI = 0.91, AGFI = 0.90, and RMSEA = 0.058.

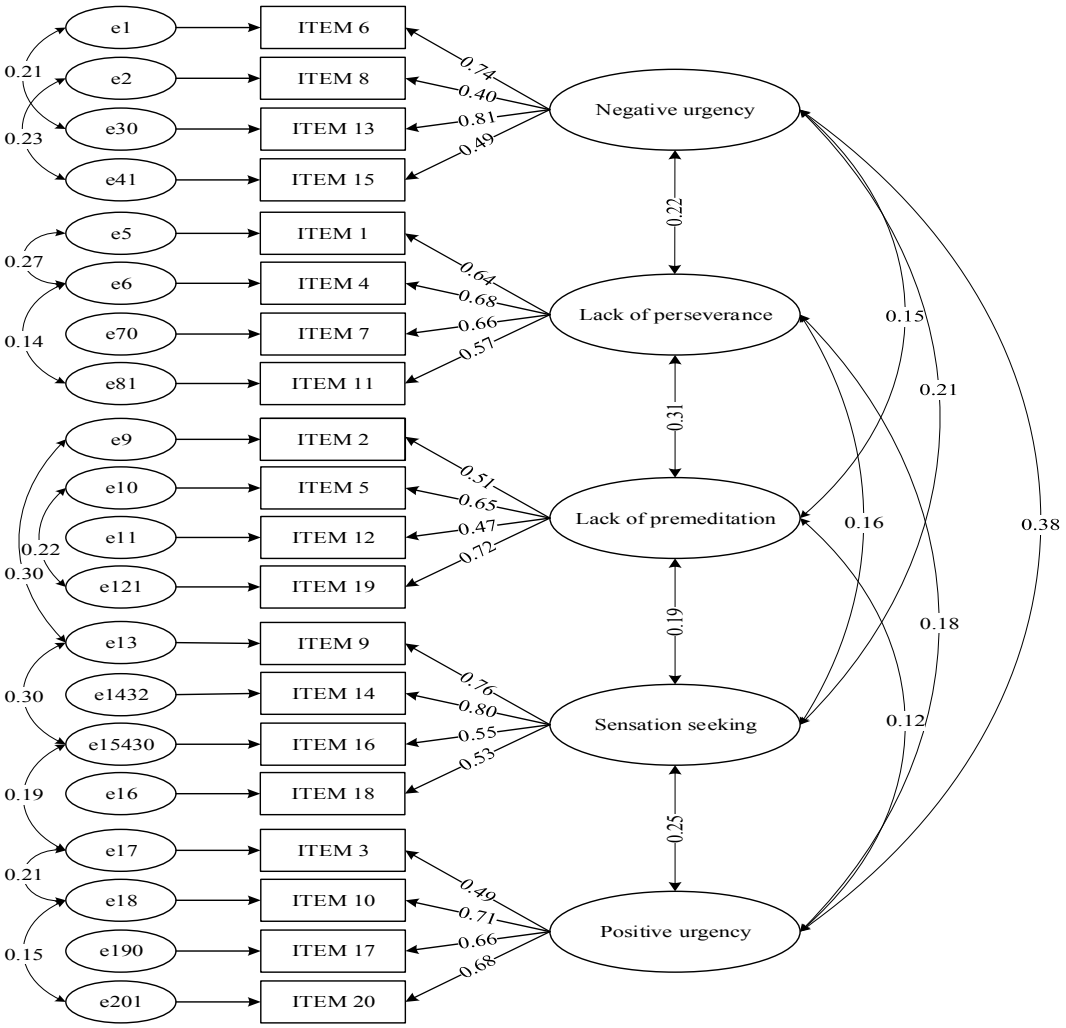

Figure 2. Latent factor of Impulsive Behavior Scale-Short Form (IBS-SF) for students after creation of covariance between levels of item errors in different factors

Table 2. Correlation matrix between subscales of Problematic and Risky Internet Use Screening Scale (PRIUSS) and Impulsive Behavior Scale-Short Form (IBS-SF)

	Social harm	Emotional harm	Impulsive use of internet
Positive urgency	0.22	0.20	0.42
Lack of perseverance	0.21	0.18	0.24
Lack of premeditation	0.36	0.18	0.23
Sensation seeking	0.31	0.20	0.51
Positive urgency	0.19	0.21	0.42

$P < 0.01$

The numerical values of goodness of fit indices for the corrected measuring model show good regression between the assumed 5-factor IBS-SF and data.

Construct validity of IBS-SF

In this study, in order to investigate the construct validity of IBS-SF, the correlation between different subscales of IBS-SF (including positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking) and different subscales of PRIUSS (including social harm, emotion harm, and impulsive use of internet) was evaluated. As can be observed in table 2, the significant positive correlation between different subscales of IBS-SF and PRIUSS subscales empirically support the construct validity of IBS-SF.

Discussion

The present study was conducted to investigate psychometric properties of the IBS-SF among undergraduate Farsi-speaking Iranian students. The confirmatory factor analysis of the IBS-SF-IrV showed that the 5-factor structure of IBS-SF (including positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking) has an acceptable fit with the data. This finding was in line with that of the studies by Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). The construct validity of IBS-SF was empirically supported by shared variance between multiple impulsivity traits and different types of self-damaging behaviors, like risky sexual behaviors, substance abuse, alcohol abuse, pathologic gambling, and domestic violence. This finding was in line with the findings of Dir et al. (2014), Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). Eventually, internal consistency values of subscales of the IBS-SF-IrV showed that this version has adequate reliability. In addition, numerical values acquired for internal consistency coefficients of the IBS-SF-IrV are comparable with those of short and long versions in other existing languages; French (Billieux et al., 2012), English (Cyders et al., 2014), Spanish (Candidoa et al., 2012) and Italian (D'Orta et al., 2015).

Moreover, the present results empirically supported the meta-context explanatory power of the theoretical IBS-SF model. This result was in line with that of the studies by Cyders et al. (2014), D'Orta et al. (2015), Candidoa et al. (2012), and Lynam (2013). On the one hand, prediction of different types of impulsive behaviors through personality traits and the trait nature of these behaviors cause the theoretical IBS-SF model to become independent from context factors. This finding was in line with the findings of Thomson and Carlson (2014), Mueller et al. (2010), Miller et al. (2013), James and Taylor (2007), and Whiteside and Lynam (2003). However, in impulsivity and self-damaging behavior researches, emotion regulation strategies (Ammerman et al., 2015; Pivarunas & Conner, 2015; van Zutphen, Siep, Jacob, Goebel, & Arntz, 2015; Velotti & Garofalo, 2015), coping strategies of activating experiences (Keough, Badawi, Nitka, O'Connor, & Stewart, 2016), self-control (Choi et al., 2014; Ludwig et al., 2013), negative emotionality (James & Taylor, 2007), and goal regulation (Fulford, Eisner, & Johnson, 2015) were presented as the most

important conceptual explanation for the explaining power of impulsive traits in different types of risky behaviors.

It should be noted that the present study had some limitations. First, the study sample only consisted of undergraduate university students. Therefore, further researches on other samples are required in order to generalize the issue. Second, the present study was conducted through only one measurement. Accordingly, it is not possible to evaluate the consistency of IBS-SF scores. Third, the technical specifications of the IBS-SF-IrV were determined by both factor validity and convergent validity. Thus, the evaluation of technical specifications of the IBS-SF-IrV by other methods, like predictive validity and divergent validity, is suggested. Forth, although the present IBS-SF data were acquired from both men and women, a sexual equivalence analysis of the factor structure of IBS-SF was not considered.

Finally, the results of the present study show that the IBS-SF-IrV is an exact and authentic, multidimensional self-reporting scale in impulsivity behavior researches for measuring different dimensions of impulsivity traits among undergraduate, Farsi-speaking, Iranian students.

Conflict of Interests

Authors have no conflict of interests.

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