International Journal of
IJCHP
Clinical and Health Psychology

Using a structural equation model to assess the equivalence between assessment instruments: the dimension of sensation seeking as measured by Zuckerman's SSS-V and Arnett's AISS

Hugo Carretero-Dios[1] and José M. Salinas (*Universidad de Granada, España*)

ABSTRACT. The aim of this instrumental study is to analyze the degree of equivalence between the construct of sensation seeking as measured by Sensation Seeking Scale form V, SSS-V and Arnett Inventory of Sensation Seeking, AISS. A structural equation model is employed in order to analyze the equivalence. The study includes 322 participants aged between 18 and 77. First, the equivalence between the SSS-V and the AISS was analyzed using the total sample. Second, two different age groups were established (18-30 years old age group, *n* = 183; and 40-77 years old age group, *n* = 84), assessing the degree of equivalence in both cases. Based on the total sample and the 40-77 years old age group the results suggest that both instruments are not measuring the same dimension. However, in the 18-30 years old age group the disattenuated correlation obtained by the structural equation model was estimated to be 1.00, which means that, the SSS-V and AISS measure essentially the same dimension for this age group. These results are discussed taking into account the theoretical proposal of Zuckerman and Arnett, and the content (items) of the SSS-V and AISS.

KEY WORDS. Sensation seeking. SSS-V. AISS. Construct validity. Structural equation modelling. Instrumental study.

---

[1] Correspondence: Facultad de Psicología. Universidad de Granada. Campus Cartuja s/n. 18071 Granada (España). E-mail: hugocd@ugr.es

RESUMEN. El objetivo de este estudio instrumental fue analizar el grado de equivalencia entre dos instrumentos centrados en la evaluación de la búsqueda de sensaciones: la *Sensation Seeking Scale form V*, SSS-V y el *Arnett Inventory of Sensation Seeking*, AISS. Para ello, y con una muestra de 322 participantes con edades comprendidas entre los 18 y 77 años, se ha aplicado un modelo de ecuaciones estructurales. En un primer momento se evaluó el grado de equivalencia entre ambos instrumentos usando do el total muestral. Posteriormente se configuraron dos grupos de participantes teniendo como variable de asignación a la edad (de 18 a 30 años, $n = 183$; de 40 a 77 años, $n = 84$), y se evaluó de nuevo la equivalencia entre los instrumentos para ambos grupos. Los resultados ponen de relieve que los instrumentos no evaluarían el mismo constructo si se considera el total muestral y el grupo con edades entre los 40 y 77 años. Sin embargo, estos datos son debidos al efecto de la edad sobre las respuestas a las escalas. En el grupo con edades entre los 18 y 30 años, la correlación estimada a través de las ecuaciones estructurales indicaría que los instrumentos evalúan esencialmente el mismo constructo. Finalmente se discuten estos resultados en función de las propuestas teóricas de Zuckerman y Arnett, y del contenido (ítems) que define a la SSS-V y el AISS.

PALABRAS CLAVE. Búsqueda de sensaciones. SSS-V. AISS. Validez de constructo. Ecuaciones estructurales. Estudio instrumental.

The Sensation Seeking Scale Form V, SSS-V (Zuckerman, Eysenck, and Eysenck, 1978), may be considered the most frequently used instrument to assess sensation seeking (Roth, Schumacher, and Brähler, 2005). However, this scale has been subjected to some criticism over the last years (Arnett, 1994; Arnett, Offer, and Fine, 1997; Watten, 1997), being Arnett (1994) the author that most systematically has criticised it. Zuckerman defined sensation seeking 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 experiences" (Zuckerman, 1979, p. 10). In base of this definition, Zuckerman developed the SSS-V. This instrument is a multidimensional self-report inventory with four factorially obtained sub-scales (Zuckerman, 2005): a) thrill and adventure seeking (TAS), with items which reflect a desire to engage in sports or other activities involving speed, danger or risk; b) experience seeking (ES) which represents the need to seek new experiences through the mind and senses, travelling and a non-conforming lifestyle; c) disinhibition (Dis) which represents the seeking of sensation through drinking, partying, gambling and sexual variety; and d) boredom susceptibility (BS) subscale, with items reflecting an aversion to repetitive experiences and routine. The SSS-V uses a dichotomous forced choice answer format.

The more important limitations of the SSS-V have been summarized in different studies (Ferrando and Chico, 2001; Roth, 2003; Roth and Herzberg, 2004; Roth *et al.,* 2005). There are three principal points of criticism. Firstly, the SSS-V includes numerous items regarding alcohol and drug consumption and sexual behaviour, which can be cause of tautological relations. Secondly, some items are out of date. Thirdly, several items concern strenuous physical activities, so that the results on age-related differences in the responses should be considered with caution.

In order to avoid the limitations of SSS-V, Arnett developed a new scale of sensation seeking, the Arnett Inventory of Sensation Seeking, AISS (Arnett, 1994), which was based on a new conceptualisation of sensation seeking. The conceptual differences between the sensation seeking dimension as measured by the SSS-V and the AISS are fundamentally of two types (Ferrando and Chico, 2001). Firstly, Arnett has been more concentrated on the role of socialisation in modifying the biological propensity for sensation seeking. Secondly, the Zuckerman's subscales are centred in the need for novelty and complexity of stimulation, whereas the Arnett's subscales occupy with the need for novelty and intensity of stimulation. "Sensation seeking is not only a potential for taking risks, but is more generally a quality of seeking intensity and novelty in sensory experiences, which may be expressed in multiple areas of a person's life" (Arnett, 1994 p. 290). The AISS is composed of two 10-items subscales: a) intensity, which represents the intensity of stimulation of the senses; and b) novelty, with items expressing openness to experience. Each item is rated on one unipolar 4 point Likert scale.

Previous studies have provided sufficient support for the reliability and validity of the SSS-V (Ball, Farnill, and Wangeman, 1984; Birenbaum, 1986; Byman, 2005; Carton, Jouvert and Windlocher, 1992; Saxvik and Joireman, 2005; Viken, Kline, and Rose, 2005; Zuckerman, 1979, 1996), and of the AISS (Arnett, 1994; Ferrando and Chico, 2001; Roth, 2003; Roth and Herzberg, 2004; Roth *et al.,* 2005), although, as the studies have shown, neither the SSS-V nor the AISS scale scores have high reliabilities. When the internal structure of the instruments is explored using confirmatory factor analysis, neither of the models is wholly adequate as proposed by the authors (Ferrando and Chico, 2001; Haynes, Miles, and Clements, 2000), however the indices fit considered indicate that the models seems to provide a reasonable fit to the data.

Although nowadays the SSS-V and AISS are used to assess sensation seeking, the research carried out to analyze the equivalence between the dimension of sensation seeking as measured by SSS-V and the AISS is few (Andrew and Cronin, 1997; Arnett, 1994; Ferrando and Chico, 2001), and the results are not conclusive. Because the items of SSS-V and AISS were developed from different theoretical points of view on sensation seeking, it could be hypothesized that the instruments might assess somewhat different constructs. Sensation seeking research has shown that the correlations between the total SSS-V and AISS scores are relatively low considering that the two scales are supposedly assessing aspects of the same construct. Arnett (1994) reported a correlation of $r = .41$, and Andrew and Cronin (1997) obtained an $r = .59$. The higher value was obtained by Ferrando and Chico (2001), $r = .72$.

The studies mentioned above provide results on the correlations between the scores on AISS and SSS-V, in spite of the fact that the correlation obtained between scale scores might not be appropriate indication of the relation between the constructs (Van de Vijver and Poortinga, 2002). Specifically, it should be pointed out that the SSS-V and AISS scale scores present low reliabilities, and because of this, the correlations between scale scores may be attenuated. In fact, the disattenuated correlation between the SSS-V and AISS total scores has been estimated to be .94 (Andrew and Cronin, 1997) and .93 (Ferrando and Chico, 2001), which would lead us to the conclusion that both scales measure the same construct.

In spite of the results obtained by the disattenuated correlation between the SSS-V and AISS total scores, it should be noted that the scores provided by the questionnaires implicate non precise measurements and that the estimation of a relationship between the latent variables employing directly manifest variables may cause biased results (Bollen, 1989). As far as we know, there is only one systematic study where the degree of equivalence between the SSS-V and AISS has been assessed. Ferrando and Chico (2001) analyzed the equivalence between the measures provided by both instruments using a structural equation model (SEM). Ferrando and Chico (2001) used a SEM, developed by Jöreskog (1971) to test the hypothesis that the disattenuated correlation between SSS-V and AISS scales is unity. Although the fit of the model was not exceptionally good (Non-Normed Fit Index, NNFI = .93; Root-Mean-Square Error of Approximation, RMSEA = .08), the values were considered to be adequate, and it was concluded that both instruments measure the same construct. "Although the SSS-V and the AISS were developed using a somewhat different conceptualisation, the psychometric analysis of the present data suggests that both scales measure essentially the same dimension" (Ferrando and Chico, 2001, p. 1131).

In spite of the fact that the results suggest that the SSS-V and the AISS measure the same construct, two principal limitations should be pointed out. First, to adopt this conclusion similar studies would have to be carried out. The conclusion that the SSS-V and the AISS assess the same constructs based on the available results may be risky. Second, Ferrando and Chico (2001) used a sample of 448 undergraduate psychology students with a mean of 22.61 years and a standard deviation of 7.18. When the AISS was developed, one of the central aspects was to create a new instrument to overcome the limitations related with the content of the SSS-V. Specifically, the AISS included exclusively items that are not age related, and items which would express physical strength, antisocial or norm-breaking behaviour were not included in the scale. The studies where the relationship between the SSS-V and the AISS has been analysed have exclusively used young people samples. In these samples, the different contents of the SSS-V and the AISS may be irrelevant. However, and taking into account the characteristics of AISS and SSS-V, the differences between both scale scores may be observed for older groups of people.

The aim of this instrumental study (Carretero-Dios and Pérez, 2007; Montero and León, 2007) is to analyze the degree of equivalence between the dimension of sensation seeking as measured by the SSS-V and the AISS. The equivalence is assessed using a structural equation model (SEM). The sample includes people aged between 18 and 77, and the equivalence between the SSS-V and the AISS is analyzed using the total sample. Next, two different age samples are configured and the degree of equivalence is assessed in both cases. The study pretends to corroborate the results found so far on the relation between both scales for samples of young people. It is expected that differences between sensation seeking as measured by the SSS-V and the AISS should be greater in sample of older people. This is grounded on the conceptual and content differences that can be observed between the SSS-V and the AISS (Arnett, 1994; Zuckerman, 1994).

Method

Participants

   The sample consisted of 323 participants aged between 18 and 77 (*M* = 33.51 years, *SD* = 14.52). The sample contained 141 males (*M* = 33.86 years, *SD* = 14.93) and 182 females (*M* = 31.48 years, *SD* = 14.14). Of the total sample, 180 participants were university students, and 143 were non-University students. This sample was part of the total sample used in a research aimed to study the relationship between humour appreciation and sensation seeking.

Measures

   Among other personality questionnaires, the participants completed the Spanish version of Sensation Seeking Scale Form V (SSS-V; Zuckerman, 1994) and the Arnett Inventory of Sensation Seeking (AISS, Arnett, 1994). In both Spanish versions the internal structure agrees with those proposed by the theory, and the psychometric properties are similar to those of the original instruments (Ferrando and Chico, 2001). Demographic details were also taken.

Procedure

   In some libraries of the University of Granada (Spain), a booklet of questionnaires was handed in to each person who wished to collaborate. This booklet was preceded by standard instructions and consent form. Along with this sample-collecting procedure, a quota sampling was used; these included sex (similar number of men as women), and age (over thirty years old). To carry out this second sampling, we turned to a snowball procedure. The reported testing time varied from 30 to about 45 minutes.

Results

   Descriptive statistics (means and standard deviation) as well as reliability estimates (Cronbach's alpha) were computed for the SSS-V and AISS. The results are given in Table 1.

TABLE 1. De acriptive statistics for the SSS-V and AISS.

	M	*SD*	$\bar{\alpha}$
SSS-V			
TAS	5.71	2.23	.84
DIS	4.31	2.17	.61
ES	5.71	2.23	.66
BS	3.01	1.53	.45
SSS-V total	34.01	18.80	.87
AISS			
Intensity	22.12	4.95	.62
Novelty	25.66	4.48	.55
Total AISS	47.78	8.17	.69

Notes: N = 323. TAS: Thrill and adventure seeking. ES: Experience seeking. DIS: Disinhibition. BS: Boredom susceptibility.

Table 1 shows that Cronbach's alpha was sufficiently high for most of the used scales. However, the internal consistency of the *BS* (.45) and *Novelty* (.55) scales was rather low. These data are similar to the results obtained in others studies (Ferrando and Chico, 2001; Roth, 2003; Zuckerman, 1994).

The partitioned correlation matrix between the SSS-V and AISS subscales was computed, and the results are presented in Table 2.

TABLE 2. Partitioned correlation matrix between SSS-V and AISS.

	TAS	ES	DIS	BS	NOV	INT
TAS	--	.53	.46	.24	.49	.54
ES	.53	--	.41	.20	.38	.31
DIS	.46	.41	--	.35	.38	.43
BS	.24	.20	.35	--	.27	.33
NOV	.49	.38	.38	.27	--	.50
INT	.54	.31	.43	.33	.50	--

Notes. N = 323. TAS: Thrill and adventure seeking. ES: Experience seeking. DIS: Disinhibition. BS: Boredom susceptibility. NOV: Novelty. INT: Intensity.

The partitioned correlations among scales ranged from .20 to .54, all of them were positive and significant. The *BS* subscale showed the lowest correlations values (ranged from .20 to .35). The *TAS* (ranged from .24 to .54) and *Intensity* (ranged from .31 to .54) subscales were the measures with higher correlations. The correlation between the total SSS-V and AISS scores was estimated to be .64. This value is lower than the .72 correlation reported by Ferrando and Chico (2001), and higher than the .41 correlation obtained by Arnett (1994) and the .59 correlation showed by Andrew and Cronin (1997).

The disattenuated correlation between two sets of measures obtained in SSS-V and AISS subscales was computed using a structural equation model (SEM) and the hypothesis that this correlation is unity was tested. The fitted SEM is a measure model with two correlated dimensions: η_1 measured by the indicators Tas, Es, Dis and Bs, and η_2 measured by the indicators novelty (Nov) and intensity (Int). The SEM used here was developed by Jöreskog (1971), and the fit of the model is assessed in two stages. First, the data are fitted to the matrix of correlations presented in Table 1, and the model is fitted without restrictions. In this first step the disattenuated correlation between the two sets of measures was estimated to be .91. In the second step the correlation between the two dimensions is constrained to be unity and the fit is computed. The results are presented in Figure 1.

FIGURE 1. Parameter estimates of the structural equation model with the disattenuated correlation constrained to be unity (total sample, $N = 323$).
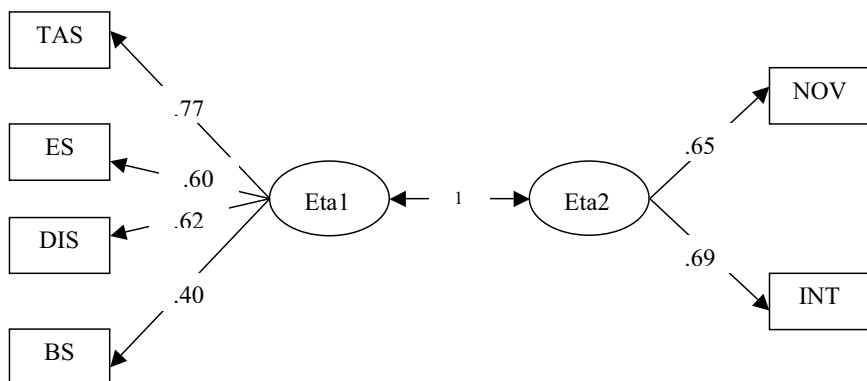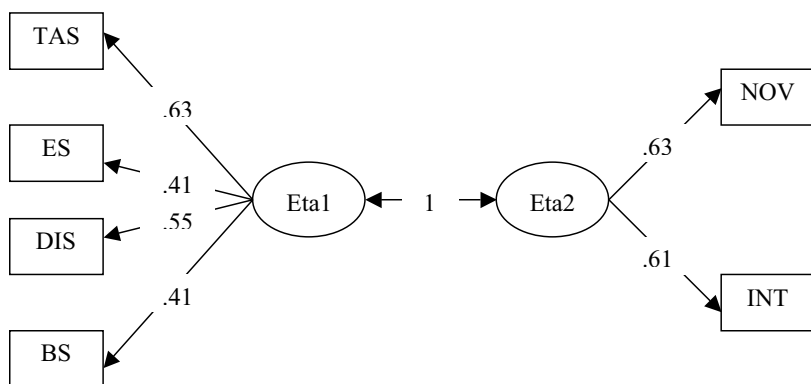

Notes. TAS: Thrill and adventure seeking. ES: Experience seeking. DIS: Disinhibition. BS: Boredom susceptibility. NOV: Novelty. INT: Intensity. Eta1: Sensation seeking measured by indicators TAS, ES, DIS and BS. Eta2: Sensation seeking measured by indicators NOV and INT.

In the restricted model the standardized pattern coefficients obtained for SSS-V, ranged from .40 *(BS)* to .77 *(TAS)*. For AISS the coefficients were .65 (Novelty) and .69 *(Intensity)*. These results are quite similar to those reported by Ferrando and Chico (2001).

When the correlation between the two dimensions is constrained to be unity, $\chi^2 = 34.075$, $df = 9$. In the unrestricted baseline model, $\chi^2 = 29.823$, $df = 8$. Consequently, the fit difference is significant ($\chi^2 = 4.252$, $df = 1$, $p = .02$), if the disattenuated correlation between the two sets of measures is constrained to be unity the fit of the model is worse. The hypothesis that the correlation between the two sets of measures is unity was rejected.

To examine the influence of age on the equivalence between the dimension of sensation seeking as measured by Zuckerman's SSS-V and Arnett's AISS, two age-groups (18-30 years: $n = 84$; 40-77 years: $n = 183$) were formed. The results of the assessment of fit using both 18-30 years age-group and 40-77 years age-group are presented in Figure 2 and Figure 3 respectively.

FIGURE 2. Parameter estimates of the unrestricted structural equation model on 18-30 years-group.

Notes. TAS: Thrill and adventure seeking. ES: Experience seeking. DIS: Disinhibition. BS: Boredom susceptibility. NOV:= Novelty. INT: Intensity. Eta1: Sensation seeking measured by indicators TAS, ES, DIS and BS. Eta2: Sensation seeking measured by indicators NOV and INT.

FIGURE 3. Parameter estimates of the unrestricted structural equation model on 40-77 years-group.
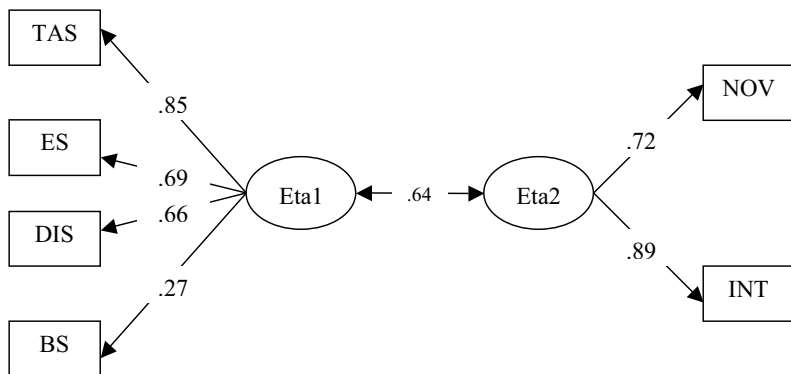
Notes. TAS: Thrill and adventure seeking. ES: Experience seeking. DIS: Disinhibition. BS: Boredom susceptibility. NOV: Novelty. INT: Intensity. Eta1: Sensation seeking measured by indicators TAS, ES, DIA and BS. Eta2: Sensation seeking measured by indicators NOV and INT.

According to the results for the SSS-V, in both age-groups the best measures of sensation seeking was the *TAS* scale and the worst the *BS* scale. As for the AISS, the *Intensity* subscale was estimated to be more precise than *Novelty* in the 40-77 years age-group. For 18-30 years age-group there were no differences between *Novelty* and *Intensity*. The disattenuated correlation between two sets of measures obtained on SSS-V and AISS subscales was estimated to be 1.00 for 18-30 years age-group. The disattenuated correlation was .68 for 40-77 years age-group. The value for 18-30 years age-group was considerably better than the value for 40-77 years-group. This data show the influence of age group on the equivalence between the SSS-V and AISS.

In order to reinforce the influence of age sample on the equivalence between the SSS-V and AISS, the factorial loadings of the SSS-V and AISS was compared to the loadings reported by Ferrando and Chico (2001). In Ferrando and Chico's (2001) study, the mean age of the participants was 22.61 and the standard deviation 7.18. In this study the respondents' mean age was 33.51 and the standard deviation 14.52. It was hypothesized that the loadings of SSS-V would be less stable than those obtained in the AISS due to the age differences between both samples.

To obtain the factorial loading of SSS-V and AISS, the procedure employed by Ferrando and Chico was used. For the AISS the factorial solution was obtained by the maximum likelihood estimation. For the SSS-V the initial solution was obtained by least square factorial analysis of the tetrachoric correlation matrix. The structures were subjected to a procrustean transformation using an authors' program implemented in Matrix Laboratory, MATLAB. Tucker's phi congruence coefficient (Van de Vijver and Poortinga, 2002) was computed and results are given in Table 3 and 4.

TABLE 3. AISS factor pattern and congruence matrix under the bifactorial model.

Items	FI	FII	
Nov1	.17	.13	Marry someone from a foreign country
Nov2	.08	.01	Patient about waiting in a long line
Nov3	.10	.14	Making as few plans as possible in a trip
Nov4	.19	.11	Excited while speaking in front of a group
Nov5	.70	-.11	Travel to strange places
Nov6	.63	.05	Explore an unknown land
Nov7	-.06	.29	Like spicy foods
Nov8	.11	.11	Like to have the TV on
Nov9	.01	.28	Order something familiar in a restaurant
Nov10	.58	.09	Visit another planet
Int1	.24	.03	Swim in very cold water
Int2	.08	.32	Like loud music
Int3	.13	.24	Frightening movies
Int4	.24	.33	Fast rides in an amusement park
Int5	-.01	.21	Gamble with money
Int6	.01	.43	Movies with a lot of explosions
Int7	.19	.32	Work better under pressure
Int8	-.15	.58	See a car accident
Int9	.26	.40	Look down in a high place
Int10	.05	.47	Be in a battle
Cong Matrix			
	.95	.18	
	.18	.96	

Notes. N = 323. Nov: Novelty. Int: Intensity. Cong Matrix: Congruence Matrix.

$$\begin{pmatrix} 0.95 & 0.18 \\ 0.18 & 0.96 \end{pmatrix}$$

Table 3 shows the factorial structure and the congruence coefficients matrix obtained for the two factors of the AISS. The factorial equivalence among both solutions can be accepted for this scale, because the congruence coefficients are higher than .95 (Ten Berge, 1986).

TABLE 4. SSS-V factor pattern and congruence matrix under the four-factor model.

Items	FI	FII	FIII	FIV	
Tas1	.66	.22	-.04	.10	Mountain climbing
Tas2	.50	.31	.24	.29	Frightening things
Tas3	.99	-.44	.11	-.26	Water skiing
Tas4	.87	-.10	.11	-.24	Surf-board
Tas5	.54	.12	-.01	.21	Fly an airplane
Tas6	.52	.21	-.05	-.08	Scuba diving
Tas7	.69	.12	.07	.21	Parachute jumping
Tas8	.60	.14	.05	-.03	Dive off the high board
Tas9	.46	.15	-.23	-.02	Sail a long distance
Tas10	.61	-.00	.05	.15	Fast skiing
Es1	.06	.18	.17	.24	Body smells
Es2	.25	.40	.28	.22	Explore city
Es3	-.01	.49	.42	.12	Marijuana
Es4	.06	.24	.44	.12	Drugs produce hallucinations
Es5	.20	.25	-.00	-.17	Try new foods
Es6	.27	.32	.07	.04	Trip without pre-plan
Es7	.02	.31	.22	.04	Far out friends
Es8	.12	.47	-.08	-.29	Homosexual
Es9	.15	.38	-.07	-.05	Modern paintings
Es10	.11	.50	-.07	-.12	Press in individual ways
Dis1	.15	.19	.32	.12	Wild party
Dis2	.14	.14	.09	.13	Free about sex (swingers)
Dis3	-.05	.37	.61	.16	Get high
Dis4	.33	.26	.24	.21	New experiences
Dis5	.22	-.08	.31	.18	Persons physically exciting
Dis6	.03	-.06	.29	.20	Drinks full party
Dis7	.11	.22	.13	.17	Sexual experiences
Dis8	.21	-.02	.16	-.07	Flighty rich persons
Dis9	.06	.06	.19	.21	Sexy movies
Dis10	-.07	-.16	.56	.34	Couple of drinks
Bs1	.11	-.15	.11	.04	Movie seen before
Bs2	.01	-.02	.32	.15	Same old faces
Bs3	-.08	.06	.23	.24	Boring person
Bs4	.17	-.27	.08	.09	Predictable movie
Bs5	-.09	.05	.22	.23	Travel videos
Bs6	.27	.29	.24	.18	Unpredictable friends
Bs7	-.03	.16	.42	.18	Get restless at home

TABLE 4. SSS-V factor pattern and congruence matrix under the four-factor model. *(Cont.)*

Items	FI	FII	FIII	FIV	
Bs8	.01	-.20	.12	.26	To be a bore
Bs9	.01	-.01	.27	.27	Sharp and witty people
Bs10	-.05	-.35	.23	.28	No patience with dull person
Cong Matrix					
	.97	.21	.17	.06	
	.18	.87	.24	.14	
	.15	.24	.84	.60	
	.05	.12	.53	.75	

Notes: N = 323. Tas: Thrill and adventure seeking. Es: Experience seeking. Dis: Disinhibition. Bs: Boredom susceptibility. Cong Matrix: Congruence Matrix.

$$\begin{pmatrix} 0.9721 & 0.2077 & 0.1704 & 0.0606 \\ 0.1851 & 0.8660 & 0.2446 & 0.1408 \\ 0.1480 & 0.2385 & 0.8444 & 0.5964 \\ 0.0467 & 0.1219 & 0.5294 & 0.7497 \end{pmatrix}$$

Table 4 shows the factorial structure and the congruence coefficients matrix of the SSS-V. Here, there is congruence only in the TAS (Tas) subscale. In the other three factor Tucker's phi coefficients were lower than the cut off to accept factorial congruence, that is, .90 (Van de Vijver and Poortinga, 2002)

Discussion

The present study was aimed at investigating the degree of equivalence between the dimension of sensation seeking as measured by Zuckerman's SSS form V and Arnett's AISS using a structural equation model. In general, the present study provides further support for the proposed relationship between sensations seeking as measured by both instruments (Arnett, 1994).

Using the total sample, when the disattenuated correlation between two sets of measures obtained on SSS-V and AISS subscales (measured by the indicators Tas, Es, Dis and Bs, and measured by the indicators Nov and Int) was constrained to be unity the fit of the model was worse than the unrestricted model. The hypothesis that the correlation between the two sets of measures is unity was rejected. However, Ferrando and Chico (2001), by the same structural equation model as used in this study, concluded that both instruments measure the same construct.

It should be noted that the AISS was developed including only the items that are not related to age. However, the SSS-V includes numerous items related to alcohol and drug consumption, sexual behaviour, and strenuous physical activities. Due to this, it was hypothesized that the differences between both scales may be observed for groups of older people. If the sample is formed principally by young people (university students)

the differences between SSS-V and AISS may not emerge. Ferrando and Chico (2001) employed a sample of 448 undergraduate psychology students. The mean age was 22.61 and the standard deviation 7.18. In this study there were 322 respondents whose mean age was 33.51 and the standard deviation 14.52.

To investigate the differences between age group the participants were divided into two groups: 18-30 years age-group ($n = 84$) and 40-77 years age-group ($n = 183$). The disattenuated correlation between two sets of measures obtained on SSS-V and AISS was estimated at 1.00 for 18-30 years age-group. With this sample the results of the structural equation model confirm that both instruments measure the same construct. However, in older people, the disattenuated correlation was estimated to be .64, which means that, the Zuckerman's SSS form V and Arnett's AISS do not measure essentially the same dimension in this age group. Although the correlation was high, the value suggests that both scales present differences in the content of the scale.

Although the SSS-V and the AISS were developed using somewhat different conceptualisations, the results of prior studies showed that both instruments measured the same construct. Nevertheless, these studies used university student's samples, where the age range was reduced. Most of the SSS-V items address topics (alcohol and drug consumption, sexual behaviour and strenuous physical activities) that are very influenced by the age of participants. Due to this, it is necessary to use samples with different intervals of age and to analyze the equivalence between SSS-V and AISS across age groups. Two age groups have been used in this study and the results confirm the difference between the SSS-V and AISS for older people. These results are in line with the different conceptualisations of sensation seeking presented by Zuckerman (1994) and Arnett (1994), and with the content of the scales.

To confirm this conclusion, the factorial congruence between the loadings matrix reported by Ferrando and Chico (2001) was estimated using the SSS-V and AISS, and the matrix obtained in this study for both instruments. The results indicated factorial congruence for AISS. Nevertheless, with the SSS-V, the congruence was only adequate to the TAS subscale. In the other SSS-V subscales the Tucker's phi coefficients were lower than the demanding value to accept the factorial equivalence. These data may be used to underline the influence of age sample on the SSS-V scores.

The results of this study have special relevance when analysing the conclusions obtained by research aimed at assessing the validity of scales with respect to different criteria. If the criteria are influenced by the age of participants, the differences between the SSS-V and AISS may reflect age-related differences and not differences in sensation seeking. Future research is necessary in order to replicate the results of this study. It would be useful to use different age intervals, and bigger samples.

References

Andrew, M. and Cronin, C. (1997). Two measures of sensation seeking as predictors of alcohol use among high school males. *Personality and Individual Differences, 22,* 393-401.
Arnett, J. (1994). Sensation seeking: A new conceptualization and a new scale. *Personality and Individual Differences, 16,* 289-296.

Arnett, J., Offer, D., and Fine, M. (1997). Reckless driving in adolescence: State and trait factors. *Accident Analysis and Prevention, 29,* 57-63.

Ball, I.L., Farnill, D., and Wangeman, J.F. (1984). Sex and age differences in sensation seeking: Some national comparisons. *British Journal of Psychology, 75,* 257-265.

Birenbaum, M. (1986). On the construct validity of the sensation seeking scale in a non-English speaking culture. *Personality and Individual Differences, 7,* 431-434.

Bollen, K.A. (1989). *Structural equations with latent variables.* New York: Wiley.

Byman, R. (2005). Curiosity and sensation seeking: A conceptual and empirical examination. *Personality and Individual Differences, 38,* 1365-1379.

Carretero-Dios, H. and Pérez, C. (2007). Standards for the development and review of instrumental studies: Considerations about test selection in psychological research. *International Journal of Clinical and Health Psychology, 7,* 863-882.

Carton, S., Jouvert, R., and Windlocher, D. (1992). Cross-cultural validity of the sensation seeking scale: Development of a French abbreviated form. *European Psychiatry, 7,* 225-234.

Ferrando, P.J. and Chico. E. (2001). The construct of sensation seeking as measured by Zuckerman's SSS-V and Arnett's AISS: A structural equation model. *Personality and Individual Differences, 31,* 1121-1133.

Haynes, C., Miles, J., and Clements, K. (2000). A confirmatory factor analysis of two models of sensation seeking. *Personality and Individual Differences, 29*, 823-839.

Jöreskog, K.G. (1971). Statistical analysis of sets of congeneric tests. *Psychometrika, 36,* 109-133.

Montero, I. and León, O. (2007). A guide for naming research studies in Psychology. *International Journal of Clinical and Health Psychology, 7*, 847-862

Roth, M. (2003). Validation of the Arnett Inventory of Sensation Seeking (AISS): Efficiency to predict the willingness towards occupational chance, and affection by social desirability. *Personality and Individual Differences, 35,* 1307-1314.

Roth, M. and Herzberg, P.Y. (2004). A validation and psychometric examination of the Arnett Inventory of Sensation Seeking (AISS) in German Adolescents. *European Journal of Psychological Assessment, 20,* 205-214.

Roth, M., Schumacher, J., and Brähler, E. (2005). Sensation seeking in the community: Sex, age and sociodemographic comparisons on a representative German population sample. *Personality and Individual Differences, 39,* 1261-1271.

Saxvik, S. and Joireman, J. (2005). Sensation seeking, felt gender compatibility and psychosocial adjustment in women. *Personality and Individual Differences, 38*, 1505-1515.

Ten Berge, J.M.F. (1986). Some relations between descriptive comparisons of components from different studies. *Multivariate Behavioural Research, 21,* 29-40.

Van de Vijver, F. and Poortinga, Y. (2002). Structural equivalence in multilevel research. *Journal of Cross Cultural Psychology, 33,* 141-156.

Viken, R., Kline, M., and Rose, R. (2005). Development and validation of an MMPI-based Sensation Seeking Scale. *Personality and Individual Differences, 38*, 619-625.

Watten, R.G. (1997). Use of drugs, coping styles, mental absorption and some outcomes related to health and social activity. *European Addiction Research, 3,* 192-198.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. New Jersey: Erlbaum

Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking.* Cambridge; Cambridge University Press.

Zuckerman, M. (1996). Item revisions in the Sensation Seeking Scale form V (SSS-V). *Personality and Individual Differences, 20,* 515.

Zuckerman, M. (2005). *Psychobiology of personality*. Cambridge: Cambridge University Press.
Zuckerman, M., Eysenk, S., and Eysenck, H.J. (1978). Sensation seeking in England and American: cross-cultural, age, and sex comparisons. *Journal of Consulting and Clinical Psychology, 46,* 139-149.