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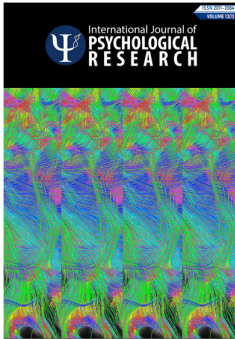
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The Spanish Version of the Sexual Opinion Survey (SOS-6): Evidence of Validity of a Short Version

La versión española de la Encuesta de Opinión Sexual (SOS-6): Evidencia de validez de una versión corta

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Abstract.

The aim of this work was to provide validity evidences of the short Spanish version of the Sexual Opinion Survey (SOS-6). First, a psychometric study was performed to examine the factorial invariance of the scale across different groups. A sample of 1,500 heterosexual adults (50% men, 50% women) from the general Spanish population, aged 18 to 80, was examined. Results showed that the unidimensional model of the SOS-6 is invariant across sex, age range, relationship status, and educational level. Secondly, a laboratory study was performed to determine the relationship between erotophilia and objective and subjective sexual arousal in response to sexual stimuli. The sample consisted of 130 young Spanish university students (46.92% men, 53.08% women) with heterosexual orientation. In men, erotophilia was related to subjective sexual arousal; in women, erotophilia was related to subjective sexual arousal and estimation of genital sensations. In conclusion, this work provides validity evidences of the short version of the SOS-6 and describes the factorial equivalence of the scale across groups and its concurrent validity.

Resumen.

El objetivo de este trabajo fue aportar evidencias de validez a la versión española breve del Sexual Opinion Survey (SOS-6) mediante dos estudios independientes. En primer lugar, se realizó un estudio psicométrico para examinar la invarianza factorial de la escala por diferentes grupos. Se empleó una muestra de 1.500 adultos heterosexuales (50% hombres, 50% mujeres) de la población española general de entre 18 y 80 años de edad. Los resultados mostraron que el modelo unifactorial del SOS-6 es invariante por sexo, rango de edad, estatus de relación de pareja y nivel de estudios. En segundo lugar, se realizó un estudio de laboratorio para determinar la relación de la erotofilia en la excitación sexual objetiva y subjetiva ante estímulos sexuales. La muestra estuvo compuesta por 130 jóvenes universitarios (46,92% hombres, 53,08% mujeres) de nacionalidad española y con orientación heterosexual. En los hombres, la erotofilia se relacionó con la excitación sexual subjetiva; en las mujeres, la erotofilia se asoció tanto con la estimación de la excitación sexual como con la valoración de sensaciones genitales. Como conclusión, este trabajo aporta evidencias de validez a la versión española breve del SOS-6, mostrando su equivalencia por grupos y su validez concurrente.

Keywords.

Sexual Opinion Survey, factorial invariance, concurrent validity, sexual arousal.

Palabras Clave.

Sexual Opinion Survey, invarianza factorial, validez concurrente, excitación sexual.

1. Introduction

Erotophilia-erotophobia is defined as a learned attitude concerning the affective evaluation of sexual stimuli along a continuum in which one end has a negative valence or erotophobia, and the other end has a positive valence or erotophilia (Fisher, Byrne, White, & Kelley, 1988). This construct is a frequent human sexuality research area, and it is considered as an indicator of sexual health. It has been associated with sexual experience (Blanc Molina, Sayans-Jiménez, Ordóñez-Carrasco, & Rojas Tejada, 2018; García-Vega, Robledo, Fernández, & Fernández, 2010), sexual functioning (Ponseti & Bosink, 2010; Sánchez-Fuentes, Moyano, Granados, & Sierra, 2019; van Lankveld, Wolfs, & Grauvogl, 2018), subjective orgasm experience (Arcos-Romero, Moyano, & Sierra, 2018), sexual inhibition/sexual excitation trait (Granados, Salinas, & Sierra, 2017), and sexual assertiveness (Santos-Iglesias, Sierra, & Vallejo-Medina, 2013), among other concepts and constructs. For its evaluation, Fisher et al. (1988) developed the Sexual Opinion Survey (SOS), a scale composed of 21 items presenting good internal consistency reliability indicators (Cronbach's alpha values of .86 for men and .82 for women) and test-retest reliability (correlations higher than .84 and .85 after two weeks and after two months, respectively) (Tanner & Pollack, 1988). Vallejo-Medina, Granados, and Sierra (2014) reported a short Spanish version (SOS-6) consisting of six items (e.g., 'I find it exciting to think about having sexual intercourse') scored from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Higher scores indicate higher levels of erotophilia or more positive sexual attitudes. Its unidimensional structure showed acceptable reliability (Cronbach's alpha values of .74) as well as evidence of convergent validity; its scores were positively correlated with related constructs such as sexual assertiveness and general sexual functioning (Vallejo-Medina et al., 2014).

Different studies have focused on the differences between men and women in terms of erotophobia and erotophilia, and frequently men are found to be more erotophilic than women (Del Río-Olvera, López-Vega, & Cabello-Santamaría, 2013; Guerra, Del Río-Olvera, Morales, & Cabello-Santamaría, 2017; Santos-Iglesias et al., 2013). The construct has been observed to present differences based on age: erotophilia decreases with age (Vallejo-Medina et al., 2014). Concerning relationship status, results are contradictory: several studies report that married people are more erotophilic (Guerra et al., 2017; Sierra, Ortega, & Gutiérrez-Quintanilla, 2008), whereas others have found no significant differences (Del Río-Olvera et al., 2013).

To minimize evaluation biases and make valid comparisons, the instruments used must be equivalent across groups with different sociodemographic characteristics. Nevertheless, despite the multiple erotophobia-erotophilia comparisons made between different groups, the factorial

equivalence of the SOS-6 remains unassessed, and its validity has not been tested using psychophysiological measures of sexual arousal. Therefore, the aim of the present work is to provide information from two independent studies that found evidence of the validity of the SOS-6. The first is a psychometric study focus on the factorial invariance across different population groups. The second study focuses on the association between erotophilia and objective and subjective sexual arousal in response to visual sexual stimuli within the laboratory.

2. Study 1

The aim of this study was to analyze the factorial invariance of the SOS-6 across sex, age range, relationship status, and educational level.

2.1 Method

2.1.1 Participants

The sample consisted of 1,500 heterosexual adults from the general Spanish population (750 men, 750 women), aged between 18 and 80. In men, the mean age was 40.72 (SD = 14.08); 92.1% were in a relationship and 48.7% had a university degree. In women, the mean age was 40.08 (SD = 13.70); 90.3% were in a relationship and 51.3% had university studies. Table 1 presents the sociodemographic characteristics of both men and women. As it is shown, no significant differences across sex were found in terms of sociodemographic data.

2.1.2 Instruments

Background Questionnaire. It included questions about sex, sexual orientation, age, nationality, relationship status, and educational level.

Short Spanish version of the Sexual Opinion Survey (SOS-6; Vallejo-Medina et al., 2014) described in the Introduction.

2.2 Procedure

Data were collected using the traditional paper-and-pencil format as well as online surveys. Both methods are equally reliable and valid to collect sex-related data (Sierra, Moyano, Vallejo-Medina, & Gómez-Berrocá, 2018). The traditional method (paper-and-pencil) was used in university centers, social centers, libraries, and other public places. Subjects were provided the self-report battery in print format in an envelope so that the answered instruments were returned in the closed envelope. The online evaluation of the instruments was distributed via social networks using a link created on the LimeSurvey® platform. Before responding, participants signed an informed consent agreement stating their willingness to participate and guaranteeing the anonymity and confidentiality of their responses. No compensation was provided for their participation in the study. The average time to complete the questionnaires

Table 1

Sociodemographic Characteristics of the sample from study 1

		Total N=1,500	Men n=750	Women n=750	t/χ^2
Age (M, SD)		40.40 (13.89)	40.72 (14.08)	40.08 (13.70)	.90
Age range (n, %)	18-34 y/o	500 (33.3%)	250 (33.3%)	250 (33.3%)	0
	35-49 y/o	500 (33.3%)	250 (33.3%)	250 (33.3%)	
	≥ 50 y/o	500 (33.3%)	250 (33.3%)	250 (33.3%)	
Partner relationship (n, %)	Yes	1,368 (91.2%)	691 (92.1%)	677 (90.3%)	1.63
	No	132 (8.8%)	59 (7.9%)	73 (9.7%)	
Education level (n, %)	University	750 (50%)	365 (48.7%)	385 (51.3%)	1.07
	Non-University	750 (50%)	385 (51.3%)	365 (48.7%)	

was 10 minutes. The study was previously approved by the Human Research Ethics Committee of the University of Granada.

2.3 Data Analysis

In order to confirm that the SOS-6 invariably evaluates a single dimension in different population groups, a confirmatory factor analysis (CFA) was carried out using R[®] (Version 3.4.4; R Core Team, 2016) and its integrated interface RStudio[®] (Version 1.1.447; R Studio Team, 2016) along with lavaan package (Version 0.6-3; Ponseti & Bosinski, 2012). Multigroup invariance analysis by groups was carried out across sex (men and women), age range (18-34, 35-49, and 50 years old or older), relationship status (in a relationship or not), and education (university degree or not). The progressive invariance of the one-factor model was tested at different levels (configural, weak, strong, and strict). SOS-6 was established as a factor with six observable variables between errors. The Weighted Least Squares Means and Variance Adjusted (WLSMV; Beauducel & Herzberg, 2006; Carlier et al., 2019; Hirschfeld & von Brachel, 2014) estimation method was used; the WLSMV estimation method is a robust estimator in the absence of multivariate normality and is designed for ordinal data (Hu & Bentler, 2016). The following criteria were taken into account to evaluate the multigroup CFA: CFI and TLI > .90 and RMSEA < .08 (Hu & Bentler, 1999; Manrique & Semenova, 2015; Wang & Wang, 2012), as well as the difference between the CFI comparative index values (Bentler, 1990). The difference between nested models was considered; therefore, if the CFI value was higher than .01 in favor of the model with fewer restrictions, the most restrictive model would be rejected (Cheung & Rensvold, 2002; Correia, Rosado, & Serpa, 2017). Finally, the invariance levels representing the relationship between observable variables and latent variables were analyzed (Milfont & Fischer, 2010). Internal consistency reliability was estimated using ordinal alpha (Zumbo, Gadermann, & Zeisser, 2007) and omega coefficient (McDonald, 1999; Ventura-León, 2018). The

first coefficient was calculated using MBESS[®] package (R package, Version 4.2.0; Kelley, 2018) and the second coefficient using userfriendlyscience[®] package (R package, Version 0.7.2; Peters, 2018).

2.4 Results

2.4.1 Factorial Invariance (FI)

Results showed that the unidimensional model of the SOS-6 lacked covariances among observable variables for the different multigroup analyses; the same model was found for all the analyzed groups. One-factor model fit results showed that values related to CFI allowed the acceptance of factorial equivalence for all the groups examined at different levels. A strict level of invariance was observed across relationship status [RMSEA = .037 (.024-.049); CFI = .977] and educational level [RMSEA = .043 (.031-.055); CFI = .969]. A weak level of factorial invariance was showed across sex [RMSEA = .042 (.028-.057); CFI = .980] and age range [RMSEA = .034 (.015-.050); CFI = .984] (see Table 2).

2.4.2 Reliability

The Spanish version of the SOS-6 showed adequate internal consistency reliability in all the examined groups. Ordinal alpha values ranged between .79 and .82, and omega coefficients ranged between .70 and .77 (see Table 3).

3. Study 2

The aim of this study was to determine the relationship between erotophilia and objective and subjective sexual arousal in participants exposed to sexual stimuli during an experimental laboratory task.

3.1 Method

3.1.1 Participants

The sample consisted of 130 (61 men, 69 women) university students. All of them had Spanish nationality and identified themselves as heterosexuals. Mean age was 21.23 (SD = 3.09) in men and 20.58 (SD = 2.43) in

Table 2

Fit indices and invariance indicators for the unifactorial model of the Spanish version of the SOS-6

	Model	RMSEA	Δ RMSEA	90% CI RMSEA	CFI	Δ CFI	RMSR	CMIN/DF	df	$R\chi^2$	$\Delta R\chi^2$	p
Sex (men,women)	1. Configural	.045	NA	.029-.062	.981	NA	.046	2.549475	18	98.752	NA	<.001
	2. Weak	.042	-.003	.028-.057	.980	-.001	.050	2.335719	23	86.904	- 11.848	<.001
	3. Strong	.059	.017	.047-.072	.951	-.029	.060	3.616202	28	161.896	74.992	<.001
	4. Strict	.063	.004	.052-.075	.932	-.019	.082	4.004832	34	197.855	35.959	<.001
Age range (18-34,35-49, ≥ 50 y/o)	1. Configural	.041	NA	.022-.059	.984	NA	.047	1.833141	27	102.360	NA	.005
	2. Weak	.034	-.007	.015-.050	.984	0	.051	1.572391	37	85.534	- 16.826	.015
	3. Strong	.041	.007	.027-.054	.972	-.012	.058	1.825339	47	123.757	38.223	<.001
	4. Strict	.066	.025	.055-.076	.907	-.065	.104	3.150926	59	240.897	117.14	<.001
Relationships (yes,no)	1. Configural	.045	NA	.028-.061	.982	NA	.047	2.483781	18	82.425	NA	<.001
	2. Weak	.046	.001	.032-.061	.976	-.006	.050	2.591452	23	75.421	- 7.004	<.001
	3. Strong	.041	-.005	.027-.054	.977	.001	.051	2.236253	28	78.870	3.449	<.001
	4. Strict	.037	-.004	.024-.049	.977	0	.054	2.011408	34	79.717	.847	<.001
Education level (university, non-university)	1. Configural	.046	NA	.029-.062	.981	NA	.047	2.551575	18	97.227	NA	<.001
	2. Weak	.042	-.004	.027-.057	.980	-.001	.050	2.321813	23	85.997	- 11.23	<.001
	3. Strong	.040	-.002	.027-.054	.978	-.002	.052	2.210601	28	98.952	12.955	<.001
	4. Strict	.043	.003	.031-.055	.969	-.009	.069	2.392268	34	119.500	20.548	<.001

Note. RMSEA: Root Mean Square Error of Approximation; Δ RMSEA: Increase of Root Mean Square Error of Approximation; 90% CI RMSEA: 90% confidence interval for RMSEA; CFI: Comparative Fit Index; Δ CFI: Increase of Comparative Fit Index; RMSR: Root Mean Square Residual; CMIN/DF: Chi Square per degree of freedom; df: Degrees of freedom; $R\chi^2$: Chi Square robust estimator; $\Delta R\chi^2$: Increase of Chi Square robust estimator.

Table 3

Reliability coefficients: Ordinal alpha and omega

		n	Ordinal α	Omega
Sex	Men	750	.82	.76
	Women	750	.82	.75
Age range	18-34 y/o	500	.82	.77
	35-49 y/o	500	.81	.70
	≥ 50 y/o	500	.79	.72
Education level	University	750	.82	.74
	Non-university	750	.81	.75

women. 44.3% of men and 53.6% of women were in a relationship at the time of the evaluation. Exclusion criteria were: (a) having medical problems that could affect the sexual response, (b) having psychological disorders, (c) using drugs/alcohol, (d) having sexual dysfunctions, and (e) history of sexual abuse.

3.1.2 Instruments and Materials

Background Questionnaire. It included questions about sex, age, sexual orientation, relationship status, length of the relationship, problems of physical or psychological health, drugs and alcohol use, sexual dysfunctions, sexual victimization, etc.

Short Spanish version of the Sexual Opinion Survey (SOS-6; Vallejo-Medina et al., 2014). We used the same version of Study 1. In the present study, ordinal alpha and omega values in men were .82 and .69, respectively; these values in women were .82 and .75, respectively.

Spanish version of the Ratings of Sexual Arousal (RSA; Mosher, 2011; Sierra et al., 2017). It consists of five items that assess subjective sexual arousal as a state in a specific sexual situation: overall estimation of sexual arousal, estimation of the intensity of genital sensation, estimation of sexual warmth, estimation of non-genital physical sensations, and estimation the level of self-absorption experienced in the sexual situation. It uses a Likert scale in which 1 means *no arousal* and 7 *extremely aroused*. Higher scores indicate a higher level of subjective sexual arousal. This version has shown adequate psychometric properties; its internal consistency reliability is .90 for both men and women (Sierra et al., 2017). In the present study, ordinal alpha values were .71 and omega values were .92 in men; in women, these values were .60 and .83, respectively.

Spanish version of the Ratings of Genital Sensation (RGS; Mosher, 2011; Sierra et al., 2017). It assesses sexual arousal as a state, specifically, genital sensations in a specific sexual moment. It consists of a list of 11 increasingly intense descriptions from 'no genital sensation' to 'multiple orgasms, repeated orgasmic release in a single

sexual episode'. Higher scores indicate higher subjective sexual arousal. The authors of this scale report excellent external validity, which is significantly associated with other constructs related to sexual health.

Genital response. Objective sexual arousal in men was recorded using a penile plethysmograph, a device that measures changes in the circumference of the penis when an erection occurs (Vallejo-Medina, Soler, Gómez-Lugo, Saavedra-Roa, & Marchal-Bertrand, 2017). In women, a vaginal pulse amplitude was obtained by vaginal photoplethysmograph, which reflects short-term changes in vaginal tissue blood congestion (Rosen & Beck, 2011; Stanton, Boyd, Fogarty, & Meston, 2019). A polygraph Biopac MP150 (BIOPAC Systems, Inc., Goleta, CA, USA), using the Acqknowledge 4.2 software, was used to acquire and process the data. Genital responses were defined in terms of differences between the baseline score (neutral video) and the mean score during the sexual situation (erotic video).

Visual stimuli. (a) Neutral content video (documentary about nature), three minutes of duration; (b) sexually explicit video in which a heterosexual couple has sexual intercourse including cunnilingus, fellatio, and orgasm. The validity of the erotic video to induce sexual activation was previously demonstrated in a pilot study using a sample of heterosexual university students (Sierra, Granados, Sánchez-Fuentes, Moyano, & López, 2015).

3.2 Procedure

The study was previously approved by the Human Research Ethics Committee of the University of Granada. Young university students were invited to participate through posters and social media posts. To screen participants, a self-report battery composed of the Background Questionnaire and the Spanish version of the SOS-6 was used. Once at the laboratory of human sexuality, the experimental task consisted of the exposure to two videos: (a) a three-minute neutral content film to obtain the baseline and (b) a three-minute erotic content film to induce sexual activation. Psychophysiological recording of the genital response was simultaneously carried out. A researcher of the same sex as the participant explained the task, showing the registration instruments, their placement, and their operation. In men, changes in penis circumference were measured in millimeters using an indium-gallium ring. In women, vaginal pulse amplitude in volts was recorded using a photoplethysmograph. When the researcher left the experimentation room, the participant individually and privately placed the recording device and indicated that the device was ready via an intercom communicating with the control room. In order to check that the registration signal was correct, five minutes of habituation took place with the recording devices connected. The room was kept at a constant temperature, brightness, and noise conditions.

The films were projected on a 23.5" LCD screen placed approximately 100 cm. in front of the participant. At the end of the erotic video, participants were instructed to complete the RSA and RGS scales to self-report their subjective sexual arousal in response to the sexual stimuli. An identification code was assigned to each participant data to protect anonymity and guarantee data confidentiality. No compensation was given for performing the experimental task.

3.3 Data Analysis

The descriptive statistics of the examined variables were first calculated, and their differences by sex were examined. All the participants included in the study showed a degree of objective sexual arousal during exposure to the erotic video. Sexual activation was identified by calculating measurement differences during exposure to the neutral video compared to exposure to the erotic video (millimeters for men and volts for women). In all cases, the measurements taken during exposure to the erotic video were higher than those taken during exposure to the neutral video. Secondly, bivariate correlations between erotophilia, subjective sexual arousal, evaluation of genital sensation, and genital response were analyzed. Finally, linear regression models were used to determine the concurrent validity of erotophilia on sexual arousal as a state in the presence of sexual stimuli. Several regression models were tested. In all of these, each type of sexual arousal was the dependent variable: the estimation of ratings sexual arousal (RSA), ratings of genital sensations (RGS), and objective sexual arousal. Erotophilia was the independent variable.

3.4 Results

After calculating the descriptive statistics and examining their differences across sex, the results showed no significant differences between men and women in any of the examined variables (see Table 4).

In men, erotophilia significantly and positively correlated with subjective sexual arousal. RSA and RGS significantly correlated with objective sexual arousal, showing sexual concordance (see Table 5). A single significant linear regression model was obtained; in this model, erotophilia explained 8% of the variance of the RSA ($p < .05$) (see Table 6).

In women, erotophilia significantly and positively correlated with RSA and RGS. The genital response was associated with RSA indicating sexual concordance. This result was not observed in the case of RGS (see Table 5). It was shown two significant linear regression models. Erotophilia explained 8% of the variance of the RSA ($p < .05$) and 10% of the variance of the RGS ($p < .01$) (see Table 6).

Table 4

Descriptive statistics of the variables from Study 2

	Men n=61	Women n=69	Range	t
	M (SD)	M(SD)		
Erotophilia	35.87 (5.29)	36.07 (5.57)	6-42	-.21
Subjective sexual arousal (RSA)	18.39 (6.86)	17.04 (5.08)	5-35	1.26
Genital sensations (RGS)	3.11 (1.55)	3.22 (1.24)	1-11	-.41
Sexual response	16.27 (15.14)	.049 (.051)		

Note. Values of sexual response in men are millimeters. Values of sexual response in women are volts.

Table 5

Bivariate correlation matrix between the variables from Study 2

	1	2	3	4
1. Erotophilia	-	.31*	.21	.001
2. Subjective sexual arousal (RSA)	.31*	-	.75**	.46**
3. Genital sensations (RGS)	.34**	.60**	-	.53**
4. Sexual response	.05	.26*	.18	-

Note. Values above the diagonal are based on men's scores. Values below the diagonal are based on women's scores. ** $p < .01$; * $p < .05$.

4. Discussion

The main objective of the studies described in this work was to examine evidence of the validity of the short Spanish version of the Sexual Opinion Survey (SOS-6; Vallejo-Medina et al., 2014). Two independent studies were carried out. The first study examined the factorial equivalence of the scale across different population groups. In the second study, the concurrent validity of the scale was examined within the laboratory; this experiment established the association between erotophilia and objective and subjective sexual arousal as a state.

In the first study, similar to the original proposal by Vallejo-Medina et al. (2014), SOS-6 was found to present a unidimensional structure; additionally, its equivalence was also observed across groups with different sociode-

mographic characteristics. According to Muñiz, Elosua, and Hambleton (2013), it is essential to confirm that a measurement instrument allows for the comparison of scores across different population groups. Based on this statement, the factorial invariance of the Spanish version of the SOS-6 was observed between men and women, among people of different ages, between people with and without a relationship, and between people with and without university studies. A strict level of invariance was obtained across relationship status and educational level. Factorial equivalence was also obtained across the age range and sex, although the level of invariance was weak in these cases. Consequently, none of these sociodemographic characteristics would change the erotophobia-erotophilia construct as measured by the Spanish version of the SOS-6, which allows for the comparison of scores between different groups. Therefore, as has been demonstrated by other measures of relevant dimensions of sexual health, such as attitudes toward sexual fantasies (Arcos-Romero, Calvillo, & Sierra, 2019), subjective orgasm experience (Arcos-Romero & Sierra, 2019), sexual satisfaction (Calvillo, Sánchez-Fuentes, Parrón, & Sierra, 2019) or the double sexual standard (Álvarez Muelas, Gómez Berrocal, Vallejo-Medina, & Sierra, 2019), the short Spanish version of the SOS-6 presents adequate psychometric properties that allow for valid comparisons of the construct among individuals with different characteristics, thus minimizing evaluation bias (Muñiz & Fonseca-Pedrero, 2019).

On the other hand, it has been shown that the scale has adequate internal consistency reliability. Although the original study by Vallejo-Medina et al. (2014) only reported the Cronbach's alpha coefficient, the study shows additional internal consistency values, specifically, ordinal alpha and omega coefficient. The analysis of these results ascertained the optimal internal consistency of the scale in all the examined groups, with values equal to or greater than .70.

Differences across sex are common in human sexuality studies (see Petersen & Hyde, 2011), especially among variables examined in the laboratory, such as sexual arousal (Arcos-Romero, Granados, & Sierra, 2019; Sierra, Álvarez Muelas, et al., 2019; Sierra, de la Rosa, et al., 2019). However, the second study found no differences by sex in erotophilia or concerning subjective self-reported sexual arousal toward visual sexual stimuli. This confirms the evolution of sexual attitudes over the past years, especially among young women such as those included in this study sample. On the other hand, the results showed differences between men and women regarding the association of erotophilia with sexual arousal as a state experienced in a specific time. In men, erotophilia was associated only with the subjective sexual arousal (RSA) when exposed to an erotic stimulus. By contrast, in women, erotophilia plays an important role in the estimation of both the subjective sexual arousal

Table 6

Linear regression model for explaining the subjective sexual arousal (RSA) in men and women, and the genital sensations (RGS) only in women

Models		B	SD	β	t	R ²	F
1. Men (RSA)	Erotophila	0.40	0.16	0.31	2.52	0.08	6.34*
2. Women (RSA)	Erotophila	0.28	0.11	0.31	2.63	0.08	6.93*
3. Women (RGS)	Erotophila	0.08	0.03	0.34	2.98**	0.10	8.85**

Note. RSA: Ratings of sexual arousal; RGS: Ratings of genital sensations. * $p < .05$; ** $p < .01$.

(RSA) and genital sensations (RGS) when exposed to erotic stimuli. According to Staley and Prause (2013), exposure to visual sexual stimuli can differ between sexes due to certain individual characteristics, such as the trait of erotophilia. These findings are in concordance with those in a study by Sierra et al. (2017), who reported that erotophilia was positively and significantly associated with subjective sexual arousal and with the evaluation of genital sensations in men and women. The authors found positive associations in the expected direction; however, the associations were low (Sierra et al., 2017). It should be highlighted that, in the present study, erotophilia was not associated with objective sexual arousal either in men or women. As in other laboratory studies, erotophilia was not associated with genital response (Nobre et al., 2004). In other words, erotophilic sexual attitudes are associated with the subjective experience of sexual arousal when the person is exposed to sexual stimuli, but it does not seem to be related to the intensity of objective genital reactions to these stimuli.

Although similarities were found between men and women regarding sexual concordance, a positive association between subjective and objective sexual arousal was found: the correlation values are higher in men than in women. These findings were expected because, according to Sierra, Álvarez Muelas, et al. (2019), sex is one of the main moderators of sexual concordance, and there is a higher degree of concordance in men than in women. In this regard, also previous studies report that the association between subjective and objective sexual arousal is stronger in men than in women (Chivers, Seto, Lalumière, Laan, & Grimbos, 2010; Meston & Stanton, 2019). Sierra, Díaz, et al. (2019) state that agreement between both measures is uncommon, especially in the case of women.

In conclusion, the present work provides evidence of the validity of the short Spanish version of the SOS-6. On the one hand, the scale shows equivalence across different population groups, specifically across sex, age range, relationship status, and educational level. On the other hand, the concurrent validity of the scale has been shown with the association between the construct of erotophilia and the subjective sexual arousal as a state in both men and women. Thus, the study presents additional evidence of the role of the erotophobia-erotophilia construct in sexual functioning.

As limitations of the studies, the weak invariance observed in the first study, when comparing sex and age range, suggests that these comparisons should be made with caution. In the second study, due to the sample consisted exclusively of heterosexual young people, the generalization of the results to the general population is limited.

References

- Álvarez Muelas, A., Gómez Berrocal, C., Vallejo-Medina, P., & Sierra, J. C. (2019). Invariance of Spanish version of Sexual Double Standard Scale across sex, age, and education level. *Psicothema*, 31, 465–474. doi:10.7334/psicothema2019.102.
- Arcos-Romero, A. I., Calvillo, C., & Sierra, J. C. (2019). *Evidencias de validez de la versión española del Hurlbert Index of Sexual Fantasy*. Manuscript submitted for publication.
- Arcos-Romero, A. I., Granados, M. R., & Sierra, J. C. (2019). Relationship between orgasm experience and sexual excitation: Validation of the Model of the Subjective Orgasm Experience. *International Journal of Impotence Research*, 31, 282–287. doi:10.1038/s41443-018-0095-6.
- Arcos-Romero, A. I., Moyano, N., & Sierra, J. C. (2018). Psychometric properties of the Orgasm rating scale in context of sexual relationship in the Spanish sample. *The Journal of Sexual Medicine*, 15, 741–749. doi:10.1016/j.jsxm.2018.03.005.
- Arcos-Romero, A. I., & Sierra, J. C. (2019). Factorial invariance, differential item functioning, and norms of the Orgasm Rating Scale (ors). *International Journal of Clinical and Health Psychology*, 19, 57–66. doi:10.1016/j.ijchp.2018.11.001.
- Beauducel, A., & Herzberg, P. Y. (2006). On the performance of maximum likelihood versus means and variance adjusted weighted least squares estimation in CFA. *Structural Equation Modeling*, 13, 186–203. doi:10.1207/s15328007sem1302_2.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238–246. doi:10.1037/0033-2909.107.2.238.
- Blanc Molina, A., Sayans-Jiménez, P., Ordóñez-Carrasco, J. L., & Rojas Tejada, A. J. (2018). Comparison of the predictive capacity of the erotophobia-

- erotophilia and the attitudes toward sexual behaviors in the sexual experience of young adults. *Psychological Reports*, 121, 815–830. doi:10.1177/0033294117741141.
- Calvillo, C., Sánchez-Fuentes, M. M., Parrón, T., & Sierra, J. C. (2019). Validación del Interpersonal Exchange Model of Sexual Satisfaction Questionnaire en adultos con pareja del mismo sexo. *International Journal of Clinical and Health Psychology*. Advance online publication. doi:10.1016/j.ijchp.2019.07.005.
- Carlier, I. V. E., van Eeden, W. A., de Jong, K., Giltay, E. J., van Noorden, M. S., van der Feltz-Cornelis, C., & van Hemert, A. M. (2019). Testing for response shift in treatment evaluation of change in self-reported psychopathology amongst secondary psychiatric care outpatients. *International Journal of Methods in Psychiatric Research*, 28, e1785. doi:10.1002/mpr.1785.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9, 233–255. doi:10.1207/S15328007SEM0902_5.
- Chivers, M. L., Seto, M. C., Lalumière, M. L., Laan, E., & Grimbos, T. (2010). Agreement of self-reported and genital measures of sexual arousal in men and women: A meta-analysis. *Archives of Sexual Behavior*, 39, 5–56. doi:10.1007/s10508-009-9556-9.
- Correia, M., Rosado, A., & Serpa, S. (2017). Psychometric properties of the Portuguese version of the Frost Multidimensional Perfectionism Scale. *International Journal of Psychological Research*, 10, 8–17. doi:10.21500/20112084.2109.
- Del Río-Olvera, F. J., López-Vega, D. J., & Cabello-Santamaría, F. (2013). Adaptation of sexual opinion survey: Revised sexual opinion survey. *Revista Internacional de Andrología*, 11, 9–16. doi:10.1016/j.androl.2012.09.003.
- Fisher, W. A., Byrne, D., White, L. A., & Kelley, K. (1988). Erotophobia-erotophilia as a dimension of personality. *The Journal of Sex Research*, 25, 123–151. doi:10.1080/00224498809551448.
- García-Vega, E., Robledo, E. M., Fernández, P. G., & Fernández, R. R. (2010). Influence of the sex and gender in the sexual behavior of adolescents. *Psicothema*, 22, 606–612.
- Granados, M. R., Salinas, J. M., & Sierra, J. C. (2017). Spanish version of the Sexual Excitation/Sexual Inhibition Inventory for Women: Factorial structure, reliability and validity evidences. *International Journal of Clinical and Health Psychology*, 17, 65–76. doi:10.1016/j.ijchp.2016.09.003.
- Guerra, C., Del Río-Olvera, F. J., Morales, I. M., & Cabello-Santamaría, F. (2017). Validation of the reduced version for adolescents of the revised Sexual Opinion Survey. *Revista Internacional de Andrología*, 15, 135–140. doi:10.1016/j.androl.2016.10.006.
- Hirschfeld, G., & von Brachel, R. (2014). Multiple-group confirmatory factor analysis in R-A tutorial in measurement invariance with continuous and ordinal indicators. *Practical Assessment, Research & Evaluation*, 19, 1–12.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55. doi:10.1080/10705519909540118.
- Hu, L., & Bentler, P. M. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, 48, 936–949. doi:10.3758/s13428-015-0319-7.
- Kelley, K. (2018). The MBESS R Package. [Computer software]. MBESS. Retrieved from: <https://CRAN.R-project.org/package=MBESS>.
- Manrique, R. D., & Semenova, N. (2015). Psychometric properties and structural validity of the short version of the Personality Belief Questionnaire (PBQ-SF). *International Journal of Psychological Research*, 8, 48–59.
- McDonald, R. P. (1999). *Test theory: A unified treatment*. Mahwah, NJ: Lawrence Erlbaum.
- Meston, C., & Stanton, A. M. (2019). Understanding sexual arousal and subjective-genital arousal desynchrony in women. *Nature Reviews Urology*, 16, 107–120. doi:10.1038/s41585-018-0142-6.
- Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, 3, 111–121. doi:10.21500/20112084.857.
- Mosher, D. L. (2011). Multiple Indicators of Subjective Sexual Arousal. In T. D. Fisher, C. M. Davis, W. L. Yarber & S. L. Davis (Eds.), *Handbook of Sexuality-Related Measures* (pp. 59-61). Routledge: New York, NY.
- Muñoz, J., Elosua, P., & Hambleton, R. K. (2013). Directrices para la traducción y adaptación de los tests: segunda edición. *Psicothema*, 25, 151–157. doi:10.7334/psicothema2013.24.
- Muñoz, J., & Fonseca-Pedrero, E. (2019). Diez pasos para la construcción de un test. *Psicothema*, 31, 7–16. doi:10.7334/psicothema2018.291.
- Nobre, P. J., Wiegel, M., Bach, A. K., Weisberg, R. B., Brown, T. A., Wincze, J. P., & Barlow, D. H. (2004). Determinants of sexual arousal and the accuracy of its self-estimation in sexually functional males. *Journal of Sex Research*, 41, 363–371. doi:10.1080/00224490409552243.

- Peters, G. (2018). Userfriendlyscience: Quantitative analysis made accessible. [Computer software]. Retrieved from: <http://userfriendlyscience.com>.
- Petersen, J. L., & Hyde, J. S. (2011). Gender differences in sexual attitudes and behaviors: A review of meta-analytic results and large datasets. *Journal of Sex Research*, 48, 149–165. doi:10.1080/00224499.2011.551851.
- Ponseti, J., & Bosink, H. A. G. (2010). Subliminal sexual stimuli facilitate genital response in women. *Archives of Sexual Behavior*, 39, 1073–1079. doi:10.1007/s10508-009-9587-2.
- Ponseti, J., & Bosink, H. A. G. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48, 1–36. Retrieved from: <http://www.jstatsoft.org/v48/i02/>.
- R Core Team. (2016). R: A language and environment for statistical computing [Computer software]. Vienna: R Foundation for Statistical Computing. Retrieved from: <https://www.R-project.org/>.
- R Studio Team. (2016). RStudio: Integrated Development for R [Computer software]. Boston, MA: RStudio Inc. Retrieved from: <http://www.rstudio.com/>.
- Rosen, R. C., & Beck, J. G. (2011). *Patterns of sexual arousal: Psychophysiological processes and clinical applications*. New York, NY: Guilford Press.
- Sánchez-Fuentes, M. M., Moyano, N., Granados, M. R., & Sierra, J. C. (2019). Validation of the Spanish version of the Arizona Sexual Experience Scale (ASEX) using self-reported and psychophysiological measures. *Revista Iberoamericana de Psicología y Salud*, 10, 1–14. doi:10.23923/j.rips.2019.01.021.
- Santos-Iglesias, P., Sierra, J. C., & Vallejo-Medina, P. (2013). Predictors of sexual assertiveness: The role of sexual desire, arousal, attitudes, and partner abuse. *Archives of Sexual Behavior*, 42, 1043–1052. doi:10.1007/s10508-012-9998-3.
- Sierra, J. C., Álvarez Muelas, A., Arcos-Romero, A. I., Calvillo, C., Torres-Obregón, R., & Granados, M. R. (2019). Relación entre la excitación sexual subjetiva y la respuesta genital: diferencias entre hombres y mujeres. *Revista Internacional de Andrología*, 17, 24–30. doi:10.1016/j.androl.2017.12.004.
- Sierra, J. C., Arcos-Romero, A. I., Granados, M. R., Sánchez-Fuentes, M. M., Calvillo, C., & Moyano, N. (2017). Escalas de Valoración de Excitación Sexual y Valoración de Sensaciones Genitales: propiedades psicométricas en muestras españolas. *Revista Internacional de Andrología*, 15, 99–107. doi:10.1016/j.androl.2016.10.008.
- Sierra, J. C., de la Rosa, M. D., Granados, M. R., Calvillo, C., Arcos-Romero, A. I., Sánchez-Fuentes, M. M., & Moyano, N. (2019). Evidencias de validez de la versión española de las Sexual Inhibition/Sexual Excitation Scales-Short Form (SIS/SES-SF). *Revista Iberoamericana de Diagnóstico y Evaluación – e Avaliação Psicológica*, 50, 173–184. doi:10.21865/RIDEP50.1.14.
- Sierra, J. C., Díaz, G., Álvarez Muelas, A., Calvillo, C., Granados, M. R., & Arcos-Romero, A. I. (2019). Relación de deseo sexual con la excitación sexual objetiva y subjetiva. *Revista de Psicopatología y Psicología Clínica*, 24, 173–180. doi:10.105944/rppc.23932.
- Sierra, J. C., Granados, M. R., Sánchez-Fuentes, M. M., Moyano, N., & López, C. (2015). Activación sexual ante estímulos sexuales visuales: Comparación entre hombres y mujeres. *Paper presented in: XXXV Congreso Interamericano de Psicología, (Lima, Peru, 13-16 Julio de 2015)*.
- Sierra, J. C., Moyano, N., Vallejo-Medina, P., & Gómez-Berrocal, C. (2018). An abridged Spanish version of Sexual Double Standard Scale: Factorial structure, reliability, and validity evidence. *International Journal of Clinical and Health Psychology*, 18, 59–80. doi:10.1016/j.ijchp.2017.05.003.
- Sierra, J. C., Ortega, V., & Gutiérrez-Quintanilla, J. R. (2008). Encuesta de opinión sexual: fiabilidad, validez y datos normativos de una versión reducida en muestras salvadoreñas. *Revista Mexicana de Psicología*, 25, 139–150.
- Staley, C., & Prause, N. (2013). Erotica viewing effects on intimate relationships and self/partner evaluations. *Archives of Sexual Behavior*, 42, 615–624. doi:10.1007/s10508-012-0034-4.
- Stanton, A. M., Boyd, R. L., Fogarty, J. J., & Meston, C. M. (2019). Heart rate variability biofeedback increases sexual arousal among women with female sexual arousal disorder: Results from a randomized-controlled trial. *Behavior and Research Therapy*, 115, 90–102. doi:10.1016/j.brat.2018.10.016.
- Tanner, W. M., & Pollack, R. M. (1988). The effects of condom use and erotic instructions on attitudes toward condoms. *The Journal of Sex Research*, 25, 537–541. doi:10.1080/00224498809551481.
- Vallejo-Medina, P., Granados, M. R., & Sierra, J. C. (2014). Propuesta y validación de una versión breve del Sexual Opinion Survey en población española. *Revista Internacional de Andrología*, 12, 47–54. doi:10.1016/j.androl.2013.04.004.
- Vallejo-Medina, P., Soler, F., Gómez-Lugo, M., Saavedra-Roa, A., & Marchal-Bertrand, L. (2017). Procedure to validate sexual stimuli: Reliability and validity of a set of sexual stimuli in a sample of young Colombian heterosexual males. *International Journal of Psychological Research*, 10, 18–24. doi:10.21500/20112084.2268.
- van Lankveld, J., Wolfs, K., & Grauvogl, A. (2018). Gender differences in the relationship of sexual functioning with implicit and explicit sex

- linking and sex waiting: A community sample study. *The Journal of Sex Research*, 29, 1–13. doi:10.1080/00224499.2018.1542656.
- Ventura-León, J. (2018). Intervalos de confianza para coeficientes Omega: Propuesta para el cálculo. *Adicciones*, 30, 77–78. doi:10.20882/adicciones.962.
- Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus*. Chichester: Wiley.
- Zumbo, B. D., Gadermann, A. M., & Zeisser, C. (2007). Ordinal versions of coefficients alpha and theta for likert rating scales. *Journal of Modern Applied Statistical Methods*, 6, 21–29. doi:10.22237/jmasm/1177992180.