

## Validity evidence and norms of the Spanish version of the Hurlbert Index of Sexual Fantasy

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### Abstract

**Background:** Sexual fantasies are described as thoughts or mental images with sexual content. The Hurlbert Index of Sexual Fantasy (HISF) evaluates the positive attitude towards sexual fantasies. The objective of this study was to provide validity evidence of the Spanish version of the HISF and to present its standard scores. **Method:** The sample was composed of 3,458 adults from the general Spanish population (1,641 men; 1,817 women), distributed across age groups (18-34, 35-49, and over 50 years old). **Results:** The unifactorial structure of the Spanish version of the HISF showed strict measurement invariance across sex, age range, and education level. Positive attitudes towards sexual fantasies significantly correlated with erotophilia, sexual assertiveness, sexual desire, and sexual functioning. Also, the scale was useful for differentiating between individuals with sexual functioning difficulties and individuals with no difficulties. Finally, the standard scores were obtained based on sex and age range. **Conclusions:** The Spanish version of the HISF is a reliable, valid, and invariant scale for assessing a positive attitude towards sexual fantasies in people with different sociodemographic characteristics.

**Keywords:** Sexual fantasies, attitude, Hurlbert Index of Sexual Fantasy, validity evidence, norms.

### Resumen

**Evidencias de validez y baremos de la versión española del Hurlbert Index of Sexual Fantasy.** **Antecedentes:** las fantasías sexuales constituyen pensamientos o imágenes mentales con contenido sexual. El Hurlbert Index of Sexual Fantasy (HISF) evalúa la actitud positiva hacia las fantasías sexuales. El objetivo de este estudio fue aportar evidencias de validez a la versión española del HISF y presentar sus baremos. **Método:** la muestra estuvo compuesta por 3.458 adultos de la población española general (1.641 hombres, 1.817 mujeres), distribuidos en tres grupos de edad (18-34, 35-49 y 50 años o mayores). **Resultados:** la estructura unifactorial mostró nivel de invarianza estricta por sexo, rango de edad y nivel educativo. La actitud positiva hacia las fantasías sexuales correlacionó significativamente con erotofilia, asertividad sexual, deseo sexual y funcionamiento sexual. Además, la escala mostró capacidad para diferenciar entre individuos con y sin dificultades en el funcionamiento sexual. Finalmente, se presentan las puntuaciones baremadas por sexo y rango de edad. **Conclusiones:** la versión española del HISF es una escala fiable, válida e invariante para evaluar la actitud positiva hacia las fantasías sexuales en personas con diferentes características sociodemográficas.

**Palabras clave:** fantasías sexuales, actitud, Hurlbert Index of Sexual Fantasy, evidencias de validez, baremos.

Most people admit that they engage in fantasies during sexual activity (Moyano & Sierra, 2014). Sexual fantasies are thoughts or mental images with sexual content that affect emotions and physiological state (Perla, Sierra, Vallejo-Medina, & Gutiérrez-Quintanilla, 2009). The lack of sexual fantasies has been associated with inhibition of sexual desire (Boncinelli, Gaci Scaletti, Nanini, Daino, & Genazzani, 2013; Santos-Iglesias, Calvillo, & Sierra, 2013), whereas the experience of sexual fantasies has been associated with better sexual functioning (Birnbaum, Kanat-Maymon, Mizrahi, Recanatí, & Orr, 2019; Moyano, Byers, & Sierra, 2016).

According to Sierra, Santos-Iglesias, Vallejo-Medina, and Moyano (2014), the study of sexual fantasies includes three different dimensions: (1) attitude towards sexual fantasies, (2)

daydream or ability to develop sexual cognitions, and (3) type of experienced fantasy. Regarding the last one, Moyano and Sierra (2014) valued fantasies as positive or negative sexual cognitions. The use of sexual fantasies in sexual therapy is common (see Newbury, Hayter, Wylie, & Riddell, 2012). Therefore, before identifying the most adequate sexual fantasies for a patient, it is essential to evaluate and, if necessary, modify the attitude towards sexual fantasies (Sierra, Santos-Iglesias et al., 2014).

Comparing different population groups (e.g., men and women) requires instruments with invariant structures to minimize evaluation biases (Muñiz, Elosua, & Hambleton, 2013). Given the relevance of this issue the human sexuality area (see Sakaluk, 2019), in recent years there has been an increasing interest to examine the factorial invariance of scales to evaluate erotophilia (Arcos-Romero, Calvillo, Granados, Álvarez-Muelas, & Sierra, 2020), sexual assertiveness (Sierra, Santos-Iglesias, & Vallejo-Medina, 2012), subjective orgasm experience (Arcos-Romero & Sierra, 2019), sexual satisfaction (Calvillo, Sánchez-Fuentes, Parrón-Carreño, & Sierra, 2019), and sexual double standard (Álvarez-Muelas, Gómez-Berrocal, Vallejo-Medina, & Sierra,

2019). To date, factorial invariance of the instruments to evaluate dimensions of sexual fantasy has not been analyzed. However, comparisons between men and women (Goldey, Avery, & van Anders, 2014; Moyano et al., 2016; Santos-Iglesias, Sierra, & Vallejo-Medina, 2013), different age range (Perla et al., 2009), and different education levels (Kasemy, Desouky, & Abdelrasoul, 2016; Moyano & Sierra, 2014) are common.

One of the few instruments to evaluate attitude towards sexual fantasies is the Hurlbert Index of Sexual Fantasy (HISF; Hurlbert, 2011; Hurlbert & Apt, 1993), that was originally developed to evaluate thoughts and emotions associated with sexual fantasies. Its 25 items assess the individual propensity towards sexual fantasies. Hurlbert and Apt (1993) reported a Cronbach's alpha of .82 and a test-retest reliability coefficient of .86 after one week. In Spain, Desvarieux, Salamanca, Ortega, and Sierra (2005) proposed a reduced ten-item version to specifically assess positive attitudes towards sexual fantasies; its Cronbach's alpha was .85. This version presented adequate validity evidence, it was significantly correlated with the frequency of sexual fantasies and sexual desire. Perla et al. (2009) confirmed its good internal consistency reliability (Cronbach's alpha: .92 in adults and .87 in adolescents). They also showed its convergent validity, the scale positively correlated with sexual daydreaming and erotophilia. Furthermore, scores in men were higher than in women. Differences across gender were later showed by Santos-Iglesias, Sierra et al. (2013), who also showed that men report positive attitudes towards sexual fantasies more frequently. Other studies have associated the Spanish version of the HISF with different related variables: sexual assertiveness, erotophilia, and sexual desire (Santos-Iglesias, Sierra et al., 2013), attitude towards masturbation (Sierra, Santos-Iglesias, & Monge, 2013), sexual daydreaming (Pérez-González, Moyano, & Sierra, 2011), sexual guilt (Sierra, Perla, & Santos-Iglesias, 2011), and sexual functioning (Sierra, Vallejo-Medina et al., 2014).

The aim of the present study is to provide validity evidence and to present the standard scores for the Spanish version of the HISF (Desvarieux et al., 2005). First, the item analysis will be carried out. Also, the unidimensionality of the scale will be tested by analyzing its factorial invariance across population groups that have been compared in previous studies (i.e., sex, age range, and education level). Due to associations among related variables are essential to obtain validity evidence of an instrument (Muñiz & Fonseca-Pedrero, 2019), the association between positive attitudes towards sexual fantasies and erotophilia, sexual assertiveness, sexual desire, and sexual functioning will be analyzed. Furthermore, evidence of discriminant validity will be tested by comparing the mean scores of the HISF between a group of individuals with sexual functioning difficulties and a group without these difficulties. Finally, the standard scores of the HISF for the Spanish population will be presented.

## Method

### Participants

The sample consisted of 3,458 heterosexual adults from the general Spanish population (1,641 men and 1,817 women), distributed into three age groups (18-34 years old;  $n = 1,321$ ; 35-49 years old,  $n = 1,191$ ; and 50 years old or older,  $n = 946$ ). 52.5% of the participants reported having University studies. Inclusion criteria were being an adult (i.e., 18 years old or older),

Spanish nationality, and heterosexual orientation. Table 1 presents the descriptive statistics of the evaluated sociodemographic and psychosexual variables.

### Instruments

**Sociodemographic and Sexual History Questionnaire.** Includes information about sex, age, nationality, sexual orientation, education level, relationship, and sexual activity.

**Spanish version of the Hurlbert Index of Sexual Fantasy (HISF; Desvarieux et al., 2005; Hurlbert, 2011).** It consists of ten items to evaluate the positive attitude towards sexual fantasies through a Likert scale from 0 (*Never*) to 4 (*All of the time*). Higher scores indicate more positive attitudes towards sexual fantasies.

**Short Spanish version of the Sexual Opinion Survey (SOS-6; Fisher, White, Byrne, & Kelley, 1988; Vallejo-Medina, Granados, & Sierra, 2014).** Its six items evaluate erotophilia through a Likert scale from 1 (*I strongly disagree*) to 7 (*I strongly agree*). Its Cronbach's alpha reliability is .74 and its convergent validity is adequate. Higher scores indicate higher erotophilia. In the present study, Cronbach's alpha coefficient was .72.

**Spanish version of the Sexual Assertiveness Scale (SAS; Morokoff et al., 1997; Sierra, Vallejo-Medina, & Santos-Iglesias, 2011).** It consists of 18 items distributed into three factors: Sexual assertiveness to initiate sexual activities, Sexual assertiveness to refuse unwanted sexual contact, and STI-prevention. It uses a Likert scale from 0 (*Never*) to 4 (*Always*). It has shown evidence of good concurrent validity. Higher scores indicate higher sexual assertiveness. In this study, we considered sexual assertiveness to initiate sexual activities and sexual assertiveness to refuse unwanted sexual contact; the Cronbach's alpha values were .72 and .76, respectively.

**Spanish version of the Sexual Desire Inventory (SDI; Moyano, Vallejo-Medina, & Sierra, 2017; Spector, Carey, & Steinberg, 2011).** Its 13 items evaluate interest in sexual activity across three dimensions: Partner-focused dyadic sexual desire, Dyadic sexual desire for an attractive person, and Solitary sexual desire. Different assessment scales are used for each question (e.g., 0 = *Not at all* to 7 = *Many times per day*; 0 = *No desire* to 8 = *Strong desire*). Its internal consistency reliability ranges from .80 to .93 (Cronbach's alpha), depending on gender and age group. It has shown evidence of convergent validity. Higher scores indicate higher sexual desire. In the present study, Cronbach's alpha values were .86 for Partner-focused dyadic sexual desire, .89 for Dyadic sexual desire for an attractive person, and .92 for Solitary sexual desire.

**Spanish version of the Massachusetts General Hospital-Sexual Functioning Questionnaire (MGH-SFQ; Fava, Rankin, Alpert, Nierenberg, & Worthington, 1998; Sierra, Vallejo-Medina, Santos-Iglesias, & Lameiras-Fernández, 2012).** It consists of five items that evaluate general sexual functioning over the previous month in terms of desire, excitation, orgasm, erection (in men), and sexual satisfaction. It uses a Likert scale from 0 (*Totally absent*) to 4 (*Normal*). Its Cronbach's alpha reliability is .90 in men and .93 in women. The scale has shown adequate evidence of convergent validity. Higher scores indicate better sexual functioning. In this study, Cronbach's alpha value was .89 for men (five items) and .93 for women (four items).

### Procedure

Participants were recruited from the general Spanish population. To obtain a balanced proportion of men and women,

Table 1  
Descriptive statistics of the sociodemographic and psychosexual variables

		Total (N = 3,458)	Men (n = 1,641)	Women (n = 1,817)	t / $\chi^2$		
Socio-demographic	Age (M, SD)	39.02 (13.31)	39.20 (13.20)	38.88 (13.42)	0.69		
	Age range (n, %)	18-34 y/o	1,321 (38.2%)	626 (38.1%)	695 (38.2%)	0.72	
		35-49 y/o	1,191 (34.4%)	556 (33.9%)	635 (34.9%)		
		≥ 50 y/o	946 (27.4%)	459 (28%)	487 (26.8%)		
	Education level (n, %)	University	1,815 (52.5%)	831 (50.6%)	984 (54.2%)	4.27	
		Non-university	1,643 (47.5%)	810 (49.4%)	833 (45.8%)		
Relationship (n, %)	Yes	3,378 (97.7%)	1,615 (98.4%)	1,763 (97%)	7.35***		
	No	80 (2.3%)	26 (1.6%)	54 (3%)			
Sexual activity (n, %)	Yes	3,369 (97.4%)	1,608 (98%)	1,761 (96.9%)	3.95*		
	No	89 (2.6%)	33 (2%)	56 (3.1%)			
Psychosexual variables		<b>M (SD)</b>	<b>M (SD)</b>	<b>M (SD)</b>	<b>t</b>	<b>d</b>	
HISF	Sexual fantasies (positive attitude)	28.46 (8.57)	30.73 (3.34)	26.41 (9.08)	15.46***	0.63	
SOS	Erotophilia	34.12 (7.20)	35.38 (6.27)	32.92 (7.80)	9.46***	0.35	
SAS	Sexual assertiveness (initiation)	14.01 (4.92)	14.38 (4.34)	13.68 (5.37)	4.22***	0.14	
	Sexual assertiveness (refusal)	13.59 (5.69)	11.48 (5.55)	15.51 (5.10)	-22.16***	-0.76	
SDI	Partner-focused sexual desire	39.94 (9.02)	41.87 (7.36)	38.19 (9.98)	12.41***	0.42	
	Sexual desire (attractive person)	7.29 (4.77)	8.64 (4.55)	6.06 (4.63)	16.50***	0.56	
	Sexual desire (solitary)	13.39 (8.65)	15.76 (7.91)	11.25 (8.72)	15.95***	0.54	
MGH-SFQ	General sexual functioning		18.15 (3.47)	13.13 (4.42)			

Note: There is no data for the total sample for the variable "General sexual functioning (MGH-SFQ)" because this variable is different in men (5 items) and women (4 items). \*\*\* $p < .001$ ; \* $p < .05$

a quota convenience sampling method was used. The sample was distributed incidentally across three age groups (18-34, 35-49, and 50 years old or older). The assessment was conducted in different public places (e.g., public libraries, classrooms, social centers, health centers) by well-trained researchers. Once the questionnaire was completed, it was returned in a sealed envelope. Participants signed an informed consent in which anonymity, confidentiality, and the exclusive use of test scores for only research purposes were guaranteed. They completed the questionnaires on their own. Ethical approval was obtained from the Ethics Committee of Human Research of the University of Granada.

#### Data analysis

Missing data analysis showed percentages of missing values that did not exceed 2% in the items of all the used scales. The missing values were replaced using the estimation method of the median of nearby points. First, the item analysis was carried out. Second, the unidimensionality of the scale was tested by analyzing its factorial invariance across groups using the lavaan package (version 0.6-3; Rosseel, 2012) included in the R statistical software (version 3.4.4; R Core Team, 2016) and its integrated RStudio interface (version 1.1.447; RStudio Team, 2018). Groups were analyzed by sex, age range, and education level. The progressive invariance of the one-factor model was tested at different levels. The following indicators were used to evaluate the model fit: CFI and TLI > .90 and RMSEA < .08 (Hu & Bentler, 1999), and the difference between CFI comparative index values (Bentler, 1990).

The difference between the models nested at different levels was considered; thus, if the discrepancy in the CFI value were higher than .01 in favor of the least restrictive model, the most restrictive model would be rejected (Cheung & Rensvold, 2002). Then, using Student's *t*-test, differences across sex in the mean scores of the observed variables were examined. Due to the significant differences found in most of the psychosexual variables, we decided to carry out the rest of the analyses separately for men and women. To test the validity evidence based on correlations with related variables, we examined the bivariate correlation matrix between positive attitudes towards sexual fantasies and erotophilia, sexual assertiveness, sexual desire, and sexual functioning. Then, multiple linear regression models were tested to explain sexual functioning based on positive attitudes towards sexual fantasies, erotophilia, and sexual assertiveness. Furthermore, a Student's *t*-test was used to examine the differences in mean scores of the HISF between a group of individuals with difficulties in the dimensions of general sexual functioning (MGH-SFQ) and a group of individuals without these difficulties. Based on the scores from the items of the MGH-SFQ, we considered individuals with difficulties who showed scores from 0 to 2 (*Markedly diminished* to *Moderately diminished*); individuals with no difficulties showed scores equal to 4 (*Normal*). Participants whose scores were equal to 3 (*Minimally diminished*) were excluded from this analysis. Finally, the norms of the HISF differentiated by sex and age range were obtained. Histograms, skewness, and kurtosis were observed. Considering the normal distribution of the sub-samples of men and women, we decided to use the direct scores of the scale.

Table 2  
Item analysis of the Spanish version of the HISF

	M (SD)	Median	Skewness	Kurtosis	Discrimination index	Ordinal $\alpha$ if item deleted
Item 1. <i>Considero saludables las fantasías sexuales</i> (I think sexual fantasies are healthy)	3.34 (0.92)	4	-1.48	1.90	.63	.93
Item 2. <i>Disfruto con las fantasías sexuales</i> (I enjoy fantasizing about sex)	3.11 (1.05)	3	-1.14	0.69	.75	.92
Item 3. <i>Me agrada compartir mis fantasías sexuales con mi pareja</i> (I feel comfortable sharing my sexual fantasies with my partner)	2.84 (1.21)	3	-0.79	-0.38	.65	.93
Item 4. <i>Disfruto de mis fantasías sexuales cuando me masturbo</i> (I enjoy using my sexual fantasies during masturbation)	2.41 (1.47)	3	-0.44	-1.19	.56	.94
Item 5. <i>Me excito fácilmente cuando pienso en el sexo</i> (I am easily aroused by thoughts of sex)	2.67 (1.08)	3	-0.58	-0.27	.69	.93
Item 6. <i>Me divierte escuchar las fantasías sexuales de mi pareja</i> (I enjoy hearing my partner's sexual fantasies)	2.90 (1.21)	3	-0.93	-0.12	.72	.93
Item 7. <i>Los pensamientos sexuales entran en mi mente con facilidad</i> (Thoughts about sex enter my mind without much effort)	2.51 (1.13)	3	-0.34	-0.60	.69	.93
Item 8. <i>Creo que las fantasías sexuales incrementan el interés sexual</i> (I believe sexual fantasy enhances sex)	3.14 (0.96)	3	-1.12	1.02	.69	.93
Item 9. <i>Me excitan las fantasías sexuales de mi pareja</i> (I find my partner's sexual fantasies to be exciting)	2.78 (1.18)	3	-0.77	-0.25	.76	.93
Item 10. <i>Disfruto experimentando mis fantasías sexuales durante las relaciones sexuales</i> (I enjoy using my sexual fantasies during sex)	2.75 (1.19)	3	-0.68	-0.47	.71	.93

Results

Item analysis

The mean scores of the HISF items were higher than the theoretical midpoint of the scale (i.e., 2). The lowest mean was in item 4 ( $M = 2.41$ ) and its standard deviation was the highest ( $SD = 1.47$ ). Item 1 showed the highest mean ( $M = 3.34$ ) and median ( $Mdn = 4$ ). The discrimination index for each item was higher than the minimum criterion .30 (Johnson & Wichern, 2002), ranging from .56 (item 4) to .76 (item 9). Internal consistency reliability, estimated by ordinal alpha, was .94 for the total sample; this value failed to improve with the elimination of any of the ten items (Table 2). Furthermore, the Test Information Function of the HISF (Figure 1) showed that the maximum value reached was above 15 and the most stable measurements fluctuated between -2 and +1. Values different from those indicated, whether lower or higher, suggested that the results would present more errors.

Factorial invariance

The unidimensional model fitting indicated that the values associated with CFI allowed for the acceptance of the factorial equivalence for all the examined groups. Results showed strict measurement invariance across sex [RMSEA = .050 (.045-.055); CFI = .987], age range [RMSEA = .052 (.047-.056); CFI = .984], and education level [RMSEA = .031 (.026-.036); CFI = .996]. Fit indices and invariance indicators for the unifactorial model are displayed in Table 3.

Sex differences

No significant differences across sex were found in mean age, age range, and education level. Results showed a higher

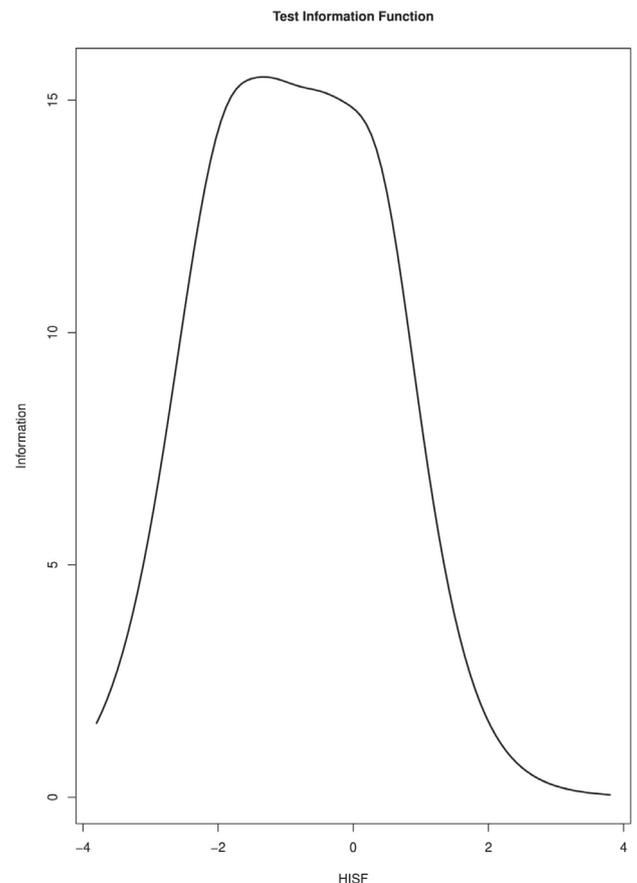


Figure 1. Test Information Function for HISF

Table 3  
Fit indices and invariance indicators for the unifactorial model

	Model	RMSEA	ΔRMSEA	90% CI RMSEA	CFI	ΔCFI	RMSR	CMIN/DF	df	Rχ <sup>2</sup>	ΔRχ <sup>2</sup>	p
Sex (men; women)	1. Configural	.036	NA	.030-.042	.996	NA	.033	3.216	52	609.923	NA	<.001
	2. Weak	.033	-.003	.027-.039	.996	0	.034	2.891	61	374.876	-235.047	<.001
	3. Strong	.049	.016	.044-.054	.989	-.007	.045	5.204	70	733.045	358.169	<.001
	<b>4. Strict</b>	<b>.050</b>	<b>.01</b>	<b>.045-.055</b>	<b>.987</b>	<b>-.002</b>	<b>.050</b>	<b>5.322</b>	<b>80</b>	<b>761.621</b>	<b>28.576</b>	<b>&lt;.001</b>
Age range (18-34; 35-49; ≥ 50 y/o)	1. Configural	.053	NA	.047-.058	.990	NA	.048	4.196	93	1127.765	NA	<.001
	2. Weak	.051	-.002	.046-.056	.988	-.002	.052	3.996	111	700.751	-427.015	<.001
	3. Strong	.050	-.001	.045-.055	.987	-.001	.054	3.888	129	788.612	87.861	<.001
	<b>4. Strict</b>	<b>.052</b>	<b>.002</b>	<b>.047-.056</b>	<b>.984</b>	<b>-.003</b>	<b>.062</b>	<b>4.059</b>	<b>149</b>	<b>862.115</b>	<b>73.503</b>	<b>&lt;.001</b>
Education level (university; non-univers.)	1. Configural	.019	NA	.010-.026	.999	NA	.023	1.595	50	329.225	NA	.005
	2. Weak	.024	.005	.018-.030	.998	-.001	.028	1.989	59	262.939	-66.286	<.001
	3. Strong	.025	.001	.019-.031	.997	-.001	.030	2.056	68	305.338	42.399	<.001
	<b>4. Strict</b>	<b>.031</b>	<b>.006</b>	<b>.026-.036</b>	<b>.996</b>	<b>-.001</b>	<b>.040</b>	<b>2.634</b>	<b>78</b>	<b>396.228</b>	<b>90.89</b>	<b>&lt;.001</b>

Note: In bold: level of invariance accepted for each group. RMSEA: Root Mean Square Error of Approximation; ΔRMSEA: Increase of Root Mean Square Error of Approximation; 90% CI RMSEA: 90% confidence interval for RMSEA; CFI: Comparative Fit Index; ΔCFI: Increase of Comparative Fit Index; RMSR: Root Mean Square Residual; CMIN/DF: Chi Square per degree of freedom; df: difference test; Rχ<sup>2</sup>: Chi Square robust estimator; ΔRχ<sup>2</sup>: Increase of Chi Square robust estimator

percentage of women without a relationship and sexual activity. There were also significant differences across sex among the psychosexual variables; men showed higher mean scores in all of them, except for sexual assertiveness to refuse sexual contact (Table 1).

Validity evidence based on correlations with related variables

In both men and women, positive attitudes towards sexual fantasies positively correlated with erotophilia, sexual assertiveness to initiate sexual activities, partner-focused sexual desire, sexual desire for

Table 4  
Bivariate correlation matrix for positive attitude towards sexual fantasies and the examined variables in men and women

	1	2	3	4	5	6	7	8
1. HISF (Fantasies)	–	<b>.54***</b>	<b>.32***</b>	<b>-.12***</b>	<b>.54***</b>	<b>.25***</b>	<b>.41***</b>	<b>.32***</b>
2. SOS (Erotophilia)	<b>.64***</b>	–	<b>.22***</b>	-.04	<b>.37***</b>	<b>.23***</b>	<b>.44***</b>	<b>.23***</b>
3. SAS (Initiation)	<b>.54***</b>	<b>.46***</b>	–	.04	<b>.29***</b>	.05	<b>.11***</b>	<b>.18***</b>
4. SAS (Refusal)	<b>.16***</b>	<b>.18***</b>	<b>.23***</b>	–	-.08**	-.01	-.02	.01
5. SDI (Partner)	<b>.63***</b>	<b>.48***</b>	<b>.47***</b>	<b>.17***</b>	–	<b>.10***</b>	<b>.23***</b>	<b>.51***</b>
6. SDI (Attractive person)	<b>.30***</b>	<b>.31***</b>	<b>.14***</b>	<b>.08***</b>	<b>.24***</b>	–	<b>.42***</b>	.04
7. SDI (Solitary)	<b>.44***</b>	<b>.49***</b>	<b>.25***</b>	<b>.05*</b>	<b>.29***</b>	<b>.40***</b>	–	<b>.16***</b>
8. MGHFSQ (Sexual functioning)	<b>.41***</b>	<b>.29***</b>	<b>.30***</b>	<b>.16***</b>	<b>.66***</b>	<b>.10***</b>	<b>.17***</b>	–

Note: In bold: correlations between positive attitude towards sexual fantasies and all the variables. Values above the diagonal are based on men's scores. Values below the diagonal are based on women's scores. \*\*\*p < .001; \*\*p < .01; \*p < .05

Table 5  
Linear regression models for explaining general sexual functioning (MGH-SFQ) in men and women

	Predictors	B	SD	β	t	R <sup>2</sup>	F
Men	Positive attitude towards sexual fantasies	.13	.02	.26	8.48***	.114	46.97
	Erotophilia	.04	.02	.07	2.21*		
	Sexual assertiveness (initiation)	.07	.02	.09	3.43**		
	Sexual assertiveness (refusal)	.02	.02	.04	1.39		
Women	Positive attitude towards sexual fantasies	.18	.02	.37	11.49***	.196	93.70
	Erotophilia	-.01	.02	-.01	-0.27		
	Sexual assertiveness (initiation)	.07	.02	.09	3.20**		
	Sexual assertiveness (refusal)	.08	.02	.09	3.81***		

Note: \*\*\*p < .001; \*\*p < .01; \*p < .05

*Table 6*  
Differences in means of the HISF between a group of individuals with no difficulties and a group of individuals with difficulties in the dimensions of the sexual functioning (MGH-SFQ)

	Groups	Men					Women				
		n	M	SD	t	d	n	M	SD	t	d
Sexual desire	No difficulties	1,288	31.72	6.80	10.02***	0.66	1,201	28.31	8.18	12.24***	0.70
	Difficulties	218	26.48	8.90			454	21.92	9.92		
Sexual excitation	No difficulties	1,270	31.88	6.66	9.16***	0.79	1,217	28.40	7.91	14.34***	0.87
	Difficulties	192	25.56	9.20			411	20.48	10.22		
Orgasm	No difficulties	1,359	31.67	6.63	8.59***	0.86	1,257	28.47	8.00	15.31***	0.98
	Difficulties	143	24.62	9.59			352	19.56	10.06		
Erection	No difficulties	1,375	31.60	6.75	7.64***	0.87	-	-	-	-	-
	Difficulties	107	24.50	9.44			-	-	-		
Sexual satisfaction	No difficulties	1,226	31.58	6.92	6.63***	0.52	1,262	28.13	8.15	13.01***	0.82
	Difficulties	221	27.52	8.62			366	20.57	10.23		

*Note:* \*\*\* $p < .001$

an attractive person, solitary sexual desire, and sexual functioning. However, positive attitudes towards sexual fantasies were positively associated with sexual assertiveness to refuse sexual activity only in women; this association was negative in men (Table 4).

Multiple linear regression models showed that the positive attitude towards sexual fantasies was the most significant variable on general sexual functioning in both men ( $B = .13$ ) and women ( $B = .18$ ). Sexual functioning was significantly explained by positive attitudes towards sexual fantasies, erotophilia, and sexual assertiveness. These variables explained 11.4% of the variance of the sexual functioning in the model for men ( $F = 46.97, p < .001$ ) and 19.6% in the model for women ( $F = 93.70; p < .001$ ) (Table 5).

Considering the dimensions of the MGH-SFQ, we compared mean scores of the HISF between a group of individuals with difficulties in sexual functioning and a group without these difficulties. Results showed that the Spanish version of the HISF had the ability to significantly discriminate between both groups; individuals with no difficulties reached higher scores in positive attitudes towards sexual fantasy (Table 6).

*Standard scores*

Finally, the norms of the Spanish version of the HISF were calculated. Table 7 presents the standard scores differentiated by sex and age groups. In order to propose useful standard scores with homogeneous groups, we established three age groups (18-34, 35-49, and 50 years old and older) based on the levels proposed by Arnett (2000), that depend on the subjective perception of the period of adulthood. Other sexual health measurement instruments also present their standard scores using these age ranges (e.g., Arcos-Romero & Sierra, 2019; Moyano et al., 2017; Santos-Iglesias, Vallejo-Medina, & Sierra, 2014; Sierra, Santos-Iglesias et al., 2012; Vallejo-Medina et al., 2014).

Discussion

Sexual attitudes are associated with sexuality in general (e.g., erotophilia) or specific, toward some specific sexual behavior

*Table 7*  
Standard scores of the HISF in men and women of different age groups

Age	Men (n = 1,641)			Women (n = 1,817)		
	18-34 y/o (n = 626)	35-49 y/o (n = 556)	≥ 50 y/o (n = 459)	18-34 y/o (n = 695)	35-49 y/o (n = 635)	≥ 50 y/o (n = 487)
<i>Ordinal α</i>	.91	.92	.93	.90	.93	.94
<i>M</i>	32.40	30.70	28.50	29.20	27.20	21.40
<i>SD</i>	6.40	7.30	8.00	7.00	8.50	10.30
<i>Min</i>	0	2	0	5	0	0
<i>Max</i>	40	40	40	40	40	40
<i>Percentile</i>						
1	13	10	4	10	5	0
5	20	16	14	16	12	2
10	24	20	18	20	15	7
15	26	23	21	22	18	9
20	28	25	22	23	20	12
25	29	27	24	25	22	14
30	30	28	25	26	23	16
35	31	29	26	27	24	18
40	32	30	27	28	26	19
45	33	31	28	29	26	21
50	34	32	29	30	28	23
55	34	33	30	31	29	24
60	35	34	31	32	30	25
65	36	35	32	33	31	26
70	37	36	34	34	32	28
75	37	36	35	34	34	29
80	38	37	36	35	36	31
85	39	38	38	36	37	32
90	40	40	38	38	38	35
95	40	40	40	40	40	37
99	40	40	40	40	40	40

*Note:* Ordinal α: reliability coefficient; M: mean; SD: standard deviation; Min.: minimum; Max.: maximum.  
Men: skewness = -.93; kurtosis = .89; Women: skewness = -.68; kurtosis = .07

(e.g., sexual fantasies). Attitude towards sexual fantasies is a good indicator of sexual health (Santos-Iglesias, Sierra et al., 2013; Sierra, Vallejo-Medina et al., 2014), thus it is important to use measurement instruments with adequate psychometric properties. The aim of this study was to provide validity evidence of the Spanish version of the Hurlbert Index of Sexual Fantasy (HISF; Desvarieux et al., 2005) and to present its standard scores for the Spanish population.

The Spanish version of the HISF has shown excellent internal consistency reliability; an ordinal alpha of .94 was obtained for the total sample. This value is higher than those reported by Desvarieux et al. (2005), Perla et al. (2009) and Santos-Iglesias, Sierra et al. (2013). Also, excellent reliability coefficients were obtained in the three established age groups, ranged between .91 and .93 in men and between .90 and .94 in women. Regarding the analysis of the Information Function of the HISF, the results are positive, the range of values with accurate scores has an adequate amplitude. The one-factor structure of the HISF showed strict factorial invariance across sex, age range, and education level, which allows us for a comparison of scores between people with these sociodemographic characteristics. Evaluation bias (Muñiz et al., 2013; Muñiz & Fonseca-Pedrero, 2019) is minimized in comparisons across sex, age, and education level. This issue is important because many studies in human sexuality make comparisons among population groups, especially between men and women. We can conclude that the higher frequency of positive attitudes towards sexual fantasies in men compared to women in the present study (and in previous studies, e.g., Perla et al., 2009; Santos-Iglesias, Sierra et al., 2013) is not due to measurement bias of the HISF.

Similar to Perla et al. (2009) and Santos-Iglesias, Sierra, et al. (2013), positive attitudes towards sexual fantasies were correlated with erotophilia in both men and women. As expected, the propensity to positively respond to sexual stimuli was related to higher positive attitudes towards sexual fantasies. In both sexes, positive attitudes towards sexual fantasies have also been correlated with sexual assertiveness to initiate sexual activity, in accordance with Santos-Iglesias, Sierra, et al. (2013). However, sexual assertiveness to refuse unwanted sexual activity was negatively associated with positive attitudes towards sexual fantasies in men. That is to say, men who reported more positive attitudes towards sexual fantasies are less assertive in rejecting unwanted sexual contact. This result could be associated with the differences across sex found in these variables, indicating that, although men report more positive attitudes towards sexual fantasies than women, women report more assertiveness to reject unwanted sexual activity. This could be an expression of traditional gender roles in which women tend to limit their sexual activities more frequently (Simon & Gagnon, 2003).

Regarding sexual desire, our results indicate that positive attitudes towards sexual fantasies are correlated with interest in sexual activities, whether in a relationship or alone (i.e., dyadic and solitary sexual desire), according to results reported by Santos-Iglesias, Sierra et al. (2013). Accordingly, Birnbaum et al. (2019) showed that sexual fantasies involving a partner are associated with significantly higher levels of sexual desire in both sexes. The differences in the magnitude of the correlations between attitude towards sexual fantasies and partner-focused sexual desire and sexual desire for an attractive person are noteworthy in both men and women; this fact indicates that the two dimensions of sexual desire suggested by Moyano et al. (2017) are relatively different constructs.

Also, positive attitudes towards sexual fantasies have been associated with better sexual functioning in both sexes. Regression models tested to explain sexual functioning indicate that positive attitudes towards sexual fantasies have more relevance than erotophilia and sexual assertiveness. As expected, positive attitudes towards sexual fantasies are associated with better sexual functioning. The same result has already been advanced by Sierra, Vallejo-Medina, et al. (2014) in women, among whom this association was found to increase with age. The relevance of positive attitudes towards sexual fantasies in sexual functioning was confirmed by the ability of the HISF scores to discriminate between individuals with and without difficulties in the different dimensions of sexual functioning. Men and women with difficulties in desire, excitation, orgasm, erection, and/or sexual satisfaction have significantly lower HISF scores than individuals with normal sexual functioning.

The standard scores for the Spanish population, differentiated by sex and age range, show that positive attitudes towards sexual fantasies decrease as age increases. It also occurs with other important dimensions of human sexuality, such as erotophilia (Vallejo-Medina, Granados et al., 2014), sexual assertiveness (Santos-Iglesias et al., 2014; Vallejo-Medina, Sierra, 2014; Sierra, Santos-Iglesias et al., 2012), or subjective orgasm experience (Arcos-Romero & Sierra, 2019). A possible explanation could be related to the dysfunctions of some aspects of sexual functioning as age increases (Sierra, Vallejo-Medina et al., 2012).

As limitations, despite the use of a large sample, we used a probabilistic quota sampling that reduces the generalization of our results to the entire Spanish population. No evidence of test-retest reliability has been provided. Also, no control scale for the detection of random or dishonest responses has been used. As conclusions, we could highlight that this study provides validity evidence of the Spanish version of the HISF, which is a reliable, valid, and invariant scale to evaluate the positive attitude towards sexual fantasies in people with different sociodemographic characteristics.

## 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., Granados, R., Álvarez-Muelas, A., & Sierra, J. C. (2020). The Spanish version of the Sexual Opinion Survey (SOS-6): Evidence of validity of a short version. *International Journal of Psychological Research*, *13*, 40-49. doi:10.21500/20112084.4506
- Arcos-Romero, A. I., & Sierra, J. C. (2019). Factorial invariance, differential item functioning, and norms of the Orgasm Rating Scale. *International Journal of Clinical and Health Psychology*, *19*, 57-66. doi:10.1016/j.ijchp.2018.11.001

- Arnett, J. J. (2000). Emerging Adulthood a theory of development from the late teens through the twenties. *The American Psychologist*, 55, 469-480. doi:10.1037/0003-066X.55.5.469
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238-246.
- Birnbaum, G. E., Kanat-Maymon, Y., Mizrahi, M., Recanat, M., & Orr, R. (2019). What fantasies can do to your relationship: The effects of sexual fantasies on couple interactions. *Personality and Social Psychology Bulletin*, 45, 461-476. doi:10.1177/0146167218789611
- Boncinelli, V., Gaci Scaletti, D., Nanini, C., Daino, D., & Genazzani, A. R. (2013). Sexual fantasies and female hypoactive desire. *Sexologies*, 22, 19-23. doi:10.1016/j.sexol.2012.08.004
- Calvillo, C., Sánchez-Fuentes, M. M., Parrón-Carreño, T., & Sierra, J. C. (2020). Validation of the Interpersonal Exchange Model of Sexual Satisfaction Questionnaire in adults with a same-sex partner. *International Journal of Clinical and Health Psychology*, 20, 140-150. doi:10.1016/j.ijchp.2019.07.005
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233-255. doi:10.1207/S15328007SEM0902\_5
- Desvarieux, A. R., Salamanca, Y., Ortega, V., & Sierra, J. C. (2005). Validation of a Spanish version of Hurlbert Index of Sexual Fantasy: A measure of attitude toward sexual fantasies. *Revista Mexicana de Psicología*, 22, 529-539.
- Fava, M., Rankin, M. A., Alpert, J. E., Nierenberg, A. A., & Worthington, J. J. (1998). An open trial of oral sildenafil antidepressant-induced sexual dysfunction. *Psychotherapy and Psychosomatics*, 67, 328-331. doi:10.1159/000012299
- Fisher, W. A., White, L. A., Byrne, D., & Kelley, K. (1988). Erotophobia-erotophilia as a dimension of personality. *The Journal of Sex Research*, 25, 123-151. doi:10.1080/00224498809551448
- Goldey, K. L., Avery, L. R., & van Anders, S. M. (2014). Sexual fantasies and gender/sex: A multimethod approach with quantitative content analysis and hormonal response. *The Journal of Sex Research*, 51, 917-931. doi:10.1080/00224499.2013.798611
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55. doi:10.1080/10705519909540118
- Hurlbert, D. F. (2011). Hurlbert Index of Sexual Fantasy. In T. D. Fisher, C. M. Davis, W. L. Yarber & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (3th. ed., pp. 262). Abingdon: Routledge.
- Hurlbert, D. F., & Apt, C. (1993). Female sexuality: A comparative study between women in homosexual and heterosexual relationships. *Journal of Sex & Marital Therapy*, 19, 315-327. doi:10.1080/00926239308404375
- Johnson, R. A., & Wichern, D. W. (2002). *Applied Multivariate Statistical Analysis* (5th ed.). New Jersey, NJ: Prentice-Hall.
- Kasemy, Z., Desouky, D. E., & Abdelrasoul, G. (2016). Sexual fantasy, masturbation and pornography among Egyptians. *Sexuality & Culture*, 20, 626-638. doi:10.1007/s12119-016-9346-1
- Morokoff, P. J., Quina, K., Harlow, L. L., Whitmire, L., Grimley, D. M., Gibson, P. R., & Burkholder, G. J. (1997). Sexual Assertiveness Scale (SAS) for women: Development and validation. *Journal of Personality and Social Psychology*, 73, 790-804. doi:10.1037/0022-3514.73.4.790
- Moyano, N., Byers, E. S., & Sierra, J. C. (2016). Content and valence of sexual cognitions and their relationship with sexual functioning in Spanish men and women. *Archives of Sexual Behavior*, 45, 2069-2080. doi:10.1007/s10508-015-0659-1
- Moyano, N., & Sierra, J. C. (2014). Positive and negative sexual cognitions: Similarities and differences between men and women from southern Spain. *Sexual and Relationship Therapy*, 29, 454-466. doi:10.1080/14681944.2014.934667
- Moyano, N., Vallejo-Medina, P., & Sierra, J. C. (2017). Sexual Desire Inventory: Two or three dimensions? *The Journal of Sex Research*, 54, 105-116. doi:10.1080/00224499.2015.1109581
- Muñoz, J., Elosua, P., & Hambleton, R. K. (2013). International Test Commission Guidelines for test translation and adaptation: Second edition. *Psicothema*, 25, 151-157. doi:10.7334/psicothema2013.24
- Muñoz, J., & Fonseca-Pedrero, E. (2019). Ten steps for test development. *Psicothema*, 31, 7-16. doi:10.7334/psicothema2018.291
- Newbury, R., Hayter, M., Wylie, K. R., & Riddell, J. (2012). Sexual fantasy as a clinical intervention. *Sexual and Relationship Therapy*, 27, 358-371. doi:10.1080/14681994.2012.733816
- Pérez-González, S., Moyano, N., & Sierra, J. C. (2011). Sexual daydreaming: Its relationship to attitudes towards sexual fantasy and personality traits. *Cuadernos de Medicina Psicosomática y Psiquiatría de Enlace*, 99, 9-20.
- Perla, F., Sierra, J. C., Vallejo-Medina, P., & Gutiérrez-Quintanilla, R. (2009). Un estudio psicométrico de la versión española reducida del Hurlbert Index of Sexual Fantasy [A psychometric study of the reduced Spanish version of the Hurlbert Index of Sexual Fantasy]. *Boletín de Psicología*, 96, 7-16.
- 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/>
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48, 1-36. Retrieved from <http://www.jstatsoft.org/v48/i02/>
- RStudio Team (2018). *RStudio: Integrated Development for R*. Boston, MA: RStudio Inc. Retrieved from <http://www.rstudio.com/>
- Sakaluk, J. K. (2019). Expanding statistical frontiers in sexual science: Taxometric, invariance, and equivalence testing. *The Journal of Sex Research*, 56, 475-510. doi:10.1080/00224499.2019.1568377
- Santos-Iglesias, P., Calvillo, G., & Sierra, J. C. (2013). A further examination of Levine's model of sexual desire. *Psychology & Sexuality*, 4, 34-45. doi:10.1080/19419899.2011.576697
- 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
- Santos-Iglesias, P., Vallejo-Medina, P., & Sierra, J. C. (2014). Equivalence and standard scores of the Hurlbert Index of Sexual Assertiveness across Spanish men and women. *Anales de Psicología*, 30, 232-237. doi:10.6018/analesp.30.1.143321
- Sierra, J. C., Perla, F., & Santos-Iglesias, P. (2011). Sexual guilt in youngsters: The influence of attitudes and sexual experience. *Revista Latinoamericana de Psicología*, 43, 73-81.
- Sierra, J. C., Santos-Iglesias, P., & Monge, F. S. (2013). Inventario de Actitudes Negativas hacia la Masturbación: validez, fiabilidad y propuesta de una versión reducida para población adolescente [Negative Attitudes toward Masturbation Inventory: Validity, reliability, and proposal of a reduced version for adolescent population]. *Revista Argentina de Clínica Psicológica*, 22, 57-66.
- Sierra, J. C., Santos-Iglesias, P., & Vallejo-Medina, P. (2012). Evaluation of the factorial and metric equivalence of the Sexual Assertiveness Scale (SAS) by sex. *Psicothema*, 24, 316-322.
- Sierra, J. C., Santos-Iglesias, P., Vallejo-Medina, P., & Moyano, N. (2014). *Autoinformes como instrumento de evaluación en Sexología Clínica [Self-reports as an evaluation instrument in Clinical Sexology]*. Madrid: Síntesis.
- Sierra, J. C., Vallejo-Medina, P., & Santos-Iglesias, P. (2011). Psychometric properties of the Spanish version of the Sexual Assertiveness Scale (SAS). *Anales de Psicología*, 27, 17-26.
- Sierra, J. C., Vallejo-Medina, P., Santos-Iglesias, P., & Lameiras-Fernández, M. (2012). Validation of Massachusetts General Hospital-Sexual Functioning Questionnaire (MGH-SFQ) in a Spanish population. *Atención Primaria*, 44, 516-526. doi:10.1016/j.aprim.2012.02.004
- Sierra, J. C., Vallejo-Medina, P., Santos-Iglesias, P., Moyano, N., Granados, M. R., & Sánchez-Fuentes, M. M. (2014). Sexual functioning in the elderly: Influence of age and psychosexual factors. *Revista Internacional de Andrología*, 12, 64-70. doi:10.1016/j.androl.2013.10.002
- Simon, W., & Gagnon, J. H. (2003). Sexual scripts: Origins, influences and changes. *Qualitative Sociology*, 26, 491-497. doi:10.1023/B:QUAS.0000005053.99846.e5
- Spector, I. P., Carey, M. P., & Steinberg, L. (2011). Sexual Desire Inventory. In T. D. Fisher, C. M. Davis, W. L. Yarber & S. L. Davis (Eds.), *Handbook of Sexuality-Related Measures* (3th. ed., pp. 192-195). London: Sage.
- Vallejo-Medina, P., Granados, M. R., & Sierra, J. C. (2014). Proposal and validation of a short version of the Sexual Opinion Survey in the Spanish population. *Revista Internacional de Andrología*, 12, 47-54. doi:10.1016/j.androl.2013.04.004