



# Temperamental basis of sense of humor: The Spanish long form of the trait version of the State-Trait-Cheerfulness-Inventory



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## ARTICLE INFO

### Article history:

Received 27 November 2013

Received in revised form 12 March 2014

Accepted 29 March 2014

### Keywords:

Humor

STCI-T

Test adaptation

Cheerfulness

Seriousness

Bad mood

## ABSTRACT

Despite the numerous definitions and dimensions proposed to explain the sense of humor and the variety of instruments developed for its assessment, little attention has been paid to its affective and attitudinal basis in the models developed so far. The long form of the trait version of the State-Trait-Cheerfulness-Inventory (STCI-T; Ruch, Köhler, & van Thriel, 1996) was developed using a facet approach to measure the temperamental basis of sense of humor using three theoretically-derived concepts: cheerfulness, seriousness, and bad mood. This paper presents the psychometric analysis of the Spanish long form of the trait version of the STCI-T. We assessed the dimensionality of the instrument, the internal consistency and test-retest reliability of its facets and scales and the relationships between STCI-T domains and other variables. We assessed four independent samples comprised of 1049 participants in total with ages ranging between 18 and 94 years. The psychometric characteristics appeared to be satisfactory and proved to be replicable. Moreover, relationships between (a) the temperamental basis of sense of humor and (b) personality and well-being were also replicated. Results provide validity evidence for using the Spanish version of the STCI-T to assess the temperamental basis of sense of humor in the Spanish population.

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## 1. Introduction

Although the construct “sense of humor” has been widely described, its definition has traditionally focused on local aspects, disregarding its temperamental basis. Ruch, Köhler, & van Thriel (1996) developed one of the few theoretical models in which the affective and attitudinal basis of sense of humor has been granted considerable importance. In this model, sense of humor is defined using three dimensions: cheerfulness, seriousness, and bad mood. The detailed definitions and description of these three dimensions made it possible to develop the State-Trait-Cheerfulness-Inventory (STCI), which assesses cheerfulness, seriousness, and bad mood both as states (STCI-S; Ruch, Köhler, & Van Thriel, 1997) and traits (STCI-T; Ruch et al., 1996).

Factor analyses of STCI scores compared the trait facets proposed in the model with their representation in other instruments assessing sense of humor. Results of such analyses have shown that cheerfulness, seriousness, and bad mood account for much of the

variance of such instruments (Köhler & Ruch, 1996; Ruch & Carrell, 1998). Moreover, the three trait dimensions have been: (a) associated with relevant health and well-being variables (Martin, Publik-Doris, Larsen, Gray, & Weir, 2003; Yip & Martin, 2006); (b) included in comprehensive models of personality (Ruch & Köhler, 2007); (c) used for predicting behaviors in experiments (Thompson, Ruch, & Hasenöhr, 2004; Zweyer, Velker, & Ruch, 2004); and (d) considered to influence the outcome of humor treatment (Hirsch, Junglas, Konrad, & Jonitz, 2010).

The long form of the trait version of the STCI (STCI-T; Ruch et al., 1996) assesses the theoretical facets of the temperamental basis of sense of humor with 106 items. Trait cheerfulness is considered to be an enduring disposition. It has been defined using five facets: a prevalence of cheerful mood (CH1), a low threshold for smiling and laughter (CH2), a composed view of adverse life circumstances (CH3), a broad range of active elicitors of cheerfulness and smiling/laughter (CH4), and a generally cheerful interaction style (CH5). Trait seriousness is considered to be an attitude toward the world and a habitual frame of mind. It is considered to be made up of the following elements: a prevalence of serious states (SE1), a perception that even everyday happenings are important and deserving of thorough and intensive consideration (SE2), the tendency to plan ahead and set long-range goals (SE3), the tendency

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to prefer activities for which concrete, rational reasons can be produced (SE4), the preference for a sober, object-oriented communication style (SE5), and a humorless attitude about cheerfulness-related matters (SE6). Finally, trait bad mood, also a habitual affect, has been defined as the predominance of three mood states and their respective behaviors. Such components are a generally bad mood (BM1), sadness (i.e., despondent and distressed mood; BM2), and ill-humoredness (i.e., sullen and grumpy or grouchy feelings; BM4). Two further facets are specifically related to a sad (BM3) and ill-humored (BM5) behavior of individuals in cheerfulness-evoking situations (see Ruch & Köhler, 2007; Ruch et al., 1996).

The STCI-T has been assessed in various studies, which have confirmed its usefulness and psychometric properties (Ruch & Köhler, 2007). In a recent study, Carretero-Dios, Eid, and Ruch (2011) analyzed the convergent and discriminant validity of the trait factors of the STCI-T through a multilevel confirmatory factor analysis of multitrait-multimethod data. They found high convergent validities using self-reported trait measures and their corresponding peer reports. Convergent validity was also considerably high regarding the latent correlations between trait and state self-report measures. These authors also found strong evidence of discriminant validity. Specifically, the correlations observed between cheerfulness, seriousness, and bad mood confirmed the hypothesized associations. The trait factors cheerfulness and bad mood were highly negatively correlated with each other, while the correlations between these two factors and seriousness were moderate. The authors also reported a positive correlation between seriousness and bad mood and a negative correlation between seriousness and cheerfulness. This pattern of correlations was observed for peer and state ratings as well. As in previous studies (Ruch & Köhler, 2007), Carretero-Dios et al. (2011) showed that the traits cheerfulness, seriousness, and bad mood can be reliably assessed using the STCI-T, with Cronbach alpha values between .75 and .91.

The aim of the present study was to conduct a comprehensive assessment of the STCI-T in independent large samples of Spanish adults. As the STCI-T has broad empirical support in research on sense of humor, we aimed at obtaining evidence of its power with Spanish samples. In the present study, we conducted traditional psychometric analyses and explored the reliability of the STCI-T using internal consistency and test–retest approaches. In addition, we examined the factor structure of the STCI-T using exploratory and confirmatory analyses. Furthermore, we obtained external validity evidence by studying the relationship between the temperamental basis of sense of humor and other related variables such as personality and well-being.

### 1.1. Development of the Spanish trait form of the STCI: Initial stages

The 106 original items of the STCI-T (cheerfulness: 38 items; bad mood: 31 items; seriousness: 37 items) underwent a back-translation process (Hambleton & de Jong, 2003) involving four bilingual specialists. In addition, a new set of extra items was developed considering the conceptualization of each facet (AERA, APA, & NCME, 1999). This process led to an initial version of the STCI-T composed of 188 items (cheerfulness: 66 items; bad mood: 53 items; seriousness: 69 items).

These 188 items were evaluated by six experts in test construction to obtain validity evidence based on test content (Delgado-Rico, Carretero-Dios, & Ruch, 2012). The evaluation focused on determining to what extent the items created were representative of the target dimension and relevant to the facet for which they were developed. As regards formal aspects, the classic criteria set by Angleitner, John, and Löhr (1986) served as a reference. Specifically, the items were assessed on the basis of the following fea-

tures: comprehension (i.e., whether the item was properly understood), ambiguity (i.e., the chances that the item would be interpreted in different ways), and clarity (i.e., whether the item was concise/accurate/direct).

Of the 188 items assessed, 60 were considered to have insufficient content validity (content validity index,  $CVI < .70$ ; interjudge agreement Kappa index,  $Kappa < .40$  in representativeness and/or relevance). After removing these 60 items, we proposed an experimental Spanish version of the STCI-T that included 128 items (cheerfulness: 50 items; seriousness: 45 items; bad mood: 33 items). The present study describes the analyses of this version and their main results.

## 2. Materials and methods

### 2.1. Sample

Data from four different samples were collected in order to implement all the intended analyses.

Sample 1 (the *construction sample*) included 276 adults (18–94 years;  $M = 44.53$ ,  $SD = 17.94$ ), of whom 133 were males and 143 were females. Slightly more than half were married or lived with a partner (55.8%) and 44.2% were single or unmarried. More than a quarter held a university degree (28.6%), 24.2% were undergraduate university students, 22.7% held a school-leaving diploma qualifying for university entrance, and the rest had vocational training education (25.5%).

Sample 2 (the *test–retest sample*) consisted of 150 undergraduate psychology students (41 male and 109 female) aged between 17 and 54 years ( $M = 21.31$ ,  $SD = 5.50$ ).

Sample 3 (*replication sample I*) consisted of 423 undergraduate students of different academic areas (323 female and 100 male) aged between 17 and 59 years ( $M = 20.29$ ,  $SD = 4.76$ ).

Sample 4 (*replication sample II*) consisted of 200 adults aged between 18 and 87 years ( $M = 36.24$ ,  $SD = 19.60$ ) of which about 44.5% were male ( $n = 89$ ), 15.4% held a university degree, and 83% ( $n = 166$ ) held a school-leaving diploma qualifying for university entrance (five did not indicate their education level).

### 2.2. Instruments

#### 2.2.1. Experimental trait form of the State-Trait-Cheerfulness-Inventory

The 128-item were initially used to assess the temperamental basis of sense of humor. Their psychometric characteristics were studied in the construction sample. Items were rated on a 4-point Likert scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”).

#### 2.2.2. Spanish trait form of the State-Trait-Cheerfulness-Inventory (STCI-T)

This version derived from the construction sample was used in the test–retest sample and the replication samples. It consisted of 104 items rated on a 4-point Likert scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”).

#### 2.2.3. NEO-FFI

The NEO Five-Factor Inventory (NEO-FFI), a short version of the NEO Personality Inventory-Revised (NEO-PI-R), was administered to Sample 4. The NEO-FFI (Costa & McCrae, 1992) is an instrument that uses 60 items (12 per scale) to measure the five major domains of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Responses are provided on a 5-point Likert scale ranging from 0 (“strongly disagree”) to 4 (“strongly agree”).

### 2.2.4. Psychological well-being scale

Psychological well-being was measured with the subjective Psychological Well-being Scale (Sánchez-Cánovas, 1994) in Sample 3. This instrument, based on previous findings and scales pertaining to well-being, is a reliable and valid 30-item questionnaire developed to measure five well-being factors: (1) life satisfaction (11 items); (2) happiness (6 items); (3) sociability (4 items); (4) health (4 items); (5) and hope (5 items). Answers are scored on a 6-point Likert scale (from “never” to “always”).

### 2.2.5. Beck Depression Inventory (BDI-IA)

Sample 3 also completed the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979). This self-report questionnaire was developed to measure the severity of depression with 21 multiple-choice questions rated on a 4-point scale indicating the degree of severity “over the past week, including today” (from 0 = “not at all” to 3 = “extreme form of each symptom”).

### 2.2.6. Trait items of the State-Trait Anxiety Inventory

Finally, Sample 3 completed the trait form of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This 20-item self-report questionnaire assesses trait anxiety using a 4-point Likert scale (from “never” to “always”).

## 2.3. Procedure

Two trained evaluators made individual contact with the adult participants and the undergraduate students, who were assessed in small groups in public places of the university campus. Individuals who accepted to cooperate received a booklet that included the standard instructions and the consent form. The construction and test–retest samples (i.e., Samples 1 and 2) were only administered the STCI-T scale. In the replication samples (i.e., Samples 3 and 4), the booklet of questionnaires included the STCI-T, the instruments aimed at obtaining validity evidence based on relationships with personality, and the subjective Psychological Well-being Questionnaire. All data were collected independently in the four samples. None of the participants were paid for their services.

## 3. Results

### 3.1. Item analysis and exploratory factor analysis

The 128 items of the experimental Spanish trait version of the STCI-T were tested in the construction sample. Discrimination indices (i.e., corrected item-total correlation  $<.20$ ) and high content redundancy led to removing 24 items. Thus, we proposed a 104-item Spanish version of the STCI-T. Of the total of 104 items, 72 came from the original version while 32 belonged to the new set of items created by the facets conceptualization. Of them eight were included in the cheerfulness, 12 in seriousness and 12 in bad mood facets. This difference in the number of items between both versions is due to BM2 facet (8 items in the original version; 6 items in the Spanish version) where no new items were created attending to the original conceptualization of this facet but two items were removed because their poor psychometric properties. The number of items of the other facets of the Spanish version of the STCI-T was the same as in the original STCI-T.

No facets deviated from a normal distribution. The average absolute levels of skewness and kurtosis of the facets were .13 and .18, respectively. Cronbach alpha ranged from .68 to .84 for the cheerfulness facets; from .61 to .79 for the seriousness facets; and from .64 to .84 for the bad mood facets. Cronbach alpha was high for the scales (i.e., cheerfulness = .91, seriousness = .89, and

bad mood = .93). We obtained the following mean discrimination indices for the facets: .48 for cheerfulness, .42 for seriousness, and .51 for bad mood. Thus, individual items exhibited adequate properties.

The internal structure was tested with a principal components analysis. KMO value was .87, and Bartlett’s test showed statistical significance (Chi-square = 1611.94,  $df = 120$ ,  $p < .001$ ), indicating that the samples met the expected criteria for interpreting factor solutions.

Due to the high correlation between the temperamental basis of sense of humor a Promax rotation ( $kappa = 4$ ) was applied. The factor pattern (Table 1) suggested the existence of three factors with eigenvalues higher than 1 (4.84, 3.64, and 3.59) that altogether explained 61.11% of the variance. The factors were clearly identified as cheerfulness, seriousness, and bad mood. As shown on Table 1, CH1 loaded on cheerfulness and bad mood equally high; all others facets loaded highest on the factor that it was supposed to belong to. Thus, responses of participants reflected the same dimensions specified in the theoretical model taken as a reference.

The intercorrelations between factors revealed the following: cheerfulness showed a mild negative correlation with seriousness ( $r = -.14$ ,  $p < .001$ ) and a negative correlation with bad mood ( $r = -.50$ ,  $p < .001$ ). A positive correlation was found between the two forms of humorlessness ( $r = .35$ ,  $p < .001$ ).

The potential effect of gender was also tested. No effects were identified for cheerfulness [ $F(1, 275) = 2.03$ ,  $p = .15$ ] or seriousness [ $F(1, 275) = .05$ ,  $p = .81$ ], but significant gender effects emerged for bad mood, where women exhibited significantly higher scores than men [males:  $M = 1.74$ ,  $SD = .48$ ; females:  $M = 1.96$ ,  $SD = .58$ ;  $F(1, 234) = 10.20$ ,  $p < .01$ ]. Gender effects were connected to age because they were found only for participants older than 55. Regarding age, bad mood tended to be slightly higher among older participants ( $r = .14$ ,  $p < .05$ ), with a statistically significant effect of sample size. Seriousness was strongly correlated with age ( $r = .48$ ,  $p < .001$ ), although no age effect was observed for cheerfulness ( $r = .02$ ,  $p = .85$ ). Thus, older participants mainly scored higher on seriousness, which is consistent with former studies.

### 3.2. Test–retest

The reliability of the Spanish version of the STCI-T was evaluated using a test–retest procedure with an eight-week interval

**Table 1**

Loadings of the 16 STCI-T facets on the three unrotated and obliquely rotated factors.

Facets	PC 1	PC 2	PC 3	Obl 1	Obl 2	Obl 3	$h^2$
<b>Cheerfulness</b>							
CH1	-.69	.51	-.04	.52	.21	-.52	.74
CH2	-.60	.42	.18	.63	.05	-.22	.57
CH3	-.32	.58	.21	.66	.28	-.05	.49
CH4	-.58	.43	.48	.92	-.08	.11	.77
CH5	-.53	.26	.54	.84	-.24	.22	.64
<b>Seriousness</b>							
SE1	.51	.23	-.08	-.11	.44	.19	.32
SE2	.35	.66	-.10	.19	.77	.01	.58
SE3	.44	.52	-.11	.06	.67	.07	.48
SE4	.61	.47	-.10	-.01	.69	.20	.61
SE5	.34	.60	-.24	.02	.77	-.14	.54
SE6	.60	.33	-.30	-.28	.67	-.01	.57
<b>Bad mood</b>							
BM1	.77	-.13	.45	.06	-.06	.96	.82
BM2	.79	-.12	.28	-.09	.05	.79	.72
BM3	.75	.08	.34	.11	.17	.81	.69
BM4	.73	-.07	.40	.07	.00	.88	.71
BM5	.65	.15	.08	-.06	.33	.46	.45

Note.  $N = 276$ . Expected loadings were italicized. PC = unrotated factors (principal components). Obl = rotated factors.  $h^2$  = communality.

between the first and the second administration (test–retest sample,  $n = 150$ ). In the second administration, Cronbach alpha ranged from .70 to .90 for the cheerfulness facets; from .63 to .77 for the seriousness facets; and from .71 to .88 for the bad mood facets. The scales showed higher Cronbach alpha values (i.e., cheerfulness = .84, seriousness = .76, and bad mood = .87). These alpha values were maintained at retest. The test–retest correlations ranged from .77 to .80 for the cheerfulness facets, from .58 to .80 for the seriousness facets, and from .62 to .80 for the bad mood facets (all values  $p < .001$ ). Again, higher values were observed for the scales, where the following test–retest correlations were obtained: cheerfulness = .84, seriousness = .83, and bad mood = .83 (all values  $p < .001$ ). Both results show adequate reliability levels in all scales.

### 3.3. Confirmatory factor analysis

A confirmatory factor analysis using Mplus 5.0 (Muthén & Muthén, 2004–2008) was performed for Sample 3 with the aim of assessing whether the three dimensions (i.e., cheerfulness, seriousness, and bad mood) emerged from the data obtained, confirming their usefulness for defining the temperamental basis of sense of humor. Item parcels were created in order to distinguish measurement error from true differences by choosing the optimal solution in terms of fit (Carretero-Dios et al., 2011). Three indicators were used for each factor as it was the optimal solution, that is, the lowest number of indicators needed for reaching adequate properties. Nine observed variables were created in total – three for each trait. The MLR estimator was used, which takes into account the non-independence of observations and also the possible non-normality of the data.

Three different models derived from theoretical foundations (Ruch et al., 1996) were tested: a two-factor model (Model 1), composed of positive dimensions (i.e., cheerfulness) versus negative dimensions (i.e., seriousness and bad mood), a three-factor model (Model 2), composed of the three independent dimensions (i.e., cheerfulness, seriousness, and bad mood), and a one-factor model. The latter model did not show any convergence, so only the results of the other two models are presented.

Various alternative criteria were used to determine global model-data fit as recommended by Kaplan (2000). Table 2 shows the fit indices obtained with each model.

As shown on Table 2, Model 1 (i.e., cheerfulness vs. seriousness and bad mood) showed a poor fit. By contrast, the model considering the three temperamental basis of sense of humor showed excellent fit indices. Thus, a structure defined by three factors, which corresponded to the three expected scales, showed the best fit to the data.

### 3.4. Relationships with other variables: Personality

Validity evidence based on relationships with other variables was obtained. First, the relationship between humor and personality was tested in order to confirm the relationships found by Ruch and Köhler (2007) in a Spanish sample. These authors associated (a) cheerfulness with higher extraversion, openness, and agree-

ableness, and with lower neuroticism; (b) seriousness with lower extraversion but higher conscientiousness; and (c) bad mood with low extraversion, agreeableness, and high neuroticism. Responses to the shortened version of the NEO-PI-R (NEO-FFI) were collected and its scores were correlated with those of the STCI-T. Table 3 shows the results of correlating domains from both instruments.

Table 3 shows that the intercorrelations between the STCI-T and personality were similar to those found in former studies. First, cheerfulness correlated positively with extraversion and agreeableness and negatively with neuroticism (all effects were mid-range to high). At the same time, the positive correlation between cheerfulness and openness was low even though statistical significance was reached. Conversely, bad mood correlated positively with neuroticism (strong effect) and negatively with the remaining factors of personality (all effects were low to mid-range). Finally, seriousness only correlated significantly with conscientiousness, showing a positive relationship between both factors (mid-range effect).

### 3.5. Relationships with other variables: Well-being

Taking into account previous research (Martin et al., 2003), positive correlations (mid-range) were expected between cheerfulness and positive dimensions of well-being (e.g., happiness or life satisfaction), while negative indicators of well-being (e.g., anxiety or depression) were expected to correlate negatively with cheerfulness (mid-range effects). The expected pattern was the opposite for bad mood (and seriousness, with lower correlations values). Table 4 shows the results of computing correlations between the STCI-T and positive and negative scales of well-being.

As shown on Table 4, results fit the expected pattern. First, all the positive factors of well-being correlated positively with the cheerfulness facet. By contrast, negative correlations were found for seriousness and bad mood. All the correlations were statistically significant ( $ps < .01$ ), except for those between health, hope and satisfaction facets as well as seriousness ( $p > .05$ ).

Relationships between (a) the STAI and BDI and (b) STCI-T facets were also tested by following the previous hypotheses. Both showed significant negative correlations with cheerfulness and significant positive correlations with bad mood (and seriousness, with lower correlations values).

## 4. Discussion

The aim of the study was to provide an overall evaluation of the STCI-T scale in the Spanish context in order to obtain validity evidence for this specific sample. To do so, a wide variety of procedures were implemented, providing strong evidence of the adequacy of the scale and the three-dimensional definition of the attitudinal basis of sense of humor.

First, results of the item analysis led to the development of a Spanish version in which items with poor properties were removed. Once an experimental version with 104 items had been administered, exploratory factor suggested the existence of three factors clearly identified as cheerfulness, seriousness, and bad mood. In factor pattern CH1 loaded on cheerfulness and bad mood equally high as occurred in the original version of the STCI-T. In this sense, CH1 items imply a “lack of bad mood” and not only a presence of cheerfulness mood.

Correlations analyses highlighted clear convergences between the theoretical and applied relationships found between facets and scales and between scales. The reliability of the scale was confirmed by assessing its internal consistency but also by using a test–retest procedure. Finally, findings of the confirmatory factor analysis indicated that the three-dimensional model had the best fit.

**Table 2**  
Assessment of the fit of the STCI-T data.

Models	Chi-square	df	RMSEA	SRMR	CFI	TLI
Model 1	656.94	53	.164	.106	.852	.815
Model 2	101.45	51	.048	.033	.988	.984

Note.  $N = 423$ . RMSEA = root-mean-square error of approximation. SRMR = standardized root mean square residual. CFI = comparative fit index. TLI = Tucker–Lewis index.

**Table 3**

Means, standard deviations, Cronbach alphas, and intercorrelations between the trait form of the State-Trait-Cheerfulness-Inventory (STCI-T) and the NEO Five-Factor Inventory (NEO-FFI).

Scales	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STCI-T										
(1) Cheerfulness	2.90	.45	.91							
(2) Seriousness	2.51	.37	-.10	.84						
(3) Bad mood	2.06	.57	-.57*	.41*	.87					
NEO-FFI										
(4) Neuroticism	1.78	.58	-.43*	.21	.65*	.69				
(5) Extraversion	2.54	.70	.67*	-.17	-.58*	-.52*	.73			
(6) Openness	2.30	.64	.29*	.06	-.25*	-.21	.26*	.61		
(7) Agreeableness	2.39	.54	.45*	.00	-.35*	-.29*	.42*	.38*	.70	
(8) Conscientiousness	2.43	.55	.21	.40*	-.26*	-.29*	.26*	.22	.45*	.73

Note. *N* = 200. Cronbach alphas in italics.

\* *p* < .001 (adjusted level of significance due to alpha error accumulation).

**Table 4**

Means, standard deviations, Cronbach alphas, and intercorrelations between the trait form of the State-Trait-Cheerfulness-Inventory (STCI-T) and the psychological well-being scales.

Scales	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
STCI-T												
(1) Cheerfulness	3.07	.45	.93									
(2) Seriousness	2.37	.36	-.39*	.87								
(3) Bad mood	1.73	.50	-.65*	.53*	.94							
Well-being												
(4) Happiness	3.50	.75	.64*	-.23*	-.56*	.83						
(5) Hope	3.24	.81	.53*	-.19	-.53*	.77*	.85					
(6) Health	3.67	.72	.36*	-.10	-.41*	.61*	.57*	.66				
(7) Sociability	4.19	.64	.52*	-.24*	-.41*	.58*	.50*	.48*	.71			
(8) Life satisfaction	3.86	.64	.49*	-.12	-.52*	.75*	.74*	.71*	.57*	.87		
(9) Anxiety	20.98	9.96	-.55*	.35*	.75*	-.65*	-.61*	-.53*	-.40*	-.65*	.81	
(10) Depression	6.13	5.44	-.45*	.33*	.64*	-.46*	-.51*	-.41*	-.39*	-.55*	.62*	.86

Note. *N* = 423. Cronbach alphas in italics.

\* *p* < .001 (adjusted level of significance due to alpha error accumulation).

Regarding the effects of age and gender, the main patterns already observed in previous studies were reproduced (Ruch et al., 1996). Gender was not found to have an effect on the temperamental basis of sense of humor on participants younger than 55 (previous studies didn't include older participants), while higher seriousness scores were observed among older participants. Along the same lines, when validity evidence was explored based on the relationships with other variables (i.e., personality and well-being) the previous findings (Martin et al., 2003; Ruch & Köhler, 2007) were reproduced. Cheerfulness was correlated with higher extraversion, openness, and agreeableness, and with lower neuroticism; seriousness was correlated with higher conscientiousness; and bad mood was correlated with high neuroticism and lower extraversion. Regarding well-being, positive correlations (mid-range) were observed between cheerfulness and positive dimensions of well-being (e.g., happiness or hope), while negative indicators of well-being (e.g., anxiety or depression) were negatively correlated with cheerfulness (mid-range effects). The observed pattern was the opposite for bad mood (and seriousness, with lower correlations values). These results suggested a relationship between a "good sense of humor profile" according to the temperamental basis of sense of humor (i.e., high scores in cheerfulness and low scores in seriousness and bad mood) and a positive well-being.

In summary, all the findings converged to indicate the adequacy of applying the scale in Spanish samples. Results corroborated that the attitudinal basis of sense of humor is composed of three dimensions: cheerfulness, seriousness, and bad mood. Furthermore, they confirmed the predicted relationships between the three factors and basic personality dimensions as well as a selection of variables used to assess psychological well-being. Future research should focus on testing the usefulness of the scale in applied settings

and obtaining new validity evidence based on relationships with other theoretically relevant variables.

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