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Chilean Spanish version of the State Trait Cheerfulness Inventory (STCI-T-60, trait form): Individual and couple forms

Abstract: The adaptation and validation of a Chilean Spanish version of the State Trait Cheerfulness Inventory (STCI-T-60) including a couple evaluation, is presented. The inventory was developed by Ruch (1990) to measure three traits (cheerfulness, seriousness, and bad mood), considered to enable exhilaration, which is the main indicator of the sense of humor experience. Ruch suggested studying basic temperamental traits and stable dispositions involved in the possibility of experiencing humor. The inventory was applied to three Chilean samples: a validation sample of 500 adults individuals, evaluated in a stratified manner considering gender, age and socio-economic level; a replication sample of 298 middle-class adults; and a couple sample of 53 middle-class couples. The results showed adequate internal consistency and solid validity of the constructs in all groups. The study contributes to research in the field of the sense of humor from local and transcultural perspectives. The validation of a couple form will contribute specifically contribute to the study of the sense of humor as a couple relational dynamic and its relations with other relational variables.

Keywords: humor, cheerfulness, seriousness, bad mood, couples

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1 Introduction

The sense of humor differs substantially among individuals. This variation can be associated with differences in the degree to which individuals understand

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humorous stimuli; the manner in which they express humor and cheerfulness (CH); their ability to make humorous comments or perceptions; the way in which they perceive different types of joke, caricature, and other humorous material; the extent to which they actively seek resources to make others laugh; their capacity to remember jokes or humorous incidents; and their tendency to use humor as an imitation mechanism (Hehl and Ruch 1985).

Humor can be categorized in relation to personality dimensions. The types of humor referred to as nonsense and wit are related to character traits such as CH, agreeableness, and positive affect, whereas those referred to as satire and sarcasm are related to negative affect, neuroticism, psychoticism, and irritability (Ruch 1998). In addition to affective variables, such as CH and bad mood (BM), humor is affected by mind-frame dispositions such as seriousness (SE) (Ruch 1990). CH, SE, and BM appear to be basic temperamental traits and stable dispositions that support certain types of humor. At the same time, these constructs can represent current and circumstantial dispositions (Ruch 1990). With respect to humor, this approach involves the following attributes: (1) humor is not a one-dimensional unit, and individuals differ in more than one dimension; (2) humor has more than one pole and the lack of humor needs representation; (3) humor includes affective and mind-frame factors; and (4) the disposition to humor varies both intrapersonally and interpersonally.

The model of humor indicators, such as CH, SE, and BM, emerged from an experimental study carried out by Willibald Ruch (1990, 1993). To address the difficulty of defining the concept of sense of humor, Ruch (1996) studied the behavioral traits involved in the ability to experience humor and the emotion of exhilaration, which can be empirically assessed. The term "exhilaration", from the Latin *hilaris* 'cheerful', is used to describe the process of reaching a state of CH. (see Figure 1). This process involves behavioral components (laughter, postures, gestures), physiological aspects (breathing, cardiac activity), and psychological and experiential aspects (exhilaration, perceptions) in response to humor. Situations and stimuli, such as humor, tickling, and nitrous oxide, can induce a state of exhilaration by different means. Elements such as drugs, alcohol, and social influence can regulate (encourage or inhibit) the expression of this state.

Ruch et al. (1996) developed the 60-item State Trait Cheerfulness Inventory standard trait form (STCI-T-60) to measure the constructs of CH, SE, and BM. These constructs determine the threshold at which the state of exhilaration is reached, the level of exhilaration, and its stability over time. CH, SE, and BM affect an individual's current or general tendency to become exhilarate. Hence, humor is understood as a personality trait that can be assessed with the STCI-T-60. If an individual quickly responds to a humorous stimulus with laughter and a positive affective reaction, implies current states and usual traits in his/her

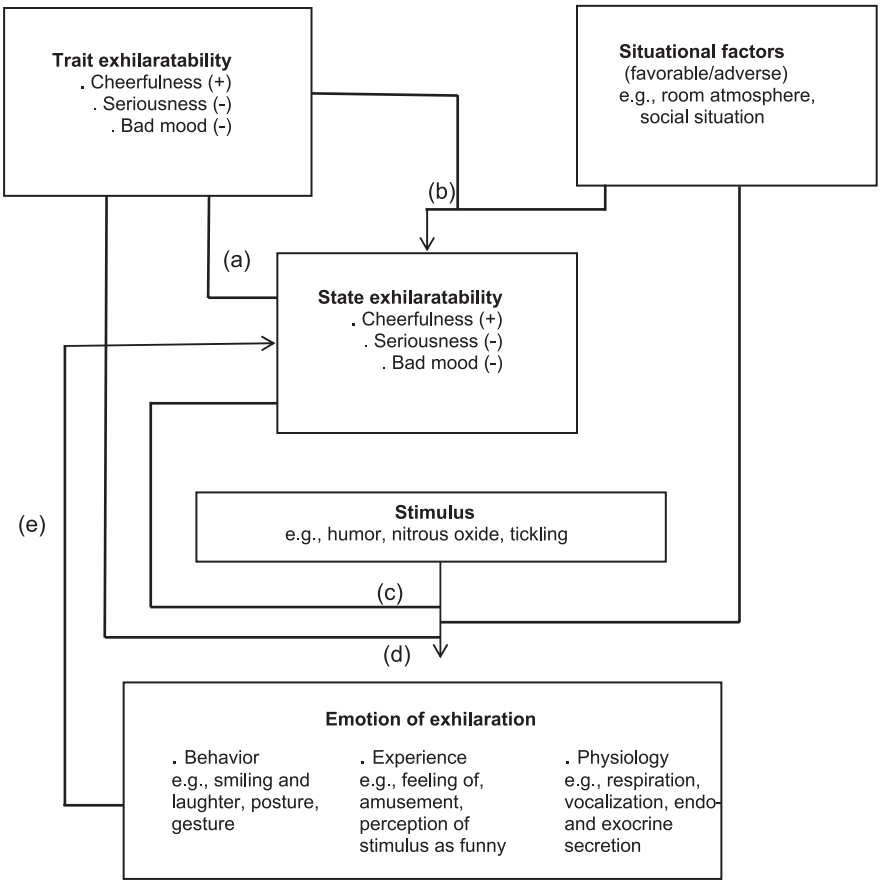

Fig. 1: Relational diagram of variables involved in the emotion of exhilaration (redrawn with authors' permission from Ruch and Köhler 1998). Research questions related to (a) the state-trait relationship, (b) how the trait of cheerfulness moderates the effect of adversity on mood, whether the (c) state and (d) trait of cheerfulness represent individuals' dispositions toward smiling and laughter, and (e) the effect of smiling/laughter on mood.

disposition to humor. The state refers to the actual disposition to humor, which can vary over time, whereas the trait is considered to persist over time. Thus, the concept of CH as a usual mood, stable disposition, or trait (Ruch 1993) involves a longer duration, less fluctuation in intensity, and less dependence on external stimuli. In contrast, exhilaration is a temporary, current, and circumstantial state involving an intense increase in CH that can be observed in an individual's behavior, physiology, and emotional experience.

Since its creation in the 1990s, the STCI-T-60 has been used in a variety of studies. One study investigated the intermediation of CH, SE, and BM in pain tolerance in 76 women, demonstrating a relationship between low SE scores and high CH scores and pain increased tolerance (Zweyer et al. 2004). An empirical study involving 90 depressive patients showed that participation in a humor-based therapy group improved CH, SE and BM indicators, as well as life satisfaction, with respect to the control group (Hirsch et al. 2010).

2 Sense of humor in couples' relationships

The well-being of couples' relationships is related to the effective protection of the affectionate bond, rather than to concrete problem solving. Protection of the bond can be understood as the preponderance of positive over negative affects during arguments and the restoration of the emotional climate thereafter (Gottman 1999). In addition to the adoption of these supportive strategies in times of conflict, the use of humor in periods between crises favors flexibility and proneness to change (Driver and Gottman 2004; Tapia et al. 2009). Hence, partners' senses of humor influence the couple's capacity to cope with states of negativity, the degree and type of negativity expressed during arguments, and the capacity to come together again after an argument. These intra and post argument variables have been shown to be very powerful in minimizing the risk of divorce. Accordingly, sense of humor is a factor that protects couples' stability and satisfaction (Driver and Gottman, 2004; Gottman 1999).

Evidence has shown that CH, health, and well-being are correlated. Individuals with high CH scores reported using humor as a coping strategy to experience more positive and less negative affect and needs for affiliation and nurturance. These individuals are emotionally intelligent and possess high interpersonal competence (Köhler and Ruch, 1996; Ruch and Hofmann 2012; Wrench and McCroskey 2001). These outcomes are consistent with factors related to marital satisfaction and the outcomes of couples' therapy (Driver and Gottman 2004; Gottman 1999).

Other studies have observed that marital satisfaction is influenced by partners' perceptions of one another. Attributional studies have found that couples with low satisfaction levels tend to consider one another's negative aspects to be fundamental and positive aspects to be circumstantial, whereas highly satisfied couples see one another's negative aspects as circumstantial and positive aspects as essential (Gottman 1999). Given this evidence, the construction of a couples' version of the STCI-T-60 (for each spouse, with direct and observational perspective versions) would enable comparison of self-perceptions and partners' perspectives on traits associated with the sense of humor, such as CH, SE, and BM, as

well as other variables related to couples' well-being. Consequently, process outcome studies have shown that agreement between partners on how to assess changes has a predominant effect on the results of the therapeutic process. Other studies have shown the predictive effect of agreement between the spouses regarding alliance in couple therapy, rather than by the self-assessed opinion (Horvath et al. 2010; Symonds and Horvath, 2004). In this study, the STCI-T-60 was adapted for the Chilean population and its reliability and validity in assessing CH, BM, and SE in this sociocultural context were tested. The couples' version of the STCI-T-60 was developed and the validity and reliability were also tested using couples' self-reporting and observational perspectives on one another.

3 Methodology

3.1 Participants

3.1.1 Construction sample

An intentional sample of 500 married individuals (300 [60%] women, 200 [40%] men) in Santiago, Chile, stratified by gender, age, and socioeconomic level (SEL), was used to test the reliability of the adapted Chilean version of the STCI-T-60. One hundred (20%) individuals were aged 16–19 years, 300 (60%) were 20–39 years old, and 100 (20%) were aged 40–64 years. SEL was determined using the Graffar (1956) classification; it was high in 100 (20%) individuals, medium in 300 (60%), and low in 100 (20%) individuals.

3.1.2 Replication sample

The study was replicated using an intentional sample of 298 middle-class adults (11 [37.2%] men, 187 [62.8%] women) residing in Santiago, Chile, who had been living with (n = 48 [16.1%]) or married to (n = 220 [73.8%]) their partners for at least 1 year or who had separated in the past year (n = 30 [10.1%]). The latter were asked to answer the questionnaire with respect to the last month of their marriage. The mean age was 37.5 (standard deviation [SD] = 9.9) years old and the average duration of relationships was 11.9 (SD = 10.4) years. Most (n = 216 [72.5%]) participants in this sample had children; 178 (82.4%) had only common children with their partners, 22 (10.2%) had no common children with their partners, and 16 (7.4%) participants had common and no common children. The majority (74.5%) of participants had university-level educations.

3.1.3 Couples sample

The couples' version of the STCI-T-60 was tested using an intentional sample of 53 middle-class couples residing in Santiago, Chile, who had been living with (n = 3 [5.7%]) or married to (n = 50 [94.3%]) their partners for at least 1 year. The mean ages of women and men were 41.4 (SD = 9.3) years old and 44 (SD = 9.2) years old, respectively. The average duration of relationships was 14.3 (SD = 10.1) years. Of these couples, 96.3% had children. Most men (77.7%) and women (90.7%) had completed university-level education.

3.2 STCI-T-60

The original English version of the self-administered STCI-T-60 trait form (Ruch et al. 1996) was adapted in this study. This instrument is divided into three 20-item subscales (CH, SE, and BM) with Cronbach's alpha values of .92, .81, and .93, respectively. The concepts of state and trait are distinguished for each construct. CH and BM are defined as affective constructs, whereas SE is a mind-frame concept. The CH and BM subscales have five facets each, and the SE subscale has six facets. Responses are structured by a Likert scale ranging from "strongly disagree" (1) to "strongly agree" (4). The administration time is 20–25 minutes. Table 1 shows the characteristics of the subscales and facets.

3.3 Procedure

The following steps were taken to adapt the STCI-T-60 to the Chilean sociocultural context and validate the adapted instrument:

1. Three native Spanish-speaking translators translated the STCI-T-60 from English to Spanish, and three native English-speaking translators performed back-translation from Spanish to English.
2. Three experts in personality psychology reviewed the formal aspects and content of the translated instrument.
3. Additional items were constructed based on the experts' recommendations, yielding a preliminary Chilean Spanish version of the STCI-T with 85 items.
4. The preliminary instrument was administered to a sample of 150 middle-class psychology and engineering students (53% women, 47% men; mean age, 20 years) at Universidad del Desarrollo, Santiago, Chile, to evaluate its internal consistency.
5. The items were evaluated by subscale; those that contributed least to the overall reliability (Cronbach's alpha value) of the scale were eliminated to

Table 1: Subscales and items of the individual and couples' forms of the State Trait Cheerfulness Inventory (STCI-T-60)

Construct	Item description	Item example	Item example (couples' form)
Cheerfulness	Prevalence of cheerful mood Low threshold for laughter and smiling Positive outlook on adverse circumstances of life Large range of triggers for cheerfulness, laughter, and smiling Cheerful interaction style	It is easy to make me laugh.	It is easy to make ____ laugh.
Seriousness	Prevalence of serious states Perception of daily life events as serious and important Goal-oriented lifestyle Preference for concrete and rational activities Simple communication style Attitude characterized by lack of sense of humor towards situations, people and actions	I rarely act without due reason.	____ rarely acts without due reason.
Bad mood	Prevalence of bad mood Prevalence of sadness Sadness in cheerful situations Feelings of irritability	I am often in a bad mood.	____ is often in a bad mood.

yield a final Chilean Spanish version of the STCI-T-60. Original items were not replaced, and any amendment of them affected only the wording.

6. The wording and narrative form of items were adapted to create a couples' version of the STCI-T-60, including forms for men (STCI-T-60 [M]) and women (STCI-T-60 [W]). These forms, as well as the adapted Chilean Spanish version of the STCI-T-60, were assessed using the sample of couples.

4 Results

4.1 Internal consistency

The results of initial testing and replication showed adequate internal consistency for all STCI-T-60 subscales (Table 2). The CH and BM subscales were signifi-

Table 2: Psychometric characteristics of STCI-T-60 scales

Scale	Construction sample (n = 500)									Replication sample (n = 298)								
	Ni	M	SD	α	Citc			Sk	Ku	Ni	M	SD	α	Citc			Sk	Ku
					mean	min	max							mean	min	max		
CH	20	60.80	10.00	.88	.49	.18	.69	−.10	−.99	20	66.13	8.91	.90	.55	.24	.72	−.91	1.86
SE	20	52.54	6.85	.71	.28	.15	.44	.26	.66	20	56.07	9.62	.74	.35	.01	.53	.97	5.51
BM	20	41.30	8.10	.80	.37	−.08	.57	.45	.74	20	40.58	10.30	.90	.52	−.12	.70	.69	.52

Notes: Ni = Number of items, M = mean, SD = standard deviation, α = Cronbach's alpha, Citc = corrected item-total correlation, Sk = skewness, Ku = kurtosis, CH = Cheerfulness, SE = Seriousness, BM = Bad Mood.

Table 3: Correlations among cheerfulness, seriousness and bad mood subscales of the Chilean Spanish version of the STCI-T-60 in construction and replication samples

	CH	SE	BM
CH		.08	−.48
SE	.09		.22
BM	−.50	.23	

Notes: CH = Cheerfulness, SE = Seriousness, BM = Bad Mood.
Construction sample, n = 500 (300 [60%] women, 200 [40%] men); replication sample, n = 298 (187 [62.8%] women, 11 [37.2%] men).
Construction sample: $r \geq .17$, $p < .001$; replication sample: $r \geq .21$; $p < .001$.

cantly and highly correlated, whereas the SE subscale showed a slightly lower degree of correlation with other subscales (Table 3). The correlation between CH and BM was inversely proportional.

4.2 Exploratory factor analysis

A principal component analysis with oblique (direct Oblimin) rotation was conducted on the 60 items of the adapted instrument. The Kaiser-Meyer-Olkin (KMO) measure verified sampling adequacy (KMO = .863). Sphericity was rejected (Bartlett's chi-squared = 13706.25, df = 177, $p < .01$), indicating that the data were suitable for factor analysis. In the initial analysis, the eigenvalues of 15 factors were >1 (Kaiser's criterion) and these factors explained 64.0% of variance. Thus, these 15 factors were retained (eigenvalues for factors 16, 17 and 18 were .96, .92 and .90, respectively). Table 4 shows the factor structure when a three-factor model was required.

4.3 Confirmatory factor analysis

Confirmatory factor analysis was conducted using data from the replication sample. Three models were compared to determine the best fit of the data (Carretero-Dios et al. 2011). The first model grouped all items in a single factor, the second model compared the CH factor with a composite of BM and SE, and the third model tested the three factors originally proposed for the test. Only the third model yielded acceptable fit indices (Table 5).

Table 4: Exploratory factor analysis: three-component solution after Oblimin rotation

Item	RC1	RC2	RC3	h^2
1				.22
31		**.59**		.39
34				.26
37				.33
51				.28
8				.16
13				.12
29			**.42**	.50
40		**.62**		.46
54		**.67**		.45
56				.36
21				.32
48		**.52**		.40
6		**.64**		.48
11		**.41**		.19
17		**.42**		.19
24				.24
27				.16
43		**.61**		.41
45				.53
4	**.80**			.65
19				.18
32	**.81**			.67
46			**.45**	.42
50	**.61**			.44
9				.11
22	**.53**			.31
30				.29
2				.10
14				.58
35	**.43**			.20
53	**.62**			.43
16	**.61**			.39
26	**.72**			.61
38	**.55**			.32
44	**.41**			.17
25				.26
41	**.66**			.45
57	**.45**			.48
59	**.73**			.55
5				.17
7				.06
15			**.53**	.45

Table 4 (cont.)

Item	RC1	RC2	RC3	h^2
33	**.41**	**.59**		.51
18			**.63**	.48
28				.11
39				.16
49			**.64**	.49
12				.14
23			**.44**	.20
47				.24
60	**.50**	**.48**		.49
3				.19
20				.19
42				.22
52				.19
10				.20
36				.11
55		**.51**		.27
58		**.57**		.45
Eigenvalue	10.25	5.52	3.71	
% of variance	17.08	9.19	6.18	
Assigned subscale	CH	BM	SE	

Notes: RC = rotated component, h^2 = communality, CH = Cheerfulness, SE = Seriousness, BM = Bad Mood.
Factor loadings > .40 appear in bold.
Extraction method: Principal component analysis; Rotation method: Direct Oblimin.

4.4 Gender and socioeconomic level

In initial testing, the mean CH score was higher in men (64.199; SD = 8.814) than in women (58.537; SD = 10.127, $t = -6.456$, $p < .001$). In the replication sample, no gender- or age-related difference in any subscale score was observed. As expected, CH scores differed significantly according to SEL in initial testing ($F = 27.95$, df = 2,498, $p < .01$; Figure 3); mean CH scores of participants with low, medium, and high SELs were 55.1 (SD = 8.9), 61.9 (SD = 10.3), and 63.3 (SD = 7.8), respectively. No significant difference in this score was found between medium and high SELs. BM scores also differed significantly according to SEL ($F = 6.88$, df = 2,498, $p < .01$; Figure 3), specifically between participants with low (mean = 42.9, SD = 6.4) and high (mean = 39.4, SD = 7.2) SELs. SE scores did not differ according to

Table 5: Confirmatory analysis: fit indices for the STCI-T-60 using different models

	Model 1 (One factor)	Model 2 (Two factors)	Model 3 (Three factors)
χ^2	675.75	355.10*	126.75*
	df = 90	df = 89	df = 87
CFI	.581	.810	.972
TLI	.511	.775	.966
AIC	13692.89	13374.26	13149.90
RMSEA	.174	.118	.046
SRMR	.162	.128	.053

Notes: *p < .05.
Model 1: items reunited on one general factor; model 2: two-factor solution (cheerfulness *vs.* bad mood + seriousness); model 3: items parceled based on theoretical scales.
χ^2 = scaled chi-squared test; *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis index; AIC = Akaike's information criterion; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

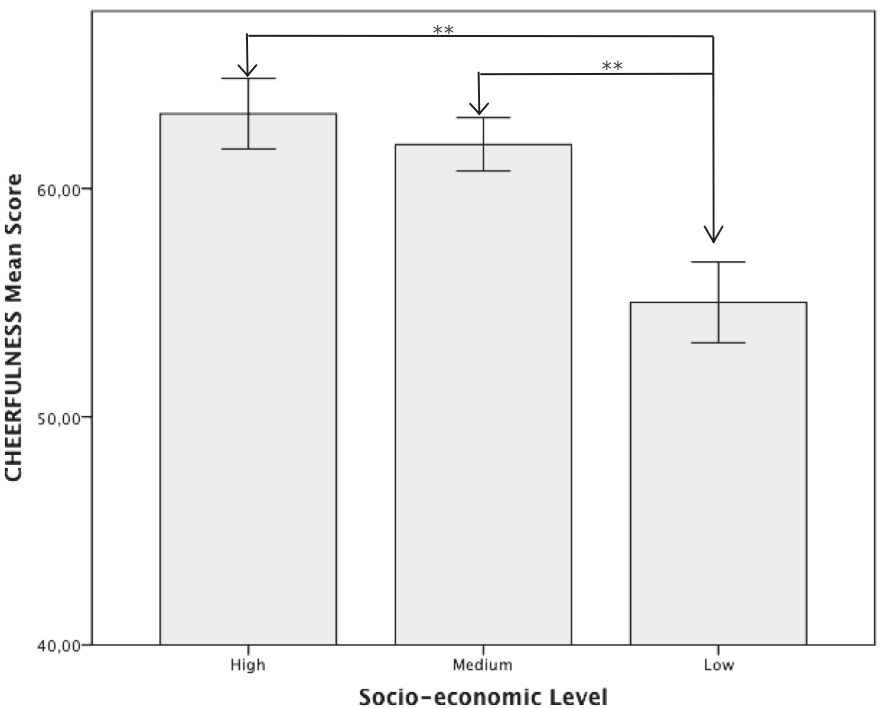

Fig. 2: Mean differences in cheerfulness subscale scores by socioeconomic level. Notes: Error bars represent 95% confidence intervals. **p < .01.

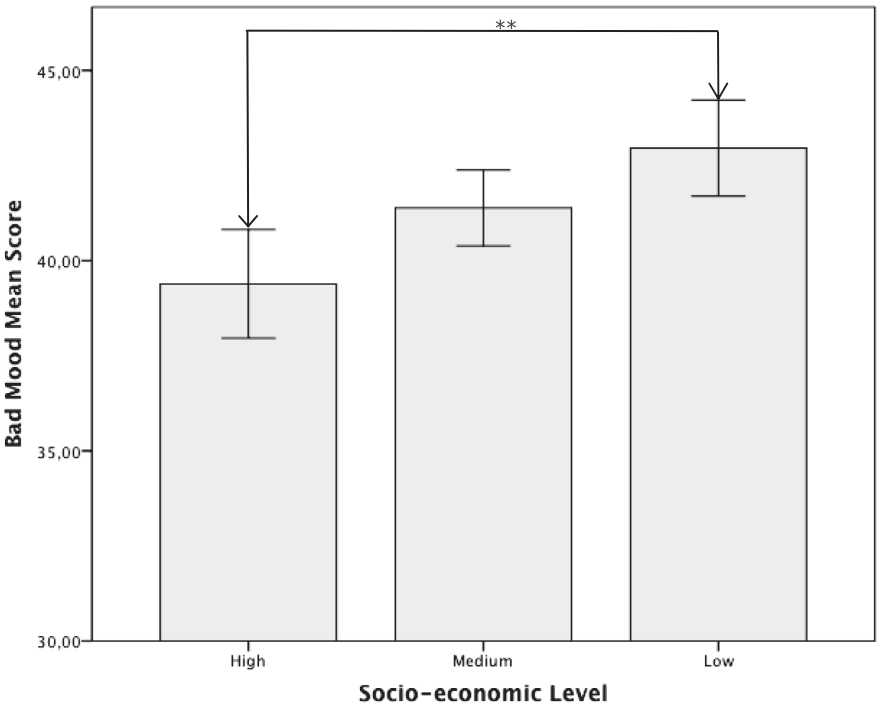

Fig. 3: Mean differences in bad mood subscale scores by socioeconomic level. Notes: Error bars represent 95% confidence intervals. $^{**}p < .01$.

SEL ($F = .39$, df = 2,498, $p = .96$); as variance heterogeneity was found, a Welch correction was used for analysis.

4.5 STCI-T-60 couples' version

All subscales of the couples' version of the STCI-T-60 and the STCI-T-60 (M) and (W) versions evaluating oneself (Mh and Wh) and one's partner (Mw and Wm) showed adequate internal consistency (Table 6). Differences in mean scores between Wh and Wm were significant only for the CH subscale ($t = 3.223$, $p < .01$). Correlations between Mh and Mw scores were significant for the CH ($r = .431$, $p < .01$) and BM ($r = .515$, $p < .001$) subscales, and those between Wh and Wm scores were significant for the CH ($r = .509$, $p < .001$), SE ($r = .460$, $p < .001$) and BM ($r = .525$, $p < .001$) subscales. A weak but significant inverse correlation was observed between husbands' and wives' CH and BM scores

Table 6: Correlations and mean differences in scores on the direct and couples' versions of the Chilean Spanish STCI-T-60

S	α				M	SD	M	SD	*t*	*p.*	*r*	*p.*	M	SD	M	SD	*t*	*p*	*r*	*p*
	Mh	Mw	Wh	Wm	Mh		Mw		Mh/Mw				Wh		Wm		Wh/Wm			
CH	.896	.934	.915	.902	63.35	8.06	61.20	10.04	1.572	.122	.431	.002*	66.00	8.24	62.26	7.88	3.223	.002*	.509	.000**
SE	.740	.868	.870	.864	54.60	6.34	54.62	9.73	−.014	.989	.220	.136	52.68	8.65	54.90	8.62	−1.739	.088	.460	.001**
BM	.898	.916	.837	.900	38.96	9.08	41.68	10.78	−1.944	.058	.515	.000**	37.94	7.40	41.04	9.34	−2.663	.010	.525	.000**

Notes: S = subscale, α = Cronbach's alpha, M = mean, SD = standard deviation, *t* = Student's *t*, *p* = significance, *r* = Pearson's correlation, Mh = man's self-evaluation, Mw = man evaluated by woman, Wh = woman's self-evaluation, Wm = woman evaluated by man, CH = cheerfulness, SE = seriousness, BM = bad mood.

Table 7: Correlations between men's and women's scores within couples

		Men's scores		
		Cheerfulness	**Seriousness**	**Bad mood**
Women's scores	Cheerfulness	.05	.06	−.28*
	Seriousness	.07	.14	.11
	Bad mood	.06	−.01	.21

Note: Values are Pearson's *r*. *$p < .05$.

within couples, suggesting that the traits studied are not assortative mating (Table 7).

Pearson's correlations between self and peer evaluations are typically .40–.50 in the general population, similar to our results (Ruch et al. 1996). Lower correlations may be expected in clinical samples (e.g., those in couples' therapy), when cross-matching between spouses could be related to marital satisfaction.

5 Discussion

In this study, we adapted and validated direct and couples' Chilean Spanish versions of the STCI-T-60, which showed adequate internal consistency and solid validity in several Chilean samples (initial testing, replication, and couples). Correlations between the CH and BM subscales were highly significant and inversely proportional in initial testing and replication. Factor analyses of data from initial testing and replication confirmed the adequate construction of the three factors, which explained a similar percentage of variance as for the original instrument (Ruch et al. 1996).

In initial testing of the Chilean Spanish version of the instrument, CH scores were higher in men than in women; this result differs from those obtained in our replication sample and in US and German samples (Ruch et al. 1996). We have no clear explanation for this discrepancy, although it is probably related to cultural factors. CH scores were lower and BM scores were higher in participants with low than in those with higher SEL, probably due to living conditions.

Mean SE scores for the direct and couples' versions of the adapted instrument were slightly higher than in German and US samples (Ruch et al. 1996), possibly due to cultural differences in the role of humor. Furthermore, Ruch et al.'s (1996) validation of the scale showed that SE scores increased with age (>40 years),

whereas we observed no age-related difference. This outcome is probably related to sociocultural factors, but it should be explored in further studies.

Future correlation studies are needed to evaluate the external validity of the Chilean scale. For example, the relationship between personality traits and STCI-T-60 subscales should be investigated and correlations between couples' satisfaction dimensions and these subscales should be explored.

Our development of a couples' version of the STCI-T-60 and its testing in a sample of couples make a novel contribution to research on the role of sense of humor in couples' relationships. This version of the instrument enables examination of the relationships between sense of humor and well-being factors, such as satisfaction, in couples' relationships. Given that positive affect has been found to have a preventive effect and that partners' perceptions of one another and perceptual agreement have been established as resources for protection of the relationship (Gottman 1999; Horvath et al. 2010; Symmons and Horvath 2004; Tapia et al. 2009), the joint use of the direct and couples' versions of the STCI-T-60 might provide a useful measure of sense of humor as a factor in couples' relational well-being in combination other variables, such as marital satisfaction, therapeutic change, or therapeutic alliance. Furthermore, the mean differences and correlations between self-evaluations and partner's evaluations in our sample of couples demonstrate the applicability of this form of the instrument in this field. The high and significant correlations between Mh and Mw and Wh and Wm are comparable to the results of peer evaluations conducted by Ruch et al. 1996

This study contributes to research on the role of humor in couples' relationships. Moreover, the validation of a Chilean Spanish version of the STCI-T-60 makes it possible to conduct local and transcultural studies of the relationship between humor and other variables of human experience in the fields of general health, psychotherapy, and education.

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