

Spanish Version of the Satisfaction with Life Scale: Validation and Factorial Invariance Analysis in Chile

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Abstract. The aim of this study is to: (1) examine the psychometric properties of the Spanish version of the Satisfaction with Life scale (SWLS) on a representative sample of the Chilean population ($N = 1,500$); (2) test the factorial invariance of the SWLS across gender and employment status (henceforth status); and (3) provide normative data of the SWLS for Chile. Results suggest that the Spanish version of the SWLS is a valid and reliable instrument for measuring global life satisfaction in Chile and for comparison across gender and status. Confirmatory factor analysis shows support, across all groups, for a modified single-factor structure of the SWLS that allows error terms of items 1 and 2 to correlate ($GFI > .98$; $RMSEA < .08$). Cronbach's alpha coefficient ranges between .68 and .84 for different groups, with an average value of .80 for the total sample. The SWLS scores converge with an alternative single-item measure of life satisfaction ($r = .63$, $p < .001$) and with measures of conceptually related constructs. The factorial structure of the scale is invariant with respect to gender and status ($CFI > .99$; $RMSEA < .06$). Metric invariance holds for gender ($\Delta CFI = 0$; $RMSEA = .051$) and status ($\Delta\chi^2 = 23.93$, nonsignificant; $\Delta CFI = 0$; $RMSEA = .045$). Scalar invariance holds for gender and some status combinations; partial scalar invariance holds for the rest. Mean levels of life satisfaction can be compared across gender and status, albeit cautiously for status combinations for which scalar invariance does not hold.

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In a recent review article, Diener, Inglehart, and Tay (2013) pointed out the need for psychometrically sound measures of life satisfaction and described their characteristics. Self-report scales of life satisfaction must reflect the thoughtful and reasonable assessments that people make of their lives. Scales must be reliable, yielding identical scores when administered under the same conditions, and scores should remain the same over time if life conditions are unchanged. Life satisfaction scales should also predict relevant future behaviours that have been consistently associated with levels of life satisfaction/dissatisfaction – such as health and longevity.

Scale validity

The Satisfaction with Life scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985) is one of the most widely used scales in the assessment of global life satisfaction (Pavot & Diener, 1993, 2008, for reviews). The SWLS assesses a person's conscious evaluative judgments of his or her life as a whole, based on a

comparison of the person's life with a self-imposed standard or set of standards (Andrews & McKennell, 1980). Unlike other life satisfaction scales, the SWLS allows the respondent to integrate and weigh different facets of life domains using the respondent's own criteria. The SWLS shows good convergent validity with other life satisfaction scales and with other types of assessments of quality of life and subjective well-being (SWB) (e.g. Vera-Villaruel, Urzúa, Celis-Atenas, & Silva, 2012). The SWLS also moderately converges with other types of life satisfaction measurements that do not depend on respondent self-reports, such as expert assessments and peer or family member ratings of the target person (Pavot, Diener, & Suh, 1998). The SWLS has good concurrent validity, being positively related to constructs such as positive affect and self-esteem (Pavot & Diener, 2008). Test-retest reliabilities are usually above 0.8 over a period of several weeks and above 0.5 over a period of years (Diener et al., 1985;

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Pavot et al., 1998). The scores are stable under unchanging conditions, but are sensitive to changes in circumstances in people's lives, although the SWLS shows moderate temporal stability, which is expected in a measure of life satisfaction. National mean levels of life satisfaction provide strong evidence for the validity of the SWLS in reflecting quality of life differences in societies. Another type of validity evidence for the SWLS is the difference between groups of individuals who appear to have fortunate versus unfortunate life circumstances (Pavot & Diener, 1993).

Factor structure

Five reflective items compose the SWLS. Exploratory and confirmatory factor analyses have consistently indicated a single-factor structure of the SWLS (e.g., Bendayan, Blanca, Fernández-Baena, Escobar, & Trianes, 2013; Vera-Villaruel et al., 2012), where item number five usually shows a lower loading score, although a two-factor structure has also been proposed (e.g., Vautier, Mullet, & Jmel, 2004). The scale tends to show good internal reliability, with Cronbach's alpha coefficient of .80, or even higher, indicating convergence among life satisfaction items that are worded in different ways. In a meta-analysis study, Vassar (2008) reported an average Cronbach's alpha of .78. Originally written in English, its five reflective items are at the reading level of the sixth to tenth grades; the instrument is thus usable with most adults. The original response format was a 7-point Likert-type response scale ranging from 'strongly disagree' to 'strongly agree'. The five items are all keyed in a positive direction, so the five responses can simply be added to arrive at a total score for the scale. However, studies using a 5-point Likert format are not rare (e.g., Atienza, Pons, Balaguer, & Garcia-Merita, 2000).

Cross cultural validation

The SWLS has potential as a cross-cultural index of global life satisfaction. The items have been translated into more than 13 languages (e.g., Sachs, 2003) and its psychometric properties have been assessed in numerous countries.

Objectives of the study

SWLS has been translated into Spanish in several versions (Atienza et al., 2000; Diener, 2014; Núñez, Martín-Albo, & Domínguez, 2010; Vázquez, Duque, & Hervás, 2013). The objectives of this paper relate to several observations. Firstly, the psychometric properties (e.g., dimensionality) of these Spanish versions of the scale have been tested in different countries (e.g. Vázquez et al., 2013; Vera-Villaruel et al., 2012)

and across age groups (e.g. Pons, Atienza, Balaguer, & García-Merita, 2000). However, to our knowledge, the psychometric properties of this scale have not been examined in Chile across gender and status groups (e.g. student, worker, etc.). Secondly, there have been few efforts to assess the Spanish version's factorial invariance across gender (e.g., Atienza, Balaguer, & García-Merita, 2003; Pons et al., 2000). Also, we identified no studies that examine factorial invariance of the Spanish version of SWLS across status groups. Previous studies have shown that occupation is important to well-being and is a "mechanism for meeting intrinsic needs and interests" (e.g., Anaby, Jarus, Backman, & Zumbo, 2010, p. 84), indicating the importance of examining the factorial invariance of the SWLS across status groups. Thirdly, to our knowledge, there are no normative data for the Spanish version of the SWLS in Chile, across gender and status groups. An individual's score could be better understood and interpreted when compared to individuals in his/her group and in other groups, showing the importance of providing normative data for the SWLS scale. As a result, the objectives of the current study are threefold: (1) to examine the psychometric properties (i.e., dimensionality, internal reliability, and concurrent validity) of the Spanish version of the SWLS on a representative sample of the Chilean population; (2) to test the factorial invariance of the SWLS across gender and status groups (student, worker, retired, housekeeper, and unemployed); and (3) to provide normative data of the SWLS in the context of Chile. Moreover, after confirming factorial invariance across groups, we compare the mean levels of life satisfaction of the different groups of people.

Method

Sample and data collection

The current study drew upon a national sample of the Chilean population. We implemented stratified random sampling based on geographic location to collect data. We used the Chilean census and obtained a sample of 1,500 participants, with a margin of error of 2.53%¹, which is lower than the common threshold of 5%. Participants were sampled from the country's 15 regions; the Greater Santiago region was overrepresented. Some 30% of the centres of population (i.e., cities and towns) and districts were selected proportionally. Blocks, houses, and individuals were randomly selected. A face-to-face administration of the questionnaire was chosen. A team of professional canvassers went door-to-door for three weeks to

¹Computed at a 95% confidence level, using the total population of Chile (2011): 17201 million.

personally administer the survey questionnaire to the sampled participants.

We excluded cases where the individual did not open the door or if the person who opened the door was less than 15 years old or refused to answer. In such cases, we proceeded with a replacement that met the stratifying criteria i.e. from the same stratum. All participants were informed from the beginning about the objectives of the interview and that there was no financial reward. Informal consent was obtained on the spot. No cases were presented of non-Spanish speakers, or those with cognitive impairments. After excluding 21 individuals who had missing values on their SWLS scores or status data, an effective sample of 1,479 participants was used for the analysis. The demographic data of the sample are presented in Table 1.

Instruments

Satisfaction with Life scale (SWLS).

Participants were asked to evaluate their SWLS (Diener et al., 1985) by indicating their agreement on a 5-point Likert scale labelled from 1 ('strongly disagree')

to 5 ('strongly agree'). Diener et al. (1985) used a 7-point Likert response format in their original English-language scale. Data analysis through basic co-relational techniques has been shown to be inadequate for 5-point items (i.e., ordinal scale item) which leads to lower reliability for behavioural items (Batista-Foguet, Saris, Boyatzis, Guillén, & Serlavós, 2009). However, a recent paper has provided evidence that for agree/disagree (A/D) answer modalities, 5-point Likert scales with all categories labelled lead to better data quality than 7-point response scales (Revilla, Saris, & Krosnick, 2014). The items used are presented in Appendix A. We collected our data in 2011, prior to the recent Spanish versions: Diener (2014) and Vázquez et al. (2013). At that time, we identified major differences between two different versions of the Spanish SWLS and the original English version. Therefore, we assessed the differences and tailored the items to reconcile the differences. Please refer to Appendix B.

We used the standard back-translation technique to ensure that the items that we used were closer to the original English items. The fifth author initially translated the original English-language version of SWLS

Table 1. Sample Characteristics (Entire Sample and Based on Status Groups)

	Status Groups					
	Entire Sample N = 1479	Student n = 190	Worker n = 784	Retired n = 126	Housekeeper n = 317	Unemployed n = 62
Gender						
Male	49.3%	47.9%	64.3%	59.5%	3.5%	77.4%
Female	50.7%	52.1%	35.7%	40.5%	96.5%	22.6%
Age (years)						
15–17	3.7%	28.9%	–	–	–	–
18–25	18.6%	63.2%	14.8%	–	7.9%	22.6%
26–34	17.0%	7.4%	23.1%	–	14.8%	16.2%
35–44	19.6%	0.5%	26.1%	–	21.1%	27.4%
45–54	19.6%	–	23.2%	7.2%	27.8%	17.7%
55–65	12.2%	–	11.4%	23.8%	16.4%	14.5%
>65	9.3%	–	1.4%	69.0%	12.0%	1.6%
Education Level						
No Education/ Primary in progress	8.7%	4.7%	3.1%	22.2%	18.6%	22.2%
Primary	25.7%	35.3%	19.9%	31.0%	32.5%	31.0%
Secondary	50.4%	58.9%	54.1%	29.4%	45.7%	29.4%
University Graduate	14.0%	1.1%	21.1%	14.3%	3.2%	14.3%
University Postgraduate/Ph.D.	1.2%	–	1.8%	3.1%	–	3.1%
Marital Status ^a						
Married	38.2%	0.6%	40.0%	48.0%	53.5%	27.4%
Single	37.7%	96.1%	37.4%	12.0%	16.8%	30.6%
Living together	9.2%	2.8%	10.2%	1.6%	11.1%	21.0%
Separated	8.5%	0.5%	9.2%	7.2%	10.1%	16.1%
Divorced	1.3%	–	1.9%	–	0.6%	3.2%
Widow	5.1%	–	1.3%	31.2%	7.9%	1.7%

Note: ^a 25 missing values on marital status

into Spanish, and this version was then translated back into English by an independent native English translator unaffiliated with the study. The two translators then resolved minor differences that emerged during the back-translation process. The items we used reconciled the differences between the two versions that had existed.

Furthermore, we compared the items we used to those that Diener (2014) presented. We believe that the items, used in this study, add value to Diener's Spanish SWLS for Items 1, 3, and 4, and are similar to his version for Items 2 and 5. Please refer to Appendix B.

Other measures

To assess the concurrent validity of the scale, we relied on an alternative single-item measure of life satisfaction and measures of the conceptually related constructs of global job satisfaction (van de Ven & Ferry, 1980), satisfaction with own health (also referred to as subjective health), satisfaction with social life (referred to as social life), satisfaction with leisure time (referred to as leisure time), and self-esteem (Loewe, Bagherzadeh, Araya-Castillo, Thieme, & Batista-Foguet, 2014). Participants used a 5-point Likert scale to provide their responses. To assess the global level of life satisfaction and job satisfaction, we asked respondents the following questions: 'In general, how satisfied are you with your life/job?' respectively.

Stages of data analysis

Our analysis consisted of five stages: analysis of descriptive statistics; confirmatory factor analysis (scale dimensionality); reliability analysis of the SWLS; factorial invariance analysis; and variance and mean comparison across groups. We used the SPSS 23 and LISREL 8.8 packages for data analysis.

Results

Descriptive Statistics

As per Table 2, the mean of each item was between 3 and 4 with a few exceptions: retired (Item 2), housekeeper (Items 2 and 5), and unemployed (Items 1, 2, and 5); these were slightly below 3. Absolute values of skewness and kurtosis were less than or equal to 1, indicating that the univariate normality of all items, across all groups, was within the acceptable level for applying maximum likelihood (ML)² estimation in

²In structural equation modeling the error proceeding from the ordinal variable is considered in the error part, hence, there is no need to use polychoric correlations for ordinal variables (Coenders, Satorra, & Saris, 1997).

confirmatory factor analysis (Muthén & Kaplan, 1985). Similarly, the items were considered as normally distributed variables, with skewness smaller than 2 and kurtosis smaller than 7. The data are also tested for multivariate normality. Mardia's (1974) test rejected the multivariate normality of the data for all groups as well as for the entire sample. Given the violation of the multivariate normality assumption, we applied Satorra-Bentler chi-square (χ^2) (Satorra & Bentler, 1994) to evaluate goodness of fit in confirmatory factor analysis, and consequently, to obtain robust standard error and test statistics. A combination of goodness of fit indices was also used to ensure that non-multivariate normality of data was not an issue in our analyses. We applied goodness of fit index (GFI), non-normed fit index (NNFI), normed fit index (NFI), parsimony normed fit index (PNFI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR).

Scale dimensionality

Based on differing research findings we examined the scale as a single-factor structure and a two-factor structure. In the two-factor structure, the first three items loaded on the first factor and focus on the present level of satisfaction; whereas Items 4 and 5 loaded on the second factor and assess satisfaction with past accomplishments (Pavot & Diener, 1993). Upon exploration of modification indices, we identified the need for a modified single-factor structure that allowed error terms of Items 1 and 2 to correlate. Confirmatory factor analysis results for a single-factor structure, modified single-factor structure, and two-factor structure are shown in Table 3.

Based on the fit indices and per the combinational rule suggested by Hu and Bentler (1999), all models (single-factor, modified single-factor, and two-factor structure) were not rejected and could represent the observed data for the overall sample. Relying on Hu and Bentler (1999), all of the fit indices supported the three models (GFI, NNFI, CFI, and NFI > .95; RMSEA < .08; SRMR < .06). In general, the modified single-factor structure best fitted the data (Table 3)³. We therefore selected the modified single-factor structure, allowing the error terms of items 1 and 2 to correlate, as the baseline model for the following factor validity analysis of the SWLS for each group (gender and status).

³Moreover, the correlation between the two factors, in the two-factor structure, was .89, a very high value, revealing that the two factors could not be easily distinguished. In addition, the modified single-factor structure was more parsimonious than the two-factor structure (PNFI = 0.398 vs. 0.397, respectively).

Table 2. Means and Standard Deviations for Items (N = 1479)

	Item				
	1	2	3	4	5
Male	3.35 (0.92)	3.14 (0.92)	3.66 (0.84)	3.52 (0.91)	3.11 (1.09)
Female	3.26 (0.91)	3.08 (0.98)	3.58 (0.92)	3.57 (0.90)	3.08 (1.10)
Student	3.72 (0.68)	3.42 (0.88)	3.85 (0.76)	3.68 (0.85)	3.40 (1.04)
Worker	3.34 (0.91)	3.15 (0.95)	3.65 (0.87)	3.56 (0.90)	3.08 (1.10)
Retired	3.18 (0.87)	2.96 (0.94)	3.64 (0.85)	3.54 (0.84)	3.08 (1.10)
Housekeeper	3.10 (0.96)	2.91 (0.97)	3.46 (0.93)	3.50 (0.96)	2.97 (1.11)
Unemployed	2.81 (0.94)	2.87 (0.84)	3.23 (0.91)	3.21 (0.91)	2.92 (1.05)

Note: () = Standard deviation

Table 3. Fit Indices for Single-Factor, Modified Single-Factor, and Two-Factor Structures of the SWLS for the Overall Sample

	$\chi^2(df)^a$	GFI	NNFI	CFI	NFI	RMSEA	SRMR	PNFI
Single-factor structure								
	33.75(5)	0.988	0.981	.990	.989	.062	.025	0.494
Modified single-factor model with correlation between error terms of Items 1 and 2								
	18.77(4)	0.993	0.988	.995	.994	.050	.019	0.398
Two-factor structure								
	21.91(4)	0.992	0.985	.994	.993	.055	.018	0.397

Notes: *df* = degrees of freedom; GFI = goodness of fit index; NNFI = non-normed fit index; CFI = comparative fit index; NFI = normed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; PNFI = parsimony normed fit index.

^a Satorra-Bentler χ^2 .

Confirmatory factor analysis was then applied to assess the goodness of fit of the modified single-factor structure of the SWLS for each group. The results for each group are summarized in Table 4. Overall, the modified single-factor structure of the SWLS fitted the data well for males, females, and all five status groups. The fit indices—including GFI, NNFI, CFI, and NFI—were higher than .96 across all groups and were higher than the recommended cut-off value of .95, providing strong evidence of modified single-factor structure fit for all seven groups. Moreover, the RMSEA (range from 0 to .077) showed a good fit for the modified single-factor structure of SWLS across all seven groups. At the same time, we employed SRMR, which is more sensitive to simple model misspecification than other fit indices (Hu & Bentler, 1999). The SRMR showed that the fit of the modified single-factor structure was adequate for all groups (range from .012 to .041). In sum, all fit indices represented an adequate fit between the modified single-factor structure of the SWLS and the data, across all groups. In other words, the uni-dimensionality of the 5-item SWLS was confirmed across gender and status.

A detailed analysis of factor loadings and R^2 values was performed. All items had standardized factor loadings generally higher than .50 except for students (Item 4: .49 and Item 5: .48) and unemployed (Item 1: .48, Item 4: .49, and Item 5: .44). These findings supported the modified single-factor structure for the overall sample and all groups (Hair, Black, Anderson, & Tatham, 1995). Moreover, the factor loadings represented the same pattern across different groups as well as the overall sample, where the third item showed the highest factor loading (except for the 'retired' group) and Item 5 showed the lowest factor loading compared to other items (except for the 'housekeeper' group where the lowest factor loading is related to Item 1). This result regarding Item 5 is consistent with the results of previous studies (e.g., Gouveia, Milfont, Da Fonseca, & de Miranda Coelho, 2009; Pavot & Diener, 1993).

In all groups and in the overall sample, R^2 values ranged from .23⁴ to .88, exceeding the cut-off value of

⁴The only R^2 value less than .20 relates to Item 5 for the 'unemployed' group. That R^2 value, of .192, is very close to the accepted cut-off value.

Table 4. Fit indices for a modified single-factor structure^a of the SWLS for each gender and status group

	$\chi^2(df)^b$	GFI	NNFI	CFI	NFI	RMSEA	SRMR
Male	3.68(4)	0.998	1.001	1.00	.997	0.000	.012
Female	21.96(4)	0.984	0.973	.989	.987	.077	.029
Student	6.17(4)	0.984	0.969	.988	.967	.054	.037
Worker	9.67(4)	0.994	0.991	.996	.994	.043	.019
Retired	2.88(4)	0.987	1.015	1.00	.985	.000	.030
Housekeeper	7.20(4)	0.987	0.990	.996	.991	.050	.022
Unemployed	2.71(4)	0.981	1.033	1.00	.975	0.000	.041

Notes: *df* = degrees of freedom; GFI = goodness of fit index; NNFI = non-normed fit index; CFI = comparative fit index; NFI = normed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

^a Modified single-factor model with correlation between error terms of Items 1 and 2.

^b Satorra-Bentler χ^2 .

.20 indicated by Hair et al. (1995). This indicates a relatively strong linear association between the SWLS construct and its items. In addition, the R^2 pattern was generally the same across the seven groups and the overall sample, where the fifth item showed the lowest R^2 value (except for the 'housekeeper' group where the lowest R^2 is related to Item 1) and Item 3 showed the greatest contribution to the SWLS variance (the highest R^2 value) except for the 'retired' group where the greatest R^2 is related to Item 1. This pattern is consistent with recent studies (e.g., Gouveia et al., 2009).

Reliability analysis of the SWLS

Reliability analysis of the SWLS was conducted by computing corrected item total correlation, Cronbach's alpha, and omega coefficients (Ω) for the total sample and for every group. The corrected item-total correlation was higher than .39 (related to Item 4 for the 'student' group) for all items in all groups. Correlations were higher than the cut-off value of .25 (Nunnally & Bernstein, 1994). The corrected item-total correlation was relatively lower for Items 4 and 5 across all groups, consistent with previous studies (e.g., Gouveia et al., 2009). Cronbach's alpha coefficient for the whole sample was .80. As for the groups, it ranged from .68 (for the 'student' group) to .84 (for the 'housekeeper' group). Overall, these results indicate an adequate reliability for the entire sample as well as for the seven groups (Hair et al., 1995).

The assumption of equality of all factor loadings of the SWLS (i.e., every item contributes equally to the SWLS) was not satisfied. Thus, we applied the omega coefficient (Ω), as another measure of reliability that does not require tau-equivalence. A similar result was seen in the reliability of the entire sample ($\Omega = .80$). Also, the omega coefficients indicated similar reliability estimates for all groups, ranging from .68 to .84.

Moreover, Cronbach's alpha coefficient did not improve if any item was deleted.

Factorial invariance analysis

There are two types of factorial invariance: structural (configural)⁵ and measurement (metric⁶ and scalar⁷) invariance. Analysis of structural invariance relates to whether groups have the same factor structure. Analysis of measurement invariance relates to whether groups have the same factor loadings (metric) and the same item intercepts (scalar). We used the following procedure, which is widely applied in the literature (e.g., Atienza et al., 2003; Clench-Aas, Nes, Dalgard, & Aarø, 2011; Wu & Yao, 2006).

Structural invariance. We used the modified single-factor model (see section *Scale dimensionality*) as our baseline model to test for structural invariance i.e. whether the SWLS factor structure is invariant by gender and status. We tested this model by applying confirmatory factor analysis for every group (see Table 4). We also examined structural invariance using pairwise comparison for gender (Appendix D) and single-routine comparison for status (Appendix C). As per Table 5, Appendix C, and Appendix D, structural invariance held for gender (CFI = .99; RMSEA = .057) and status (CFI = .99; RMSEA = .047), indicating equality of factor structure across groups. Since structural invariance was supported for gender and status, we then moved to the next step, measurement invariance.

Measurement invariance. We examined measurement invariance (metric and scalar) by imposing restrictive constraints (e.g., equality of factor loadings or item intercepts across groups) on the model. Metric invariance

⁵Structural invariance and configural invariance are interchangeable terms.

⁶Metric invariance and weak invariance are interchangeable terms.

⁷Scalar invariance and strong invariance are interchangeable terms.

Table 5. Structural and Measurement (Metric, Scalar, and Partial Scalar) Invariance between Groups

	Structural Invariance	Measurement Invariance			Equality of Factor Variance	Equality of Latent Mean
		Metric Invariance	Scalar Invariance	Partial Scalar Invariance		
Gender						
Male-Female	Yes	Yes	Yes	N/A	Yes	Yes
Status						
Single-routine Comparison	Yes	Yes	No	See 'pairwise comparison'	See 'pairwise comparison'	See 'pairwise comparison'
Pairwise Comparison						
Student-Worker	Yes	Yes	Yes	N/A	Yes	Yes
Student-Retired	Yes	Yes	No	Yes*	Yes	No
Student-Housekeeper	Yes	Yes	No	Yes**	No	No
Worker-Retired	Yes	Yes	Yes	N/A	Yes	Yes
Worker-Housekeeper	Yes	Yes	Yes	N/A	Yes	Yes
Retired-Housekeeper	Yes	Yes	Yes	N/A	Yes	Yes
Unemployed-Worker	Yes	Yes	No	Yes***	Yes	Yes
Unemployed-Retired	Yes	Yes	No	Yes***	Yes	Yes
Unemployed-Housekeeper	Yes	Yes	No	Yes***	Yes	Yes
Unemployed-Student	Yes	Yes	No	Yes****	Yes	No

Notes: * For Items 1, 2, and 5. ** For Items 1, 2, 3, and 5. *** For Items 1, 2, 4, and 5. **** For Items 1 and 3.

relates to whether the groups have the same factor loadings. We constrain the factor loadings of items to be equal across gender and status groups to test for invariance of the factor loadings. Scalar invariance relates to whether the groups have the same item intercepts. The intercepts are forced to be equal to test whether the intercept equality constraint is rejected or not.

For metric and scalar invariance across gender, we conducted pairwise comparison. We applied confirmatory factor analysis to determine whether the factor loading (metric invariance) and item intercept (scalar invariance) equality constraints were rejected. We used the difference between CFI (Δ CFI) of models (i.e., between baseline and metric, and between metric and scalar) which is the most reliable global fit index for pairwise comparison (Cheung & Rensvold, 2002; Clench-Aas et al., 2011). A Δ CFI value of less than or equal to .01 would lead to failure to reject invariance across gender (Cheung & Rensvold, 2002). We also checked the RMSEA for major changes to make sure the constrained model still fitted the data well (Clench-Aas et al., 2011). Furthermore, we used the chi-square difference ($\Delta\chi^2$), however, with caution, given the large sample size and the resulting high-power situation. As per Table 5 and Appendix D, metric (Δ CFI = 0; RMSEA = .051) and scalar (Δ CFI = 0; RMSEA = .049) invariance held for gender.

For metric and scalar invariance across status, we conducted a single-routine comparison—comparing

all five status groups at the same time. We applied confirmatory factor analysis to determine whether the factor loading and item intercept equality constraints, among all five groups, were rejected. We used the $\Delta\chi^2$, CFI, and the RMSEA as indices for rejecting metric and scalar invariance (Cheung & Rensvold, 2002). We also checked Δ CFI for major changes. As per Table 5 and Appendix C, metric invariance held for status ($\Delta\chi^2 = 23.93$, nonsignificant; CFI = .99; Δ CFI = 0; RMSEA = .045), indicating that there is no difference between the groups in terms of factor loadings. However, scalar invariance did not hold ($\Delta\chi^2 = 89.76$, $p < .001$; CFI = .96; Δ CFI = .03; RMSEA = .072), indicating that the intercepts of items are different, at least, between two groups. As a result, we conducted pairwise comparison for all possible status group combinations. This is helpful to better identify the sources of difference among groups and to assess the combinations in depth.

We applied confirmatory factor analysis on group combinations—pairwise comparison—to determine whether the item intercept equality constraints (scalar invariance) were rejected. We used the Δ CFI of models (Cheung & Rensvold, 2002; Clench-Aas et al., 2011) and the RMSEA (Clench-Aas et al., 2011) as fit indices for rejecting scalar invariance. Furthermore, we checked $\Delta\chi^2$, however, with caution, given the large sample size and the resulting high-power situation. If the hypothesis of scalar invariance (item intercept) was rejected, a partial scalar invariance model would be specified in

which one or two intercepts would not be constrained to be equal across groups.

The fit indices for factorial invariance models for gender and all status group combinations are presented in Appendix D. A summary of the findings is presented in Table 5.

Structural and metric invariance held for gender and status. This means that factor structure and loadings could be assumed to be equal. Scalar invariance held for gender but did not hold for status. We thereby conducted pairwise comparison for all combinations of status groups. Pairwise scalar invariance was only supported for four combinations of status groups: 'student-worker,' 'worker-retired,' 'worker-housekeeper,' and 'retired-housekeeper'. For combinations whose scalar invariance was not supported we checked for partial scalar invariance, item by item, and identified items for which scalar invariance held (Byrne, Shavelson, & Muthén, 1989). For example, as per Table 5, the 'student-retired' combination had sufficient evidence for structural and metric invariance. However, scalar invariance was not supported for this combination. Upon examination of partial scalar invariance, we identified the intercepts of Items 1, 2, and 5 to be invariant for this combination. Partial scalar invariance held for all combinations whose scalar invariance was rejected. If partial scalar invariance was obtained, a cross-group means comparison could still be made – but with caution (Byrne et al., 1989).

SWLS variance and mean: Comparison between groups

Our findings of invariance, metric and scalar (full and partial), allowed us to compare groups for SWLS variance and mean differences. The results indicated equality of variance ($\Delta\text{CFI} = 0$; $\text{RMSEA} = .050$) and equality of means ($\Delta\text{CFI} = 0$; $\text{RMSEA} = .049$) across gender. The results of the two-sample *t*-test supported these findings as well, with no significant difference in variances ($F = 2.077$, $p = .15$) and in means ($t = 1.086$, $p = .28$). Our results also showed that variances between status groups were equal except for the 'student-housekeeper' combination. In this case, we used an adjusted model for the *t*-test to check for equality of means. Means of SWLS between status groups were equal, except for the 'student' group whose mean was greater than those of the 'retired,' 'housekeeper,' and 'unemployed' groups. Please refer to Table 5.

Concurrent validity analysis

To assess concurrent validity, we studied the relationship between SWLS and an alternative single-item measure of global life satisfaction. We also assessed the

association between SWLS and the related constructs of subjective health, satisfaction with social life, self-esteem, satisfaction with leisure time, and global job satisfaction. The correlations between SWLS and other variables are summarized in Appendix E. As expected, SWLS was positively and significantly correlated with global life satisfaction with an *r* ranging from .44 ('retired') to .65 ('housekeeper') with an average value of .63 for the overall sample. In the total sample and the groups, SWLS was positively and significantly associated with subjective health (ranging from .28 to .40), satisfaction with social life (ranging from .17 to .30), satisfaction with leisure time (ranging from .21 to .36), and self-esteem (ranging from .42 to .60). SWLS was also positively but weakly related to global job satisfaction ($r = .11$, $p = .004$).

Discussion

The contribution of this study is threefold. Firstly, we tested the psychometric properties of the Spanish version of the SWLS in the context of Chile. Secondly, we tested the factorial invariance of the Spanish version of the SWLS across gender and different status groups. Thirdly, we provided normative data of the SWLS in the context of Chile to aid in the interpretation of scores on the scale. Table 6 shows the percentiles corresponding to the total score in the SWLS. In this table, we present normative data from the Chilean population for the SWLS based on percentile ranks corresponding to raw scores. We do so for the entire sample and for the status groups, by gender.

The psychometric properties of the Spanish version of the SWLS were satisfactory in a representative sample of the Chilean population. In this study, through confirmatory factor analysis, our results supported a modified single-factor structure that allowed the error terms of Items 1 and 2 to correlate. We believe, the need for modification is due to item wording (specificity) and not to measurement error. The specific component of Items 1 and 2 is that they use the extreme words *ideal* and *excellent*, which are not shared by the other three items (Saris & Satorra, 1987). The wording of items 1 and 2 makes them more similar than they fundamentally are. Based on this result we recommend that future research substitutes these extreme words or allows for correlation among error terms of Items 1 and 2. A consequence of this modification was that the modified single-factor structure had the best fit indices and was more parsimonious than the two-factor structure where we have very high correlation between the two factors. Our result is consistent with Sachs (2003) who suggested a modified single-factor structure that allowed error terms of items 1 and 2 to correlate due to extreme wording. Comparing both the single- and two-factor

Table 6. Normative Data from the Chilean Population for the SWLS Based on Percentile Ranks Corresponding to Raw Scores

Raw Score	Entire Sample (1479)	Student			Worker			Retired			Housekeeper			Unemployed		
		Total (190)	M (91)	F (99)	Total (784)	M (504)	F (280)	Total (126)	M (75)	F (51)	Total (317)	M (11)	F (306)	Total (62)	M (48)	F (14)
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
7	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
8	1	0	1	0	1	1	1	0	0	0	2	0	2	0	0	0
9	2	1	1	0	2	2	2	1	1	1	3	5	3	2	2	0
10	4	1	1	0	4	4	5	3	3	2	6	9	6	5	6	0
11	7	1	1	1	7	7	8	6	7	5	12	9	12	12	16	0
12	12	2	2	2	10	10	11	11	9	13	18	14	18	24	28	11
13	17	4	4	5	15	15	16	16	14	20	24	23	24	31	33	21
14	23	8	8	8	21	22	21	24	23	25	32	27	32	36	39	29
15	31	13	13	14	29	30	27	36	34	39	40	32	40	51	52	46
16	40	22	21	23	38	39	37	46	41	53	47	45	47	64	64	64
17	50	35	35	35	48	48	49	54	49	62	56	59	55	71	71	71
18	61	49	48	49	60	60	59	66	65	68	66	64	67	77	76	82
19	72	59	58	61	71	71	70	77	81	71	76	64	77	86	84	93
20	83	75	75	75	83	82	83	86	91	79	87	77	88	94	94	93
21	92	87	91	84	92	92	93	93	95	89	95	95	95	97	97	96
22	95	92	95	90	95	95	95	96	99	92	96	100	95	98	98	100
23	97	97	96	97	97	97	97	98	100	95	97	100	96	99	99	100
24	98	98	97	99	98	99	98	99	100	98	98	100	98	100	100	100
25	99	99	99	100	99	100	99	100	100	99	99	100	99	100	100	100

Notes: Raw scores were calculated by addition of the five items (range: 5–25); M = male; F = female; () = total number of individuals in the category.

models, Sachs (2003) suggested that the two-factor model with 'present' and 'past' items was not a better framework with which to interpret the SWLS. Also, in line with previous research (Pavot & Diener, 1993), this study shows that item five exhibits the weakest item-total correlation and factor loading across all groups and on the overall sample.

Internal reliability coefficients for the total sample and groups were above the acceptable threshold of 0.70 (Hair et al., 1995) and in the range of previous studies (Vassar, 2008), except for the 'student' group, where the coefficient was close to the acceptable threshold ($\alpha = .68$). Items 4 and 5 for this group had the lowest factor loadings (0.49 and 0.48, respectively) and R^2 (.24 and .23, respectively). These two items are related to satisfaction with past achievements (Sachs, 2003; Vautier et al., 2004). We believe that this lower value of internal reliability, compared to other groups, is due to age. Students have a younger mean age (92.1% were less than 25 years old) than other groups (Table 1) and are therefore expected to have fewer achievements, hence, their answers might be less accurate for Items 4 and 5, leading to higher measurement error. Furthermore, satisfaction is a cognitive assessment of ideals, where the respondent's reference when answering the questions is the ideal situation (Andrews & McKennell, 1980). Therefore, groups with older individuals might assess their satisfaction with less measurement error. The implication of this finding is that the scale might not be appropriate for younger individuals, specifically students, and should be used with caution since satisfaction is a cognitive assessment of ideals and might be impacted by age. However, we have acceptable fit indices for this group, as they were inflated due to its low power resulting from low reliability coefficients.

SWLS was strongly correlated to a single-item measure of life satisfaction in the total sample ($r = .63$) and in all groups. SWLS was also positively and significantly associated to the related construct of subjective health ($r = .35$) in the total sample. Several studies have shown that subjective health is strongly correlated with life satisfaction (e.g., Diener, Suh, & Oishi, 1997). Regarding the relationship between life satisfaction and job satisfaction of workers, we found a correlation of .11. This association is weak compared to meta-analyses that show a moderate correlation (ranging from .31 to .44) between both constructs (Bowling, Eschleman, & Wang, 2010). Finally, in our study SWLS was strongly associated with self-esteem ($r = .57$) for the total sample. Many studies have reported a similar size of this association (Arrindell, van Nieuwenhuizen, & Luteijn, 2001). For example, Arrindell et al. (2001) reported a correlation of .58 in the total sample.

Our results also indicated factorial invariance of the Spanish version of SWLS across gender. This is consistent with the results of other studies that examined the factorial invariance of the SWLS across gender in university students and adults (e.g. Wu & Yao, 2006). Núñez et al. (2010) also found their Spanish version of the SWLS to be invariant across gender in a sample of adults engaged in physical activity. In contrast, using Atienza et al.'s (2000) Spanish version of the scale, Atienza et al. (2003) found that the SWLS was sensitive to gender in a sample of Spanish junior high school students. These authors found that factor loadings of Items 2 and 5 were not equal for males and females.

As for factorial invariance across status groups, our results indicated that structural and metric invariance hold for a single-routine comparison. This means that the factorial structure and factor loadings of the items are invariant across status groups. However, scalar invariance did not hold for the single-routine comparison. Therefore, we examined scalar invariance across all status group combinations – pairwise comparison. Scalar invariance held for the combinations of 'worker' with 'student,' 'retired,' and 'housekeeper,' and for the 'retired-housekeeper' combination. This means that for these combinations all item intercepts were invariant. Partial scalar invariance held for the combinations for which scalar invariance was not met. Establishing factorial invariance is a condition for meaningful comparison across groups. Accordingly, we call for caution when comparing mean levels of life satisfaction between those group pairs whose SWLS was only partially invariant in this study.

The results of the current study should be considered in light of several methodological limitations. Firstly, we did not test the discriminant validity of the SWLS. In addition to showing that a measure behaves in a manner that is consistent with the nomological network (concurrent validity), it is also important to show that the measure is distinguishable from other constructs. Secondly, people tend to report greater life satisfaction when interacting directly with another person rather than in an anonymous interview (Schwarz, Strack, Hippler, & Bishop, 1991). In our study, canvassers administered the survey, which may have led to responses that are socially desirable. Thirdly, functional, and to some extent structural, factorial invariance cannot be directly tested using statistical methods. Expert judgments and qualitative methods are best for identifying these forms of non-equivalence (Berry, Poortinga, Segall, & Dasen, 2002). Fourthly, the 'student' and 'unemployed' groups exhibited lower statistical power than other groups and potentially, inflated fit indices. Finally, the generalizability of our findings is restricted to the paper's context (country: Chile; groups: gender and status). We recommend that future

research tackles these limitations through samples that include a larger number of students and unemployed; ideally from different countries.

References

- Anaby D., Jarus T., Backman C. L., & Zumbo B. D. (2010). The role of occupational characteristics and occupational imbalance in explaining well-being. *Applied Research in Quality of Life*, 5(2), 81–104. <https://doi.org/10.1007/s11482-010-9094-6>
- Andrews F. M., & McKennell A. C. (1980). Measures of self-reported well-being: Their affective, cognitive, and other components. *Social Indicators Research*, 8(2), 127–155. <https://doi.org/10.1007/BF00286474>
- Arrindell W. A., van Nieuwenhuizen C., & Luteijn F. (2001). Chronic psychiatric status and satisfaction with life. *Personality and Individual Differences*, 31(2), 145–155. [https://doi.org/10.1016/S0191-8869\(00\)00125-2](https://doi.org/10.1016/S0191-8869(00)00125-2)
- Atienza F. L., Balaguer I. & García-Merita M. L. (2003). Satisfaction with Life Scale: Analysis of factorial invariance across sexes. *Personality and Individual Differences*, 35(6), 1255–1260. [https://doi.org/10.1016/S0191-8869\(02\)00332-X](https://doi.org/10.1016/S0191-8869(02)00332-X)
- Atienza F. L., Pons D., Balaguer I., & García-Merita M. (2000). Propiedades psicométricas de la Escala de Satisfacción con la Vida en adolescentes [Psychometric properties of the Satisfaction with Life Scale in adolescents]. *Psicothema*, 12(2), 314–319.
- Batista-Foguet J. M., Saris W., Boyatzis R., Guillén L., & Serlavós R. (2009). Effect of response scale on assessment of emotional intelligence competencies. *Personality and Individual Differences*, 46(5–6), 575–580. <https://doi.org/10.1016/j.paid.2008.12.011>
- Bendayan R., Blanca M. J., Fernández-Baena J. F., Escobar M., & Trianes M. V. (2013). New empirical evidence on the validity of the Satisfaction with Life Scale in early adolescents. *European Journal of Psychological Assessment*, 29(1), 36–43. <https://doi.org/10.1027/1015-5759/a000118>
- Berry J. W., Poortinga Y. H., Segall M. H., & Dasen P. R. (2002). *Cross-cultural psychology: Research and applications* (2nd ed.). Nueva York, NY: Cambridge University Press.
- Bowling N. A., Eschleman K. J., & Wang Q. (2010). A meta-analytic examination of the relationship between job satisfaction and subjective well-being. *Journal of Occupational and Organizational Psychology*, 83(4), 915–934. <https://doi.org/10.1348/096317909X478557>
- Byrne B. M., Shavelson R. J., & Muthén B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin*, 105(3), 456–466. <https://doi.org/10.1037/0033-2909.105.3.456>
- Cheung G. W., & Rensvold R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. https://doi.org/10.1207/s15328007sem0902_5
- Clench-Aas J., Nes R. B., Dalgard O. S., & Aarø L. E. (2011). Dimensionality and measurement invariance in the Satisfaction with Life Scale in Norway. *Quality of Life Research*, 20(8), 1307–1317. <https://doi.org/10.1007/s11136-011-9859-x>
- Coenders G., Satorra A., & Saris W. E. (1997). Alternative approaches to structural modeling of ordinal data: A Monte Carlo study. *Structural Equation Modeling: A Multidisciplinary Journal*, 4(4), 261–282. <https://doi.org/10.1080/10705519709540077>
- Diener E. (2014). *Escala de Satisfacción con la Vida* [Satisfaction with Life Scale]. Retrieved from Member Resources of the Psychology Department, University of Illinois at Urbana – Champaign website: http://internal.psychology.illinois.edu/~ediener/Documents/SWLS_Spanish2.pdf
- Diener E., Emmons R. A., Larsen R. J., & Griffin S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13
- Diener E., Inglehart R., & Tay L. (2013). Theory and validity of Life Satisfaction scales. *Social Indicators Research*, 112(3), 497–527. <https://doi.org/10.1007/s11205-012-0076-y>
- Diener E., Suh E., & Oishi S. (1997). Recent findings on subjective well-being. *Indian Journal of Clinical Psychology*, 24, 25–41.
- Gouveia V. V., Milfont T. L., da Fonseca P. N., & de Miranda Coelho J. A. P. (2009). Life satisfaction in Brazil: Testing the psychometric properties of the Satisfaction with Life Scale (SWLS) in five Brazilian samples. *Social Indicators Research*, 90, 267–277. <https://doi.org/10.1007/s11205-008-9257-0>
- Hair J. F., Black B., Anderson R., & Tatham R. (1995). *Multivariate data analysis: Text and readings*. Englewood, NJ: Prentice Hall.
- Hu L. T., & Bentler P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Loewe N., Bagherzadeh M., Araya-Castillo L., Thieme C., & Batista-Foguet J. M. (2014). Life domain satisfactions as predictors of overall life satisfaction among workers: Evidence from Chile. *Social Indicators Research*, 118(1), 71–86. <https://doi.org/10.1007/s11205-013-0408-6>
- Mardia K. V. (1974). Applications of some measures of multivariate skewness and kurtosis in testing normality and robustness studies. *Sankhyā: The Indian Journal of Statistics, Series B*, 36(2), 115–128.
- Muthén B., & Kaplan D. (1985). A comparison of some methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology*, 38(2), 171–189. <https://doi.org/10.1111/j.2044-8317.1985.tb00832.x>
- Nunnally J. C., & Bernstein I. H. (1994). The assessment of reliability. *Psychometric Theory*, 3(1), 248–292.
- Núñez J. L., Martín-Albo J., & Domínguez E. (2010). Análisis de las propiedades psicométricas de la Escala de Satisfacción con la Vida en sujetos practicantes de actividad física [Psychometric properties of the Satisfaction with Life Scale in physical activity practitioners]. *Revista de Psicología del Deporte*, 19(2), 291–304.

- Pavot W., & Diener E.** (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment*, 5(2), 164–172. <https://doi.org/10.1037/1040-3590.5.2.164>
- Pavot W., & Diener E.** (2008). The Satisfaction with Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology*, 3(2), 137–152. <http://doi.org/10.1080/17439760701756946>
- Pavot W., Diener E., & Suh E.** (1998). The temporal Satisfaction with Life Scale. *Journal of Personality Assessment*, 70(2), 340–354. https://doi.org/10.1207/s15327752jpa7002_11
- Pons D., Atienza F. L., Balaguer I., & García-Merita M. L.** (2000). Satisfaction with Life Scale: analysis of factorial invariance for adolescents and elderly persons. *Perceptual and Motor Skills*, 91(1), 62–68. <https://doi.org/10.2466/pms.2000.91.1.62>
- Revilla M. A., Saris W. E., & Krosnick J. A.** (2014). Choosing the number of categories in agree–disagree scales. *Sociological Methods & Research*, 43(1), 73–97. <https://doi.org/10.1177/0049124113509605>
- Sachs J.** (2003). Validation of the Satisfaction with Life Scale in a sample of Hong Kong University students. *Psychologia*, 46(4), 225–234. <https://doi.org/10.2117/psysoc.2003.225>
- Saris W. E., & Satorra A.** (1987). Characteristics of structural equation models which affect the power of the likelihood ratio test. In W. E. Saris, & I. N. Gallhofer (Eds.), *Sociometric research* (pp. 220–236). London, UK: Palgrave Macmillan.
- Satorra A., & Bentler P. M.** (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.); *Latent variables analysis: Applications for developmental research*, (pp. 399–419). Thousand Oaks, CA: Sage Publications.
- Schwarz N., Strack F., Hippler H. J., & Bishop G.** (1991). The impact of administration mode on response effects in survey measurement. *Applied Cognitive Psychology*, 5(3), 193–212. <https://doi.org/10.1002/acp.2350050304>
- van de Ven A. H., & Ferry D. L.** (1980). *Measuring and assessing organizations*. New York, NY: John Wiley & Sons.
- Vassar M.** (2008). A note on the score reliability for the Satisfaction with Life Scale: An RG study. *Social Indicators Research*, 86(1), 47–57. <https://doi.org/10.1007/s11205-007-9113-7>
- Vautier S., Mullet E., & Jmel S.** (2004). Assessing the structural robustness of self-rated satisfaction with life: A SEM analysis. *Social Indicators Research*, 68(2), 235–249. <https://doi.org/10.1023/B:SOCI.0000025595.92546.eb>
- Vázquez C., Duque A., & Hervás G.** (2013). Satisfaction with Life Scale in a representative sample of Spanish adults: Validation and normative data. *Spanish Journal of Psychology*, 16(e82), 1–15. <https://doi.org/10.1017/sjp.2013.82>
- Vera-Villarreal P., Urzúa A., Pavez P., Celis-Atenas K., & Silva J.** (2012). Evaluation of subjective well-being: Analysis of the Satisfaction with Life Scale in Chilean population. *Universitas Psychologica*, 11(3), 719–727.
- Wu C., & Yao G.** (2006). Analysis of factorial invariance across gender in the Taiwan version of the Satisfaction with Life Scale. *Personality and Individual Differences*, 40(6), 1259–1268. <https://doi.org/10.1016/j.paid.2005.11.012>

Appendix A

Spanish version of the SWLS items used to collect data

Item number	Item
1	En la mayoría de aspectos, mi vida está cerca de mi ideal
2	Las condiciones de mi vida son excelentes
3	Estoy satisfecho(a) con mi vida
4	Hasta ahora, he conseguido las cosas que para mí son importantes en la vida
5	Si volviera a nacer, no cambiaría casi nada de mi vida

Appendix B

Comparative table: Different versions of the SWLS

Item	English Version	Spanish Versions			Item used	Comments
	Diener et al., (1985)	1) Atienza et al. (2000)	2) Núñez et al. (2010)	3) Diener's website (2014)		
1	In most ways my life is <u>close</u> to my ideal	En la mayoría de los aspectos mi vida es <u>como quiero que sea</u>	En general, mi vida se <u>corresponde con mis ideales</u>	En la mayoría de las formas de mi vida se <u>acerca a mi ideal</u>	En la mayoría de aspectos, mi vida <u>está cerca de mi ideal</u>	The item that we use is closer to the original English scale. For instance, 'esta cerca' is the literal translation of 'is close.' 1) 'Como quiero que sea' translates to 'as I want it to be.' 2) 'Corresponde con mis ideales' translates to 'corresponds to my ideals.' 3) 'Se acerca' translates to 'approaches.'
2	The conditions of my life are <u>excellent</u>	Las circunstancias de mi vida son <u>buenas</u>	Mis condiciones de vida son <u>muy buenas</u>	Las condiciones de mi vida son <u>excelentes</u>	Las condiciones de mi vida son <u>excelentes</u>	The item that we use is closer to the item in the English scale. 1) 'Buenas' translates to 'good' and not 'excellent' 2) 'Muy buenas' translates to 'very good' and not 'excellent' 3) The item we use is exactly the same as Diener's later translation
3	I am <u>satisfied</u> with my life	Estoy <u>satisfecho</u> con mi vida	Estoy <u>satisfecho</u> con mi vida	Estoy <u>satisfecho</u> con mi vida	Estoy <u>satisfecho(a)</u> con mi vida	The item we use is similar to other Spanish versions of the scale. However, the added value of the item that we use is that it is gender sensitive.
4	So far I <u>have gotten the important things</u> I want in life	Hasta ahora he conseguido de la vida las cosas que <u>considero importantes</u>	Hasta ahora, he <u>logrado cosas importantes</u> en la vida	Hasta ahora, he conseguido las cosas <u>importantes que quiero en la vida</u>	Hasta ahora, he conseguido las cosas <u>que para mí son importantes en la vida</u>	1) 'Considero importantes' translates to 'consider important' and not 'are important' 2) 'He logrado' translates to 'I have accomplished' and not 'I have gotten.' Furthermore, 'cosas importantes' translates to 'important things' and not 'the important things I want' 3) The item we use is similar to Diener's Spanish version. The difference is that we emphasize that importance is defined by the respondent: 'que para mi son importantes.' We find this is crucial to reconcile the older versions, 1) and 2)
5	If I could live my life over, I <u>would change almost nothing</u>	Si pudiera vivir mi vida otra vez, <u>la repetiría tal y como ha sido</u>	Si volviese a nacer, <u>desearía tener la misma vida</u>	Si pudiera vivir mi vida de nuevo, <u>no cambiaría casi nada</u>	Si volviera a nacer, <u>no cambiaría casi nada</u> de mi vida	1) 'La repetiría' translates to 'I would repeat' and not 'I would change almost nothing' 2) 'Desearía tener la misma vida' translates to 'I would have the same life' and not 'I would change almost nothing' 3) The item that we use is similar to Diener's Spanish version. Both use 'no cambiaría casi nada' which literally translates to 'I would change almost nothing'

Appendix C

Fit indices for different factorial invariance models based on a single-routine comparison between all status groups

	Satorra - Bentler $\chi^2(df)$	$\Delta\chi^2(\Delta df)$	CFI	RMSEA
Structural (baseline)	62.78(38)		0.99	0.047
Metric (Weak)	86.71(54)	23.93(16)	0.99	0.045
Scalar (Strong)	176.38(70)	89.67***(16)	0.96	0.072

Notes: The actual *p*-value for metric is .09.

* = *p* < .05. ** = *p* < .01. *** = *p* < .001.

Appendix D

Fit indices for different factorial invariance models based on a pairwise comparison between groups

	Satorra - Bentler $\chi^2(df)$	$\Delta\chi^2(\Delta df)$	CFI	RMSEA	SRMR
<u>Male-Female</u>					
Structural (baseline)	26.94(8)		0.99	0.057	0.029
Metric (Weak)	35.12(12)	8.18(4)	0.99	0.051	0.034
Scalar (Strong)	44.91(16)	9.79(4)	0.99	0.049	0.034
Equality of factor variance	47.78(17)	2.87(1)	0.99	0.050	0.049
Equality of latent mean	49.72(18)	1.94(1)	0.99	0.049	0.049
<u>Student-Worker</u>					
Structural (baseline)	15.90(8)		1.00	0.045	0.019
Metric (Weak)	17.26(12)	1.36(4)	1.00	0.030	0.019
Scalar (Strong)	30.68(16)	13.42*(4)	0.99	0.043	0.021
Equality of factor variance	44.87 (17)	14.19***(1)	0.98	0.058	0.047
Equality of latent mean ¹	62.50(18)	17.63***(1)	0.97	0.071	0.038
<u>Student-Retired</u>					
Structural (baseline)	8.77(8)		1.00	0.025	0.030
Metric (Weak)	10.12(12)	1.35(4)	1.00	0.000	0.035
Scalar (Strong)	24.33(16)	14.21**(4)	0.98	0.058	0.048
Partial scalar (strong) ²	13.58(14)	3.46(2)	1.00	0.000	0.038
Equality of factor variance	16.61(15)	3.03(1)	1.00	0.026	0.095
Equality of latent mean ³	40.08(15)	26.5***(1)	0.93	0.100	0.036
<u>Student-Housekeeper</u>					
Structural (baseline)	13.45(8)		0.99	0.052	0.022
Metric (Weak)	14.58(12)	1.13(4)	1.00	0.029	0.022
Scalar (Strong)	38.43(16)	23.85***(4)	0.98	0.075	0.046
Partial scalar (strong) ⁴	26.52(15)	11.94**(3)	0.99	0.055	0.037
Equality of factor variance	46.06(16)	19.54***(1)	0.97	0.086	0.120
Equality of latent mean ⁵	75.58(16)	49.06***(1)	0.94	0.121	0.021
<u>Worker-Retired</u>					
Structural (baseline)	12.08(8)		1.00	0.034	0.030
Metric (Weak)	15.46(12)	3.38(4)	1.00	0.025	0.055
Scalar (Strong)	21.72(16)	6.26(4)	1.00	0.028	0.055
Equality of factor variance	23.63(17)	1.91(1)	1.00	0.029	0.083
Equality of latent mean ⁶	23.10(17)	1.38(1)	1.00	0.028	0.055
<u>Worker-Housekeeper</u>					
Structural (baseline)	16.73(8)		1.00	0.045	0.022
Metric (Weak)	23.07(12)	6.34(4)	1.00	0.041	0.044
Scalar (Strong)	32.99(16)	9.92*(4)	0.99	0.044	0.048
Equality of factor variance	36.41(17)	3.42(1)	0.99	0.046	0.090
Equality of latent mean ⁶	42.66(17)	9.67**(1)	0.99	0.052	0.042

Appendix D (Continued)

	Satorra - Bentler $\chi^2(df)$	$\Delta\chi^2(\Delta df)$	CFI	RMSEA	SRMR
<u>Retired-Housekeeper</u>					
Structural (baseline)	10.03(8)		1.00	0.034	0.030
Metric (Weak)	12.22(12)	2.19(4)	1.00	0.009	0.042
Scalar (Strong)	14.60(16)	2.38(4)	1.00	0.000	0.043
Equality of factor variance	18.82(17)	4.22*(1)	1.00	0.022	0.130
Equality of latent mean ⁶	16.14(17)	1.54(1)	1.00	0.000	0.041
<u>Unemployed-Worker</u>					
Structural (baseline)	12.85(8)		1.00	0.038	0.019
Metric (Weak)	18.04(12)	5.19(4)	1.00	0.035	0.021
Scalar (Strong)	80.12(16)	62.08***(4)	0.96	0.097	0.026
Partial scalar (strong) ⁷	26.42(15)	8.38*(3)	0.99	0.042	0.021
Equality of factor variance	27.29(16)	0.87(1)	0.99	0.041	0.021
Equality of latent mean	34.22(17)	6.93**(1)	0.99	0.049	0.021
<u>Unemployed-Retired</u>					
Structural (baseline)	5.62(8)		1.00	0.000	0.030
Metric (Weak)	13(12)	7.38(4)	1.00	0.030	0.060
Scalar (Strong)	70.95(16)	57.95***(4)	0.81	0.190	0.200
Partial scalar (strong) ⁷	18.77(15)	5.77(3)	0.99	0.052	0.057
Equality of factor variance	19.58(16)	0.81(1)	0.99	0.049	0.056
Equality of latent mean	22.98(17)	3.4(1)	0.98	0.061	0.058
<u>Unemployed-Housekeeper</u>					
Structural (baseline)	10.47(8)		1.00	0.040	0.022
Metric (Weak)	17.08(12)	6.61(4)	0.99	0.047	0.028
Scalar (Strong)	71.67(16)	54.59***(4)	0.94	0.136	0.030
Partial scalar (strong) ⁷	25.38(15)	8.3*(3)	0.99	0.061	0.027
Equality of factor variance	27.26(16)	1.88(1)	0.99	0.061	0.035
Equality of latent mean	28.19(17)	0.93(1)	0.99	0.059	0.034
<u>Unemployed-Student</u>					
Structural (baseline)	9.06(8)		1.00	0.033	0.037
Metric (Weak)	13.17(12)	4.11(4)	1.00	0.028	0.048
Scalar (Strong)	43.62(16)	30.45***(4)	0.90	0.118	0.110
Partial scalar (strong) ⁸	14.85(13)	1.68(1)	0.99	0.034	0.058
Equality of factor variance	18.20(14)	3.35(1)	0.98	0.049	0.066
Equality of latent mean	163.81(15)	145.61***(1)	0.46	0.282	0.091

Notes: Δ = change; df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

1= Equality of latent mean is also tested based on the scalar model and the same result is found.

2= Partial scalar measurement invariance model is specified by the equality of intercept of item 1, 2, and 5.

3= Equality of latent mean is tested based on the partial scalar model. Equality of latent mean is also tested based on equality of variance and the same result is found.

4= Partial scalar measurement invariance model is specified by the equality of intercept of item 1, 2, 3, and 5.

5= Equality of latent mean is tested based on the partial scalar model.

6= Equality of latent mean is tested based on the scalar model. Equality of latent mean is also tested based on equality of variance and the same result is found.

7= Partial scalar measurement invariance model is specified by the equality of intercept of item 1, 2, 4 and 5.

8= Partial scalar measurement invariance model is specified by the equality of intercept of item 1 and 3.

* = $p < .05$. ** = $p < .01$. *** = $p < .001$.

Appendix E

Mean, standard deviation, and correlation for variables used for concurrent validity analysis

	Mean	SD	1	2	3	4	5
<u>Overall Sample (N = 1479)</u>							
1-SWLS	3.33	0.71					
2-GLS	2.88	0.74	0.63***				
3-Health	3.62	0.72	0.35***	0.25***			
4-Social life	4.00	0.82	0.26***	0.25***	0.16***		
5-Leisure time	3.55	0.94	0.28***	0.21***	0.22***	0.22***	
6-Self-esteem	3.94	0.61	0.57***	0.49***	0.37***	0.35***	0.33***
<u>Male (n = 729)</u>							
1-SWLS	3.35	0.69					
2-GLS	2.90	0.73	0.61***				
3-Health	3.77	0.67	0.34***	0.24***			
4-Social life	3.98	0.79	0.27***	0.25***	0.17***		
5-Leisure time	3.60	0.90	0.26***	0.13***	0.21***	0.20***	
6-Self-esteem	3.94	0.61	0.56***	0.45***	0.39***	0.34***	0.26***
<u>Female (n = 750)</u>							
1-SWLS	3.31	0.73					
2-GLS	2.85	0.77	0.64***				
3-Health	3.47	0.74	0.37***	0.25***			
4-Social life	4.01	0.85	0.25***	0.24***	0.16***		
5-Leisure time	3.50	0.98	0.29***	0.28***	0.21***	0.25***	
6-Self-esteem	3.94	0.62	0.57***	0.53***	0.37***	0.36***	0.38***
<u>Student (n = 190)</u>							
1-SWLS	3.61	0.56					
2-GLS	3.06	0.68	0.50***				
3-Health	3.82	0.68	0.28***	0.10			
4-Social life	4.20	0.64	0.18*	0.15*	0.21**		
5-Leisure time	3.67	0.90	0.21**	0.17*	0.31***	0.30***	
6-Self-esteem	3.96	0.59	0.53***	0.33***	0.39***	0.46***	0.29***
<u>Worker (n = 784)</u>							
1-SWLS	3.36	0.70					
2-GLS	2.92	0.74	0.64***				
3-Health	3.73	0.66	0.34***	0.24***			
4-Social life	3.98	0.83	0.30***	0.28***	0.17***		
5-Leisure time	3.42	0.99	0.30***	0.22***	0.25***	0.20***	
6-Self-esteem	4.00	0.61	0.57***	0.49***	0.37***	0.37***	0.33***
<u>Retired (n = 126)</u>							
1-SWLS	3.28	0.66					
2-GLS	2.81	0.67	0.44***				
3-Health	3.28	0.75	0.31***	0.24**			
4-Social life	3.89	0.81	0.19*	0.22*	0.14		
5-Leisure time	3.86	0.62	0.36***	0.24**	0.29**	0.33***	
6-Self-esteem	3.94	0.52	0.58***	0.33***	0.39***	0.28**	0.44***
<u>Housekeeper (n = 317)</u>							
1-SWLS	3.19	0.77					
2-GLS	2.75	0.80	0.65***				
3-Health	3.33	0.75	0.36***	0.26***			
4-Social life	3.99	0.88	0.17**	0.18**	0.08**		
5-Leisure time	3.63	0.90	0.33***	0.28***	0.21***	0.22***	
6-Self-esteem	3.86	0.64	0.60***	0.58***	0.37***	0.26***	0.40***

Appendix E (Continued)

	Mean	SD	1	2	3	4	5
<u>Unemployed (n = 62)</u>							
1-SWLS	3.00	0.66					
2-GLS	2.53	0.67	0.61***				
3-Health	3.75	0.79	0.40**	0.27*			
4-Social life	3.81	0.82	0.28*	0.21 ⁺	0.23 ⁺		
5-Leisure time	3.80	0.87	0.22 ⁺	0.17	0.37**	0.42**	
6-Self-esteem	3.56	0.68	0.42**	0.44***	0.41**	0.53***	0.37**

Notes: SD = Standard deviation; SWLS = Satisfaction with Life Scale; GLS = global life satisfaction.

⁺ = $p < .1$. * = $p < .05$. ** = $p < .01$. *** = $p < .001$.