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Satisfaction with Life Scale: New Psychometric Evidence in a Romanian Emerging Adults Sample

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Abstract:

The purpose of the article was the adaption and the validation of Satisfaction with Life Scale in correlation with measures of the curiosity and the Big Five personality traits in the case of a sample of emerging adults. In addition to SWLS, we applied inventories for curiosity (CEI-II) and Big Five personality traits (BFI-10) on a group of students emerging as adults (N = 520; \bar{X} age = 19,70). Both the exploratory factor analysis and the confirmatory factor analysis showed an adequate fit of a single-factor model ($\chi^2/df = 2,19$; CFI = .99; RMSEA = .049). This structure was confirmed by a multigroup confirmatory factor analysis and gender invariant. SWLS shows acceptable internal consistency ($\alpha = .79$). Supporting its criterion-related validity, the SWLS correlated positively with curiosity and its factors, stretching and embracing, with all the personality traits, extraversion, agreeableness, conscientiousness, except for openness, and negatively with neuroticism. The results show that SWLS is fit for the work with emerging adults.

Keywords: Life satisfaction, SWLS, factorial structure, validity, curiosity, big five personality traits, emerging adults

1. Introduction

The Satisfaction with Life Scale (SWLS) is very frequently used in the assessment of life satisfaction and, implicitly, with subjective well-being (SWB). Developed by Diener, Emmons, Larsen, & Griffin (1985) with a view to evaluating the cognitive component of subjective well-being, the scale has passed the test of validity in various environments and cultures such as Greece (Galanakis, Lakioti, Pezirkianidis, Karakasidou, & Stalikas 2017), Spain (Vásquez, Duque, & Hervás 2013), Turkey (Durak, Senol-Durak, & Gencoz 2010), Sweden (Hultell & Gustavsson 2008), Brazil (Gouveia, Milfont, Da Fonseca, & de Miranda Coelho 2009), Peru (Caycho-Rodríguez, Ventura-León, García Cadena, Barboza-Palomin, Arias-Gallegos, Dominguez-Vergara et al. 2018), Colombia (Useche & Serge, 2016), Mexico (López-Ortega, Torres-Castro, & Rosas-Carrasco, 2016; Padros Blazquez, Hernandez, Medina 2015), Malaysia (Aishvarya, Maniam, Karuthan, Sidi, Nik Jaafar, & Oei, 2014; Swami & Chamorro-Premuzic, 2009), Taiwan (Wu & Yao 2006), Canada (Esnaola, Benito, Antonio-Agirre, Freeman, & Sarasa, 2017), etc.

The scale does not focus on domains specific to one's individual life; instead, it assesses the global level of life satisfaction in accordance with the subjective criteria the person establishes for himself. SWLS is a short scale that includes 5 items assessed on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), while the score varies from *extremely dissatisfied* to *highly satisfied with life* (Diener et al., 1985). As evidenced by the following studies (Diener et al., 1985; Pavot & Diener, 1993; Diener, Suh, Smith, & Shao, 1995), the final scores of the scale can be understood as: (5–9) Extremely Dissatisfied; (10–14) Dissatisfied; (15–19) Slightly below average in life satisfaction; (20–24) Average score; (25–29) High score; (30–35) Very high score.

The validations of the scale were made, in most cases, in correlation with the instruments that measure concepts of positive psychology such as hope (Bayley, & Snyder 2007; Galanakis et al., 2017), meaning in life (Steger, Frazier, Oishi, & Kaler, 2006; Galanakis et al., 2017), happiness, anxiety, stress, and resilience (Caycho-Rodríguez et al., 2018), anxiety and depression (Maroufizadeh, Ghaheri, Samani, & Ezabadi, 2016), perceived health and social support (López-Ortega et al., 2016), clinical depression and positive and negative affectivity (Padros Blazquez et al., 2015), the mental component of the quality of life, anxiety, dispositional optimism, pessimism, sleep quality (Hinz, Conrad, Schroeter, Glaesmer, Brähler, Zenger et al., 2019), etc.

As for the coefficient of internal consistency of the scale, studies have shown different alpha indexes in the case of different types of populations: $\alpha = .78$ (Sun & Kong, 2013 – university students); $\alpha = .82$ (Cazan, 2014 - undergraduates); $\alpha = .84$ (Useche & Serge, 2016 – university students) and $\alpha = .90$ (Rosengren, Jonasson, Brogårdh, & Lexell, 2015 – people with Parkinson's disease).

2. Studies of the Validation of SWLS on the Romanian Population – Outline

The studies of the SWLS validation of the Romanian population have shown similarities with the original properties of the scale (Pavot & Diener, 1993; Diener et al., 1985). All the pieces of research show the existence of only one important factor of SWLS (Marian, 2007; Stevens, Constantinescu, Lambriu, Butucescu, Sandu, & Uscătescu 2012; Marcu,

2013; Cazan, 2014). In the case of the samples made up of the general population, such as in the student sample, the internal consistency shows relatively similar high indexes: $\alpha = .85$ ($N = 391$; $\bar{X}_{age} = 31,01$; $S.D. = 13,27$) (Marian, 2007), $\alpha = .81$ ($N = 285$; $\bar{X}_{age} = 27,35$; $S.D. = 13,23$) (Marcu, 2013), $\alpha = .82$ (students university) (Cazan, 2014) and after the one-month retest period, the reliability indexes remain $r = .69$ (Marian, 2007), and $.67$ (Marcu, 2012), respectively, which shows the stability of the results obtained throughout the stages of testing. The test-retest coefficients obtained in the studies mentioned are similar to the test-retest reliability coefficient from international research reported by Pavot and Diener (1993). The convergent validity shows that life satisfaction correlates negatively with anxiety, depression, hostility, and psychoticism (Marian 2007; Stevens et al., 2012), and positively with self-esteem (Stevens et al., 2012).

Validation Studies	Cronbach's α	Factors	Mean Total Score
Adults (general population) ($N = 391$; $\bar{X}_{age} = 31,01$; $S.D. = 13,27$) (Marian, 2007)	.85	Single (EFA)	22,31
Adults (general population) ($N = 72$; $\bar{X}_{age} = 20,94$; $S.D. = 1,21$) (Stevens et al., 2012)	.82	Single	23,88
Adults (general population) ($N = 285$; $\bar{X}_{age} = 27,35$; $S.D. = 13,23$) (Marcu, 2013)	.81	Single (CFA)	24,20
Undergraduates ($N = 342$; $\bar{X}_{age} = 20,00$) (Cazan, 2014)	.82	Single (CFA)	-

Table 1: Studies of SWLS on the Romanian population

Although SWLS validation studies are conducted on many types of samples, a few studies in the cases of adolescents (Moksenes, Løhre, Byrne, & Haugan, 2014; Jovanović, 2016) and individuals in the transition from adolescence to adulthood are included in the category of emerging adults (Arnett, 2015).

In the present study, we propose to analyse the psychometric properties of the scale in association with two instruments with which SWLS has not been associated in the validation process, namely, the instruments for curiosity (Curiosity and Exploration Inventory-II- CEI-II) and for the Big Five personality traits (Big Five Inventory-10 – BFI-10).

3. Method

3.1. Participants and Procedure

The psychometric data in this paper come from processing the answers of a number of 520 undergraduates (214 females and 306 males, among which there were no significant age differences) studying at public faculties from the same city in the technical (67%), economic (19%) and philological (14%) domain and included in the emerging adults category ($\bar{X}_{age} = 19,70$; $S.D. = 1,59$). Participants provided informed consent and completed the measures voluntarily and anonymously. The measures were administered in groups during the teaching activities and each administration was completed in about 5–7 minutes. The study subjects were not rewarded for participating in the study.

3.1.1. Instruments Applied in Addition to SWLS

- *Curiosity and Exploration Inventory-II (CEI-II)* (Kashdan, Gallagher, Silvia, Winterstein, Breen, Terhar et al., 2009) contains 10 items assessed on a scale from 1 (*very little or not at all*) to 5 (*to the highest extent*), and it is structured around two subscales: Stretching– the motivation to look for knowledge and new experiences (e.g.: *I am at my best when doing something that is complex or challenging*) and Embracing – the willingness to embrace newness, uncertainty and the unpredictable nature of day-to-day life (e.g.: *I like to do things that are a little frightening*). The sum of the scores for the two subscales is the score for Curiosity. The Cronbach's alpha indexes in the case of undergraduates vary from .78 to .80 for Stretching, from .83 to .85 for Embracing, and from .83 to .85 for the total score of the two subscales – total CEI-II (Kashdan et al. 2009). In our sample, $\alpha = .70$ for Stretching, .72 for Embracing subscales and .77 for Curiosity total score.
- *Big Five Inventory-10 – BFI-10* (Rammstedt & John, 2007), which measures personality factors within the Big Five Model using 10 items, 5 reverse, on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*): Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to experience. The measure was developed on samples of American students ($N = 1627$) and German students ($N = 833$), and reliability was checked by means of a second test after a period of 6–8 weeks in both cultures. The test–retest correlations varied between .68 and .84. The average of stability coefficients after the second test was $r = .75$ (.72 in the American sample and .78 in the German sample), suggesting that scales BFI-10 have respectable stability levels (Rammstedt, & John, 2007). In the present piece of research, the consistency indexes varied from $\alpha = .25$ for Agreeableness and for Openness to $\alpha = .38$ for Extraversion, $\alpha = .46$ for Neuroticism, and $\alpha = .60$ for Conscientiousness. Given that the minimum permitted for extra-short scales with two items per factor is .45 (Thalmayer, Saucier, & Eigenhuis, 2011), one can consider that the indexes are acceptable, except for Agreeableness, which has the lowest index. As Furnham

(2008) shows, the alpha indexes are influenced by the number of items in the scale; therefore, the consistency indexes for the two-item scale was expected to have a moderate or even weak value, and an internal consistency could show redundancy and the narrowness of the scale.

3.1.2. Data Analysis

Data analysis for the examination of the characteristics of the scales were conducted with SPSS 22 and Amos 20; they used the exploratory factorial analysis (EFA) and the confirmatory factorial analysis (CFA), multigroup-CFA, descriptive statistics, internal consistency and bivariate correlations of SWLS with other measures.

4. Results and Discussion

4.1. Factorial Structure

The exploratory factor analysis with Principal component method revealed a one-factor solution that accounts for 57,01% of the variation with the items, with the following saturation of the factors: .77 (item 1), .73 (item 2), .85 (item 3), .74 (item 4), .64 (item 5) (KMO = .80; Bartlett's test of sphericity = 812,800; $p = .000$). To verify the result obtained, we resorted to CFA. The Mardia coefficient was 8,20. We used the method maximum likelihood with a bootstrap of 2000 (Bias-corrected confidence intervals - 95). To assess the model fit, various indexes of fit were examined in CFA: χ^2 value, df, IFI (incremental fit index), NFI (normed fit index), CFI (comparative fit index), RMSEA (root mean squared error of approximation), SRMR (standardized root mean square residual). Inspection of so-called modification indices revealed that the fit of the model could be increased by allowing the correlation of the errors of item 2 (*The conditions of my life are excellent*), item 5 (*If I could live my life over, I would change almost nothing*), item 4 (*So far I have gotten the important things I want in life*) and item 5 (*If I could live my life over, I would change almost nothing*). Thus, the fit indices obtained were considered good: $\chi^2 = 6,57$; $df = 3$; $\chi^2/df = 2,19$; IFI = .996; NFI = .992, CFI = .996; RMSEA = .049 (CI 90% - .000 - .100); SRMR = .0156, $p = .087$ (table 2).

Model	χ^2	df	CMIN/df	IFI	NFI	CFI	RMSEA (CI 90%)	SRMR
Single-factor	6,57	3	2,19	.996	.992	.996	.049 (.000 - .100)	.015

Table 2: Confirmatory Factor Model

According to the criteria outlined by Little (2013), values of the CFI higher than .90 are indicative of an acceptable and higher than .95 indicate an excellent fit; values of the RMSEA less than .05 indicate a good fit, and values as high as .08 represent acceptable fit.

Standardized factor loadings were within the range of .53 (item 5) and .86 (item 3) (fig. 1). The factor loading of item 5 (*If I could live my life over, I would change almost nothing*), which is poor in comparison with other items, is common to several studies of SWLS validation carried out on the Romanian population (Cazan, 2014; Stevens et al., 2012). In comparison with the other items, the respective item has weaker correlations with items 1 ($r = .39$) and 2 ($r = .25$); also Pavot and Diener (1993) drew attention to the fact that the homogeneity and convergence of item 5 (which the authors find to be weak in comparison to other items) can be accounted for by the fact that the content reflects orientation to the past. As other authors who tested the scale on the Romanian population show, this aspect could lead to a cultural interpretation that is not specific to the Romanian respondents (Stevens et al., 2012). Further research is meant to clarify the relationship between the orientation to the past and the perception of the quality of life.

As for the model obtained through the correlations of the errors, many studies demonstrated that the one-factor model, with errors correlated between items 4 and 5, is more reliable than the original model (Clench-Aas, Nes, Dalgard, & Aaro, 2011; Glaesmer, Grande, Braehler, & Roth, 2011; Cazan, 2014). The comparison with other studies on the validation of SWLS on students (Cazan, 2014) shows both similarities and differences. Both studies are carried out on students within the same age bracket. In both studies, CFA leads to the confirmation of a single factor. In Cazan's study ($N = 342$), the more reliable model entailed the correlation of errors of items 4 and 5, while in the present study there were three items with correlated errors: item 4 with item 5, and item 2 with item 5. Again, the result suggests that item 5 has special importance for the respondents. Alpha Cronbach indexes are different, $\alpha = .82$ (Cazan, 2014) and $\alpha = .79$ in the present study, respectively.

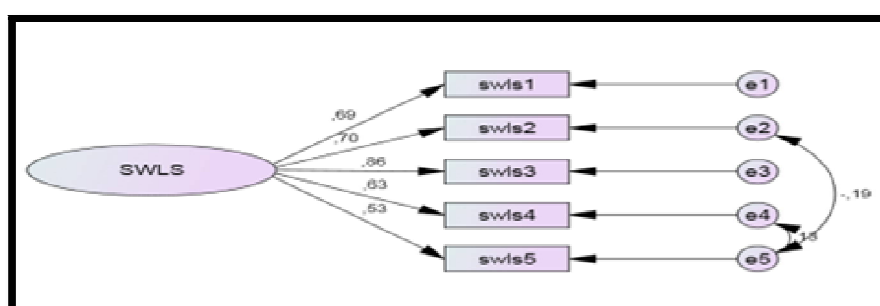


Figure 1: Confirmatory Factorial Analysis of the SWLS

4.2. Factorial Invariance

To analyze the factorial invariance, we studied the hierarchy of models with constraints for the gender criterion. Model 1 (the one without the equality constraints of specific parameters to which all subsequent models are reported) was tested without constraints both for the male and the female samples. Both CFI and RMSEA values were adequate. Model 2 imposed constraints on all factor loadings. Again, the values obtained are high. Model 3 tested the constraints imposed on covariances. The estimations of the models fit the data at an acceptable level (table 3). The value of $\Delta\chi^2$ was not statistically significant, and the comparison of models show that ΔCFI varies between -.005 and -.006.

Model	χ^2	df	CMIN/df	RMSEA	SRMR	CFI	ΔCFI	p
Configural	13,22 9	6	2,20	.049	.0210	.991	-	-
Weak invariance	13,46 1	10	1,34	.026	.0216	.996	-.005	.199
Strong invariance	13,67 1	11	1,24	.025	.0218	.997	-.006	.252
Strict invariance	21,15 7	18	1,17	.019	.0262	.996	-.005	.272

Table 3: Factorial invariance across gender

4.3. Descriptive Statistics

The average score of life satisfaction obtained in the case of emerging adults is a moderately low level, according to Diener et al. (1985). 17,2% from participants declare they were unsatisfied and extremely unsatisfied, while at the opposite side, those with high satisfaction was 20.8%. There were no significant gender differences in the total score of Satisfaction with Life (\bar{X} males = 24,59; S.D. = 5,59; \bar{X} females = 25,40; S.D. = 5,39; $p = .105$) (table 4).

	\bar{X}	S.D.	Skewness	Kurtosis	Cronbach' s α If Item Deleted
1. In most ways, my life is close to my ideal.	4,54	1,28	-.45	.10	.74
2. The conditions of my life are excellent.	5,11	1,28	-.39	-.40	.76
3. I am satisfied with my life.	5,30	1,36	-.86	.37	.71
4. So far I have gotten the important things I want in life.	5,42	1,48	-.88	.07	.75
5. If I could live my life over, I would change almost nothing.	4,55	1,93	-.38	-1,03	.80
Total life satisfaction score	24,93 $\alpha = .79$	5,51	-	-	-

Table 4: Descriptive statistics

The alpha index obtained, $\alpha = .79$, shows that the instrument meets the essential requirements about reliability. For the sub-samples of males and females, respectively, the values of internal consistency were .78 and .82, respectively. The correlation between items and SWLS total score (between .69 and .75) is significant for $p < 0.01$.

4.4. Convergent Validity

Taking into account the specialized literature (Kashdan et al., 2009; Jovanović, & Brdaric, 2012), we hypothesized that SWL score would correlate positively with Curiosity, Stretching and Embracing, with Extraversion, Conscientiousness, Agreeableness and negatively with Neuroticism. As for the factors Agreeableness and Openness, several studies demonstrate that the latter haven't proven to be predictors of life satisfaction. For example, studies on teenagers empirically claim that Openness is not a predictor of life satisfaction (Glaesmer et al., 2011) or it is a very weak predictor ($\beta = .08$) (Suldo, Minch, & Hearon, 2015). A study on university students found out that the only predictors of life satisfaction were Neuroticism, Extraversion, and Conscientiousness (Fagley, 2012).

The data we obtained show that life satisfaction correlates with Curiosity ($r = .30$; $p < .01$), Stretching ($r = .30$; $p < .01$), and Embracing ($r = .23$; $p < 0.01$) (table 5). The relationship between Curiosity and life satisfaction was not surprising. The previous research has shown that Curiosity can improve one's wellbeing in all its forms (emotional, psychological, and social) (Kashdan et al., 2009). The people who have high scores for Curiosity, Stretching and Embracing claim to have higher positive affectivity and happiness. In addition, there are reverse relationships between Curiosity and emotional disorders such as depression and anxiety (Kashdan et al., 2009). The significant moderate correlations between Curiosity, Stretching, embracing on the one hand and life satisfaction on the other hand that we obtained are not surprising since a receptive attitude, openness to novelty and uncertainty afford both the pleasure to discover and tension (Kashdan et al., 2009). Total SWL score correlates with all the factors of personality (Extraversion – $r = .28$; $p < 0.01$; Agreeableness – $r = .15$; $p < 0.01$; Conscientiousness – $r = .35$; $p < 0.01$; Neuroticism – $r = -.32$; $p < 0.01$), except for Openness (table 5). It is well-known that extroverted, agreeable, emotionally-balanced individuals with a high degree of conscientiousness are mentally healthy, stress-resistant, intellectually curious, and can work for long periods. In addition, we used the regression analysis to find out the factors that predict life satisfaction. The total SWL score became a

dependent variable, and its predictors were Extraversion ($\beta = .23$), Conscientiousness ($\beta = .27$), and (negatively) Neuroticism ($\beta = -.22$).

	Variables	Total SWLS Score
CEI-II	Stretching	.30**
	Embracing	.23**
	Curiosity	.30**
BFI-10	Extraversion	.28**
	Agreeableness	.15*
	Conscientiousness	.35**
	Neuroticism	-.32**
	Openness to experience	.02

Table 5: SWLS bivariate correlations with validated measures

**p < .01; *p < .05

All three personality factors account for 22 % of the variance in Life Satisfaction. In a separate regression, Stretching is a relatively moderated predictor of Life Satisfaction ($\beta = .29$), accounting for .08% of the variance of the SWL score. The factor Embracing does not become a predictor for Life Satisfaction.

5. Discussion and Conclusions

The study focused on the validation of SWLS on a sample of Romanian emerging adults. The results support the original one-factor model of SWLS, which proved to be gender-invariant. As for internal consistency, we obtained alpha Cronbach indexes, which are lower than those in other international or Romanian pieces of research on SWLS validation. For the female sample, Cronbach's alpha is comparable with the indexes over .80 obtained in other studies. One aspect that needs to be clarified in subsequent studies is that of item 5, which obtained weak factor loading compared to the other items and whose errors were correlated with those of the other two items for perfecting the model in CFA. Although other early studies draw attention to the homogeneity and convergence of item 5 – an item that reflects the respondents' orientation to the past – it seems that for the Romanian population this has a special significance noted in other studies that have considered SWLS analysis. This should be verified in further studies. The aspects discovered regarding the covariance of items 4 and 5 are in line with previous research (Clench-Aas, Nes, Dalgard, & Aaro, 2011; Glaesmer, Grande, Braehler, & Roth, 2011; Moksnes et al., 2014). For example, Moksnes et al. (2014) showed that the correlated residual variances between items 4 and 5 "might imply that it is difficult to differentiate the semantic meaning in them" (p. 668). The correlation of the errors of items 5 and 2, also, must be taken into account in subsequent studies. The convergent validity was ensured with scales that measure curiosity and trait personality. There are significantly moderate correlations between curiosity and its dimensions, Stretching and Embracing and life satisfaction. It is the same with life satisfaction and Extraversion, Conscientiousness, Agreeableness, and Neuroticism (negatively). There were no correlations between life satisfaction and Openness to experience.

The paper demonstrates that healthy personality traits, Extraversion, Agreeableness, Conscientiousness, and curiosity can support SWB, while Neuroticism can worsen it. We correlate the result we obtained with the one reported on by Pavot and Diener (1993) who showed that life satisfaction correlates positively with extraversion and negatively with neuroticism. The data obtained in the present study are to be added to those that support the SWLS validity construct. In addition, it is shown that in the case of emerging adults, personality is a predictor of Life Satisfaction. The overall conclusion highlights the psychometric properties of the instrument SWLS to measure Life Satisfaction, and it accounts for its use in the case of emerging adults.

6. Limitations of the Present Study

We consider that the most relevant limitations of the paper is the use of two self-report scales in the assessment of the convergent validity, out of which one is an extra-short scale such as BFI-10, a scale with low reliability in the case of Agreeableness and Conscientiousness (Rammstedt & John, 2007; Pejić, Tenjović, & Knežević, 2014; Carciofo, Yang, Song, Du, & Zhang, 2016). Another limitation is related to the fact that the sample was made up entirely of students. However, future validation studies must include a heterogeneous sample.

7. References

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