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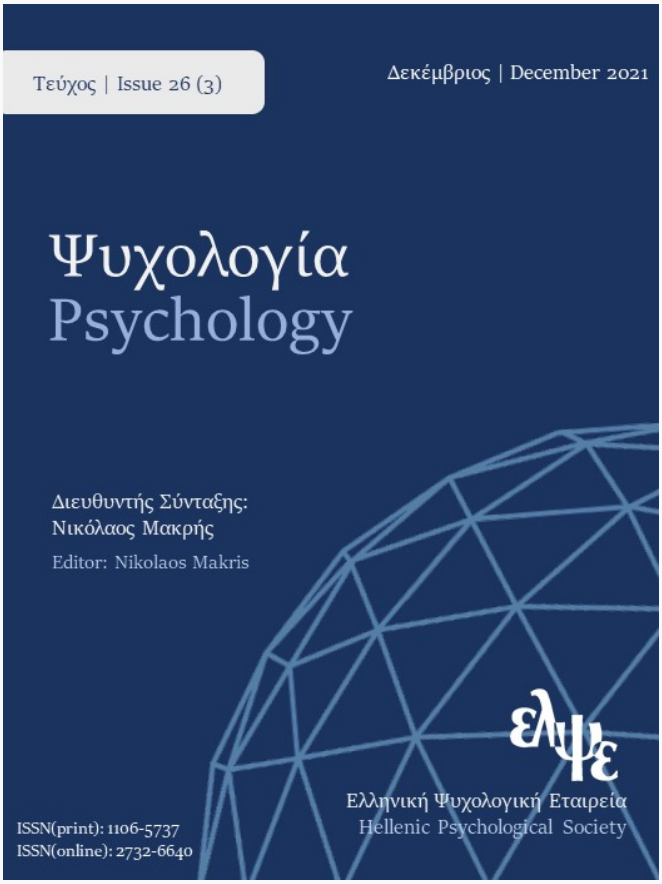

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ΣΥΝΤΟΜΗ ΑΝΑΦΟΡΑ | BRIEF REPORT

Psychometric properties of the Satisfaction with Life Scale in a Cypriot student sample

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KEYWORDS

reliability
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subjective well-being
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ABSTRACT

Subjective well-being has been researched across multiple studies to identify how different people define happiness and satisfaction in their lives. Life satisfaction, a key component of subjective well-being, has been used on its own as a global judgment of an individual's subjective level of satisfaction with life. The Satisfaction with Life scale (SWLS) allows people to express their perceptions about 5 simple statements. This study aimed to assess the psychometric properties of the Greek version of the scale in a Cypriot sample of 341 university students. Psychometric analysis revealed that the data fit well in a unidimensional factor model in a confirmatory factor analysis, with adequate reliability indices of McDonald's ω and Cronbach's α =.86, and test-retest reliability of Pearson r = .85. SWLS scores had negative correlation coefficients with scores from trait anxiety, perceived stress, neuroticism, behavioral inhibition and depression measures, and moderate to strong positive correlations with scores from optimism and self-esteem measures; they were weakly positively associated with social desirability and uncorrelated with need for cognition scores. Overall, the SWLS scale had satisfactory psychometric properties in terms of reliability, factorial, convergent and discriminant validity and can be used with a Greek-speaking student population.

Introduction

In "Correlates of Avowed Happiness", Warner Wilson (1967) provided a broad review of subjective well-being (SWB) research. Based on the data available at that time, Wilson concluded that the happy person is a "young, healthy, well educated, well-paid, extroverted, optimistic, worry-free, religious, married person with high self-esteem, job morale, modest aspirations, of either sex and of a wide range of intelligence" (p.294). Since then, researchers have focused their efforts in comprehending the processes that govern happiness.

Subjective well-being is an extensive category of phenomena that includes people's emotional reactions, domain satisfactions, and global judgments of life satisfaction (Diener, 2013; Pavot & Diener, 1993), characteristics that are often correlated. Initially, SWB was defined as a general area of scientific interest rather than a single, specific construct. In later years, more concrete descriptions of SWB were provided; for example, Diener et al. (2015) stated that "subjective well-being is defined as people's evaluations of their lives—the degree to which their thoughtful appraisals and affective reactions indicate that their lives are desirable and proceeding well" (p. 234).

SWB is considered as an umbrella term (Diener et al., 2017) that includes wide-ranging assessments, such as life satisfaction, aspirations, judgments, feelings that people base their actions upon, and even discrepancy processes, such as social comparison. Further, it is a term that addresses different aspects of one's emotional experience such as negative and positive emotion. Negative affect , positive affect, and life satisfaction (LS) are considered facets of SWB (Diener et al., 1999). The individual features of SWB are easily distinguishable in factor analyses and display distinct associations with other terms and measures evaluating similar concepts. Diener and colleagues (2017) urged researchers to assess these individual features separately. This paper focuses on the life satisfaction facet of SWB and an empirical examination of the psychometric properties of the Satisfaction with Life Scale.

Development and psychometric properties of the Satisfaction with Life Scale

Life satisfaction can be referred to as a judgmental and cognitive evaluation, in which individuals assess their life's quality, emphasising areas that they highlight as important (Linley et al., 2009; Shin & Johnson, 1978). Upward and downward evaluations are involved in how individuals perceive their life. Life satisfaction is reported after comparing those evaluations with the standards that a person holds. Thus, assessment of life satisfaction can be a conscious process, based on individual criteria, and therefore differences in criteria may result in different levels in life satisfaction. People tend to evaluate their lives with their own unique set of standards of a happy and fulfilling life, focusing on particular domains. For example, some people may express the opinion that health is more important in order to be happy, and others may consider income of greater importance (Pavot & Diener, 1993). When people are asked to provide a conscious evaluation of their life, it is expected that the estimates they give can represent internal values or aspirations, and if a global evaluation is elicited, they reflect on long-term perspectives rather than short-term affective reactions (Pavot & Diener, 1993).

For a "global evaluation" of life satisfaction, a scale of 48 items was initially developed by Diener et al. (1985). These items were produced following theories based on the discrepancies between a person's life and their unique standards for a satisfied life. Factor analyses revealed three factors: negative affect, positive affect, and LS. The authors had purposefully included items measuring negative and positive affect to examine if LS would stand out. Ten of the items loaded strongly on a life satisfaction factor and were later reduced to 5 items (see Table 2) due to "high semantic similarity of several of those items" (Diener et al., 1985, p. 72). This resulted in the current Satisfaction with Life Scale (SWLS). The respondents answer individually on each one of the items on a Likert scale from 1 to 7, with options ranging from "strongly disagree" to "strongly agree". Item scores can be summed, and higher total scores represent higher satisfaction with life.

Studies have shown that the scale has good reliability. Specifically, a coefficient alpha of .87 along with a 2-month test-retest correlation coefficient of .82 was presented by Diener et al. (1985) pointing out that over extensive periods of time, the test-retest stability decreased to .54. Other studies reported coefficient alpha of .87 and .86 for the test-retest stability coefficient (Adler & Fagley, 2005; Steger et al., 2006).

Moreover, there is evidence of construct validity through the relationship of the SWLS with numerous measures and constructs (Lucas et al., 1996). For example, moderate positive correlations between SWLS and positive affect have been found, while negative affect, perceived stress and depression had negative associations with SWLS (Arrindell et al., 2001; Chang & Sanna, 2001; Kang et al., 2003). Extroversion related positively with SWLS (Hayes & Joseph, 2003) while neuroticism presented a negative association (Schimmack et al., 2004). Associations with self-esteem ranged from .55 to .64 (Arrindell et al., 2001; Chang & Sanna, 2001; Kang, et al., 2003; Steger et al., 2006). Similarly, optimism had a weak to moderate positive relationship with SWLS (Chang & Sanna, 2001; Steger et al., 2006). These results suggest that some of the suggested characteristics predicted life satisfaction and that personality traits related to global judgments of one's life. Overall, many researchers

from different cultural contexts and geographical locations have examine the psychometric properties of the SWLS.

The present study aimed to assess the psychometric properties of SWLS in a Greek-speaking sample. Indices of the reliability and validity of the scores obtained from the SWLS were also examined. Negative associations were expected between SWLS and measures of neuroticism, depression symptomatology, perceived stress, state and trait anxiety, and behavioral inhibition. Positive associations were anticipated with measures of self-esteem, life orientation and social desirability. A need for cognition scale was also administered to assess discriminant validity. Finally, differences were explored based on gender, place of origin, and year of study. It was expected that no significant differences would arise between these demographic data groups in a relatively homogeneous student sample.

Methodology

Sample

The study was based on secondary data analysis of a study aimed to examine wording effects in conceptually distinct areas and their criterion validity (Koutsogiorgi, 2020). Data were conveniently collected from 341 students attending multiple classes in the Psychology, Education, Sociology and Political Science departments across two universities in Cyprus via an online survey on the SurveyMonkey platform. After ethical approval obtained from the Cyprus National Bioethics Committee, participants were informed about the study and asked to respond to a battery of self-report scales. Demographic information was also gathered regarding their place of origin, type of university, year of studies, age and gender. The participants were Greek-speaking, 81.8% female, aged from 17 to 44 years old (M = 21.63, SD = 3.64), from rural areas (35%) and cities (65%). There were undergraduate students in their first (15.8%), second (15.8%), third (33.4%), and fourth or higher year (23.2%), as well as postgraduate students (9.4%) and missing cases (2.3%).

Instrumentation

The following self-report scales were administered:

Satisfaction with Life Scale (SWLS; Diener et al., 1985). The 5-item scale was developed to assess the satisfaction with life facet of SWB. Responses were recorded on a 7-point Likert scale (options: *strongly disagree*, *disagree*, *slightly disagree*, *neither agree or disagree*, *slightly agree*, *agree*, *strongly agree*). The Greek version of the scale used in this study was retrieved from Diener's online archive, http://labs.psychology.illinois.edu/~ediener/SWLS.html

Life Orientation Scale - Revised (LOT-r; Scheier et al., 1994). The 10-item LOT-r was designed to assess dispositional optimism and more specifically "the generalized expectancies for positive versus negative outcomes" (Scheier et al., 1994, p. 25) with scores on a 5-point Likert scale. The scale was adapted in Greek by Lyrakos et al. (2013).

Rosenberg Self Esteem Scale (RSES; Rosenberg, 1965). The 10-item RSES focuses on positive and negative feelings about one's self. The answers were given on a 6-point Likert scale. The scale has been adapted in Greek and administrated in Greek-speaking samples (e.g., Michaelides et al., 2016).

State and Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The inventory's purpose is to measure one's position on two opposite poles of anxiety affect, referred to as "state anxiety" and "trait anxiety". For the current study, only the 20 items measuring trait anxiety were administered and responses were recorded on a 4-point frequency scale. The scale was adapted in Greek by Fountoulakis and colleagues (2006).

Patient Health Questionnaire 9 (PHQ-9; Kroenke et al., 2001). The PHQ-9 was developed to assess depression symptomatology based on DSM-IV. It consists of 9 items rated on a 4-point frequency scale. The tool can be referred to as a self-report form of the PRIME-MD diagnostic instrument that is used to detect common mental disorders. The scale was adapted in Greek by Karekla, Pilipenko and Feldman (2012).

Behavioral Inhibition Scale (BIS; Carver & White, 1994). BIS is a sub-scale of the 24-item self-report questionnaire BIS/BAS that assesses the behavioral inhibition and the behavioral approach systems. The 7 items referring to behavioral inhibition were used for the present study and scored using a 4-point ordinal scale. BIS is commonly used to assess one's reactivity toward punishment and motivation to avoid unpleasant outcomes. The scale was translated in Greek by the authors, using forward and backward translation.

NEO Five Factor Inventory – Neuroticism (NEO-FFI; Costa & McCrae, 1992). The NEO-FFI consists of 60 items measuring the five dimensions of personality (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness). In the current study, only the 12-item neuroticism dimension items were administered, as adapted in Greek by Panayiotou, Kokkinos and Spanoudis (2004), and rated on a 5-point Likert scale.

Need for Cognition Scale (NFC; Cacioppo et al., 1984). NFC aims to provide an assessment of how much an individual finds joy in gaining and processing information or simply, how much they enjoy thinking. It consists of 18 items and responses were given on a 5-point ordinal scale. The scale was adapted in Greek by Georgiou and Kyza (2018).

Social Desirability (SD; Reynolds, 1982). SD is a 13-item scale used to assess socially desirable behaviours that occur infrequently and socially undesirable behaviours that are very common, based on a dichotomous, true-false response format. The scale was translated in Greek by the authors, using forward and backward translation.

Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983). The PSS was designed to measure the level to which one's situations in life are perceived as stressful. The Greek adaptation of the scale (Michaelides et al., 2016) used in this study consisted of 10 items rated on a 5-point frequency scale.

Statistical Analysis

Confirmatory factor analysis was conducted in MPlus 8.4 to test for the unidimensional structure of the Greek version of SWLS. Due to violations of normality on all items of the scale, the robust maximum likelihood (MLR) estimator was used. In addition to the χ^2 statistic, four global fit indices were also considered: the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Cut off scores values of CFI and TLI ≥0.95, RMSEA and SRMR ≤0.05 were used as evidence of good model-data fit (Geiser, 2013). Prior to assessing mean differences between demographic groups, measurement invariance analysis for gender and place of origin groups was examined at the configural, metric, and scalar level; groups were considered (strongly) invariant if the chi-square difference test of nested models using the scaled chi-square (Satorra & Bentler, 2010) was non significant. Correlation analysis was employed to investigate whether individual characteristics assessed by other scales as observed scores relate to the focal variable LS, which was modeled as a latent construct. Reliability indices (McDonald's ω, Cronbach's α) were estimated in JASP.

Results

Reliability coefficients and descriptive statistics for each individual scale are presented on Table 1. The SWLS presented high reliability with McDonald's ω = Cronbach's α = .86. The mean score indicated average satisfaction levels for the sample, but with substantial variability. A small sample of 27 students were re-administered the questionnaire after a 3-week time period. The test-retest reliability for SWLS was adequately high, Pearson r =

.85. All other scales had high reliability coefficients, with the exception of the Social Desirability scale, and low skewness values, except PHQ-9.

Table 1
Descriptive statistics and reliability coefficients for all scales

Scale	Cronbach's α	McDonald's ω	Mean	St. Deviation	Skewness	Kurtosis
Satisfaction with Life Scale	.856	.857	23.59	6.00	-0.45	0.02
Life Orientation Scale – Revised	.784	.792	14.50	4.49	-0.30	-0.32
Rosenberg Self Esteem Scale	.902	.908	45.05	8.66	-0.30	-0.21
State-Trait Anxiety Inventory – TA	.917	.919	42.25	10.84	0.48	-0.30
Patient Health Questionnaire 9	.869	.876	6.14	5.19	1.20	1.15
Behavioral Inhibition Scale	.787	.793	20.40	3.53	-0.11	0.12
NEO FFI (N)	.864	.866	30.74	8.25	0.53	0.30
Need for Cognition Scale	.828	.829	61.60	10.33	0.23	-0.24
Social Desirability Scale	.654	.660	8.04	2.58	-0.40	-0.27
Perceived Stress Scale	.869	.876	28.61	6.89	0.11	-0.09

In a confirmatory factor analysis model where all five items loaded on a single latent factor, the fit indices were acceptable: *S-B* $\chi^2_{(5)}$ = 15.12, p = .01, *CFI* = .981, *TLI* = .962, *RMSEA* = .077, *SRMR* = .025. A post-hoc modification (error covariance between items 2 and 3) resulted in a non-significant χ^2 and excellent fit indices, but was not pursued to preserve model parsimony. All items had significant and strong loadings on the latent factor (Table 2). McDonald's omega reliability was .87.

Table 2
Factor loadings (and standard errors) for the items of the SWLS

Item	Unstandardized	Standardized
1. In most ways my life is close to my ideal	1.000	0.782 (0.031)
2. The conditions of my life are excellent	1.041 (0.077)	0.801 (0.034)
3. I am satisfied with my life	1.065 (0.064)	0.900 (0.019)
4. So far I have gotten the important things I want in my life	0.991 (0.080)	0.718 (0.041)
5. If I could live my life over, I would change almost nothing	0.833(0.094)	0.538 (0.051)

Multigroup measurement invariance was then conducted for male and female groups and for individuals originating from urban or rural areas (Table 3). Configural invariance was acceptable for gender and place of origin analyses as indicated by the non significant chi square statistic. Equality constraints were subsequently placed on factor loadings and then on item intercepts. Chi-Square difference testing using the Satorra-Bentler scaled chi-square, revealed that metric and scalar models did not fit significantly worse than the configural model. Since strong invariance was established, mean comparisons were carried out. There were no significant mean differences on LS between males and females (t_{338} = -0.82, p = .415), and people living in cities and in rural areas (t_{338} = -1.24, p = .216). Additionally, year of study was not found to relate with satisfaction with life, *F(4,328)* = .29, p = .883. For participants in their 1st year of undergraduate studies (M = 23.61, SD = 6.10) up to the ones in postgraduate studies (M = 24.29, SD = 7.12), the average reported life satisfaction scores were very similar.

Table 3
Measurement invariance for gender and place of origin groups

Models	Gender invariance			Place of origin invariance		
	S-B χ^2	df	p-value	S-B χ^2	df	p-value
Configural	17.404	10	.066	17.367	10	.067
Metric	17.721	14	.220	19.617	14	.143
Scalar	23.012	18	.190	25.602	18	.109
Model comparison						
Metric to Configural	0.905	4	.924	2.430	4	.657
Scalar to Configural	5.657	8	.686	8.138	8	.420

Notes. S-B χ2: Satorra-Bentler χ^2 test statistic and difference test, df = degrees of freedom

The bivariate associations between SWLS scores and all the other measures used in the study appear on Table 4. SWLS scores displayed moderate to strong significant associations with self-esteem, r = .65, and dispositional optimism, r = .51, as expected. Moderate to strong negative associations were found with trait anxiety, r = - .66, neuroticism, r = -.54, perceived stress, r = -.55, and depression symptomatology, r = -.43. Weaker correlations were found with social desirability, r = .34 and behavioral inhibition, r = -.20 (all p < .001). Finally, evidence of discriminant validity was provided by the lack of association with the need for cognition scale scores.

Table 4
Pearson correlation coefficients of SWLS with other scale scores

Scales	SWLS	NEO FFI (N)	PHQ9	STAI	RSES	LOT-R	BIS	NFC	SD
NEO-FFI (N)	-.542**								
PHQ9	-.432**	.675**							
STAI	-.663**	.844**	.676**						
RSES	.648**	-.679**	-.527**	-.759**					
LOT-R	.506*	-.548**	-.429**	-.646**	.665**				
BIS	-.204**	.580**	.286**	.548**	-.370**	-.363**			
NFC	-.008	-.127*	-.066	-.138*	.165*	.226**	-.092		
SD	.345**	-.346**	-.273**	-.391**	.378**	.290**	-.181**	.157*	
PSS	-.553**	.746**	.582**	.755**	-.548**	-.455**	.471**	-.119	-.360**

**Notes.* *p < .05, **p < .001. SWLS: Satisfaction with Life Scale, NEO-FFI (N): Neuroticism subscale of the NEO Five Factor Inventory, PHQ9: Patient Health Questionnaire, STAI: State and Trait Anxiety Inventory, RSES: Rosenberg Self Esteem Scale, LOT-R: Life Orientation scale-Revised, BIS: Behavioral Inhibition Scale, NFC: Need for Cognition scale, SD: Social Desirability scale, PSS: Perceived Stress Scale.

Discussion

The study aimed to assess the reliability and validity of the Greek adaptation of the SWLS in a student sample in Cyprus. The results suggested that reliability indexes of the Greek version of the scale are in line with those of the original English version (Diener et al., 1985), as well as with other studies concerning its adaptation and translation in various languages (Hayes & Joseph, 2003). Moreover, the scale had a simple factor structure of a

unidimensional construct, as shown by confirmatory factor analysis. Furthermore, results were in close agreement with psychometric studies that investigated the adaptation of the SWLS in adult (Galanakis et al., 2017) and patient (Lyrakos et al., 2013) samples in Greece.

No significant differences arose from the different sub-groups tested. This confirms the initial assumption that demographic characteristics do not affect, at least directly, a person's life satisfaction. However, it must be acknowledged that the current sample consisted of students and was homogeneous in terms of age, education, and culture.

As regards correlations with other constructs, the initial hypotheses were met, with scales measuring emotions or personality traits significantly associated with SWLS in the expected direction. Neuroticism and depression symptomatology both negatively correlated with a person's global judgment of their life, highlighting the fact that LS indeed has a correlation with negative affect (Arrindell et al., 2001; Chang & Sanna, 2001; Kang et al., 2003). In addition, the level to which a person gives stressful attributes to situations in their life, is linked to lower LS. This is no surprise, as Schimmack et al. (2004) suggested that personality traits can be a significant factor in one's global judgment of life. Moreover, this opinion can be traced even in SWB research (Pavot & Diener, 1993) were the idea exists that the construct (SWB) also has trait-like properties.

Following previous studies on the effect of optimism and self-esteem on LS (Chang & Sanna, 2001; Kang, et al., 2003), our findings concur that both constructs positively relate to a person's LS. Need for cognition was not correlated to SWLS scores, providing evidence of discriminant validity, in agreement with findings from Henning and Vorderer (2001). It could be argued that people who engage more in thinking may be less satisfied with their lives due to a general overthinking of their life situations. Alternatively, the opposite view could be supported, that a tendency to gather and process information relates to successful "anchoring" of the self into the world and better psychological functioning (e.g. Gauthier et al., 2006). Finally, social desirability construed as a response style in self-report scales, whereby participants paint a more favorable impression of themselves (Furnham, 1986) might explain the positive association with LS. However, there is some evidence that as a personality characteristic, social desirability enhances the prediction of SWB. Their shared variance may be a result of individual perceptions of higher adjustment: individuals view themselves as more fitting in their social contexts and evaluate their lives more positively (Diener et al., 1991).

A broad interest in the area of SWB has been unfolding over the past decades. This interest has been slowly divided into specific fields of research for further exploration of the effects of daily life constructs and psychopathological aspects on SWB's constructs. The research presented in this paper aimed to provide evidence regarding the adaptation of the SWLS in Greek. Limitations of the study were the use of a conveniently selected, predominantly female student sample, and the secondary nature of the data which did not allow for the administration of additional scales (e.g., quality of life, well-being measures) for convergent validity purposes. In combination with studies in typical and patient samples in Greece (Galanakis et al., 2017; Lyrakos et al., 2013), the findings support the use of the Greek adaptation of the scale, providing adequate psychometric evidence on the factor structure, reliability and validity of the scores.

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Conflicts of Interest

The authors declare no conflict of interest.

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ΣΥΝΤΟΜΗ ΑΝΑΦΟΡΑ | BRIEF REPORT

Ψυχομετρικές ιδιότητες της Κλίμακας Ικανοποίησης από τη Ζωή σε φοιτητικό δείγμα Κυπρίων

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εγκυρότητα
Κλίμακα Ικανοποίησης από τη Ζωή
προσαρμογή κλίμακας
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ΠΕΡΙΛΗΨΗ

Η υποκειμενική ευεξία ή ευημερία έχει ερευνηθεί εκτενώς σε μια προσπάθεια κατανόησης πώς οι άνθρωποι την αντιλαμβάνονται και την ορίζουν στη ζωή τους. Η ικανοποίηση από τη ζωή ως ένα σημαντικό στοιχείο της υποκειμενικής ευεξίας ή ευημερίας, έχει χρησιμοποιηθεί ως ένας ολιστικός τρόπος αξιολόγησης του υποκειμενικού επιπέδου ικανοποίησης από τη ζωή. Η Κλίμακα Ικανοποίησης από τη Ζωή (Satisfaction with Life scale) επιτρέπει την έκφραση αντιλήψεων για το θέμα αυτό μέσα από 5 απλές δηλώσεις. Η μελέτη αυτή είχε σκοπό την εξέταση ψυχομετρικών ιδιοτήτων της κλίμακας στην ελληνική γλώσσα σε ένα δείγμα 341 φοιτητών πανεπιστημίου στην Κύπρο. Η ανάλυση έδειξε ότι τα δεδομένα είχαν αποδεκτή εφαρμογή σε ένα μονοδιάστατο παραγοντικό μοντέλο κατά την επιβεβαιωτική ανάλυση παραγόντων. Οι δείκτες αξιοπιστίας McDonald's ω και Cronbach's α = .86, και ελέγχου-επανελέγχου Pearson r = .85 ήταν ικανοποιητικοί. Οι βαθμοί από την Κλίμακα Ικανοποίησης από τη Ζωή είχαν αρνητική συσχέτιση με σκορ από μετρήσεις άγχους ως χαρακτηριστικό προσωπικότητας, αντιληπτού άγχους, νευρωτισμού, συμπεριφορικής αναστολής, και κατάθλιψης. Είχαν μέτριους ως ψηλούς θετικούς δείκτες συσχέτισης με μετρήσεις αισιοδοξίας και αυτοεκτίμησης, χαμηλή θετική συσχέτιση με μέτρηση κοινωνικής ευαρέσκειας, ενώ δεν συσχετίζονταν με την ανάγκη για γνωστική ενασχόληση/σκέψη. Οι ψυχομετρικές ιδιότητες της Κλίμακας Ικανοποίησης από τη Ζωή ήταν ικανοποιητικές ως προς τους ελέγχους αξιοπιστίας, παραγοντικής, συγκλίνουσας και αποκλίνουσας εγκυρότητας και μπορεί να χρησιμοποιείται σε φοιτητικούς πληθυσμούς στην ελληνική της εκδοχή.