Further validation of Single-Item Self-Report Measure of Satisfaction with Life

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CORRECTION

On page 109 in the table 1 z statitics were calculated without taking into account the correlation of the unshared variables (see Steiger, 1980). Hereby, we show the corrected z values. The effective sample size for each of the comparisons was smaller due to missing values related to calculating three coeficients for the same participants. In the parentheses are correlation coefficients used for these comparisons which were calculated on smaller samples. NOTE: the tests yielded nonsignificant results for all the comparisons apart from correlation with Conscientiousness which was marginally significant, therefore, the interpretation of the results and conclusions mostly does not change. Future studies should investigate potential differences on larger and more representative samples.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, 87, 245-251.

Table 1. Means, standard deviations and correlations of SWLS and one-item life satisfaction with perceived stress, depressiveness, anxiety, loneliness and Big Five personality traits

Scale	Reliability coefficients	M (SD)/%	SWLS	Single-item life satisfaction	z	N
SWLS		20.95 (5.70)	-	.57**		
Single-item life satisfaction		5.80 (2.01)	-	-		
Sex		50.3% women	−.26**(−.24**)	−.22** (−.20**)	−0.55	158
Age		21.13 (1.82)	−.07 (−.10)	−.08 (−.07)	−0.40	155
Perceived stress		10.51 (3.02)	−.53** (−.53**)	−.50** (−.50)	−0.40	153
Depressiveness		14.28 (4.55)	−.54** (−.53**)	−.59** (−.61**)	1.35	147
Anxiety		12.17 (3.97)	−.39** (.39**)	−.39** (−.39**)	0.00	147
Loneliness		4.85 (1.76)	−.42**(−.42**)	−.42** (−.43**)	0.15	153
Extraversion		9.32 (2.57)	.35** (.33**)	.30** (.29**)	0.56	150
Agreeableness		9.36 (2.17)	.20** (.18*)	.16** (.15)	0.40	150
Conscientousness		8.94 (2.58)	.27**(.30**)	.14 (.13)	2.30	150
Openness to experience		10.47 (2.13)	.15 (.12)	.10 (.08)	0.53	151
Emotional Stability		8.01 (2.62)	.17* (.16*)	.22** (.19*)	−0.40	150

Sex: 0 – women, 1 – men.
*p < .05; **p < .01.

FURTHER VALIDATION OF SINGLE-ITEM SELF-REPORT MEASURE OF SATISFACTION WITH LIFE

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Abstract: *Valid, reliable and easily applied measures of well-being are essential in large surveys concerning public health, education and psychology. General satisfaction with life is often measured in such surveys. Previous studies showed that single-item self-report measure of satisfaction with life could be sufficient in terms of validity and reliability in certain research contexts. To provide more data on its psychometric properties convergent validity with Satisfaction With Life Scale (SWLS)(Diener et al., 1985) was investigated. Furthermore, correlation pattern of both measures with criterion variables was investigated. A total of 195 students took part in the study. When correction for attenuation was included, correlation between single-item measure of satisfaction with life and SWLS was .68. Correlations of both measures with criterion variables, including sex, well-being indicators and personality, did not differ significantly statistically. Issues related to convergent and divergent validity of single-item satisfaction with life measure are discussed. Due to its convenience of use compared to multi-item scales, the use of single-item self-report measure in large surveys in which many other variables have to be measured should be considered. Nevertheless, future studies on large samples should provide more data on convergent validity as well as in relation to other facets of validity, such as predictive validity.*

Keywords: life satisfaction, single-item measure, validity.

1. Introduction

In the recent years, a lot of effort has been put into investigating the factors influencing life satisfaction. The concept is closely related to happiness and has great impact on all spheres of life, especially health, education, work, family and community [1]. Analyses in that area contribute to finding an answer to the question of what determines the sense of living a satisfying life within the context of research on well-being and happiness through searching for its predictors. Measurement issues are crucial to capture the usefulness of different indicators of the satisfaction with life. Satisfaction with life has been defined as a "global evaluation by the person of the quality of his or her life"[2] and is conceptualized as the evaluative component of well-being [3]. Researchers often take it into account as the main component of mental health or adjustment conceptions [4].

Satisfaction with life functions both as dependent variable and predictor in different research contexts. Stress has a significant impact on perceptions of satisfaction with life [5]. Perceived stress was found to be a better predictor of life satisfaction for younger adults than for middle aged and older adults [6]. Life satisfaction in college students is adversely influenced by college stress [7]. Overall life satisfaction was found to be positively associated to seeking social support and problem-focused coping [8]. What is more satisfaction with life has been shown to be related to measures of mental health and to be predictive of future behaviors such as suicide attempts [9].

Multiple researches show that there are significant relationships between personality traits and satisfaction with life. Previous study showed that Big Five personality traits predispose people to experiencing stable levels of subjective well-being [10]. Personality dispositions such as neuroticism and extraversion can markedly influence levels of subjective well-being [11].

Students (5th–7th graders') who reported high level of satisfaction with life tended to rate themselves higher on measures of extraversion and lower on measures of neuroticism and anxiety. Neuroticism and extraversion are strong predictors of life satisfaction [12]. However, the results also suggest that conscientiousness is an additional dimension of personality relevant to understanding subjective well-being [13]. Depression significantly affects levels of satisfaction with life. There is also substantial amount of research concerning the negative relationship of loneliness and lack of social support with life satisfaction [14]. Satisfaction with family life was more strongly associated with high level of overall satisfaction with life than satisfaction with friends [15]. What is more, studies consistently show more proclivity of women towards rumination and depressiveness than men [16].

Initial study on a single-item self-report measure of satisfaction with life provided data supporting its validity and reliability. It should be noted that even though obtained reliability was very good, the reliability coefficients measured with simple test-retest measures underestimate reliability of single-item tools [17].

There are several measures of emotional and cognitive aspects of well-being, with those focused on cognitive sphere conceived as satisfaction with life measures [18]. There are both multi-item and single item measures of satisfaction with life. One of the most commonly used multi-item methods to assess satisfaction with life is *Satisfaction with Life Scale* [19]. It showed very good psychometric properties in different samples [20].

2. Single-item scales

Single-item scales are considered reliable and valid tools in certain research contexts, and they seem especially practical in large surveys which measure many variables [21][22][23]. In some situations they can be even more

adequate than multi-item measures [24] as they are less time-consuming and reduce the monotony of long surveys. To use these measures properly and to minimize the possible errors, recommendations for the application of single-item scales are being constantly developed [25]. Nonetheless, despite all the benefits, it is important to emphasise that the use of single-item measures is not always advisable. Some situations require multidimensional assessment which can only be reliable by applying a multi-item method. One of the reasons that make single-item measures useful tools applicable in statistical testing of complex models, is the fact that analysis of Likert response format data at the item level is statistically robust [26]. Nevertheless, in cases in which single-item measures are used it is recommended to use more stringent alpha level in order to make cautious statistical decisions.

On the basis of previous theoretical frameworks and empirical research into life satisfaction, the aims of the current study were to: (1) assess convergent validity of single-item life satisfaction scale with SWLS; (2) compare correlation pattern of single-item life satisfaction scale and SWLS with measures of perceived stress, depressiveness, anxiety, loneliness, and Big Five personality traits. It is expected to obtain similar strong correlations with other measures of well-being, and somewhat weaker correlations with extraversion, neuroticism and conscientiousness, and gender.

3. Methods

Participants. A total of 195 students from different universities in Pomerania Region in Poland took part in the study, 85 men (43.6%) and 98 women (50.3%), 12 (6.2%) persons did not report gender, with mean age of 21.13 years ($SD = 1.82$). Students were from different faculties, courses of study, years and modes of study.

Measures. A self-report, single-item measure of life satisfaction was developed on the basis of item from *WHOQOL Brief scale* [27]. Originally used 5-point response scale has been modified to 9-point response scale, in compliance with recommendations to use at least 7-point Likert format response data when conducting statistical analyses on single item measures [26]. Life satisfaction was measured by question "How much do you enjoy your life?" with 9-point response scale, from 1 - "Not at all" to 9 – "An extreme amount". Initial studies provided data supporting its validity and reliability [21]. Other measures were widely used valid and reliable scales adapted in Poland. Satisfaction with life was measured with *Satisfaction With Life Scale* (SWLS), a 5-item, 7-point Likert response format scale with reliability of $α = .81$ in the present sample. Perceived stress was measured with *Perceived Stress Scale (PSS-4),* a 4-item, 5-point Likert response format scale [28] ($α = .75$). Depressiveness and anxiety were measured by *Hospital Anxiety and Depression Scale,* which includes 14 items with 4-point response format, seven items for anxiety ($α = .84$) and seven for depression ($α = .78$) [29]. Loneliness was measured by *Short Loneliness Scale,* which includes three items with 3-point response format ($α = .80$) [30].

Personality was measured by *Ten Item Personality Inventory*, which includes 10 items with 7-point response format, two items for each Big Five personality trait. Reliability of each trait was examined in test-retest procedure in previous research [31]. Spearman-Brown reliability coefficients in this sample were .53 for extraversion, .17 for agreeableness, .63 for conscientiousness, .62 for emotional stability, and .39 for openness for experience.

Procedure. Data collection used convenience sampling. Students were invited to participate anonymously in the study during lectures or classes. More than 90% of all present students agreed to do so. Ninety one percent of participants filled in 'paper and pencil' questionnaires and nine percent of students completed online versions of the questionnaires. Participation in the study was anonymous and no monetary or other material rewards were offered to the participants.

Statistical analyses. Means, standard deviations, percentages and correlation coefficients were calculated. Differences between correlation coefficients where calculated using z statistic. All statistical analyses were conducted in IBM SPSS 24.

4. Results

Distribution of the results is presented in figure 1. The results are slightly negatively skewed but still to a large extent are close to a normal distribution. One-item life satisfaction scale ($M = 5.80$, $SD = 2.01$) and *SWLS* ($M = 20.95$, $SD = 5.70$) were moderately correlated, $r = .57$, $p < .001$. After correction for attenuation, using previously reported reliability coefficient for single-item measure obtained from a subsample (ICC = .87) [21] and Cronbach's alpha for SWLS measured in the present sample ($α = .81$), the correlation coefficient between measured constructs was $r = .68$. Both of them are also correlated similarly to the criterion variables, with conscientiousness showing largest difference, however, statistically non-significant Means, standard deviations and correlations of SWLS and single-item life satisfaction scale with studied variables are presented in table 1. Comparison of correlation coefficients of single-item measure and SWLS with criterion variables showed no statistical differences across all variables.

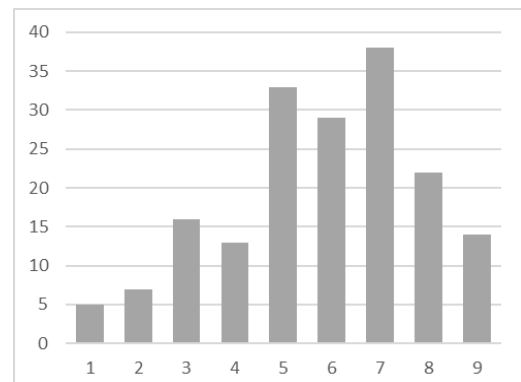*Figure 1. Distribution of the single-item life satisfaction scale results*

Table 1. Means, standard deviations and correlations of SWLS and one-item life satisfaction with perceived stress, depressiveness, anxiety, loneliness and Big Five personality traits

Scale	M (SD)/%	SWLS	single-item life satisfaction	Z
SWLS	20.95 (5.70)	-	.57**	-
Single-item life satisfaction	5.80 (2.01)	-	-	-
Gender	50.3% women	–.26**	–.22**	0.38
Age	21.13 (1.82)	–.07	–.08	–0.14
Perceived stress	10.51 (3.02)	–.53**	–.50**	0.38
Depressiveness	14.28 (4.55)	–.54**	–.59**	–0.69
Anxiety	12.17 (3.97)	–.39**	–.39**	0.01
Loneliness	4.85 (1.76)	–.42**	–.42**	–0.07
Extraversion	9.32 (2.57)	.35**	.30**	–0.52
Agreeableness	9.36 (2.17)	.20**	.16**	–0.33
Conscientousness	8.94 (2.58)	.27**	.14	–1.29
Openness to experience	10.47 (2.13)	.15	.10	–0.48
Emotional Stability	8.01 (2.62)	.17*	.22**	0.47

Gender: 0 – women, 1 – men.
$*p < .05$; $**p < .01$.

5. Discussion

The obtained results showed some level of convergent validity between single-item measure of satisfaction with life and SWLS, however, it could be considered insufficient when taking into account more stringent recommendations [32]. To further examine the validity, correlation coefficients of both measures with criterion variables theoretically related to satisfaction with life were compared. The comparison showed no statistically significant differences and the relationships with most of the criterion variables were very similar for single-item measure and SWLS (in many cases being almost identical up to two decimal places). It should be noted that correlations of both measures with stress and depressiveness were very similar in magnitude to correlation between the two measures themselves, which raises divergent validity questions. The measures were related with the theoretical framework as predicted. Both were related positively with extraversion, conscientousness (single-item measure marginally non-significantly) and emotional stability. Also, both were related with sex (lower satisfaction among women), and negatively with perceived stress, depressiveness, anxiety, and loneliness.

Obtained results are good premises to continue research concerning the relationship between *SWLS* and single-item satisfaction with life measure. Main limitation of this study is a relatively small and homogenous sample of students. Another one is the cross-sectional data, and therefore the predictive validity of studied measures was not tested. Main strength of this study is the use of widely applied, valid, and reliable measures of criterion constructs. That choice facilitates interpretation of the results, as well as its replication. Future studies should further investigate convergent validity of single-item measure with other measures of satisfaction with life, as well as similarity of correlation patterns of *SWLS (and possibly other standard measures of life satisfaction)* and single-item life satisfaction measure, mainly how much of the explained variance of criterion variables is common for both of the life satisfaction measures and how much of it is unique for each measure. The future studies should also investigate validity of studied measure using different methods of measurement, such as observation or experience sampling methodology. There is also need for data on predictive validity of single-item measure.

The aim of this study was to provide empirical evidence of the psychometric properties of single-item life satisfaction scale. So far the obtained data suggest that single-item measure of satisfaction with life is a promising option for survey situations in which ultra-short scale to measure this construct is necessary.

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