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Psychometric Evaluation of the Hebrew Language Version of the Satisfaction with Life Scale

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Abstract The satisfaction with life scale (SWLS) is a widely accepted and widely used tool for measuring well-being. Although its potential as a cross-cultural index is recognized, an introduction and systematic validation of the Hebrew version is needed. Thus, the purpose of this study is: (1) to describe the process of developing the Hebrew version of the SWLS, and (2) to examine its construct validity as well as its internal consistency. Four hundred and eighty seven working adults completed the following self reported Hebrew language versions of the: (1) SWLS, (2) positive affect and negative affect scales (PANAS), and (3) the self-rated health (SRH) scale. In addition, as way of gathering additional evidence of validity, the SWLS was completed by proxy (i.e., each participant's life partner or significant other). Confirmatory factor analysis supported a single-factor structure with significant correlations between the SWLS and the rest of the measures—PANAS scores, the SRH scores as well as the SWLS scores as measured by proxy. In addition, item-analysis supports the internal consistency of the scale. The Hebrew version of the SWLS is a valid and reliable scale and can be utilized in the Israeli context.

Keywords Subjective well-being · Life satisfaction · Validity · Reliability · Israel

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1 Introduction

The notion of subjective well-being (SWB) has received a great deal of attention across cultures particularly with the emergence of the positive psychology movement (Diener et al. 1999). Rather than concentrating on repairing damage within a diseased model of human functioning, this movement focuses on what makes life worth living and how people can thrive and flourish (Seligman and Csikszentmihalyi 2000). Moreover, well-being has become one of the outcome measures of a rehabilitation intervention recognized by the World Health Organization (1993). The concept of SWB incorporates two main aspects: an affective component, which refers to one's experience in pleasant and unpleasant affects, and a cognitive component which addresses one's judgment of their life as a whole which is exhibited by life satisfaction. The satisfaction with life scale (SWLS) is a well-established tool for measuring the cognitive component of SWB which enables individuals to judge their life satisfaction based on their own criteria. The items in the scale are global (e.g., *in most ways my life is close to my ideal*) and thus allow individuals to weigh domains of their life based on their own values rather than a list of domains imposed by a researcher. Thereby, it reflects the idiosyncracies of life for each individual and captures one's well-being more accurately (Diener 1994). Additionally, the scale is quick and easy to administer in different age groups (Pavot and Diener 1993).

The existing data suggest that the SWLS has potential as a cross-cultural index of life satisfaction (Pavot and Diener 1993). The SWLS has been adapted to various national contexts including Brazil (Gouveia et al. 2009), Malaysia (Swami and Chamorro-Premuzic 2009), Lebanon (Ayyash-Abdo and Alamuddin 2007), Netherlands (Arrindell et al. 1991), Norway (Vitterso et al. 2005), Hong Kong (Sachs 2003), Spain (Atienza et al. 2000), Sweden (Hultell and Gustavsson 2008), Portugal (Neto 1993), the Czech Republic (Lewis et al. 1999) and Taiwan (Wu and Yao 2006). However, to date a Hebrew version of the SWLS, as well as a psychometric evaluation of this cross-culturally adapted measure has not been found in the literature. Therefore there is a need for a systematic evaluation of the concept of SWB in the Israeli context.

Predictors of life satisfaction differ among cultures (e.g., poor vs. wealthy, individualist vs. collectivist) and the concept of well-being itself might be perceived differently across nations due to different societal values and political climates (Diener et al. 2003; Oishi et al. 1999). Although Israel is a western individualist nation, its political climate might affect the way well-being is perceived and measured. Diener et al. (2003) suggest that cross-cultural investigation of well-being need to examine the factor structure of the targeted scale and its reliability. Therefore, it is important to see whether SWLS can capture the phenomena of well-being in the Israeli context.

The purpose of this study is to describe the process of developing the Hebrew version of the SWLS and to examine its validity and reliability. Focusing on the scale validity of the SWLS, several studies using factor analysis have demonstrated a unidimensional structure for the SWLS among different cultures and various populations e.g., medical outpatients in the Netherlands (Arrindell et al. 1991), people with schizophrenia in Taiwan (Wu and Wu 2008). In addition, a number of studies strengthened the scale's construct validity by examining its relation to other measures of well-being. For example the SWLS scale score was positively associated with quality of life (Wu and Wu 2008), with positive affect (Smead 1991) and general health (Arrindell et al. 1991); and an expected negative association with negative affect was demonstrated (Larsen et al. 1985; Smead 1991). In addition, there is a vast support for the scale's internal

consistency as well as its stability (e.g., Diener et al. 1985; Pavot and Diener 1993; Vassar 2008). To that end, our hypotheses are as follows: The SWLS (1) has a one dimensional structure; (2) is associated with measures of affect and health; and (3) has sufficient internal consistency.

2 Method

2.1 Participants and Procedure

The current study was part of a larger study of well-being conducted in Israel during September 2004 to June 2006. This study explored well-being from an occupational perspective and included several questionnaires that measured aspects of well-being. The present study used data related to well-being.

This study included a convenience sample of working adults living in Israel. The inclusion criteria included participants who (a) were between the ages of 27–60 (b) were working at least 20 hours a week and for a minimum of 2 years at the same job, and (c) had a minimum of 10 years of education. Shift workers or people with physical or emotional disabilities were excluded from the study as their conditions might affect well-being.

A snowball sampling method was used to recruit participants. Data were collected by trained occupational therapy students during an individual meeting. After signing a consent form the participants completed a battery of questionnaires set in a randomized order. Finally, for purposes of validity testing, the SWLS was also completed by the participant's significant other while not in the presence of the participant for only part of the sample (60%). The study was approved by the Behavioural Research Ethics Board of Tel Aviv University.

Our sample included 487 adults (39% male) with a mean age of 39 (SD = 9.5). Seventy-seven percent of the participants were living with a partner and 67% had children. Participants had 15.5 (SD = 2.5) years of education, their household density (number of people per room) ranged from 0.25 to 3 (mean = 0.87, SD = 0.34), and 46% of the participants' income was above the mean Israeli income. The majority of the sample (72%) was located in urban areas, 16% lived in sub-urban areas and the remaining participants (12%) lived in rural areas. Participants' overall mean working hours per week was 42 (SD = 12.8); most of the participants were professionals (59%) (e.g., engineers,), some were associated professionals (16%) (e.g., computer technicians); 11% were clerks; and the remainder (14%) held jobs classified in the basic range (e.g., transit operators).

2.2 Instruments

The SWLS (Diener et al. 1985) assessed the cognitive component of SWB where the individual was asked to judge his or her satisfaction with life as a whole. It contained five statements in which participants were asked to rate their level of agreement on a 7-point scale. The final score was calculated by the sum of the assigned values for each statement and ranged from 7 (*totally disagree*) to 35 (*totally agree*). Evidence of the SWLS' reliability and validity has been reported in several studies (Pavot and Diener 1993; Vassar 2008). The SWLS was translated to Hebrew for the sake of this study using a translation-back translation method.

The positive and negative affect scales (PANAS) (Watson et al. 1988) assessed the affective component of SWB and contained two scales. Each scale included ten items that referred to two dimensions of mood: positive and negative affect. The 20 items were set randomly and participants were asked to rate how frequently they experienced each mood item on a 5-point scale. By summing the assigned values, two scores were generated, one for each scale, ranging from 10 (*minimal negative/positive affect*) to 50 (*maximum negative/positive affect*). The validity and reliability of PANAS has been demonstrated (Watson et al. 1988). The PANAS was translated to Hebrew for the sake of this study using a translation-back translation method.

Self rated health (SRH) scale assessed the individual subjective perspective of his or her current general health condition. It included one item set as a Visual Analog Scale (VAS) (Paul-Dauphin et al. 1999), a plain vertical line, 100 mm in length whose ends represented opposite aspects of an individual's health condition (*poor health condition* to *excellent*). The participant was asked to mark his or her level of health along the line using a pencil. Scores ranged from 0 (*poor*) to 10 (*excellent*), based on the distance in centimeters, of the mark from the zero point. This scale was found valid across ages and suitable in epidemiologic studies and health surveys among different populations (Miilunpalo et al. 1997). The SRH scale was already translated to Hebrew and was found appropriate to the Israeli context (Carmel et al. 2007).

Demographic variables were collected using a demographic questionnaire in which three indicators of socio-economic status (SES) were assessed: (1) income (2) education, and (3) household density. The last indicator addressed population density inside the housing unit in terms of person per room (Lawrence 2006). A ratio between number of people living in the household and number of rooms was calculated. Lower ratios indicated lower levels of density and higher levels of SES.

2.3 Translation of the SWLS

The SWLS was adapted to the Hebrew language using translation-back translation method via the following procedure: the SWLS was translated separately by two native Hebrew speakers who were also fluent in English. They were asked to report specific items or concepts found to be difficult to translate. Both found the translation straight-forward except for item two (*the conditions of my life are excellent*) which needed carefully selected words. Then, back-translation of the translated version was done by two different native English speakers who were also fluent in Hebrew. The back-translated version was similar to the original so no further changes were needed.

In the next stage, ten occupational therapy students fluent in Hebrew and English reviewed the final version of the scale as a group, to verify clarity of item wording, while supervised by the investigators. No words or phrases were identified as unclear. Finally, a pilot study was conducted, in which ten participants completed the translated version and provided feedback on clarity of all items. Again, no specific problems were reported. The final translated version is shown in the Appendix.

2.4 Data Analysis

A Cronbach's alpha coefficient was calculated to examine the internal consistency of the translated version. The scale's construct validity was measured using two methods: (1) Pearson correlation coefficients between the SWLS scores and the PANAS, SRH scores,

and SWLS scores rated by the participant's significant other; and (2) confirmatory factor analysis (CFA) for examining the factor structure of the scale. The CFA of the polychoric correlation matrix was performed via structural equation modeling (SEM) where robust maximum likelihood method was selected using EQS 6 (Bentler 1985, 1995). The following indices of fit were considered to determine whether the single factor model fit the data: Comparative fit index (CFI) and root mean square error of approximation (RMSEA). The cutoff criteria/values for accepting the model were CFI $\geq$ 0.95 and RMSEA $<$ 0.08 (Hu and Bentler 1999). In fact, Hu and Bentler (1999) state that if a combinational rule indicates that the model fits the data well, there is a greater confidence about the goodness of fit of the model. Parameter estimates were also examined to see if there were irregular values such as unexpected signs or extreme values. Squared multiple correlations were used to evaluate the variance accounted for each indicator (item).

3 Results and Conclusions

3.1 Reliability

Results of the item analysis of the SWLS are shown in Table 1. Relatively lower corrected item-total correlations were found in item four and five. Cronbach's α of the whole scale was 0.86 which demonstrates its internal consistency.

Table 1 Item analysis for the SWLS ($N = 487$)

	Mean	SD	Skewness	Kurtosis	Corrected item-total correlation
Item1	4.89	1.45	−0.67	−0.48	0.69
Item2	4.96	1.43	−0.82	−0.003	0.73
Item3	5.21	1.36	−1.04	0.54	0.77
Item4	5.95	1.44	−0.73	−0.207	0.64
Item5	4.16	1.66	−0.17	−1.08	0.58
Total score	24.17	5.9	−0.63	−0.22	

SWLS Satisfaction with life scale

Table 2 Standardized solution of the construct of well-being ($N = 487$)

	Std. estimates	R^2
Factor loading		
λ_1	0.77	0.59
λ_2	0.85	0.72
λ_3	0.90	0.82
λ_4	0.67	0.45
λ_5	0.64	0.41

λ = factor loading

Table 3 Pearson correlation between measures of well-being and SWLS score

	N	*r*
Measures		
Positive affect	474	0.274**
Negative affect	474	−0.302**
Self-rated health	474	0.251**
SWLS by significant other	286	0.59**

** $P < 0.01$

3.2 Construct Validity of the SWLS

The CFA results of a single-factor solution/structure for the SWLS are summarized in Table 2. The CFA involved estimating 10 parameters and 5 degrees of freedom. Indices of fit indicated that the model fit the data well (CFI = 0.996, RMSEA = 0.053).

There was no irregularity in parameter values. The squared multiple correlations for the five indicators (items) ranged from 0.41 to 0.82 where the fifth item accounted for the least variance and the third item had the most contribution for the scale variance. This pattern of factor loading is consistent with recent findings suggesting that the fifth item often has the lowest factor loading in comparison with the other items (Gouveia et al. 2009; Slocum-Gori et al. in press).

The results of the combinational rule suggested by Hu and Bentler (1999) (CFI = 0.996, RMSEA = 0.053), while considering the simplicity of the model, strengthens our confidence in the goodness of fit of the model. Our results are in line with previous findings supporting a single-factor structure of the SWLS (Arrindell et al. 1991; Wu and Wu 2008). It should be noted that when we repeated the analysis above, treating the items as continuous (using a Pearson covariance matrix), as is often done in the SWLS literature, the conclusions of the CFA were the same.

Pearson correlations indicated the SWLS is significantly correlated with all of the following measures of well-being: positive affect, negative affect, health perception, and life satisfaction perceived by one's significant other (see Table 3).

As expected, SWLS scores were negatively correlated with negative affect and positively correlated with positive affect and health. Interestingly, life satisfaction rated by the participants themselves had a strong correlation with SWLS scores evaluated by the participant's significant other. As these findings are consistent with previous reports (Larsen et al. 1985; Pavot and Diener 1993; Smead 1991), as well as with Diener's (1984) theory of well-being, they strengthen the validity of the Hebrew translated version.

One of the limitations of this study is that it is based on a convenience sample of working adults that is not necessarily representative of the Israeli population such as younger and older adults as well as clinical population. However, the mean life satisfaction score in our sample (24.17) falls within the normative data of non-clinical populations (Pavot and Diener 1993). This provides support for the applicability of the SWLS within Israel. To further establish the validity and reliability of the SWLS in the Israeli context future studies are warranted within different age groups, minorities and clinical population.

In conclusion, our results indicate the Hebrew version of the SWLS is a valid and reliable tool. Its single factor structure was confirmed and its internal consistency values were satisfactory. Therefore, this version can be used in the Israeli context.

Appendix: The Hebrew Version of the Satisfaction with Life Scale

הוראות. בהמשך תמצא חמש הצהרות. נא דרג את מידת הסכמתך מ-1 עד 7.
אנא שמור על פתיחות ויושר בתשובותיך.

7= מסכים מאוד
6= מסכים
5= מסכים קלות
4= איני מתנגד ואיני מסכים
3= לא מסכים קלות
2= לא מסכים
1= מאוד לא מסכים

_____ברוב האופנים חיי קרובים לאידיאל שלי

_____המצב של חיי מצוין

_____אני שבע רצון מחיי

_____עד כה השגתי את הדברים החשובים שאני רוצה בחיים

_____אם יכולתי לחיות את חיי שוב לא הייתי משנה כמעט דבר

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