

The Satisfaction With Life Scale Examining Construct Validity

Jacqueline van Beuningen

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Explanation of symbols

.	data not available
*	provisional figure
**	revised provisional figure (but not definite)
x	publication prohibited (confidential figure)
—	nil
—	(between two figures) inclusive
0 (0.0)	less than half of unit concerned
empty cell	not applicable
2011–2012	2011 to 2012 inclusive
2011/2012	average for 2011 up to and including 2012
2011/'12	crop year, financial year, school year etc. beginning in 2011 and ending in 2012
2009/'10– 2011/'12	crop year, financial year, etc. 2009/'10 to 2011/'12 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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Summary

This report describes the validity testing of a multi-item scale of global life satisfaction, namely the Satisfaction With Life Scale (SWLS). This scale has been proposed as an alternative to single-item life satisfaction measures. As expected, the scale has sufficient construct validity and consists of one underlying dimension. The SWLS is significantly related to an alternative global life satisfaction measure, which indicates convergent validity. However, this correlation is rather low, which raises the question whether the SWLS measures the same as the single-item life satisfaction measure. The correlation of the SWLS with an alternative well-being measure (i.e. mental health index) is lower than the correlation with global life satisfaction. This provides evidence of discriminant validity. Other aspects related to well-being, such as health and illness, also correlate significantly with the SWLS. This shows nomological validity.

However, the SWLS also has a number of serious shortcomings. It suffers from data collection mode effects and the data show that a specific group of respondents misinterprets the scale. Furthermore, the SWLS and the single-item global life satisfaction are almost equally related to other aspects that predict well-being. Therefore, the SWLS has no clear added value as an alternative of the single-item life satisfaction. In conclusion, it is recommended that a single-item measure be used instead of the SWLS.

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1 Introduction

1.1 Background

This report examines the validity of the Satisfaction With Life Scale (SWLS) developed by Diener et al. (1985). The main goal of this report is to analyse whether an alternative multi-item scale of global life satisfaction is sufficiently valid and can be used instead of a single-item measure. Given that a single-item measure cannot be checked for internal consistency, a short multi-item scale could be a good alternative. Thus, convergent, discriminant, and nomological validity are analysed for this scale. In addition, the SWLS will be compared to a single-item measure of global life satisfaction to check whether this is a viable alternative.

1.2 The Satisfaction With Life Scale

As the SWLS was developed to measure global life satisfaction, i.e. life satisfaction as a whole (Diener, Emmons, Larsen, and Griffin 1985), it does not include (positive and negative) affect, happiness or satisfaction related to various life domains. Instead, it consists of five synonymous statements. Life satisfaction is distinct from happiness and positive affect, since the latter are emotional rather than cognitive (Diener, Suh, Lucas, and Smith 1999). It is useful to measure life satisfaction apart from happiness not only because it is a separate aspect of subjective well-being, but also because it correlates differently with well-being predictors (Pavot and Diener 1993; Van Beuningen and Kloosterman 2011).

The assessment of satisfaction with life is a cognitive judgmental process. That is, it can be interpreted as a process during which someone trades off good and bad aspects in their life. Life satisfaction is defined as “a global assessment of a person’s quality of life according to his chosen criteria” (Shin and Johnson 1978, p.478). People compare themselves to an internal standard they have set. This standard is not constructed by comparing oneself to others: the questions do not relate to how satisfied people are when they compare themselves to what others have achieved. In other words, people construct their own standard and compare themselves to what they would have liked to have achieved by a certain time.

It is important to note that global life satisfaction refers to life in general instead of specific domains. Even though there is some agreement on which life domains contribute to life satisfaction, people are likely to assign different weights to

different domains: for example, social contacts may be relevant, but these matter more to some than to others. In addition, people might find other things important that are not covered by the scale. Hence, a domain-specific scale does not cover the full extent of global life satisfaction.

Unlike previous global life satisfaction measures that have typically consisted of a single-item measure (Kahneman and Krueger 2006), the SWLS consists of five items all tapping into global life satisfaction:

- (1) In most ways my life is close to my ideal;
- (2) The conditions of my life are excellent;
- (3) I am satisfied with my life;
- (4) So far I have gotten the important things I want in life; and
- (5) If I could live my life over, I would change almost nothing.

The primary objective of the report is to assess the psychometric properties of the scale, such as internal consistency.

1.3 Structure of the report

Section 2 discusses previous studies testing the validity of the SWLS. Data collection methods, operationalisation and analyses are subsequently described in section 3. Section 4 includes the results of the analyses, while section 5 presents the main conclusions of the study.

2 Previous research

The SWLS has been validated in various ways in previous studies. First, convergent validity was assessed by comparing the SWLS with other related scales and the self-report SWLS with peer reports (Lucas, Diener, and Suh 1996; Pavot, Diener, Randall Colvin, and Sandvik 1991; Pavot and Diener 1993a). Relatively high correlations are reported between the SWLS and a person's satisfaction with their day, a memory recall task of satisfying and dissatisfying times, and peer reports of the SWLS.

Secondly, temporal stability has been checked by measuring the SWLS a second time after an intervening period (Lucas et al. 1996; Pavot and Diener 1993a). This showed that repeated SWLS measurements over time are stable. However, when

time intervals were spaced further apart, correlations were lower. This is as expected, as the chance of an event which affects life satisfaction increases over time.

Thirdly, by separating the SWLS from other unrelated constructs, such as positive affect, discriminant validity was established (Lucas et al. 1996; Pavot and Diener 1993a). These studies show that correlations between the SWLS and other constructs such as positive affect, negative affect, optimism, or self-esteem are lower than correlations between the (same) SWLS collected with different methods or in different time periods.

Lastly, the effect of mood on the SWLS was assessed to rule out the possibility that the measure taps into dynamic processes instead of a stable, global assessment of life satisfaction (Pavot and Diener 1993b).

Previous research has not looked extensively at the nomological net of well-being. The nomological net refers to well-known antecedents and consequences of well-being. By relating the SWLS to some of these, nomological validity can be examined. Diener et al. (1999) argue that health is one of the most important predictors of well-being. Hence, in this study self-reported health and suffering from long-term illness will be included to test nomological validity.

3 Method

3.1 Data collection

The SWLS was included in Statistics Netherlands' 2010 Perceptions Survey ('Onderzoek Belevingen'). The Perceptions Survey employs a mixed-mode design: respondents are first approached to give a response via CAWI, then re-approached using CATI or, if no phone number was available, CAPI ("HPE") (Janssen 2010; Cuppen, van der Laan, and van Nunspeet 2011). The sample consists of 3,402 people aged 18 years and older. The majority responded using CAWI (61.4 percent).

In this study the Dutch translation of the SWLS developed by Arrindell, Meeuwesen, and Huyse (1991) was used (see Appendix A). A 7-point Likert scale was used ranging from 1 "Strongly disagree" to 7 "Strongly agree". The neutral or mid-scale category is referred to as "Neutral" in the Dutch translation. Table 3.1.1 shows the descriptives and correlation matrix of the SWLS items.

3.1.1 Descriptives and correlations of SWLS indicators

Indicator	Unweighted mean (SD)	Weighted mean (SD)	Minimum	Maximum	N(%)	1	2	3	4	5
1. SWLS 1 close to ideal	5.16 (1.47)	5.13 (1.49)	1	7	3395 (99.8)	1				
2. SWLS 2 conditions excellent	5.45 (1.45)	5.41 (1.48)	1	7	3397 (99.9)	0.70	1			
3. SWLS 3 satisfied	5.79 (1.33)	5.76 (1.36)	1	7	3398 (99.9)	0.67	0.71	1		
4. SWLS 4 important things	5.16 (1.54)	5.13 (1.57)	1	7	3396 (99.8)	0.54	0.53	0.57	1	
5. SWLS 5 change nothing	4.48 (1.90)	4.45 (1.92)	1	7	3391 (99.2)	0.46	0.42	0.41	0.46	1

3.2 Analyses

The following analytical steps were taken to study the SWLS:

Step 1

The percentage of missing values and outliers are analysed and results are examined to see whether any respondents should to be excluded from further analysis. Also, the effects of response sets are examined. In this case we specifically look at respondents who only score on the extreme values at the endpoints of the scale. The number of such response sets are compared to similar response sets found on the Personal Well-being Index (PWI), which measures satisfaction on eight different life domains and is aggregated into an overall index (see Appendix A for an overview of the PWI).

Step 2

Principal Component analysis (PCA) is conducted to determine construct validity of the SWLS. PCA determines the factors accounting for the total variance in a set of variables. Furthermore, the SWLS indicators are summed into an SWLS construct score for each respondent. Construct validity is also tested using reliability analysis, and Cronbach's alpha is reported. These analyses determine whether the five SWLS indicators can be condensed into one overall SWLS construct.

Step 3

The overall SWLS score is calculated and compared to results of previous studies, and the scores of various subpopulations are described. Possible mode effects are also addressed.

Step 4

Correlations of the SWLS with other conceptually related constructs are examined. The multi-item SWLS scale is compared to a single-item measure of global life satisfaction to establish convergent validity. This single-item measure refers to the level of satisfaction with life as a whole and is measured on an 11-point scale. To test discriminant validity, correlations with the Mental Health Inventory (MHI-5) are examined (Ware and Sherbourne 1992; Berwick et al. 1991). In addition, the SWLS is related to each of the eight indicators of the PWI. Each refers to satisfaction with a different life domain. By examining correlations of the SWLS and constructs which in theory should be related to life satisfaction, nomological validity can be established. Self-reported health and the question whether people suffer from a long-term illness are used for this.

4 Results

4.1 Data assumptions tests

The number of missing responses ranges from 4 to 11 on the five SWLS indicators out of a total of 3,402. This is a maximum of 0.3 percent of observations. Two respondents did not respond on any of the five indicators and one had four out of five missing values. Overall, 17 of the 3,402 respondents (0.5 percent) had a missing value on one or more of the SWLS indicators. As the number of missing data is quite small, missing values are not imputed. Both listwise and pairwise deletion methods will be used in the analyses.

Next, the answer distributions of the five SWLS indicators are tested for deviations from normality. The second and third SWLS indicators (“the conditions of my life are excellent” and “I am satisfied with my life”) are slightly negatively skewed as they are outside the range of -1 and 1. In addition, kurtosis is slightly higher than the cut-off value of 2 for the third indicator, “I am satisfied with my life” (Kurtosis = 2.85, $p < 0.10$). Kurtosis is considered more harmful to OLS regression analysis than skewness (Hair, Anderson, Tatham, and Black 1998). The Shapiro-Wilk test is sensitive to sample size and likely to be significant for large samples. Hence, it would not be informative in this case. Since kurtosis is not extremely high for any of the indicators, these will not be transformed.

In the following step, the multivariate outliers are examined by regressing the five SWLS indicators on the single-item global life satisfaction measure. The critical Mahalanobis Distance shows that there are 108 outliers ($D^2(5) > 20.52$, $p < 0.001$), which is 3.2 percent of the sample. The average SWLS score for the remaining respondents is 26.21 ($SD = 6.04$, $N = 3,294$), which is slightly higher than the score with outliers (i.e. 26.05). The SWLS scores of the outliers correlate significantly in the expected direction with overall satisfaction with life ($r = 0.40$; $p < 0.001$) and self-reported health ($r = 0.27$; $p < 0.01$). Therefore, we assume that these respondents represent meaningful subgroups in the population and should be included in the remainder of the analyses. Examination of the answer patterns of the outliers shows that these respondents have either very high or low scores on three or four indicators and the opposite for the remaining indicator(s).

Lastly, respondents with extreme values are identified. These respondents selected only “1” or “7” (i.e. the extreme values) on each of the SWLS indicators. In total, 22 respondents scored only “1”, while 135 respondents scored only “7”. This translates into an overall SWLS score of 5 and 35 respectively. By comparison, for the PWI, consisting of eight life domains, only 21 respondents score on the extremes of the scale (Van Beuningen and De Jonge 2011). The PWI was included in the same survey as the SWLS. The effect of these extreme response sets on the factor analysis is discussed in section 4.2. In addition, the SWLS scores are estimated both with and without the respondents with extreme response sets in section 4.3, mode effects on the number of extreme response sets are studied in section 4.4, and the nomological validity of the SWLS is re-examined in section 4.5.

4.2 Factor analysis

The SWLS indicators can be included in an exploratory factor analysis (Kaiser-Meyer-Olkin = 0.85; Bartlett’s Test of Sphericity $\chi^2(10) = 7849.98$; $p < 0.01$). The results of this analysis imply that there is at least some degree of correlation among the five SWLS indicators. The minimum correlation between the indicators is 0.41, while the maximum is 0.71. This is sufficient to warrant factor analysis (Hair et al. 1998).

Principal Components Analysis (PCA) was conducted to explore the factor structure of the SWLS. The five SWLS indicators combine into one factor. Factor rotation was not used, as only one component was extracted. Factor loadings range from 0.65

to 0.86. Factor loadings above 0.40 are relevant and can be included in the scale (Hair et al. 1998). The explained variance of the indicators on the factor is 64 percent. Table 4.2.1 shows the results of the factor analysis. The extracted communalities, or shared variance, range from 0.43 to 0.73. Results for listwise deletion of missing values are the same as for pairwise deletion. The factor loadings and explained variance reported here are comparable to those reported in other studies (Arrindell et al. 1991; Arrindell, Heesink, and Feij 1999; Diener et al. 1985; Pavot et al. 1991). In previous studies explained variance of the first component was between 60 and 67 percent.

4.2.1 Factor analysis

Indicator	Factor loading	Communality
SWLS 1 close to ideal	0.85	0.73
SWLS 2 conditions excellent	0.86	0.73
SWLS 3 satisfied	0.85	0.73
SWLS 4 important things	0.77	0.60
SWLS 5 change nothing	0.65	0.43
% explained variance component 1	64	

Note. Principal Components Analysis.

Cronbach's alpha is 0.85, which is well above the 0.70 threshold. Therefore, the SWLS scale shows sufficient construct reliability (Hair et al. 1998). Since the alpha value is sufficient, no indicators are excluded. The alpha would increase only slightly if the fifth SWLS indicator ("If I could live my life over, I would change almost nothing") were excluded. The level of the Cronbach's alpha is comparable to the level reported in other studies, in which it ranged from 0.82 to 0.87 (Arrindell et al., 1999; Arrindell et al., 1991; Diener et al., 1985; Pavot et al. 1991).

Several alternative factor analyses are estimated. First, the factor analysis is replicated excluding respondents with only extreme values. The factor structure remains unidimensional. Factor loadings range from 0.61 to 0.84, which is sufficient, although the explained variance falls to 60 percent. This is a decrease of 4 percent points.

Secondly, a factor analysis excluding the multivariate outliers is conducted. Factor loadings range from 0.67 to 0.88, and explained variance increased to 67 percent. Although both respondents with extreme values on the SWLS and multivariate

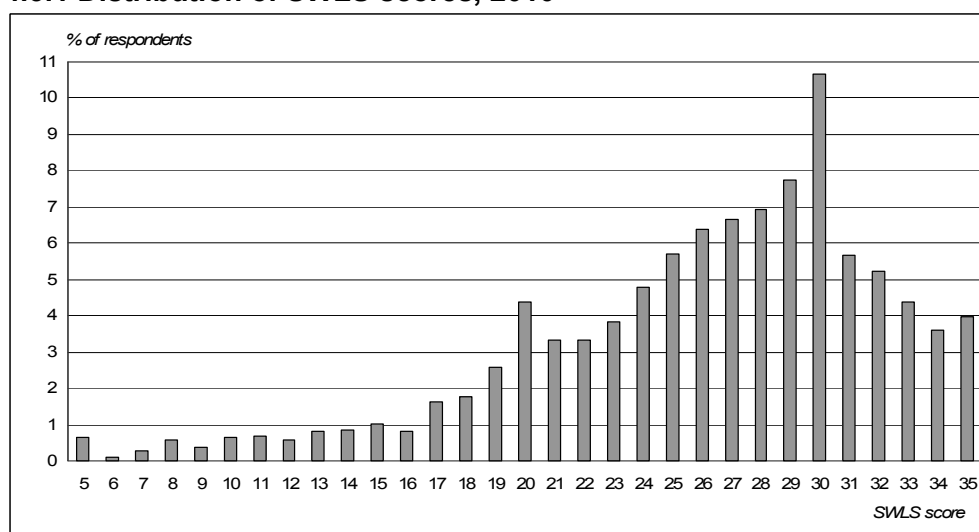
outliers with divergent answer patterns on the SWLS affect the factor analysis, they do not fundamentally change the factor structure of the scale.

4.3 SWLS scores examined

In the original scale development study, the SWLS was summed to form an overall score (Diener et al. 1985). When all full responses are summed in this study, the average unweighted SWLS score is 26.05 (SD = 6.10, N = 3385), whereas the average weighted sum is 25.87 (SD = 6.20). This corresponds with a high satisfaction score; things are mostly good (Diener 2006). In the remainder of this section and in section 4.5, this weighted sum is compared to results in previous literature and to other constructs.

The average weighted sum found in this study (25.87, SD = 6.20) compares favourably to the original score of 23.5 (SD = 6.43) reported by Diener et al. (1985) for a US sample. It is slightly lower than the reported average of 26.18 (SD = 5.72) from a sample of healthy young Dutch adults (Arrindell et al. 1999), and slightly higher than the reported average of 23.63 (SD = 7.01) from a Dutch medical outpatients sample (Arrindell et al. 1991). Therefore, the weighted sum score reported here seems plausible. Figure 4.3.1 shows the distribution of the weighted summed SWLS scores.

4.3.1 Distribution of SWLS scores, 2010



When the weighted summed SWLS score is tested against the weighted summed SWLS score without extreme respondents ($N = 157$ with extreme response sets), the scores differ slightly: the confidence intervals do not overlap when the scores are weighted but not aggregated to the total population. The 95 percent CI of the original SWLS including all respondents ranges from 25.66 to 26.08 with a mean of 25.87, whereas the CI of the SWLS without extreme response sets ranges from 25.45 to 25.85 with a mean of 25.65. Hence, the extreme respondents significantly affect the SWLS scores, although the effect is very small.

4.3.2 Weighted summed SWLS scores of subpopulations, 2010

Demographic group	SWLS (SD)
Gender	
Male	25.74 (6.10)
Female	26.00 (6.30)
Age	
18-24	25.30 (5.75)
25-34	26.15 (6.06)
35-44	25.67 (6.82)
45-54	25.87 (5.93)
55-64	26.08 (6.08)
65 and older	25.94 (6.35)
Ethnicity	
Dutch	26.24 (5.94)
Western foreign background	25.33 (6.76)
Non-western foreign background	23.47 (7.06)
Education level	
Tertiary II (university master, doctor)	27.94 (4.91)
Tertiary I (hbo, university bachelor)	27.38 (5.20)
Secondary (havo, vwo, mbo 2-4)	26.02 (6.07)
Lower secondary (vmbo, mbo1, mavo onderb)	25.05 (6.57)
Primary (primary education)	24.11 (6.68)
Marital status	
Married	26.68 (5.87)
Divorced	23.91 (6.93)
Widowed	25.07 (6.49)
Unmarried	25.18 (6.27)
Employment status	
Employed	26.40 (5.74)
Unemployed	24.84 (6.91)

Note. Only full responses are included.

Various groups are compared on their SWLS scores. The group classifications are based on gender, age, ethnicity, education level, and marital status (Table 4.3.2). Group differences are tested using *t* and ANOVA tests on weighted data that is not aggregated to the total population. Post hoc tests are used to determine which groups differ. Men and women do not differ significantly on life satisfaction ($t(3381) = -1.18$; *ns*) and the same holds for the various age groups ($F(5,3381) = 1.07$; *ns*). This is in line with previous research (Arrindell et al. 1991). Foreigners with non-western background score lower than western foreigners and native Dutch people (Welch $F(2,525.78) = 25.62$; $p < 0.01$). The latter two do not differ significantly when variance heterogeneity is corrected for. People with only primary school education report lower life satisfaction than people with higher education ($F(4,3285) = 33.22$; $p < 0.01$). Differences in life satisfaction between different marital status groups are reported in the literature (Arrindell et al. 1991). In this study, we also find that divorced people score lower than widowed and unmarried people, who in turn score lower than married people ($F(3,3381) = 26.86$; $p < 0.01$). Lastly, unemployed people have a lower life satisfaction than employed people ($t(3381) = 6.95$; $p < 0.01$).

4.4 Mode effects

When the weighted summed SWLS scores are divided by response mode (i.e. CAWI or web-based, CATI or telephone, and CAPI or face-to-face), the scores are significantly different ($F(2,3381) = 22.58$; $p < 0.01$). Post hoc analyses show that differences between each mode are significant. CATI respondents score highest on the SWLS ($M = 26.95$; $SD = 5.73$), followed by CAWI ($M = 25.79$; $SD = 6.06$); CAPI respondents score lowest ($M = 24.66$; $SD = 7.07$). Cronbach's alpha ranges from 0.75 for CATI to 0.83 and 0.89 for CAPI and CAWI. The correlations between SWLS indicators are from 0.22 to 0.63 in CATI, from 0.49 to 0.76 in CAWI, and from 0.37 to 0.69 in CAPI. The correlational pattern across indicators is similar in the various modes.

The question is whether these mode effects occur because of the differences in mode and the related risk of social desirability, or because of selectivity in the sample composition of each mode. Hence, SWLS differences might be caused by variety in sample composition across modes. However, when gender, age, education, marital status, ethnicity, and urbanisation are controlled for, the OLS regression shows a significant increase of explained variance for each SWLS indicator when mode is added to the regression (van der Houwen, 2012). This effect is especially large for

the third SWLS indicator (“I am satisfied with my life”): the explained variance increases by 6.9 percent after adding mode. The added explained variance for the other indicators ranges from 1.1 to 3.6 percent.

Compared to the PWI, the SWLS is more sensitive to differences in mode. The added explained variance for mode on the PWI indicators ranges from 0.5 to 1.3 percent. This implies that the SWLS scale is more sensitive to data collection mode than the PWI. This may be caused by the complexity of the scale, as discussed in section 4.5.

When the respondents with extreme response sets and the multivariate outliers are classified per mode, some differences stand out. First, at 1.2 percent, the percentage of respondents scoring only “1” on the SWLS indicators is highest in CAPI. In CATI and CAWI it is only 0.2 and 0.8 percent. Secondly, the percentage of respondents scoring only “7” on the SWLS is highest in CATI: 6.0 percent. In CAPI and CAWI it is 3.5 and 3.3 percent respectively. Thirdly, outliers occur most in CAPI, namely 6.3 percent, followed by CATI with 5.1 percent, and only 1.0 percent in CAWI. Overall, CAWI seems the least sensitive to extreme or divergent answers.

4.5 Validity checks

Correlations of the SWLS score with a global life satisfaction question, the mental health inventory – 5 (MHI-5), the eight life domain satisfaction indicators, self-reported health, and (not) suffering from long-term illnesses are examined. All operationalisations can be found in Appendix A.

By comparing the SWLS to a single-item measure of global life satisfaction, convergent validity can be determined. Given that the SWLS is a multi-item measure of global life satisfaction, it should correlate significantly with a single-item global life satisfaction measure. Further, the SWLS should correlate more strongly with this single-item measure than with the MHI-5, which focuses on how people have been feeling during the past four weeks (Driessen 2011; Ware and Sherbourne 1992). As such, it is a more dynamic affective scale that assesses well-being. A higher score implies better mental health. By correlating the cognitively focused SWLS with the affective MHI-5 discriminant, validity can be established.

Lastly, health is reported to be one of the main predictors of global life satisfaction (Diener et al. 1999; Van Beuningen and Kloosterman 2011). Therefore, testing whether health measures are related to the SWLS provides an indication of nomological validity. Both self-reported and objective measures of health are included. The literature predicts the former will be more strongly related to the SWLS than the latter (Diener et al. 1999).

The results shown in Table 4.5.1 confirm the expectations based on the literature: the SWLS correlates positively and most strongly with the single-item global life satisfaction measure ($r = 0.56, p < 0.01$). This shows convergent validity and is in line with findings by Diener et al. (1985) who use a single-item measure of happiness. In turn, the SWLS also correlates positively with the MHI-5, although the correlation is weaker ($r = 0.45, p < 0.01$). This is an indication of discriminant validity. Correlations of the SWLS with the eight life domain satisfaction indicators of the PWI are generally lower than that of the SWLS with the global life satisfaction measure. There are two exceptions: the correlation with the standard of living ($r = 0.52, p < 0.01$) and with achievement in life ($r = 0.55, p < 0.01$). Both indicators are more general than the other indicators, so it is reasonable that these correlations are closer to the global life satisfaction correlation.

4.5.1 Weighted correlations of the SWLS with related constructs to determine convergent, discriminant, and nomological validity

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 SWLS summed	1												
2 PWI1 global life satisfaction, single-item	.56	1											
3 PWI2 satisfaction with standard of living	.52	.71	1										
4 PWI3 satisfaction with health	.38	.54	.48	1									
5 PWI4 satisfaction with achievement in life	.55	.65	.63	.49	1								
6 PWI5 satisfaction with personal relationships	.42	.57	.48	.39	.53	1							
7 PWI6 satisfaction with safety	.27	.36	.34	.34	.32	.32	1						
8 PWI7 satisfaction with community	.41	.53	.51	.40	.49	.46	.48	1					
9 PWI8 satisfaction with future security	.44	.55	.54	.45	.51	.40	.44	.59	1				
10 PWI9 satisfaction with spirituality or religion	.15	.26	.24	.23	.25	.23	.25	.29	.30	1			
11 Mental Health Inventory - 5	.45	.49	.39	.40	.41	.41	.25	.34	.37	.13	1		
12 Self-reported health	.31	.33	.27	.66	.29	.23	.20	.24	.30	.11	.35	1	
13 Suffering from long-term illnesses (Yes = 1, No = 2)	.14	.15	.13	.47	.15	.09	.15	.12	.16	.03	.16	.50	1

Note. All correlations are significant except for 0.03, $p < 0.01$. Correlations are weighted but not aggregated to the population.

Lastly, the SWLS is positively related to self-reported health ($r = 0.31, p < 0.01$) and not suffering from long-term illnesses ($r = 0.14, p < 0.01$). As expected from the literature, the former correlation is much stronger than the latter (Diener et al. 1999) and almost the same as previously reported for positive health attitudes (Arrindell et al. 1991). The correlations refer to weighted data that are not aggregated to the total population.

Even though the correlation with the alternative global life satisfaction measure is higher than any of the other correlations, at 0.56 it can still be considered relatively low. A detailed examination of the scores reveals that the distortion is mainly caused by low SWLS scores combined with high global life satisfaction scores. In other words, a group of respondents score very low on the SWLS (1 or 2 out of a maximum 7) and high on global life satisfaction (between 6 and 10 out of a maximum 10). It is particularly striking that this is the case for the third SWLS indicator (“I am satisfied with my life”), which is almost identical to the global life satisfaction question. A total of 89 respondents (2.6 percent) score inconsistently, i.e. 1 or 2 on the third SWLS item and 6 to 10 on global life satisfaction (Table 4.5.2).

Subsequently, the characteristics of this group are examined. As the vast majority of the group also scores low on the other SWLS indicators, the inconsistency occurs not only for the third SWLS item. The inconsistent group does not differ in age ($t(3390) = -0.08, ns$), gender ($\chi^2(1) = 0.00, ns$), or urbanisation of residential area ($\chi^2(4) = 8.33, ns$), but does differ on education level ($\chi^2(4) = 11.59, p < 0.05$) and ethnicity ($\chi^2(2) = 18.53, p < 0.01$). The group with inconsistent scores is comprised of more people with a western and non-western background as well as more people with lower and intermediate education levels.

4.5.2 Cross-tabulation of SWLS3 and global life satisfaction

		SWLS3 I am satisfied with my life						
		1 Strongly disagree	2	3 4 Neutral	5	6 7 Strongly agree		
PW11 How satisfied are you with life as a whole?	0 Completely dissatisfied	7	2	0	2	0	1	3
	1	1	0	0	0	0	0	1
	2	4	2	1	1	0	3	1
	3	1	7	1	1	1	0	0
	4	3	5	9	5	4	3	0
	5 Neutral	8	11	32	98	33	55	11
	6	0	9	16	47	54	43	3
	7	9	9	24	72	149	402	108
	8	20	16	6	30	93	761	489
	9	12	3	1	5	13	177	289
	10 Completely satisfied	7	4	1	6	1	36	166

Note. The shaded area refers to the largest group with inconsistent scores on these two indicators (i.e. high score on PW1 and low on SWLS3).

When the weighted correlations are examined for this group, the SWLS correlations are negative not only for global life satisfaction ($r = -0.22, p < 0.05$), but also for self-reported health ($r = -0.31, p < 0.01$). Correlations with the mental health index ($r = -0.12, ns$), and not suffering from long-term illnesses ($r = -0.13, ns$) are not significant, but are in the same direction. This is in contrast to the correlations of the overall sample and suggests there is a group of respondents who misinterpreted the SWLS because it is too complex.

Moreover, the correlations of the SWLS with mental health, self-reported health and suffering from long-term illness are very similar to the correlations of the single-item global life satisfaction with these constructs. The correlations reported above hardly change, i.e. by only 0.02 at the most, when the multivariate outliers are excluded. The same holds for the results without the extreme respondents. Therefore, the low correlation of the alternative global life satisfaction scales is apparently not a function of the outliers or extreme respondents.

5 Reflection and conclusions

The aim of this report is to examine the construct validity of the Satisfaction With Life Scale. On the whole, the SWLS shows high internal consistency; that is the five indicators can be combined into one construct that consists of one underlying dimension measuring global life satisfaction.

In addition, factor analysis results, internal reliability findings, and the SWLS scores are very comparable to those reported in previous studies. There is also evidence of convergent, discriminant, and nomological validity. Thus, the SWLS is related to an alternative measure of global life satisfaction, whereas it is less related to scales measuring other aspects of well-being such as mental health, as expected. At the same time, the SWLS correlates with other constructs such as health or suffering from illness. These are expected to be influenced by life satisfaction, which is also predicted by theory.

However, the correlation between the single-item global satisfaction measure and the SWLS is not very strong ($r = 0.56$), mainly because of a group of respondents who misinterpreted the SWLS; without this group the correlation increases to 0.66. As people with low and intermediate levels of education and non-native speakers are overrepresented in this group, it suggests the SWLS may be too complex.

The SWLS is also sensitive to differences in data collection mode: being interviewed directly about global life satisfaction versus answering questions online affects the response to the SWLS. Respondents may report higher life satisfaction when asked face-to-face or via the telephone than when completing the questionnaire online. As expected, CATI respondents score highest on the SWLS, however, CAPI respondents score lowest. This could be caused by differences in

sample composition between the different modes. Future research could address the sensitivity of the SWLS to data collection modes in more detail. In addition, outliers and extreme respondents affect the SWLS score somewhat, although excluding these respondents does not change the interpretation of the scale.

Unfortunately, the single-item measure of life satisfaction used by Statistics Netherlands in the Permanent Survey of Living Conditions from 1997 onwards was not included in this study. This question differs from the global life satisfaction question included here. The standard question asks: “To what extent are you satisfied with the life you currently lead?”. The question compared to the SWLS in this study asks: “How satisfied are you with your life as a whole?”. Hence, the standard question taps into a more dynamic life satisfaction evaluation because it refers to the current situation, whereas the other question relates to life as a whole. This implies that the standard question would differ more from the SWLS than the one tested here.

A definite answer to the question of whether this multi-item scale is better than a single-item life satisfaction measure cannot be given. Previous research has shown that a single-item measure may be more sensitive to context or order effects (Pavot and Diener 1993b). However, the results of this study show that the SWLS has several problems. Specifically, there is evidence that the SWLS is difficult to answer for a specific group of respondents. Also, we do not find that correlations of the SWLS with other related constructs are stronger than correlations of the single-item measure with these constructs. Because of the relatively low correlations, it seems that the SWLS might measure something else than the single-item life satisfaction measure included here. Hence, we do not recommend that the single-item measure on global life satisfaction should be replaced by the SWLS.

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Appendix: Scales

Dutch translation of Satisfaction with Life Scale

This scale was developed by Arrindell et al. (1991).

1. In de meeste gevallen is mijn leven bijna ideaal.
2. Mijn levensomstandigheden zijn uitstekend.
3. Ik ben tevreden met het leven.
4. Tot nu toe heb ik de belangrijkste dingen in mijn leven bereikt.
5. Als ik mijn leven opnieuw kon beginnen, dan zou ik bijna niets veranderen.

The answer labels are: "Helemaal mee oneens" (1), "Tamelijk mee oneens" (2), "Een beetje mee oneens" (3), "Neutraal" (4), "Een beetje mee eens" (5), "Tamelijk mee eens" (6), and "Helemaal mee eens" (7).

Global life satisfaction (personal wellbeing index)

How satisfied are you with your life as a whole? (PW11)

The response scale is an eleven-point scale ranging from "0" to "10", where "0" stands for "Completely dissatisfied" and "10" for "Completely satisfied". The midpoint of the scale coded "5" means "Neutral" or "Not dissatisfied, not satisfied".

Personal Wellbeing Index

The PWI is measured by asking respondents the following questions (in brackets are the domains these correspond with) (IWbG 2006):

How satisfied are you with...?

1. your standard of living? (PW12)
2. your health? (PW13)
3. what you are achieving in life? (PW14)
4. your personal relationships? (PW15)
5. how safe you feel? (PW16)
6. feeling part of your community? (PW17)
7. your future security? (PW18)
8. your spirituality or religion? (PW19)

The response scale for each question is an eleven-point scale ranging from "0" to "10", whereby "0" stands for "Completely dissatisfied" and "10" for "Completely

satisfied”. The midpoint of the scale coded “5” means “Neutral” or “Not dissatisfied, not satisfied”.

Mental Health Inventory-5

Mental Health Inventory 5 items (MHI-5) (Ware & Sherbourne, 1992)

How much, during the past 4 weeks....

1. Did you feel very nervous?
2. Have you felt so down in the dumps, nothing could cheer you up?
3. Have you felt calm and peaceful? (Reverse coded)
4. Have you felt down-hearted and depressed?
5. Have you been happy? (Reverse coded)

The scale ranges from “All of the time” (1) to “None of the time” (6).

Self-reported health

In general, how is your health?

The scale is a five-point scale ranging from “Very bad” (1) to “Very good” (5).

Suffering from long-term illnesses

Do you have one or more long-term illnesses or health problems? (1 = Yes, 2 = No)