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PSYCHOMETRIC PROPERTIES OF THE 9-ITEM VERSION OF THE TEMPORAL SATISFACTION WITH LIFE SCALE (TSWLS) IN THE ITALIAN CONTEXT

ANDREA ZAMMITTI
ANGELA RUSSO
GIUSEPPE SANTISI
UNIVERSITY OF CATANIA, ITALY

PAOLA MAGNANO
UNIVERSITY KORE OF ENNA, ITALY

The aim of this paper was to validate and examine the psychometric properties of the 9-item Temporal Satisfaction With Life Scale (TSWLS) in the Italian context. Four studies were conducted. In Study 1, we performed an exploratory factor analysis. The 3-factor structure — past life satisfaction, present life satisfaction, and future life satisfaction — was confirmed. In Study 2 we tested the structure of the nine items of the scale, based on confirmatory factor analysis. The 3-factor structure with a high-order factor was the best factorial solution. In Study 3 we tested the concurrent validity of the TSWLS. The scale was significantly and positively related with life satisfaction, flourishing, and positive affects, and negatively related with negative affects. In Study 4 we showed the stability of the TSWLS using the test-retest method after an interval of four weeks.

Keywords: Psychometric properties; Temporal Satisfaction With Life Scale (TSWLS); Positive psychology; Life satisfaction; Italian adaptation.

Correspondence concerning this article should be addressed to Andrea Zammitti, Department of Educational Sciences, University of Catania, Via Biblioteca 4, 95124 Catania (CT), Italy. Email: andrea.zammitti@unict.it

In the field of positive psychology (Seligman & Csikszentmihalyi, 2014), research has shown an increasing interest in the construct of life satisfaction. Life satisfaction has been conceptualized as a cognitive constituent of subjective well-being (see Prasoon & Chaturvedi, 2016 for a review) and can be defined as a cognitive and global evaluation of one's quality of life based on chosen criteria (Diener, 1984; Pavot & Diener, 1993; Shin & Johnson, 1978). The importance of a valid life satisfaction assessment is well known: in a recent systematic review and meta-analysis (Tang et al., 2020), life satisfaction, as a positive indicator of well-being, has been found positively associated with basic psychological need satisfaction.

A review of the life satisfaction literature (Erdogan et al., 2012) suggests that scholars studying life satisfaction draw on and distinguish between top-down and bottom-up perspectives on life satisfaction. The former explains life satisfaction through stable characteristics such as personality traits (DeNeve & Cooper, 1998; Steel et al., 2008) and the latter views life satisfaction as shaped by contentment in multiple domains (Heller et al., 2004; Pavot & Diener, 2008).

On the one side, the top-down approach conceptualized life satisfaction as a function of stable traits (Erdogan et al., 2012), such as more agreeableness, extraversion, conscientiousness, openness, and less

neuroticism (for a meta-analysis, Steel et al., 2008). Other traits illustrate expression of emotions (e.g., emotional stability) and the way in which life events are interpreted (e.g., defensiveness; for the meta-analysis, DeNeve & Cooper, 1998).

On the other side, the bottom-up approach considers life satisfaction as a function of satisfaction with different life domains (Heller et al., 2004; Pavot & Diener, 2008), including work, family, health, and leisure. From a further multi-level perspective, the factors influencing life satisfaction judgments can be understood by analyzing two orthogonal axes: the first operates a vertical evaluation (all aspects of my life at this time), the second operates a temporal evaluation (throughout my life; Pavot & Diener, 2008).

Regarding the vertical evaluation, it was found that people differ in how they weigh each domain (Erdogan et al., 2012). Satisfaction with domains congruent with one's values has been shown to be relatively important for one's life satisfaction (Oishi et al., 1999). Regarding the temporal evaluation, life satisfaction can be more comprehensively assessed across different portions of the life span, deepening among present, past, and future levels of global life satisfaction (Pavot et al., 1998).

Time perspective is the capacity to revisit the past through our memories and to project ourselves into the future using our imagination (Savickas, 1991). Moreover, time influences on life satisfaction judgments consist of complex representations of immediate, intermediate, and long-term components (Pavot & Diener, 2008).

As argued by Pavot et al. (1998), the consideration of temporal dimension on evaluating life satisfaction is advantageous from several perspectives: from a developmental viewpoint, the changing nature of life satisfaction can be fully assessed within a temporal framework; moreover, from a psychometric measurement standpoint, assuming a temporal perspective by dividing it into past, present, and future (Park et al., 2017; Zimbardo et al., 1997) can help the interviewee to focus on a specific time frame and thereby reduce the potential measurement error (Ye, 2007).

Assessment of Temporal Life Satisfaction

By introducing temporal focuses on the original Satisfaction With Life Scale (SWLS; Diener et al., 1985; Pavot & Diener, 1993), Pavot et al. (1998) developed the Temporal Satisfaction With Life Scale (TSWLS), a 3-factor measure composed of the past, present, and future dimensions. In their original study, Pavot et al. (1998) demonstrated favorable psychometric properties of the TSWLS, such as a good internal consistency (alpha coefficients were .92, .92, and .93 for Times 1, 2, and 3, respectively) and good test-retest reliability (values ranging from .83 for a 4-week interval, to .82 for a 9-week interval). Moreover, the TSWLS has been validated in various cultural contexts, such as the Canadian (McIntosh, 2001), Chinese (Ye, 2007), Turkish (Akyurek et al., 2019), Spanish (Tomas et al., 2016), German (Trautwein, 2004).

However, some issues suggested the need for further improvement. Specifically, the results from McIntosh's (2001) study, though confirming the 3-factor structure, showed that some fit indices were somewhat poor (e.g., RMSEA = .10), although others indicated the model was acceptable (e.g., CFI = .92, RCFI = .93). More in depth, following the research of McIntosh (2001), Ye (2007) observed that the mean scores of the first items of each subscale (i.e., past: "If I had my past to live over, I would change nothing"; present: "I would change nothing about my current life"; future: "There will be noting that I will want to change about my future") were lower than the other items; besides, mean scores of the fifth items (past: "I had the important things I wanted in my past"; present: "I have the important things I want right now"; future: "I will have the important things I want in the future") were higher than the others and strongly negatively skewed. Furthermore, these items were less consistent with the other items.

Consistent with this data, Ye's (2007) conclusions suggest that, although the 15-item model fitted the data well — $\chi^2[78, N = 646] = 341.64$; RMSEA = .07; CFI = .96; NFI = .95; TLI = .95; GFI = .93; and AGFI = .90 —, some items of the 15-item model have lower factor loadings than others, and the 9-item model had better fit indices: $\chi^2[20, N = 646] = 48.42$; RMSEA = .05; CFI = .99; NFI = .99; TLI = .99; GFI = .98; and AGFI = .96. Therefore, Ye's (2007) validation presents only nine items (instead of 15), including three items per time frame.

Aim of the Paper

Following this direction, the paper aims to provide the Italian validation of a measure of the Temporal Satisfaction With Life Scale (TSWLS; Pavot et al., 1998), verifying its reliability, factorial structure, and validity. Nowadays, several instruments are available to measure specific aspects of the broad concept of subjective well-being, such as the Satisfaction With Life Scale (SWLS; Diener et al., 1985; Di Fabio & Gori, 2016), the Flourishing Scale (FS; Diener et al., 2010; Italian validation Giuntoli et al., 2017), the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988; Italian validation Terraciano et al., 2003). Despite this, to our knowledge, there still is no Italian validated scale evaluating the three dimensions of the time perspective of life satisfaction.

To achieve this goal, we conducted four studies.[1] In the first, the Temporal Satisfaction With Life Scale was translated into Italian and then the psychometric requisites of the scale were evaluated. We tested the reliability and structure of the scale using exploratory factor analysis (EFA). In the second study, we examined the stability of the factorial structure by using confirmatory factor analysis (CFA). The third study examined concurrent validity. We correlated TSWLS dimensions and the total score with other measures of well-being. Consistent with the literature, the TSWLS is expected to be related to other specific aspects of subjective well-being, such as life satisfaction, positive and negative affect, and flourishing. Specifically, flourishing can be defined as a basic component in the evaluation of psychological well-being (Santisi et al., 2020), that indicates feelings of meaning and purpose in life (Diener et al., 2010). Unsurprisingly, Pavot et al. (1998) found that the TSWLS was positively correlated with the SWLS (Diener et al., 1985; mean *r* value in three studies was .89) and positive affect (mean *r* value in three studies was .56), and negatively related with negative affect (PANAS; Watson et al., 1988; mean *r* value in three studies was –.47). Furthermore, Ye (2007) noted a positive correlation between the TSWLS and the General Life Satisfaction Scale (GLSS); moreover, McIntosh (2001), reported a positive correlation between the TSWLS and the Self-Anchoring Striving Scale (Cantril, 1965; Kilpatrick & Cantril, 1960), which assesses subjective well-being as a global life evaluation. Finally, with the fourth study, we examined the temporal stability of the scale using the test-retest method.

Study 1: Factorial Structure of the Scale

The purpose of Study 1 was to test the factorial structure of the TSWLS. We used exploratory factor analysis (EFA) to examine the underlying factor structure.

Cultural Adaptation of the TSWLS

The cultural adaptation of the TSWLS was carried out through the procedures indicated by Beaton et al. (2000). Initially, we performed a direct translation: the items and instructions of the scale were

translated independently by two researchers, psychologists with experience in test validation. The two translated versions were then compared. The few differences were discussed between the two researchers, until an agreement was found. The final version was drawn up based on these two translations.

Following the back translation procedure, the Italian version was translated back into English by a native English speaker. This allowed for further details to be fixed. A team of three experts reviewed the translations and the original version of the test, defining the final version. This version was administered within a pilot study to 25 adult participants. After completing the test, they were asked if the items were understandable. All respondents answered affirmatively. This version was used in the following studies.

Method

Participants and Procedure

The procedure for collecting data took place through an online survey. We used convenience sampling from the general population. The participants were 319 Italian adults (88 males, 27.6%; 231 females, 72.4%) aged from 18 to 68 years (M = 33.24, SD = 12.82) with 34.8% (n = 111) being married. The percentage of education level was distributed as follows: 11% (n = 35) junior high school degree; 51.7% (n = 165) high school degree; 31.7% (n = 101) bachelor's degree; 5.6% (n = 18) master's degree. The respondents lived in different Italian regions.

The participants were volunteers. The research was presented with the following instructions: "The following study is proposed to validate in Italy a scale that evaluates satisfaction with one's past, present, and future. Participation in the research is voluntary. You will be asked to respond to statements indicating your degree of agreement or disagreement. There are no right or wrong answers. The results of the research will be presented in an anonymous, aggregated form, and, in any case, it will not be possible to trace the individual participants. The results will be presented at scientific congresses or in publications. The authors of the research undertake not only to respect ethical principles during the various phases, but also to promote them during the dissemination of the results. If you accept these conditions and want to participate in the research, go ahead with filling in the form, otherwise do not take this research into consideration."

Participants who decided to participate in the research filled out the Italian version of the TSWLS, with the same instructions as the original version: "Below are nine statements with which you may agree or disagree. These statements concern your past, present, or future. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your answers. The 7-point scale is: 1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *neither agree nor disagree*, 5 = *slightly agree*, 6 = *agree*, 7 = *strongly agree*." The survey was approved by the University of Catania (Italy) ethics commission, and the research complied with the ethical guidelines of the Italian Psychological Association.

Data Analysis

We used exploratory factor analysis (EFA) to verify the factorial structure. We used principal axis factoring with promax rotation for nine items in SPSS 27.0 (Grieder & Steiner, 2021).

First, we verified that the distribution of skewness and kurtosis was normal. Normal values range from –2 to +2 (George & Mallery, 2010). We checked the Kaiser-Mayer-Olkin (KMO) test and the Bartlett's sphericity test. This value indicates if the data are suitable for factor analysis; values of KMO > .70 with a significant Bartlett's test (χ^2) indicate adequacy to conduct EFA (Polit & Beck, 2020; Tabachnick & Fidell, 2019).

The number of factors to be extracted was determined by the scree test and the number of factors with an eigenvalue greater than 1 (Polit & Beck, 2020; Tabachnick & Fidell, 2019). Items were considered part of a factor when the factor loading was equal to or greater than .45 (Tabachnick & Fidell, 2019).

Reliability was assessed with Cronbach's alphas; it is considered excellent when above .90, good above .80, and acceptable when above .70 (George & Mallery, 2010). To confirm internal consistency, we calculated the McDonald's Omega values, a more sensitive and appropriate index of internal consistency compared with Cronbach's alphas (Dunn et al., 2014). According to some authors, McDonald's Omega is a better estimate (Zinbarg et al., 2005); it must be greater than .70; when greater than .80, it indicates good internal reliability.

Results

The distribution of the items scores, based on the values of skewness and kurtosis, was normal (Kim, 2013). The Kaiser-Mayer-Olkin (KMO) test value of this study was .83 and the Bartlett's test was significant ($\chi^2 = 2090.91$, $p < .000$). This indicates that the data are suitable for factor analysis. The eigenvalues of the three factors were 4.83, 1.62, and 1.02. They accounted for 83.03% of the variance.

All nine items were retained because their factor loadings were greater than .45 (Tabachnick & Fidell, 2019): three items for past life satisfaction (Items 1, 2, and 3), three for present life satisfaction (Items 4, 5, and 6), and three for future life satisfaction (Items 7, 8, and 9). Table 1 summarizes the results of these analyses. Cronbach's alpha was: .88 for past life satisfaction, .93 for present life satisfaction, and .86 for future life satisfaction. Total Cronbach's alpha was .89. McDonald's Omega was: .89 for past life satisfaction, .94 for present life satisfaction, and .86 for future life satisfaction. McDonald's Omega for the overall TSWL was .89.

Study 2: Confirmatory Factor Analysis (CFA)

The aim of Study 2 was to test the construct validity of the nine items of the scale, using CFA. Therefore, we assessed the extent to which the observed variables were representative of the underlying latent construct of temporal life satisfaction.

Method

Participants and Procedure

The same procedure as in Study 1 was used to collect the data. In this case, participants were 322 Italian adults (130 males, 40.4%; 192 females, 59.6%) aged from 18 to 65 years ($M = 32.60$, $SD = 11.80$). The percentage of education level was: 6.2% ($n = 20$) junior high school degree; 41.9% ($n = 135$) high school degree; 39.8% ($n = 128$) bachelor's degree; 12.1 % ($n = 39$) master's degree. The respondents, also in this case, lived in different Italian regions; 58 (18%) were unemployed, 150 (46.6%) employed, and 114 (35.4%) were students.

TABLE 1
Descriptive statistics and factor loadings for the nine items of the TSWLS (N = 319)

	M	*SD*	Skewness	Kurtosis	Factor 1	Factor 2	Factor 3
Past life satisfaction							
Item 1	4.65	1.55	–0.33	–0.61	**.58**	.23	.07
Item 2	4.20	1.63	–0.14	–0.70	**.99**	–.06	–.02
Item 3	4.40	1.59	–0.27	–0.62	**.87**	–.01	–.01
Present life satisfaction							
Item 4	5.05	1.47	–0.82	0.28	.01	**.93**	.01
Item 5	4.75	1.62	–0.65	–0.25	–.02	**.96**	–.06
Item 6	4.72	1.52	–0.54	–0.22	.03	**.84**	.06
Future life satisfaction							
Item 7	3.91	1.76	–0.97	–0.85	.01	.05	**.79**
Item 8	5.01	1.29	–0.38	0.27	.04	–.07	**.78**
Item 9	5.71	1.20	–1.12	1.68	–.05	.02	**.89**

Note. TSWLS = Temporal Satisfaction With Life Scale. Factor 1 = past life satisfaction; Factor 2 = present life satisfaction; Factor 3 = future life satisfaction. Values in bold indicate factor loadings greater than .45.

DATA ANALYSIS

We conducted CFA using LISREL 8.80 (Jöreskog & Sörbom, 2006). We tested construct validity using two different models intending to find the best factorial solution: Model 1 consists of three first-order factors (past life satisfaction, present life satisfaction, and future life satisfaction); Model 1 was compared with Model 2, composed of one factor (general life satisfaction). To verify the general adequacy of the models, indices were compared with the acceptable threshold (Schermelleh-Engel et al., 2003). The model fit was verified using the Satorra-Bentler scaled chi-square test (SBχ^2; Satorra & Bentler, 2001), comparative fit index (CFI; Bentler, 1990), root-mean-square error of approximation (RMSEA; Steiger, 1990), standardized root-mean-square residual (SRMR; Hu & Bentler, 1999). To compare the two models, we used the Akaike information criterion (AIC; Burnham & Anderson, 2004).

The CFI can take a value from 0 to 1; values of .90 or greater indicate a good fit (Bentler, 1990, 1998). The interpretation of the RMSEA index follows these indications: a value of .05 or less indicates a very good model fit; a value of .08 shows an acceptable fit, and a value greater than .10 shows an untenable model (Browne & Cudeck, 1993; Steiger, 1990). The SRMR is considered good when it is below .08 (Hu & Bentler, 1999). Regarding the interpretation of AIC, values closer to zero indicate a better model fit (Hair et al., 1998).

For convergent validity, we examined the average variance extracted (AVE; Fornell & Larcker, 1981) and composite reliability coefficient (CR; Bacon et al., 1995); both are good indicators of the quality of measurement (Valentini & Damasio, 2016). Acceptable values of AVE need to be higher than .50 which indicates a sufficient degree of convergent validity. In this case, the latent constructs explain more than half of their indicators' variance. For CR, acceptable values are greater than .70.

Finally, we assessed discriminant validity to determine whether the variables can be distinguished from each other (Lee & Lim, 2013; Moon, 2009). Discriminant validity exists if the square

roots of AVE are higher than correlations between constructs (Fornell & Larcker, 1981; Koufteros, 1999). The Cronbach's alpha and McDonald's Omega values were used to determine the internal consistency.

RESULTS

Model 1 (nine items, 3-factor solution) showed the following fit: SB$\chi^2(24) = 45.06$; CFI = .99; RMSEA = .07, 90% CI [.04, .09]; SRMR = .06; AIC = 100.90. Model 2 (nine items, 1-factor solution) showed the following fit indexes: SB$\chi^2(27) = 171.59$; CFI = .84; RMSEA = .22, 90% CI [.21, .24]; SRMR = .15; AIC = 505.05. The AIC value of Model 1 was smaller than that of Model 2.

We estimated convergent validity for each factor through CR and AVE. The values for these indices were as follows: past life satisfaction, CR = .85, AVE = .65; present life satisfaction, CR = .94, AVE = .85; future life satisfaction, CR = .86, AVE = .68. These values confirmed a very good convergent validity.

As shown in Table 2, the square roots of the AVE values are higher than the correlations between constructs. This means that the discriminant validity of the TSWLS is guaranteed. Table 2 reports AVE and CR values, correlations between factors and, in parentheses, the square roots of the AVE values.

TABLE 2
Convergent and discriminant validity of the TSWLS (N = 322)

	AVE (√AVE)	CR	Factor 1	Factor 2	Factor 3
Past life satisfaction	.65 (.80)	.85			
Present life satisfaction	.85 (.92)	.94	.47**		
Future life satisfaction	.68 (.82)	.86	.37**	.57**	

Notes. TSWLS = Temporal Satisfaction With Life Scale. AVE = average variance extracted; CR = composite reliability coefficient; Factor 1 = past life satisfaction; Factor 2 = present life satisfaction; Factor 3 = future life satisfaction.
** $p < .001$.

In this study, Cronbach's alpha was: .84 for past life satisfaction, .94 for present life satisfaction, and .87 for future life satisfaction. Total Cronbach's alpha was .89. McDonald's Omega was: .85 for past life satisfaction, .94 for present life satisfaction, and .87 for future life satisfaction. McDonald's Omega for the overall TSWL was .88.

STUDY 3: CONCURRENT VALIDITY OF THE SCALE

In Study 3, we examined the concurrent validity of the TSWLS. The aim was to test the relationships of the TSWLS with instruments measuring subjective well-being, such as general life satisfaction, positive and negative affect, and flourishing.

METHOD

Participants and Procedure

The participants were 318 Italian adults (males = 106, 33.3%; females = 212, 66.7%) aged between 18 and 65 years (M = 36.43, SD = 14.89). About half of them had a bachelor's degree (152, 47.8%); the remaining portion had a high school (137, 43.1%), junior high school (15, 4.7%), or master's degree (14, 4.4%). The majority were workers (166, 52.20%); the remaining portion was composed of students (110, 34.50%) or unemployed people (42, 13.20 %). The same procedure as in Study 1 and Study 2 was used to collect the data.

DATA ANALYSIS

SPSS Version 25.0 was used in this study. The concurrent validity was assessed by correlating the scores of the TSWLS with the following measures: Satisfaction With Life Scale (Diener et al., 1985), Flourishing Scale (Diener et al., 2010), and Positive Affect and Negative Affect Schedule (Watson et al., 1988), using Pearson's r coefficient.

MEASURES

Temporal Satisfaction With Life Scale (TSWLS). The same scale used in Study 1 and Study 2 was also used in Study 3. In this study, Cronbach's alpha values were: .88 for past life satisfaction, .93 for present life satisfaction, .92 for future life satisfaction, and .91 for general life satisfaction. McDonald's Omega values were: .87 for past life satisfaction, .93 for present life satisfaction, and .92 for future life satisfaction. McDonald's Omega for the overall score was .90.

Satisfaction With Life Scale (SWLS; Diener et al., 1985) includes five items that require individuals to rate the extent to which they agree with statements on a 7-point Likert scale (from 1 = *strongly agree* to 7 = *strongly disagree*). A sample item from this measure is "In most ways, my life is close to my ideal." Cronbach's alpha and McDonald's Omega values were .89 and .89, respectively.

Flourishing Scale (FS; Diener et al., 2010) is an 8-item scale that evaluates flourishing. Responses are provided on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item from this measure is "I lead a purposeful and meaningful life." Cronbach's alpha value was .89. McDonald's Omega value was .90.

Positive Affect and Negative Affect Schedule (PANAS; Watson et al., 1988) includes 20 items that evaluate positive and negative affect. The scale consists of words that describe positive or negative affect (e.g., interested, scared, afraid); respondents are asked to indicate to what extent they have felt that affect in recent weeks, using a 5-point Likert scale from 1 (*not at all*) to 5 (*a lot*). Cronbach's alpha values were .91 for positive affect and .92 for negative affect. McDonald's Omega values were .91 for positive affect and .92 for negative affect.

RESULTS

The correlations between the subscales and total scores for the TSWLS and the other scales are reported in Table 3. The total score for the TSWLS and the other dimensions were significantly and positively related to general satisfaction, flourishing, and positive affect; they were negatively related to negative affect.

TABLE 3
Correlations between the dimensions of the TSWLS and satisfaction, flourishing, positive and negative affects (N = 318)

	Satisfaction	Flourishing	Positive affects	Negative affects
Past life satisfaction	.64**	.46**	.31**	–.31**
Present life satisfaction	.82**	.68**	.56**	–.47**
Future life satisfaction	.61**	.68**	.53**	–.39**
General life satisfaction	.83**	.72**	.55**	–.46**

Note. TSWLS = Temporal Satisfaction With Life Scale.
** $p < .001$.

STUDY 4: TEST-RETEST RELIABILITY

The purpose of the fourth study was to evaluate the stability of the TSWLS using the test-retest method.

METHOD

Participants and Procedure

The participants were 42 Italian adults (males = 15, 35.7%; females = 27, 64.3%) aged between 21 and 63 years (M = 31.59, SD = 12.55). Twenty-one of them (50%) had a high-school degree, 15 (35.7%) had a bachelor's degree, five (11.9%) had a master's degree, and one had a junior high school degree (2.4%). They were workers in 21 cases (50%), students in 20 cases (47.6%), and one was unemployed (2.4%).

Participants were volunteers and were asked to complete an online survey, using the same procedures as in the previous studies. In this case, the presentation of the study specified that it was a longitudinal research that entailed for a second session four months later. For this reason, an email address to which to send the second research protocol was required. To protect anonymity, the collection of personal email addresses was separated from the rest of the questionnaire data. This meant that the email addresses were stored in a separate database, accessible only to an authorized researcher directly involved in the collection process. The rest of the questionnaire responses were stored separately. To pair the protocols of the first and second administration, a code consisting of the first letter of the name, the first letter of the surname, and the day of birth was required. As previously specified, the research was approved by the ethics commission of the University of Catania and followed the ethical guidelines of the Italian Association of Psychology.

DATA ANALYSIS

SPSS Version 25.0 was used to conduct the analyses. The Cronbach's alpha and McDonald's Omega values were used to determine the internal consistency, and the test-retest reliability of the TSWLS was performed using intraclass correlation coefficients after a 4-week interval.

Results

All the values of Cronbach's alpha were included between .82 and .91 in the first stage of the survey, and between .89 and .93 in the second stage. McDonald's Omegas were included between .86 and .92 in the first phase and .92 and .94 in the second phase.

The results showed that the intraclass correlation coefficient for the subscales past life satisfaction, present life satisfaction, and future life satisfaction were, respectively, .79, 95% CI [.61, .89], $p < .001$; .93, 95% CI [.85, .96], $p < .001$; .93, 95% CI [.87, .96], $p < .001$. Thus, the test-retest reliability of the TSWLS was demonstrated. The TSWLS is a reliable scale that can be used by researchers in the future.

Discussion

In this research, we aimed to verify the psychometric properties of the TSWLS in the Italian context. The data from these four studies support the validity and reliability of the 9-item TSWLS (McIntosh, 2001; Pavot et al., 1998) as a measure of temporal life satisfaction. The scale shows a high level of construct validity (Study 1), confirming the past-present-future 3-factor structure (Study 2), and a good concurrent validity, showing correlations with other measures of well-being (Study 3); moreover, the scale shows good test-retest reliability (Study 4).

The first study (Study 1) aimed to test the factorial structure of the Italian cultural adaptation of the 9-item TSWLS by applying EFA (three factors: past, present, and future life satisfaction). After a direct translation and back translation procedure, the final version of the Italian TSWLS was administered in a pilot study. Using exploratory factorial analysis, construct validity was verified. First, the suitability of the data for factor analysis was verified (Polit & Beck, 2020; Tabachnick & Fidell, 2019). Second, items were checked to determine if they represented a specific factor, analyzing whether factor loadings were equal to or higher than .45 (Tabachnick & Fidell, 2019); as a result, all nine items were retained because their factor loadings were adequate. Third, reliability was studied, with Cronbach's alphas showing an excellent value for present life satisfaction and good values for past and future life satisfaction; moreover, both total Cronbach's alpha and total McDonald's Omega indicate good internal reliability.

Study 2 tested the construct validity of the (9-item) Italian TSWLS by using CFA. These results strongly support the notion that a temporal distinction is useful to adequately describe the construct of life satisfaction (Diener & Lucas, 1999). Specifically, Model 1 of the 9-item TSWLS with a 3-factor solution (past life satisfaction, present life satisfaction, and future life satisfaction) is organized under a high-order factor of general satisfaction. Similarly, the original version of the TSWLS (Pavot et al., 1998) showed better results than Model 2 with only one factor of general life satisfaction, further confirming the structure verified by Study 1. Furthermore, confirmatory factor analysis demonstrated both convergent and discriminant construct validity of the scale.

These findings suggested that the temporal distinction (past, present, and future) in life satisfaction is as meaningful for Italians as for other Western cultures, such as North American (Pavot et al., 1998), Canadian (McIntosh, 2001), German (Trautwein, 2004), Spanish (Tomas et al., 2016), Turkish (Akyurek et al., 2019), as well as for Eastern cultures such as Chinese (Ye, 2007).

Study 3 examined the concurrent validity of the TSWLS to test the relationships between the TSWLS and other specific aspects of subjective well-being, such as life satisfaction, positive and negative affect, and flourishing. As expected, the Italian 9-item TSWLS was significantly and positively related to life satisfaction (SWLS; Diener et al., 1985), flourishing (FS; Diener et al., 2010), and positive affect (PANAS; Watson et al.,

1988); conversely, it was negatively related to the negative affect of PANAS. These results are consistent with the literature showing that the TSWLS positively correlated with the SWLS (Pavot et al., 1998) and positive affect, and negatively related to negative affect (Carrillo et al., 2021; Litalien et al., 2013; Pavot et al., 1998).

The aim of Study 4 was to measure the temporal stability of the scale using the test-retest reliability method. Results show that scores detected the first time were correlated with those detected the second time, proving the good temporal stability of the scale.

In summary, by examining the psychometric properties of the scale across four independent groups of participants, these four studies demonstrate the validity and reliability of the 9-item TSWLS.

Conclusions and Limitations

The present research provides empirical support to the inclusion of a temporal component into the life satisfaction construct and suggests the 9-item TSWLS is a valid and reliable measure of temporal life satisfaction in the Italian context. However, the results should be considered within the framework of the research limitations. Primarily, the convenience sampling used in all four studies does not guarantee the representativeness of the entire Italian population. Moreover, the cross-sectional nature of the third study did not allow for verification of the predictive validity of the scale.

Future studies may shed additional light on life satisfaction judgments over the life course (McIntosh, 2001). Some research has shown that people generally tend to be more satisfied with their present than with their past life (Busseri et al., 2012; Carrillo et al., 2021); however, regarding future temporal life satisfaction, other studies have suggested that negative views of the future are strongly related to subjective well-being in young-old adults but diminish in importance in late senescence (e.g., Rönnlund et al., 2017). Such findings may depend on older people's tendency to have more integrated and comprehensive evaluations of their lives (Erikson, 1968, 1982; Shmotkin, 1991). Finally, future studies could integrate the contextual dimension into the measurement of temporal life satisfaction, taking into account the different contexts (e.g., family, work, free time) in which temporal life satisfaction may be experienced.

Note

1. All the data that support the findings of this study are available from the corresponding author, upon reasonable request.

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