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# Revisiting the Structure of Subjective Well-Being in Middle-Aged Adults

**Magda Chmiel · Martin Brunner · Romain Martin · Daniela Schalke**

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**Abstract** Subjective well-being is a broad, multifaceted construct comprising general satisfaction with life, satisfaction with life domains (health, family, people, free time, self, housing, work, and finances), positive affect, and negative affect. Drawing on representative data from middle-aged adults (N = 738), the authors used three different structural models to analyze the interrelationships among these facets of subjective well-being. In a top-down model, a single factor representing global subjective well-being explained the correlations found among the more specific facets of subjective well-being and exerted the strongest influence on general satisfaction with life, satisfaction with health, and satisfaction with finances. In a bottom-up model, satisfaction with the latter two domains had the strongest effect on global subjective well-being. The authors discuss the implications of their findings for research on subjective well-being.

**Keywords** Subjective well-being · Satisfaction with life · Positive affect · Negative affect · Bottom-up model · Top-down model

## 1 Introduction

The overarching goal of this study was to investigate the structure of subjective well-being (SWB), drawing on the comprehensive conceptual model proposed by Diener et al. (1999). This model distinguishes four major facets of SWB:

1. *(Global) life satisfaction* is a cognitive evaluation of the quality of one's life as a whole; it covers such areas as desire to change one's life, satisfaction with current life circumstances, satisfaction with past, satisfaction with future, and significant others' views of one's life.
2. *Pleasant or positive affect* refers to recent occurrences of positive emotions such as joy, elation, contentment, pride, happiness, and ecstasy.

M. Chmiel (✉) · M. Brunner · R. Martin · D. Schalke
Research Center for Educational Measurement and Applied Cognitive Science (EMACS), University of Luxembourg, Campus Walferdange, 7220 Walferdange, Luxembourg
e-mail: magda.chmiel@uni.lu

3. *Unpleasant or negative affect* refers to recent occurrences of unpleasant emotions such as guilt, shame, sadness, anxiety, worry, anger, stress, depression, and envy.
4. *Domain satisfaction* refers to the level of contentment with specific domains of one's life such as *work*, *family*, *people*, *free time*, *health*, *finances*, *self*, and *housing*.

The Diener et al. (1999) conceptual model of SWB is an important theoretical framework as it describes the breadth of the multifaceted construct of SWB. However, it does not specify the interrelations of the various facets. Thus, when this conceptual model is translated into a structural model of SWB, all facets of SWB can be considered as correlated, but the direction of the casual relationship remains unspecified. Figure 1a displays this structural model, which we call the *baseline model* (latent factors, depicted as ellipses in Fig. 1a, are measured by several manifest indicators, depicted as rectangles).

The pattern of correlations observed between the facets of SWB in the baseline model may be explained by two distinct processes (Diener 1984). The operation of these processes implies two different structural models of SWB that entail qualitatively different measurement approaches.

The *top-down model* specifies that global SWB affects its more specific facets (cf. Diener 1984). Thus, people with higher global SWB experience more positive affect (PA) and less negative affect (NA). This model also implies that people with higher global SWB are more satisfied with their lives in general (SL) as well as with specific life domains. The top-down model therefore answers the question: Which facet of SWB is influenced to the greatest extent by global SWB? Further, if the top-down model fits the data reasonably well, global SWB accounts for the correlations (i.e., the common variance) among the more specific facets of SWB. Psychometrically speaking, the top-down model belongs to the broader class of *effect indicator* measurement models (Bollen and Lennox 1991), as global SWB (indirectly) exerts an effect on the indicators of specific facets (i.e., the measures of specific facets of SWB) via the factors representing those specific facets of SWB. Hence, in the effect indicator measurement model, a change in the construct of global SWB causes a change in the indicators of SWB.

In the *bottom-up model*, in contrast, the more specific facets of SWB cause global SWB. Specifically, the level of global SWB is caused by satisfaction with individual life domains, as well as by the level of PA and the level of NA. According to this view, a high level of global SWB depends on a person's mental summing up of experiences of positive affect, of the absence of negative affect, and of satisfaction with the self and individual life domains (cf. Diener 1984). Thus, in the bottom-up model, various domains of SWB, PA, and NA may be mutually correlated and exert a direct influence on global SWB. In this model, the facets that are the most immediate and important to peoples' lives are generally considered to exert the strongest influence (Scherpenzeel and Saris 1996). The bottom-up model therefore addresses the question: Which facet of SWB best explains global SWB? Psychometrically speaking, the bottom-up model belongs to the broader class of *causal indicator* measurement models, as the indicators of specific facets of SWB (indirectly) cause global SWB via the factors representing those specific facets of SWB. Hence, in the causal indicator measurement model, a change in the indicators of specific aspects of SWB causes a change in the level of global SWB. Crucially, to identify the bottom-up model, it is necessary to specify at least two indicators to be influenced by global SWB (Bollen and Davis 2009, Fig. 6b). We chose indicators of global life satisfaction (i.e., the Satisfaction with Life Scale by Diener et al. 1985) for two reasons: (1) the Satisfaction with Life Scale is a valid, reliable, and stable measure that has been widely used to assess global SWB in diverse populations, clinical trials, and cross-cultural studies for over 20 years (Pavot and

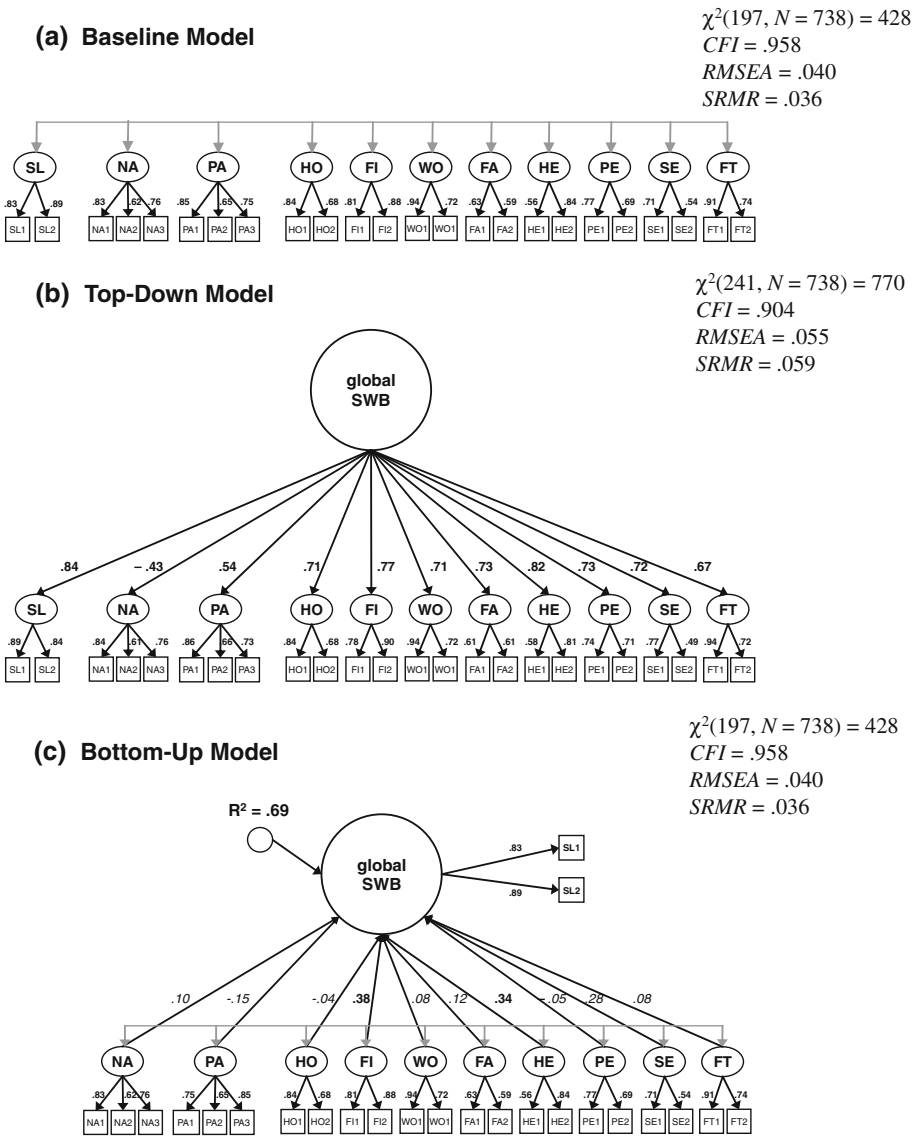


**Fig. 1** Alternative structural models of subjective well-being: **a** baseline model, **b** top-down model, and **c** bottom-up model. *NA* negative affect, *PA* positive affect, *SL* satisfaction with life; satisfaction with life domains, *HO* housing, *FI* finances, *W* work, *FA* family, *HE* health, *PE* people, *SE* self, *FT* free time, *CFI* Comparative Fit Index, *RMSEA* Root Mean Square Error of Approximation, *SRMR* Standardized Root Mean Square Residual. Error terms of manifest variables are omitted from Fig. 1 to ensure clarity of presentation

Diener 2008). (2) Respondents to items assessing global life satisfaction are theoretically expected to integrate and weight specific facets of their life (Pavot and Diener 1993). In this article, we assumed PA, NA, and satisfaction with specific life domains to indirectly influence the indicators of global life satisfaction via global SWB. The bottom-up model

thus informs on the average weight that people assign to these key aspects of their lives in assessing their global life satisfaction.

Although previous research has provided rich insights into the interrelationships among the various facets of SWB (Gallagher et al. 2009; Headey et al. 1991; Lance et al. 1995; Leonardi et al. 1999), the generalizability of these findings may be limited for several reasons. First, and perhaps most importantly, most studies examined only one or a few facets of SWB and thus did not cover SWB in its full breadth as defined by Diener et al. (1999). However, the facets of SWB may demonstrate substantial correlations, and therefore share a considerable amount of variance. Omitting any facet may thus affect the size of the relationships between global SWB and the facets included in the study (in both the top-down and the bottom-up model).

Second, although several studies have analyzed the relation between global SWB and its facets, they have typically used either the bottom-up or the top-down model as the analytical framework for their analyses (Diener 1984). Thus, these studies inform on the operation of either bottom-up or top-down processes, but not on both.

Third, in their reviews of SWB research, Diener (1984) and Lance and Sloan (1993) observed that global SWB and/or its more specific facets were often measured by single items. However, single-item measures tend to have lower reliabilities than multi-item measures, potentially resulting in unpredictable bias in the relationships observed between global SWB and its specific facets in both top-down and bottom-up models (cf. Cohen et al. 2003).

Fourth, the interrelationships between the various facets of SWB seem to depend strongly on the sample, particularly on the age of the target population. For example, Leonardi et al. (1999) questioned US citizens aged 55–99 years and found that those with high global SWB were also highly satisfied with their leisure and health (in a top-down model), whereas satisfaction with housing had the highest impact on global SWB (in a bottom-up model). Satisfaction with finances was not related to global SWB in either model, perhaps because older people tend to be less concerned by money issues than are younger ones. They have fewer dependants and most have a steady, secure income (i.e., a pension). In contrast, Lance et al. (1995) found college students with high global SWB to be highly satisfied with their housing and finances (in a top-down model), and satisfaction with the partner and leisure to have the highest impact on global SWB (in a bottom-up model). Health was not substantially related to global SWB—as young people are generally in good health, they do not seem to be greatly concerned by health issues. However, as higher education in the US is quite expensive, it was students in a more privileged financial situation who enjoyed higher levels of global SWB.

Fifth, studies juxtaposing age groups have focused primarily on differences in SWB between samples of young and old respondents, whereas the SWB of middle-aged adults has been somewhat neglected. Yet this age group faces its own specific challenges. At middle age, people often begin to experience health problems, have mortgages to pay, children to educate, and elderly parents to take care of. Research examining the SWB of middle-aged adults, and the relevant facets of SWB at this stage of life, is therefore warranted.

Taken together, previous research has provided rich insights into the structure of SWB. As many of these studies showed one or more of the limitations outlined above, however, findings on the structure of SWB are still far from conclusive, particularly with regard to middle-aged adults. Drawing on the comprehensive conceptual model of SWB by Diener et al. (1999), this study therefore rigorously investigated interactions among global and

specific facets of SWB in middle-aged adults by comparing the results of the baseline, the top-down, and the bottom-up models of SWB.

## 2 Methods

Data were obtained from a stratified random sample of 738 (367 men, 371 women) middle-aged adults, aged 52, living in Luxembourg. Stratification criteria included the geographic area within the country and gender.

To assess SWB in its full breadth as defined by Diener et al. (1999), we administered a questionnaire comprising valid and reliable measures of the various facets of SWB. Specifically, (global) satisfaction with life (SL) was measured by the five-item Satisfaction with Life Scale (Diener et al. 1985). Domain-specific satisfaction with life in each of seven domains (i.e., health, work, finances, free time, people, housing, and family) was assessed by four items from the Fragebogen zur Lebenszufriedenheit (Fahrenberg et al. 2000). Satisfaction with the domain of self was assessed using four items from the Rosenberg (1965) self-esteem scale. Participants rated their global and domain-specific satisfaction on a 6-point rating scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The frequency of positive affect (PA) and negative affect (NA) was measured with the Positive Affect Negative Affect Schedule (PANAS, Watson et al. 1988). The PANAS is a 20-item scale that measures 10 positive and 10 negative affects using single adjectives (e.g., active, excited, irritated, or anxious) that are rated on 5-point scale ranging from 1 (*never*) to 5 (*very often*).

We created parcel scores (i.e., sum scores of subsets of items from individual scales) to capture the latent constructs in the three models under investigation. Parcel scores have many psychometric advantages over individual item scores, including higher reliability, a higher ratio of common-to-unique factor variance, and a lesser likelihood of distributional violations. Proper use of parcel scores requires that the items measuring a specific latent construct are reasonably unidimensional (Little et al. 2002). We therefore conducted preliminary confirmatory factor analyses for each scale to check for unidimensionality. In cases where unidimensionality was established, we allocated the scale items at random to two or three parcels (two parcels for domain-specific facets of SWB and three parcels for NA and PA). If certain items in a scale shared some specific variance in addition to the target construct, they were parceled together. The residual term of the parcel scores in the three models as depicted in Fig. 1 accounted for these specific sources of variance.

Parameters of all three models were computed by means of the MLR estimation method as implemented in Mplus 5.2 (Muthén and Muthén 1998–2006). To asses the fit of the models, we used the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR).

## 3 Results

The baseline model yielded a good fit (see Fig. 1a) to the data (cf. Hu and Bentler 1999). Values of the standardized factor loadings ranged from $\lambda = .54$ to $\lambda = .94$ ($Mdn\ \lambda = .75$), confirming the factors representing the various facets of SWB to be well defined. It is worth highlighting that all correlations among the facets of SWB were substantial (see Table 1), indicating that they shared a considerable amount of variance. However, as the correlations were clearly different from 1, the findings also underscore the multifaceted nature of SWB.

**Table 1** Correlations between the facets of subjective well-being as obtained for the baseline model

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. SL | – | | | | | | | | | | |
| 2. PA | .44 | – | | | | | | | | | |
| 3. NA | −.35 | −.14 | – | | | | | | | | |
| 4. Work | .60 | .45 | −.29 | – | | | | | | | |
| 5. Family | .54 | .42 | −.37 | .45 | – | | | | | | |
| 6. Free time | .56 | .24 | −.29 | .45 | .56 | – | | | | | |
| 7. Health | .73 | .51 | −.56 | .59 | .55 | .52 | – | | | | |
| 8. Finances | .71 | .41 | −.20 | .62 | .48 | .58 | .54 | – | | | |
| 9. Self | .64 | .72 | −.50 | .51 | .50 | .36 | .74 | .47 | – | | |
| 10. People | .54 | .37 | −.30 | .56 | .75 | .64 | .51 | .53 | .50 | – | |
| 11. Housing | .57 | .28 | −.25 | .46 | .62 | .58 | .45 | .70 | .46 | .56 | – |
| SD | .75 | .46 | .47 | .89 | .54 | .89 | .66 | .78 | .54 | .62 | .68 |
| Alpha | .84 | .80 | .80 | .85 | .80 | .85 | .76 | .85 | .62 | .66 | .78 |

Alpha = estimate of a scale score's reliability

Further, all facets of SWB, except those referring to NA, were positively interrelated. Hence, relative to respondents with low NA, those with high NA tended to be less satisfied with life in general as well as with specific life domains, and they experienced less PA.

The correlations among the various facets were compatible with the operation of both top-down and bottom-up processes. We therefore examined the structural models of SWB that reflected those processes in detail.

We first consider the top-down model. This model revealed an acceptable fit to the data (see Fig. 1b), demonstrating that a single factor representing global SWB accounts reasonably well for the common variance among the more specific facets of SWB. In this model, the top-down influence of global SWB was statistically significant for all of its facets, indicating that people with high global SWB are also more satisfied with specific domains of their lives and with themselves, and that they experience more PA and less NA. Further, global SWB exerted the strongest influence (as indicated by the standardized factor loading of .84 in Fig. 1c) on SL. This result supported the idea that global life satisfaction can be regarded as an excellent measure of global SWB. Further, global SWB had a strong influence on health and finances, indicating that people with high global SWB are also very satisfied with the state of their health and finances.

The bottom-up model also yielded a good fit to the data (see Fig. 1c), with factor loadings and intercorrelations among the facets of SWB identical to those observed in the baseline model. Satisfaction with the life domains of finances and health had the highest and the only statistically significant bottom-up impact on global SWB. Hence, satisfaction with finances and health appeared to be the most immediate and important life domains explaining the overall level of SWB among middle-aged adults in Luxembourg. The facets of SWB explained 69% of the variance in global SWB.

## 4 Discussion

This study was the first to analyze the comprehensive conceptual model of SWB proposed by Diener et al. (1999) in its full breadth. Drawing on representative data from middle-aged

adults who had completed reliable multi-item measures of SWB, we investigated alternative structural models of SWB. The pattern of intercorrelations found for the baseline model clearly demonstrated the multifaceted nature of SWB. Crucially, this pattern of correlations is compatible with the operation of two distinct processes (Diener 1984), which imply two qualitatively different approaches to measuring SWB. Specifically, the results of the top-down model showed that a single factor representing global SWB accounts reasonably well for the correlational associations found among a broad set of SWB facets as described by Diener et al. (1999). Global SWB had the strongest impact on SL, confirming that the Satisfaction with Life Scale (i.e., the indicators of SL) can be viewed as an excellent measure of global SWB. The bottom-up model revealed that the interplay of specific facets of SWB, PA, and NA explained 69% of the variance in SWB. Further, satisfaction with the life domains of finances and health had the strongest and the only statistically significant bottom-up impact on global SWB.

Finally, the results from both the bottom-up and the top-down model converged in indicating that satisfaction with the life domains of finances and health may play the main role in the interaction between global SWB and the more specific facets of SWB in middle-aged adults. Many people at the age of 52 have families to support, children to educate, mortgages to pay, and elderly parents to take care of. Financial security is therefore very important to them. Moreover, it is at often this stage of life that people begin to experience health problems, realize that good health cannot be taken for granted, and start to value it more.

Several limitations of this study warrant mention. First, the data were collected at a single point of time. It was thus impossible to determine the direction of the causal relationship between global SWB and its specific facets in either the bottom-up or top-down models. However, even the best longitudinal research cannot resolve this problem completely. Although it is possible to assess the mutual influences of global and specific facets of SWB from time 1 to time 2 in longitudinal studies, it must still be assumed that global and specific facets of SWB interact according to either a top-down or a bottom-up model at a given point of time. However, as several scholars have pointed out, both of these processes may operate simultaneously. It is thus impossible to discern the cause from the effect at a given point of time. To draw a complete picture of how global and specific facets of SWB interact, future research would need to juxtapose longitudinal extensions of the bottom-up and top-down models applied in this study.

Second, the identification of the bottom-up model requires that global SWB affects at least two criteria (Bollen and Davis 2009). Note that the regression weights obtained depend on the criteria chosen. Thus, if other criteria were chosen, different regression weights might be obtained for the relation between global SWB and its specific facets. This problem cannot be circumvented, as a choice of criteria has to be made. We therefore opted for one of the most reliable and valid measures of the global level of SWB: the Satisfaction with Life Scale. Future studies might benefit from by including other, non-self-report measures as criteria to define and identify global SWB in the bottom-up model. For example, real-time measures—such as sampling moods, emotions, and other feelings at random moments in respondents' everyday life—could prove highly informative (Kahneman 1999).

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