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A bifactor model of subjective well-being: A re-examination of the structure of subjective well-being

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ABSTRACT

The present research has aimed to extend the previous research on the structure of subjective well-being (SWB) by applying the bifactor model. The Satisfaction with Life Scale (SWLS) and the Positive and Negative Affect Schedule (PANAS) were administered to two large samples of Serbian young adults ($N_1 = 1669$, $N_2 = 1522$). The bifactor model of SWB with one general and three specific factors (life satisfaction, positive affect, and negative affect) provided the best fit to the data and outperformed the original three-factor model and the higher-factor model in both samples. The results supported the multidimensional nature of SWB, with a strong general factor underlying the SWLS and PANAS. Bifactor modeling has shown that SWLS and PANAS reflect both common and specific variance in SWB, with about half of the reliable variance in life satisfaction, positive affect, and negative affect being independent of the general factor. The present findings imply that researchers should be careful when interpreting SWLS and PANAS scores and that general SWB factor should be taken into account. Implications for scale scoring and interpretation, and theoretical conceptualization of SWB are discussed.

1. Introduction

Subjective well-being (SWB) has become one of the most exciting and challenging topics in social sciences in recent years. SWB is most commonly defined as "a person's cognitive and affective evaluations of his or her life" (Diener, Lucas, & Oishi, 2002, p. 63), comprising three distinct components: life satisfaction (LS), positive affect (PA) and negative affect (NA) (Diener, 1984). The tripartite structure of SWB has been rarely questioned and the distinction between SWB components has been widely adopted as a fundamental premise of SWB research (Schimmack, 2008).

Despite enormous progress in this field, we argue that several fundamental issues regarding SWB are yet to be resolved and that the key questions involving the conceptual basis and structure of SWB still remain unanswered. These issues have been summarized by Busseri and Sadava (2011), who provided a superb overview of crucial problems concerning the structure and conceptualization of SWB. It was excellently noted by these authors that even the fundamental question regarding the conceptual status of SWB (i.e., is SWB a psychological construct or merely a name for research area) is yet to be resolved. The term SWB has been used inconsistently in the literature, thus creating confusion concerning its conceptual status. SWB has been referred to as a multi-faceted construct (Luhmann, Hawkley, Eid, & Cacioppo, 2012, p. 431), broad category of phenomena (Diener, Suh, Lucas, & Smith, 1999, p. 277), and an umbrella term (Diener & Ryan, 2009, p. 391). Despite the problems regarding how SWB has been conceptualized, there are only a limited number of studies aimed at thoroughly examining the structure of SWB (e.g., Busseri, in press). Previous studies on the structure of SWB mostly examined two types of models: three-factor model with correlated factors of LS, PA, and NA, and a higher-order model with general SWB factor that explains the covariation among the first-order factors of LS, PA, and NA (for a review, see Busseri & Sadava, 2011). However, these models have some limitations which do not enable full understanding of complex constructs such as SWB. For example, the three-factor model cannot explain the sources of common variance in SWB, while in the higher-order model the general and specific influences on the observed indicators cannot be evaluated simultaneously. The present study evaluated a bifactor model of SWB, which has been recently proposed as a model that addresses these limitations of traditional models used to evaluate the structure of multidimensional constructs.

The bifactor model consists of one general factor and a number of specific factors, allowing each item to load both on the general factor and specific factor (Reise, 2012). It specifies that correlations among indicators can be accounted for by a general factor (shared variance among indicators) and a number of specific factors (unique variance in the indicators of specific domain over and above the general factor). The bifactor model can be effectively used not only for understanding the structure of multidimensional constructs, but also for determining which scores can be reliably interpreted (Reise, 2012). Given that many of the most challenging problems in the field of SWB (e.g., whether to combine affective well-being and cognitive well-being scores, and how distinct are affective and cognitive well-being) resolve around the issue

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of its structure, the bifactor model seems to be a valuable tool in solving these problems.

A bifactor model is particularly suitable for examining the structure of broad constructs such as SWB, which comprise moderately associated components (Reise, Morizot, & Hays, 2007). The bifactor model is useful for resolving the debate whether SWB is merely an umbrella term for cognitive and affective evaluations of one's life or a latent entity representing the common variance among a set of items measuring LS, PA, and NA. Furthermore, it could help determine whether there is a general factor ('g') of SWB and offer guidelines for interpretation of SWB questionnaires.

1.1. The present study

Only limited number of SWB models has been evaluated in previous studies (e.g., Busseri, in press), and researchers have rarely tried to disentangle common and specific components in SWB measures (e.g., Busseri, Sadava, & DeCourville, 2007). Therefore, the present research aimed at evaluating alternative structural models of SWB, as measured by two instruments considered to be the gold standards in the field: the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). We were especially interested in evaluating the bifactor model of SWB (Fig. 1), which enabled us to test how much of the total and common variance in SWB can be attributed to the general factor and the specific factors, as well as to examine whether forming the total and sub-construct scores is justified.

To our knowledge, only two studies have explored the structure of SWB using the bifactor model (Chen, Jing, Hayes, & Lee, 2013; Vittersø & Nilsen, 2002). The current research extends prior studies in three ways. First, we used both past month and general time instructions for the PANAS. These two instructions enabled us to test whether the structure of SWB depends on the time frame used in the assessment of affective experiences. There has been much disagreement over which time frame captures best the subjective evaluations of affective experiences (e.g., Schimmack, 2007), so we decided to use instructions for the assessment of both the trait-based affect and the short-term affect. Second, the present research was not exclusively concerned with finding the model with best fit indices, but also with computing several indices such as omega hierarchical and explained common variance (see Reise, Moore, & Haviland, 2010, for details), which were not reported in studies conducted by Chen et al. (2013), and Vittersø and Nilsen (2002). These indices can be derived from the bifactor model and used to give information on the strength of the general factor, the amount of variance in SWB that can be attributed to a general factor, and the reliability of each SWB component score after controlling for the variance of the general factor. They can also help us evaluate whether domain-specific scores can be used in a meaningful way over and above the general SWB factor. Finally, given that most studies dealing with the SWB structure have been restricted to samples from Western culture, the present research may contribute to the understanding of cross-cultural generalizability of previous findings, because it was conducted within the context of non-Western, developing country, Serbia.

2. Methods

2.1. Sample and procedure

In the present research, two samples of students from the University of Novi Sad, Serbia were recruited. Sample 1 consisted of 1669 participants (57% females; mean age = 22.15 years, SD = 3.21), while the Sample 2 was comprised of 1522 participants (76% females; mean age = 20.01 years, SD = 1.85). Both samples completed the SWLS and the PANAS, but had different time frame instructions for the PANAS. Sample 1 respondents rated how they had felt "during the past month", while the Sample 2 had "in general, that is, on the average" instruction.

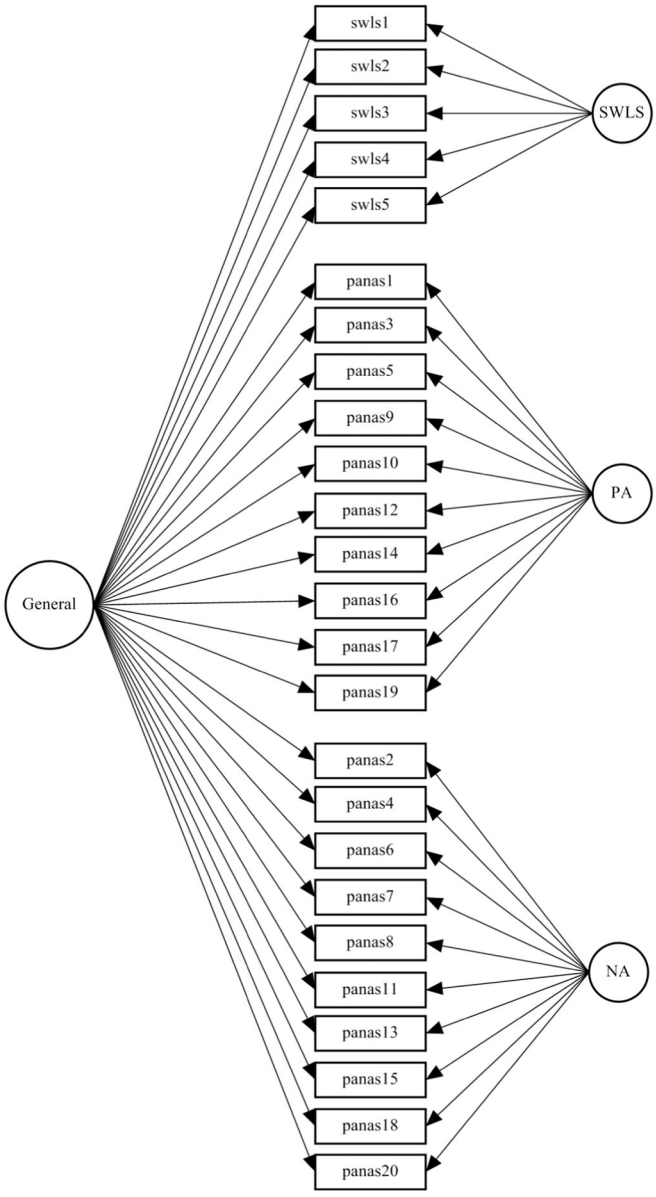

Fig. 1. Bifactor model of subjective well-being.

2.2. Instruments

Satisfaction with Life Scale (SWLS; Diener et al., 1985) consists of 5 items to assess cognitive component of SWB. Items are rated on a 7-point scale, from 1 (strongly disagree) to 7 (strongly agree). We used the Serbian version of the SWLS which demonstrated favorable psychometric properties in previous research (Vasić, Šarčević, & Trogrlić, 2011). In the present study, internal consistency of the scale was .83 in Sample 1, and .78 in Sample 2.

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) consist of two 10-items scales: PA and NA, rated on a 5-point scale from 1 (very slightly or not at all) to 5 (extremely). In the present study, we used the Serbian version of the PANAS, which showed adequate psychometric properties in previous studies (e.g., Mihić, Novović, Čolović, & Smederevac, 2014). Cronbach's alphas of the PANAS subscales were adequate in the present samples (for PA: $\alpha = .84$ in Sample 1, $\alpha = .82$ in Sample 2; for NA: $\alpha = .85$ in Sample 1, $\alpha = .84$ in Sample 2).