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Support for a general factor of well-being☆

Ylenio Longo [a,*], Iain Coyne [a], Stephen Joseph [b], Petter Gustavsson [c]

[a] Division of Psychiatry and Applied Psychology, University of Nottingham, UK
[b] School of Education, University of Nottingham, UK
[c] Department of Clinical Neuroscience, Karolinska Institutet, Sweden

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ABSTRACT

Well-being is typically defined as positive feeling (e.g. happiness), positive functioning (e.g. competence, meaning) or a combination of the two. Recent evidence indicates that well-being indicators belonging to different categories can be explained by single "general" factor of well-being (e.g. Jovanović, 2015). We further test this hypothesis using a recent well-being scale, which includes indicators of positive feeling and positive functioning (Huppert & So, 2013). While the authors of the scale originally identified a two-factor structure, in view of recent evidence, we hypothesize that the two-factor solution may be due to a method effect of different items being measured with different rating scales. In study 1, we use data from the European Social Survey round 3 ($n = 41{,}461$) and find that two factors have poor discriminant validity and, after using a bifactor model to account for different rating scales, only the general factor is reliable. In study 2, we eliminate method effects by using the same rating scale across items, recruit a new sample ($n = 507$), and find that a one-factor model fits the data well. The results support the hypothesis that well-being indicators, typically categorized as "positive feeling" and "positive functioning," reflect a single general factor.

1. Introduction

Well-being is often defined as a set of positive feeling (e.g. happiness, satisfaction) and positive functioning elements (e.g. engagement, self-acceptance) (Ryan & Deci, 2001). Some operationalizations of well-being focus on positive feeling (e.g. Diener, 1984), some focus on positive functioning (e.g. Ryff, 1989), while others include elements of both (e.g. Huppert & So, 2013; Keyes, 2002).

Despite the conceptual distinction between positive feeling and positive functioning, the two have been found to be highly correlated, with relationships as high as .76 and .84 reported (Linley, Maltby, Wood, Osborne, & Hurling, 2009; Keyes, Shmotkin, & Ryff, 2002). Furthermore, recent evidence suggests that well-being indicators, which are typically categorized as positive feeling and positive functioning, may be explained by a single higher-order or "general" factor. For example, Gallagher, Lopez, and Preacher (2009) tested several models in a student sample ($n = 591$) and a representative U.S. sample ($n = 4032$), and found that a single higher-order factor adequately explained the relationships among different well-being indicators. More complex models, with two or more higher-order factors, fit the data slightly better, at the expense of parsimony. These findings were corroborated in a large international sample ($n = 7617$) showing that positive feeling and positive functioning factors had a latent correlation of .96, exhibited similar correlations with external criteria, and their components fitted a single higher-order factor (Disabato, Goodman, Kashdan, Short, & Jarden, in press).

This hypothesis has also been tested using a bifactor model. A bifactor model assumes that each indicator may reflect both a general factor (e.g. well-being) and specific factors (e.g. positive feeling or positive functioning). Thus, in a bifactor model each indicator is allowed to load both on a general factor and on a specific factor. In several studies a bifactor model fit well-being data better than a higher-order model (Chen, Jing, Hayes, & Lee, 2013; Jovanović, 2015) with the general factor explaining most of the variance in well-being indicators (Chen et al., 2013; de Bruin & Du Plessis, 2015; Jovanović, 2015). These findings suggest that indicators of well-being (e.g. happiness, self-acceptance) may be adequately explained by a single higher-order or general factor.

In this article, we aim to build on these findings using a recently developed operationalization and measure of well-being, which includes elements of positive feeling and positive functioning (Huppert & So, 2013). The operationalization includes ten indicators: happiness, emotional stability, vitality, resilience, optimism, engagement, competence, meaning, positive relationships and self-esteem. These indicators were identified by defining the opposites of symptoms of depression and anxiety. This operationalization makes an important

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* Corresponding author at: School of Medicine, Division of Psychiatry and Applied Psychology, University of Nottingham, YANG Fujia Building, Jubilee Campus, Nottingham NG8 1BB, UK.
E-mail address: yleniolongo@gmail.com (Y. Longo).

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contribution to research, as it combines a comprehensive list of well-being indicators and shows how these may be linked to symptoms of psychological health problems.

Based on their operationalization, Huppert and So (2013) identified ten items, measuring each well-being indicator, from the European Social Survey Round 3. After factor analyzing the data, they found that the ten items loaded on two separate factors. The wording of all items but one was positive. However, the rating scales were scored in two different directions. Four items, measuring happiness, emotional stability, vitality and resilience, were scored from low to high: low ratings indicating low levels of the construct and high rating indicating high levels of the construct. Conversely, the other six items, measuring optimism, engagement, competence, meaning, positive relationships and self-esteem, were scored from high to low: low ratings indicating high levels of the construct and high ratings indicating low levels of the construct.

Each of the two factors that emerged in Huppert and So's (2013) study was almost exclusively made up of items scored in the same direction. Specifically, four items scored from low to high loaded on the first factor[1], four items scored from high to low loaded on the second factor, and two items scored from high to low loaded on the first factor, but exhibited some cross-loadings on the second factor (e.g. .28).

When items are scored in opposite directions, they often produce separate factors in a factor analysis. For example, two simulation studies have shown that, if only 10% of respondents complete a questionnaire carelessly, thus not noticing the change in rating scale, factor analytic results will not support a one-factor solution even though the construct measured is unidimensional (Schmitt & Stults, 1985; Woods, 2006). Instead, the analyses will indicate that a second factor or a method factor is necessary to account for the negatively-scored items. However, these factors would be artifacts due to the measurement method, rather than substantial differences in meaning among the items.

Two corrections are often used to account for these method effects. First, one can specify that the errors among negatively- or positively-scored items of a construct correlate. These correlated errors reduce the methodological bias that produced different responses to positive and negative items (Bachman & O'Malley, 1986; Marsh, 1996). Alternatively, one can use a bifactor model by specifying a general factor and two "method" factors, explaining the variance in positively and negatively scored items (e.g. Alessandri, Vecchione, Eisenberg, & Łaguna, 2015). One advantage of a bifactor model over a correlated errors model is that the magnitude of the method effects is more readily interpretable (Brown, 2015), as one can inspect the factor loadings and reliability of each factor.

Based on the evidence outlined hitherto, we hypothesized that after controlling for methods effects, Huppert and So's (2013) well-being scale would exhibit a strong general factor. We tested this hypothesis in two studies.

2. Study 1

In study 1, we tested the one-factor hypothesis using the same sample as Huppert and So (2013).

2.1. Method

2.1.1. Participants

Data was acquired from the European Social Survey round 3 (2006), which administered the well-being items to 43,000 individuals aged 14 and above (54% female) from 23 countries. Twenty-one cases were excluded from the analyses because they had no values for any of the items, and responses from the Hungarian sample were excluded because all values for the vitality item were missing. Thus, the overall sample was slightly reduced to 41,461 respondents. Ages ranged from 14 to 101 ($M = 47.35$, $SD = 18.53$), 54% were females, and 93% reported belonging to the ethnic majority. They also reported the following marital status: 51% were married, 27% were never married or in a civil partnership, 10% were widowed, 8% were divorced, 2% were in a civil partnership, 1% were separated.

2.1.2. Measures

Ten items were selected by Huppert and So (2013) to measure well-being (see Table 1). Positive emotion (i.e. happiness), emotional stability (i.e. calmness), vitality and resilience were scored in one direction, while the rest of the items were scored in the opposite direction. Specifically, happiness was measured on a scale from 0 (extremely unhappy) to 10 (extremely happy). Calmness and vitality were measured on a scale from 1 (none or almost none of the time) to 4 (all or almost all of the time). Competence, engagement, meaning, optimism, positive relationships and self-esteem were measured on a scale from 1 (agree strongly) to 5 (disagree strongly). The resilience item used the same agreement scale, but it was reverse-worded (see Table 1).

2.1.3. Analysis

Confirmatory factor analyses were carried out using the Lavaan package (version .5–18, Rosseel, 2012) in R version 3.2.0 (R Core Team, 2015). The following four models were specified: (1) the two-factor model presented in Huppert and So's (2013) study; (2) a one-factor model with no method correction; (3) a bifactor model (a) where items loaded on a general factor and two specific factors corresponding to the two factors in Huppert and So's (2013) study; (4) a bifactor model (b) where items loaded on a general factor and two specific factors each with positively and negatively scored items, respectively. If the latter bifactor model (b) fits the data better than the bifactor model (a), it would suggest that any systematic variance, not accounted for by the general factor, results from method effects rather than substantive factors. In both bifactor models all factors were uncorrelated (Holzinger & Swineford, 1937).

We used Robust Maximum Likelihood (MLR) due to some deviations from multivariate normality: Mardia's statistic of multivariate kurtosis >5 (Bentler, 2006). Furthermore, fewer than 7% of the cases

Table 1
Items used in Study 1 (Huppert & So, 2013) and Study 2.

Construct	Items used in Study 1	Item used in study 2
Competence	Most days I feel a sense of accomplishment from what I do	Most days I feel a sense of accomplishment from what I do
Emotional stability	(In the past week) I felt calm and peaceful	In the past week, I felt calm and peaceful
Engagement	I love learning new things	I love learning new things
Meaning	I generally feel that what I do in my life is valuable and worthwhile	I generally feel that what I do in my life is valuable and worthwhile
Optimism	I am always optimistic about my future	I am optimistic about my future
Positive emotion	Taking all things together, how happy would you say you are?	Taking all things together, how happy would you say you are?
Positive relationships	There are people in my life who really care about me	There are people in my life who really care about me
Resilience	When things go wrong in my life it generally takes me a long time to get back to normal. (reverse score)	When things go wrong in my life, it generally takes me a short time to get back to normal
Self-esteem	In general, I feel very positive about myself	In general, I feel positive about myself
Vitality	(In the past week) I had a lot of energy	In the past week, I felt energetic

[1] Resilience was a negatively phrased item, scored from 1 (Agree strongly), to 5 (Disagree strongly).