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The personality of meaning in life: Associations between dimensions of life meaning and the Big Five

Katie M. Lavigne[ab], Samantha Hofman[c], Angela J. Ring[c], Andrew G. Ryder[cd] and Todd S. Woodward[ab]*

[a]*Department of Psychiatry, University of British Columbia, Vancouver, Canada;* [b]*Translational Research Unit, BC Mental Health and Addictions Research Institute, Provincial Health Services Authority, Vancouver, Canada;* [c]*Department of Psychology, Concordia University, Montreal, Canada;* [d]*Culture and Mental Health Research Unit, Lady Davis Institute, Sir Mortimer B. Davis – Jewish General Hospital, Montreal, Canada*

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The goal of the current study was to identify aspects of personality that are associated with different ways in which people find meaning in life. This was achieved using constrained principal component analysis (CPCA) on data from 322 university students, who completed the Sources of Meaning and Meaning in Life questionnaire and the Big Five Aspects Scale. CPCA demonstrated that personality traits and life meaning are associated, but not redundant, with one another. Specifically, respondents with high scores on lower-level aspects of Openness to Experience tended to derive meaning from questioning, learning and challenging tradition, whereas those with high scores on aspects of Conscientiousness and Extraversion tended to derive meaning from success at work, health, and family. Results suggest that personality traits are associated with variations in the domains used to derive meaning in life, and demonstrate the utility of CPCA as an innovative statistical technique for the study of individual differences.

Keywords: personality; meaning; big five; principal component analysis; multivariate multiple regression

Introduction

There is substantial evidence that the attribution of meaning to one's life is an important basis of psychological well-being and general health, and that a sense of meaninglessness leaves one at risk for psychopathology (Ryff & Keyes, 1995; Zika & Chamberlain, 1992). Researchers have focused on the positive outcomes of perceiving life as meaningful, and likewise the negative outcomes of perceiving life as meaningless. A number of variables have been connected to the perception of life meaning, including positive affect (King, Hicks, Krull, & Del Gaiso, 2006), social connectedness (Twenge, Catanese, & Baumeister, 2003), and the cognitive accessibility of one's true self (Schlegel, Hicks, Arndt, & King, 2009). Finding meaning in life is also positively associated with measures of well-being and its various components, such as happiness, life-satisfaction, and spirituality (Mascaro & Rosen, 2006). Conversely, the perception of life as meaningless has been shown to relate positively to psychopathology (Scannell, Allen, & Burton, 2002; Zika & Chamberlain, 1992). For example, people who perceive life as meaningless are at greater risk for disorders such as depression and anxiety (Mascaro & Rosen, 2008), and have a higher incidence of substance use and suicidal behaviour (Edwards & Holden, 2001; Harlow, Newcomb, & Bentler, 1986).

People vary widely in the extent to which life is experienced as meaningful, and this variation has striking implications for well-being. It behoves us then to consider how dimensions of individual difference, especially the well-validated and widely studied Big Five personality traits, are associated with this sense of having meaning in life. Some of the investigated associations involve constructs conceptually related to life meaning. For example, positive health behaviours, such as decreased substance use and increased physician visits, have been related to Conscientiousness (Roberts, Walton, & Bogg, 2005). Volunteerism has been related to Extraversion and Agreeableness, and positive appraisal of events to Extraversion and (low) Neuroticism (Ozer & Benet-Martinez, 2006). Self-compassion understood as a personal strength aiding in the search for hope and meaning in challenging times, has been related to Agreeableness, Conscientiousness, Extraversion, and (low) Neuroticism (Neff, Rude, & Kirkpatrick, 2007).

*Corresponding author. Email: Todd.S.Woodward@gmail.com

A few studies have used measures that purport to directly measure meaning, and have examined associations with the Big Five personality domains. Henningsgaard and Arnau (2008) found that spiritual meaning was associated with Extraversion, Agreeableness, Conscientiousness, and (low) Neuroticism. A general sense of meaningfulness in life has also been related to Extraversion and (low) Neuroticism (Francis & Hills, 2008; Halama, 2005), as well as Conscientiousness (Halama, 2005).

Early instruments assessing life meaning assumed a single dimension from meaningfulness to meaninglessness; following debate around this practice (Mascaro & Rosen, 2008; Ryff & Keys, 1995), researchers have explored a more nuanced understanding of this construct. Steger, Kashdan, Sullivan, and Lorentz (2008) suggested a relation between the search for meaning and the presence of meaning with personality. Using the NEO PI-R (Costa & McCrae, 1992a) to measure the Big Five personality traits and the Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006) to measure meaning, they found distinct associations between some personality traits and the search for versus the presence of meaning. Certain facets of Openness to Experience and Agreeableness were associated with a search for meaning, whereas certain facets of Extraversion, Agreeableness, Conscientiousness, and (low) Neuroticism were associated with the presence of meaning, a sense of purpose in life.

While there is now a robust body of literature linking the sense of life's meaning to key dimensions of individual difference on the one hand, and important outcomes on the other, there is relatively little work on *how* people derive this sense in the first place. The life domains upon which one can potentially rely for a sense of meaningfulness is potentially very broad. Their proper study thus requires the multifaceted approach to the study of life meaning that has emerged in recent years. To this end, based on theoretical work combined with qualitative analyses of focus groups, Schnell and Becker (2006) developed the Sources of Meaning and Meaning in Life (SoMe) questionnaire. This multidimensional Self-report instrument assesses two dimensions of meaning in life (i.e. meaningfulness and crisis of meaning) as well as 26 potential sources of meaning. These sources of life meaning are factor analyzable into Self-transcendence (Vertical and Horizontal; Schnell, 2009), Self-actualization, Order, and Well-being and Relatedness.

Schnell and Becker (2006) used path analysis to examine relations between the Big Four personality domains of the Trier Integrated Personality Inventory (TIPI; Becker, 2003; Neuroticism, Extraversion/Openness, Conscientiousness, and Disagreeableness), the four dimensions of sources of life meaning, and meaningfulness. They reported significant associations between Conscientiousness and Order; Disagreeableness and Self-transcendence; and between Extraversion/Openness and Self-actualization as well as Well-being and Relatedness. Each of these was also significantly related to meaningfulness, but only Extraversion/Openness showed a direct association in the path analysis. Twenty-six separate regression analyses were then conducted to examine more in-depth relations between sources of life meaning and the Big Four. This analysis revealed significant effects between: (a) Neuroticism and four SoMe scales; (b) Extraversion/Openness to Experience and 15 SoMe scales; (c) Conscientiousness and 11 SoMe scales; and (d) Disagreeableness and six SoMe scales.

These associations further demonstrate the interrelatedness of personality and sources of meaning, but this set of results could be simplified using multivariate analysis methodology. To study four personality domains and 26 sources of meaning, Schnell and Becker (2006) observed 104 possible personality-meaning links, and the number of links would increase further if one were to consider lower-order narrow-band personality dimensions, as is often recommended (e.g. Costa & McCrae, 1992b; DeYoung, Quilty, & Peterson, 2007). Although alpha levels were adjusted accordingly, employing separate univariate multiple regressions for each of the 26 sources of life meaning does not take into account their shared variance, which can be used to simplify interpretation of overlap between two datasets (namely, personality and sources of meaning).

When comparing two broad and multifaceted constructs, it is common in the individual differences literature to use separate techniques to derive the primary dimensions and then interrelate them. For example, one might compute the number of primary dimensions using principal component analysis (PCA) in a first step, followed by multiple regression in a second step, using personality traits (e.g. the Big Five) as the predictor variables, and the derived SoMe dimensions as criterion variables. However, this method does not produce dimensions of life meaning that are specifically predictable from personality; rather, it relates personality traits back to known dimensions of the SoMe. This is because the primary dimensions of the SoMe are not optimized to summarize the variance in the SoMe that is predictable from personality, and inevitably contain variance resulting from other factors that may not be of interest. In order to identify personality-predictable dimensions, multivariate multiple regression must be carried out in the first step in order to isolate the variance in the SoMe that is predictable from personality, and PCA carried out in a second step on the variance-constrained predicted scores from the multivariate multiple regression. This is not a subtle distinction: the dimensions resulting from the latter method (which explain the maximum variance predictable from personality)

almost always differ substantially from the former (which explain the maximum overall variance). If the aim is to investigate the dimensions underlying life meaning that are specifically predictable from personality, as is the case in the current study, it is preferable to use a statistical method that is designed for this purpose.

We therefore employed constrained principal component analysis (CPCA; Hunter & Takane, 1998, 2002; Takane & Hunter, 2001; Takane & Shibayama, 1991), a method that combines multivariate multiple regression and PCA, for the present study. CPCA allows one to examine the component structure of the variance in a set of criterion variables (e.g. the SoMe subscales) that is specifically predicted by a set of predictor variables (e.g. the Big Five aspects). In addition to determining the primary dimensions of the SoMe that are predictable from personality, this methodology allows determination of the percentage of overall variance in the SoMe that personality accounts for, and the percentage of overall variance in the SoMe accounted for by each extracted dimension. As such, this approach allows us not only to determine specific links between personality and meaning constructs, but draw general conclusions about the extent to which sources of meaning are reducible to, related to, or independent from personality traits.

Method

Participants

As part of a larger online study, 322 university students (79% female) completed the SoMe and the BFAS. Ages ranged from 17 to 54, with a mean of 23.57 (SD = 6.16). Participants in psychology courses received course credit for participation; other participants were entered into a draw to win a cash prize. This study was approved by the Human Research Ethics Committee at the university where data collection took place.

Measures

The SoMe is a 151-item self-report questionnaire assessing two dimensions of meaning in life (i.e. meaningfulness and crisis of meaning) as well as 26 potential sources of life meaning (see Table A1 in the Appendix). Meaningfulness refers to a fundamental sense of meaning, based on a feeling that one's life is coherent, significant, and purposeful, whereas crisis of meaning refers to a sense of one's life as empty, pointless, and lacking meaning (Schnell, 2009, 2010, 2011). The 26 sources of meaning make up four dimensions (Schnell & Becker, 2006): Self-transcendence, Self-actualization, Order, and Well-being and Relatedness. Self-transcendence can be further divided into Horizontal and Vertical dimensions, which refer to deriving meaning from societal issues and spiritual sources, respectively (Schnell, 2009). Self-actualization refers to finding meaning in actualizing one's inner potential and succeeding in life. Well-being and Relatedness refers to deriving meaning from leisure and social relationships. Finally, Order refers to finding meaning in rationality, values, and conservatism. The BFAS is a 100-item questionnaire that indexes the Big Five personality domains and provides scores for 10 lower-level aspects, two for each of the Big Five (DeYoung, Quilty, & Peterson, 2007): Neuroticism (volatility, withdrawal); Extraversion (enthusiasm, assertiveness); Openness to Experience (intellect, openness); Agreeableness (compassion, politeness); and Conscientiousness (industriousness, orderliness). Subscale reliabilities for this sample ranged from 0.59 (social commitment) to 0.95 (explicit religiosity) for the SoMe and 0.68 (politeness) to 0.90 (volatility) for the BFAS, and were generally comparable to previously published values (DeYoung et al., 2007; Schnell & Becker, 2006).

Statistical analysis

For the current study, the criterion variables consisted of participants' standardized mean scores on the SoMe's 26 sources of life meaning (322 participants × 26 variables), and the predictor variables consisted of participants' standardized mean scores on the ten BFAS aspects (322 participants × 10 variables). CPCA is performed in two steps, referred to as the external analysis and internal analysis. The external analysis consists of a multivariate multiple regression of the criterion variables on the predictor variables. This is simply the multivariate analogue of a least squares linear regression. The set of criterion variables is referred to as the overall matrix (the total variance in the SoMe subscales). The external analysis produces two matrices from the overall matrix. These two matrices reflect the three elements of a simple regression equation, namely, the predicted and residual scores. The matrix of predicted scores reflects the variance in the SoMe subscales that is predictable from the BFAS aspects, whereas the matrix of residual scores reflects the variance in the SoMe subscales that is not predictable from the BFAS aspects.

The internal analysis consists of PCAs on each of these three matrices. The resulting three component solutions (overall, predicted, and residual solutions, respectively) can then be examined to determine which dimensions of the SoMe can be explained by personality and which cannot. In order to determine the particular BFAS scales that are related to each of the components extracted from the predicted solution, correlations are computed between participants' scores

Table 1. Variance (cell values in regular font) and percentage of variance accounted for (cell values in italics) by the CPCA.

	External analysis (regression)	Internal analysis (PCA)					All components
		1	*2*	*3*	*4*	*5*	
Overall	26.0	4.2	3.3	2.9	2.9	2.6	15.8
Overall (%)	*100.0*	*16.0*	*12.5*	*11.1*	*11.1*	*10.1*	*60.8*
Predictable	6.0	2.1	1.9	–	–	–	4.0
Overall (%)	*23.2*	*8.1*	*7.2*	–	–	–	*15.3*
Predictable (%)	*100.0*	*34.9*	*31.0*	–	–	–	*65.9*
Residual	20.0	2.0	2.9	1.9	2.0	2.3	11.1
Overall (%)	*76.8*	*7.5*	*11.2*	*7.2*	*7.7*	*9.0*	*42.6*
Residual (%)	*100.0*	*9.8*	*14.6*	*9.4*	*10.0*	*11.7*	*55.5*

Notes: The external analysis consisted of a multivariate multiple regression of the SoMe on the BFAS. The internal analysis consisted of three different principal component analyses (PCAs): one on the unconstrained variance in the SoMe (*Overall*), one on the variance in the SoMe predictable from the BFAS (*Predictable*) and one on the variance in the SoMe not predictable from the BFAS (*Residual*). The variance accounted for by the external analysis and each component extracted in the internal analysis is listed in rows labeled in regular font. The percentages of variance accounted for by the external analysis and each component extracted in the internal analysis are listed in rows labeled in italic font. *Overall (%)*: percentage of overall variance attributable to the source identified in each column. *Predictable (%)*: percentage of predictable variance attributable to the source identified in each column, and *Residual (%)*: percentage of residual variance attributable to the source identified in each column. Values can be computed by dividing the appropriate variance values listed in regular font. All internal analyses were separately rotated using varimax. Order of components generally corresponds to the magnitude of variance explained, but was re-ordered for the residual solution to reflect Table 5.

on each component and their scores on the ten BFAS scales. For the PCAs, the number of components retained was determined by inspection of scree plots. All PCA solutions were separately rotated using varimax with Kaiser normalization. Computations were carried out using MATLAB version 7.6 (MathWorks, 2008).[1]

Results

Table 1 shows the distribution of variance for each of the elements of the CPCA (i.e. overall, predicted, and residual solutions). The column representing the external analysis shows that the BFAS accounted for 23.2% of the variance in the SoMe, while the columns representing the internal analysis show the percentage of variance accounted for by the components extracted from each solution.

The component loadings of the 26 SoMe subscales for the overall solution, prior to the external analysis, are presented in Table 2. Five components were extracted, and the resulting structure showed strong similarities to the originally reported factor structure of the SoMe (Schnell & Becker, 2006), with all originally reported dimensions emerging in the results, including the distinction between Horizontal and Vertical Self-transcendence, which was described later by Schnell (2009).

The component loadings for the SoMe dimensions predictable from personality are listed in Table 3 and plotted in Figure 1. The dominant loadings on the first component were as follows: positive loadings on creativity (aesthetic sense), knowledge (questioning, keeping informed), unison with nature (harmony with nature), self-knowledge (confrontation and analysis of oneself), social commitment (commitment for justice), and challenge (endeavour, adventure); negative loadings on tradition (holding onto the well-established) and practicality (pragmatism and realism). This component was labeled questioning/learning. The second component was characterized by positive loadings on health (fitness, wholesome nutrition), care (consideration and helpfulness), power (fight, dominance), community (friendship, close family), generativity (creating things valued beyond one's death), and achievement (competence, skill, success), and was labeled responsibility.

Predictor loadings are computed as correlations between component scores and the set of predictor variables (i.e. BFAS aspects). These are listed in Table 4 and plotted in Figure 2, and should be interpreted alongside Table 3 and Figure 1, as simultaneous interpretation of Tables 3 and 4 (or Figures 1 and 2) is necessary for understanding the SoMe components predictable from personality (namely, questioning/learning and responsibility). Predictor loadings are essential for interpretation of the components derived from the predicted solution because they relate the derived components back to the set of predictor variables. As can be observed in Table 4, questioning/learning was most strongly correlated with the openness, intellect, and assertiveness aspects of the Big Five, while responsibility was most strongly correlated with orderliness, industriousness, compassion, enthusiasm, assertiveness, and intellect.

Table 2. Component loadings for overall solution (PCA on SoMe subscales).

	Component				
SoMe scale	Horizontal self-transcendence	Self-actualization	Order	Well-being and relatedness	Vertical self-transcendence
Social commitment	**0.72**	0.04	−0.06	0.14	−0.11
Unison with nature	**0.70**	0.10	−0.20	0.23	−0.02
Knowledge	**0.70**	0.35	0.13	−0.04	0.00
Harmony	**0.67**	0.15	0.13	0.32	0.23
Self-knowledge	**0.63**	0.39	0.10	−0.02	0.19
Development	**0.62**	**0.44**	0.31	0.09	0.04
Creativity	**0.53**	0.34	−0.34	0.13	0.12
Health	**0.50**	−0.22	0.38	0.19	0.08
Generativity	**0.46**	0.31	0.38	0.25	0.32
Individualism	0.31	**0.78**	0.08	0.00	−0.05
Freedom	0.23	**0.66**	0.07	0.07	−0.06
Power	0.24	**0.61**	0.36	0.14	−0.02
Challenge	0.25	**0.60**	−0.09	0.39	−0.11
Wellness	−0.29	**0.49**	0.02	0.34	0.17
Reason	0.09	0.00	**0.76**	0.06	−0.03
Practicality	−0.11	0.14	**0.71**	0.23	0.13
Achievement	0.00	**0.45**	**0.69**	0.04	0.02
Morality	0.13	0.03	**0.57**	0.25	**0.41**
Fun	0.02	0.30	0.17	**0.75**	0.05
Community	0.18	−0.01	0.20	**0.74**	0.01
Care	0.25	0.00	0.24	**0.66**	0.04
Love	0.12	0.11	−0.06	**0.60**	0.28
Spirituality	0.10	0.08	−0.09	0.07	**0.87**
Explicit religiosity	0.06	−0.11	0.12	0.02	**0.80**
Tradition	−0.22	−0.24	0.34	0.16	**0.62**
Attentiveness	0.35	0.26	0.03	**0.48**	**0.53**

Note: All loadings greater than or equal to 0.40 are set in bold text.

Table 5 presents the component loadings of the SoMe subscales for the five components extracted from the residual solution. These components are computed on sources of variance in the SoMe subscales that are specifically not predictable from personality. In accordance with the novelty of the dimensions that were predictable from personality, the five components that emerged in the residual solution showed strong similarities to the overall solution. However, close inspection of the loadings demonstrates that the residual solution differs slightly from the overall solution due to the variance removed by the predicted solution.

Discussion

The current study, using comprehensive measures of meaning and the Big Five, and a novel multivariate statistical analysis technique, demonstrated that personality traits are associated with deriving life meaning in particular ways. Specifically, people with high levels of Openness to Experience (both aspects) and of the assertiveness aspect of Extraversion were more likely to characterize activities involving questioning, learning, and challenging tradition as meaningful. Conversely, people with high levels of Extraversion (both aspects), Conscientiousness (both aspects), the compassion aspect of Agreeableness, and the intellect aspect of Openness to Experience were more likely to attribute meaning to activities that involve success at work, good health and a sense of family. Importantly, these dimensions in meaning of life, which maximize the variance predictable from personality, differed substantially from the standard scale dimensions, which simply maximize the overall variance in the SoMe.

Those dimensions computed on the variance in the SoMe that was not predictable from the BFAS essentially retrieved the five components that were present in the overall solution: Horizontal Self-transcendence, Self-actualization, Order, Well-being and Relatedness, and Vertical Self-transcendence (Tables 2 and 5). For example, the Vertical Self-transcendence dimension from the overall solution is not reflected in the predicted solution, and is relatively unchanged in the residual solution, consistent with Rican and Janosova's (2010) finding that spirituality and the Big Five comprise six separate components. At a glance, the similarities between the overall and residual solutions appear to suggest that the Big Five is not especially associated with sources of life meaning.

Table 3. Component loadings for predicted solution (PCA on SoMe subscales predicted by BFAS aspects).

	Component	
SoMe scale	Questioning/learning	Responsibility
Creativity	**0.58**	0.00
Knowledge	**0.48**	0.23
Tradition	**−0.47**	0.10
Unison with nature	**0.43**	0.09
Self-knowledge	**0.38**	0.20
Practicality	**−0.37**	0.26
Social commitment	**0.37**	0.09
Challenge	**0.36**	0.23
Development	0.34	0.33
Individualism	0.33	0.07
Freedom	0.27	0.07
Explicit religiosity	−0.13	0.05
Spirituality	−0.07	0.06
Health	0.06	**0.45**
Care	0.05	**0.44**
Power	0.28	**0.39**
Community	0.04	**0.38**
Achievement	−0.08	**0.35**
Generativity	0.13	**0.35**
Fun	0.04	0.34
Morality	−0.14	0.33
Reason	−0.21	0.31
Attentiveness	0.13	0.30
Harmony	0.28	0.28
Love	0.07	0.27
Wellness	0.01	0.06

Note: All loadings greater than or equal to 0.35 are set in bold font.

Table 4. Predictor loadings for predicted solution (PCA on SoMe subscales predicted by BFAS aspects).

	Component	
BFAS aspect	Questioning/learning	Responsibility
O2 Openness	**0.87**	0.05
O1 Intellect	**0.55**	**0.37**
E2 Assertiveness	**0.40**	**0.52**
C2 Orderliness	−0.32	**0.70**
C1 Industriousness	−0.06	**0.64**
A1 Compassion	0.21	**0.63**
E1 Enthusiasm	0.14	**0.62**
A2 Politeness	−0.18	0.31
N2 Withdrawal	−0.17	−0.27
N1 Volatility	0.01	−0.24

Note: All loadings greater than or equal to 0.35 are set in bold font.

However, given that the BFAS accounted for almost a quarter of the overall variance in the SoMe, we instead propose that the Big Five are not ideal predictors of the SoMe's standard scale dimensions (i.e. its underlying component structure). Therefore, examining associations between the Big Five and the well-established underlying dimensions of the SoMe does not appear to be beneficial in terms of furthering our understanding about the relation between personality traits and sources of meaning in life. Investigating more fine-grained aspects of life meaning and personality allows for a deeper understanding of the associations between personality and the ways in which people derive meaning in their lives.

The emergence of two novel components (questioning/learning and responsibility) from the predicted solution (i.e. the portion of variance in the SoMe that is predictable from the BFAS; Table 3) further suggests that the Big Five aspects cannot accurately predict the established dimensions of the SoMe; rather, personality traits were related to certain sources of meaning within these dimensions that combined to form the two novel components that emerged in our predicted solution. One interpretation of these results is that personality traits are associated with a greater likelihood of finding meaning in particular avenues of life. Given the current findings, this would suggest that people with high levels of openness, intellect, and assertiveness are more likely to derive meaning through creative and non-traditional means as well as through questioning and learning, whereas those with high levels of orderliness, industriousness, compassion, and enthusiasm are more likely to find meaning through a focus on work, family, and friends.

The emergence of dimensions of life meaning involving questioning and learning on the one hand, and responsibility on the other, may reflect the sample composition. University students may be particularly likely to organize their engagement with meaning according to these two dimensions. At the same time, these two higher-order components share a conceptual similarity with the proposed higher-order personality dimensions of stability and plasticity. DeYoung (2006; DeYoung, Peterson, & Higgins, 2002) has argued that the ways in which people extract meaning from a complex universe can be understood according to a two-dimensional scheme that corresponds to higher-order dimensions of the Big Five: stability (low Neuroticism, high Agreeableness, and high Conscientiousness), similar to responsibility, involves adherence to existing cultural forms; plasticity (high Extraversion, high Openness to Experience) involves willingness to explore new forms.

One difference is the association between Extraversion and responsibility in this study, given that Extraversion is not generally believed to relate to stability (but see DeYoung et al., 2002). A possible explanation for this might involve Schnell and Becker's (2006) finding that Extraversion/Openness showed a direct association with their overall meaningfulness scale. They hypothesized that extraverted and open people are more likely to find meaning regardless of the ways in which they find meaning, which may explain why Extraversion shows associations to both

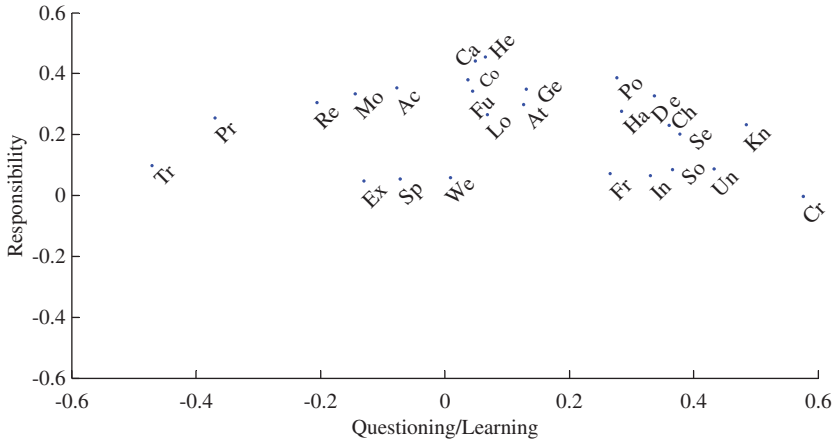

Figure 1. Plot of component loadings for predicted solution (PCA on SoMe subscales predicted by BFAS aspects) displayed in Table 3. Notes: Ac = Achievement, At = Attentiveness, Ca = Care, Ch = Challenge, Co = Community, Cr = Creativity, De = Development, Ex = Explicit Religiosity, Fr = Freedom, Fu = Fun, Ge = Generativity, Ha = Harmony, He = Health, In = Individualism, Kn = Knowledge, Lo = Love, Mo = Morality, Po = Power, Pr = Practicality, Re = Reason, Se = Self-Knowledge, So = Social Commitment, Sp = Spirituality, Tr = Tradition, Un = Unison with Nature, and We = Wellness.

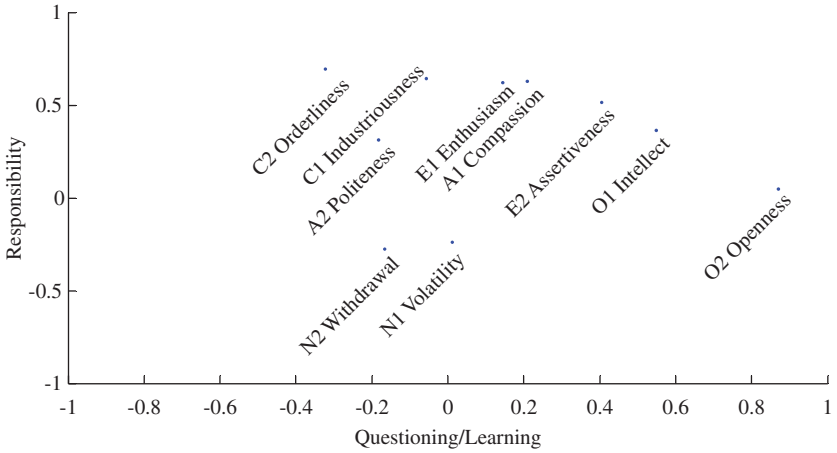

Figure 2. Plot of predictor loadings for predicted solution (PCA on SoMe subscales predicted by BFAS aspects) displayed in Table 4.
Notes: A = Agreeableness, C = Conscientiousness, E = Extraversion, N = Neuroticism, and O = Openness-to-Experience.

components that emerged from the predicted solution in the current set of results. Future research using demographically heterogeneous samples will be necessary to determine whether our obtained two-component solution is a consequence of our student sample or reflects a deeper structure.

Another interpretation of the reported results is that some SoMe items may be more accurate measures of personality than they are of meaning in life, which would lead to these items being well-predicted by the BFAS relative to the SoMe items that more accurately measure meaning in life. Although such an interpretation may be valid, it is not strongly supported by comparison of the items within the SoMe subscales that were and were not strongly predicted from the BFAS (Tables 3 and 5). However, future studies investigating the convergent and discriminant validity of the SoMe may be required to fully discount this alternative interpretation of the results.

The agreement between the overall and residual solutions (Tables 2 and 5, respectively) and the previously proposed dimensional structure of the SoMe (proposed by Schnell & Becker, 2006, and revised by Schnell, 2009) is striking, particularly in light of the fact that the original study was carried out on a German sample of 60% students with a mean age of 31.7 (the current Canadian sample is 100% students, with a mean age of 23.6). However, some minor differences were detectable, such as development, self-knowledge, and creativity being more strongly related to the Horizontal Self-transcendence component than the Self-actualization component (the opposite is the

Table 5. Component loadings for residual solution (PCA on SoMe subscales not predicted by BFAS aspects).

	Component				
SoMe scale	Horizontal self-transcendence	Self-actualization	Order	Well-being and relatedness	Vertical self-transcendence
Social commitment	**0.70**	0.18	0.04	0.01	−0.06
Unison with nature	**0.67**	0.15	−0.07	0.16	−0.01
Knowledge	0.31	**0.41**	0.10	−0.05	0.12
Harmony	**0.48**	0.33	0.11	0.18	0.27
Self-knowledge	0.23	**0.54**	0.04	−0.03	0.22
Development	0.22	**0.59**	0.20	0.04	0.11
Creativity	0.19	0.27	−0.10	0.20	0.08
Health	**0.42**	−0.06	0.16	−0.02	0.15
Generativity	0.25	**0.44**	0.29	0.15	0.36
Individualism	−0.02	**0.73**	0.08	0.20	−0.10
Freedom	−0.02	**0.64**	0.14	0.13	−0.10
Power	0.00	0.39	0.24	0.17	0.06
Challenge	0.09	**0.40**	−0.03	**0.41**	−0.12
Wellness	−0.29	0.15	0.07	**0.59**	0.06
Reason	0.09	0.09	**0.65**	−0.05	−0.01
Practicality	0.10	0.13	**0.55**	0.27	0.05
Achievement	−0.15	0.38	**0.52**	0.04	0.04
Morality	0.01	0.15	**0.49**	0.14	**0.41**
Fun	0.03	0.18	0.27	**0.58**	0.02
Community	0.24	−0.01	0.33	**0.41**	0.02
Care	0.18	0.10	0.27	0.31	0.11
Love	0.14	0.01	−0.04	**0.58**	0.22
Spirituality	0.05	0.15	−0.18	0.16	**0.80**
Explicit religiosity	0.01	0.04	0.12	−0.06	**0.79**
Tradition	0.09	−0.19	0.22	0.16	**0.52**
Attentiveness	0.25	0.30	0.00	**0.43**	**0.46**

Notes: All loadings greater than or equal to 0.40 are set in bold font.
Order of components changed to correspond to Table 2 to facilitate comparison (is not ordered by amount of variance accounted for).

case for the originally reported SoMe dimensions). Possible sources of these changes include a heightened importance placed on self-exploration, societal and environmental issues (e.g. development, self-knowledge, and social commitment) for personal growth in younger students, and/or general cultural/demographic differences.

Some limitations of this study include the use of self-report questionnaires and our reliance on a student sample. Self-report measures are commonly used when investigating both personality and life meaning. The measures included in this study go beyond traditional measures used in the field, in that they assess a variety of sources of life meaning as well as lower-level aspects of the Big Five personality traits, allowing for a deeper understanding of the association between personality traits and sources of meaning in life. With regard to the student sample used in the current study, our results replicated Schnell and Becker's (2006) findings, which were based on an older German sample that was not entirely comprised of university students. However, the components that emerged from the predicted solution (questioning/learning and responsibility) might be reliant on our sample's motivations to learn and achieve, and may, therefore, not be generalizable to other populations.

Conclusions

Our results provide new insight into the dimensions of meaning that can be predicted by the Big Five aspects, suggesting that grouping the SoMe into its established primary dimensions is not optimal for understanding how personality is associated with the ways in which people find a sense of meaning in their lives. Rather, personality traits were found to associate with combinations of sources of meaning from several of the primary dimensions, suggesting that personality traits are associated with variations in domains used to derive meaning in life. Specifically, we found that people who are open and assertive appear to derive meaning from questioning, learning, and challenging tradition, whereas people who are conscientious, extraverted and compassionate appear to find life meaning from success at work, good health, and a sense of family. By carrying out PCA on the predicted scores resulting from a multivariate multiple

regression, CPCA ensures that components (in the predicted solution) are optimized to be based exclusively on variance in the criterion variables that can be explained by the predictor variables. This method of constraining the overall variance prior to dimension reduction avoids some of the issues commonly encountered in research dealing with multifaceted and intercorrelated variables and, in our opinion, could be widely applicable to the study of individual differences, which often involves comparing two or more multidimensional constructs.

Note

1. Although, we conducted our analysis using specialized software for technical computing (MATLAB), this special case of CPCA is easily amenable to conventional statistical packages, such as SPSS, without the need for external macros or complicated syntax (contact the corresponding author for a simple description of how to perform CPCA in SPSS).

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Appendix

Table A1. Twenty six sources of meaning of the SoMe (Schnell, 2009; Schnell & Becker, 2006).

Dimension/scale	Description
Self-transcendence	
Vertical Self-transcendence	
Explicit religiosity	Religion and faith
Spirituality	Connection with a higher reality
Horizontal Self-transcendence	
Unison with nature	Harmony and unity with nature
Social commitment	Commitment for justice, public welfare, or human rights
Generativity	Doing or creating things valued beyond one's death
Care	Consideration, forethought, helpfulness
Health	Healthiness, fitness, wholesome nutrition
Self-actualization	
Individualism	Independence and realization of potentials
Challenge	Endeavour, adventure, risk
Power	Power, fight, dominance
Development	Personal growth, determination, goal attainment
Freedom	Autonomy, liberty, self-rule
Knowledge	Questioning, keeping informed, trying to understand
Achievement	Competence, skill, success
Creativity	Fantasy, aesthetic sense, originality
Self-knowledge	Confrontation with and analysis of oneself
Order	
Reason	Rationality and logic
Morality	Values and rules
Tradition	Conservation, order, holding onto the well-established
Practicality	Pragmatism and realism
Well-being and Relatedness	
Fun	Humor and enjoyment
Wellness	Pleasure and hedonism
Harmony	Balance and accord with oneself and others
Attentiveness	Awareness, continuity, ritualization
Love	Romanticism and intimacy
Community	Close contacts and friendship, sense of family