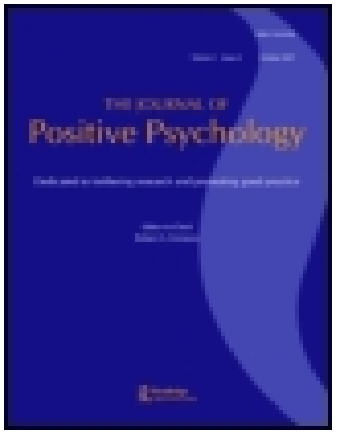

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Structural properties of personal meaning systems: A new approach to measuring meaning of life

Karin Pöhlmann [a], Barbara Gruss [a] & Peter Joraschky [a]
[a] Technical University of Dresden, Germany
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Structural properties of personal meaning systems: A new approach to measuring meaning of life

KARIN PÖHLMANN, BARBARA GRUSS, & PETER JORASCHKY

Technical University of Dresden, Germany

Abstract

This article introduces a new qualitative–quantitative approach to assess meaning of life. The participants described their sources of meaning and how they were interconnected. Four quantitative measures for (1) the accessibility of meaning-related knowledge, the degree of (2) differentiation and (3) elaboration of personal meaning systems, and (4) their coherence were calculated. The sample consisted of 59 theology and science students. The study tested (a) whether the structural properties of personal meaning systems predicted health and well-being, and (b) reflected different degrees of expertise in constructing meaning. Differentiation, elaboration, and coherence measures correlated with health and well-being and predicted life satisfaction. Theology students presented more differentiated, elaborated, and coherent personal meaning systems than science students. Both results indicate that assessing structural properties of personal meaning systems can be a promising new approach to measure meaning of life.

Keywords: *Meaning of life, personal meaning system, meaning assessment, subjective well-being*

Introduction

Viktor Frankl's (1959) and Aaron Antonovsky's (1979) work on concentration camp survivors demonstrated the significance of personal meaning orientations for overcoming adversities and achieving well-being and happiness. Meaning orientations and personal growth are considered to be core components of mental health and are also positively related to physical health (Ryff & Keyes, 1995; Ryff & Singer, 1998). However, meaning is not an inherent quality of life, it has to be actively developed by making choices and forming commitments (Baumeister, 1991). In order to evaluate one's life as meaningful, Baumeister (1991) assumes that it is necessary to experience purpose, efficacy, value, and self-worth. A sense of purpose is provided by striving successfully for relevant goals and by pursuing somewhat more elusive fulfilment experiences. A sense of value is achieved by considering oneself as good and justified in one's actions. Efficacy includes feeling effective, capable, and in control of one's life, even if that control is in part illusionary. People feel positive about their lives when they have multiple sources of self-esteem. Having multiple means to satisfy these sources of meaning makes life appear more secure, while relying on merely a few sources makes one more vulnerable to threats and losses.

Pluralistic Western societies do not offer fixed formulas for the problem of life's meaning, nor do they automatically equip people with a sense of purpose, efficacy, value, and self-worth. The wide array of potential sources of purpose, efficacy, value, and self-worth requires that each person decide individually what makes her life meaningful. Meaning is derived from several sources and domains (Debats, 1996b, 1999; Kaufman, 1986; Lukas, 1986), yet, empirical studies repeatedly found that the mere number of sources of meaning does not account for well-being. It is rather the intensity of the commitment to these sources (Battista & Almond, 1973) and the sense of fulfilment they provide (Debats, 1996a; Shek, 1991) that result in a sense of well-being and happiness. The individual meaning systems people create out of what society offers as potential sources of meaning differ in their degree of

Correspondence: Karin Pöhlmann, Department of Psychotherapy and Psychosomatic Medicine, University Hospital Carl Gustav Carus, Fetscherstrasse 74, D-01307 Dresden, Germany. Tel: 351 458 25 25. Fax: 351 458 58 26. E-mail: Karin.Poehlmann@tu-dresden.de

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complexity and integration. Their choices often fail to form a coherent meaning system, they resemble, moreover, patchwork collections of unrelated elements and consequently fail to be a source of orientation and contentment (Bibby, 1983).

The question of what makes life meaningful has intrigued empirical research, and qualitative and quantitative approaches have been applied to gather empirical data on the topic. This section will give a brief overview on qualitative and quantitative approaches to the assessment of meaning of life. Qualitative studies based on a phenomenological approach (e.g., Battista & Almond, 1973; Debats, 1996b; DeVogler & Ebersole, 1980; Wong, 1998) focused on the contents of meaning. These types of studies analysed what people described as sources of meaning in their lives and aimed at identifying reliable and stable meaning categories. Meaning categories that were identified by DeVogler & Ebersole (1980) and later replicated in the studies of Debats (1996a, 1996b, 1999; Debats, Drost, & Hansen, 1995) are understanding, relationship, service, belief, expression, obtaining, growth, and existential–hedonistic strivings.

Another approach focusing on the content of meaning-related cognitions is the personal meaning system concept of Dittmann-Kohli (1995; Dittmann-Kohli & Westerhof, 2000). She uses the term personal meaning system for the subjective representation of the self and of life as a whole that a person generates in the course of her life. The personal meaning system encompasses the interpretation of what it means to live one's life and the goals and purposes one strives for. It represents an evaluation of one's life up to the present as well as an appraisal of the possibilities and chances still to come in the person's future life stages.

The assessment of the personal meaning system is based on a sentence completion procedure which stimulates statements about the person's abilities, weaknesses, feelings, and overall evaluations of self and life. These statements are coded according to the domains of physical and psychological self, activities, social relations, time, and change, as well as self and life evaluations.

Other studies assessed meaning quantitatively based on questionnaires. Examples for this type of meaning assessment are the Purpose In Life test (PIL; Crumbaugh, 1968; Crumbaugh & Maholick, 1964), the Seeking Of Noetic Goals scale (SONG; Crumbaugh, 1977), the Life Regard Index (LRI; Battista & Almond, 1973), the Sources Of Meaning Profile (SOMP; Reker & Wong, 1988), or the Personal Meaning Profile (PMP; Wong, 1998). These self-report measures assess how strongly a person experiences a sense of meaning or purpose in life. The Life Regard Index (LRI; Battista & Almond, 1973) is a widely used instrument with good psychometric qualities.

Two crucial components of positive life regard are framework and fulfilment. Framework refers to having an overarching sense of perspective about one's life, a philosophy of life, or a direction derived from a set of life goals spawned by this perspective. The second dimension of fulfilment refers to the extent people view themselves as fulfilling the framework or having accomplished their life goals. The LRI consists of the two 14-item subscales of framework and fulfilment which are rated on a 5-point Likert scale. The sum score of the two scales provides a quantitative measure for a person's positive life regard.

Antonovsky's Sense Of Coherence scale (SOC; Antonovsky, 1983) is another widely used instrument which is supposed to assess meaning-related dimensions. The questionnaire examines to what extent people find life comprehensible, manageable, and meaningful. The cognitive component of comprehensibility refers to understanding the demands one is confronted with as predictable and ordered. Manageability relates to the coping skills and resources that are necessary to deal with the demands. Finally, the motivational component of meaningfulness refers to finding the tasks one faces significant and worth engagement. However, factor analysis failed to confirm the three dimensions (Chamberlain & Zika, 1988), and the use of a global score of sense of coherence was recommended by Antonovsky (1983) himself.

These instruments measure how strongly people experience a sense of purpose and direction in their lives, and how strongly they are motivated to seek meaning in life. Qualitative studies mainly focus on contents of sources of meaning without examining how these contents are related to each other. Studies based on questionnaires which measure formal attributes of personal meaning systems lose information on what specifically makes life meaningful to the individual. The objective of this study is to develop a standardized procedure for the assessment of content as well as structural properties of personal meaning systems. To achieve this goal, qualitative and quantitative assessment elements are combined: A qualitative idiographic approach allows for an in-depth exploration of the various elements that provide meaning to a person's life and also makes inquiries into the relations between single meaning elements possible. To assess structural features of personal meaning systems, specifically the degree of differentiation and the extent of interrelatedness of these sources, four quantitative measures were developed, representing (1) the *accessibility* of meaning-related knowledge, (2) the degree of *differentiation* of a meaning system, (3) the *elaboration* of connections between

single meaning elements, and (4) the degree of *coherence* and integration of the whole network. These quantitative measures allow for interindividual comparisons of the complexity of personal meaning systems.

The accessibility dimension illustrates how easily the individual can gain cognitive access to beliefs, experiences, and other sources that generate meaning. Accessibility can be understood as the knowledge component of personal theories on meaning (cf., Dittmann-Kohli, 1995). Knowing what makes life meaningful may be a necessary precondition for successfully creating a coherent structure that provides orientation in the face of the ever-changing demands and vagaries of modern life. However, the empirical evidence reported above suggests that the quantity of meaning sources alone does not provide people with a sense of orientation and fulfilment.

The dimension of differentiation addresses the question of the diversity of a person's sources of meaning. Is one source of meaning sufficient to deal with all the hassles, hardships, and adversities of life or is it better to rely on different sources of meaning? Religion might be one source that fulfils several needs for meaning. It forms a firm basis of values, structures daily activities, offers orientation for making decisions in everyday life, promotes favourable coping styles, and provides the social support of a religious community (Gartner, Larson, & Allen, 1991; Koenig & Cohen, 2002). Not all sources of meaning may be that encompassing, though. Baumeister (1991) hypothesizes that drawing strength and orientation from several different sources of meaning may be relevant beyond the academic sense of illustrating cognitive complexity. It may prove to be important to be able to fall back on other domains of meaning in case you lose one important source of purpose such as a close relationship or a job you feel devoted to. If one source of meaning is lost, the remaining ones become more prominent and people then actively strive for other possible sources of meaning to balance the loss. A similar argument has been formulated by Linville (1985, 1987), who argues that a greater degree of self-complexity (i.e., more categories organizing self-knowledge and also greater independence of these categories) serves as a buffer against stress and depression.

The third structural feature, elaboration, refers to how tightly the web of meaning elements is woven, that is how many connections exist between the single elements of a person's meaning system. This dimension demonstrates most clearly people's efforts to construct meaning by forming their own system of interrelated beliefs about what gives life purpose. Efforts to impose meaning on life are not always successful, though. The fourth dimension of coherence therefore describes how well the parts of a meaning web fit together and whether they form a coherent whole or rather a haphazard collection of elements that offer fulfilment on a moment to moment basis but may not provide a reliable basis in times of crises. The development of measures for elaboration and coherence was based on findings that demonstrated that the mere presence of meaning elements did not provide a sense of purpose and structure, but rather that it was crucial how they fitted together to form a coherent pattern (cf., Bibby, 1983; Debats, 1996a, 1996b, 1999; Kaufman, 1986; Lukas, 1986). The assessment procedure for these four dimensions is described in the Methods section.

In sum, the qualitative–quantitative approach preserves the idiosyncratic nature of patterns of meaning elements while it simultaneously allows for interindividual comparisons of the complexity of these concepts. To analyse whether our approach to assessing the complexity of individual constructions of meaning had identified valid dimensions, (a) we tested whether having more complex personal meaning systems possessing a high degree of differentiation, elaboration, and coherence contributed to somatic and mental health and subjective well-being; and (b) we checked whether the structural properties of meaning networks distinguished between different groups of individuals which were assumed to differ in their degree of expertise in constructing meaning.

The two groups of individuals we chose were students of theology and science/engineering students. We assumed that students of theology would possess a higher degree of expertise in the area of meaning of life. This assumption is based on two types of empirical evidence. First, there is ample empirical evidence that religious people are healthier (Gartner et al., 1991; Koenig & Cohen, 2002). Second, theories of wisdom hold that wisdom is a type of expertise concerning complex matters of life. This type of expertise is found more often in certain professions (Baltes & Smith, 1990), such as psychotherapists and ministers who counsel people on how to deal with difficult life situations and crises. The science/engineering students were chosen as representatives of a view of life that relies more on science and the empirical findings it provides than on the spiritual and historical perspective of the humanities. We chose young people because we expected their life paths and their current life situations to bear a strong resemblance to each other. Attending school and university as well as finding a partner and becoming economically independent from your parents are common life tasks for many young adults. Certainly, not all of them have experienced exactly the same type or number of critical life events, but the circumstances of life should vary far more among middle-aged or older adults.

Methods

Samples

Data on personal meaning systems, somatic and mental health, and subjective well-being was collected in two student samples. The data was collected at the beginning of the semester and participation in the study was voluntary. Sample one consisted of 30 students of theology (11 men, 19 women), their mean age was 24.4 years ($SD = 3.6$). Nine participants of this group were studying religious education and the other 21 were parish priests to be. The second sample comprised 29 science and engineering students (15 men, 14 women) with a mean age of 23.0 years ($SD = 2.0$). This group included students from several subjects, among them biology ($n = 5$), physics ($n = 4$), computer science ($n = 4$), engineering ($n = 4$), and chemistry ($n = 3$). Most of the theology students were in their seventh study term ($M = 6.9$; $SD = 4.1$), the science and engineering students were in their sixth term ($M = 5.5$; $SD = 3.2$). No differences were found between the two groups in sociodemographic characteristics such as gender ratio, age, and study years.

Physical health, mental health, and subjective well-being

A global assessment of physical health was made by asking the participants to rate the statement ''Right now I feel absolutely healthy and physically fit'' on a scale ranging from 1 (not at all true) to 5 (absolutely true). Mental health was assessed using the Hospital Anxiety and Depression Scale (HADS; Herrmann, Buss, & Snaith, 1995). The questionnaire contains two scales, for depression and anxiety, respectively, with seven items each. Scores below seven indicate that the person is neither depressed nor suffering from anxiety. Two instruments were applied to assess different components of subjective well-being: the Satisfaction with Life scale and the Sense Of Coherence questionnaire. The Satisfaction With Life scale (Diener, Emmons, Larsen, & Griffin, 1985) is a one-dimensional self-report instrument measuring global life satisfaction based on five items (e.g., ''I am satisfied with my life''). While the original uses a scale ranging from one to seven, we modified the range from one to five in order to make the response format equal for all items. A nine item short version of Antonovsky's original questionnaire was used to assess the sense of coherence. The SOC-L9 (Schumacher, Wilz, Gunzelmann, & Brähler, 2000) has very good psychometric qualities (Cronbach's alpha = 0.87) and correlates highly with the original, longer version of the instrument ($r = 0.94$).

The assessment of personal meaning systems

The participants were first asked to name all things, elements, experiences, or beliefs that contributed to making their lives meaningful. They were given 5 minutes to write down these meaning elements. Second, they were asked to rank their meaning elements according to their importance. The time period assigned to this task was 2 minutes. In the third and final step, the participants were given 5 minutes to describe how these elements were related to each other. The time limits were set to standardize the assessment procedure and to minimize memory effects on meaning-related information.

Content of meaning elements

The elements named by the participants were assigned to eight meaning domains. These were based on Debats' (1999) set of significant commitments, which in turn was derived from categories identified by Battista and Almond (1973) and DeVogler and Ebersole (1980, Ebersole 1998). Several of Debats' categories were slightly modified. The eventual categories were: *relationships* (commitment to spouse, family, friends), *life task* (engagement in one's job, schooling, or other main occupation), *personal well-being* (experiencing fulfilment in the appreciation of life, hedonistically striving for pleasure, and maintaining one's physical and mental health), *self actualization* (striving for goals and realising one's potentiality), *service* (helping other people, being involved in social causes), *beliefs* (practicing religious or spiritual beliefs, being committed to social/political beliefs), *materiality* (pursuing materialistic goals and gratification), and a *miscellaneous* category for statements not pertaining to the other seven domains.

The individual descriptions were assigned to the eight meaning categories by two independent raters who were blind to sample assignment (i.e., whether the descriptions were from theology or science students). To examine the extent of agreement between the two raters, kappa coefficients were calculated. They ranged from $\kappa = 1$ for material elements to $\kappa = 0.75$ for meaning elements concerning self actualization, indicating good to very good rater agreement for all meaning categories.

Structural features of meaning systems

Four different measures were created to represent different structural features of how individuals construct meaning in their lives. As a measure of the *accessibility* of meaning-related knowledge, the number of elements named as sources of meaning during the first step of the assessment procedure

was counted. To assess differentiation and elaboration of the personal meaning structures, the individual descriptions were transformed into network illustrations by assigning the contents to the respective categories and drawing lines between them for each connection the person had described. For example, a statement like "doing sports helps me to relax and replenish my energy level so that I can fully commit to the demands my job encompasses" would be transformed into well-being ("doing sports helps me to relax and replenish my energy level . . .") and connected by a line with life-task ("... fully commit to the demands my job encompasses").

Based on these network illustrations, the measures for differentiation and elaboration were calculated. The number of different meaning categories present in the network represents the degree of *differentiation*. The number of connections made between the single elements of the person's network indicates the degree of *elaboration* of the meaning system. And finally, two different external raters than those who transformed the written text into web illustrations made a global rating of the *coherence* and integration of each person's meaning web based on a 5-point scale from 1 (not coherent) to 5 (very coherent) based on the written text. Examples for different degrees of coherence in the individual descriptions of personal meaning systems from another sample of psychology students served as anchor ratings. To assess rater agreement, weighted kappa was calculated, which was $\kappa = 0.75$, indicating good rater agreement. For further analyses, mean ratings of the two scores were used.

Results

Sources of meaning

The participants were first asked to name all things that offered experiences of meaning and fulfilment to their own lives. Table I presents how frequently elements pertaining to the eight meaning domains were named by theology and science/engineering students. It also shows which categories they rated to be their most important sources of meaning.

Theology students as well as science/engineering students named 262 meaning elements altogether, which means that individuals in both groups had named 9.0 elements on average (see Table I). Mann-Whitney U-tests were conducted to examine whether the two groups differed in what they drew meaning from. In both groups, relationships and self-actualization were the most frequently named sources of meaning. The third most frequently named category was personal well-being; science/engineering students named significantly more meaning elements of this kind than theology students did ($Z = -2.373$; $p = 0.018$). And finally, belief was named five times more frequently by theology students than by science/engineering students ($Z = -4.328$; $p = 0.000$). Twelve of the future parish priests and religious education teachers did not consider religious faith or other types of beliefs as essentials for having purpose in life. The two other categories of life task and service were only rarely named as contributing meaning.

Table I. Sources of meaning and most important sources of meaning of students of theology and science and engineering students.

	All meaning elements		Most important meaning elements	
	Theology Students (%)	S/E (%)	Theology Students (%)	S/E (%)
Relationships	38.2	34.8	41.4	72.3
Life task	6.1	3.4	–	–
Belief	11.8	2.3	48.3	3.4
Personal well-being	17.6	30.5	–	6.9
Self-actualization	22.9	27.1	7.0	17.2
Service	3.1	1.1	3.5	–

So, even though the number of elements generating meaning was the same for both groups, there were differences in the quantitative significance of several categories, namely subjective well-being and belief. Commitment to meaning elements is more important than their mere number. When looking at the elements that were rated as most important to contributing meaning, very different patterns for theology and science/engineering students were found. Relationships proved to be a far more important source of meaning for the science/engineering students than they were for theology students. While relationships were an important source of meaning for theology students, too, their most important source of meaning was belief. Other differences concerned the importance of self-actualization and subjective well-being: science/engineering students mentioned self-actualization twice as frequently as theology students, and well-being was an important source of meaning only for the science/engineering students while theology students did not name it at all as an important source of meaning.

Intercorrelations between the four structural properties of personal meaning systems

Before analysing the relations between the dimensions representing structural properties and health and well-being, we examined whether the four measures of accessibility, differentiation, elaboration,

and coherence could be considered independent dimensions of personal meaning systems. The correlations between the dimensions ranged between $r = 0.21$ for accessibility and differentiation and $r = 0.77$ for elaboration and coherence. All other correlations were between $r = 0.50$ and $r = 0.65$, indicating that there was little overlap between the dimensions and they could be considered different aspects of personal meaning constructions. The high correlation between elaboration and coherence demonstrated a high degree of overlap between these two dimensions, even though they were based on two different sources of information. The evaluations of these two aspects were performed by two different pairs of raters, one rating elaboration and one coherence, respectively. The elaboration rating was done based on the web illustration and was a purely quantitative count of connections between meaning elements, while the coherence rating was done based on the participants' written text and includes an appraisal of whether the story made sense (e.g., was free of contradictions). Both ratings appraised the interconnectedness of the meaning sources which was considered to be the essential component of active meaning construction. It is interesting to note that counting the number of connections between meaning elements can serve as an alternative approach to evaluating an individuals story as a whole. The high degree of agreement between the two measures can be seen as support of the validity of this aspect of assessment. In terms of differential validity, it was found that the elaboration measure correlated significantly negatively with anxiety while the coherence rating did not (see Table II).

Table II. Correlations between structural meaning properties and health and well-being measures.

	ACC	DIFF	ELA	COH
Sense of coherence	0.22	0.39**	0.36**	0.42**
Satisfaction with life	−0.02	0.46**	0.34**	0.35*
Depression	−0.17	−0.18	−0.25*	−0.32*
Anxiety	−0.02	−0.12	−0.27*	−0.21
Global physical health	−0.01	−0.18	0.25*	0.26*

ACC = Accessibility, DIFF = Differentiation, ELA = Elaboration, COH = Coherence. *$p \leq 0.05$; **$p \leq 0.01$

Table III. The influence of structural properties of personal meaning systems on satisfaction with life.

	R	R^2	R_i^2	F_i	p_{Fi}
I					
Sense of coherence	0.79	0.63		105.6	0.000
II					
Accessibility					
Differentiation					
Elaboration	0.85	0.69	0.09	4.6	0.000

R_i^2 = increment of R^2
F_i = increment of F

Structural properties of personal meaning systems and health and well-being

To examine whether the complexity and coherence of personal meaning networks contribute to health and well-being, correlations were calculated and a regression analysis carried out with the structural dimensions as predictors of life satisfaction. Table II shows the correlations between the structural properties of personal meaning systems and health and well-being measures.

As was expected, the mere quantity of sources of meaning did not correlate with health or well-being. But deriving meaning from different sources and being able to build an elaborate network of meaning by connecting these different elements contributed significantly to physical and mental health and subjective well-being. The external evaluation of the coherence of the students' meaning system also proved to be positively correlated to health and well-being measures (i.e., students whose meaning systems were evaluated as more coherent and free of contradictions by others felt healthier and were more satisfied with their lives).

A hierarchical regression analysis was conducted to examine whether structural properties of personal meaning systems contribute significantly to a person's life satisfaction. The self-rated sense of coherence scores were entered at the first step in the equation and the scores for accessibility, differentiation, elaboration, and coherence of the meaning systems were entered jointly at step 2. This allowed for an assessment of the degree to which the more formal structural features of personal meaning systems added unique information to the participants' appraisal of how predictable, manageable, and meaningful their life is (refer to Table III for R^2 and R^2 change values).

The sense of coherence a person experienced contributed fundamentally to life satisfaction, explaining 63% of the variance. Still, the structural meaning dimensions of accessibility, differentiation, elaboration, and coherence accounted for an additional 9% of the variance.

Degrees of expertise in constructing meaning

Before testing for differences in structural properties of their meaning systems, we checked whether students of theology and students of science and engineering differed in the appraisals of their physical and mental health and subjective well-being. We

Table IV. Structural properties of personal meaning systems of students of theology and science and engineering students.

	Theology students		Science/engineering students			
	M	*SD*	*M*	*SD*	*F*(1)	*p*
Accessibility	9.0	3.3	9.0	4.2	0.24	n.s.
Differentiation	3.9	0.9	3.4	1.0	6.05	0.02
Elaboration	5.0	2.2	3.9	1.9	7.53	0.01
Coherence	3.6	0.9	3.1	0.9	5.01	0.03

found no differences in their global physical health. There were also no differences in measures of depression and anxiety, both groups proving to be reasonably healthy in both areas. However, students of theology expressed a higher sense of coherence and were more satisfied with their lives.

It was then examined whether theology students possessed a higher degree of expertise in dealing with the problem of making life meaningful. In that case their meaning systems should be more differentiated, more elaborated, and more coherent, but not necessarily more accessible. Table IV presents the data on accessibility, differentiation, elaboration, and coherence for students of theology and science/engineering students.

The results demonstrate that both groups derived meaning from the same number of elements. However, in terms of differentiation and elaboration, the meaning networks of theology students were more complex than those of science and engineering students. When theology students described what made their life meaningful they listed elements deriving from a broader spectrum of categories and they also established more connections between these elements. The external rating based on the description of how their meaning sources were related also indicated that the meaning systems of theology students were more coherent and complex than those of science and engineering students.

Discussion

The aim of this paper was to introduce a new approach to assessing meaning of life that specifically focuses on the complexity and degree of integration of sources that individuals draw meaning from. The procedure assesses the structural features of accessibility, differentiation, elaboration, and coherence of personal meaning systems. These structural properties represent essential aspects of how individuals form a coherent framework comprised of different sources of meaning. With the exception of the elaboration and coherence measures, which both refer to the interconnectedness of a person's sources of meaning, the dimensions proved to be sufficiently independent of each other to view them as separate aspects of personal meaning systems.

Since the assessment of structural features of personal meaning networks is based on idiographic descriptions it is possible to preserve the idiosyncratic meaning pattern while allowing for inter-individual comparisons of the structure of these patterns. While the mere number of meaning elements did not contribute to health or well-being, the differentiation, elaboration, and coherence measures of individual meaning systems correlated with physical and mental health and well-being and were a significant predictor of life satisfaction. The more different categories people were able to draw meaning from, the more satisfied they were with their lives. The results also confirmed that the two groups of theology and science/engineering students differed in the degree of complexity of their personal meaning systems.

Structural properties of personal systems and health and well-being

Confirming existing evidence, the mere number of sources of meaning did not contribute to well-being (Battista & Almond, 1973). The structural properties of personal meaning systems on the other hand showed significant correlations with health and well-being. Being able to experience meaning from different sources contributes to well-being but is not related to anxiety or depression. The elaboration of meaning systems showed significant correlations to well-being as well as to mental and physical health measures. This is true also for the coherence measure where two external raters appraised the coherence of the individual's story of his experience in what makes life meaningful. Both dimensions reflect the individual's active creating of meaning by weaving distinct sources of meaning together to form a personal meaning system. The structural properties of personal meaning systems proved to have an additional impact on life satisfaction even after the sense of coherence as another strong predictor of life satisfaction had been taken into account. Both results demonstrate that the structural properties of differentiation, elaboration, and coherence are crucial dimensions to unravel how people create their own meaning systems.

Degrees of expertise in making life meaningful

We assumed that the personal meaning systems of future parish priests and religious education teachers would prove to be more complex than those of future engineers because religious training prepares them to deal with the crucial questions of life and to help other people find answers to them. The results

confirmed this hypothesis. While theology and science/engineering students named a similar number of sources of meaning they differed in the structural properties representing the complexity and coherence of personal meaning networks: the meaning systems of theology students were more differentiated and more elaborated compared with those of science and engineering students (i.e., they derived meaning from a more diverse set of meaning elements and these diverse meaning elements were more closely interconnected). External raters considered the meaning systems of theology students to be more coherent than those of science students. Both groups differed also in terms of the specific sources they derived meaning from. Theology students named belief significantly more frequently and subjective well-being less frequently than science students. These differences were even more marked considering their main sources of meaning: only science/engineering students considered subjective well-being an important meaning element while they rarely regarded belief an important element of meaning. Theology students seemed to be equipped with more meaning elements that provide orientation and structure in the long run, while science/engineering students seemed to be more committed to the type of meaning sources that offer immediate pleasure and fulfilment. Even though we chose the two groups on account of their similar life situation and were unable to find differences in sociodemographic characteristics and health, theology students proved to possess more complex meaning structures. They also scored higher on measures of subjective well-being such as life satisfaction and sense of coherence, indicating that they find their lives more manageable and meaningful. This confirms our assumption that future parish priests and religious education teachers should be more capable of constructing meaning either as a result of their religious belief or as a consequence of their developing a greater pertinent expertise due to their training. It is intriguing that differences in the complexity of personal meaning systems are evident even at their relatively young age. A longitudinal follow-up would be interesting, to see what happens in later stages of life.

The relationship between content and structure

One question that is not addressed by the results of this study concerns the relation between the content of meaning elements and the structure of the meaning web. In other words, does it matter what type of meaning elements you weave into the pattern of your meaning web? Different combinations of meaning elements form different patterns of meaning, while the structural features, especially the elaboration component, indicate how tightly they are woven together to form a coherent whole. An important difference related to the contents of individual meaning systems could be whether they provide the individual with a long-term life orientation and stability or whether they are relying more on meaning elements that provide immediate fulfilment experiences or future-oriented outcomes (cf., Baumeister, 1991).

Evidently, further research is required to validate the new assessment procedure, and to replicate the findings based on larger samples. Longitudinal studies are necessary to examine the stability of structural characteristics of personal meaning systems such as accessibility, differentiation, elaboration, and coherence and to gain a more thorough insight into the link between structural properties of personal meaning systems and subjective well-being. Another approach to check the validity of the structural properties as crucial components of how meaning construction would be to compare these measures of complexity of personal meaning systems with traditional self-report instruments that provide measures for the broadness of a person's meaning orientation. For example, the Personal Meaning Profile (PMP; Wong, 1998). In spite of these open questions, the findings reported here suggest that the assessment of structural properties of meaning systems is a promising new approach to analyse the crucial question of how people connect different sources of meaning and form their own coherent theory of what makes life meaningful.

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