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## Measuring meaning in life at macro and micro-level: real-world implications and future directions (types, approaches, and number of envisioned and realized meanings in life)

Joel Vos


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# Measuring meaning in life at macro and micro-level: real-world implications and future directions (types, approaches, and number of envisioned and realized meanings in life)

Joel Vos

Metanoia Institute, IMEC International Meaning Events and Community, London, United Kingdom

## ABSTRACT

This study advocates measuring meaning in life at a micro-level, addressing limitations of instruments measuring macro-level concepts such as the presence and search for meaning, purpose, coherence or significance. Three studies were conducted: a worldwide survey ( $N = 1281$ ), a longitudinal Corona-Survey ( $N = 1451$ ), and a clinical trial on Systematic Meaning in Life Psychotherapy ( $N = 70$ ). Micro-level instruments included: Meaning Sextet Questionnaire, Meaning Approach Scale, Number of Meaning Scale. Findings revealed that social and large types of meaning strongly predict positive well-being, while materialistic, hedonistic, and self-oriented types predicted negative outcomes. The critical-intuitive approach to meaning-making significantly predicted better well-being, whereas traditional-conformist and goal-oriented approaches predicted worse outcomes. The minimum number of realized meanings for well-being was 5.63. Micro-level instruments identified larger effects and explained more variance than macro-level instruments. This research suggests micro-level assessment (realized and envisioned types, approaches and number of meanings) is particularly relevant in real-world situations where detailed, individualized meaning-making matters, such as psychotherapy and counter-radicalization interventions.

## ARTICLE HISTORY

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## KEYWORDS


Meaning; purpose; measurement; well-being; questionnaire; psychotherapy; existentialism

Meaning in life is a multifaceted concept that has garnered significant attention in psychological research (Vos, 2022, 2025, 2023a-b), particularly as it has been associated with positive well-being and reduced risk of mental and physical health problems (Park, 2010; Schulenberg et al., 2008; Seligman, 2002; Vos, 2022, 2021a-b, 2016a-b; Wong, 2013). Contemporary definitions encompass three core elements: comprehension, purpose, and mattering (George & Park, 2016, 2017; Martela & Steger, 2016). A comprehensive systematic review has expanded these concepts, framing meaning as an individual's overarching framework comprising motivation (e.g. purpose, goals), values, understanding of their context (e.g. worldview, coherence, cultural and historical context), and self-worth/significance (Vos, 2016a, 2016b, 2018, 2022). Importantly, empirical studies underscore that meaning transcends philosophical theories, incorporating practical and existential skills and commitment (ibid.). While these definitions have proven invaluable for research purposes, they often prove too broad for practical application in psychotherapy, coaching, or individual training (Vos et al., 2025). Whereas these definitions address general meaningfulness at a macro-level, a more granular, micro-level examination

of meaning may be needed to precisely understand an individual's struggles and develop tailored psychological interventions and personal development strategies. This article proposes four distinct micro-level components of an individual's sense of meaning in life: types of meaning, approaches to meaning, number of meanings, and the detailed differences between envisioned and realized meanings. To illustrate the relevance of micro-level assessment, consider the following case study:

Sarah, a 35-year-old accountant, epitomized success on paper but grappled with a profound sense of emptiness and unfulfillment. Initial macro-level assessment using the Meaning in Life Questionnaire revealed a low presence and a moderate search for meaning. Subsequent meso-level examination, in line with the Multidimensional Existential Meaning Scale, indicated moderate levels of coherence and purpose but low personal significance. These generic outcomes confirmed the meaning-oriented struggles that Sarah had already told the therapist. However, the questionnaires failed to provide more specific insights or practical solutions. Recognizing this limitation, her therapist administered three micro-level questionnaires. The Meaning Sextet Questionnaire unveiled a discrepancy between Sarah's most valued social types of meaning (i.e., personal relationships and

**CONTACT** Joel Vos  [joel.vos@metanoia.ac.uk](mailto:joel.vos@metanoia.ac.uk)  The Metanoia Institute, 13 North Common Road, Ealing, W5 2QB, United Kingdom

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community impact) and her actually realized meanings (much professional and material success, but little social types of meaning). The Number of Meanings Scale exposed a limited range of fulfilling experiences, primarily centered on professional accomplishments. The Meaning Approach Scale identified a rigid, goal-oriented life strategy, which research suggests is less fulfilling than approaches incorporating intuition and critical thinking. These micro-level insights elucidated the root causes of Sarah's experiences of low meaningfulness and significance, as the macro-level and meso-level questionnaires had already shown. Armed with this granular understanding, her therapist crafted a tailored intervention plan to diversify her sources of meaning, integrate experiential reflection into her goal-driven life, and bridge the gap between her envisioned and realized meanings through increased social activities and community volunteering. This precision-targeted approach fostered Sarah's gradual development of a larger sense of meaningfulness and significance.

### Types of meaning

The micro-level assessment of an individual's subjective sense of meaning in life has evolved from Frankl's (1948/1985) foundational work on finding meaning through experiences, productivity, and attitudes. Following Frankl's micro-level clinical observations, various measurement tools have been developed, including the Purpose in Life Test (Crumbaugh, 1977), Sources of Meaning and Meaning in Life (SoMe) (Schnell, 2009), and Personal Meaning Profile (Wong et al., 2013). Scholars such as Fegg et al. (2008), Längle (2019), Reker and Wong (1988), Scheler (1973), Van Deurzen (2004), and Westerhof et al. (2004) have proposed frameworks to summarize the various micro-level meaning-making strategies. Recent frameworks like SoMe are more comprehensive, yet diversity persists among questionnaires and frameworks. Therefore, Vos (2023a) conducted a systematic review of all 107 empirical studies on micro-level meaning, involving 45,710 participants across 48 countries, revealing six types and 27 subtypes of meaning: materialistic, hedonistic, self-oriented, large and existential-philosophical types (see Supplemental Table 1). For example, Sarah found social types of meaning important in life, but only realized materialistic types. This Universal Meaning Sextet is the most comprehensive framework of micro-level meanings, as this integrates and extends all previous frameworks. Based on this universal typology, Vos developed and validated the Meaning Sextet Questionnaire (MSQ), via a Delphi group of eight researchers, an eight-participant interview study, a 108-participant feasibility study in the UK, US and Europe, and a validation study with 1,281 participants from 49 countries.

### Approaches to meaning

Whereas the previous paragraph asked *what* individuals find meaningful, this paragraph asks *how* individuals precisely find meaning. Types of meaning are like building blocks, but they do not describe *how* people construct their meaning framework with these blocks (cf., Merleau-Ponty, 1964). Vos has identified three dominant approaches to finding meaning in his systematic historical-linguistic analysis of Indo-European words for meaning (Vos, 2023b), systematic analyses of economic and cultural studies (Vos, 2020), philosophical analyses (Vos, 2019, Vos, 2015), and further validation through a worldwide survey (Vos, 2023b).

The traditional-conformist approach emphasizes adherence to established values and norms through religious, cultural, or ideological practices. The goal-oriented (also called 'functionalistic' or 'mechanistic') approach views meaning as actively constructed through personal goal-setting and linear routes to ambitious goals. The critical-intuitive (or 'phenomenological') approach relies on authentic experiences and intuitions to identify meaning through critical self-reflection and embracing life's complexities.

Most questionnaires that measure meaning at a macro or meso-level appear to assume a goal-oriented approach, using terminology such as goals or purpose (e.g., Crumbaugh, 1977; Crumbaugh & Maholick, 1964; Ryff & Keyes, 1995). Some questionnaires employ a traditional-conformist approach, focusing on religion and self-transcendent meanings (Wong, 2020), whereas recent publications incorporate more experiential/intuitive approaches (Kim et al., 2022; Vanhooren et al., 2022). Recognizing the lack of a comprehensive questionnaire that simultaneously measures all three approaches, Vos developed and validated the Meaning Approach Scale (MAS), employing the same methodological development as the MSQ (Vos, 2023b). For example, the MAS showed that Sarah predominantly used a rigid, goal-oriented approach, which research indicates is less fulfilling than a critical-intuitive approach that utilizes experiences, intuition, and critical reflection to discover meaning in life (Vos, 2023b).

### Number of meanings

The idea that it is beneficial to have multiple examples of meaning in life has been championed by several influential figures in existential psychology, such as Frankl (1948/1985) and Fabry (1986). Lukas (2014) further developed this notion, suggesting that having multiple fulfilled meanings in life can serve as a buffer against life's inevitable challenges. She argues that individuals

**Table 1.** Socio-demographic characteristics.

Sociodemographic characteristic	Results	WSM	CS	SMLP
Total N		1281	1451	70
Country	Southeast-Asia	250	267	0
	Continental Europe	219	348	0
	Middle East	143	92	0
	Latin & South-America	115	99	0
	United Kingdom	113	187	70
	Africa	98	84	0
	Russia	97	74	0
	Australia & New-Zealand	95	76	0
	United States	87	123	0
	Canada	64	101	0
Region type*	Large City	691	709	
	Small city	237	289	
	Village	256	347	
	Countryside	97	106	
Housing situation	Living with partner	362	401	24
	Living with partner and child(ren)	321	315	23
	Living alone	259	328	15
	Living with extended family	183	209	3
	Living with others(non-relatives)	156	198	5
Age(mean, st.dev.)		31.4(11.2)	32.2(13.2)	35.9(9.3)
Gender	Female	730	769	39
	Male	540	655	28
	Non-binary	11	27	3
Sexual orientation	Heterosexual	830	895	53
	Homosexual/bisexual	217	202	8
	Not disclosed	231	354	9
Years of education	M(SD)	9.7(6.7)	10.5(5.7)	9.6(7.2)
Work situation	Employed	431	561	30
	Self-employed	329	409	23
	Student	267	261	3
	Unemployed	131	69	5
	Retired or sick	123	79	9
Work type*	Vocationally trained craftsperson, technician, IT-specialist, nurse, artist or similar	551	235	15
	Generally trained office worker or secretary	4	241	8
	Academically trained professional or similar	231	265	13
	Unskilled or semi-skilled manual worker	141	319	17
	Manager	216	233	12
	Manager	139	158	5
Sense of ethnic Belonging*	To a majority group	1037	987	
	To a minority group	123	359	
	To a very small minority group	121	105	
Religion (multiple possible)	Roman Catholic	398	406	8
	Protestant	267	289	15
	Muslim	321	359	16
	None	298	267	16
	Hindu	176	198	5
	Spiritual or Something-ist	165	178	3
	Buddhist	115	156	3
	Jewish	57	76	3
	Daoism, Confucianism, Shinto or Jainism Sikh	32	33	0
	Other	39	37	1
Relationship status	Married	451	523	21
	Single	327	365	19
	Relationship	324	333	17
	Widowed `	121	165	10
	Other	58	65	3
Children	Number of children (M, SD)	2.1(1.7)	3.2(1.8)	1.7(1.4)

\*Not measured in SMLF.

with multiple examples of meaning have greater resilience when confronted with losses or setbacks in their life goals. The COVID-19 pandemic lockdowns starkly illustrated this principle; case studies indicated that individuals who depended solely on outdoor activities for their sense of meaning experienced more stress as they had no fulfilling meanings left when the lockdowns made it impossible to go outdoors; individuals with

more varied meanings, including activities that could be done indoors, seemed less likely to feel stressed (Vos, 2021c). This scenario reinforces the wisdom of the adage, 'Don't put all your eggs in one basket'. Despite the compelling rationale for cultivating more meanings, empirical research has yet to establish the minimum number of meanings necessary for leading a fulfilling and flourishing life.

### **Envisioned versus realized meanings**

During the development of the MSQ and MAS, meaning experts and research participants highlighted a significant distinction between the meanings they envisioned and those they actually realized (Vos, 2023a-b). For instance, at the beginning of the COVID-19 lockdowns, many individuals found the same meanings important as before the pandemic – such as outdoor activities. However, their inability to realize these important meanings led to frustration, stress and mental health problems. Subsequently, we saw during the pandemic that many individuals flexibly shifted to other meanings, such as online self-study – which could be done indoors during lockdowns – which led to better life satisfaction and well-being (Vos et al., 2025; Vos, 2021). Thus, it seems to be the gap between envisioned and realized meanings – ‘unrealized meanings’ – that is important for an individual’s life satisfaction and well-being (cf. Kurganski et al., 2022; Vos et al., 2013). When individuals experience low life satisfaction and well-being due to these unrealized meanings, they may shift how they realize, re-envision and re-appraise their meanings.

Individuals are more likely to feel unfulfilled or frustrated by unrealized meanings if these meanings are important to them. Individuals differ in the meanings they find important. For example, on average, individuals in Western countries find materialistic, hedonistic, and self-oriented types of meaning relatively more important than those in countries where people dominantly see social and large types as important (Vos, 2020, 2022, 2023a, 2025). Furthermore, across cultures, individuals experience better life satisfaction and well-being when they predominantly focus on social and large types, rather than materialistic, hedonistic, and self-oriented types; thus, unrealized social or large types are more likely to negatively impact life satisfaction and well-being (ibid.).

To differentiate between envisioned and realized types of meaning, the MSQ has two subscales: an envisioned types of meaning subscale measuring the importance of an individual’s attributes to each type and sub-type of meaning, and a realized types of meaning subscale measuring the extent to which an individual realizes each type and sub-type (Vos, 2023a). As hypothesized, the number of unrealized meanings predicted life satisfaction and well-being in feasibility and validation studies with the MSQ (Vos, 2023a). Thus, an individual’s life satisfaction and well-being seem to depend on how much they realize the meaningful life and the meaningful world they envision.

Based on these studies, we may expect that an individual’s total number of realized meanings (measured using micro-level instruments, such as the MSQ) correlates with a generic sense of meaningfulness (measured using macro-level instruments, such as the Purpose in Life test or the Meaning in Life Questionnaire-Presence subscale). We may also expect that the total amount of unrealized types of meaning (measured at micro-level), particularly social and large types of meaning, leads to a generic sense of dissatisfaction or crisis about life, for instance, measured at macro-level with the Satisfaction With Life Scale (Diener et al., 1985), SoMe-crisis subscale (Schnell, 2009) or the dissatisfaction factor in the Seeking of Noetic Goals scale (Schulenberg et al., 2014). We would also expect that unrealized meanings (measured at micro-level) predict various measures of well-being. Conversely, realizing the meaningful life and world an individual envisions (measured at micro-level) may improve their life satisfaction, well-being and generic sense of meaningfulness (measured at macro-level).

How could individuals respond to unrealized meanings? Park and Folkman (1997) described in their meaning-making model that an individual’s response to unrealized meanings depends on their appraisal of the situation (Park, 2010). Individuals assess their situation’s opportunities and limitations to realize the meanings they find important (‘primary appraisal’). Subsequently, they evaluate their resources to cope with unrealized meanings, such as their personal skills and the resources in their social network and society (‘secondary appraisal’). These primary and secondary appraisals are often influenced by one’s personal situation, social network and society (Da Silva et al., 2024; Kurganski et al., 2022).

The ‘awareness of such feelings of emptiness [triggered by unrealized meanings, –author clarification] can motivate people to respond to their circumstances, and ... guide them in an objective direction that they experience as full or satisfying’ (Schulenberg et al., 2008, p. 449). When life events or situations make it difficult to realize what is meaningful, individuals may use various strategies to maintain an overall sense of meaning (Proulx & Heine, 2006, 2010; Proulx & Inzlicht, 2012).

Firstly, individuals may feel helpless and not know what to do, as operationalized by the indecisiveness factor in the Seeking of Noetic Goals scale (Schulenberg et al., 2014). Secondly, when individuals feel that their meanings are under threat or lost, or if there is an opportunity to improve their meanings, they may try to realize their meanings via an active search for meaning (Da Silva et al., 2024; Kurganski et al., 2022); this may be measured with the Meaning in Life Questionnaire-Search subscale (Steger et al., 2006). Thirdly, individuals may reappraise the situation, as the meaning-making model has shown

(Park, 2010; Park & Folkman, 1997) and as research has shown that people may accommodate and assimilate life events in their global meaning framework (Heine et al., 2006; Park, 2010). Fourthly, individuals may also re-visit the meanings they find important, such as re-prioritizing or trying out new examples or types of meaning (Heine et al., 2006). Individuals may also change their approach to life, for example, by striving more passionately and intensely towards their goals (i.e. increased goal-oriented approach), by increasingly following a tradition or charismatic leader (i.e. increased traditional-conformist approach), and/or by avoiding existential feelings and critical-thinking (i.e. decreased critical-intuitive approach) (cf., Heine et al., 2006; Hogg, 2014; Luyckx et al., 2009).

Figure 1 summarizes this section on envisioned and realized meanings. This shows that individuals envision specific types and approaches to meaning that they find important. However, they may not be able to realize all types and approaches. Depending on their personal situation, social network and society, individuals may differ in their experiences and appraisal of these unrealized meanings. For example, individuals may respond to these experiences and appraisals of unrealized meanings by becoming indecisive, adopting new methods to realize their meanings, re-appraising the situation, or re-envisioning their approaches to meaning. For example, in the before-mentioned case study, Sarah was dissatisfied about her life and searched for meaning (measured with

macro-level instruments) because she did not realize the social type of meaning most important to her (measured at micro-level with the MSQ). Following the unrealized types of meaning that the MSQ revealed, Sarah's therapist helped her set goals and develop skills to develop personal relationships and community impact. This micro-level assessment of unrealized meanings may also explain the frequently reported ambiguous and complex relationships between the presence and search for meaning measured with macro-level instruments (Park, 2010, Schulenberg et al., 2011; Steger et al., 2009). Thus, measuring the relationship between envisioned and realized meanings at micro-level may reveal more details and explain more variance in individual meaning-making than macro-level instruments.

### Research questions

In summary, while macro and meso-level assessments offer valuable overviews of meaning in life, micro-level tools provide the precision necessary for identifying specific causes of meaning-oriented struggles and developing targeted clinical interventions and personal development strategies. However, although several micro-meaning instruments have been developed, most have only been validated in controlled settings such as laboratory studies, student populations, or generic surveys. We hypothesize that while macro/meso-level measurements may suffice in

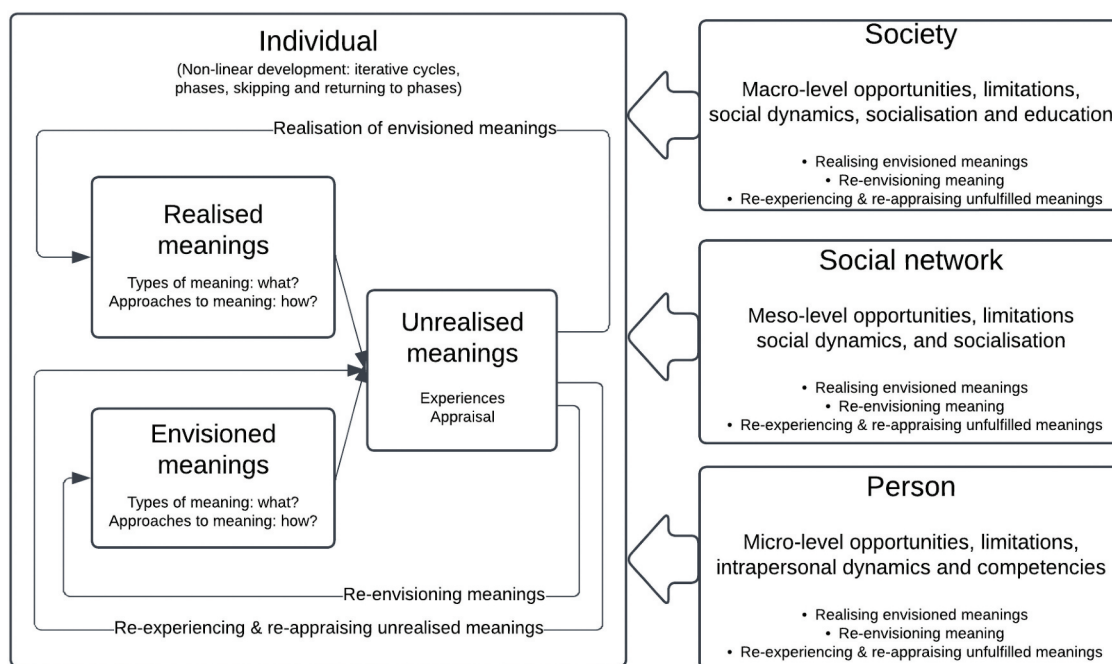


Figure 1. Conceptual model of unrealized types and approaches to meaning. Model reproduced with permission from joelvols.com (see the website for more information on the full model)

artificial research contexts, micro-level assessment is crucial in real-life situations, such as psychotherapy trials and coping with the COVID-19 pandemic. Therefore, this study examines the validity and practical utility of micro-level meaning assessments in three real-world contexts: a cross-cultural survey, a longitudinal survey during the COVID-19 pandemic and a psychotherapy trial. This article aims to answer the following research questions in each of these three studies:

**RQ1:** Types of meaning: Does the realization of specific types of meaning (measured by MSQ) predict macro-level meanings (i.e. a generic sense of the presence of meaning in life, measured with macro-level instruments), mental and physical well-being?

**H1-1:** Unrealized social, larger, and existential-philosophical types positively predict macro-level meaning and positive well-being.

**H1-2:** Unrealized materialistic, hedonistic, and self-oriented types negatively predict macro-level meaning and positively predict negative well-being.

**RQ2:** Approaches to meaning: Do different approaches (measured by MAS) predict macro-level meaning, mental and physical well-being?

**H2-1:** The critical-intuitive approach positively predicts macro-level meaning, positive mental and physical well-being.

**H2-2:** Traditional-conformist and goal-oriented approaches negatively predict macro-level meaning, mental and physical well-being.

**RQ3:** Number of meanings: How does the number of realized meanings relate to macro-level meaning and well-being, and is there a minimum number required for well-being?

**H3-1:** The number of realized meanings predicts macro-level meaning.

**H3-2:** There is an asymptotic relationship between the number of realized meanings and well-being, with diminishing returns as the number of meanings increases.

**H3-3:** There is a minimum/optimal number of realized meanings beyond which additional meanings do not significantly improve well-being.

**RQ4:** Envisioned importance of meanings versus realized meanings: To what extent do the studies confirm the model in [Figure 1](#)?

**H4-1:** Well-being is more strongly predicted by unrealized types of meaning (measured at micro-level) than low life satisfaction, crisis in meaning and search for meaning (measured at macro-level).

**H4-2:** Unrealized types of meaning (measured at micro-level) predict low life satisfaction, crisis in meaning and search for meaning (at macro-level).

**H4-3:** Individuals may respond to unrealized types of meaning by an increased search for meaning and shifts in the specific types and approaches to meaning.

**RQ5:** Overall comparison of micro-level and macro-level instruments: How do micro-level meaning measurements (MSQ, MAS, NMS) compare to macro-level meaning questionnaires in predicting mental and physical well-being?

**H5:** Micro-level instruments better predict well-being than macro-level instruments.

## Methods

### Studies

The research questions will be answered in three studies.

*Worldwide Survey of Meaning in Life (WSM)*: 1,281 participants from 49 countries completed an online questionnaire battery (see below). This study aimed to assess the MSQ and MAS's structural validity, reliability, construct validity, predictive validity, cross-cultural validity, and interpretability. Analyses included factor analysis, correlations, and cross-cultural comparisons. All variables showed a near-normal distribution with no missing values (see details in: Vos, 2023a, 2023b).

*Corona-Survey (CS)*. Conducted online from April 2020 to April 2023, with bi-monthly questionnaires (Vos, 2021c). A total of 1,451 participants from 51 countries completed the baseline survey. Average follow-up completion rate was 61.7% (895 individuals). The CS included the previously mentioned questionnaires in the WSM plus medical/COVID-specific measures (COVID-19 diagnosis and Immune Status Questionnaire, Versprille et al., 2019). WSM and CS were promoted via social media, Prolific, and MTurk.

*Systematic Meaning in Life Psychotherapy (SMLP)*. Developed via systematic reviews and meta-analyses,

SMLP is a ten-session treatment with a structured manual and ten-day therapist training (see details in: Vos, 2018, 2023d). The study involved 37 participants receiving SMLP and 33 receiving Care As Usual (CAU), divided into five therapy groups in UK private practices affiliated with IMEC International Meaning Events and Community between 2013 and 2020. Participants were cancer survivors post-curative treatment seeking psychological support. CAU consisted of supportive-expressive therapy (Payne et al. 2009), which aligns with clinical standards and UK guidelines (NICE guideline CSG4). Outcomes were measured at baseline, post-therapy, and 6-month follow-up, and the same measures were included as the WSM. Additional session-by-session instruments were administered but not analyzed in this study.

### Instruments

Due to word count limitations, readers are referred for details about instrument development and items in Vos, 2023a-b.

#### Macro- and meso-level meaning instruments

- *Meaning in Life Questionnaire*: 10 items, sub-scales Presence of Meaning, Search for Meaning (Steger et al., 2006)
- *Scales of Psychological Well-Being*: 7-item purpose subscale (Ryff & Keyes, 1995)
- *Purpose in Life*: 20 items (Crumbaugh & Maholick, 1964);
- *Seeking of Noetic Goals*: 20 items (Crumbaugh, 1977);
- *Sources of Meaning and Meaning in Life (SoMe)*: subscales Meaningfulness, Crisis (Schnell, 2009);
- *Sense of Coherence (SOC)*: 9 items (Antonovsky, 1979).

#### Micro-level meaning instruments

- *Meaning Sextet Questionnaire (MSQ)*: This instrument operationalized six types of meaning identified in a systematic review of all studies on types of meaning (Vos, 2023a): materialistic, hedonistic, self-oriented, social, larger, and existential-philosophical. The questionnaire comprised 27 items/subtypes of meaning (see Supplemental Table S1). Respondents rated for each item how important this was for them (envisioned types of meaning): 'How important is this for you in your life? (this is about your ideal, regardless of whether you make this happen in reality)' (1, totally unimportant, -5, totally important). Subsequently, they filled in whether they realized each types of meaning: 'How much are you doing or experiencing this

now? (this is about what you do in reality)' (1, seldom, -5, very often).

- *Meaning Approach Scale (MAS)*. This 45-item questionnaire assesses three approaches to meaning in life (Vos, 2023b): traditional-conformist, goal-oriented and critical-intuitive approaches. Each approach was represented by 15 statements, ranging from 1, totally disagree, to 5, totally agree.
- *Number of Meaning Scale (NMS)*. This scale was developed to assess the number of examples of meaning in life through two open-ended questions, capturing examples of envisioned and realized meanings. By avoiding standardized answers typical in multiple-choice questionnaires, we simulated real-life reflection on meaning, minimized suggestion bias, accommodated cultural variations and personal interpretations of meaning. We quantified responses by counting the number of distinct meanings listed for each item. The items were as follows:
  - a. *Potential Envisioned Meanings*: 'Please list the most important potential sources of meaning in your life, whether you have attained them or not. Be as comprehensive as possible, using keywords or brief phrases for each source'.
  - b. *Realized Meanings*: 'Now, please list the most important examples of meaning that you have actually attained or are currently experiencing in your life. Again, be as comprehensive as possible, using keywords or brief phrases for each example'.
  - c. *Prompt for both items*: 'Consider various aspects of life such as personal achievements, enjoyment, self-development, social relationships, altruism, societal contributions, spirituality, and appreciation for existence'. These prompts followed from the most frequently reported MSQ items.

#### Outcome instruments

- *Positive Wellbeing*: 10-item positive-affects PANAS subscale (Watson et al., 1988); 6-item quality-of-life SF-6D-scale (Brazier et al., 2002).
- *Negative wellbeing*. 10-item positive-affects PANAS subscale (Watson et al., 1988); 9-item depression PHQ-9-scale (Kroenke et al., 2001); 7-item anxiety GAD7-scale (Spitzer et al., 2006).
- *Life satisfaction*: 5-item Satisfaction With Life Scale (Diener et al., 1985).
- *Physical well-being (Coronasurvey only)*: self-reported COVID-19 diagnosis; Immune Status Questionnaire (Versprille et al., 2019)

### Sociodemographic instruments

- To measure potential moderators, we administered Vos' Sociodemographic Questionnaire (Vos, 2023a, 2023b, 2023c), as Table 1 shows. As the sociodemographic variables only had non-significant or at best small moderation effects, we will not further present them.

### Statistical analyses

- *Preparatory analysis:* Descriptive statistics, missing values, and outlier analyses were conducted as in Vos (2023c), including testing the assumptions of statistical tests, such as multivariate normality and multicollinearity. Across the studies, values were missing randomly and replaced via multiple regression analyses on near-time points, and all variables had normal/near-normal distributions.
- *Validity and reliability of scales:* For each scale, reliability was examined with Cronbach's alpha (<.50 unacceptable, .50-.60 poor, .60-.70 questionable, .70-.80 acceptable, .80-.90 good, >.90 excellent). To examine convergent validity, we calculated Pearson's correlations ( $r < .30$  'weak',  $r = .30$ -.50 'moderate',  $r > .50$  'strong'). Significance level was set at  $p < .05$ , without corrections for the number of estimations to offset for Statistical Error Types-I/II. For precise estimates, bootstrapping was conducted with 5000 resamples.
- *Software:* SPSS29, AMOS29.
- *Structural Equation Models (SEM):* SEM-models included relationships among variables, including mediation and moderation effects in the WSM/CS/SMLP-studies, longitudinal cross-lagged panel analysis in CS, and longitudinal multilevel cross-lagged panel analyses in SMLP. We created the latent variables 'macro-level meanings' (based on MLQ-presence, SPWB-purpose, PIL, SoMe-meaningfulness and SOC), 'unrealized types of meaning' (based on the difference between MSQ-subcales envisioned and realized types of meaning), 'positive well-being' (based on PANAS-positive subscales, SF-6D) and 'negative well-being' (based on PANAS-negative affects, PHQ9, GAD7). We only presented SEM-models with latent variables, as these had better fit indexes; only if significant, we reported differences in the fit indexes between models with and without latent variables.
- Model fit was assessed using multiple indices: Chi-square test ( $\chi^2$ ), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root

Mean Square Residual (SRMR). Good model fit was indicated by CFI and TLI values  $> .95$ , RMSEA  $< .06$ , SRMR  $< .08$  (Hu & Bentler, 1999).

### Findings

This section is structured according to the research questions, systematically answering each question in the WSM, CS and SMLP studies.

#### ***RQ1: types of meaning: does the realization of micro-level types of meaning predict macro-level meaning and well-being?***

*WSM:* SEM showed a good fit, when unrealized materialistic, hedonistic, self-oriented, social, large and existential-philosophical types of meaning predicted macro-level meaning ( $\chi^2 (203) = 287.45$ ,  $p = .09$ ; CFI = .96; TLI = .95; RMSEA = .04, 90% CI [.003, .005]; SRMR = .05). Unrealized materialistic, hedonistic, self-oriented types of meaning had moderate negative effects on macro-level meaning (resp.  $\beta = -.31, -.35, -.33$ , all  $p < .001$ ), whereas social, large and existential-philosophical types had large effects (resp.  $\beta = .82, .55, .59$ , all  $p < .001$ ). These findings were confirmed when examining individual correlations (Supplemental Tables S2–S3). Thus, these findings indicated that social, large, and existential-philosophical types (measured at micro-level) correlated with a larger sense of general meaningfulness in life (measured at macro-level) than materialistic, hedonistic, and self-oriented meanings.

SEM demonstrated a good fit, when all unrealized types of meaning predicted positive and negative well-being ( $\chi^2 (84) = 112.36$ ,  $p = .08$ ; CFI = .97; TLI = .97; RMSEA = .03; 90% CI [.027, .049]; SRMR = .045). Unrealized materialistic, hedonistic, self-oriented types of meaning had moderate negative effects on positive well-being (resp.  $\beta = -.43, -.32, -.33$ , all  $p < .001$ ) and negative well-being (resp.  $\beta = .20, .16, .22$  all  $p < .001$ ). Unrealized social, large and existential-philosophical types had large negative effects on positive well-being (resp.  $\beta = .60, -.51, -.48$ , all  $p < .001$ ) and negative well-being (resp.  $\beta = .61, .59, .60$ , all  $p < .001$ ). This indicated that the more importance individuals found in materialistic, hedonistic, and self-oriented types of meaning, the lower their positive and the larger their negative well-being. In contrast, the more importance individuals found in social, large, and existential-philosophical types, the lower their positive and the larger their negative well-being.

To summarize these findings in WSM: the unrealized types of meaning (measured at micro-level) predicted general meaningfulness (measured at macro-level) and well-being, with social, large and existential-

philosophical types having more positive effects than materialistic, hedonistic and self-oriented types.

CS: In a longitudinal, cross-lagged SEM-model, an individual's unrealized types of meaning predicted macro-level meaning ( $t-1$ ) at the next measurement-moment ( $t$ ) ( $\chi^2 (3889) = 4500.25$ ,  $p = .23$ ; CFI = .95; TLI = .94; RMSEA = .045, 90% CI [.040, .050]; SRMR = .050). Over time, there was a significant decrease in unrealized materialistic, hedonistic, self-oriented, social, large and existential-philosophical types of meaning (resp.,  $\beta = .56, .43, .52, .57, .59, .51$ , all  $p < .001$ ). Another longitudinal, cross-lagged SEM-model showed that an individual's unrealized types of meaning ( $t-1$ ) predicted at the next measurement moment ( $t$ ) positive and negative well-being ( $t$ ) ( $\chi^2 (38970) = 41258.60$ ,  $p = .32$ ; CFI = .97; TLI = .97; RMSEA = .03, 90% CI [.03, .03]; SRMR = .04), self-reported COVID-19 diagnosis and immune status ( $\chi^2 (17280) = 18144.00$ ,  $p < .01$ ; CFI = .98; TLI = .98; RMSEA = .03, 90% CI [.02, .03]; SRMR = .04). In summary, all unrealized types of meaning (measured at micro-level) predicted future macro-level meaning (measured at macro-level), well-being, COVID-19 status and immune system functioning.

SMLP: Over time, the experimental SMLP-group showed a significant decrease in unrealized materialistic, hedonistic, self-oriented, social, large and existential-philosophical types of meaning (resp.,  $\beta = .32, .38, .36, .55, .64, .62$ , all  $p < .001$ ); there were no significant changes in the CAU control-group (differences SMLP/CAU: Cohen's  $D = .82$ ). In a longitudinal, cross-lagged SEM-model, unrealized types of meaning ( $t-1$ ) predicted at the next measurement-moment ( $t$ ) macro-level meaning ( $\chi^2 (1869) = 2056.90$ ,  $p = .08$ ; CFI = .97; TLI = .97; RMSEA = .003, 90% CI [.02, .04]; SRMR = .04), positive and negative well-being ( $\chi^2 (45) = 52.65$ ,  $p = .20$ ; CFI = .98; TLI = .98; RMSEA = .003, 90% CI [.01, .05]; SRMR = .04). The SMLP-group had larger improvements than CAU in their positive and negative well-being (resp., Cohen:  $D = .72-.56$ ). In summary, individuals in the SMLP-group improved more than CAU in realizing various types of meaning (measured at micro-level), and this increased realization subsequently predicted improvements in their macro-level meaning and well-being. These findings seemed to confirm the hypothesized therapeutic mechanism of change in the SMLP-group that individuals improve thanks to their increased skills to realize their meanings in everyday life (Vos, 2018; Vos & Vitali, 2018).

Conclusion: Consistent with H1-1, social, large, and existential-philosophical types of meaning positively predicted macro-level meaning and well-being across all three studies. These types of meaning emerged as significant predictors of resilience and improved mental and physical health, particularly in challenging contexts such as the COVID-19 pandemic and cancer survivorship.

In line with H1-2, materialistic, hedonistic, and self-oriented types were associated with lower macro-level meaning and poorer well-being.

### **RQ2: approaches to meaning: do different micro-level approaches (measured by MAS) predict macro-level meanings and well-being?**

WSM: SEM showed a good fit, when traditional-conformist, goal-oriented and critical-intuitive approaches predicted macro-level meaning ( $\chi^2 (16) = 15.39$ ,  $p = .09$ ; CFI = .96; TLI = .97; RMSEA = .04, 90% CI [.02, .07]; SRMR = .04). Traditional-conformist and goal-oriented approaches had moderate effects, and critical-intuitive approaches had large effects (resp.  $\beta = .40, .34, .57$ , all  $p < .001$ ). SEM showed good fit when the three approaches predicted positive and negative well-being ( $\chi^2 (16) = 22.45$ ,  $p = .08$ ; CFI = .96; TLI = .96; RMSEA = .05; 90% CI [.003, .007]; SRMR = .04). Traditional-conformist and goal-oriented approaches had small effects on positive well-being (resp.  $\beta = .32, .34$ , all  $p < .001$ ) and negative well-being (resp.  $\beta = .25, .29$ , all  $p < .001$ ). Critical-intuitive approaches had large positive effects on positive well-being (resp.  $\beta = .62$ ,  $p < .001$ ) and large negative effects on negative well-being (resp.  $\beta = -.47$ ,  $p < .001$ ). Post-hoc comparison indicated that a critical-intuitive approach was associated with larger macro-level meanings and positive well-being and lower negative well-being (resp. Cohen's  $D = .43, .63, -.51$ ). In summary, the critical-intuitive approach (measured at micro-level) strongly correlated with larger macro-level meaning (measured at macro-level) and beneficial well-being. In contrast, traditional-conformist and goal-oriented approaches correlated with smaller macro-level meaning and well-being.

CS: The longitudinal, cross-lagged SEM-models showed that the three approaches to meaning (measured at  $t-1$ ) perfectly predicted macro-level meaning, positive and negative well-being, COVID-19 status and immune functioning at the next measurement-moment ( $t$ ) ( $\chi^2 (0) = 1.00$ ,  $p = .09$ ; CFI = 1.0, TLI = 1.0, RMSEA = 0). Traditional-conformist and goal-oriented approaches had small positive effects on macro-level meanings, positive and negative well-being, COVID-19 status and immune functioning (resp. for each approach:  $\beta = .22, .18, .23, .22, .18; .19, .16, .17, .20, .19$ ). The critical-intuitive approach had large positive effects on macro-level meanings and positive well-being, moderate negative effects on negative well-being and COVID-19 status, and positive effects on immune functioning (resp.:  $\beta = .53, .49, -.39, -.29, .30$ ). Thus, the critical-intuitive approach (measured at micro-level) was associated with larger macro-level meaning and improved

well-being and health, whereas traditional-conformist and goal-oriented approaches were associated with smaller macro-level meaning and worse well-being and health.

*SMLP*: In the SMLP-group, individuals decreased in their use of a traditional-conformist approach, slightly increased in their goal-oriented approach, and strongly increased in their critical-intuitive approach (resp.,  $\beta = -.42, .19, .55$ , all  $p < .001$ ). In the CAU control-group, there were no changes in approaches to meaning (difference between SMLP/CAU in traditional-conformist, goal-oriented and critical-intuitive approaches: Cohen's  $D = .52, .30, .91$ ; all  $p < .001$ ). The multilevel, longitudinal, cross-lagged SEM-model had a good fit, when the three approaches ( $t-1$ ) predicted at the next measurement moment ( $t$ ) macro-level meaning ( $\chi^2 (273) = 290.00$ ,  $p = .20$ ; CFI = .97; TLI = .97; RMSEA = .025, 90% CI [.01, .04]; SRMR = .03), positive and negative well-being ( $\chi^2 (272) = 280.00$ ,  $p = .21$ ; CFI = .98; TLI = .97; RMSEA = .024, 90% CI [.01, .04]; SRMR = .03). In summary, as expected, SMLP-individuals strongly increased in their critical-intuitive approach, slightly increased in their goal-oriented approach, and decreased in their traditional-conformist approach (measured at micro-level), which led to a larger sense of general meaningfulness (measured at macro-level) and improved well-being.

*Conclusion*: Consistent with H2-1, the critical-intuitive approach (measured at micro-level) was positively associated with general meaningfulness (measured at macro-level) and well-being across all three studies. The critical-intuitive approach emerged as a significant predictor of resilience and improved mental and physical health, particularly in challenging contexts such as the COVID-19 pandemic and cancer survivorship. In line with H1-2, individuals with a strong traditional-conformist or goal-oriented approach improved less than individuals with a critical-intuitive approach in their general meaningfulness and experienced worse well-being and health.

***RQ3: how does the number of realized meanings (measured at micro-level) relate to macro-level meaning and well-being, and is there a minimum number required for well-being?***

We hypothesized an asymptotic impact of the number of realized meanings on positive and negative well-being; for example, the impact of realizing one more meaning is larger if a person has only one other realized example of meaning in their life, than a person who already has many realized meanings. We wanted to identify the number of meanings where any additional

meaning would not significantly improve positive and negative well-being.

*WSM*: SEM showed a good fit when the number of meanings predicted macro-level meanings ( $\chi^2 (5) = 7.82$ ,  $p = .16$ ; CFI = .99; TLI = .99; RMSEA = .03, 90% CI [.02, .05]; SRMR = .02)/SEM showed a good fit when the number of meanings predicted positive and negative well-being with asymptotic functions ( $\chi^2 (42) = 58.73$ ,  $p = .05$ ; CFI = .97; TLI = .96; RMSEA = .05, 90% CI [.04, .06]; SRMR = .03). The model identified an optimal number of realized meanings at 5.93 (95% CI [5.71, 6.15]); beyond this point, additional meanings did not significantly improve the combined positive and negative well-being outcomes ( $p > .05$ ). The marginal effect of an additional realized meaning on positive well-being decreased from 0.28 (standardized units, 95% CI [0.24, 0.32]) when moving from 1 to 2 meanings, to 0.03 (95% CI [0.01, 0.05]) when moving from 5 to 6 meanings. For negative well-being, the marginal effect (in terms of reduction) decreased from 0.25 (95% CI [0.21, 0.29]) to 0.02 (95% CI [0.00, 0.04]) for the same intervals. The asymptotic model provided a significantly better fit than other models, supporting our hypothesis of diminishing returns (Linear SEM:  $\Delta\chi^2 (2) = 145.62$ ,  $p < .001$ ; Quadratic SEM:  $\Delta\chi^2 (1) = 39.87$ ,  $p < .001$ ).

*CS*: SEM showed a good fit when the number of meanings predicted macro-level meanings ( $\chi^2 (2556) = 2987.34$ ,  $p = .07$ ; CFI = .97; TLI = .97; RMSEA = .03, 90% CI [.02, .04]; SRMR = .03). Cross-lagged panel SEM showed a good fit, when the number of meanings ( $t-1$ ) predicted positive and negative well-being at the subsequent time-point ( $t$ ) with asymptotic functions ( $\chi^2 (1156) = 2103.78$ ,  $p < .001$ ; CFI = .94; TLI = .93; RMSEA = .042, 90% CI [.039, .045]; SRMR = .048). The model identified a minimum number of realized meanings at 5.48 (95% CI [5.33, 5.63]); beyond this point, additional meanings did not significantly improve the combined well-being outcomes at the subsequent time point ( $p > .05$ ). The marginal effect of an additional realized meaning at  $t-1$  on positive well-being at  $t$  decreased from 0.26 (standardized units, 95% CI [0.22, 0.30]) when moving from 1 to 2 meanings, to 0.03 (95% CI [0.01, 0.05]) when moving from 5 to 6 meanings. For negative well-being at  $t$ , the marginal effect (in terms of reduction) decreased from 0.22 (95% CI [0.18, 0.26]) to 0.02 (95% CI [0.00, 0.04]). The asymptotic model provided a significantly better fit than other models (Linear SEM:  $\Delta\chi^2 (2) = 138.56$ ,  $p < .001$ ; Quadratic SEM:  $\Delta\chi^2 (1) = 37.92$ ,  $p < .001$ ).

*SMLP*: SEM showed a good fit when the number of meanings predicted macro-level meanings ( $\chi^2 (294) = 318.52$ ,  $p = .15$ ; CFI = .99; TLI = .99; RMSEA = .02, 90% CI [.01, .03]; SRMR = .03). The multi-level longitudinal SEM-

model with asymptotic functions showed a good fit, when the number of realized meanings predicted positive and negative well-being ( $\chi^2(186) = 257.32, p < .001$ ; CFI = .95; TLI = .94; RMSEA = .046, 90% CI [.035, .056]; SRMR = .052). The model identified a minimum number of realized meanings at 5.31 (SD = 1.3, 95% CI [5.12, 5.50]); beyond this point, additional meanings did not significantly improve the combined well-being outcomes ( $p > .05$ ). This optimal number did not differ between SMLP and CAU groups ( $\Delta\chi^2(1) = 2.14, p = .14$ ). For the SMLP-group, the marginal effect of an additional realized meaning on positive well-being decreased from 0.29 (standardized units, 95% CI [0.24, 0.34]) when moving from 1 to 2 meanings, to 0.04 (95% CI [0.01, 0.07]) when moving from 5 to 6 meanings. For negative well-being, the marginal effect (in terms of reduction) decreased from 0.26 (95% CI [0.21, 0.31]) to 0.03 (95% CI [0.00, 0.06]) for the same intervals. The marginal effects were smaller in the CAU control-group but followed a similar pattern. For positive well-being, the effect decreased from 0.21 (95% CI [0.16, 0.26]) to 0.02 (95% CI [-0.01, 0.05]), and for negative well-being, from 0.19 (95% CI [0.14, 0.24]) to 0.01 (95% CI [-0.02, 0.04]). SMLP showed significantly greater increases in the number of realized meanings over time than CAU ( $\beta = 0.24, SE = 0.05, p < .001$ ). This increase in realized meanings was associated with greater improvements in positive well-being ( $\beta = 0.31, SE = 0.06, p < .001$ ) and greater reductions in negative well-being ( $\beta = -0.28, SE = 0.06, p < .001$ ) in SMLP compared to CAU. The asymptotic model provided a significantly better fit than other models (Linear SEM:  $\Delta\chi^2(4) = 112.78, p < .001$ ; Quadratic SEM:  $\Delta\chi^2(2) = 31.46, p < .001$ ).

**Conclusion:** The number of realized meanings predicted overall meaningfulness (measured at macro-level) and positive and negative well-being. We used meta-analysis to calculate the average number of the minimum realized meanings across the three studies, using a random effects model to reflect the heterogeneous contexts; this showed a pooled number of 5.63 realized meanings (95% CI [5.35–5.91]).

#### **RQ4: to what extent do the studies confirm the model shown in Figure 1?**

**WSM:** Positive and negative well-being were significantly better predicted by all unrealized types of meaning than by life satisfaction, indecisiveness, crisis and search for meaning ( $\chi^2(82) = 130.00, p = .05$ ; CFI = .90; TLI = .88; RMSEA = .07; 90% CI [.06, .08]; SRMR = .09;  $\Delta(\chi^2) = 17.64, p < .001$ ;  $R^2 = .60$  versus .75). The macro-level scores for overall life satisfaction, crisis, indecisiveness and search for meaning correlated with the micro-level scores for

unrealized materialistic (resp.  $R = -.20, .25, .23, .20$ ; all  $p > .01$ ), hedonistic (resp.  $R = -.31, .36, .33, .29$ ; all  $p > .01$ ), self-oriented (resp.  $R = -.38, .43, .46, .43$ ; all  $p > .01$ ), social (resp.  $R = -.56, .62, .68, .62$ ; all  $p > .01$ ), large (resp.  $R = -.55, .59, .63, .60$ ; all  $p > .01$ ) and existential-philosophical types of meaning (resp.  $R = -.44, .50, .52, .51$ ; all  $p > .01$ ).

Thus, unrealized types of meaning (measured on micro-scale) correlated with macro-scales measuring life satisfaction, indecisiveness, crisis and search for meaning, and were better in predicting well-being than these macro-scales.

**CS:** Positive and negative well-being were significantly better predicted by the various unrealized types of meaning than by life satisfaction, indecisiveness, crisis and search for meaning ( $\chi^2(4529) = 4950.75, p = .10$ ; CFI = .91; TLI = .90; RMSEA = .06, 90% CI [.05, .07]; SRMR = .07;  $\Delta(\chi^2) = 4950.75, p < .001$ ;  $R^2 = .66$  versus .85). In a good-fitting cross-lagged SEM-model, the six unrealized types at time-point  $t-1$  predicted lower life satisfaction and larger crisis at time-point  $t-1$  and  $t$ ; these changes in satisfaction, indecisiveness and crisis subsequently predicted changes in the search for meaning, the six types and three approaches at time-point  $t$  ( $\chi^2(470) = 525.40, p = .05$ ; CFI = .98; TLI = .98; RMSEA = .01, 90% CI [.005, .015]; SRMR = .03). Post-hoc analyses revealed that the participants' experiences of an increase in their unrealized types of meaning at time-point  $t-1$  predicted several outcomes at time-point 1: stronger social, large and existential-philosophical types of meaning, a stronger traditional-conformist and goal-oriented approach, and a weaker critical approach (resp., Cohen's  $D = .49, .44, .25, .43, .37, .33$ ). These findings confirmed that unrealized types of meaning can lead to changes in types and approaches to meaning, macro-meaning and well-being. Unrealized types of meaning (measured at micro-level) were better than life satisfaction, indecisiveness, crisis and search for meaning (measured at macro-level) in predicting these changes.

**SMLP:** Positive and negative well-being were significantly better predicted by all unrealized types of meaning than by life satisfaction, indecisiveness, crisis and search for meaning ( $\chi^2(1962) = 2250.30, p = .06$ ; CFI = .94; TLI = .93; RMSEA = .08, 90% CI [.07, .09]; SRMR = .06;  $\Delta(\chi^2) = 193.40, p < .01$ ;  $R^2 = .55$  versus .87). In a good-fitting cross-lagged SEM-model, the six unrealized types of meaning predicted life satisfaction, indecisiveness, and crisis at time-point  $t-1$ , which subsequently predicted changes in the search for meaning, the six types and three approaches at time-point  $t$  ( $\chi^2(60) = 58.20, p = .54$ ; CFI = .99; TLI = .98; RMSEA = .03, 90% CI [.01, .05]; SRMR = .07). This confirmed the WSM and CS findings.

**Conclusion:** The findings confirmed H4–1 by showing in the three studies that well-being was more strongly

predicted by micro-level instruments (unrealized types of meaning) than macro-level instruments (low life satisfaction, indecisiveness, crisis and search for meaning). The findings for RQ1 already showed unrealized types predicting well-being, particularly unrealized social, large and existential-philosophical types. This indicated that micro-level questionnaires were better than macro-level questionnaires in understanding the challenges to one's meanings. H4–2 was also confirmed, as unrealized types of meaning (particularly social, large and existential-philosophical types) predicted low life satisfaction, indecisiveness, and crisis in meaning, subsequently predicting a search for meaning and a change in the approach to meaning. This suggested that the perceived lack of realizing one's envisioned meanings was associated with negative emotions and well-being (see RQ1) and low life satisfaction. In response to these adverse effects triggered by these unrealized types of meaning, individuals could increase their search for meaning, such as shifts in their types and approaches. These findings provided initial validation of [Figure 1](#). However, this study did not examine the influence of appraisal, personal situation, social network and society.

#### **RQ5: how do micro-level meaning measurements (MSQ, MAS, NMS) compare to macro-level meaning questionnaires in predicting well-being?**

*WSM*: Good fit indexes were found for the SEM-model in which macro-level meanings predicted positive and negative well-being ( $\chi^2 (162) = 190.50$ ,  $p = .06$ ; CFI = .91; TLI = .90; RMSEA = .006, 90% CI [.04, .08]; SRMR = .08), but this fit was worse than the model in which positive and negative well-being were predicted by types and approaches (resp.,  $\Delta\chi^2 = .78.14$ ,  $p < .001$ ,  $R^2 = .45$  versus  $.75$ ;  $\Delta\chi^2 = 168.05$ ,  $p < .001$ ,  $R^2 = .45$  versus  $.85$ ). Thus, although macro-level instruments did explain well-being, they explained this significantly worse than micro-level instruments.

*CS*: The SEM-model in which macro-level meanings predicted positive and negative well-being showed a positive fit ( $\chi^2 (38970) = 41500.00$ ,  $p = .06$ ; CFI = .94; TLI = .93; RMSEA = .05, 90% CI [.04, .06]; SRMR = .06), but this fit was significantly worse than the model in which positive and negative well-being were predicted by types and approaches (resp.,  $\Delta\chi^2 = 241.40$ ,  $p < .001$ ,  $R^2 = .65$  versus  $.85$ ;  $\Delta\chi^2 = 41499$ ,  $p < .001$ ,  $R^2 = .65$  versus 1.00). These findings showed that, although macro-level instruments did explain well-being outcomes, they explained this worse than micro-level instruments. No significant fit was found for the SEM-model in which macro-level meaning predicted COVID-19 status and immune system functioning ( $\chi^2 (17280) = 18500.00$ ,  $p$

$< .001$ ; CFI = .85; TLI = .84; RMSEA = .009, 90% CI [.08, .10]; SRMR = .10), and this fit was significantly worse than the model in which positive and negative well-being were predicted by types and approaches (resp.,  $\Delta\chi^2 = 365.00$ ,  $p < .01$ ,  $R^2 = .65$  versus  $.85$ ;  $\Delta\chi^2 = 18499$ ,  $p < .01$ ,  $R^2 = .65$  versus 1.00). Thus, during the COVID-19 pandemic, well-being and physical health were better predicted with instruments measuring meaning at the micro-level than at the macro-level.

*SMLP*: A positive fit was found for the SEM-model in which macro-level meaning predicted positive and negative well-being ( $\chi^2 (272) = 290.00$ ,  $p = .21$ ; CFI = .95; TLI = .94; RMSEA = .03, 90% CI [.02, .03]; SRMR = .05), but this fit was worse than the model in which positive and negative well-being were predicted by types and approaches (resp.,  $\Delta\chi^2 = 237.35$ ,  $p < .01$ ,  $R^2 = .60$  versus  $.87$ ;  $\Delta\chi^2 = 10.00$ ,  $p < .001$ ,  $R^2 = .60$  versus  $.84$ ). This demonstrated that in the clinical trial, the changes in well-being were better explained by micro-level instruments measures than macro-level instruments.

*Conclusion*: Consistent with H5, instruments that measure meaning at the micro-level (MSQ, MAS) were better predictors than instruments measuring meaning at the macro-level (MLQ, SPWB, PIL, SONG, SOME, LRI, SOC) regarding positive and negative well-being and physical health (PANAS, SWLS, PHQ9, SF-6D, COVID-19 status, immune system functioning).

## **Discussion**

The findings of this study underscore the critical importance of measuring meaning in life at the micro-level, rather than relying solely on macro-level assessments. This distinction became particularly evident in the real-world studies on COVID-19 and clinical trials, where micro-level evaluations demonstrated greater effects in predicting well-being and physical health outcomes. These results align with previous research suggesting that examining specific sources of meaning provides more informative insights than merely assessing overall meaningfulness (Schnell, 2009; Schnell & Danbolt, 2023). Furthermore, micro-level measurements of meaning seem especially advantageous in exploring applied topics, such as physical health, politics, radicalization, violent extremism, and terrorism. Critics of meaning-oriented studies in these applied fields have pointed out that generic or indirect measures often lack specificity and informative value (Bélanger, 2021; Da Silva et al., 2024; Echelmeyer et al., 2023).

The findings confirm previous studies showing the importance of meaning for mental and physical well-being (Sherman & Simonton, 2012; Yanez et al., 2009). Due to the micro-level assessment, this study provided

new insights into specific adaptive and maladaptive meaning-making patterns (Cohen & Cairns, 2012; Dezutter et al., 2013). For example, the results indicated that specific types of meaning – especially social and large types – along with a critical-intuitive approach, may lead to positive well-being, health and generic meaningfulness in life. In contrast, materialistic, hedonistic, and self-oriented types of meaning, and traditional-conformist and goal-oriented approaches, may lead to negative well-being and health and diminished generic meaningfulness in life. Additionally, the analyses identified an optimal number of 5.63 (95% CI [5.35, 5.91]) realized meanings being beneficial, generally aligning with recommendations from therapists (Lukas, 2014).

This study also showed the difference between the meanings individuals envision and the meanings they realize. When individuals do not realize the meanings they envision ('unrealized meanings'), they will likely experience lower general meaningfulness in life, well-being and health. This confirms several studies highlighting the need for fulfilling and maintaining one's wishes for meaning (Kruglanski et al., 2022; Proulx & Inzlicht, 2012). Other authors have argued unrealized meanings, or threats thereof, could lead to various negative affects, such as physical arousal, physical and psychological stress, existential moods, and mental health problems (McGregor & Marigold, 2003; Proulx & Heine, 2006, Vall & Routledge, 2012; Proulx & Heine, 2010).

The Meaning-Making Model tells that individuals may need to (re)appraise the unrealized meanings, for example, by assessing the size of the threat and one's resources to cope with this (Park, 2010). The findings suggested that individuals could respond in various ways. Firstly, individuals could increasingly search for new ways to realize their meanings, such as using a different method or improving their skills to achieve the meaningful life and world they want. Secondly, individuals may re-envision what is important, such as searching for other examples of the same type of meaning, or shifting to different types. Individuals may also change their approach to life, for example, by conforming more to the traditions or authoritative figures of a social group or society, or using a more passionate goal-oriented approach, or less using their intuitions, experiences and critical thinking. Thirdly, although this article did not examine this, other studies indicate that individuals may reappraise their situational opportunities, limitations and resources (Park, 2010).

Several studies have shown that some individuals may radicalize (through multiple iterative non-linear rounds and phases of meaning-making, including returning to earlier phases or skipping phases) in the realization, re-

envisioning and re-appraisal processes in response to the unrealized meanings (Da Silva et al., 2024; Kruglanski et al., 2022; Proulx & Inzlicht, 2012). For example, radicalizing individuals may increasingly conform to the meanings of a traditional or extremist network, fulfill their meanings through their involvement in this network, and increasingly focus on a narrow range of large or existential-philosophical types of meaning, which could lead to extremist attitudes, intentions and actions. Many authors have shown that how individuals (re)envision, realize and (re)appraise their situation can be influenced by their personal situation, social network and society (ibid.). Whereas previous studies have shown the role of meaning-making in radicalization, these studies have been criticized for using too generic and indirect measures of meaning (Bélanger, 2021, Da Silva et al., 2023; Echelmeyer et al., 2023). This study offers micro-level tools to develop a more detailed analysis of individual and social changes (Vos, 2020, 2025).

### **Limitations & recommendations**

Despite its comprehensive nature, this study has several limitations that should be acknowledged. Although participants were recruited from multiple countries, the cultural nuances influencing meaning-making processes may not have been fully captured. Across the three studies, sociodemographic variables had minimal or non-significant effects; future research should further explore cultural and sociodemographic moderators and mediators. As the Worldwide Survey of Meaning in Life was a one-shot cross-sectional study, it could only indicate correlations; however, the longitudinal Coronasurvey and clinical trial provided initial evidence of causal relationships. Future studies should incorporate more follow-up measurements, multiple control groups, and rigorous experimental designs. Future studies should test all hypothesized components in Figure 1, for example, as predicted by research on radicalization (Da Silva et al., 2024; Kruglanski et al., 2022; Park, 2010; Proulx & Heine, 2006, 2010; Proulx & Inzlicht, 2012). Additionally, the reliance on self-reported data constrained the objective assessment of meaning and well-being; therefore, future studies may investigate meaning at the level of embodied felt sense (Kim et al., 2022; Remmers et al., 2016, Schlegel et al., 2013; Vanhooren et al., 2022), neurobiological and evolutionary mechanisms (Dang et al., 2021; Vos, 2025).

Despite its limitations, this study suggests some clear implications. Researchers are recommended to add micro-level instruments to their test battery, if they are interested in precisely identifying the specific micro-level meaning-making processes. For example, they

may use the MSQ, MAS and NMS (downloadable from joelvos.com and free for non-commercial, clinical and research purposes).

Therapists, life coaches and trainers may want to administer these questionnaires to help their clients develop self-insight into the specific types and numbers of meaning that they envision and realize, and the approach they use; based on these questionnaires, therapists may develop a tailored plan for the individual, like Sarah at the beginning of this article. Our findings align with a meta-analysis of 60 clinical trials on meaning-centered therapies (Vos & Vitali, 2018), demonstrating the effectiveness of meaning-focused interventions in enhancing quality-of-life and reducing psychological stress. Clients may benefit from using a critical-intuitive approach to systematically explore all types of meaning and to identify and apply at least six examples of meaning in their life, particularly social and large types. An example of an intervention that integrates these research findings is the ten-session Systematic Meaning in Life Psychotherapy (Vos, 2018).

## Disclosure statement

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