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Meaning in everyday life: Working, playing, consuming, and more

Edited by
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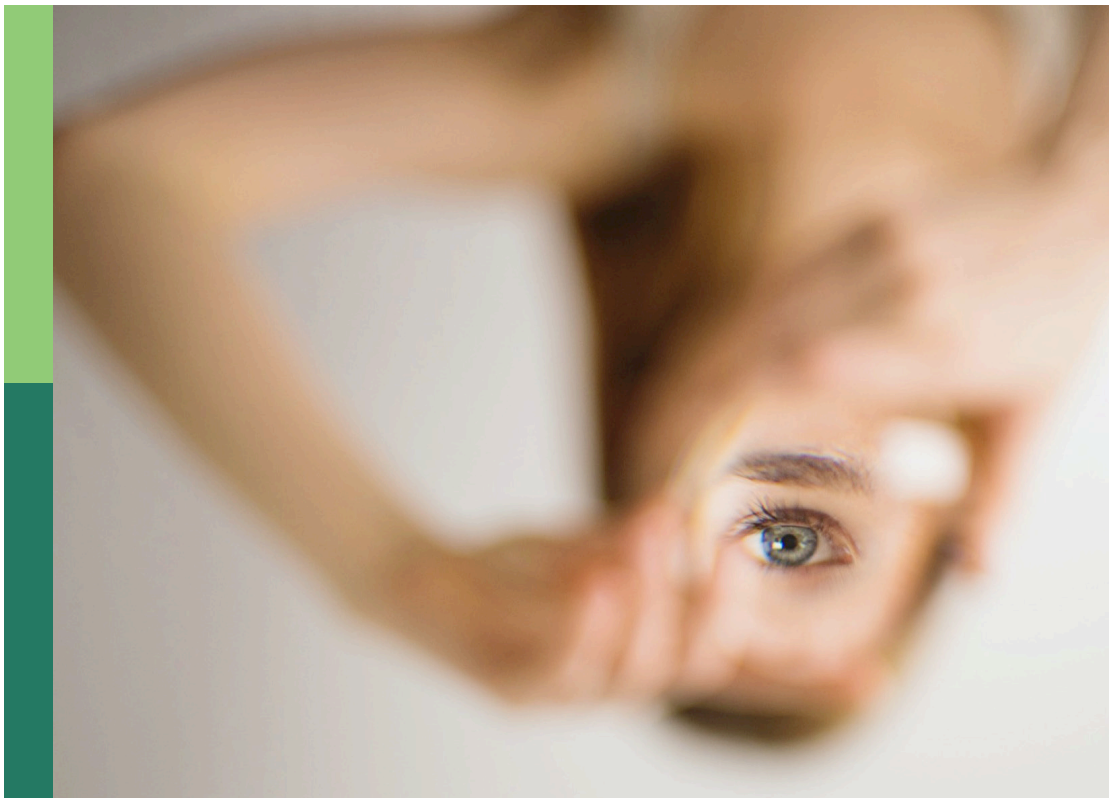

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Meaning in everyday life: Working, playing, consuming, and more

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Editorial: Meaning in everyday life: working, playing, consuming, and more

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meaning in life, wellbeing, growth, meaningful life, experiences, positive psychology, existential psychology

Editorial on the Research Topic
Meaning in everyday life: working, playing, consuming, and more

The search for meaning lies at the very core of human psychology, from young children asking "why" questions in an effort to make sense of the world to adults seeking more meaning through work, hobbies, and the marketplace. While scholarly interest in meaning dates back centuries, researchers have only gradually begun to explore the search for meaning in a systematic manner. Existing empirical research has begun uncovering many psychological, spiritual, and physical effects of meaning and purpose for individuals, organizations, and communities, but many gaps remain. The current collection addresses one particular gap: how people seek, find, and create meaning through everyday activities. It includes 12 articles that highlight the latest innovative work to advance new knowledge about meaning in life by understanding how people pursue, find, and experience meaning through everyday activities.

"Connecting the dots": past, present, and future in the science of meaning in life

The desire for a meaningful life is one of the cornerstones of human existence. Defined as "shared mental representations of possible relationships among things, events, and relationships" (Baumeister, 1991, p. 15), the way in which people perceive and prioritize meaning in their lives has changed over time in response to historical and cultural shifts. While the study of meaning is centuries old in philosophy, it is relatively new in fields that focus on how to enhance and enrich human functioning (e.g., Russo-Netzer and Vos, in press). Even though scholars have begun to develop sophisticated ways to examine how people search for and create meaning in their lives, the study of meaning has been relatively circumscribed to understanding the concept of meaning and how it contributes to wellbeing and coping (e.g., Janoff-Bulman and Yopyk, 2004; Steger et al., 2009; Linley and Joseph, 2011; Steger, 2012; Czekierda et al., 2017; Russo-Netzer, 2018). Several studies in this collection further support and extend the importance of meaning in life as a resource for promoting wellbeing, whether it is in the context of post-traumatic growth or life satisfaction. Kalashnikova et al. compare suicidal and non-suicidal patients' views on the

meaning of life as a resource for coping with psychological crises. The study highlights the importance of meaning in life as a coping resource for psychological distress and suggests that enhancing meaning in life could be an effective intervention for preventing suicide. Ryu and Suh explore the contribution of meaning in life to the relationship between self-disclosure and post-traumatic growth. Specifically, self-disclosure was found to positively influence post-traumatic growth by increasing deliberate rumination, eliciting positive social responses, and enhancing one's sense of meaning in life. This suggests that processing traumatic experiences through meaningful social interactions can lead to personal growth. The importance of intentional reflection and awareness to the experience of meaning in life is also highlighted in processes that promote wellbeing, such as mindfulness. In their article, Li et al. propose a mindfulness-to-meaning theory, which suggests that mindfulness promotes the experience of meaning in life, which, in turn, enhances life satisfaction. This underscores the potential benefits of mindfulness practices in promoting wellbeing and personal growth in everyday life. Osin et al. explore the relationship between ego development, which refers to an individual's capacity to engage with increasingly complex ideas, and eudaimonia, which refers to a sense of wellbeing and flourishing. Their findings suggest that people with higher ego development are better able to make meaning out of their experiences and find purpose in their lives. Lui et al. add another dimension of meaning in everyday life and experience by exploring potential mechanisms that link future orientation and prosociality among youth during the pandemic. Their study suggests that the awareness of meaning and quest for meaning mediate the relationship between future orientation and prosocial behavior. Further extending the importance of social factors in promoting wellbeing, particularly in the context of rapidly changing social structures, Li and He found that social fairness and trust mediated the relationship between social security satisfaction and subjective wellbeing.

New perspectives and directions in the study of meaning in life

Existing research suggests that individuals can derive meaning from diverse sources, based on their breadth (number of sources) and depth (level of commitment) related to different life domains (Schnell, 2021). Further exploring the importance of varied sources of meaning in life, Karwetzky et al. found that different sources of meaning, such as family, work, or religion, were associated with distinct patterns of brain activity across four age groups. This suggests that the neural mechanisms underlying the experience of meaning may differ depending on the source of that meaning.

The recent COVID-19 pandemic (among other things) has laid bare how meaningful life is grounded in everyday life and activities, be it starting a new hobby, caring for one's community, Zooming with friends and family around the world, or pivoting to a new job so that daily work can feel more purposeful. In parallel, there has been a growing interest among scholars and practitioners alike in how the search for meaning plays out in everyday life and how this approach to studying meaning may shed novel light on the complex puzzle that is meaning. Along these lines, Iso-Ahola and Baumeister delineate leisure as an unrecognized source of meaning in life. By exploring how leisure activities satisfy the basic needs of meaning (i.e., purpose, value, efficacy, and self-worth), the authors structure a foundation for further theory development and empirical testing of various conceptual dimensions which characterize leisure activities.

Religion is considered a central source of meaning for many, offering a structured and comprehensive perspective on life, along with a system of principles, morals, and directives to lead a meaningful and worthwhile existence (Spilka et al., 2003; Krok, 2014). Soenke et al. investigate the role of normative support in atheists' perception of meaning after being reminded of death. It highlights the importance of social support in promoting a sense of meaning in individuals who do not hold religious beliefs. Another perspective on the nature and origins of one's sense of meaning in life is offered by Landau who invites the readers into a philosophical exploration of potential conflicts that may arise when individuals prioritize meaning in life over other values, such as autonomy or personal growth. The article raises ethical considerations and prompts further examination of the concept of meaningfulness.

Finally, two studies suggest new methods for exploring how individuals derive meaning in their everyday lives. Cantarero et al. propose a brief tool to measure an individual's motivation for making sense of their experiences. The authors also suggest that the new scale could be used in a variety of research and clinical settings to better understand the role of meaning motivation in individuals' lives. Finally, Kreiss and Schnell examine the relationship between daily activities and a sense of meaning, suggesting that engaging in meaningful activities is positively associated with wellbeing. Their study is unique, employing an experience-sampling method to collect data on daily activities and their perceived meaning.

Overall, this Research Topic brings together work from multiple disciplines that can answer big-picture questions about the nature and experience of a meaningful life through the study of meaning in everyday life.

Author contributions

PR-N drafted the manuscript. JH offered revisions and provided approval for the publication of the content. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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ORIGINAL RESEARCH
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What Matters Most in Life? A German Cohort Study on the Sources of Meaning and Their Neurobiological Foundations in Four Age Groups

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Existing work in the field of positive psychology suggests that people can draw meaning from a variety of sources. The present study aimed to identify the most important sources of meaning and to explore the role of age and neural adaptation processes in this context. As part of a large German cohort study, 1,587 individuals between 12 and 94 years were asked to provide a maximum of five responses to the question "What matters most to you in life?" We divided the study population into four age groups and analyzed the obtained answers qualitatively and quantitatively using (1) word clouds and (2) frequency comparisons based on a summarizing content analysis. A chi-squared test was used to test the observed differences between age groups. Identified sources of meaning could be clustered into 16 main and 76 subcategories, with *relationships* (by 90% of respondents) and *health and well-being* (by 65% of respondents) being the most frequently named main categories, followed by a *good living environment* (by 28%), *(leisure) time* (by 26%), and *work* (by 24%). The study revealed some remarkable age-related patterns. While the importance of *partnership* increased with age, *social networks* were less important to older individuals. We also found that, for example, the importance of *self-realization*, *success and career* decreased with age, while the opposite was true for *life satisfaction* and *peace and harmony*. *Security* was most important to individuals in the two middle age groups between 30 and 69 years. The study advances our understanding of meaning across various ages by showing that individuals of different ages perceive different things as meaningful to them. Interpreting our results in the light of a neurobiological model of motivation systems, we argue that neural adaptation processes may play an important role in the (changing) perceptions of meaning throughout life.

Keywords: sources of meaning, meaningfulness, neurobiology, motivation, aging

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INTRODUCTION

Earliest records teach us that the pursuit of a good and meaningful life has always been an important aspiration of mankind. But what aspects enrich our lives and fill them with meaning? What matters most? The research on meaning in life addresses these questions, defining meaning as a construct of human experience that provides life with direction through coherence, purpose,

and significance (Martela and Steger, 2016). It is influenced by multiple factors including, but not limited to, achievements, relationships, work, religion, spirituality, self-transcendence, generativity, personal growth, leisure activities, traditions, and values (Reker and Woo, 2011; Schnell, 2020). Findings from different countries indicate that perceptions regarding meaning in life have a cultural component. For example, in Denmark, generativity was ranked as a primary source of meaning (Pedersen et al., 2018), whereas in a Brazilian study the most important source of meaning was attributed to religion (Damásio et al., 2013). By contrast, human relationships (family/interpersonal relations) were at the foreground of meaning in studies from New Zealand (Groudan and Jose, 2014), the United States (De Vogler and Ebersole, 1981; Baum and Stewart, 1990), and the Netherlands (Debats, 1999). Furthermore, the perception of meaning in life also correlates with important psychological factors such as health, anxiety/hypochondria (Yek et al., 2017), cognition (Aftab et al., 2019), and depression (van der Heyden et al., 2015; Volkert et al., 2019).

Findings on the relationship between meaning and age are not conclusive. While some authors report higher levels of meaning in older people (Schnell and Becker, 2007; Steger et al., 2009), others found an inverted U-shape with a peak around age 60 (Aftab et al., 2019). Interestingly, empirical research also points to age-related differences regarding the sources of meaning. While younger adults tend to draw meaning from the achievement of personal goals, self-realization, or the fulfillment of basic needs, older individuals draw meaning from spirituality, engagement in society, traditions, and self-transcendence (Reker et al., 1987; Reker and Wong, 1988; Hupkens et al., 2018). It is unclear whether the observed changes form part of a gradual, ongoing process, or occur in response to particular life experiences (or in certain time intervals) as suggested by Alter and Hershfield (2014). One potential explanation for the changed perception regarding the source of meaning is due to adjustments in life goals throughout the life span (van Rast and Marcoen, 2000). The adjustment of life goals entails a different perception of—and ability to distinguish—between realistic and unrealistic goals, depending on learning processes and the expectation of the number of years of life remaining (Argyle, 1999; Carstensen et al., 1999; Brandtstädter, 2015).

Although empirical research has significantly improved our understanding of meaning in life, there is still no definitive picture of its sources, possible changes in perception regarding these sources across different age groups, and the underlying physiological processes related to this. This article seeks to better understand the sources of meaning and therefore provide valuable insights for society but also for each individual.

Research Objectives

By evaluating data from a large German cohort study, we attempted to identify and quantify the sources of meaning in four age groups. We hypothesized that specific factors determine the perception of meaning in life and that these determinants vary across age groups. The results are discussed in the light of a *neurobiological model of motivation systems*, a model that relates perceptions of a "good life" to lifelong neurophysiological growth and maturation processes. This article is part of a larger study on the determinants of happiness, life satisfaction, and meaning.

MATERIALS AND METHODS

Participants

Our analyses are based on a survey conducted in Germany between September 2017 and January 2018. In total, 1,587 people aged between 12 and 94 participated in the study.

The distribution of our sample, comprising both males and females, across four age groups is shown in **Table 1**.

For cross-generational comparisons, we defined four age groups:

Age group 1: up to 29 years
Age group 2: 30 to 49 years
Age group 3: 50 to 69 years
Age group 4: 70 years or older

The age groups should reflect typical phases of life, such as youth and education (Age group 1), starting work, building a career and establishing a family (Age group 2), middle adulthood (Age group 3), and retirement (Age group 4).

The sample largely represents Germany's actual demographic distribution. Participants in Age group 2 were slightly overrepresented (35 vs. 28%), while those in Age group 4 were slightly underrepresented (10 vs. 17%; Federal Statistical Office, 2021). Overall, more females (1,000) than males (587) participated in the study, with some differences between age groups.

Survey Instrument

Data was collected using both online and paper questionnaires. The questionnaire began with the question "What matters most to you in life?". Participants could give a maximum of five answers. No prioritization was asked for, and no word limit was set for the responses.

Furthermore, we queried various socio-demographic variables, such as age, subjective health status, financial worries, occupational status, or city size although not all collected variables were relevant for this part of the study. To ensure the questionnaire's comprehensibility, we pre-tested it with 15 individuals in August 2017.

Sampling and Recruitment

The relevant population comprised all persons aged 10 years and older living in Germany. Individuals with cognitive impairments (e.g., dementia) were excluded from participation. We shared information about the possibility to participate in the survey *via* radio (Deutschlandfunk), television (WDR), social media (Facebook), and the Witten/Herdecke University's webpage. In addition to an online survey (1,027 participants), 560 people were recruited in various public settings (e.g., cafés, trains), four general practitioners' and ophthalmologists' practices, and two schools. All study participants received extensive information material on the study objectives and the processing of the data collected.

TABLE 1 | Study population and distribution across different age groups.

	Total	Age group 1 (≤29 years)	Age group 2 (30 to 49 years)	Age group 3 (50 to 69 years)	Age group 4 (≥70 years)
Study participants	1,587 (100%)	367 (23%)	552 (35%)	506 (32%)	162 (10%)
Male	587 (37%)	130 (36%)	173 (31%)	181 (36%)	103 (64%)
Female	1,000 (63%)	237 (64%)	379 (69%)	325 (64%)	59 (36%)

The study obtained ethics approval from the Witten/Herdecke University's Ethics Committee (ethics vote no. 138/2017).

Analysis

A two-stage procedure was selected to answer the research questions. First, we generated word clouds to graphically analyze the unprocessed material. Articles, pronouns, and adverbs were excluded from the word clouds to focus on content-bearing words.

Subsequently, we conducted a summarizing content analysis according to Mayring (2000) to investigate the answers in a structured way. All analyses were carried out in MAXQDA 2020 (Kuckartz and Rädiker, 2019). Methodologically, the content analysis followed comprehensive rules, which we defined in advance using a 7-step process model (see **Figure 1**).

Frequencies were first calculated for the main and then for the subcategories. To analyze the share of participants that mentioned a particular category, we divided the number of codings per category by the number of participants. In cases where participants gave several answers that could be assigned to the same main or subcategory, we counted only one coding per category. We used the chi-squared test to analyze differences between age groups and considered $P \leq 0.05$ statistically significant.

In total, we received 6,609 responses from 1,587 respondents, which corresponds to an average of 4.2 responses per participant. However, some differences were observed in the distribution of responses by age groups. In Age groups 1–3, the average number of responses ranged from 4.1 to 4.4, while in Age group 4 it was only 3.3.

All analyses were conducted in German. We then translated the results into English.

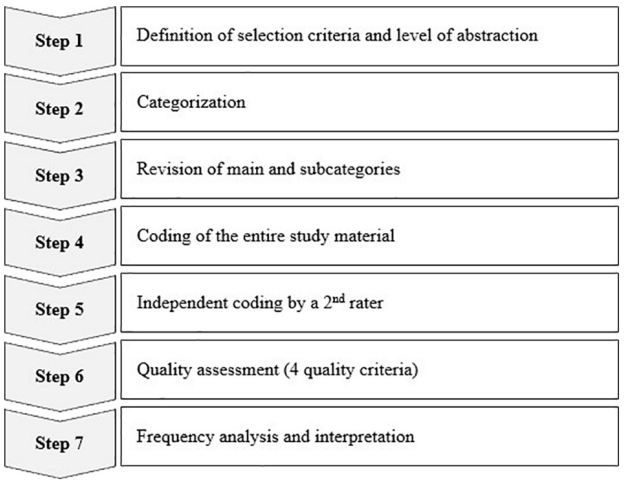

FIGURE 1 | Schematic overview of the qualitative content analysis approach.

RESULTS

Word Clouds

For all participants across the various age groups, *health*, *family,* and—by some distance—*friends* were mentioned most frequently as being most important to them in life. The next most frequently mentioned group of terms comprised *work*, *love*, *time,* and *children*. As shown in **Figure 2**, *money* did not feature as often as could be expected among the 50 most frequently used words to describe factors that contribute meaning to life.

A comparison of the responses from the youngest and the oldest age group is shown in **Supplementary Figure 1**. We observed that *health* and *family* were mentioned very often in both age groups. Interestingly, *friends*, *work*, and *time* were mentioned more often by younger individuals, whereas, for example, *partnership* and *peace* were mentioned more often by older respondents.

Summarizing Content Analysis

The summarizing content analysis resulted in 16 main and 76 subcategories. We present the overall categorization including exemplary responses in **Supplementary Table 1**.

The frequencies at the **main category level** for the overall study population and four age groups are shown in **Table 2**. We sorted the categories in descending order according to the frequency with which topics that could be allocated to them were mentioned in the overall study population (column "Total").

In terms of all respondents, 90% considered *relationship*-associated aspects to be very important. *Health and well-being* were placed second with 65%, and approximately a quarter of respondents mentioned aspects related to a *good living environment* (28%), *(leisure) time* (26%), and *work* (24%).

When comparing the responses obtained from different age groups, we observed some significant differences. Although *relationships* remained at the top of the list in all age groups, their frequency decreased from 93% in Age group 1 to 85% in Age group 4, whereas *health and well-being* and a *good living environment* were mentioned more frequently by older than by younger participants.

Additionally, the analysis also showed some interesting age-specific differences regarding less frequently mentioned aspects. For example, *Personal growth* was particularly important for younger people (Age group 1), while *security*

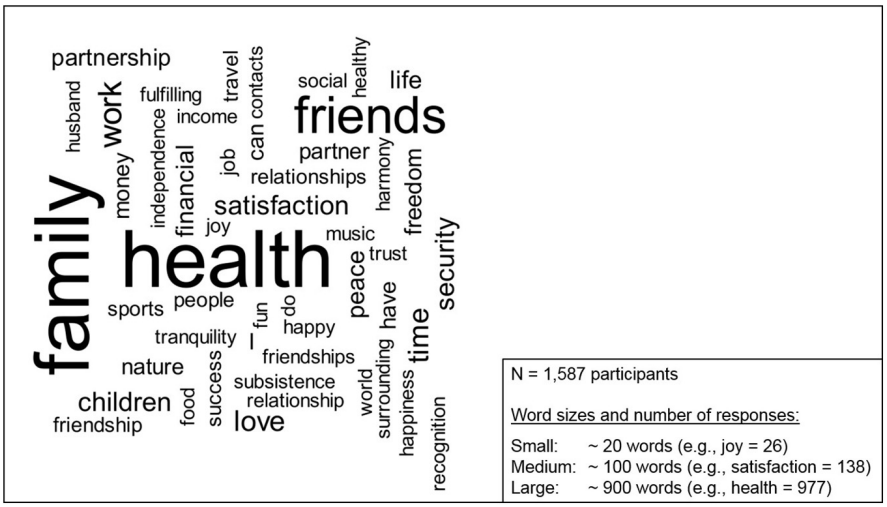

FIGURE 2 | Word cloud representing the distribution of responses from the overall study population.

TABLE 2 | Distribution of responses across the main categories for the overall study population and according to different age groups.

	Main categories	Total[1]	Age group 1	Age group 2	Age group 3	Age group 4	χ^2	(df)	*P*
**	Relationships	90%	93%	91%	87%	85%	13.82	(3)	0.003
***	Health and well-being	65%	50%[b]	65%	71%	76%	52.84	(3)	<0.001
***	Good living environment	28%	17%[b]	24%	38%[a]	36%	55.83	(3)	<0.001
***	(Leisure) time	26%	28%	31%[a]	24%	10%[b]	21.19	(3)	<0.001
***	Work	24%	31%[a]	27%	22%	4%[b]	51.29	(3)	<0.001
***	Security	18%	10%[b]	20%	24%[a]	10%[b]	40.43	(3)	<0.001
***	Personal growth	14%	18%[a]	16%	9%[b]	7%[b]	24.39	(3)	<0.001
***	Sense and meaningfulness	12%	8%[b]	15%	14%	8%	12.42	(3)	<0.001
***	Happiness	11%	16%[a]	11%	9%	4%[b]	20.59	(3)	<0.001
	Values	10%	10%	11%	11%	10%	0.09	(3)	0.993
***	Freedom	10%	7%[b]	15%[a]	9%	6%	23.58	(3)	<0.001
	Life satisfaction	9%	10%	8%	9%	12%	1.79	(3)	0.616
*	Material possessions	9%	11%	8%	9%	3%[b]	9.58	(3)	0.023
	Social rank	4%	4%	4%	5%	2%	2.66	(3)	0.448
	Other	4%	5%	4%	3%	2%	5.07	(3)	0.167
	Long life	0%	0%	0%	1%	1%	4.49	(3)	0.213
	Codings per participant	4.2	4.1	4.4	4.2	3.3			
	N	1,587	367	552	506	162			

[1] *Table is sorted in descending order in column "Total".*
[a] *Standardized residuals ≥ 2.*
[b] *Standardized residuals ≤ −2.*
*Significance levels (Pearson's chi-squared test): *P < 0.05; **P < 0.01; and ***P < 0.001.*

and *sense and meaningfulness* were mentioned most often by Age groups 2 and 3.

Some other notable variations were observed for the main categories *happiness*, *life satisfaction,* and *freedom*. While 16% of the participants in Age group 1 mentioned aspects related to momentary *happiness*, this proportion fell to only 4% in Age group 4. Although *freedom* was regarded as being very important by 15% of respondents in Age group 2, this perception was shared less frequently by those in Age group 3 (9%), and Age group 4 (6%). *Material possessions* were mentioned significantly less often in Age group 4 (3%) than among younger participants.

The **frequencies at the subcategory** level are shown in **Table 3**. The categories were again sorted in descending order according to their frequency in the responses of the overall study population (column "Total"). To facilitate readability, the table only includes subcategories that contain codes from at least 5% of the study participants in at least one age group, while the frequency of the remaining subcategories is presented in aggregated form ("Total other subcategories"). Only 12% of the survey respondents

TABLE 3 | Distribution of responses across the subcategories for the overall study population and according to different age groups.

	Subcategories	Main categories	Total[1]	Age group 1	Age group 2	Age group 3	Age group 4	χ^2	(df)	*P*
**	Family	Relationships	68%	72%	70%	66%	57%	13.12	(3)	0.004
***	Health for me	Health and well-being	61%	49%[b]	60%	67%	72%	38.03	(3)	<0.001
***	Social network	Relationships	44%	60%[a]	42%	39%	27%[b]	61.75	(3)	<0.001
**	Partnership	Relationships	18%	14%	19%	17%	26%[a]	11.83	(3)	0.008
***	Financial security	Security	16%	7%[b]	18%	22%[a]	9%[b]	42.74	(3)	<0.001
***	Love and trust	Relationships	15%	21%[a]	17%	12%	8%[b]	20.65	(3)	<0.001
***	Peace and harmony	Good living environment	13%	6%[b]	9%[b]	19%[a]	22%[a]	54.94	(3)	<0.001
	Activity/entertainment hobbies	(Leisure) time	12%	16%	11%	13%	9%	6.56	(3)	0.087
***	To have time and spend it with what/those you love	(Leisure) time	10%	9%	15%[a]	7%	1%[b]	35.91	(3)	<0.001
	Satisfaction for me	Life satisfaction	9%	9%	8%	8%	11%	1.71	(3)	0.635
***	Nature	Good living environment	8%	3%[b]	7%	13%[a]	7%	32.69	(3)	<0.001
***	Happiness for me	Happiness	8%	14%[a]	8%	5%[b]	2%[b]	31.44	(3)	<0.001
***	Self-realization	Personal growth	6%	8%	8%	4%[b]	2%[b]	17.21	(3)	<0.001
**	Health for us or others	Health and well-being	6%	2%[b]	7%	7%	8%	13.62	(3)	0.004
*	Money	Material possessions	5%	7%	5%	5%	1%[b]	8.20	(3)	0.042
	Societal security	Good living environment	5%	6%	5%	4%	2%	2.86	(3)	0.414
***	Success and career	Work	4%	11%[a]	3%	2%[b]	0%[b]	52.56	(3)	<0.001
*	AE: Fulfilment	Sense and meaningfulness	4%	4%	6%[a]	3%	2%	9.47	(3)	0.024
*	Holidays/travel	(Leisure) time	4%	4%	6%	4%	1%[b]	9.02	(3)	0.029
	Self-determination	Freedom	4%	2%	5%	5%	4%	5.56	(3)	0.135
	Recognition	Social rank	4%	4%	4%	5%	2%	2.75	(3)	0.431
	New experiences and challenges	Personal growth	4%	5%	5%	2%	3%	6.39	(3)	0.094
	Joy and satisfaction at work	Work	4%	4%	5%	3%	1%[b]	7.19	(3)	0.066
	A society worth living in	Good living environment	4%	2%	3%	5%	3%	4.26	(3)	0.235
**	Faith and spirituality	Sense and meaningfulness	3%	2%	2%	6%[a]	4%	12.57	(3)	0.006
	Total other subcategories		*12%*	*12%*	*12%*	*13%*	*11%*			
	Codings per participant		4.2	4.1	4.4	4.2	3.3			
	N		1,587	367	552	506	162			

[1] *Table is sorted in descending order in column "Total" and contains only subcategories that have a frequency ≥ 5% in at least one age group.*
[a] *Standardized residuals ≥ 2.*
[b] *Standardized residuals ≤ −2.*
*Significance levels (Pearson's chi-squared test): *P < 0.05; **P < 0.01; and ***P < 0.001.*

mentioned any of these remaining subcategories, indicating that most codings are covered by the displayed categories.

Within *relationships*, which was the most important main category, *family* (68%), *social network* (44%), and *partnership* (18%) were the most frequent subcategories. When comparing the responses between age groups with increasing age, the frequency of responses involving *family* and, in particular, *social network* decreased, while a *partnership* was mentioned more often by older than by younger people. In the main category *health and well-being*, which was the second most important category at the upper level, both *health for me* and *health for us or others* appeared to be more important for older than for younger individuals. Although *financial security* was important to 18% of respondents in Age group 2 and 22% in Age group 3, interestingly the values were much lower for Age group 1 (7%) and Age group 4 (9%). Aspects related to *peace and harmony* were mentioned more frequently by older participants, as was shown by the difference between the responses of Age group 1 (6%) and Age group 4 (22%). The opposite was observed in terms of *success and career*, as aspects of this subcategory were mentioned more frequently by respondents in Age group 1 (11%) than by respondents in subsequent age groups (3% or less). Overall, aspects that are more material or performance-oriented such as *money*, *self-realization,* and *new experiences and challenges* were mentioned less often by older participants.

DISCUSSION

Interpretation of Key Findings

The study aimed to identify and compare the perceived sources of meaning in a randomly selected sample of persons in Germany, and to determine the differences in these perceptions across four different age groups. By examining the categorization derived from the data, the large number of categories identified (16 main and 76 subcategories) indicates that, for the sample in question, meaning can be drawn from many sources. Despite the relatively large number of categories, the analysis showed that *relationships*

(especially *family*) were overwhelmingly ranked as being the most important source of meaning, followed by *health and well-being*. Further aspects such as a *good living environment*, which includes the subcategories *peace and harmony*, *societal security,* and *environmental protection*, as well as *(leisure) time* were also indicated as being important sources of meaning, although not nearly as important as *relationships*. Toward the middle of the range of the frequency of responses, aspects related to *work* and *success* were mentioned, alongside *freedom* or *personal growth*. *Material possessions* or *social rank* were of great importance to relatively few people.

When comparing the results between the four predefined age groups, we found some interesting differences, such as the higher level of importance attributed to *partnership*, *peace and harmony,* and a lower level of importance attributed to *social networks, success and career,* and *self-realization* in older people.

The **neurobiological model of motivation systems** (Esch, 2017; Michaelsen and Esch, 2021) hypothesizes that many of these changes can, at least partly, be attributed to age effects. According to this model, our perceptions of meaning and well-being are subject to lifelong neurophysiological processes of growth, pushing maturation and translating experiences into neuronal structures ("neuronal plasticity"). The model distinguishes three motivation systems (A, B, and C), that are ultimately aligned under the primary goal of optimally adapting to our socio-cultural environment throughout our lives.

The Wanting System (also "Type A Motivation") characterizes the first phase of life including young adulthood. To adequately capture this phase of life in our analyses, we broadly clustered Age group 1 up to age 29. It is clear that this is a broad clustering of several phases (childhood, adolescence, and early adulthood) into one broad phase. However, it is worth noting that according to the model, these phases share similar neurobiological characteristics, i.e., great potential for freedom and adaptation, and incomplete neural preparation for the concrete challenges of life. Under the strong influence of dopamine, peak moments are perceived as a thrill or "happiness." Against the background of Type A Motivation, it seems plausible that *success and career* could be identified as important sources of meaning in life in Age group 1. Similarly, factors such as *social network*, *material possessions*, *happiness for me*, *leisure time*, *self-realization* and *success, and career* were named more often by respondents in this age group than by older respondents.

The Threat-Avoidance System (also "Type B Motivation") assumes that our body activates its stress physiology more often as we adapt and mature. This correlates to the observation that in midlife, many people prefer to "persist and defend" rather than to "conquer," because they increasingly crave security and try to avoid stress (see also Stefano et al., 2005). In the results of our survey, this increased need for safety and protection was apparent from the responses of Age groups 2 and 3, which attributed increasing importance to *financial security* and a decreased importance to categories such as *freedom* or *success and career*.

Finally, the Non-Wanting-System ("Type C Motivation" or "Quiescence") is characterized by altruism and affiliation. If individuals adapt to the circumstances of life and mature, lasting satisfaction, inner serenity, and self-knowledge ("wisdom") can increasingly develop with age. Our results showed some patterns that could indicate the development of Type C Motivation in the Age group 4 respondents. Firstly, according to the neurobiological model, experiences (and stress) lead to an adjustment of aspirations and a focus on the essential. This could be the reason why the respondents in Age group 4 on average provided a lower number of sources of meaning (3.3/5 possible responses) as opposed to respondents from other age groups (4+/5 possible responses). Furthermore, the increased importance attributed to inner *peace and harmony* and *partnership* by respondents in Age group 3 and Age group 4, corresponding with the decreased importance attributed to *self-realization* and *money* for Age groups 2–4 as a factor of increasing age, suggest an increasing development away from a Type B toward Type C motivation.

An overview of the *neurobiological model of motivation systems*, including involved brain areas, is presented in **Supplementary Figure 2**.

In general, we interpret the high number of responses across all age groups pertaining to *family* to indicate the significance of generativity in people's lives. This finding is consistent with those from the study conducted in Denmark by Pedersen et al. (2018) and Schnell's research involving people from different countries, age groups, and psychological conditions (Schnell, 2020). According to the neurobiological model, the transmission of experiences, knowledge, and cultural heritage to subsequent generations ("generativity") is of great importance, especially in later years, which could explain the positive correlation that some researchers have found between grandparenting, perceived meaning, and subjective well-being (e.g., Park, 2018).

While the significance of relationships for meaning was apparent for all age groups, it was interesting to note a difference in emphasis regarding relationship types among the different age groups surveyed. In our results, the importance attributed to *social networks* decreased in Age group 4, while *partnership*-related aspects were regarded as becoming increasingly important with increasing age. It thus appears that the need for social interaction shifts from having a large circle of friends in younger years to the core of *partnership* and *family* as people grow older.

Regarding the importance of *health and well-being*, our analyses showed a gradual increase in the number of responses with increasing age. This was an interesting finding since our quantitative analyses of the same database showed that the correlation between health and life satisfaction was weaker among older than younger individuals.[1] Other authors have controversially discussed the relationship between health and subjective well-being (e.g., Okun et al., 1984; Berg et al., 2006; Gana et al., 2013; Steptoe et al., 2015), with several studies pointing toward a "health paradox." Although the importance of health for meaning and well-being tends to increase with increasing age, only a few illnesses are statistically associated with lower levels of subjective well-being (Berg et al., 2009, 2011; Hanson et al., 2019; Näsman et al., 2020). According to the

[1]Karwetzky C., Werdecker, L., Michaelsen, M. M., and Esch, T. (in preparation). Happiness, satisfaction and the U-shape of life.

neurobiological model, physical health is especially important to experience happiness driven by the Wanting System (Type A Motivation), which is typically seen during adolescence and young adulthood. As we grow older and mature, a certain level of physical discomfort and health problems can be regarded as "part of life" and thus be perceived as being less of an impairment to subjective well-being.

Finally, *faith and spirituality*, which have been identified as very important sources of meaning in other countries (e.g., Brazil and Italy) and especially among older individuals (e.g., Damásio et al., 2013; Manuti et al., 2016), did not play a significant role in this study. This difference could potentially be attributed to cultural and/or socio-economic differences. However, according to the sociodemographic data collected, the proportion of religious or faithful individuals increased from age group to age group; reaching 63% in the oldest group. In the youngest age group, it was only 29%.

From a societal perspective, this study has a number of practical implications and stimulates further thought in a variety of ways. The perception of older people as important contributors to our cultural heritage, the widespread goal of eternal health and youth, and the extraordinary importance of community and connection for each individual but also our society as a whole (e.g., Costabile et al., 2021) are just a few examples.

Strengths, Limitations, and Outlook

The present study is characterized by strengths, but also limitations, that should be considered when interpreting the results.

To assess the quality of our category system, a second rater re-coded the responses of 100 participants. Cohen's Kappa (Cohen, 1960), which was used as a measure of agreement between the first and the second coding, had a value of 0.97. This value points to a high quality of the category system and the overall coding, as values between 0.61 and 0.80 are usually classified as *substantial,* and values between 0.81 and 1.00 as *almost perfect* (Fleiss, 1981). Furthermore, the 16th main category *other* accounted for only 0.95% of all codings, indicating that almost all mentions were covered by the 15 content-bearing categories. Finally, the study had a sample size that is substantial compared to most other qualitative studies on the sources of meaning (e.g., Delle Fave et al., 2013; $N = 666$; Groudan and Jose, 2014; $N = 247$).

Regarding the limitations, the use of cross-sectional instead of longitudinal data should be highlighted. Instead of following the same people over a longer period, we surveyed individuals of different ages and conducted frequency comparisons across age groups. Although the use of cross-sectional data is common due to time constraints, it is important to understand that age effects are only one possible explanation for the patterns observed. Secondly, the study is limited by some inequalities in the sample, namely the unequal gender distribution and the underrepresented cohort size in the oldest age group. Finally, the study did not investigate the neurophysiological changes which, according to Esch's model, are assumed to underlie the different motivation types. Hence, they cannot be directly used for an explanation of the observed patterns. Future studies should examine, longitudinally if possible, the relationship between specific neural adaptations and changes in sources of meaning.

In order to analyze in more detail the observed differences between countries, e.g., in the importance of religion and faith, it would be interesting to replicate this study in other regions. Finally, we recommend investigating possible changes in the sources of meaning after extraordinary life events and traumatic experiences, as some authors have observed changes in the definition of life goals after such events (e.g., Triplett et al., 2012).

CONCLUSION

The most important sources of meaning in the context of the German society were identified based on a representative sample of approximately 1,600 people, comprising individuals between the ages of 12 and 94 years. The results were further clustered according to four age groups to identify similarities and differences regarding perceived sources of meaning among individuals of different ages. We found that, across all age groups, aspects associated with *relationships* and *health* are most often considered as being important. For many sources of meaning, we identified age-related differences. While the importance of *partnership* increased significantly with age, the importance of *social networks* was lower in older individuals. Further age-related differences could be observed, for example, in the striving for *material possessions* (almost meaningless in Age group 4), *self-realization* and *success and career* (decrease with increasing age), *security* (most pronounced in midlife), and *peace and harmony* (significantly higher after midlife). Except for *financial security*, monetary aspects were not of great importance to the participants of this study. We interpreted the results in the light of a *neurobiological model of motivation systems*, arguing that the observed patterns are interrelated and represent the consequence of lifelong neurophysiologic adaptation processes.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the Witten/Herdecke University's Ethics Committee did not allow the data to be made publicly available. In the event that data is needed for review, please contact the corresponding author. Requests to access the datasets should be directed to TE, tobias.esch@uni-wh.de.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethik-Kommission der Universität Witten-Herdecke e.V. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

CK: conceptualization, investigation, formal analysis, and writing. LW: conceptualization, methodology, review, and

editing. TE: conceptualization, project administration, supervision, review, and editing. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.777751/full#supplementary-material

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ORIGINAL RESEARCH
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Social Security Satisfaction and People's Subjective Wellbeing in China: The Serial Mediation Effect of Social Fairness and Social Trust

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Objective: To test the relationship between social security satisfaction, social fairness, social trust, and people's subjective wellbeing (SWB) in China and the serial mediation effect in this study.

Methods: We utilized the data ($N = 7,978$) from Chinese Social Survey (CSS) in 2017 and 2019, involving 31 provinces across the country. There were 5,398 samples in 2017CSS and 2,580 samples in 2019CSS selected by the research objectives. There were 4,269 women and 3,709 men with the average age of participants being 43 (SD = 14.41).

Results: The results showed that the actual status of social security satisfaction, social fairness and trust, and SWB were greater than the theoretical status overall. Social security satisfaction [$\beta = 0.454$, $p < 0.001$, 95% CI = (0.377, 0.423)], social fairness [$\beta = 0.065$, $p < 0.001$, 95% CI = (−0.039, 0.124)], and social trust [$\beta = 0.108$, $p < 0.001$, 95% CI = (0.237, 0.397)] positively influenced people's SWB, respectively. Social fairness had a positive effect on social trust ($\beta = 0.298$, $p < 0.001$). Social fairness and social trust partly mediated the relationship between social security satisfaction and SWB, respectively. Social security satisfaction indirectly influenced SWB through the serial effect of social fairness and social trust. The total effect of SWB explained is 47% in the serial mediation model.

Conclusion: Satisfactory social security is likely to cause a high level of people's SWB, social fairness, and social trust. It is beneficial to form a virtuous circle in society. Allowing people to obtain satisfactory social security is conducive to social equity, promoting social trust, and improving people's SWB.

Keywords: social security satisfaction, social fairness, social trust, subjective wellbeing, mediation

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INTRODUCTION

Subjective wellbeing (SWB) is a subjective evaluation of an individual's attitude to life, reflected by happiness or life satisfaction, which is a crucial conception developed by Diener and researchers has been accepted worldwide (Larsen et al., 1985; Diener et al., 1997; Pavot and Diener, 2008). Recent studies have analyzed the trends of individual SWB at the global level. Although the SWB level is various in different countries, the factors involved are consistent

(Jebb et al., 2020). To some extent, social factors have a greater effect on SWB than sociodemographic factors (Siedlecki et al., 2013; Appau et al., 2019). After all, social problems involving the absence of health care, unemployment, and income inequality are intimately related to daily life, while citizens' SWB is a critical index for assessing the social status as well as a possible pursuit of government or public policies (Staveren et al., 2013; Suriyanrattakorn and Chang, 2021).

In the past 30 years, especially, China's economy has developed rapidly with the urbanization rate approaching 60% (Chen et al., 2019a). People placed higher demands on the quality of life and public services. The government exerts effective social management and services to ensure the speed and quality of social development and improve people's life satisfaction, which also facilitates building the government's credibility (Liu et al., 2020). In this way, the report of the 19th National Congress of the Communist Party of China pointed that the government should shoulder the responsibility of enhancing public services and meeting people's ever-growing needs for a better life. Promoting social fairness and justice will make people happier. The "14th Five-Year Plan" in China outlined that social security system is organically integrated with public services, rights and interests of vulnerable groups, employment, income distribution, and grass-roots social governance, giving it a vital role in strengthening people's livelihood and wellbeing. It showed that social security is indispensable to uphold social fairness and justice and promote happiness in life.

It is worth noting that there are still gaps in empirical research in the Chinese context through literature review. First, fairness and trust have been correlated in previous research, but no one has discussed their effects between social security satisfaction and SWB. Second, as the elements of the social system, these variables may be related to a certain extent according to societal theories, but what the relationship is in the Chinese context is unknown. Third, although prior studies have developed a simple mediation model, the multiplex model of these factors is also urgently needed. Hence, this research would comprehensively analyze the relationship between social security satisfaction and SWB from the people's view in China and check the effect of social fairness and social trust in this relationship. We would like to answer the following questions. How does social security satisfaction influence people's SWB in China? What is the role of social fairness and social trust between social security satisfaction and SWB? Whether social fairness and social trust play a serial-mediated role? The research findings are hoped to contribute to the theoretical and practical development.

LITERATURE REVIEW AND HYPOTHESIS

Social Security Satisfaction and People's SWB

Social security satisfaction in this study refers to a subjective evaluation of social security. Social security in China is the state or the government through the redistribution of national income to achieve the goal of meeting citizens' basic living needs. The social security system mainly comprises social insurance, social assistance, preferential social treatment, and social welfare in various fields. The lowest-level need of human beings is the survival need in Maslow's need hierarchy theory. They do not purse higher-level needs such as self-worth until the survival is satisfied (Maslow, 1943). A dominant role of social security is to support disadvantaged groups so that they can receive material security, such as Pension Insurance (Wahba and Bridwell, 1976; Ng et al., 2017), Employment Security (Tang et al., 2018), Medical Security (Mao and Han, 2018), Housing Security (Winston, 2017), urban and rural subsistence allowances (Ding, 2017). Satisfaction with social security represents recognition of government services.

Some international literature proposed that satisfactory social security services can alleviate these negative influences (e.g., depression and life stress) caused by social problems to improve citizens' SWB (Han and Gao, 2020). Retirement may increase the threat of depression for Europeans, Americans, and Turks; however, this risk was likely to be reduced through the Social Security pension. Satisfactory welfare funds could relieve the post-retirement economic stress, which made them happy enough (Kapteyn et al., 2013; Altun and Yazici, 2015). Enjoying benefits from the public pension scheme generally enhanced Chinese life satisfaction, such as Government and Institution Pension, Enterprise Employee Basic Pension, Livelihood Guarantee program (*Dibao*), and Urban–Rural Social Pension Scheme (Gao and Zhai, 2017; Abruquah et al., 2019; Han and Gao, 2020). Pressures to seek medical aid could be mitigated as well as physical health could be in good condition owing to medical insurance coverage, resulting in greater life wellbeing (Tran et al., 2016). Given previous conclusions from the relationship between specific social security programs and SWB, we propose hypothesis 1 as follows from the perspective of holistic satisfaction.

> *H1:* Satisfaction with social security may have a positive effect on people's SWB, namely, people with a higher level of social security satisfaction are likely to have a higher level of SWB.

Social Security Satisfaction, Social Fairness, and People's SWB

Social fairness, which encompasses justice and equality, is based on equality but is not synonymous (Chen et al., 2019b). Justice judgment theory assumes that individuals' perception of fairness is from multiple rules rather than a single rule, including rules of procedure and distribution. Distribution fairness is defined as a person's belief that is appropriate for rewards, penalties, or resources to be distributed concerning certain criteria. Procedure fairness is defined as an individual's belief that allocative procedures meeting certain criteria are fair (Leventhal, 1980). As Amartya Sen said, the root of poverty and social inequality is the loss of viability, namely, the unequal distribution of rights and benefits (Sen, 1993, 1999). They will perceive society to be unfair and injustice when people attain unsatisfactory distribution results.

Indeed, the essence of social security is to achieve fairness through redistribution. The accessibility and applicability of social security are key to upholding social fairness and justice. In particular, the support for disadvantaged groups demonstrates social fairness and justice, which benefits the enhancement of the entire SWB (Han and Gao, 2020; Wang and Li, 2020).

From the viewpoint of social fairness and justice, we can fully understand the effect of social factors on human behaviors and psychology (Schneider, 2015). Social unfairness will stimulate people to engage in a range of resistant behaviors and negative psychology, which may decline SWB (Ngamaba et al., 2018). Many argued that unfair social distribution and income inequality posed great threats to personal interests, political stability, and social progress, all of which severely decreased people's happiness and satisfaction, while social fairness was of great benefit to individual happiness (Huang, 2019; Di Martino and Prilleltensky, 2020; Roh, 2021). Wang and Li (2020) found, for example, that disaster-affected people had a higher fairness perception of government relief policy resulting in life satisfaction of post-disasters if they got satisfactory social security. It is concluded that social security satisfaction may have a positive impact on the realization of social fairness, thereby improving SWB. However, relevant research demonstrated that residents' general perception of fairness is somewhat lower than the socially recognized level (Gao and Qin, 2018). In other words, people are still troubled by a paucity of fairness in life satisfaction. Can governments heighten social fairness by increasing social security satisfaction, which indirectly enhances people's SWB? Investigations on this indirect relationship are still relatively rare. Thus, we formulate hypothesis 2 in the Chinese context.

H2: Social fairness may play a partial mediating role in the relationship between social security satisfaction and people's SWB.

Social Security Satisfaction, Social Trust, and People's SWB

Social trust refers to subjective confidence in institutions or individuals, that is, special trust quantified by institutional trust and generalized trust measured in accordance with interpersonal trust (Zmerli and Castillo, 2015; Zhao and Yu, 2017). The study with cross-national data from 29 Asian countries found that social trust still needed to be improved. High social trust made up only 37%, while low social trust was as high as 54% (Tokuda et al., 2010). In terms of societal theories, social trust is influenced by social environmental factors, it arises in a more equitable social environment. Research in European welfare states showed that welfare security policies and social trust were closely related. A fine welfare system played a role in social protection, which could increase people's institutional trust and interpersonal trust with reducing unfairness (Hadis, 2014; Daniele and Geys, 2015). Thence, social trust likely thrives in a satisfactory environment of social security.

Social trust is also an indicator that reflects the scenario of social development and contributes to personal life satisfaction (Rothstein and Uslaner, 2005; Helliwell et al., 2016; Appau et al., 2019). Some scholars discovered that social trust, from the perspective of social capital, is significantly associated with people's SWB (Clark and Lisowski, 2018). For example, Piumatti et al. (2018), drawing from 4,406 Italian samples, also found that social trust had a significant positive effect on life satisfaction. Suriyanrattakorn and Chang (2021) found, using a cross-country panel data set for 97 countries in the period 2011–2019, not only the positive direct relationship between institution trust and life satisfaction, but also the indirect positive effect between them. But a lack of social trust would contribute to financial recession, conflict and contradiction, and poor wellbeing. It is speculated that satisfactory social security policies can strengthen social trust and thereby promote SWB (Kapteyn et al., 2013; Wang and Li, 2020). Churchill and Mishra (2017) found, however, that the effects of trust on SWB are relatively weaker compared to income effects in developing countries. This is further worth verifying in China. We therefore propose hypothesis 3 based on the above-mentioned arguments and conclusions.

H3: Social trust may play a partial mediating role in the relationship between social security satisfaction and people's SWB.

Social Fairness and Social Trust

Fairness and trust are indispensable considerations for social development; they can complement each other to build an orderly and harmonious society. According to the theory of fairness heuristic, when the overall perception of fairness is formed, people will consider it insightful information to guide and illustrate the relevant fairness information that they may come across later. This fairness will later affect people's attitudes, emotions, and behaviors towards the outside (Lind, 2001; Jones and Martens, 2009). In this way, the sense of fairness is used as a trust inspiration. The relationship between social fairness and social trust has been noted in the early literature. They believed that fairness is the foundation of trust. In other words, trust arises when social fairness is felt (Brockner, 1996; Brugman et al., 2016).

On the one hand, social fairness perception can significantly increase confidence in government, but unequal social distribution may lead to the government losing trust in the people. The deterioration in social trust is likely to put the entire country in a vicious circle hindering social progress (You, 2012; Zhao and Yu, 2017; Dierckx et al., 2021). On the other hand, social fairness also contributes to interpersonal trust. Studies found that fairness outcomes and resource allocations could reinforce the sense of social belonging (Valcke et al., 2020). Not only did it stimulate personal talents and motivation, but it also improved social acceptance and social trust perception to contribute to social development. Social justice had a statistically positive effect on social trust, regardless of procedural or distributive justice (Gobena and Van Dijke, 2017; Ziller, 2017; Sharma and Yadav, 2018; Zhang and Zhou, 2018). However, there are few domestic studies on the direct

relationship between social fairness and social trust. We therefore give hypothesis 4 based on the above theoretical content.

H4: Social fairness may positively influence social trust, that is, the higher level of social fairness is connected with the higher degree of social trust.

Social Security Satisfaction, Social Fairness, Social Trust, and People's SWB

The above evidences suggested that there is a certain relationship between social security satisfaction, social fairness, social trust, and SWB (Brugman et al., 2016; Helliwell et al., 2016; Appau et al., 2019; Huang, 2019; Di Martino and Prilleltensky, 2020). As social system theory stated, social systems are inherently complex, and the various subsystems of society are interrelated and co-work to achieve the goal of social integration (Luhmann, 1984; Walby, 2007). The material and spiritual content in the society constitutes a stable social structure, which is of great significance to human life (Parsons, 2013).

Actually, social security, social fairness, and social trust are the tangible or intangible components of the social system, impacting people's life. And the quality of social security system also depends on the level of government governance (Abbott et al., 2015). Therefore, satisfactory social security makes individuals feel that rights and benefits are distributed fairly (Wang and Li, 2020; Wolfson, 2021), likely increasing institutional trust and interpersonal trust (Zhao and Yu, 2017; Ziller, 2017). Some researchers have found that social trust positively affected life satisfaction in the social quality model (Abbott et al., 2015). The results elucidated why economic prosperity is not the only indicator of advancement in life satisfaction, but rather many social determinants must be considered, such as social trust and social inequality. From this, it can be inferred that there is a chain-like relationship between social security satisfaction, social fairness, social trust, and SWB. However, a large number of studies have examined direct paths between them or simple intermediary models, but the supplements of multiple complex models have yet been insufficient. Whether this relationship holds in the Chinese context is unclear. We thus formulate hypothesis 5 and draw a comprehensive hypothetical model framework (see **Figure 1**).

H5: Social security satisfaction may indirectly affect people's SWB through the serial mediation effect of social fairness and social trust.

METHODS AND MEASURES

Sample and Data

Chinese Social Survey (CSS) is a large-scale biennial longitudinal sample survey project of the country initiated in 2005 by the Institute of Sociology of the Chinese Academy of Social Sciences. A multistage, stratified, probability-to-size proportional cluster sampling method was employed, and data collection used face-to-face household interviews with a structured questionnaire. The CSS questionnaire was divided into three parts: basic module, replacement module, and hotspot module. It guaranteed the scientific rigor of the survey at multiple levels to obtain high-quality data. During the sampling, this survey designed the sampling frame according to the zoning data of the 5th and the 6th census in China. The survey area contained 31 provinces across the country, including 151 districts, counties, municipalities, and 604 villages or neighborhood committees. More than 7,000 to 10,000 families were visited in each wave. In the execution phase, CSS relied on universities and research institutions all over the country to establish a local investigation team. During the quality control, a certain proportion of questionnaires were reviewed at each survey site to ensure the quality of the questionnaires, and all the questionnaires were double-entered. In addition, the project team anonymized the data so that no respondent was negatively affected by participating in the survey. The research results can infer the status of households aged from 18 to 69 in China.

Based on the requirements of timeliness, adaptability, and sample size, the data in 2017 and 2019 CSS were extracted. These two waves of data in 2017 and 2019 are the latest published data to reflect the current situation. And compared with other waves, they contain consistent survey data that is responsive to the present research. We considered 2017CSS and 2019CSS as the independent samples. After deleting missing values and invalid questionnaires, there were 5,398 data in 2017CSS and 2,580 data in 2019CSS. Then, due to the measurement variables, we pooled the samples together to build a new complete dataset ($N = 7{,}978$) for quantitative analysis.

Measures

Dependent Variable

SWB, the dependent variable in this study, was reliably reflected in life satisfaction (Larsen et al., 1985; Diener et al., 1997). And self-rated satisfaction with life and income has been used in the SWB measurements (Ng et al., 2017). Hence, we comprehensively adopted the existing measurement dimensions as observed variables. It measured by the question in 2017 and 2019CSS. "Please use 1–10 points to express your satisfaction assessment?" The 10-point Likert scale ranging from 1 (very dissatisfied) to 10 (very satisfied) included, respectively, family financial situation, the environmental situation of residence, and your general satisfaction with life. The total score ranged from 3 to 30. Higher means were associated with higher levels of SWB. These measures had the Cronbach's alpha coefficient of 0.767.

Independent Variable

Social security satisfaction was the independent variable. It referred to the citizens' rating of social security services that guarantee the basic life. And social security involving pension, education, medical care, employment, housing, etc., has been widely studied in China (Ding, 2017; Ng et al., 2017; Mao and Han, 2018; Tang et al., 2018; Han and Gao, 2020). Therefore, the variable was measured by the following question in this

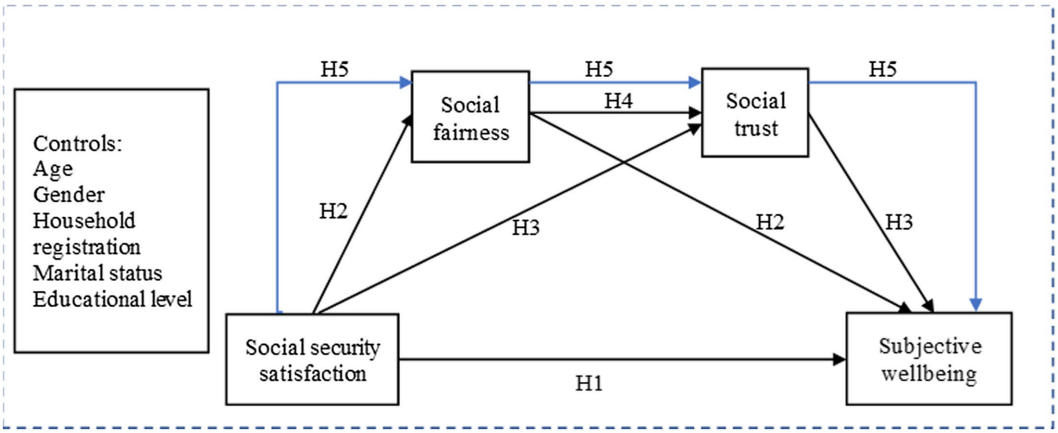

FIGURE 1 | Hypothesized model. SWB, subjective wellbeing.

data. "Please use 1–10 points to express your evaluation of the current social security situation?" And the 10-point Likert scale with six items covered pension security, medical security, employment security, urban and rural minimum living security (*Dibao*), basic housing security such as affordable housing, low-rent housing, and public rental housing, and in general, the social security status ("1 = very dissatisfied" to "10 = very satisfied"). The sum was scored from 6 to 60. And higher mean scores of them denoted higher levels of social security satisfaction. These measures had highly internal consistency reliabilities in this study (Cronbach's $\alpha = 0.912$).

Mediating Variables

Social fairness and social trust were mediators in this study. Social fairness meant a subjective assessment of social justice status. Participants responded to the question "What do you think is the level of fairness in the following aspects of current social life?," regarding public medical care, wealth and income distribution, employment opportunities, pensions and other social security benefits, and rights and benefits between urban and rural areas, with a 4-point Likert scale ("1 = very unfair" to "4 = very fair"). A range of the total score was from 5 to 20. Higher means of 5 items indicated higher degrees of social fairness (Cronbach's $\alpha = 0.808$). The analogous measurement has been utilized by Zhu et al. (2020).

In addition, social trust was composed of interpersonal trust and institutional trust. It was measured by the following questions in this literature according to previous papers (Zmerli and Castillo, 2015; Zhao and Yu, 2017; Li and Cui, 2018). "Please use 1–10 points to express your evaluation of the trust between people today?" Reassign 1 = very distrust (1–3 points), 2 = distrust (4–5 points), 3 = trust (6–7 points), 4 = very trust (8–10 points). "Do you trust the following agencies? Including central government, district/county government, township government with options from 1 to 4, respectively, indicating "very distrust" to "very trust." The total value of 4 items ranged from 4 to 16. And higher average values represented a higher level of social trust overall (Cronbach's $\alpha = 0.912$).

Control Variables

Referring to the prior literature, sociodemographic variables can influence the SWB somewhat, thus, we selected determinants as controls (Agrawal et al., 2011; Kapteyn et al., 2015; Abruquah et al., 2019) and recoded them in this research, including age (survey time minus birth year), gender (0 = female, 1 = male), household registration (0 = agricultural residence, 1 = non-agricultural residence, also including resident accounts and other), marital status (0 = married, including first marriage with a spouse and remarriage with a spouse, 1 = unmarried, including cohabitation, divorce, and widows), educational level (0 = uneducated, 1 = primary school, 2 = junior middle school, 3 = high school, 4 = secondary school/technical school, and 5 = college above and others). The detailed measurements are shown in **Table 1**.

Analysis

Software AMOS24.0 and SPSS26.0 and Macro programs (PROCESS v3.50) written by Hayes (2017) were employed in the present study ($N = 7{,}978$).

We first used the SPSS26.0 to perform reliability tests, descriptive analysis, correlations. Cronbach's alpha is the most extensively applied objective measure of reliability when multiple-item measures of a concept or construct are implemented (Tavakol and Dennick, 2011). Cronbach's test in the SPSS26.0 runs the reliability analysis of key variables. And the acceptable values of alpha are more than 0.7 in most reports (Bland and Altman, 1997; Tavakol and Dennick, 2011), which was also adopted in this study. Composite reliability (CR) and average variance extracted (AVE) verified the constructs' reliability and convergent validity. A general guideline is that CR values and AVE values should be higher than 0.7 and 0.4, respectively (Netemeyer et al., 2003; Hair et al., 2009).

Descriptive statistics is the fundamental step for discovering central and discrete trends in data. This process was run in the SPSS26.0 to get frequencies, percentages, means, and standard deviation (SD) among variables. Correlation analysis is a crucial

TABLE 1 | The details of variable measurements ($N = 7,978$).

Variables	Definitions	Min	Max
Age	The birth year of the respondent. (survey time minus birth year)		
Gender	Gender of the respondent. "0 = female; 1 = male"	0	1
Household registration	Household registration of the respondent. "0 = agricultural residence; 1 = non-agricultural residence, also including resident accounts and other"	0	1
Marital status	Marital status of the respondent." 0 = married, including first marriage with a spouse and remarriage with a spouse; 1 = unmarried, including cohabitation, divorce and widows"	0	1
Educational level	Educational level of the respondent. "0 = uneducated; 1 = primary school; 2 = junior middle school; 3 = high school; 4 = secondary school/technical school; 5 = college above and others"	0	5
Subjective wellbeing (SWB)	1. Satisfaction with family financial situation. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	2. Satisfaction with the environmental situation of residence. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	3. Satisfaction with your general satisfaction with life. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
Social security satisfaction	1. Satisfaction with pension security. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	2. Satisfaction with medical security. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	3. Satisfaction with employment security. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	4. Satisfaction with urban and rural minimum living security (*Dibao*). (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	5. Satisfaction with basic housing security such as affordable housing, low-rent housing, and public rental housing. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
	6. Satisfaction with the social security status overall. (from "1 = very dissatisfied" to "10 = very satisfied")	1	10
Social fairness	1. Fairness of public medical care. (from "1 = very unfair" to "4 = very fair")	1	4
	2. Fairness of wealth and income distribution. (from "1 = very unfair" to "4 = very fair")	1	4
	3. Fairness of employment opportunities. (from "1 = very unfair" to "4 = very fair")	1	4
	4. Fairness of pensions and other social security benefits. (from "1 = very unfair" to "4 = very fair")	1	4
	5. Fairness of rights and benefits between urban and rural areas. (from "1 = very unfair" to "4 = very fair")	1	4
Social trust	1. Interpersonal trust. (from "1 = very distrust" to "4 = very trust")	1	4
	2. Trust central government. (from "1 = very distrust" to "4 = very trust")	1	4
	3. Trust district/county government. (from "1 = very distrust" to "4 = very trust")	1	4
	4. Trust township government. (from "1 = very distrust" to "4 = very trust")	1	4

tool to understand the basis vectors between two quantities, and it has a close relationship with regression analysis (Cohen et al., 1983; Lindley, 1990). When there is a high correlation between variables, it makes sense to perform regression analysis to find a specific form of correlation. The correlation results of all variables were achieved by Pearson correlation analysis in this software so that we can further analyze the correlated form between all variables.

Then, confirmatory factor analysis (CFA) was performed by AMOS24.0 to check the model fit. CFA is a common method to test the relationship between latent variables and observed variables. We drew the confirmatory model, including SWB, social security satisfaction, social fairness, and social trust, and run it. The results of Chi-square (χ^2), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were mainly used to measure the model fit. Generally, smaller χ^2 ($p > 0.05$) is better, but larger samples can be considered separately. CFI is as close as possible to 1, if CFI >0.9, it is very satisfying. If RMSEA <0.08, it indicates an acceptable fit of the model with the degrees of freedom (Bollen, 1989; Bentler, 1990; Browne and Cudeck, 1992).

Finally, Model 6 in PROCESS3.50 was employed to test this serial mediation model. In this module, there was one dependent variable (SWB) and one independent variable (social security satisfaction), with two mediators (social fairness and social trust) operating in serial and several controls. The confidence level for all confidence intervals (CI) in output was 95%. The number of bootstrap samples for percentile bootstrap CI was 5,000. As suggested by Preacher and Hayes (2008), the effect is significant if CI does not include zero. We took social security satisfaction as an independent variable with social fairness, social trust, and SWB as dependent variables in three regression models, respectively. Hypothesis testing was performed based on the regression results of three models in turn. In the study, regression analysis equations were as follows.

$$M_{SF} = \beta_{MSF} + \eta_1 X_{SS} + \xi_{MSF} \quad (1)$$

$$M_{ST} = \beta_{MST} + \eta_2 X_{SS} + \eta_3 M_{SF} + \xi_{MST} \quad (2)$$

$$Y_{SWB} = \beta_{YSWB} + \mu_1 X_{SS} + \gamma_1 M_{SF} + \gamma_2 M_{ST} + \xi_{SWB} \quad (3)$$

where SF was social fairness, ST was social trust, SS was social security satisfaction, SWB was subjective wellbeing, ξ was control variables, including age, gender, household accounts, marital status, and educational level in the study. β was a constant. η, μ, γ were regression coefficients. And the direct effect of SS on SWB was estimated by μ_1 in equation (3). The indirect effect of SS on SWB through SF, ST, and SF and ST in serial, respectively, was $\eta_1\gamma_1$, $\eta_2\gamma_2$, and $\eta_1\eta_3\gamma_2$. The total indirect effect of SS on SWB was the sum of $\eta_1\gamma_1$, $\eta_2\gamma_2$ and $\eta_1\eta_3\gamma_2$. When added to the direct effect (μ_1), the result was the total effect of SS on SWB.

RESULTS

Descriptive Results and Correlations

The distribution of demographic characteristics in the descriptive results was relatively balanced overall. In accordance with age, the number of 35 to 54 years old was the highest at 43.5%, the average age was 43 (SD = 14.41). The gender distribution was relatively proportional to men and women at 46.5 and 53.5%, respectively. And agricultural households accounted for the majority (65.5%), while non-agricultural households accounted for 34.5%. According to marital status, 76.5% of the persons were married, 23.5% were unmarried, including cohabitation, divorce, and widows. In terms of the educational level, most people had a junior middle school diploma (31.1%) or a college degree and above (23.1%), and only 7% of people are uneducated. Full information is given in **Table 2**.

Descriptive statistics of research variables in the study can be found in **Table 3**. The means of SWB was 6.37 (SD = 1.93), indicating that the SWB level was generally high, but there was a certain discrepancy. The actual means of social security satisfaction (M = 6.04, SD = 2.21), social fairness (M = 2.66, SD = 0.58), and social trust (M = 3.02, SD = 0.62) were higher than the theoretical means. It suggested that the overall social security satisfaction, fairness, and trust were in good conditions, but there were certainly individual differences. Specifically, the levels of people's SWB, social security satisfaction, social fairness, and social trust kept all ascending from 2017 to 2019, and the gap was gradually narrowing (see **Figure 2**). The average values of SWB increased from 6.21 to 6.692, the SD decreased by 0.261. The means of people's satisfaction with social security increased by 0.639, and the SD decreased from 2.215 in 2017 to 2.147 in 2019. The mean values of

TABLE 2 | Sociodemographic characteristics (*N* = 7,978).

		Total		2017		2019	
		N	%	*N*	%	*N*	%
Survey time	2017	5,398	67.7				
	2019	2,580	32.3				
Age	≤34 years old	2,545	31.9	1,667	30.9	878	34.0
(M = 43, SD = 14.41)	35–54 years old	3,472	43.5	2,347	43.5	1,125	43.6
	≥55 years old	1,961	24.6	1,384	25.6	577	22.4
Gender	Female	4,269	53.5	2,871	53.2	1,398	54.2
	Male	3,709	46.5	2,527	46.8	1,182	45.8
Household registration	Agricultural residence	5,223	65.5	3,501	64.9	1722	66.7
	Non-agricultural residence	2,755	34.5	1,897	35.1	858	33.3
Marital status	Married	6,104	76.5	4,179	77.4	1925	74.6
	Unmarried	1,874	23.5	1,219	22.6	655	25.4
Educational level	Uneducated	556	7	413	7.7	143	5.5
	Primary school	1,499	18.8	1,058	19.6	441	17.1
	Junior middle school	2,481	31.1	1,690	31.3	791	30.7
	High school	1,103	13.8	759	14.1	344	13.3
	Secondary school/ technical school	494	6.2	322	6.0	172	6.7
	College above and others	1,845	23.1	1,156	21.4	689	26.7

N, frequency; %, percent; M, mean; SD, standard deviation.

TABLE 3 | Correlations and descriptive statistics of the study variables (*N* = 7,978).

	M	*SD*	1	2	3	4	5	6	7	8	9
1	6.37	1.93	1								
2	6.04	2.21	0.550**	1							
3	2.66	0.58	0.331**	0.493**	1						
4	3.02	0.62	0.359**	0.501**	0.475**	1					
5	43	14.41	−0.084**	0.023*	0.041**	0.120**	1				
6	0.46	0.50	0.023*	0.022	−0.007	0.026*	0.050**	1			
7	0.35	0.48	0.091**	0.055**	−0.042**	0.007	−0.019	0.011	1		
8	0.23	0.42	0.061**	0.055**	0.034**	0.015	−0.414**	0.088**	0.049**	1	
9	2.63	1.59	0.194**	0.086**	−0.045**	−0.013	−0.513**	0.086**	0.423**	0.287**	1

*1, subjective wellbeing; 2, social security satisfaction; 3, social fairness; 4, social trust; 5, age; 6, gender; 7, household registration; 8, marital status; 9, educational level; M, mean; SD, standard deviation. **p < 0.01, *p < 0.05 (2-tailed).*

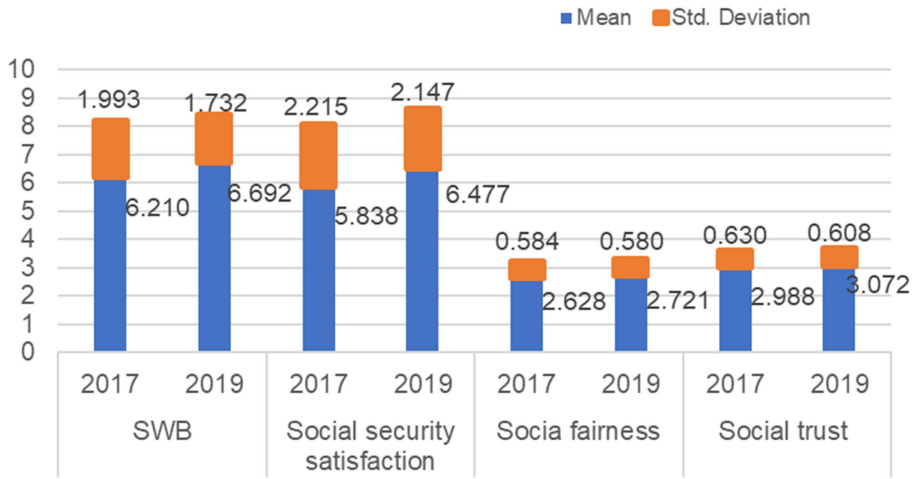

FIGURE 2 | The mean trend of the core variables in 2017 and 2019 ($N = 7,978$). SWB, subjective wellbeing; SS, social security satisfaction; SF, social fairness; ST, social trust.

social fairness (2.628 to 2.721) and social trust (2.988 to 3.072) increased slightly, but the differences had not changed obviously.

From the correlation results (see **Table 3**), satisfaction with social security, social fairness, and social trust all correlated significantly positively with SWB. Compared with social fairness ($r = 0.331$, $p < 0.01$) and social trust ($r = 0.359$, $p < 0.01$), the positive correlation between social security satisfaction and SWB was stronger ($r = 0.55$, $p < 0.01$). Secondly, social security satisfaction had a positive correlation with social fairness and social trust, and the correlation coefficients were 0.493 ($p < 0.01$) and 0.501 ($p < 0.01$), respectively. In addition, social fairness and social trust were also significantly positively correlated ($r = 0.475$, $p < 0.01$). It was meaningful to perform further regression analysis to test the specific interaction form between variables.

Confirmatory Factor Analysis and Reliability Test

The CFA results showed that $\chi^2 = 5177.61$, df = 129 ($p < 0.001$). RMSEA = 0.07 (RMSEA <0.08). CFI = 0.93 (CFI >0.9). Taking into account the large sample size ($N = 7,978$) and model complexity, however, even if χ^2 is significant and large, models with higher satisfaction with other values can be accepted (Bollen, 1989; Bentler, 1990; Browne and Cudeck, 1992). The Cronbach's α >0.7, AVE >0.4, CR >0.7 in the variables, and standardized loading factor values were above 0.3. All of them were within the acceptable range (Agnew, 1991; Bland and Altman, 1997; Netemeyer et al., 2003; Hair et al., 2009; Tavakol and Dennick, 2011). Therefore, the measurement model was satisfactory and reliable. Latent variables can be reflected by observed variables in this research (see **Table 4**; **Figure 3**).

Test of Regression Model

According to the regression results in **Table 5** ($N = 7,978$), social security satisfaction, respectively, had a significant positive effect on social fairness, social trust, and people's SWB. And all hypotheses were supported.

In Model 3 with SWB as the outcome, the results illustrated that social security satisfaction had a positive effect on SWB ($\beta = 0.454$, $p < 0.001$, 95% CI = [0.377, 0.423]). People with a high level of social security satisfaction were likely to have a high level of SWB, supporting H1. 34.1% of the variance in SWB could be explained in this model.

The regression results based on social fairness as an output variable (Model 1) showed that the high-level social security satisfaction was associated with the high-level social fairness ($\beta = 0.501$, $p < 0.001$, 95% CI = [0.127, 0.138]), and 25.4% of the variance in social fairness in China could be explained. Based on the findings of Model 3, social fairness had a significant positive impact on SWB ($\beta = 0.065$, $p < 0.001$, 95% CI = [−0.039, 0.124]). It can be seen that social fairness played a partial mediation role in the relationship between social security satisfaction and people's SWB. H2 was supported, that is, social security satisfaction indirectly influenced people's SWB through social fairness.

As expected, in Model 2 with social trust as the dependent variable, social security satisfaction positively influenced social trust ($\beta = 0.347$, $p < 0.001$, 95% CI = [0.081, 0.093]). People with a high level of social security satisfaction were likely to possess a high-level social trust. And Model 3 results also showed that social trust was significantly associated with SWB ($\beta = 0.108$, $p < 0.001$, 95% CI = [0.237, 0.397]). H3 was supported because of it. The partial mediating role of social trust was played in the relationship between social security satisfaction and people's SWB.

In Model 2, the findings also demonstrated that social fairness positively influenced social trust ($\beta = 0.298$, $p < 0.001$, 95% CI = [0.284, 0.332]). It revealed that higher levels of social fairness were correlated with higher levels of social trust, and 33.1% of the variance in social trust could be explained. H4 was supported.

The above regression results indicated that social security satisfaction had a significant indirect effect on people's SWB through social fairness and social trust. And the serial mediation

TABLE 4 | Standardized loading factors of observed variables on latent construct and reliability and validity ($N = 7,978$).

Latent variable	Observed variable	Standardized loading factor	Cronbach's α	AVE	CR
SWB	SWB1 your satisfaction with family financial status	0.736	0.767	0.540	0.777
	SWB2 your satisfaction with the environmental situation of residence	0.639			
	SWB3 overall your satisfaction with life	0.819			
Social security satisfaction	SS1 pension security	0.773	0.912	0.639	0.914
	SS2 medical security	0.775			
	SS3 employment security	0.785			
	SS4 *Dibao*	0.778			
	SS5 basic housing security	0.791			
	SS6 in general, the social security status	0.887			
Social fairness	SF1 public medical care	0.644	0.808	0.459	0.809
	SF2 employment opportunities	0.669			
	SF3 wealth and income distribution	0.703			
	SF4 pensions and other social security benefits	0.71			
	SF5 rights and benefits between urban and rural areas	0.66			
Social trust	STr interpersonal trust	0.347	0.733	0.508	0.784
	STi1 central government	0.51			
	STi2 district/county government	0.947			
	STi3 township government	0.868			

SWB, subjective wellbeing.

role of social fairness and social trust was played in the relationship between social security satisfaction and SWB, supporting H5. To observe the relationship between variables more intuitively, we have also drawn the paths and linear regression graphs, showing the overall fitting trend. Details are presented in **Figures 4, 5**.

The effect results (see **Table 6**) showed that the total effect of SWB explained was 47% in the serial mediation model. The direct effect of social security satisfaction on SWB was 39.5%, accounting for 83.99% of the total effect, and the indirect effect was 15.99% of the total effect. Specifically, the indirect effect mediated by social trust (43.48%) was greater than that mediated by social fairness (37.9%). The serial intermediary effect with social fairness and social trust accounted for 18.75% of the indirect effect. The bootstrap CI (95%) in all paths did not include zero, indicating that the effects were significant. And this serial mediation model was supported.

In addition, among the control variables, age could reversely impact SWB ($\beta = -0.053$, $p < 0.001$). As age increased, the level of SWB would decrease. Education level could positively influence SWB ($\beta = 0.136$, $p < 0.001$), namely, a high educational level was associated with a high SWB level. The marital status could significantly influence SWB ($\beta = -0.03$, $p < 0.01$). The unmarried would be a lower SWB than the married. There was no statistically significant relationship between other controls and SWB (see **Table 5**).

DISCUSSION AND CONCLUSION

In summary, this study used data from CSS in 2017 and 2019 to test the relationship among social security satisfaction, social fairness, social trust, and people's SWB. The results suggested that the actual levels of social security satisfaction, social fairness, social trust, and people's SWB were higher than the ideal means. The social status was better in 2019 than in 2017. Social security satisfaction had a positive effect on social fairness, social fairness positively influenced social trust, and social security satisfaction indirectly affected people's SWB through the mediating effect of social fairness and social trust, respectively. The serial mediation effect of social fairness and social trust existed in the relationship between social security satisfaction and SWB. Discussions are as follows.

Firstly, the results supported that social security satisfaction positively influenced people's SWB, which is in line with prior studies (Altun and Yazici, 2015; Tran et al., 2016; Abruquah et al., 2019). Under the Chinese governance model, people are highly dependent on the government, and they are eager to get more policy supports to release life pressure. Hence, social security plays a prominent role in promoting economic prosperity, maintaining social stability, and improving people's livelihoods. As a public service, the field and scope of social security coverage have a direct effect on people's life quality. Especially for vulnerable groups in society, social security, such as medical care, education, employment, pensions, and welfare, is the final obstacle to receiving support. Satisfactory social security ensures a more balanced distribution of national interests and narrows the gap between rich and poor. Under the premise of fulfilling people's basic lives, people with high-level social security satisfaction are more likely to have a good life quality (Sun and Xiao, 2011; Abbott et al., 2015). This may be the reason for the results.

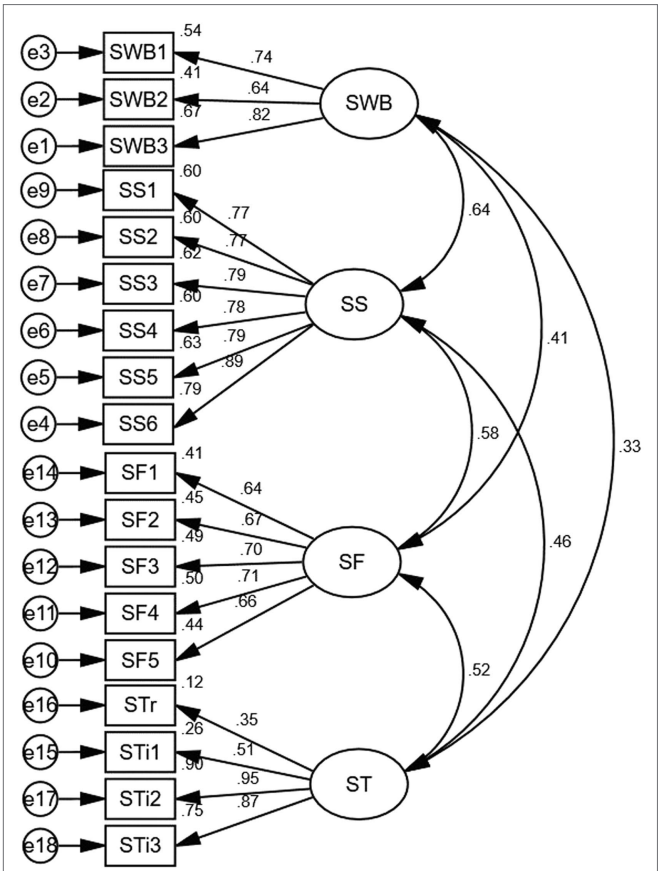

FIGURE 3 | The standardized results of CFA ($N = 7,978$). SWB, subjective wellbeing.

Secondly, our results showed that social fairness played a partial mediating role between social security satisfaction and people's SWB. Social security satisfaction indirectly influenced SWB through the mediating effect of social fairness. One reason may be due to the fact that the rapid development of China's economy has also brought about the wealth gap and the rural–urban duality. Inequality cannot be eliminated by relying on individual strength. The government shoulders a macro-control role for fairness and justice. A tool of governance is the social security system, that is, social security improves overall social fairness by redressing injustices at the beginning and end. Therefore, people's sense of acquisition and satisfaction with social security strongly influences their assessment of social fairness, and also influences their perception of belonging and identification with society. It can instill their confidence in life benefiting SWB, which consistent with the empirical data derived from 28 EU countries (Di Martino and Prilleltensky, 2020). When people lived in a fair environment, they could get the resources and assistance they deserved to withstand the risks and harms caused by class stratification. And social fairness is able to ignite people's hope for future development and reduce the risk of depression, which is beneficial for their SWB (Roh, 2021).

Thirdly, we also confirmed that social security satisfaction indirectly affected people's SWB through the mediating effect of social trust. As societal theory believed, the formation of social trust requires a friendly social environment, survival, and safety are keys. The government help citizens overcome life risks and difficulties by giving them all life guarantees that improve their satisfaction with social security. This will increase people's trust in the government to build a positive social network system promoting general social trust (Zhao and Yu, 2017). Thence, social security satisfaction has a positive impact on social trust in this text. A confidence environment free of prejudice and discrimination allows people to behave authentically and live more relaxed and happier. That's why, even in developing China, social trust had a significantly positive impact on SWB. But it disagrees with the previous research (Churchill and Mishra, 2017). Perhaps a high level of social trust is conducive to improving social quality, and people's SWB can also be influenced indirectly or directly in this way. Although China is not a developed country, the status quo of society is desirable. Social trust is likely to affect curvedly on people's SWB by improving other factors (Kapteyn et al., 2013; Piumatti et al., 2018). This finding therefore is expected.

Fourthly, the results showed that social fairness had a positive effect on social trust, which supports the relevant literature (Zmerli and Castillo, 2015; Brugman et al., 2016; Zhang and Zhou, 2018). A study in Latin America suggested that distributive unfairness and income inequality are associated with lower levels of political trust (Zmerli and Castillo, 2015). Because procedural fairness is of great importance to the survival of vulnerable groups (Dierckx et al., 2021). Ziller (2017) also found that institutional fairness can ensure the fairness of rights and interests by narrowing the gaps between different groups, which improved social integration and tolerance as well as social trust. Not only will it enlarge people's willingness to work and engage, but it will also increase political support and acceptance (Gobena and Van Dijke, 2017; Sharma and Yadav, 2018). It also proved the applicability of fairness heuristic theory in the Chinese context. Positive human behaviors are more likely to be inspired in the fair surrounding, such as trust and trustworthiness (Lind, 2001; Jones and Martens, 2009). The result may be because the sense of fairness could lead people to lower their vigilance and treat others equally, it prevents discrimination, prejudice, and conflict in society (Dierckx et al., 2021). This benefits to building a harmonious society and interpersonal trust and institutional trust. Thus, the high degree of social fairness was correlated with the high level of social trust in the present study.

Finally, based on the above conclusions, we verified the serial mediating effect of social fairness and social trust in this model through the regression test. According to social system theory (Luhmann, 1984), the elements and connections of different social systems are interconnected. When an error occurs in a subsystem, other aspects are adversely affected. On the contrary, the improvement of one system function also leads to the optimization of other functions. The coordinated operation of the social system

TABLE 5 | Regression coefficient and significance of the serial mediation model ($N = 7,978$).

	Model 1 (Outcomes: SF)				Model 2 (Outcomes: ST)				Model 3 (Outcomes: SWB)			
	B (β)	***SE***	***t***	**95%-BootLLCI, BootULCI**	***B (β)***	***SE***	***t***	**95%-BootLLCI, BootULCI**	***B (β)***	***SE***	***t***	**95%-BootLLCI, BootULCI**
Age	0.000	0.001	0.218	[−0.001, 0.001]	0.006	0.001	10.796***	[0.005, 0.007]	−0.007	0.002	−4.448***	[−0.010, −0.004]
	(0.003)				(0.127)				(−0.053)			
Gender	−0.016	0.012	−1.346	[−0.039, 0.006]	0.011	0.012	0.920	[−0.011, 0.032]	0.015	0.036	0.421	[−0.054, 0.083]
	(−0.013)				(0.009)				(0.004)			
Household registration	−0.047	0.014	−3.427**	[−0.073, −0.019]	−0.016	0.014	−1.156	[−0.034, 0.017]	0.045	0.042	1.065	[−0.039, 0.124]
	(−0.038)				(−0.012)				(0.011)			
Marital status	0.045	0.015	3.043**	[0.016, 0.075]	0.043	0.015	2.884**	[0.020, 0.075]	−0.135	0.046	−2.928**	[−0.232, −0.042]
	(0.033)				(0.029)				(−0.030)			
Educational level	−0.029	0.005	−6.026***	[−0.038, −0.020]	0.013	0.005	2.579*	[0.001, 0.020]	0.164	0.015	11.033***	[0.136, 0.194]
	(−0.079)				(0.032)				(0.136)			
SS	0.132	0.003	51.289***	[0.127, 0.138]	0.098	0.003	32.597***	[0.081, 0.093]	0.395	0.010	40.311***	[0.377, 0.423]
	(0.501)				(0.347)				(0.454)			
SF					0.319	0.011	28.124***	[0.284, 0.332]	0.215	0.036	5.918***	[0.145, 0.302]
					(0.298)				(0.065)			
ST									0.334	0.034	9.732***	[0.237, 0.397]
									(0.108)			
R	0.504				0.576				0.584			
R^2	0.254				0.331				0.341			
F(df)	$451.081_{(6)}$***				$563.748_{(7)}$***				$514.27_{(8)}$***			

*SWB, subjective wellbeing; SS, social security satisfaction; SF, social fairness; ST, social trust. B, unstandardized regression coefficients; β, standardized regression coefficients; SE, standard error. F, the significance test of the regression equation; t, the significance test value of the regression parameter; R^2, statistic relates to variation between individuals. BootLLCI, bootstrap lower bound of the confidence interval; BootULCI, bootstrap upper bound of the confidence interval, ***p < 0.001, **p < 0.01, *p < 0.05.*

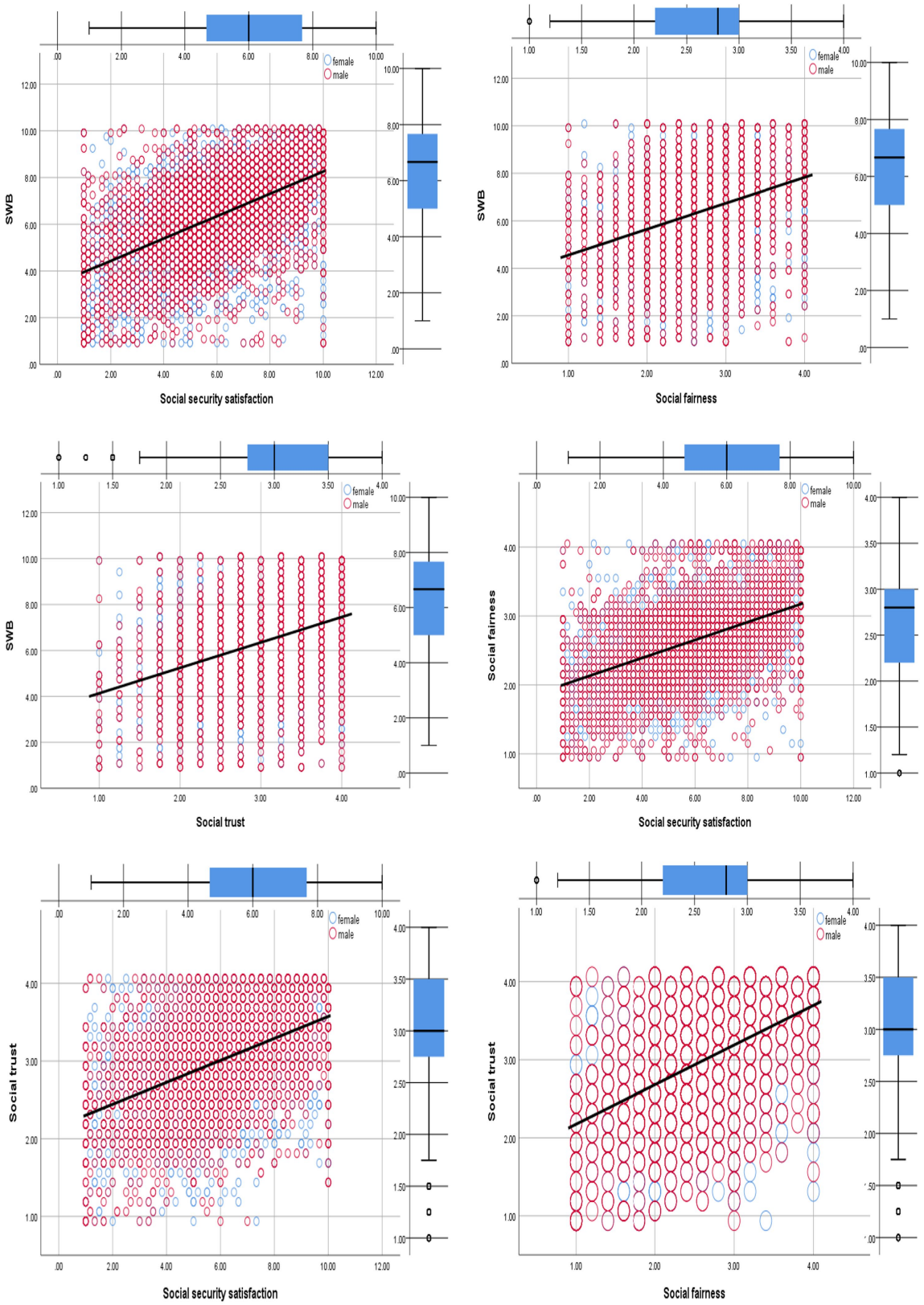

FIGURE 4 | Regression variable graph between social security satisfaction, social trust, social fairness, and SWB colored by gender ($N = 7,978$).

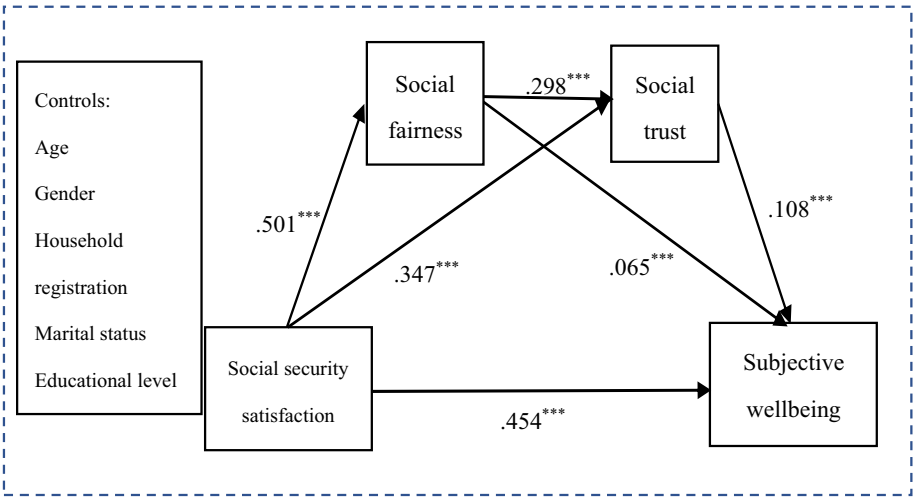

FIGURE 5 | Standardized solutions for the serial mediation model (***$p < 0.001$; $N = 7,978$).

TABLE 6 | Mediation path effect values and relative mediation effect ($N = 7,978$).

	Path	Effect	BootSE	BootLLCI-95%	BootULCI-95%	RE
Total effect		0.470	0.008	0.455	0.486	
Direct effect	SS->SWB	0.395	0.010	0.376	0.414	83.99%
Indirect effect		0.075	0.007	0.062	0.088	15.99%
1	SS->SF->SWB	0.029	0.006	0.018	0.039	37.90%
2	SS->ST->SWB	0.033	0.004	0.025	0.041	43.48%
3	SS->SF->ST->SWB	0.014	0.002	0.011	0.018	18.75%
	1 minus 2	−0.004	0.008	−0.020	0.010	
	1 minus 3	0.014	0.006	0.002	0.026	
	2 minus 3	0.019	0.003	0.014	0.024	

SWB, subjective wellbeing; SS, social security satisfaction; SF, social fairness; ST, social trust. BootSE, bootstrap standard errors. BootLLCI, bootstrap lower bound of the confidence interval; BootULCI, bootstrap upper bound of the confidence interval; RE, relative effect.

can create a stable social environment that is of positive significance to people's lives. As an important part of the social governance system, the quality of social security may have a series of social effects. Social security satisfaction plays a central role in people's SWB through a chain mechanism in the social system. To be more specific, satisfactory social security can associate with great social fairness, thereby strengthening social trust, forming benign serial effects, and then positively influencing people's SWB. This is a possible reason why this serial mediation model was supported.

Additionally, the data also showed that age, marital status, and educational level were significantly related to SWB. Age was negatively influenced people's SWB level, namely, people's SWB declined with aging, which supports the U-shaped relationship between age and wellbeing (Schwandt, 2016). People's expectations for life will increase as people grow older, and they will lower their expectations until they enter the old stage, and the reality gap will also change from big to small, creating a trend that their life satisfaction first decreases and then increases. Middle-aged Chinese with many life stresses such as divorce, unemployment, daily expenses, etc., have gone through the process of social transformation that has a huge impact on their lives, which may minimize life satisfaction (Sun and Xiao, 2011). The age distribution in this research was concentrated in the middle-aged stage. It was in the first half of the U-shaped relationship transition, so this result can be accepted. The results indicated that married people had higher SWB than unmarried, which is consistent with the literature (Lawrence et al., 2019). Intimacy is a critical social relationship for people to accept emotional support, and being able to share the life stress will undoubtedly increase married people's SWB. However, the relationship between educational levels and SWB failed to support some studies (Sun and Xiao, 2011; Kristoffersen, 2018). Their research showed that there was no obvious relation or negative relationship between educational level and SWB. Because well-educated people placed higher demands on living conditions, they needed to meet expectations at the expense of free time and overloaded work, which was correlated with lower SWB, while our results supported that educational level positively influenced SWB (Jongbloed, 2018), namely, well-educated people had a high level of SWB. This may be because of different research backgrounds. In contemporary Chinese society, educational attainment is closely related to employment opportunities, personal achievements, and welfare benefits. Compared to people with a low education level, people with a high educational degree are more likely to own social status,

prestige, and gratifying welfare benefits, all of which contribute to a high level of SWB (Ruiu and Ruiu, 2019).

THEORETICAL IMPLICATIONS

This research mainly contributes to three theoretical implications. First of all, our findings enrich the academic achievements and make up for literature gaps. The vast literature focused on the objective delivery of social security but ignored the feelings of beneficiaries. However, as direct recipients of social security benefits, citizens' satisfaction with social security is a powerful measure of the quality of social security. We examined the relationship at the subjective view of citizens to offset the objective rigidity. The results more realistically reflected how people feel. It adds new conclusions to the academic research.

Second, this study formulated a serial mediation model that can provide a reference for the relative research. Prior studies paid attention to the effect of individual factors or simple intermediary models on SWB. This leaves the research lacking a certain integrity. But our empirical model showed that social security satisfaction can influence indirectly SWB through the serial mediation model of social fairness and social trust. It notes that we should view and address social problems from a networked but not separated perspective to sidestep a vicious circle. Variables in this model can be replaced by other variables to carry out corresponding studies.

Third, it also proved the suitability of some foreign theories in the Chinese context. We give hypotheses in terms of theories, such as Maslow's need hierarchy theory, societal theories, fairness heuristic theory, social system theory, etc., to analyze the rationality of relationships. Unsurprisingly, the theoretical model and empirical results corroborated each other. This also indicates that theories in this research can explain the relationships between social security satisfaction, social fairness and trust, and people's SWB. In the future, these theories can be further developed and refined to better adapt to localization scenarios.

PRACTICAL IMPLICATIONS

As far as practical implications, we provide targeted policy suggestions for improving people's SWB. Firstly, the empirical results illustrated that social security satisfaction can directly impact on people's SWB. Thus, to protect the interests of direct beneficiaries, democratic participation and policy security should be fully integrated into social governance to pledge social order, the policy applicability. This is a necessary procedure to enhance the levels of social trust and fairness (Keping, 2017). Because democratic engagement can ensure the openness and fairness of welfare systems, achieving fair distribution of benefits, and effective policies are good for social trust, thereby ensuring people's SWB.

Secondly, because of the partial mediating effect of social fairness and trust, the state should ensure fairness and justice as much as possible in building and improving the social security system. It must be ensured that the interests of high-income groups are not harmed and that low-income groups can receive support, whereby the actual claims of middle-income groups are also taken into account. It is necessary to increase the accessibility and satisfaction of all citizens to social security and lay the foundation of social fairness and trust by expanding social security coverage. This will contribute to the high-level SWB.

Finally, due to the serial mediation effect of social fairness and trust, government of China needs to put in place a perfect monitoring and feedback mechanism to pledge the implementation of social security policy. External coercion is a powerful guarantee to avoid corruption and inefficiency in administrative systems. This also is beneficial for the improvement of social security, increasing satisfaction with fairness and trust. And public opinions need to be heard to improve social security services and enhance people's SWB achieving the ultimate goal of social governance.

LIMITATIONS

Undoubtedly, there are also certain limitations in this study. First, secondary data may have timeliness issues resulting in potential disputes. In the follow-up, it is necessary to collect first-hand longitudinal data to further test the causal link and improve the model. Second, only the roles of social security satisfaction, fairness, and trust are considered in this study, but other sociodemographic variables such as those shown in the findings have implications for further study. There is still room for improvement in the research scope and issues. Thirdly, we have to do more cross-country studies, because research conclusions in the Chinese context may be of greater significance for China's development than other countries.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: The raw data that support the findings of this study are openly available on the official website of Chinese Social Quality Data Archive at: http://csqr.cass.cn/DataExplore/, reference number 2017CSS and 2019CSS. And data in this study can be obtained by connecting with the corresponding author.

AUTHOR CONTRIBUTIONS

NL wrote and revised the full-text. MH critically revised the manuscript and guided the process. All authors reviewed and approved the final version of the manuscript.

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Self-Disclosure and Post-traumatic Growth in Korean Adults: A Multiple Mediating Model of Deliberate Rumination, Positive Social Responses, and Meaning of Life

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Background: To explore how self-disclosure leads to post-traumatic growth (PTG) in adults who have experienced traumatic events, this study identified the relationship between self-disclosure and post-traumatic growth in Korean adults. We examined a parallel multiple mediating model for this relationship.

Methods: Participants were 318 Korean male and female adult participants aged 20 years or older who had experienced trauma. We measured deliberate rumination, positive social responses, and the meaning of life as mediating variables.

Results: The results revealed that the study variables positively correlated with PTG. Self-disclosure was positively correlated with deliberate rumination, positive social responses, and meaning of life. In the multiple mediating model, deliberate rumination, positive social responses, and meaning of life mediated the relationship between self-disclosure and PTG.

Conclusion: Self-disclosure, deliberate rumination, positive social responses, and meaning of life play an important role in the growth of adults who have experienced traumatic events. The findings of this study should provide valuable information for future research and for mental health professionals who want to promote the PTG of their clients.

Keywords: trauma, growth, disclosure, rumination, social responses, meaning

INTRODUCTION

Disaster is a part of life, both in the past and present, and people may experience trauma. Moreover, modern people live with different risks, such as traffic accidents, that did not always exist and could be big or small; nevertheless, everyone experiences trauma. The high possibility of trauma implies that it is not only we who might be traumatized in the case of a disaster or accident, but also our family members or close acquaintances. After analyzing the number of patients treated for post-traumatic stress disorder (PTSD) in Korea over the past 5 years, the Korea National Insurance Services (2020) announced that the number had increased by 45.4% from 2015 to 2019. However, not all people who experience trauma have PTSD, and

they may even mature further after experiencing trauma (Tedeschi and Calhoun, 1995). Tedeshi and Calhoun (2004) called such maturation "post-traumatic growth" (PTG) and defined it as "positive psychological change occurred as a result of struggling with highly challenging and stressful life crises (p.1)."

To ensure that trauma works positively beyond just clinically preventing it from negatively affecting PTG, many researchers have been compelled to study the variables that affect PTG. First, studies have indicated that psychosocial intervention (Roepke, 2015) as well as social support (Volgin and Bates, 2016; Peng et al., 2021) help people grow after suffering trauma. Some studies (e.g., Zhou et al., 2017) have also identified that emotional regulation can lead to PTG. It has also been shown that high resilience (Miller et al., 2020; Zeng et al., 2021) or self-efficacy (Pooley et al., 2013; Zeng et al., 2021) could lead to PTG. Recently, Zerach (2020) found that those with high tolerance to distress are likely to grow after trauma. One study (Strasshofer et al., 2018) found that individuals' angry reactions to experiencing trauma helps PTG.

Self-Disclosure and Rumination After Experiencing Traumas

Depending on the ruminative response styles, either PTSD or PTG may occur after experiencing trauma (Wozniak et al., 2020). People automatically experience intrusive rumination after a traumatic event, which is a natural and normal reaction to trauma. The intrusive rumination experienced after trauma is a multidimensional concept that was theorized by Martin and Tesser (1996) and conceptualized by Treynor et al. (2003), which focuses on the harm of highly stressful and traumatic events. Intrusive rumination appears for some time after experiencing a traumatic event and then progresses to more productive rumination with deliberate effort focused on dealing with the situation over time. This deliberate rumination is associated with a lower negative affect (Nolen-Hoeksema and Davis, 2004) and is likely to lead to PTG and life satisfaction (Triplett et al., 2012). Ko and Rhee (2018) found that deliberate rumination along with emotion regulation strategies mediate between intrusive rumination and PTG. Previous studies (Triplett et al., 2012; Ko and Rhee, 2018; Kim and Bea, 2019) have revealed that deliberate rumination increases PTG. Therefore, this study focused on the way in which we could induce deliberate rumination in daily life.

This study assumes that self-disclosure is a variable that could induce deliberate rumination. Self-disclosure is the act of revealing private information to others, and previous studies (Pennebaker and O'Heeron, 1984; Pennebaker and Susman, 1988) have found health benefits in disclosing traumatic events. The therapeutic effect of self-disclosure for patients with PTSD is well-known (Yeterian et al., 2017; Ko et al., 2020). Moreover, encouraging U.S. veterans diagnosed with PTSD to talk about their trauma experiences in groups to other patients with PTSD has been extremely effective (Department of Veterans Affairs/Department of Defense, 2017). Such self-disclosure is also called adaptive disclosure by PTSD experts (Litz et al., 2015). Laurenceau et al. (1998) suggested that the speaker has cognitive awareness in the process of disclosing what they have experienced to others. Thus, we can assume that deliberate rumination might have caused such awareness. The process of disclosing one's traumatic experience to others can lead to deliberate rumination.

Positive Social Responses and Finding Meaning of Life After Self-Disclosure

Self-disclosure can arouse feelings of intimacy as well as cognitive awareness when listeners empathize and are supportive (Laurenceau et al., 1998). Self-disclosure with positive social responses might have healing effect. Chaudoir and Fisher (2010) studied the process of self-disclosure after observing the effects of many people's self-disclosure in social situations, and emotional social support was one of the factors that induced further self-disclosure. When adolescents have a problem-related conversation and a positive social response induces closeness and emotional intimacy in their friendships (Rose et al., 2016). Because positive emotional experiences have also been found to be important for developing identity in social relationships (van der Gaag et al., 2017), this study assumes that positive social responses after self-disclosure would promote PTG.

Another assumption that this study adopts is that discovering the meaning of life after experiencing trauma also leads to PTG. Triplett et al.'s (2012) study suggested a model in which deliberate rumination leads to PTG, and PTG leads to discovering the meaning of life, thereby creating an experience of subjective well-being. However, it is logically more reasonable that people mature because have discovered the meaning of life after experiencing trauma, and some studies (Fischer et al., 2020; Seol et al., 2021). Seol et al. (2021) have suggested that finding the meaning of life might be a cause of PTG. In their longitudinal study, meaning of life mediated the association between the effects of post-traumatic stress symptoms and PTG among navy soldiers deployed to the Gulf of Aden, Somalia. Because introspection could be included in the healing effect of self-disclosure as described by Pennebaker (2004), this study assumes that self-disclosure might lead to PTG by discovering the meaning of life.

Research Objectives

This study aimed to identify the relationship between self-disclosure and PTG of Korean adults, and examine the mediating effects of deliberate rumination, positive social responses, and the meaning of life on the relationship. So, this study analyzed the relationships among self-disclosure, deliberate rumination, positive social responses, the meaning of life, and the PTG of Korean adults; additionally, we analyzed a multiple mediating model of deliberate rumination, positive social responses, and meaning of life on the self-disclosure and PTG of Korean adults (**Figure 1**). These analyses are expected to provide useful information to promote Koreans' PTG.

Abbreviations: IRB, Institutional review board; MLQ, Meaning in life questionnaire; SRQ, Social reactions questionnaire; VIF, Variance inflation factors; PTG, Post-traumatic growth; PTSD, Post-traumatic stress disorder; SPSS, Statistical package for social sciences.

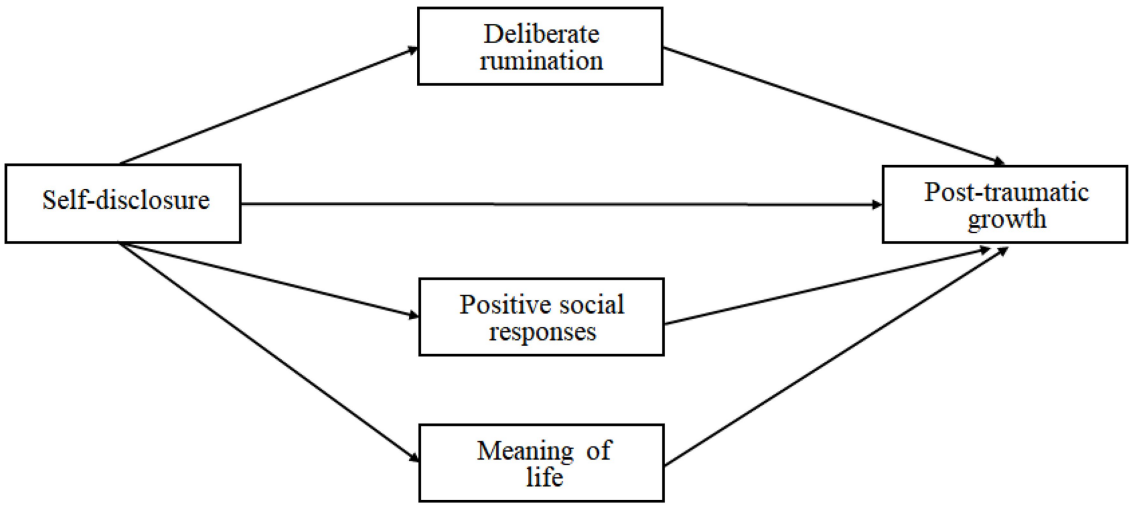

FIGURE 1 | Proposed multiple mediating model.

MATERIALS AND METHODS

Participants

Participants were 318 Korean male and female adults aged 20 years or older who had experienced trauma. They were selected by convenience sampling. G*Power 3.1.9 indicated that a minimum sample size of 307 was required to reach a statistical conclusion based on the number of predictors, a significance level of 0.001, power of 0.95, and effect size of 0.10. Thus, we planned to collect about 320 samples.

Among the participants were 210 women (66%) and 108 men (34%). The participant groups comprised 30 people (9.4%) in their 20s, 45 (14.2%) in their 30s, 164 (51.6%) in their 40s, 63 (19.8%) in their 50s, and 16 (5.0%) in their 60s or older. Regarding marital status, 63 (19.8%) were unmarried, 245 (77.0%) married, 8 (2.5%) divorced, 1 (0.3%) separated, and 1 (0.3%) answered otherwise. The most shocking traumatic events that participants reported were the death of a loved one (19.5%), followed by betrayal of a loved one (14.2%), fatal disease of a loved one (9.7%), accidents and injuries (9.1%), interpersonal breakdown (8.5%), and their own serious diseases (7.5%). Further, 236 participants (74.2%) reported experiencing negative emotions such as anxiety, fear, and depression after such traumatic events.

Measures

Self-Disclosure

Participants' self-disclosure of stress events or negative emotional experiences was measured using the self-disclosure Scale developed by Hahn et al. (2004). In the scale development study, Hahn et al. measured self-disclosure over a week, whereas we measured self-disclosure over 3 months. The frequency and depth of disclosure, and the participants' openness in disclosing their traumatic experiences to others was rated with nine items on a seven-point Likert scale. The contents of the self-disclosure items pertained to how much the participants have disclosed about traumatic events and related emotions, how many participants have disclosed, how often the participants have confided, and how often participants have been opened about it. In the process of scale development, satisfactory reliability and validity were revealed, and the internal consistency (Cronbach's α) of the nine items was 0.96 in this study.

Deliberate Rumination

Participants' deliberate rumination related to the traumatic experience was measured with the Korean version of the Event-Related Rumination Inventory, which was developed by Cann et al. (2011) and validated by Ahn et al. (2013) for Korean people. This scale originally comprised 20 items that measured intrusive and deliberate rumination. We only assessed deliberate rumination items in this study. However, the questionnaire comprised 20 items because we measured deliberate rumination at the time of the traumatic experience and 3 weeks prior to answering the questionnaire. Items examples are, "I thought about whether I could find meaning from the event" and "I tend to think about what I felt about the experience." Each item was rated on a seven-point Likert scale ranging from 1 (*not at all*) to 7 (*always*). The internal consistency (Cronbach's α) was 0.94 in this study.

Positive Social Responses

We used the Social Reactions Questionnaire (SRQ) that was developed by Ullman (2000) and validated for Korean (K-SRQ) by Sim and Ahn (2014) to measure participants' experience of receiving positive responses. The K-SRQ comprises 44 items and 7 subscales that measure both the positive and negative reactions that participants have received from others after disclosing traumatic experiences; only positive reaction items were used in this study. Sub-factors of positive response are emotional support (15 items) and tangible aid (3 items); however, the total score was included in the analysis. Participants rated items from 1 (*not at all*) to 7 (*always*), and the internal

consistency (Cronbach's α) of these 18 items was 0.97 in this study.

Meaning of Life

To measure the meaning of life perceived by participants, the Meaning in Life Questionnaire (MLQ) developed by Steger et al. (2006) was used. The MLQ used in the study was validated by Won et al. (2005) for Korean people (K-MLQ). The K-MLQ consists of 10 items and 2 subscales, presence of meaning and search for meaning. Total score was included in the analysis for multiple mediating model. Participants answered each item on a seven-point Likert scale ranging from 1 (*absolutely true*) to 7 (*absolutely untrue*). Cronbach's α for the presence of meaning, search for meaning, and the total MLQ were 0.92, 0.94, and 0.95, respectively.

PTG

To measure positive changes after experiencing traumatic events among Korean adults, this study used Tedeschi and Calhoun's (1996) PTG Inventory as validated by Song et al. (2009) for Koreans. Tedeschi and Calhoun's original scale comprises 21 items; however, this study used the 16 items arranged by Song et al. Examples of these items are, "I found myself stronger than I thought" and "I was convinced that I could overcome the difficulties." This scale has five subscales; however, in this study, only the total score was used in the analysis. Each item was rated using a scale ranging from 1 (*not at all*) to 7 (*always*). The internal consistency (Cronbach's α) of the 16 items was 0.95 in this study.

Experiences of Traumatic Events

This study measured how severe the traumatic events were to the participants, identified their relationships with the study variables, and then determined whether they should be controlled as covariates. For this purpose, Song et al.'s (2009) Trauma Experience Questionnaire revised by Shin and Chung (2012), was used. This questionnaire comprises seven items enquiring about the type, duration, and severity of the traumatic event. Respondents were asked to report whether they experienced psychological pain and scored the severity of the subjective pain that they had experienced at the time of the traumatic event. The severity of the event was rated from 1 (*no pain*) to 7 (*very painful*).

Procedure

This study was approved by an Institutional Review Board (IRB) before study commencement (approval number: 2-1,040,781-AB-N-01-2017117HR). Data were collected through an online survey with a questionnaire and informed consent was posted on an internet portal site, Google. This survey was promoted on social networking services, such as NAVER BAND and KakaoStory. We gave the participants disclosed research information to facilitate their understanding of this study and to encourage their participation before conducting survey. Participants were informed that they could withdraw at any time while responding to the survey. Each participants spent 20 min, on average, completing the questionnaire.

Statistical Analysis

IBM SPSS Statistics for Windows 26.0 and PROCESS Macro 3.5 were used for all the statistical analyses. They checked not only the mean and standard deviation, but also the skewness and kurtosis of the data for parametric statistical analyses. None of the skewness absolute values exceeded 1.5, and none of the kurtosis absolute values exceeded 3.5, indicating that the variances of each variable are close to a normal distribution (Orcan, 2020).

Pearson-Product Moment correlational analysis was performed with SPSS, and parallel multiple mediating effect was performed with PROCESS Macro 3.5 model 4. Finally, bootstrapping with 5,000 resamples with 95% confidence intervals was used to analyze the significance of the indirect effects in the mediating model and to examine the differences in each of the indirect effects.

Statistical multicollinearity problems occur when tolerance is less than 0.2 or 0.1, and variance inflation factors (VIF) are greater than 5 or 10 (Kim, 2019). Because tolerances of predictors in this study were 0.739–0.918, and VIFs were 1.089–1.353, multicollinearity was not a problem. Additionally, the Durbin Watson statistic was 1.835, which indicates that there was no autocorrelation detected in the sample as it was close to 2. In addition, there were no exogenous confounding variables among demographic profiles and variables regarding traumatic experience, which was correlated with both predictors and criterion variable; thus we did not adjust the mediating model with covariates to be free from Berkson's bias (Westreich, 2012).

RESULTS

The Relationship Among the Variables Involved in PTG

Table 1 presents the results of the analysis of the relationships among the frequency of traumatic events, severity of traumatic events, self-disclosure, deliberate rumination, positive social responses, and PTG.

The correlation analysis revealed that the frequency of traumatic events experienced by the study participants was positively correlated with self-disclosure, but not significantly to PTG ($r = 0.07$, $p > 0.05$). Additionally, the severity of traumatic events was significantly correlated with self-disclosure, deliberate rumination, and positive social responses, but there was no significant relationship between the severity of trauma events and meaning of life or PTG ($r = -0.01$, $p > 0.05$). These results suggest that the regression analysis with PTG as the criterion variable or outcome variable does not need to be adjusted by the frequency or severity of traumatic events.

Although there was a significant positive correlation between self-disclosure and PTG ($r = 0.29$, $p < 0.001$), self-disclosure was also positively correlated with deliberate rumination ($r = 0.29$, $p < 0.001$), positive social responses ($r = 0.48$, $p < 0.001$), and meaning of life ($r = 0.17$, $p < 0.01$). In addition, deliberate rumination ($r = 0.31$, $p < 0.001$), positive social responses ($r = 0.38$, $p < 0.001$), and meaning of life, ($r = 0.56$, $p < 0.001$)

TABLE 1 | Correlational matrix of the frequency of traumatic events, severity of traumatic events, self-disclosure, deliberate rumination, positive social responses, meaning of life, and PTG ($N = 318$).

Variables	1	2	3	4	5	6	6–1	6–2	7
1. Frequency of traumatic events	1								
2. Severity of traumatic events	0.21***	1							
3. Self-disclosure	0.16**	0.22***	1						
4. Deliberate rumination	0.10	0.36***	0.29***	1					
5. Positive social responses	0.06	0.17***	0.48***	0.23***	1				
6. Meaning of life	0.09	−0.03	0.17**	0.20***	0.24***	1			
6–1. Presence of Meaning	0.06	−0.07	0.15**	0.18**	0.23***	0.94***			
6–2. Search for Meaning	0.11	0.02	0.17**	0.19**	0.20***	0.93***	0.75***		
7. Post-traumatic growth	0.07	−0.01	0.29***	0.31***	0.38***	0.56***	0.53***	0.51***	1
M	3.97	9.41	35.97	81.59	84.48	56.96	28.01	28.95	81.45
SD	2.46	2.59	15.33	28.69	27.11	10.70	5.81	5.62	19.85
Skewness	1.40	−0.19	−0.05	0.13	−0.67	−0.90	−0.82	−1.09	−0.61
Kurtosis	3.21	−0.14	−1.14	−0.54	−0.14	0.68	0.25	1.02	−0.05

$^{**}p < 0.01$; $^{***}p < 0.001$.

were positively correlated with PTG. Both presence of meaning and search for meaning were positively correlated with self-disclosure and PTG.

Verification of Parallel Multiple Mediating Model for the PTG

This study examined a parallel multiple mediating effect of deliberate rumination and positive social responses on self-disclosure and PTG (**Table 2**; **Figure 2**). The results illustrated that self-disclosure influenced deliberate rumination positively ($B = 0.542$, $p < 0.001$), and deliberate rumination had a positive influence on PTG ($B = 0.148$, $p < 0.001$). In addition, self-disclosure also affected positive social responses positively ($B = 0.841$, $p < 0.001$), and positive social responses influenced PTG positively ($B = 0.209$, $p < 0.001$).

The total effect of self-disclosure on PTG is 0.370 ($p < 0.001$), the direct effect from self-disclosure to PTG was 0.092 ($p = 0.113$) and was not significant when deliberate rumination, positive social responses, and meaning of life are used as the mediating variables in this model. In **Figure 2**, the parallel triple mediating model indicates that self-disclosure affected deliberate rumination, deliberate rumination could promote people's PTG, self-disclosure also affected positive social responses, and positive social responses could improve people's PTG. In addition, self-disclosure influenced meaning of life, and meaning of life could increase PTG.

As a result of examining the indirect effects of deliberate rumination, positive social responses, and meaning of life using bootstrapping, the indirect effects were verified because there were no zeros between the upper and lower level for confidence interval of bootstrapping (**Table 3**). This means that self-disclosure is entirely beneficial to PTG through deliberate rumination, positive social responses, and meaning of life.

Table 4 reports the differences between the indirect effect sizes that were examined using bootstrapping. Because there were zeros between the upper and lower confidence interval level of bootstrapping in deliberate rumination and positive social responses, in deliberate rumination and meaning of life, and in positive social responses and meaning of life, there were no significant differences in the indirect effect sizes of deliberate rumination, positive social responses, and meaning of life.

TABLE 2 | Parallel multiple mediating effects of deliberate rumination, positive social responses, and meaning of life on self-disclosure and PTG.

Variables	*B*	*S.E.*	*t*	LLCI	ULCI
Mediating model (Outcome variable: deliberate rumination)					
Constant	62.078	3.939	15.76***	54.3285	69.8279
Self-disclosure	0.543	0.101	5.38**	0.3442	0.7407
Mediating model (Outcome variable: positive social response)					
Constant	54.225	3.422	15.85***	47.4925	60.9584
Self-disclosure	0.841	0.088	9.61**	0.6690	1.0134
Mediating model (Outcome variable: meaning of life)					
Constant	52.722	1.514	34.83***	49.7430	55.7003
Self-disclosure	0.118	0.039	3.04**	0.0416	0.1940
Dependent variable model (Outcome variable: PTG)					
Constant	8.197	5.153	1.59	−1.9412	18.3351
Deliberate rumination	0.101	0.032	3.13***	0.0372	0.1638
Positive social responses	0.144	0.038	3.86***	0.0705	0.2168
Meaning of life	0.871	0.085	10.29***	0.7043	1.0374
Self-disclosure	0.092	0.066	1.40	−0.0376	0.2217

$^{**}p < 0.01$; $^{***}p < 0.001$.
LLCI, lower level for confidence interval; ULCI, upper level for confidence interval.

DISCUSSION

This study identified the relationships among self-disclosure, deliberate rumination, positive social responses, meaning of life, and the PTG of Korean adults, and examined a multiple mediating model of deliberate rumination, positive social responses, and meaning of life on self-disclosure and PTG. These attempts have produced academically and clinically significant results for PTG, and the implications are discussed below.

First, the frequency and severity of traumatic events is not significantly correlated with the PTG of Korean adults. This result reveals that experiencing repeated trauma or the existence of a high intensity of trauma does not automatically mean that psychological growth is achieved after experiencing trauma. This suggests that growth occurs when intra-psychological or behavioral processes occur after experiencing traumas, not as a result of the trauma itself. Therefore, this

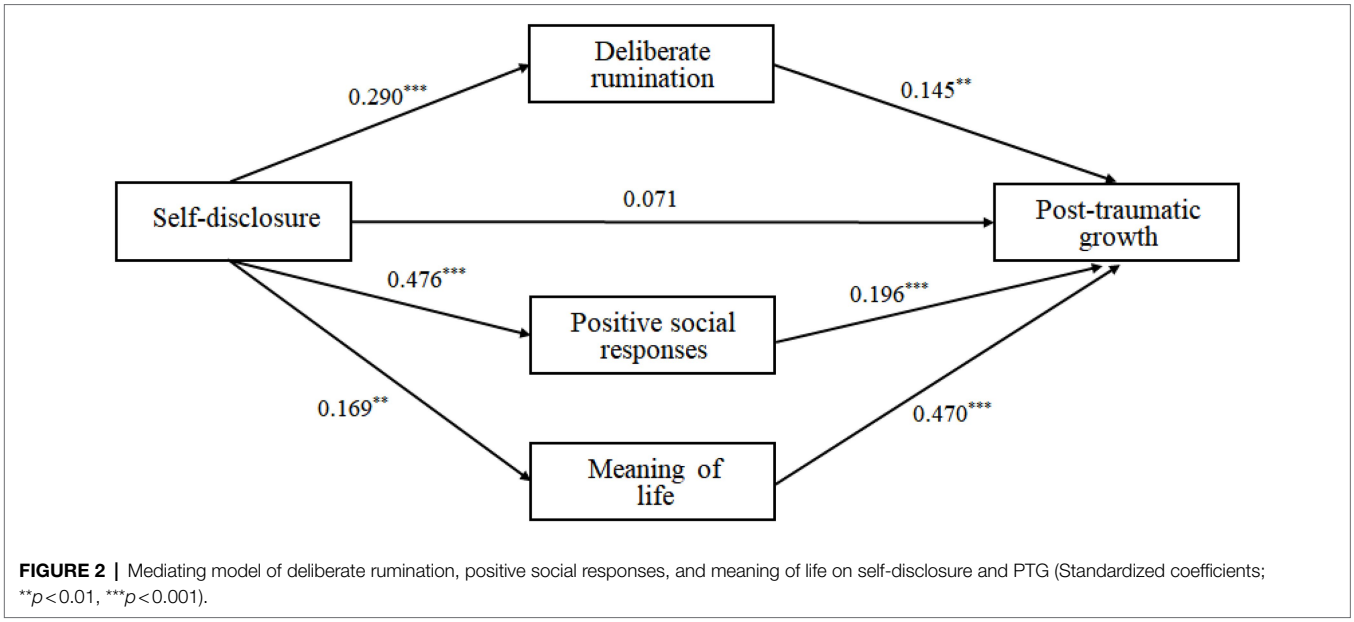

FIGURE 2 | Mediating model of deliberate rumination, positive social responses, and meaning of life on self-disclosure and PTG (Standardized coefficients; $^{**}p<0.01$, $^{***}p<0.001$).

TABLE 3 | Indirect effect of deliberate rumination, positive social responses, and meaning of life.

Section	Effect	*S.E.*	LLCI	ULCI
Total	0.278	0.056	0.1717	0.3943
Deliberate rumination	0.055	0.023	0.0135	0.1019
Positive social responses	0.121	0.042	0.0448	0.2125
Meaning of life	0.103	0.036	0.0364	0.1791

LLCI, lower level for confidence interval; ULCI, upper level for confidence interval.

TABLE 4 | Comparison between the indirect effects of deliberate rumination, positive social responses, and meaning of life.

Difference of indirect effects	Effect	*S.E.*	LLCI	ULCI
Deliberate rumination vs. positive social responses	−0.066	0.054	−0.1813	0.0327
Deliberate rumination vs. meaning of life	−0.048	0.042	−0.1322	0.0318
Positive social responses vs. meaning of life	0.018	0.055	−0.0890	0.1258

LLCI, lower for confidence interval; ULCI, upper level for confidence interval.

study informs internal and external psychological factors that cause PTG.

Self-disclosure, assumed to be a predictor or independent variable in this study, is positively correlated with PTG. It seems more logical that self-disclosure related to trauma could lead to growth rather than the assumption that growth after experiencing trauma increases self-disclosure. Some studies (e.g., Urry et al., 2011) *reported* that self-disclosure plays an important role in growth during childhood and adolescence, whereas this study found that self-disclosure might promote growth after the experience of trauma in adulthood. Pennebaker (2004) explained that self-disclosure helps to make sense of trauma experiences and to organize thoughts related to them. Therefore, we assumed that arranging and organizing trauma-related thoughts could be achieved through deliberate rumination, and this study demonstrated that self-disclosure was correlated with deliberate rumination.

This study also revealed that deliberate rumination was positively correlated with the PTG of Korean adults, and *d*eliberate rumination might have a cognitive effect, such as cognitive awareness (Laurenceau et al., 1998) and cognitive reconstruction (Huppert, 2009), that contributes to the healing or growth of people who have experienced trauma. In the parallel multiple mediating model assumed in this study, deliberate rumination mediates significantly between self-disclosure and PTG. The deliberate rumination caused by self-disclosure does result in growth after experiencing trauma for Korean adults. This finding not only reiterates the results of previous studies (Martin and Tesser, 1996; Treynor et al., 2003; Triplett et al., 2012; Ko and Rhee, 2018; Kim and Bea, 2019; Wozniak et al., 2020) that deliberate rumination can promote PTG, but also suggests that the deliberate rumination caused by self-disclosure can lead to PTG as well as recovery from PTSD. Therefore, this result makes the rationale, in encouraging patients with PTSD to engage in self-disclosure treatment in groups, more clinically persuasive. In addition, it suggests that deliberate rumination can also play an important role in PTG as well as PTSD prevention for the general population who have experienced traumatic events.

However, this study revealed that PTG is not only promoted in cognitive copings, because positive social responses have resulted in PTG. In fact, rumination and organizing thoughts related to traumas occurring after self-disclosure is an incidental effect, and the purpose of people telling others about themselves is likely to elicit empathy or receive emotional support for

consolation. Chaudoir and Fisher (2010) support the assumption that if people receive social support, especially emotional support, they are likely to continue self-disclosure. Furthermore, self-disclosure is closely related to positive social responses in this study. These two variables share about 23% of the variation. In the multiple mediating model with deliberate rumination and meaning of life, positive social responses also significantly mediated the relationship between self-disclosure and PTG. This also means that positive social responses received from others after self-disclosure results in growth after experiencing trauma in Korean adults. There are also many emotional aspects to this effect, indicating that self-disclosure can result in in instilling emotional stability with positive social responses, which can lead to growth even after experiencing trauma. However, further studies are necessary to explore how positive social responses help people obtain PTG after experiencing traumatic events.

The variable most closely related to PTG in this study is the meaning of life. This means that the growth experienced after trauma is deeply related to realizing the meaning of life. Perhaps discovering the meaning of life is a condition of PTG. Triplett et al. (2012) examined the path through which people found the meaning of life after PTG through deliberate rumination; however, this study assumed that people would realize the meaning of life in the process of deliberately ruminating about the trauma experience. Furthermore, supporting Pennebaker (2004) assumption that self-disclosure makes people realize the meaning of life, self-disclosure and the meaning of life are significantly correlated in this study. In the multiple mediating model assumed in this study, meaning of life also mediates between self-disclosure and PTG significantly. Realizing the meaning of life during or after self-disclosure might lead Korean adults to PTG.

In the parallel multiple mediating model in this study, self-disclosure is not significantly accounted for the PTG of Korean adults. This means that the three psychological variables, deliberate rumination, the positive social responses, and meaning of life mediate between self-disclosure and PTG completely. The effect of self-disclosure on PTG is caused by these three variables. In addition, there are no significant differences in the magnitude of their effects in the model. These results have great implications in the clinical approach toward patients who have experienced trauma. It is necessary to focus on deliberate rumination, positive social responses, and discovering the meaning of life when encouraging patients with PTSD or people who have experienced trauma to share their experiences in a clinical setting. In fact, Yang and Ha (2019) found that firefighters' PTG is likely to be promoted if their deliberate ruminations were enhanced after experiencing work-related traumatic events. Although, self-disclosing trauma may prevent post-traumatic stress symptoms (Stein et al., 2017), patient with PTSD can experience PTG if therapists help patients receive positive social responses from listeners and find meaning of life in the self-disclosing process. In addition, these three factors need to be considered when attempting to promote PTG even when applying other clinical methods, and not just for self-disclosure.

Because people are paying more attention to disasters and the personal trauma experiences they cause, this study investigated some psychological variables that could promote growth even after traumatizing experience, and these yielded academically and clinically useful information. However, there are some deficiencies and limitations in interpreting the results of this study. First, the sample used in this study is not representative of the Korean adult population because the data were collected with convenience sampling. Therefore, further studies are necessary to re-verify the relationship between the variables revealed in this study. Second, the process of collecting data online resulted in high proportion of women among the participants. This could probably be justified because the data collection process was not artificially controlled. In fact, the prevalence of anxiety disorders and PTSD is high in women (American Psychiatric Association, 2013). In addition, the Korea National Insurance Services (2020) reported that the number of female patients with PTSD in their 20s has increased 2.1 times over the past 5 years, and the overall number of female patients treated for PTSD was about 1.5 times that of male patients. Finally, the cause-and-effect relationship was discussed based on the results of previous studies and logic; however, the cause-and-effect relationship cannot be completely concluded based on the results obtained from a correlational study, not an experimental study.

CONCLUSION

This study investigated the relationship between self-disclosure and the PTG of Korean adults, and examined a parallel multiple mediating model of deliberate rumination, positive social responses, and meaning of life on self-disclosure and PTG. Results of the correlational analysis revealed that deliberate rumination, positive social responses, and meaning of life, as well as self-disclosure are positively correlated with the PTG of Korean adults. Furthermore, self-disclosure is positively correlated with deliberate rumination, positive social responses, and meaning of life. Positive social responses are closely correlated with self-disclosure, whereas the meaning of life is closely correlated with the PTG of Korean adults.

In the multiple mediating model, self-disclosure positively affected deliberate rumination, and deliberate rumination could promote people's PTG, whereas self-disclosure also affects positive social responses, which could improve PTG. Additionally, self-disclosure influences meaning of life positive, and meaning of life could increase PTG. In this model, deliberate rumination, positive social responses, and meaning of life mediate between self-disclosure and PTG completely, whereas there are no significant differences in the magnitude of the mediating effect of these three variables. Finally, it is expected that this study's findings will provide valuable information for future research and for mental health professionals attempting to not only prevent PTSD of persons who experienced traumatic events but also to promote the PTG of their patients with PTSD.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Institutional Review Board of Sahmyook University (code: 2-1040781-A-N-01). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

J-HR designed the study, collected data, and conducted the literature review. K-HS led analyzed and interpreted the data and wrote the final manuscript. All authors contributed to the article and approved the submitted version.

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How Mindfulness Affects Life Satisfaction: Based on the Mindfulness-to-Meaning Theory

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Life satisfaction is the general evaluation of the individual's life, which is of great significance to achieving a better life. The purpose of the present study was to investigate the mediating effect of core self-evaluation, positive affect, and negative affect in the relationship between trait mindfulness and life satisfaction based on the Mindfulness-to-Meaning theory. 991 Chinese undergraduates (692 females, 299 males) completed the Mindful Attention Awareness Scale, the Core Self-Evaluations Scale, the Positive Affect and Negative Affect Scale, and the Satisfaction with Life Scale. The results indicated that core self-evaluation and negative affect mediated the effect of trait mindfulness on life satisfaction, consistent with the Mindfulness-to-Meaning theory. Furthermore, trait mindfulness affected life satisfaction by the mediation paths of "core self-evaluation→positive affect" and "core self-evaluation→negative affect," which uncovered the underlying mechanism of promoting life satisfaction by combining the point of view of cognition (core self-evaluation) and emotion (positive and negative affect). The present study not only contributes to a better theoretical understanding of how trait mindfulness links to life satisfaction but also provides valuable guidance for enhancing life satisfaction.

Keywords: trait mindfulness, core self-evaluation, positive affect, negative affect, life satisfaction

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INTRODUCTION

As a cognitive aspect of subjective well-being, life satisfaction is the general evaluation of the individual's life, such as health conditions, social relations, and financial status (Röcke, 2021), which plays a prominent role in achieving a better life (Headey et al., 1993). Abundant studies have suggested that low life satisfaction is closely related to adverse health outcomes, such as depression, social anxiety, addictive behavior, substance abuse, and suicide (Koivumaa-Honkanen et al., 2001; Zullig et al., 2001; Koivumaa-Honkanen et al., 2004; Eng et al., 2005; Bellis et al., 2012; Rogowska et al., 2020). In utilitarian moral philosophy, life satisfaction is recognized as the ultimate goal of life (Ehrhardt and Veenhoven, 2000). Therefore, more research is needed to explore the underlying mechanism of improving life satisfaction.

Mindfulness and Life Satisfaction

Previous studies have indicated that many internal-control factors make an impact on life satisfaction, like gratitude, resilience, self-control, and self-regulation (Kandemir, 2014; Bajaj and Pande, 2016; Li et al., 2016; Liang et al., 2022). Meanwhile, as a core variable of internal-control

factors, mindfulness has been growing documented in the correlation with life satisfaction (Schutte and Malouff, 2011; Wang and Kong, 2014; Bajaj and Pande, 2016; Tan et al., 2016; Chen et al., 2017; Liang et al., 2022). Mindfulness is defined as the attention and awareness of the current experiences, characterized by non-critical observation and experience of current experience (Brown and Ryan, 2003; Brown et al., 2007). Generally speaking, the present studies can be divided into experimental and observational methods: for one thing, mindfulness based on intervention had a noteworthy impact on life satisfaction (Harnett et al., 2010; Henriksson et al., 2016; Lötzke et al., 2016; Chandrasekara, 2018; Amundsen et al., 2020; Gupta and Verma, 2020); for another thing, individuals with trait mindfulness tended to have higher scores of life satisfaction. Moreover, existing research has preliminarily expanded the path between mindfulness and life satisfaction. For example, emotional intelligence, self-control, and resilience mediated the relationship between mindfulness and life satisfaction (Schutte and Malouff, 2011; Bajaj and Pande, 2016; Tan et al., 2016; Chen et al., 2017; Liang et al., 2022). However, the underlying mechanism which combines cognition and emotion between mindfulness and life satisfaction is still unclear. Therefore, based on the Mindfulness-to-meaning theory, the present study aimed at exploring the underlying mechanism combining emotion and cognition between mindfulness and life satisfaction.

Mindfulness, Core Self-Evaluation, and Life Satisfaction

The Mindfulness-to-Meaning theory proposed by Garland et al. (2015b) clarified that mindfulness generated well-being through the processes of attention, appraisal, and emotion. In particular, the theory suggested that mindfulness engendered well-being by promoting cognitive reappraisal, during which the individual rebuilt his or her ego and value (Garland et al., 2015a). On the one hand, life satisfaction has been widely recognized as the key indicator of well-being (Diener et al., 2018). On the other hand, core self-evaluation is an essential evaluation of the ability and value held by the individual (Judge et al., 1997). Therefore, based on the Mindfulness-to-Meaning theory, we speculated that core self-evaluation played a mediation role in the relationship between mindfulness and life satisfaction. Specifically, individuals with trait mindfulness were more likely to accept themselves in a non-critical way and had higher scores on core self-evaluation. They tended to hold the idea that they were able to control their lives, upon which life satisfaction could be promoted. Moreover, previous studies have demonstrated that core self-evaluation can partially mediate the impact of trait mindfulness on life satisfaction (Kong et al., 2014; Tan et al., 2016), which lays a foundation for the hypothesis of the present study.

Mindfulness, Core Self-Evaluation, Positive Affect, Negative Affect, and Life Satisfaction

Meanwhile, according to the Mindfulness-to-Meaning theory, mindfulness contributes to positive cognitive-affective processing through cognitive reappraisal, which in turn enhances individuals' well-being (Garland et al., 2015a). Taking this theory further, mindfulness reshapes the way that individuals typically focus on their experiences, so that they engage in positive cognitive reappraisals of themselves. For example, people will reconsider their failure as a way to galvanize their growth. Additionally, in the process of cognitive reappraisal, mindfulness would further strengthen the individual's ability to regulate negative experiences and appreciate positive experiences, thereby facilitating life satisfaction (Garland et al., 2015b). That is to say, positive affect and negative affect might play a mediation role between not only mindfulness and life satisfaction but core self-evaluation and life satisfaction. Previous studies have provided preliminary evidence. On the one hand, behavioral research has provided empirical evidence for the interaction of cognition and emotion. Dennis (2010) proposed the Emotion-Cognition Integration model in a review of neuroscience research on emotion regulation, which provided neuroscientific support for the positive effect of emotion-cognition interaction on emotion regulation. Raschle et al. (2017) adopted the Affective Stroop task to explore the interaction of emotion and cognition, and fMRI results confirmed the neural correlation of the interaction between emotion and cognition. An ERP study based on mindfulness-based music training also showed that the alleviation of mindfulness on negative affect was closely linked to the interaction of emotion and cognition (Liu et al., 2021). On the other hand, several observational studies have revealed the correlation between mindfulness, core self-evaluation, positive affect, and negative affect. For one thing, mindfulness could effectively reduce negative affect in social interaction (Mandal et al., 2012; May et al., 2020), and promote positive affect (Malinowski and Lim, 2015). Besides, core self-evaluation was positively linked to positive affect and negatively linked to negative affect (Sudha and Shahnawaz, 2013). For another thing, Singh and Jha (2008) found that positive affect and negative affect were highly correlated with life satisfaction, and further studies demonstrated that positive affect had a positive impact on life satisfaction, while negative affect had the opposite effect (He et al., 2014; Extremera and Rey, 2016). As a result, positive affect and negative affect might serve as a mediator between trait mindfulness and life satisfaction, core self-evaluation, and life satisfaction as well.

The Present Study

In summary, based on the Mindfulness-to-Meaning theory, this study aimed to explore the mediating role of core self-evaluation and positive and negative affect between mindfulness and life satisfaction, which contributes to our understanding of the impact of mindfulness on life satisfaction from the perspective of cognition and emotion. Accordingly, we proposed three hypotheses following: (1) core self-evaluation could mediate the path of trait mindfulness on life satisfaction. (2) positive affect and negative affect could mediate the path of trait mindfulness on life satisfaction. (3) trait mindfulness could influence life satisfaction by the mediation chain of "core self-evaluation→negative affect" and "core self-evaluation→positive affect."

MATERIALS AND METHODS

Participants and Procedure

Totally 991 undergraduate students (692 females and 299 males) were randomly recruited in cluster sampling. The participants were from several universities in China, aging from 17 to 26 (M = 19.05, SD = 1.54). Before the test, the research assistants made an explanation to the participants concerning the purpose and confidentiality of the survey. All the participant was told that they had the right to reject the questions that made them uncomfortable, and the freedom to withdraw from the survey at any time. After completing these questionnaires, we tried our best to guarantee the authenticity and confidentiality of their responses. Besides, all the participants who completed these questionnaires were handed out 10 RMB as compensation. The study has been approved by the ethical committee of the author's organization. The above data were partly derived from the ongoing project "Early Adverse Environment Influences Cognitive Affective Mechanism". Some data have been used in previous studies (Xiang and Yuan, 2021).

Measure

Mindful Attention Awareness Scale

Mindful Attention Awareness Scale (MAAS) developed by Brown and Ryan (2003) and consisting of 15 items (e.g., "I prefer to walk fast to the destination rather than pay attention to the experience what happens on the road") was used in the research. The scale is scored by a 6-point Likert scale (from 1 "almost always" to 6 "almost never"). Higher scores indicate higher mindfulness. In the present study, we employed an adaption used by Xiang et al. (2019), which was demonstrated high reliability and validity in Chinese groups. In this study, Cronbach's alpha was 0.80.

The Satisfaction With Life Scale

The Satisfaction with Life Scale (SWLS, Diener et al., 1985) consisting of 5 items (e.g., "In most ways my life is close to my ideal") was scored by a 7-point Likert scale (from 1 "strongly disagree" to 7 "strongly agree") in the study. The higher the score indicates the better people are satisfied with their life. We employed the Chinese version of SWLS, which was proved to have high reliability and validity (Song et al., 2012; Kong et al., 2019; Xiang et al., 2020). In this study, Cronbach's alpha was 0.84.

Positive Affect and Negative Affect Scale

The positive affect and negative affect Scale (PANAS) was developed by Watson et al. (1988), which consists of 10 items measuring positive affect (e.g., excited) and 10 items for negative affect (e.g., nervous). The PANAS is a 5-point scale (from 1 "very slightly"/"not at all" to 6 "extremely"). We used the Chinese version of this scale (Zhang et al., 2004) which has demonstrated good reliability and validity in Chinese groups (Xiang et al., 2020). The Cronbach's alpha coefficients were 0.93 and 0.85 respectively.

The Core Self-Evaluations Scale

The Core Self-Evaluations Scale (CSES) was developed by Judge et al. (2003), which consisted of 10 items and was scored on a 5-point Likert-type scale. The higher scores mean higher self-evaluation. In this study, the adaption by Song et al. (2012) was used for our participants, which has shown good reliability and validity in Chinese groups (Xiang et al., 2019). In this study, the Cronbach's alpha was 0.88.

Statistical Analysis

SPSS 23.0 and AMOS 23.0 were used to conduct statistical analysis. Firstly, we used SPSS 23.0 to analyze the distribution of variables and the correlation between variables. Then, AMOS 23.0 was used to test the mediating effect of the hypothesis and the stability of the model. We took two steps to analyze the mediation effect. First, a measurement model was constructed in AMOS 23.0 to detect whether each potential variable could be well represented by its indicators. Three item parcels for mindfulness, positive affect, negative affect, and two for life satisfaction were created to control for inflated measurement errors (Little et al., 2002). Secondly, if the fitting degree of the measurement model was good, we continued to construct a structural model on this basis. For this reason, the chi-square statistic, standardized root-mean-square residual (SRMR, 0.080 or less), root-mean-square error of approximation (RMSEA, 0.080 or less), and comparative fit index (CFI, 0.900 or more) were used as an indicator of model fitting degree (Byrne, 2001). At the same time, Akaike Information Criterion (AIC) was used as the index to compare the model (Akaike, 1987) and expected cross-validation index (ECVI) to evaluate the replication potential of the model. Subsequently, we used 95% bias-corrected bootstrap method to evaluate the mediating effect significance (Fritz et al., 2012). Finally, multi-group confirmatory factor analysis was used to test the model's transgender stability.

RESULTS

Descriptive Statistics and Measurement Models

A total of 5 latent variables (mindfulness, core self-evaluation, life satisfaction, positive affect, and negative affect) and 14 observational variables were included in the measurement model. The results showed that the measurement data fit the model well [χ^2 (67, 991) = 211.109, $p < 0.001$, RMSEA = 0.047, SRMR = 0.034, CFI = 0.981], indicating that all the potential variables were well represented by the observed variables. **Table 1** shows that all latent variables in the measurement model are significantly correlated.

Common Method Variance

Because of the questionnaire method, common method variance might exist in this study. Firstly, through Harman single factor test (Podsakoff et al., 2003, 2012), the variance interpretation percentage of the first common factor was 20.227%, less than 40%. Besides, the confirmatory factor analysis was used to examine the common method variance (Iverson and Maguire, 2000; Podsakoff et al., 2003). All variables were incorporated into one latent variable. The result indicated the fitting index is less than satisfactory [χ^2/df = 12.988, CFI = 0.360, TLI = 0.335, NFI = 0.343, RMSEA = 0.110, SRMR = 0.145]. Therefore, there is no common method variance in this study.

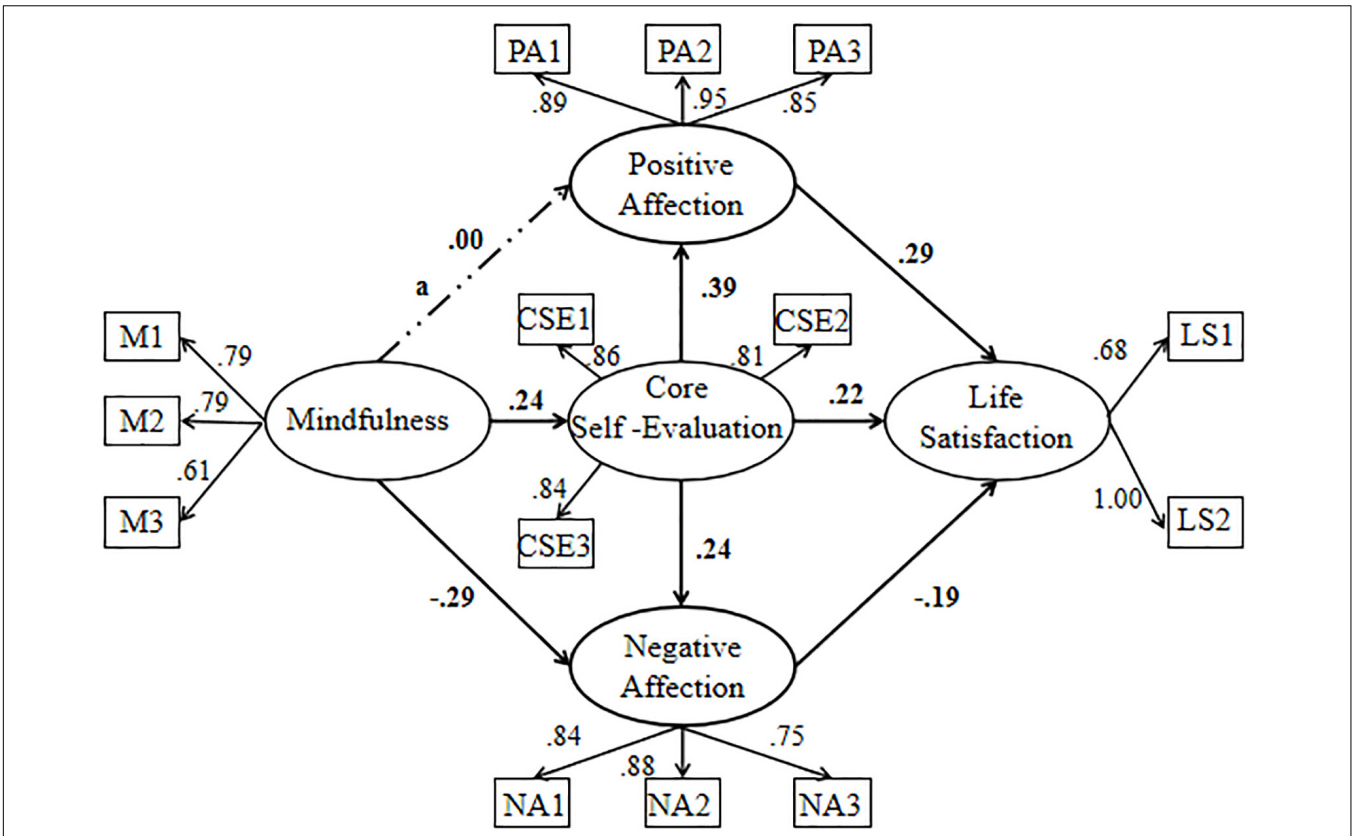

FIGURE 1 | The chain mediation model (*N* = 991). M1, M2 and M3 are three parcels of mindfulness. LS1 and LS2 are two parcels of life satisfaction. PA1, PA2 and PA3 are three parcels of positive affect. CSE1, CSE2 and CSE3 are three parcels of core self-evaluation. NA1, NA2 and NA are three parcels of negative affect.

Structural Model

The results of regression analysis showed that mindfulness directly and significantly affected life satisfaction when other variables were missing (β = 0.171, $p < 0.001$). On this basis, we built a structural equation model, which included three mediating paths (core self-evaluation, positive affect, and negative affect) and two chain mediating paths (core self-evaluation→positive affect, core self-evaluation→negative affect). The results showed that the fit degree of model 1 was good [χ^2 (69, 991) = 234.264, $p < 0.001$, RMSEA = 0.049, SRMR = 0.050, CFI = 0.978] (see **Table 2**), but the path coefficient between mindfulness and positive affect was not significant (β = 0.001, $p = 0.969$). Therefore, we built model 2 by limiting non-significant paths to zero in this Model. The results indicated that there was no significant difference between the two groups [χ^2 (70, 991) = 234.266, $p < 0.001$, RMSEA = 0.049, SRMR = 0.050, CFI = 0.978]. However, according to the principle of model simplification, model 2 was more suitable, so we chose model 2 as the final Model (see **Figure 1**).

In addition, since the structural equation model involved many limitations of data distribution (Shrout and Bolger, 2002), we further used the Bootstrap method to test the stability of the mediation variables in the structural equation model (5,000 Bootstrap samples were extracted from the original data). If the confidence interval of the estimated path coefficient does not include 0, it can be inferred that the mediating effect is significant (MacKinnon et al., 2002; Fritz and MacKinnon, 2007). The results showed that core self-evaluation [95% CI = (0.017, 0.050)] and negative affect [95% CI = (0.019, 0.049)] were significant

TABLE 1 | Descriptive statistics and correlation analysis.

	M	SD	1	2	3	4	5
1. MF	60.91	9.08	1.000				
2. CSE	34.08	6.13	0.347***	1.000			
3. PA	29.76	7.61	0.080*	0.426***	1.000		
4. NA	18.73	5.74	−0.302***	−0.426***	0.086**	1.000	
5. LS	19.64	5.90	0.171***	0.483***	0.358***	−0.211***	1.000

MF, mindfulness; CSE, core self-evaluations; PA, positive affect; NA, negative affect; LS, life satisfaction.
****p < 0.001, **p < 0.01, *p < 0.05.*

TABLE 2 | Fit indices of model 1 and model 2.

	X^2	*df*	CFI	RMSEA	SRMR	AIC	ECVI
Model 1	234.69	96	0.978	0.049	0.0497	306.264	0.309
Model 2	234.266	70	0.978	0.049	0.0497	304.266	0.307

RMSEA, root-mean-square error of approximation; SRMR, standardized root-mean-square residual; CFI, comparative fit index; AIC, Akaike information criterion; ECVI, expected cross-validation index.

TABLE 3 | Standardized indirect effects and 95% confidence intervals.

Pathways	Estimate	Lower	Upper
MF→PA→LS	0.000	−0.013	0.014
MF→CSE→LS	0.030	0.017	0.050
MF→NA→LS	0.031	0.019	0.049
MF→CSE→PA→LS	0.016	0.010	0.025
MF→CSE→NA→LS	0.006	0.004	0.011

MF, mindfulness; CSE, core self-evaluations; PA, positive affect; NA, negative affect; LS, life satisfaction.

TABLE 4 | The comparison of unconstrained model between constrained model.

	X^2/df	CFI	RMSEA	SRMR	AIC	ECVI
Unconstrained model	2.197	0.976	0.035	0.0527	504.911	0.511
Constrained model	2.152	0.971	0.034	0.0531	504.639	0.510

CFI, comparative fit index; RMSEA, root-mean-square error of approximation; SRMR, standardized root-mean-square residual; AIC, Akaike information criterion; ECVI, expected cross-validation index.

mediators between mindfulness and life satisfaction. Moreover, the two chain paths of "core self-evaluation→positive affect" [95% CI = (0.010, 0.025)] and "core self-evaluation→negative affect" [95% CI = (0.004, 0.011)] also played a significant mediating role between them (see **Table 3**).

Gender Difference

In order to test the stability of our results, we conducted a multi-group confirmatory factor analysis on model 1. Firstly, we used SPSS 23.0 to test whether there were sex differences in the five latent variables. The results showed that there were no significant sex differences in mindfulness [$t_{(991)} = 0.192$, $p = 0.848$], positive affect [$t_{(991)} = -0.919$, $p = 0.358$], negative affect [$t_{(991)} = 0.366$, $p = 0.737$] and life satisfaction [$t_{(991)} = -0.098$, $p = 0.922$], but significant sex differences in core self-evaluation [$t_{(991)} = 2.983$, $p = 0.003$] and males scored higher than females.

Based on the gender differences we had found, as suggested by Byrne (2009), we established an unconstrained structural path model (allowing free path estimations) and a constrained structural path model (limiting the path coefficients of the two sexes to be equal). The results indicated that there were significant differences between the two models [$\chi^2_{(41,991)} = 81.65$, $p < 0.01$]. At the same time, the two models show good fitness (see **Table 4**).

In addition, since χ^2 was significantly affected by the large sample size, in order to improve the accuracy of the results, we used Critical Ratios of Differences (CRD) as an indicator to further investigate the cross-sex stability of the model. According to the decision rules, when the absolute value of CRD is greater than 1.96, there is a significant difference between the two parameters (Arbuckle, 2003). The results showed that only the path of "core self-evaluation→life satisfaction" was significantly different between different gender (CRDCSE→LS = −2.679), among which, in the male sample, the direct effect of core self-evaluation on life satisfaction was very weak. Therefore, there was a difference in the cross-gender comparison of the model.

DISCUSSION

Based on the Mindfulness-to-Meaning theory, this study explored the internal relationship between trait mindfulness and life satisfaction from the perspectives of cognition (core self-evaluation) and emotion (positive affect and negative affect). The results indicated that core self-evaluation and positive and negative affect were the mediators in the relationship. Furthermore, we found that "core self-evaluation→positive affect" and "core self-evaluation→negative affect" were two mediating chain paths between trait mindfulness and life satisfaction.

Firstly, the results confirmed hypothesis 1 that trait mindfulness could influence life satisfaction through core self-evaluation, corresponding with the existing studies (Kong et al., 2014; Tan et al., 2016) and the Mindfulness-to-Meaning theory (Garland et al., 2015a,b). Individuals with a high level of mindfulness are more willing to actively accept themselves and the events that happen to them, so they are more prone to accepting things that they cannot change, such as appearance and thoughts, than individuals with low mindfulness (Brown and Ryan, 2003; Carson and Langer, 2006), and the higher the degree of self-acceptance of individuals, with more possibilities they are to form a positive self-evaluation. In other words, individuals with a higher level of trait mindfulness have a higher core self-evaluation. Simultaneously, previous studies have also found that core self-evaluation is a predictor of life satisfaction (Hsieh and Huang, 2017; Gurbuz et al., 2018), whose mechanism lies in that individuals with a high core self-evaluation are convinced that they are fully capable of controlling their own lives and thus have a higher degree of satisfaction with life. Interestingly, we found there were gender differences in the relationship between core self-evaluation and life satisfaction. Based on the difference of thoughts between males and females, we attribute this difference to the men's preference to promoting life satisfaction from emotion rather than core self-evaluation.

In addition, the results showed that only negative affect mediated between trait mindfulness and life satisfaction, while positive affect had no significant mediating effect, which was partially consistent with hypothesis 2. For one thing, mindfulness was defined as the adoption of a non-critical and an accepting attitude toward negative emotion, which promoted individuals to reduce emotional fluctuations (Brown and Ryan, 2003; Brown et al., 2007). According to the Mindfulness-to-Meaning theory, mindfulness is mainly adopted to inhibit negative affect toward stressful situations (Garland et al., 2015a). Mandal et al. (2012) have pointed out that mindfulness, to a large extent, actually affects individuals' mental health by regulating their emotional balance, i.e., thus reducing negative affect rather than enhancing positive affect. Therefore, mindfulness has a more prominent effect on negative affect than positive affect. For another thing, the impact of negative experiences are stronger and longer than positive ones (Baumeister et al., 2001). That is to say, individuals who are exposed to negative affect may be easily regulated by mindfulness than positive affect. However, there are various conclusions in terms of the mediating role of positive affect in the current research. Some studies found that trait mindfulness could

increase the positive affect and reduce the negative affect (Bajaj and Pande, 2016). Other studies concluded that, after 8-week mindfulness intervention training, the participants were found to better get rid of unpleasant experiences so as to maintain a positive experience (Schroevers and Brandsma, 2010). Therefore, the mediating role of positive affect between mindfulness and life satisfaction is needed to be further investigated.

More importantly, we found that trait mindfulness could affect life satisfaction through two chain mediations: "core self-evaluation→positive affect" and "core self-evaluation→negative affect." This result supports hypothesis 3 and totally corresponds with the Mindfulness-to-Meaning theory. Based on this theoretical model, we speculated that it was precisely by influencing an individual's cognition (core self-evaluation) that mindfulness influenced an individual's emotion (positive and negative affect) and ultimately increased life satisfaction. Specifically, the internal mechanism may be that mindfulness can change the cognition of oneself by improving self-acceptance so as to hold more positive core self-evaluation (Kong et al., 2014; Liu et al., 2019). Moreover, core self-evaluation helps individuals to build self-confidence and endows themselves and external things with a positive attitude so that they experience more positive affect and less negative affect (He et al., 2014). At the same time, the more positive the individual's emotion is, the easier to focus on the positive side of daily life and feel satisfied with it, and finally life satisfaction can be improved (Extremera and Rey, 2016).

In summary, this study novelly revealed the underlying mechanism between trait mindfulness and life satisfaction from the perspective of the Mindfulness-to-Meaning theory. The results of the study preliminarily found that both cognition and emotion are the important mediators that affect life satisfaction from trait mindfulness. Specifically, we concluded that trait mindfulness affects life satisfaction by the chain mediation mechanism of "core self-evaluation→positive affect" and "core self-evaluation→negative affect." This research not only helps to expound the intrinsic mechanism of the effect of trait mindfulness on life satisfaction but also arouses important implications for improving an individual's quality of life and promoting positive affect. In addition, this conclusion also confirmed that cognition and emotion were not two independent parts. As a manifestation of cognition, we concluded that core self-evaluation had an impact on life satisfaction through positive affect and negative affect. Future research can be expanded from the influence of emotion on cognition to comprehensively reveal the cognition-emotion interaction of mindfulness on life satisfaction.

However, this study also has several limitations inevitably. First, the study adopted self-reported method to explore the conclusion. Although showing a good reliability and validity of the measurement, there may exist social desirability bias so that alternative methods are needed to expand the topic in the future. Besides, all participants were Chinese undergraduates. The future research can take cultural, ethnic, socioeconomic status, age, gender identity and other diversity factors into account through large samples to improve the external validity of the conclusions. Finally, the present study uncovered the underlying mechanism between trait mindfulness and life satisfaction through cognition and emotion, which corresponded with the Mindfulness-to-Meaning theory to some extent. Meanwhile, in addition to life satisfaction, the Mindfulness-to-Meaning theory also demonstrated that mindfulness could further generate a sense of meaning through well-being. Future research is needed to test whether mindfulness can not only promote life satisfaction but also generate sense of meaning through the cognitive-affective processes, which totally verifies the Mindfulness-to-Meaning theory.

DATA AVAILABILITY STATEMENT

The datasets supporting the conclusions of the present study are not publicly available due to privacy concerns however they will be made available upon reasonable request from the corresponding authors.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Academic Committee of the School of Psychology of Hunan Normal University. Written informed consent to participate in this study was provided by the participants' or their legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

XL made a contribution to the design of this manuscript, data analysis, and manuscript revising. LM made a contribution to conceiving the framework of theory, data analysis, writing, and revising the manuscript. QL made a contribution to manuscript writing and data analysis. All authors contributed to the article and approved the submitted version.

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Corrigendum: How mindfulness affects life satisfaction: Based on the mindfulness-to-meaning theory

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In the published article, there was an error in affiliation 3. Instead of Department of Psychology, Beijing Normal University, Beijing, China, it should be Institute of Early Childhood Education, Faculty of Education, Beijing Normal University, Beijing, China.

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Investigating the Role of Normative Support in Atheists' Perceptions of Meaning Following Reminders of Death

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According to terror management theory, humans rely on meaningful and permanence-promising cultural worldviews, like religion, to manage mortality concerns. Prior research indicates that, compared to religious individuals, atheists experience lower levels of meaning in life following reminders of death. The present study investigated whether reminders of death would change atheists' meaning in life after exposure to normative support for atheism. Atheists (N = 222) were either reminded of death or a control topic (dental pain) and exposed to information portraying atheism as either common or rare, and then asked to rate their perceived meaning in life. Results showed that reminders of death reduced meaning in life among atheists who were told that atheism is common. Results were consistent with the view that atheism reflects the rejection of religious faith rather than a meaningful secular terror managing worldview. Discussion considers implications for maintaining healthy existential wellbeing, identifies limitations, and highlights future research directions.

Keywords: terror management theory, atheism, mortality salience, normative support, meaning in life

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INTRODUCTION

While research into the psychological construct of meaning in life has grown tremendously in recent years, researchers lament the lack of work on sources of meaning (Schnell, 2011). According to terror management theory (TMT; Greenberg et al., 1986), humans' cultural worldviews provide a meaningful sense of longevity in the face of mortality concerns. Religion is one widely researched worldview that TMT research has shown to be protective against concerns about death (see Soenke et al., 2013 for a review). It offers this protection through literal immortality beliefs, supernatural belief in an immortal soul that will live on after death. Religion is also often associated with meaning in life (see Hood et al., 2018 for a review). Conversely, a growing body of research indicates that atheists, individuals who do not believe in any supernatural agents or a soul, experience lower levels of meaning in life than religious individuals (Horning et al., 2011; Schnell and Keenan, 2011), particularly following reminders of death (Vail and Soenke, 2018). The present study further investigated that pattern, exploring whether death awareness would continue to undermine atheists' meaning in life after exposure to normative support for atheism itself.

Terror Management Theory, Religiosity, and Meaning in Life

Terror Management Theory (Greenberg et al., 1986) is an existential theory of human behavior based on the work of cultural anthropologist Becker (1971, 1973, 1975), that states that humans'

unique cognitive abilities allow for a sophisticated and abstract awareness that sets us apart as the only animal able to understand the scope and severity of our own mortality. The theory and associated research indicate that humans have developed two basic psychological constructs to manage the potential anxiety or "terror" that this understanding poses. First, cultural worldviews are sets of beliefs, standards, and values which imbue the world with order, meaning, and purpose and offer some form of either symbolic or literal permanence. Cultural worldviews can take many varying forms, but are all characterized by their role in providing a structure through which adherents can make sense of the world. These worldviews include prescriptions for achieving a sense of longevity. They can do this in two ways, either literally, as with belief in an immortal soul that will live on after death, or symbolically through cultural works that leave a lasting legacy by which we are remembered. Centrality components of worldviews include national identity, political orientation, and religious affiliation. Second, self-esteem is the sense that one is living up to the standards and values put forward by our cultural worldviews, and thus is a valuable contributor to a meaningful world. According to TMT, people manage their potential anxiety regarding their mortality by maintaining faith in these two constructs, and considerable energy is directed toward pursuing these goals.

Terror management theory's *mortality salience hypothesis* proposes that if certain psychological structures (e.g., one's cultural worldviews) help to protect individuals from concerns about death, then increasing mortality salience (MS) should strengthen people's need for these systems (Rosenblatt et al., 1989). Considerable TMT research has found that reminders of mortality can lead people to seek out and maintain a sense of meaning by affirming their cultural worldviews (see Pyszczynski et al., 2015 for review). For example, when reminded of death (vs. control topic), American undergraduates prefer a pro-American essay over an essay that is critical of America (Greenberg et al., 1990). Similarly, university students majoring in natural sciences favored an evolutionary theory account of human origin over intelligent design following reminders of death (Tracey et al., 2011).

Research into the TMT dual process model of defense (Pyszczynski et al., 1999) demonstrates that distinct types of defenses are used when death is in conscious awareness and once it has been pushed out of conscious awareness but is easily accessible. Proximal defenses are used when death is in conscious focus and tend to be rational, threat focused, and designed to address the problem of death directly through denying vulnerability or distracting oneself (Pyszczynski et al., 1999). For example, denying vulnerability to health risk factors (Greenberg et al., 2000), increasing intentions to behave in healthy ways (Arndt et al., 2003; Taubman Ben-Ari and Findler, 2005), and distracting oneself with positive emotions (DeWall and Baumeister, 2007). Once thoughts of death are outside of conscious awareness, distal defenses of worldview defense and self-esteem maintenance and enhancement take over. Unlike proximal defenses, distal defenses (often called terror management defenses) aren't so directly related to death, but instead bolster belief that one is a being of enduring value in a meaningful world. Because the present research is focused on variables that may affect atheists' distal defenses, following prior research (Greenberg et al., 1997; Kosloff et al., 2018), we use a delay and distraction task so that death is no longer in conscious focus prior to measuring our dependent variable.

According to TMT, both religious and secular worldviews address the problem of mortality by offering a template for leaving a meaningful legacy here on earth (symbolic immortality), but religious worldviews are unique in that they also offer literal immortality through supernatural belief in an immortal soul that will live on after death. Many studies find that religious belief is associated with lower levels of anxiety generally and anxiety about death specifically (see Soenke et al., 2013 for a review), and that religious belief is associated with a myriad of other positive outcomes, like meaning in life, health, longevity, and general well-being (see Hood et al., 2018 for a review). TMT research has shown that MS motivates increased religiosity and strengthened faith in supernatural concepts among religious individuals (Norenzayan and Hansen, 2006; Jong et al., 2012; Vail et al., 2012). Affirming faith in religious concepts, such as an afterlife or creation stories also reduces death related thoughts and worldview defensiveness following MS (Dechesne et al., 2003; Schimel et al., 2007). In addition to protecting against concerns about death, research on sources of meaning indicates that *religious* sources of meaning are particularly predictive of overall meaning in life (Emmons, 2005; Schnell, 2010, 2011), and religious individuals, even those lower in religiosity, tend to score higher than atheists on measures of meaning in life (Horning et al., 2011; Schnell and Keenan, 2011).

Terror Management Theory, Atheism, and Meaning in Life

Atheists, however, do not believe in any given religious supernatural concepts. Some have compellingly argued that one's atheism can be weak or strong (e.g., Flew, 1984; Martin, 1992). Weak atheism is when people passively lack affirmative belief in god; individuals can either be unaware that they don't believe, or they can be aware of it and capable of self-reporting it. Strong atheism is when one does not merely passively lack faith, but actively rejects it (also see Dawkins, 2006). Weak or strong, atheism does *not* describe the *presence* of belief in any *secular* worldview—it does not describe whether one knows much about science, strives to be compassionate toward others, wants to be remembered for their prowess on the basketball court, or believes in such secular virtues as civic engagement, teaching, farming, or raising a family. Instead, "atheism" *only* describes the *absence* of faith in supernatural concepts—at least the passive lack of faith and at most the assertive rejection of it.

Indeed, TMT research on atheists indicates that although atheists and religious believers both implicitly activate supernatural concepts following reminders of death (e.g., Jong et al., 2012), believers also express increased acceptance of faith in religious/supernatural concepts whereas atheists do not (Norenzayan and Hansen, 2006; Jong et al., 2012; Vail et al., 2012). Instead, MS can increase atheists' explicit *rejection* of supernatural concepts (Jong et al., 2012, Study 1),

and affirmations of natural (medical life extensions) but *not* supernatural (afterlife) concepts mitigate the effects of MS on their secular worldview defenses (Vail et al., 2018). Thus, at least among American atheists, the awareness of death may initially implicitly motivate the activation of supernatural concepts, but (at least under certain conditions) they can override and reject those implicit supernatural concepts and associated expressions of religious belief.

That rejection of, rather than acceptance of, a terror managing set of religious beliefs may leave atheists "groundless"—having rejected one permanence-promising system of meaning (religious concepts) without necessarily having affirmed another in its place (e.g., secular beliefs and values). That groundlessness may, at least temporarily, undermine atheists' ability to maintain a sense of meaning in life when managing the increased awareness of death. To test that idea, Vail and Soenke (2018) recruited Christian and atheist participants, and either reminded them of death or a negative control topic (dental pain) using the classic MS prime consisting of two open ended questions (Rosenblatt et al., 1989). After a delay, participants completed an eight-item measure of their perceived meaning in life (Krause, 2007). Results indicated that Christians' reported levels of meaning in life were not impacted by the MS or the control condition. However, whereas atheists in the control condition reported similar levels of meaning in life as the Christian participants, those in the MS condition showed a significant decrease in meaning in life. Thus, whereas religious participants were able to maintain a sense of meaning in life following a death reminder, atheists were vulnerable to reduced sense of meaning in life when reminded of mortality.

Salient Prevalence of Atheism: Worldview Affirmation or Negation?

Much research has found religious belief to be associated with improved well-being and better ability to cope with negative life events, but some researchers question whether these benefits of religion are a result of the faith in religious content itself, or are better accounted for by the access to social support and validation that often come with religious belief (e.g., communities of fellow believers) but are less readily available to non-believers (Hood et al., 2018). Indeed, relationships between religion and wellbeing have been well accounted for by variables like perceived social support and social capital (Salsman et al., 2005; Stark and Maier, 2008; Yeary et al., 2012). Likewise, Horning et al. (2011) found that atheists showed lower levels of meaning in life and reported access to fewer sources of social support than their religious counterparts —even those low in religiosity.

Given that social support and validation appear to be a key ingredient in the link between religiosity and improved wellbeing, Galen (2015) argued that if atheists were to perceive similar social support and validation in their secular communities, they should experience similar psychological and health benefits. A potential illustration of this presumed effect can be seen by comparing data obtained in the United States and Norway. When asked, in 2018, if they believed in God, a minority (just 13%) of Americans said "no" (Hyrnowski, 2018) whereas a majority (52.9%) of Norwegians said "no" (European Values Survey, 2017). In line with Galen's argument, research in the predominantly religious United States indicates religious engagement is positively associated with aspects of wellbeing like life satisfaction and happiness, whereas research in the predominantly secular Norway showed no significant differences between religious and non-religious individuals' aspects of social support nor wellbeing (Kvande et al., 2015).

One important question is whether the prevalence of atheism itself plays a role in shoring up atheists' wellbeing even in the face of existential threat. We identified two possible theoretical perspectives on the topic, leading to two competing hypotheses.

Worldview Affirmation Hypothesis

One perspective builds on two ideas. First: the assumption that the salient prevalence of atheism would somehow affirm atheists' permanence-promising worldview beliefs, standards, or values. Second: the TMT idea that the perception of prevalent social support for one's permanence-promising worldviews may help manage existential concerns about one's impermanence.

Indeed, prior work has found that social support and consensus can play an important role in buffering against existential threat (for a review see Greenberg et al., 2014). When others reject one's beliefs or hold a competing worldview, they raise the possibility that one's own worldview might either be wrong or irrelevant. But when others share one's worldview, that consensus helps affirm one's worldview as a valid system of meaningful beliefs, standards, and values. For example, MS caused Germans to estimate greater social consensus for their political beliefs, and Americans to estimate greater consensus for their religious beliefs (Pyszczynski et al., 1996). Likewise, MS increased participants' death-thought accessibility, but not after an affirmation of their self-worth and cultural values (Schmeichel and Martens, 2005; Vail et al., 2018).

It is notable that—at least in the United States—Christians make up over 70% of the population (Pew Research Center, 2015a), about 88% of the current (117th) and previous United States Congress is Christian (Pew Research Center, 2015b, 2021), and every single United States President has expressed belief in God (Pew Research Center, 2017). Christianity is pervasive and thoroughly integrated into the fabric of American society. In contrast, atheism in America does not enjoy the consensual validation of normative support and atheists are instead a relatively rare and often openly despised minority. Although the numbers of atheists range from 500 to 750 million worldwide (Zuckerman, 2007), anti-atheist prejudice in America is prevalent and strong (e.g., Edgell et al., 2006; Gervais et al., 2011; Jones, 2012) and most do not openly identify as atheists (Gervais and Najle, 2018). Compared to countless churches and faith-based groups, the largest American irreligious group—the Freedom from Religion Foundation—has just 32,000 members (∼0.000042% of the estimated number of atheists globally).

Such normative support for Christianity (but not atheism) could help explain why Christians (but not atheists) were able to maintain the perception of meaning in life even when reminded of death (Vail and Soenke, 2018). It might also suggest that if atheists perceived atheism to be prevalent (assuming prevalent

atheism would somehow affirm atheists' terror-managing beliefs in the same way prevalent Christianity affirms Christians' terror-managing beliefs) they might be similarly protected. Thus, combining that assumption with these TMT ideas leads to the hypothesis that: among American atheists, MS should undermine perceived meaning in life (as in prior work, Vail and Soenke, 2018) when led to view religion as prevalent but not when led to view atheism as prevalent.

Worldview Negation Hypothesis

A competing view, however, recognizes—as in the definition of atheism, above—that atheism does not describe the *presence* of any particular secular worldview beliefs, standards, or values. Atheism is not, for example, humanist compassionate values, scientific understanding, or support for the New York Yankees; it doesn't denote the adoption of particular theories of music, civics, or economic policies; and it isn't a legacy from writing a book, having children of one's own, or teaching the children of others. Atheism is completely mute about any such positive, affirmative investment in any terror-managing, permanence-promising secular worldview beliefs, standards, or values. Instead, atheism is merely the *absence* or even rejection of religious faith.

In line with that definition, this second view assumes that salient prevalence of atheism signals a negation of religious worldviews without necessarily affirming any particular terror-managing secular worldview in its place. That may create a "groundlessness" which may leave people open to reduced meaning, especially when aware of death. Nietzsche (1882) illustrated the problem in his famous "madman" passage, where an individual realizes with confidence that "God is dead" but laments that there is no clearly affirmed meaning system ready to take his place—the individual will have to take additional steps to create and affirm a coherent system of secular values. Frankl's (1946) concept of the existential vacuum can, in this case, be interpreted in a similar vein: negating traditional worldviews without affirming and engaging a replacement worldview creates vulnerability to boredom, meaninglessness, and even crisis.

Thus, this view begins by assuming atheism denotes the absence of religious faith, rather than the presence of any given secular worldviews, and that salient prevalence of atheism would merely negate a widespread sociocultural system without necessarily affirming any particular secular terror-managing worldview in its place. Thus, this view predicts that: among American atheists, MS should undermine perceived meaning in life (as in prior work, Vail and Soenke, 2018) when led to view atheism as increasingly prevalent but not when led to view it as still rare.

The Present Research

Whereas previous research has found that atheists suffered a reduction in the perception of meaning in life when reminded of death (Vail and Soenke, 2018), the present research explores that effect further. American atheists were first reminded of either death or a control topic (dental pain). They were then given information either emphasizing atheism as rare or as increasingly common (following Gervais, 2011). After these manipulations, they rated their sense of meaning in life (Krause, 2004). The worldview affirmation hypothesis assumes atheism somehow offers a permanence-promising set of secular beliefs, standards, and values, and thus predicted MS would undermine atheists' meaning in life when they perceive atheism as rare but not when they perceive strong normative support for atheism. The worldview negation hypothesis, however, recognizes atheism entails the negation of religious terror-managing worldviews rather than the affirmation of any given secular terror-managing worldviews, and thus predicted MS would undermine atheists' meaning in life when led to perceive strong normative support for atheism (negating religion but not affirming an alternative) rather than when led to perceive it as rare.

METHOD

Participants

A meta-analysis of prior MS manipulation research (Burke et al., 2010) found a large overall MS effect size of $r = 0.35$ ($d = 0.75$), though of course the true effect size may be smaller. Thus, using G*Power software (G*Power; Faul et al., 2007), we computed an *a priori* power analysis for an interaction (*F*-family tests, ANOVA interactions) for a minimum effect size threshold set to a medium size of $f = 0.25$, with power set to $\beta = 0.80$ for detecting the presence of such effects at $\alpha = 0.05$, with one numerator *df* and four groups. This analysis recommended a minimum overall sample size of 128 participants. The obtained sample size ($N = 222$) met and exceeded that minimum recommendation, and a sensitivity power analysis showed the study was sensitive enough to detect effects as small as $f = 0.18$ (small-medium effect sizes). Sample size was determined before any data analysis.

In Fall 2018, 296 participants were recruited for participation by the research panel recruitment service Cloud Research using the religious screening item "*What religion or philosophy are you affiliated with, if any? (1) Christian; (2) Muslim;(3) Jewish; (4) Buddhist; (5) Hindu; (6) Spiritual (I believe supernatural beings do exist, but I do not follow a specific religion); (7) Agnostic (I'm not sure whether, or it is impossible to know whether, supernatural beings do or do not exist); (8) Atheist (I do not believe supernatural beings exist); and (9) Other _____.*" Panel members who selected "atheist" were eligible to participate. Of the 296 participants recruited, 32 participants failed to complete extensive portions of the study, 4 did not give consent to participate and one was 17 years old and so could not consent to participate. The religious screening item was administered again at the end of the study, to confirm that the respondents were indeed atheists, and an additional 37 participants identified themselves as having religious/spiritual beliefs other than atheist and were thus excluded listwise. It is unknown whether these non-atheists were the same individuals who indicated "atheist" on the original pre-screener and subsequently changed their beliefs, or perhaps different individuals using those earlier atheist users' accounts.

Data was analyzed for the remaining 222 atheists (121 women, 101 men), ranging in age from 18–80 ($M = 41.59$, SD = 37.43), with an average 14.87 years of education (SD = 3.11). Participants were mostly white (203 Caucasian, 9 African American, 3 Asian/Pacific Islander, 2 American Indian/Native Alaskan, 5

"other") and non-Hispanic/Latino (9 Hispanic/Latino, 212 non-Hispanic/non-Latino).

Materials and Procedure

Participants completed materials for a study described as investigating "personality and social attitudes" *via* a link to an online service ([1]Provo, UT, United States) provided to them by the Cloud Research platform. After obtaining informed consent, participants completed the study materials for our 2 (MS, dental pain control) × 2 (Atheists are common, atheists are rare) factorial design on the dependent variable of meaning in life (Krause, 2004). All measures, manipulations, and exclusions for this study are reported.

Personal Need for Structure

To begin, participants completed a short version of the Personal Need for Structure Scale (PNS: Thompson et al., 2001). A person who scores high in PNS prefers order and certainty, and dislikes ambiguity. The scale consists of 6 items measured on 6-point Likert-type scale (1 = strongly disagree, 6 = strongly agree). Example items are: "I enjoy having a clear and structured mode of life" and "I become uncomfortable when the rules in a situation are not clear." Prior TMT research has found that individuals low in PNS report lower levels of meaning in life following reminders of death then those high in PNS (Vess et al., 2009). In an earlier study, Vail and Soenke (2018) found that atheists in their samples had lower levels of PNS than Christian participants. The PNS Scale was included at the beginning of this study to investigate this potential individual difference variable and support the cover story, that this is research on personality.

Mortality Salience

Participants were randomly assigned to complete either the Fear of Death Questionnaire (Florian and Kravetz, 1983) as an MS prime or an identical scale about dental pain as a control topic prime. The questionnaires were not scored, because the questionnaire topics were experimentally manipulated to prime participants' awareness of death vs. dental pain. The MS version of the questionnaire included questions like "I am very much afraid to die." and "The thought of death never bothers me." Each version used a 10 point Likert-type scale ranging from 1 *(Strongly Disagree)* to 10 *(Strongly Agree)* (Florian and Kravetz, 1983). Although the most widely used MS prime uses two open-ended questions asking participants to think about their own death (Rosenblatt et al., 1989), fear of death scales have also been widely used in TMT research as a MS prime (see Burke et al., 2010 for review). In our experience conducting fully online experiments, fewer participants respond to the open-ended primes, making it difficult to know whether they have attended to the prime and leading to loss of participant data. By using a questionnaire that participants respond to on a Likert-type scale, we feel confident that participants have thought about the questions as they respond and are primed with death.

[1]http://qualtrics.com/

Prevalence of Atheism

Following MS, participants were presented with a short passage to read about worldwide atheism rates and told that they would be asked questions about the passage later in the study to encourage them to pay attention to what they read. These passages were taken directly from Gervais (2011) to give participants some information about whether there is normative support for atheism. Half of the participants were randomly assigned to read a passage indicating that atheists are common and outnumber other established religious groups. For example, an excerpt from the passage states: "Globally, atheists are 58 times more numerous than Mormons, 41 times more numerous than Jews, and twice as numerous as Buddhists; non-believers constitute the fourth largest religious group in the world, trailing only Christians, Muslims, and Hindus (Zuckerman, 2007)." The other half of participants read a passage indicating that atheists are rare and becoming even less common worldwide (Gervais, 2011). An excerpt from this passage states: "Compared to the great world religions, atheists are fairly rare, and do not have a particularly visible worldwide presence. And, according to data from Norris and Inglehart (2004), atheists are becoming less common worldwide, relative to other religious groups."

Delay and Distraction

As already noted, a large body of research indicates that the distal effects of explicit MS primes (e.g., such as the explicit questionnaire-based MS manipulation used in the present study) emerge most strongly after a delay, when death thought is highly accessible to consciousness but no longer in focal attention (Greenberg et al., 1997; Kosloff et al., 2018). To achieve this delay, participants completed the 60 item Positive and Negative Affect Scale (PANAS-X; Watson and Clark, 1994) and a brief 3–5 min reading task (Pyszczynski et al., 1999).

Meaning in Life

Following the delay, participants completed the full 23-item Meaning in Life Questionnaire (Krause, 2004) as the dependent measure. Participants indicated their agreement with items using a six-point Likert-type scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). Sample items include "*I have a sense of direction and purpose in life*." and "*I feel good when I think about what I have accomplished in life*" (Krause, 2004).

Demographics

At the end of the study, participants completed a demographic questionnaire assessing age, sex, race/ethnicity, education level, political orientation, and religious belief/unbelief. Participants also completed a questionnaire about response environment and a question to determine any suspicion during participation.

RESULTS

A 2 (MS, control) × 2 (atheists are common, atheists are rare) ANOVA was conducted on participants' average scores for the Meaning in Life Questionnaire. Although this analysis revealed no main effect for MS [$F(1, 218) = 1.91$, $p = 0.161$, $\eta_p^2 = 0.009$] or atheists are common/rare article condition [$F(1, 218) = 0.18$,

$p = 0.676$, $\eta_p^2 = 0.001$], a significant interaction emerged [$F(1, 218) = 6.12$, $p = 0.014$, $\eta_p^2 = 0.027$].

Pairwise comparisons revealed that, among participants who read that atheists are common, meaning in life was lower in the MS than in the dental pain condition [$t(218) = -2.70$, $p = 0.007$, $d = -0.44$ (95% CI: −0.83, −0.07)]. Among those who read that atheists are rare, meaning in life did not differ between the MS and pain conditions [$t(218) = 0.76$, $p = 0.46$, $d = 0.09$ (95% CI: −0.28, 0.46)].[2] Further, among those in the MS condition, those who read that atheists are common had significantly lower levels of meaning in life than those who read that atheists are rare [$t(218) = -2.01$, $p = 0.045$, $d = -0.43$ (95% CI: −0.79, −0.03)]. Among participants in the dental pain condition, meaning in life did not significantly differ between the common and the rare condition [$t(218) = 1.47$, $p = 0.14$, $d = 0.22$ (95% CI: −0.18, 0.56)] (**Table 1**).

DISCUSSION

The present study explored whether death awareness would or would not continue to undermine atheists' meaning in life after exposure to normative support for atheism itself. Results indicated that MS (vs. pain salience) reduced atheists' perceived meaning in life when atheists were informed that atheism is common but not when informed atheism is rare.

This data pattern did not support the worldview affirmation hypothesis, which was built on (1) the assumption that normative support for atheism would affirm atheists' worldview beliefs, standards, and values, and (2) the TMT idea that affirming one's permanence-promising worldviews would help manage existential concerns about one's impermanence. As mentioned in the section "Introduction", much prior research is consistent with the latter idea—demonstrating that social support and consensus can play an important role in buffering against existential threat (Greenberg et al., 2014). Thus, the present data suggest the former assumption was incorrect—that ostensible normative support for atheism does *not* affirm any particular secular permanence-promising worldviews.

Rather, the observed data pattern was consistent with the worldview negation hypothesis, which recognized that atheism does not describe the presence of any particular secular terror-managing worldview beliefs but merely the absence or rejection of religious terror-managing beliefs. From that view, a prime suggesting atheism is rare, such that traditional religious worldviews are still prevalent, would not have negated the long-standing and familiar sociocultural systems within which atheists have always trafficked. Even if one is atheist, one can still know and meaningfully navigate toward a permanence-promising legacy within the Western Judeo-Christian sociocultural landscape even while ignoring or rejecting the supernatural concepts associated with it. In contrast, a prime suggesting growing global consensus for atheism would perhaps represent a broader negation of such religious worldviews—but without necessarily affirming any particular secular worldview in its place. That groundlessness might have left atheist participants vulnerable to reduced meaning in life when reminded of mortality, which fits data patterns observed in the present study. These findings could be seen as consistent with an incident in Don Delillo's novel about the fear of death, *White Noise* (Delillo, 1985); in the novel, an atheist character becomes disturbed when he learns that a nun also disbelieves in a supernatural higher power. It may be that non-believers get some comfort or value from other people being believers.

[2]2 (MS, control) × 2 (atheists are common, atheists are rare) (M) ANOVAs conducted on PNS and all 13 of the PANAS-X subscales revealed only a small main effect for MS condition on fatigue $F(1, 218) = 3.85$, $p = 0.051$, $\eta p^2 = 0.017$, with participants in the MS condition reporting higher fatigue ($M = 3.62$, SD = 1.21) than those in the control condition ($M = 3.29$, SD = 1.12).

TABLE 1 | Descriptive statistics of atheists' meaning in life in each cell.

	Atheism common			Atheism rare		
	M	SD	*n*	*M*	SD	*n*
Mortality salience	3.34	0.82	52	3.64	0.63	56
Pain salience	3.73	0.89	56	3.58	0.67	58

Implications, Considerations, and Future Directions

The present data patterns raise several considerations that are worth considering further, including some with implications that may spur informative future research.

Compensation Hypothesis

The first stems directly from the present findings and considers how atheists might maintain meaning in life and manage existential concerns. The idea we propose here is that, to maintain existential wellbeing, the atheist absence or rejection of a meaningful terror-managing religious faith must be compensated for by the presence of a meaningful terror-managing set of secular worldview beliefs, standards, and values. Others have similarly proposed that science can, at least in part, compensate for religion and serve an analogous psychological function (Farias et al., 2013). Indeed, MS increased support for evolutionary theory among natural science students (Tracey et al., 2011), and among atheists the typical MS-induced secular worldview defense was eliminated after a prime affirming life extension based on medical science (Vail et al., 2020).

But secular compensation requires not just scientific information and technological advances, it also entails moral, social, and cultural engagement. It means learning non-supernatural explanations about the world (science), developing a sense of purpose through secular (perhaps humanist) social standards and moral values and goals, and adopting or developing meaningful cultural paths toward living up to those worldviews. Thus, an existentially healthy individual might indeed be an atheist, but one who not only (a) lacks or rejects religious faith, but also (b) compensates for that through scientific learning and knowledge, the adoption of guiding secular humanist values (e.g., education, compassion), and a sense of purpose and legacy through secular participation in a larger and

longer-lasting cultural system—arts, sports, family, civic engagement, and so on.

In that light, the present research found the "atheism is common" prime did not buoy atheists' meaning in life when reminded of death, which would be expected because the prime did not also compensate for that negation of religion by offering in its place an affirmation of participants' secular beliefs, standards, or values. Thus, future research could test whether an affirmation of atheists' secular worldviews would help them maintain perceived meaning in life after being reminded of death.

Normative Support Prime: A Backfire Effect?

One possible alternative explanation for the present results might argue that the worldview affirmation hypothesis is still true, and that a compelling and pervasive social support for atheism would serve a buffering function for atheists, but that the "atheism is common" prime in the present study backfired. The sample of atheists recruited in this study were American atheists. Although the "religious nones" in the United States are a growing minority, atheism remains just a small minority at 3% of the population—an estimated 9.62 million of the 2015 population of 320.7 million Americans (Pew Research Center, 2015a). Further, anti-atheist prejudice is prevalent and strong (Edgell et al., 2006; Gervais et al., 2011; Jones, 2012) so many atheists remain "closeted" (Gervais and Najle, 2018), hiding their unbelief from others. The result is that most atheists are unlikely to encounter other atheists, or even hear about support for atheism, in their daily lives. Thus, it is possible that, rather than increasing social support and validation, the present "atheists are common" prime may have actually engendered a sense of isolation by drawing attention to the many atheists out in the rest of the world while one is isolated in their atheism here in the United States.

This alternative perspective can potentially explain why MS still reduced atheists' meaning in life in the "atheism is common" prime condition. However, it would have a difficult time explaining why MS had no effect in the "atheism is rare" condition. If being inadvertently reminded of one's atheist isolation makes one vulnerable to reduced meaning in life after existential threat, then surely an overt and direct reminder would produce the same effect—and yet it did not. Perhaps learning that atheists are rare may validate their sense of isolation and even help to explain it, and thereby somehow buffer against existential threat to well-being. But, it is difficult to see why the "atheism is rare" prime would not, for the very same reasons, undermine social support for atheism as a potential death-denying worldview system—which should have created a vulnerability to reduced meaning in life after a death reminder. Thus, the "backfire effect" (isolation) idea encounters problems explaining the full data pattern.

Atheism as an Achievement: A Source of (Self-)esteem?

Another alternative builds on the possibility that American atheists might feel some terror-managing sense of uniqueness, achievement, or even superiority from being one of the few atheists in America. The underlying assumption here being that, in a nation saturated with irrational and factually unverifiable religious concepts, the American atheist may interpret having become atheist as a rare and commendable intellectual achievement! Indeed, research finds unbelief is correlated with higher intelligence (Zuckerman et al., 2013), higher levels of education (Strieb and Klein, 2013), greater analytic reasoning (Pennycook et al., 2012; Shenhav et al., 2012), and an emphasis on scientific thinking (Larson and Witham, 1998; McCauley, 2011). Research on anti-theists specifically has shown that they see the rejection of religion as overcoming immature thought to reach a higher insight (Bulbulia, 2005).

Thus, if American atheists regard their atheism as an uncommon intellectual achievement, then it's possible the "atheism is rare" prime could have bolstered their self-esteem and buoyed their meaning in life after MS, whereas the "atheism is common" prime would have threatened the uniqueness of that achievement and left them vulnerable to reduced meaning in life when reminded of death. The present data patterns seem to fit with this idea, though we suggest some caveats. First, some skepticism may be warranted, as our admittedly anecdotal experience suggests very few atheists regard their atheism as a source of pride—rather, it's often a struggle. Second, atheism is hardly a source of social status/esteem in the normative American sociocultural landscape; as described above, recent research shows atheism is still highly stigmatized and the target of strong prejudice by the religious. So, it seems unlikely that the relatively rare "achievement" of atheism in America would be taken as a source of social esteem, but it might be a more limited and private source of positive *self*-regard. Third, if so, such would likely only be the case for the subset of anti-theists (Silver et al., 2014)[3] from the subset of atheists who explicitly recognize their own atheism (e.g., Flew, 1984; Martin, 1992). Thus, while possible, there are important caveats and limiting considerations that warrant skepticism.

Limitations

The generalization of the present data is of course limited to the American context. The prevalence of atheism and the corresponding importance of secular, rather than religious, worldviews varies dramatically across nations and cultural regions (Keysar and Kosmin, 2007; Streib et al., 2009). Our sample of American atheists should be understood in the broader context of the American religious landscape, where there are fewer atheists, more anti-atheist prejudice, and aspects of religion, particularly Judeo-Christian values, are embedded

[3]The six types of non-belief identified by Silver et al. (2014) include: (1) ritual atheists/agnostics, who reject belief in God, but continue to participate in religious traditions for extrinsic reasons; (2) non-theists, who do not think about religion and so see it as a non-issue; (3) anti-theists, who actively seek to end religion; (4) seeker-agnostics, who feel people can't know whether religion is correct or not; (5) activist atheists/agnostics, who are motivated by belief in secular worldviews rather than religious; and (6) intellectual atheists/agnostics, who favor scientific or philosophical arguments against religious belief.

into the fabric of society. Cross-cultural research would be needed to learn whether this finding is isolated to American atheists or whether it generalizes to atheists residing in countries where atheism is more prevalent and accepted, such as Scandinavia or New Zealand.

A related limitation results from our reliance on one single question to determine our atheist sample. Some theorists and researchers have suggested that there are different kinds of atheists (Norenzayan and Gervais, 2013; Holmes et al., 2021). For example, for some, atheism may be a central aspect of their worldview, and something that they invest in and want to spread to others. For others, their lack of belief may just reflect a lack of exposure to deistic beliefs or a lack of cognitive orientation or intuition regarding supernatural agents. Some atheists may view the world optimistically, embracing secular humanism, whereas others may embrace a more nihilistic, absurdist worldview. If we had differentiated between different types of atheists based on how they integrate their disbelief within their worldview or bases of self-worth, we might have found that for some atheists, the combination of MS and "atheists are common" would undermine meaning in life, as our results suggest, but for others, it would not. This may be a fruitful avenue for further research on how MS and the prevalence of atheism relate to meaning in life.

Additionally, the present work is limited to the outcome of perceived meaning in life, but future directions for this research could explore additional outcome measures like physical health or affective well-being (e.g., happiness). There is research to suggest that meaning in life may play a different role for atheists than it does for religious individuals. The literature on meaning in life indicates that for religious individuals, meaning in life is highly related to both physical health and psychological well-being (see Hood et al., 2018 for a review). Steger and Frazier (2005) found that meaning in life significantly mediated the relationship between religion and personal well-being; suggesting that religion's role in providing meaning is an important aspect of why religion is associated with positive outcomes. But for atheists, lower ratings of meaning in life do not translate to lower overall happiness or life satisfaction in the way they do for religious individuals (Horning et al., 2011; Schnell and Keenan, 2011). Given this, investigating the relationship between religiosity, meaning in life, and other positive outcomes from a TMT perspective is an important next step for empirical research into the psychology of religion.

CONCLUSION

Building on prior research (Vail and Soenke, 2018), the present work explored whether death awareness would undermine atheists' meaning in life after exposure to normative support for atheism itself. Results indicated death awareness did reduce atheists' meaning in life when given information that atheism is common. These data show that salient prevalence of atheism does not appear to function as an affirmation of a permanence-promising worldview, consistent with the idea that atheism does not describe the presence of a particular secular worldview but rather only the absence or rejection of religious supernatural concepts.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the California State University Channel Islands IRB. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MS and KV contributed to the conception and design of the study. JG helped with operationalizing variables. MS collected and organized the participant data and performed the statistical analysis. MS wrote the first draft of the manuscript. MS, KV, and JG wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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The efficient measurement of individual differences in meaning motivation: The need for sense-making short form

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People differ in the extent to which they express a need for sense-making (NSM), and these individual differences are important to understand in light of meaning-making processes. To quantify this important variable, we originally proposed a need for sense-making scale. We now propose a refined, similarly reliable short version of the scale (NSM-SF). The 7-item NSM-SF was validated across a series of four studies (combined N = 1,243). NSM-SF showed psychometric properties and correlations consistent with its longer forerunner. Additionally, results indicated that the need for sense-making was moderately positively related to the satisfaction of basic psychological needs (autonomy, relatedness and competence), and it related negatively to the frustration of these needs. The research offers a useful, brief tool for assessing the NSM construct and broadens our understanding of basic psychological motivations.

KEYWORDS

need for sense-making, meaning, human motivation, basic psychological needs, individual differences, scale development

Introduction

Meaning-making processes and sense-making[1] motivation have been in the spotlight of research on the psychological functioning of individuals for some time (e.g., Graeupner and Coman, 2017; Petrou et al., 2017; Iwasaki et al., 2018; Walsh, 2020). This scientific interest may be attributed to the finding that sense-making motivation

1 We define "sense-making" and "meaning-making" as finding reliable connections between objects and use the two terms interchangeably throughout the manuscript. We define "meaningful" as having reliable connections between object, events or situations.

is related to important outcomes across life domains (personal, organizational, and societal). For example, research shows that finding meaning in difficult events is beneficial to individuals as it relates to lower stress (Updegraff et al., 2008). Meaning-making motivation is also linked to how individuals experience their professional activities. For instance, the perception of meaningful work is related to work engagement (e.g., May et al., 2004). The latter, in turn, is linked to better work performance and organizational commitment (Schaufeli and Bakker, 2014). Additionally, meaning-making processes are potentially important for conservation behavior and sustainability. Perceptions of meaningfulness relate to conservation intentions through experiencing disappointment (Byrka et al., 2021). Research on sense-making thus suggests that it is an important part of human functioning, which has not only psychological consequences but may exert a broader societal impact.

Individual differences in need for sense-making

The motivation to find meaning has been long argued to be central to human functioning (e.g., Frankl, 2006). Accordingly, a growing body of research has explored individual differences related to meaning-making processes. Baumeister (1991) proposed differentiating between lower, more concrete meaning versus higher, more abstract meaning. The latter of which has often been investigated in the context of meaning in life (e.g., Steger et al., 2011; Abeyta and Routledge, 2018). Steger et al. (2006) developed the Meaning in Life Questionnaire to assess both the presence and search for meaning in life. They found that perceiving one's life as meaningful is more typical among those with high self-esteem levels and who are satisfied with life. Researchers also showed that searching for meaning in life tends to be negatively related to presence of meaning in life (e.g., Steger et al., 2006). There have also been studies pointing to individual differences in the need to have a meaningful life, which is related to, for example, religious commitment and beliefs (Abeyta and Routledge, 2018). Both the MLQ and need for meaning scale capture the more abstract meaning-making motivation related to one's life, rather than more concrete need to make sense of the world and one's actions.

Drawing on the conceptualization of the lower, more specific meaning type, Cantarero et al. (2019, 2021) proposed that people differ in the need to make sense of the world. To assess the corresponding individual differences, they developed the Need for Sense-Making Scale (NSM). The need for sense-making is understood as the desire to find reliable connections between actions, objects and events, which is essential to move about in the environment effectively. It is conceptualized as a personal resource as it elevates the chances of achieving a sense of meaning. Cantarero et al. (2021) found that need for sense-making related positively to openness to experience, self-esteem, and internal locus of control. Need for sense-making related to searching for meaning in a task, which was linked to perceiving the task as more meaningful and related to better task performance. Similarly, individual differences in need for sense-making were related to work engagement through changes in search for and the perceived presence of meaningful work. Additionally, in supplementary work (Cantarero et al., 2021, Study S2) these researchers showed that NSM is positively related to both searching and presence of meaning in life. The NSM measures the appraisal of and general tendency to engage in sense-making processes; this includes the valuation of search as well as the valuation of meaning as an experience. There is thus a growing body of evidence suggesting that it is worth taking into account individual differences in investigating motivation to make sense of what surrounds us.

Need for sense-making and basic psychological needs

Although some have proposed that the need for sense-making is an important, core human motivation, it has thus far not been linked to basic psychological needs. According to self-determination theory, three basic psychological needs (BPN) are crucial to psychological functioning: autonomy, relatedness, and competence (Deci and Ryan, 2000; Vansteenkiste et al., 2020). The need for autonomy is related to engaging in activities that one chooses out of their volition. The need for relatedness holds that feeling connected to important others is of fundamental importance to individuals. Finally, the need for competence refers to the feeling of effectiveness in how one deals with their environment (Vansteenkiste et al., 2020). Satisfaction of the needs was found to relate positively to psychological well-being and negatively to experienced stress (e.g., Reis et al., 2000; Cantarero et al., 2021a). Additionally, recent research showed that satisfaction of the need for autonomy and the need for relatedness were linked to meaningful work indirectly through autonomous motivation, and need for competence was related to meaningful work directly (Autin et al., 2021).

Need for sense-making was not conceptualized as indicating whether the need is satisfied or frustrated. Those with high levels of the need value meaning highly, irrespective of the context. High levels of need for sense-making thus indicate that sense-making is an important motivation to an individual, rather than that the need is satiated. Similarly, for example, to the need to belong (Leary et al., 2013). However, given that NSM is understood as a personal resource that is beneficial to the functioning of individuals, it should be positively related to the satisfaction of BPN. More specifically, we expected that need for sense-making would relate positively to the satisfaction of the needs for autonomy, relatedness, and competence. Additionally, frustration of the needs relates to ill-being (e.g.,

Bartholomew et al., 2011). We expected that NSM is related negatively to the frustration of the three needs.

Previous studies tested and showed good psychometric properties of the need for sense-making scale (NSM). However, with 29 items, the scale is rather long, which may contribute to the unnecessarily extensive time that participants spend on filling in this one instrument. Besides pure practical reasons, a long scale can also unintendedly contribute to higher levels of fatigue in participants. Accordingly, the aim of this research was to test a shorter version of the NSM scale and to test how the need for sense-making relates to basic psychological needs, going beyond the earlier research.

Study overview

We conducted four studies to develop and evaluate the short version of the Need for Sense-Making Scale (Cantarero et al., 2021). In Study 1, we selected items most representative of the construct. A set of seven items met this criterion (**Appendix 1**). In Study 2 through 4, we administered the Need for Sense-Making Scale Short Form (NSM-SF), alongside other measures of relevant constructs (e.g., basic psychological needs, search and presence of meaning in life), to test its factorial structure, as well as convergent and divergent validity. The studies were approved by the Faculty Research Ethics Committee and were conducted in accordance with APA guidelines and the Helsinki Declaration of Human Right. All the data files are available at https://osf.io/8s95h/?view_only=55e20ba099384ad28d2dcd35f32a4c2a.

Study 1

The aim of Study 1 was to identify items for the NSM-SF. To this end, we considered all the data from the studies presenting the long version of the scale in English reported in Cantarero et al. (2021a). Additionally, we included the data from one new study (Cantarero, 2022), which allowed us to draw reliable conclusions due to the relatively large sample.

Participants

The analyzed sample consisted of five hundred eighty-two participants (287 women, 293 men, two undisclosed). Age ranged from 18 to 70 (M_{age} = 33.86, SD_{age} = 12.52). One hundred and forty-seven participants were from the United Kingdom and 435 participants were from the United States. United Kingdom participants were university students who took part in the research without remuneration. US participants were MTurk workers who received financial remuneration for participation.

Results and discussion

Similar to Cantarero et al. (2021) we performed diagonally weighted least squares confirmatory factor analysis of the full scale, which supported the unifactorial structure of the scale; the model had a moderate fit to the data χ^2/df = 5.21; RMSEA = 0.09, 90% *CI* = [0.083, 0.091], SRMR = 0.10, GFI = 0.93, though χ^2/df exceeded the recommended 5.00.[2]

We next reviewed the content of the items to select a subset for the short version of the scale. We selected these such as to retain translational validity (i.e., construct and face validity) in light of our theoretical definition of need for sense-making. We sought to establish reliability, criterion validity, and appropriate factor structure in separate steps. We noticed that some items overlapped strongly in content (e.g., "I don't like it when things serve no purpose" and "Doing pointless activities doesn't bother me"). To avoid biased construct representation that might occur by having some items being much more similar in content to each other than others, we excluded redundant items to select only those that differed substantially. We chose one item that described reactions to novelty and discrepancy (*When I am in a new situation, I try to find meaning in it*), persistence in searching for meaning (*I tend to search for meaning of discrepant situations until I find it*), general preference of meaningful vs. meaningless activities (*I prefer to do things that are meaningful*), positive affect related to experiencing meaningfulness (*When I make sense of a situation it is pleasant to me*), negative affect related to purposeless activities (*I don't like it when things serve no purpose*), tendency to look for activities that are purposeful (*I search for activities that serve a purpose*) and we also decided to include one reverse coded item (*I don't usually try to find purpose of things*).

A diagonally weighted least squares CFA on the resultant seven items evidenced adequate fit to the data,

2 Standardized factor loadings of the long version of the scale are presented in **Supplementary Table S1** in **Supplementary Materials**.

TABLE 1 Standardized factor loadings based on confirmatory factor analysis for seven items of the Need for Sense-Making Scale (*N* = 583).

Item	Factor loading
(1) I search for activities that serve a purpose	0.71
(2) When I make sense of a situation it is pleasant to me	0.71
(3) I prefer to do things that are meaningful	0.66
(4) I don't like it when things serve no purpose	0.57
(5) I don't usually try to find purpose of things	0.35
(6) When I am in a new situation I try to find meaning in it	0.80
(7) I tend to search for meaning of discrepant situations until I find it	0.72

χ^2/df = 1.03; RMSEA = 0.01, 90% *CI* = [0.000, 0.042], SRMR = 0.04, GFI = 0.99. All factor loadings exceed 0.35 with $p < 0.001$ (Table 1).

Both long and short versions of the scale had high internal consistency, $\alpha = 0.91$ and $\alpha = 0.82$, respectively. The two versions of the scale were highly correlated $r(582) = 0.91$, $p < 0.001$.

The results of this study gave initial support for the 7-item solution of the NSM. We found that the long and short versions share similar psychometric properties with respect to internal consistency and are highly correlated, which suggests that the short version can be equivalent to the longer one.

Study 2

The aim of Study 2 was to further test the unifactorial structure of the NSM-SF. We also refined the wording of one of the items. Specifically, the double negation in item 23 (*I don't like it when things serve no purpose*) was changed to *I like it when things serve a purpose*. We conducted a confirmatory factor analysis to test the underlying dimensional structure of the scale relying on a new sample of participants.

Method

Participants and recruitment

Participants were 287 participants MTurk workers residing in the United States, who received $1.10 for taking part in the study.[3] The sample consisted of 143 women, 136 men, and one other; seven individuals did not disclose their gender. Ages ranged from 20 through 74 ($M_{age} = 40.20$, $SD_{age} = 11.01$).

Procedure and materials

After giving their informed consent, participants completed the revised NSM-SF using a seven-point Likert scale (1 = *not at all*, 7 = *very much*). At the end of the study, we gathered demographic data and debriefed participants.

Results and discussion

We tested whether the data corresponded to the unifactorial model. A diagonally weighted least squares confirmatory factor analysis (CFA) yielded good fit, χ^2/df = 0.64; RMSEA = 0.001, 90% *CI* = [0.000, 0.035], SRMR = 0.05, GFI = 0.99. All of the standardized regression weights were above 0.50 with $p < 0.001$ (Table 2).

Additionally, we analyzed the internal consistency of the scale in this sample. The results indicated high internal consistency of the NSM-SF ($\alpha = 0.88$). These results confirm the unidimensional structure of the scale and its internal reliability.

TABLE 2 Standardized factor loadings based on confirmatory factor analysis for seven items of the Need for Sense-Making Scale (*N* = 287, Study 2).

Item	Factor loading
(1) I search for activities that serve a purpose	0.80
(2) When I make sense of a situation it is pleasant to me	0.69
(3) I prefer to do things that are meaningful	0.83
(4) I like it when things serve a purpose	0.82
(5) I don't usually try to find purpose of things	0.50
(6) When I am in a new situation I try to find meaning in it	0.79
(7) I tend to search for meaning of discrepant situations until I find it	0.63

Study 3

The aim of Study 3 was to analyze the test-retest reliability of the short Need for Sense-Making Scale. The original scale measures relatively stable individual differences. Here we tested if, as for the original scale, scores measured by the short version of the scale were stable over time.

Method

Participants and procedure

We gathered data from 65 MTurk workers residing in the United States (35 women) $M_{age} = 42.65$, $SD = 11.52$ (age ranged from 22 to 65), who completed the NSM-SF twice with a break of above 6 weeks between the two measurements (42 days). Participation was rewarded with $2.10. Participants completed the NSM-SF and then provided demographic data. The overall sample size yields corresponding power in excess of $1 - \beta = 0.95$, for lower and upper critical *r* of |0.24| ($\alpha = 0.05$, two-tailed).

Results and discussion

Internal consistency of the scales measured with Cronbach's α for both measurements was high ($\alpha_{T1} = 0.88$, $\alpha_{T2} = 0.87$). The test-retest reliability of the scale was good: Time 1 and time 2 scores correlated $r(65) = 0.74$, $p < 0.001$. These results show good test-retest reliability of the scale, especially considering the relatively long period between the test and the retest. This further indicates that the short version of the scale demonstrates similar properties to the original version.

3 The scale was added at the beginning of a correlational study that focused on basic psychological needs and well-being.

Study 4

In Study 4, we examined the convergent and divergent validity of the scale. We anticipated moderate and positive associations between need for sense-making and the satisfaction of the basic psychological needs. We also expected that need for sense-making related moderately negatively to the frustration of basic psychological needs. Similarly, as in previous studies, we expected that need for sense-making related positively to both presence and search for meaning in life (Cantarero et al., 2021). Should these relationships emerge then this would speak to the convergent validity of the short NSM. To test the discriminant validity of the scale, we examined if the construct related to the tendency to anthropomorphize. We had no reason to believe that the two constructs, need for sense-making and anthropomorphizing, are indeed related.

Method

Participants and recruitment

We aimed at maximizing the number of participants we could reach within the possibility we had to conduct the study. There were 308 MTurk workers residing in the United States (111 women, 190 men, one other, six unstated) who took part in the online study. Age ranged from 18 through 72 (M_{age} = 38.82, SD_{age} = 11.65). Participation in the study was compensated with $1. We performed a sensitivity power analysis for the lowest correlation between the variables of interest in the study. The overall sample size yields corresponding power in excess of 1 – β = 0.95 for r = 0.19 (α = 0.05, two-tailed) with lower and upper critical r = |0.11|.

Procedure and materials

Participants completed four scales that were presented in random order. They completed the 10-item Meaning in Life Questionnaire (MLQ, Steger et al., 2006), with answers ranging from 1 = *absolutely untrue*, 7 = *absolutely true*. The scale consists of two subscales: searching for meaning in life (α = 0.88, e.g., *I am seeking a purpose or mission for my life*) and presence of meaning in life (α = 0.93, e.g., *I have discovered a satisfying life purpose*). We also asked participants to fill in the 24-item Basic Psychological Need Satisfaction and Frustration Scale (BPNSF, Chen et al., 2015) with answers ranging from 1 = *completely untrue*, 5 = *completely true*. The scale consists of six subscales: autonomy satisfaction (α = 0.82, e.g., *I feel a sense of choice and freedom in the things I undertake*), autonomy frustration (α = 0.86, e.g., *My daily activities feel like a chain of obligations*), relatedness satisfaction (α = 0.85, e.g., *I feel close and connected with other people who are important to me*), relatedness frustration (α = 0.90, e.g., *I feel the relationships I have are just superficial*), competence satisfaction (α = 0.87, e.g., *I feel I can successfully complete difficult tasks*) and competence frustration (α = 0.92, e.g., *I feel like a failure because of the mistakes I make*). Participants filled in the 30-item Individual Differences in Anthropomorphism Questionnaire (IDAQ, Waytz et al., 2010), as well, with ratings between 0 = *not at all* to 10 = *very much*. The scale includes a 15-item measure of anthropomorphization (α = 0.94, e.g., *To what extent does a cheetah experience emotions?*) and 15 non-diagnostic items. Finally, participants also filled in the NSM-SF (α = 0.83).

Results and discussion

We conducted a correlation analysis (**Table 3**). The results showed that the need for sense-making measured with the seven items was positively and moderately related to the satisfaction of basic psychological needs. It was related negatively to the frustration of the needs. Additionally, similarly to previous findings with the long version of the NSM (Cantarero et al., 2021), it was positively related to searching and presence of meaning in life. There was no significant relationship between need for sense-making and the tendency to anthropomorphize. These results confirm the convergent and discriminant validity of the short version of the NSM scale.

General discussion

One of our aims was to develop a short form of the need for sense-making scale. To this end, we tested the psychometric properties of the Need for Sense-Making scale Short Form by means of four studies. In Study 1, we chose seven items that formed NSM-SF and showed that the short version shows similar internal consistency as the longer version and that the two versions of the scale are highly correlated. In Study 2, we confirmed the unifactorial structure of the scale and its' high internal consistency. Results of Study 3 indicated good test-retest reliability of the NSM-SF. Taken together, we found that the short version of the scale is reliable. It presents the same pattern of results with related constructs as the original version of the scale as it relates positively yet weakly to both searching and presence of meaning in life.

We also aimed to test the relationship between need for sense-making and basic psychological needs. Study 4 showed that need for sense-making relates positively to the satisfaction of basic psychological needs, and it relates negatively to the frustration of the needs. The finding that individual differences in need for sense-making correlate positively with the three facets of self-determination (autonomy, relatedness, and competence) and negatively with their frustration is important not just for psychometric reasons but also from a theoretical vantage point. Complementing the established finding that *having* a sense of meaning contributes to human well-being (Heintzelman, 2018), our results showcase that those who benefit from having satisfied their basic psychological needs also possess a prominent *need* to make sense of the world. While

TABLE 3 Correlation matrix for Study 4.

Variable	1	2	3	4	5	6	7	8	9
(1) Need for sense-making	–								
(2) Autonomy satisfaction	0.42***	–							
(3) Autonomy frustration	−0.15 * *	−0.39***	–						
(4) Relatedness satisfaction	0.43***	0.50***	−0.43***	–					
(5) Relatedness frustration	−0.24***	−0.24***	0.70***	−0.52***	–				
(6) Competence satisfaction	0.43***	0.60***	−0.37***	0.53***	−0.28**	–			
(7) Competence frustration	−0.24***	−0.38***	0.74***	−0.46***	0.74***	−0.58***	–		
(8) Presence of meaning in life	0.39**	0.53***	−0.31***	0.48***	−0.20***	0.59***	−0.46***	–	
(9) Searching for meaning in life	0.22***	−0.16**	0.45***	−0.20**	0.45***	−0.19**	0.48***	−0.33***	–
(10) Anthropomorphization	−0.07	−0.02	0.46***	−0.13*	0.61***	−0.07	0.52***	0.04	0.36***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

we should, of course, be cautious about the causal relation of these variables, it casts meaning as a phenomenon that may be beneficial to possess *and* to require.

Research suggests that people who are in search of a sense of meaning in their lives tend to be worse off in terms of, for example, their social relatedness and self-acceptance (Steger et al., 2008). Interestingly, while search for meaning in life and the need for sense-making are (modestly) positively correlated, they thus exhibit partly opposite associations with well-being outcomes. Why might this be the case? A possibility is that some who find themselves in perpetual search for meaning are, in fact, desperately lacking it; indeed, searching for meaning in its absence comes with reduced life satisfaction (Steger et al., 2011), and those high in search for meaning tend to be somewhat lower in perceived presence of meaning (Steger et al., 2008; Van Tilburg and Igou, 2016; Van Tilburg et al., 2019). Those who set high sense-making aspirations, however, may instead be more often successful in its attainment than those who are not, as evident from the correlations between need for sense-making with *both* the perceived presence of meaning in life and the search for it.

The research presented here is one of the first steps in considering the need for sense-making as part of meaning-making models and theories of psychological needs. Although some researchers (e.g., Baumeister, 1991; Frankl, 2006) have argued that people have a need to make sense of the world and that this need is one of the essential human motivations, surprisingly, it has not been included in models that focus on core psychological needs. We hope that, given the growing interest in meaning-making motivation, our tool will enable researchers to examine the need for sense-making as a candidate in the pantheon of human motivation.

Limitations and directions of future research

One of the limitations of the presented research is that it was conducted mainly with MTurk participants. It would be worthwhile to test the scale in other populations. Furthermore, in Study 2, we refined the wording of one item to make it fit better with the other items in the scale, and the studies that followed used this refined version. Although the studies we present show that NSM and NSM-SF overlap, because of the change in wording in one item, it might be more accurate to treat NSM-SF as a separate scale rather than a shorter version of NSM. We also acknowledge that the studies we present do not cover all possible tests of the validity of the scale. Additional research could focus on the predictive power of NSM-SF or compare it with similar constructs.

Future studies should also examine the role of the need for sense-making and meaningful work in more detail. Cantarero et al. (2021) suggest that NSM is a personal resource that elevates the chances of finding a sense of meaning. Applying this to the work context, they found that NSM was positively related to the search for and presence of meaning at work, which in turn was associated with work engagement. The latter was found to be beneficial for employees and organizations (Schaufeli and Bakker, 2014), as it is linked to better task performance, higher job satisfaction and financial benefits (Bakker and Albrecht, 2018). Therefore, NSM can play an important role in work-related meaning-making processes. For example, Cantarero et al. (2021b) found that meaning interventions enhanced the experience of meaningful work and, consequently, work engagement. It would be interesting to test if individual differences in need for sense-making moderate the effect. In principle, in activities where sense-making matters, the scale can test differences between people and, thus, the way they understand and engage in a situation. This quality might also predict more generally how people cope with threats, conflicts, and other forms of psychological challenges, which opens possible new research paths.

To sum up, this study offers a valid instrument to measure need for sense-making and is the first to show how need for sense-making relates to basic psychological needs.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://osf.io/8s95h/?view_only=55e20ba099384ad28d2dcd35f32a4c2a.

Ethics statement

The studies involving human participants were reviewed and approved by Faculty of Psychology in Wroclaw Committee of Ethics of Scientific Research at SWPS University, number 06/P/04/2020. The patients/participants provided their written informed consent to participate in this study.

Author contributions

KC, WT, and AG designed the studies. KC gathered the data and conducted the analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.945692/full#supplementary-material

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Appendix 1

Please indicate how much each of the following statements reflects how you typically are, using the scale provided.

Not at all 1 2 3 4 5 6 7 Very much

(1) I search for activities that serve a purpose	1	2	3	4	5	6	7
(2) When I make sense of a situation it is pleasant to me	1	2	3	4	5	6	7
(3) I prefer to do things that are meaningful	1	2	3	4	5	6	7
(4) I like it when things serve a purpose	1	2	3	4	5	6	7
(5) I don't usually try to find purpose of things	1	2	3	4	5	6	7
(6) When I am in a new situation I try to find meaning in it	1	2	3	4	5	6	7
(7) I tend to search for meaning of discrepant situations until I find it	1	2	3	4	5	6	7

Reverse coded item: 5.

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Meaning of life as a resource for coping with psychological crisis: Comparisons of suicidal and non-suicidal patients

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Introduction: Meaning is an important psychological resource both in situations of accomplishment and in situations of ongoing adversity and psychological crisis. Meaning in life underlies the reasons for staying alive both in everyday and in critical circumstances, fulfilling a buffering function with respect to life adversities.

Aim: The aim of the present study was to reveal the role of both meaningfulness, including specific sources of meaning and reasons for living, and meaninglessness (alienation) in patients suffering from profound crisis situations with or without suicidal intentions and behavior.

Methods: The sample included 148 patients (all Caucasian) who were referred to a crisis center in Moscow, Russia. Seventy-seven patients (54 females, mean age 32.00±11.98 years) reported a current crisis situation in their life but denied suicidal thoughts or behavior. Twenty-nine patients (21 females, mean age 31.55±13.76 years) reported suicidal ideations but denied suicidal attempts or self-harming behavior. Forty-two patients (31 females, mean age 30.64±11.38 years) had episodes of suicidal attempts or self-harming behavior accompanied by suicidal intentions. There were no significant gender or age differences between groups.

Participants completed a number of measures of different aspects of meaning and meaninglessness, well-being, ill-being and psychological resources. For some patients (N=74), a clinical checklist was completed by their doctors assessing 28 various characteristics associated with the patient's clinical status.

Results and discussion: Meaningfulness and reasons for living were more helpful in distinguishing between reactions to profound crisis situations (suicidal intentions versus non-suicidal behavior) than were measures of well-being, ill-being, meaning crisis or personality resources. In both suicidal and non-suicidal crisis patients meaningfulness predicted more positive reasons for living. The relationship between meaningfulness and most reasons for living remained significant after controlling for clinically appraised suicidal "readiness," acute stress and lack of social support. Self-transcendence was the major specific source of meaning predicting higher reasons for living after adjusting for general meaningfulness.

Conclusion: The data cast some light on the psychological meaning of suicide. It follows that prevention efforts are to be focused not on eliminating the factors "pushing" one to suicidal behavior, but rather on supporting inner strengths conducive of a positive decision, *to be*, through enhancing meaningfulness and reasons for living.

KEYWORDS

meaning of life, psychological crisis, reasons for living, psychological resources, crisis of meaning, suicide

Introduction

Meaning in life is a double-edged psychological resource: it plays an important role both when one's life is heading toward positive accomplishments and when, on the contrary, one is facing adversities, suffering, or psychological crises (see e.g., Baumeister and Vohs, 2002) which are also part of our everyday living. The focus of the present study is the role of life meaning as a buffer against the impact of crisis and trauma.

Nietzsche's motto has become quite popular among contemporary students of meaning: "He who has a *why* to live for, can bear with almost any *how*" (quoted by Frankl, 1984, p. 84). Indeed, Viktor Frankl, the founder of logotherapy, stated that meaning was the critical resource for survival in inhumane circumstances, such as the Nazi concentration camps (Frankl, 1984). His argument was supported by evidence provided by numerous victims of war, natural disasters, imprisonment, or other adversities (e.g., Klinger, 1977; Eger, 2017).

Meaning (personal meaning) of life is a relational construct referring to the ties which connect our life to some superordinate context (see Baumeister, 1991a; Leontiev, 2013, 2017). Metaphorically, meaning is perhaps best characterized as a divine knot holding things together (Saint-Exupery de, 1979, p. 55). Meaningful life is thus coherent and conjoint, while meaningless life is fragmented and isolated (Leontiev, 2006). A growing number of studies define meaning as a fundamental human need (see a recent discussion in Martela et al., 2018) and as a resource which has a strong impact both on psychological and physical well-being (see e.g., Vail and Routledge, 2020).

Probably the most prominent effect of meaning is visible in extreme, highly challenging situations which may destroy people's habitual activities, put into question their values and even their reasons for living. There are multiple studies, though the data are poorly systematized, on the role of meaning as a coping resource in times of psychological crisis, stress and trauma. In particular, Park described the model of meaning-making, noting that this process, if successful, leads to a better adaptation to the stressful event (Park, 2010). Her paper analyzed about 50 empirical studies focused on the changes in meaningfulness in certain stressful situations. Meaning-making, specifically finding situational meanings through the personal reappraisal of the traumatic situation, was also predictive of posttraumatic growth (Park and Ai, 2006).

Following are some more specific results, obtained mostly recently.

In a study of people after the collective trauma created by the 9/11 terrorist attacks, both searching for and finding meaning were important for successful adaptation (Updegraff et al., 2008, p. 718). People with more meaning searching activity were less likely to report any posttraumatic symptoms. Quite a number of studies deal with the COVID-19 pandemic. In particular, higher meaning in life was associated with a lower level of stress and anxiety caused by the pandemic (Trzebinski et al., 2020) and with a lower level of stress-induced mental disturbances (Schnell and Krampe, 2020). A coping strategy called the tendency to see Meaning in Negative Experiences (MINE) (Khei, 2019) was found to help in adapting to a stressful situation, not only in the moment, but in the long run (Yang et al., 2021). In another meta-analysis, a moderate negative relationship was found between meaningfulness as measured by Meaning in Life test (MIL; Steger et al., 2006) and Antonovsky's Sense of Coherence (SOC) scale, on the one hand, and stress from confronting a cancer diagnosis, on the other. SOC showed an even stronger negative correlation with cancer stress (Winger et al., 2016).

With respect to the mechanisms by which meaning has a beneficial impact on coping with stressors, a two-way relationship has been established between meaningfulness and two coping patterns, *positive reinterpretation* and *proactive planning* (Ward et al., 2022). Specifically, meaningfulness "enhances people's awareness about the broader purpose of their lives, it may facilitate recognition about the purpose and value of personal challenges, encouraging positive reinterpretation" (Ward et al., 2022, p. 3). The researchers note that they have not been able to demonstrate causal links between meaningfulness as measured by the MIL questionnaire and coping with diverse challenging events.

An important phenomenon is the non-opposite relationship between the positive and negative poles of life meaningfulness. Positive meaning, the feeling of meaningfulness and reasons for living seem to serve unambiguously as positive anti-stress buffers. However, the role of lack of life meaning, including specific negative meanings like the feeling of futility or feeling oneself to be rejected (Joiner, 2005), a crisis of meaning, or existential

frustration (Frankl, 1969) is more ambivalent; for some people, or in some circumstances, lack of meaning may generate a positive urge toward the search for meaning. In a phenomenological study of the relationship between meaningfulness and meaninglessness (Debats et al., 1995), 122 respondents answered open questions about experiencing meaningfulness and meaninglessness. The researchers identified the following categories in their descriptions: meaningfulness, meaninglessness, no meaninglessness, and meaning as a way to cope with the crisis in the current situation. The category "no meaninglessness" was especially interesting, indicating that the structure, components and interrelations of the phenomena of meaningfulness and meaninglessness should not be considered as opposite poles of one dichotomy.

This phenomenon has long been discussed within the framework of existential analysis, but there has been no clear method for measuring it. An operationalization was proposed by Schnell and her colleagues. Schnell suggested that meaningfulness is not simply the opposite pole of a meaning of life crisis, but that these two concepts are more independent of each other than is commonly thought (Schnell, 2009). *Meaningfulness* and *crisis of meaning* comprise the two main scales of the Sources of Meaning inventory (SoMe; Schnell, 2009, see below). The independence of the two scales was tested and confirmed using correlation analysis, principal components analysis and confirmatory factor analysis: indeed, it is possible to have a combination of low meaningfulness with low crisis, a lack of awareness of the task of searching for meaning and a lack of desire to solve it. She called this pattern existential indifference (Schnell, 2010), comparing it to Frankl's existential vacuum (Frankl, 1969) and Maslow's metapathology or lack of Being-values (Maslow, 1976).

Suicidal behavior as a reaction to psychological crisis: The buffering role of meaning and reasons for living

Suicide is the cause of many premature deaths in the contemporary world; the World Health Organization (WHO, 2014) estimates their number as over 800 thousand a year, and unsuccessful suicide attempts are impossible to count. It is an evidently unhealthy condition; at the same time suicide cannot be viewed purely as an illness or disease in the clinical meaning of the term. Contemporary data fail to provide specific causes of suicides, be it clinical symptoms or life challenges; the same objective obstacles or health issues sometimes result in a suicide attempt, and sometimes not. In the case of suicidal attempts, it is usually not easy to detect whether the failure of the attempt was due to external or internal barriers with respect to the person's intention. No predictors have been reliably identified, and attempts to decrease mortality due to suicides have not been successful (Franklin et al., 2017). There are no reliable data which would allow treating suicide as an aspect of any clinical distortion or even reveal regular correlations of a suicide with any clinical syndrome (see a detailed discussion of this issue in Maung, 2021).

It is difficult to differentiate those who would make a suicide from those who would not before a suicidal attempt is made. The DSM-5 does not suggest a special category for suicide, stating that behavioral distortions like suicidal behavior and non-suicidal self-harming acts need additional investigation (Fehling and Selby, 2021). Likewise, in the ICD-11 suicidal behavior is not associated with any specific diagnosis.

Suicide is a multifactor, universally human phenomenon. Yet, every suicidal case is unique: in terms of its etiology, its biographical roots, its gender and age specificity and personal meaning contexts. No group, nation, or class of humans is free of suicidal cases. "Anyone can be at risk of suicide at any time" states the American Association of Suicidology,[1] and the person at risk is the strongest resource in preventing suicide. No wonder that suicide has been a target of not only clinical but also social, moral, and theological discourse. In most cultures and religious confessions, it is treated as undesirable, morally wrong or sinful, though there are some exceptions, such as the Bushido, the Samurai code of conduct in medieval Japan.

Psychological factors of reasons for living and suicide

The available data are more definite with respect to positive buffers against suicidal choice than with respect to the predictors of this choice. People who die from suicide are facing the same problems other people are facing; it is not the circumstances themselves, but rather their appraisal that causes emotional dysregulation (see e.g., Linehan, 1993; Turton et al., 2021). Moreover, suicidal impulses may emerge in the apparent absence of any life problems and obstacles, as for example seems to have been the case with Leo Tolstoy in the zenith of his fame (Tolstoy, 1983). Pain, hopelessness, despair, "psychalgia" (Shneidman, 1996) are regularly referred to as at least catalysts of suicidal behavior; however, a sudden and dramatic worsening of life obstacles, with a break in one's expectations, seems to be more conductive to suicidal behavior than does long-term, ongoing misery (Baumeister, 1991b).

More interesting are the data on inner strengths (Seligman, 2002) which serve as buffers against destructive forms of behavior, including suicidal attempts. These inner strengths include, among others, positive emotions that make one's life pleasant, as well as personality resources that make it more controllable, but most important seem to be positive meanings and reasons for living which provide the justification of the choice to live. "A person lives as long as he experiences his life as having meaning and value and as long as he has something to live for–meaningful projects that inspirit him and invite him to move into his future. …As soon as

1 https://www.einpresswire.com/article/457454620/american-association-of-suicidology-announces-aas365-campaign-for-national-suicide-prevention-month-and-beyond

meaning, value and hope vanish from a person's experience, he begins to stop living: he begins to die" (Jourard, 1971, p.93). The existing data suggest that meaning in life has a more important suicide preventive role than do the fear of suicidal impulses and religion-based cultural condemnation of suicide (e.g., Heisel and Flett, 2007; Wang et al., 2007).

Meaningfulness was studied as a buffer against suicidal behavior (Lew et al., 2020). It turned out that both presence of meaning in life and searching for meaning in life (MIL; Steger et al., 2006) negatively affected suicidal behavior, although the impact of the former was stronger. The search for meaning worked as a mediator between hopelessness and suicidal behaviors (Lew et al., 2020). It was also shown that both the presence of meaning and searching for it helped to reduce non-suicidal self-injury behavior (NSSI) (Conner et al., 2022).

In the context of suicide research, a highly relevant construct is that of reasons for living (RFL); indeed, the presence of such reasons is viewed as a buffer against acute experiences of depression, loneliness, loss and hopelessness (Linehan et al., 1983; Şahin et al., 1998). Reasons for living may be treated as a special case of meaning; however, we are not aware of specific studies that focus on relationships between these constructs. Meaning in life underlies the reasons for staying alive both in everyday and in crisis situations, fulfilling a buffering function with respect to life adversities. Reasons for living may prevent both suicidal ideation and suicidal attempts and yield a predictive value (Bakhiyi et al., 2016). Thus, RFL, together with meaning of life, is the target of our study. Though in some studies RFL has been considered as states (e.g., Demyttenaere et al., 2014), we treat them as trait variables. There are both theoretical and empirical reasons to consider life meaningfulness and positive reasons for living as the main and most universal precursors of a positive solution of the life/death dilemma.

Suicidal ideation and suicidal actions

Distinguishing between suicidal ideation and suicidal behavior or combining them is still an open issue in the present-day empirical studies. Though most studies combine suicidal ideation with suicidal behavior (e.g., Posner et al., 2011; Franklin et al., 2017), in some studies we find a differentiated treatment of these two groups of phenomena (Klonsky and May, 2015; Klonsky et al., 2016). In particular, it has been established that the capability for suicide meaningfully distinguishes those who have attempted suicide (attempters) from those with suicidal desire but who have not attempted (ideators) (Klonsky et al., 2018). Another study concluded that individuals who attempt suicide have severe difficulties in problem solving, compared with those with mere suicide ideation and with psychiatric controls (Ghahramanlou-Holloway et al., 2012).

The distinction between suicidal ideation and suicidal action has been most pointedly articulated by Leslie Farber, who spoke of "the life of suicide, as distinguished from the act itself" (Farber, 1966, p.77). For Farber, such a life of suicide, that is, the awareness of this possibility as a part of the human condition, is not causally connected with making a suicide. "The awareness that it is possible for us to kill ourselves does not lead us to embrace suicide, any more than does the awareness that we are sinners prompt us to go forth and sin" (Farber, 1966, p.78). The mature person has enough personal and spiritual resources not to be enchanted by this possibility, but rather to reject it in favor of life. Suicidal thoughts are however socially stigmatized as something similar to suicidal attempts. This social disapproval rather than "the life of suicide" as such may be the reason why even the thought of suicide is often experienced as something pathological.

The existentialist view on suicide: The role of meaning

In the middle of the 20th century existential philosophers (e.g., J.-P. Sartre, A. Camus, G. Marcel) added a new angle on viewing the problem. Considering the possibility of suicide meant for them ascending to a higher level of philosophical thinking, taking a conscious attitude toward one's own life, making the latter an object of conscious choice, becoming "the master of one's own death" (Camus, 1990, p. 336). Indeed, one of the key features of the existentialist approach to life is the acknowledgement of an opportunity to take a reflective and deliberate position toward one's life and to deliberately change it. The problem of suicide is thus a critical issue for the existentialist worldview, and it cannot be analyzed without the consideration of its existential aspects. Indeed, suicide is a crossroad of all the four main existential challenges (Yalom, 1980): death, meaninglessness, freedom, and isolation. It suggests a higher level of relating to one's own life, mastery over both life and death.

It is important to note that these authors referred to suicidal ideation, rather than suicidal actions. Suicidal ideation, that is emergence of thoughts about the possibility of ending one's life, quite often is viewed in research context as indistinguishable from practical suicidal attempts, as a similar phenomenon. We think that they must be distinguished, and that suicidal ideation is not necessarily a negative phenomenon: it may more likely, on the contrary, bring the person to saying "no" to the option of suicide and "yes" to living, and such a person will value life more than ever, based on this conscious choice made in view of the available alternative to it. For some people, suicidal ideation can, we believe, serve as the basis for the intention to live. Exploring this proposition is one of the aims of the present paper.

Suicidal ideation as wrestling with an existential challenge

We should take into consideration that a completed suicide is not so much an isolated action but rather a sad outcome of a more or less persistent dilemma, "to be or not to be," in which life and

death appear as two competing alternatives (see also Joiner, 2005; Joiner et al., 2009). Each of them has its own meaning; "Even a suicide believes in meaning – the meaning of dying, if not the meaning of further living. Otherwise he could not move a finger to fulfill his intention" (Frankl, 2005, p. 297). The point is which meaning will finally prevail – the meaning of living, or the meaning of giving up on living.

The idea of choosing between living and dying and the concept of a reflective "life of suicide" suggests that the person with suicidal ideations has not only urges toward a suicidal decision but also inner barriers against this decision, in favor of life. Emphasis on these positive barriers which serve as buffers against suicidal choice is in line with the message of positive psychology, stating that the royal road to mental health is supporting a person's inner strengths which function as buffers against adversities, rather than trying to exclude negative influences. This resonates also with Meichenbaum's (1985) idea of inoculation, according to which gradual exposure to small doses of a negative experience, rather than avoidance of the experience, better prepare the person to cope with stressful situations when they arise in the course of daily living. Kovacs and Beck (1977) also evaluated suicidal risks in terms of a competition between the wish to die and the wish to live.

As Victor Frankl (1984) noted in his well-known book of reflections as a Nazi concentration camp survivor, suicidal tendencies were less frequent in the camp than in everyday life. This tendency finds support in other authors (Bronisch, 1996), and indeed many explanations have been proposed (see e.g., Lester, 1997). The most plausible seems to be the explanation based on the meaninglessness of suicide under conditions in which only survival was a challenge but death was too likely and the chances for death mostly did not depend on the person's preferences and efforts.

It is thus important to distinguish two aspects of the eventually suicidal path: (1) Becoming aware of the inevitability of death and the possibility of mastering it, and (2) Choosing in favor of either life or death (Leontiev, 2008). The first awareness seems to be associated with an advanced level of personality development, becoming able to be the master of one's life and death in the context of realizing that one has two options from which to choose. "Until we can say no to life, we have not really said yes to it" (Hillman, 1964, pp. 63–64; see also Costello, 2019). This idea implies no suicidal risk, *per se*; on the contrary, it seems that those who have reflected much on this issue are less vulnerable to impulsive, self-destructive urges. The second aspect, the moment of choice, is the critical act that, for some, launches suicidal attempts.

Empirical study of the role of meaning/meaninglessness in critical circumstances

It follows from the above considerations that meaning in life appears as an important factor to some degree predictive of the outcomes of profound life crises. Meaning is to be treated both in its positive aspects (meaningfulness as perceived presence of meaning in life being a buffer against worst outcomes) and negative aspects (crisis of meaning, meaninglessness, or alienation, as a precursor of psychological disturbances). The *aim* of the present study was to reveal the role of both meaningfulness, including specific sources of meaning and reasons for living, and meaninglessness (alienation) in perceived reasons for living in patients suffering from profound crisis situations with or without suicidal intentions and behavior.

We *hypothesized* that:

> *Hypothesis 1 (H1)*: In patients suffering from profound crises without suicidal intentions, life meaningfulness, reasons for living, self-regulatory, or stress-buffering resources (hardiness, tolerance for ambiguity, action orientation, coping strategies) and well-being (subjective happiness, subjective vitality) are higher than in patients suffering from profound crises with suicidal ideations and suicidal behavior.

> *Hypothesis 2 (H2)*: Both higher meaningfulness and lower crisis of meaning predict higher reasons for living in both groups. We also hypothesized that in patients with suicidal intentions and behavior these effects would be stronger, such that meaningfulness and lower crisis of meaning would better predict reasons for living in this group. As well, we predicted an interaction effect between meaningfulness and crisis of meaning, such that crisis of meaning would have a more negative effect on reasons for living in those with lower meaningfulness

> *Hypothesis 3 (H3)*: The effects of meaningfulness, crisis of meaning and, probably, specific sources of meaning on reasons for living remain stable after adjusting for clinical appraisals of patients.

Materials and methods

Sample

Data were collected through 2010–2016 from residents of the special clinics of crisis care, Crisis Department №2 of Eramishantsev Moscow City Clinical Hospital. This department was established for patients voluntarily requesting help because of their psychological crisis or difficult life obstacles, including thinking about suicide or suicidal attempts. Most of the patients are without manifest psychiatric diagnoses; those with acute psychoses, serious alcohol or drug addictions and major somatic or neurological diseases are typically not admitted. Data collection was conducted in the middle of their inpatient treatment period

which lasted about 1 month, in the clinic. We excluded from the sample patients with organic and psychotic disorders–18 cases in total.

The initial sample included 148 inpatients 18–65 years old., 105 of them females. Of them 75, or 49.3% had completed university level education and 24 (15.8%) had started but not completed university, 32 (21.1%) had completed high school level; 2 (1.3%) reported middle school level, and 19 (12.5%) gave no education data. Diagnoses by ICD-10 included: F20-28 – 23 participants (Schizophrenia, schizotypal and delusional disorders); F31-34 – 17 participants (Mood [affective] disorders); F40-48 – 83 participants (Neurotic, stress-related and somatoform disorders); F50 – 1 participant (Behavioral syndromes associated with physiological disturbances and physical factors); F60-69–24 participants (Disorders of personality and behavior in adult persons). We considered mixed diagnosis sample acceptable, because in the domain of suicide research and treatment transdiagnostic approach focusing on behavior rather than clinical diagnosis is often applied; there have been attempts to include suicidal behavior disorder as a separate DSM-5 entity (Oquendo and Baca-Garcia, 2014).

Patients were classified into three groups *post-hoc*, by an expert psychologist who was not directly involved in treating the patient, based on their final medical history (official medical records after the end of treatment). These records contained psychiatric anamnesis, concomitant diagnoses, biographical information, admission obstacles, cases of suicidal affects, ideations, or actions, the character and the result of treatment.

Seventy-seven patients (54 females, mean age 32.00 ± 11.98 years old) reported a current crisis situation in their life but denied suicidal thoughts or behavior (group NO). Twenty-nine patients (21 females, mean age 31.55 ± 13.76 years old) reported suicidal ideations but denied suicidal attempts or self-harming behavior (group ID). Forty-two patients (31 females, mean age 30.64 ± 11.38 years old) had experience of suicidal attempts or self-harming behavior accompanied by suicidal intentions (group BE). It should be noted that self-harming behavior is considered in the clinic only in case of prominent suicidal behavior. Minimal and non-suicidal injuries are typically not admitted to the clinic and are not included in the diagnostic descriptions of behavior. Consequently, we treated both patients with suicidal attempts or self-harming behavior as the same group.

There were no significant gender and age differences found between groups. The differences on most of the additional measures (see below) were also insignificant, including subjective happiness, subjective vitality, anxiety, depression, hardiness, cognitive insight, ways of coping, action control, subjective alienation, and tolerance for ambiguity. On the contrary, significant differences between the groups were found on sources of meaning and reasons for living (see below in the results section).

All the patients in the course of an individual session with the psychologist were asked to complete a battery of inventories printed on paper; prior to completion, an informed consent was obtained.[2] The participation was voluntary; no incentives were offered. There were no cases of refusal to participate in the investigation; indeed, the patients perceived it as a part of the whole treatment process. Surveys were completed individually, without assistance or interference from the psychologist; it took them on average about 2 h to complete the materials. The measures used in the study were divided into two groups: those assessing the main targets of the study (meaning, alienation, reasons for living) and several additional ones checking for differences in personality resources and emotional states and symptoms. The additional measures yielded no significant differences between the groups.

The survey data reflected the patients' current situation which typically did not change much after getting to the clinic. We did not consider the impact of therapy or other interventions.

Main measures

(Cronbach's alphas are presented in Table 1):

1. *The reasons for living inventory (RFL)* (Linehan et al., 1983; Russian version by Olina, 2010). The RFL was developed as a tool for researching the motives that serve as a buffer to prevent suicide attempts. As a result of factor analysis, six groups of reasons covered the explanations why people choose life rather than death: (1) need to cope with problems; (2) responsibility for the family; (3) motives associated with children; (4) fear of suicide; (5) fear of social disapproval; (6) moral attitudes that prevent the making of suicide.
2. *The sources of meaning and meaning in life questionnaire (SoMe)* (Schnell, 2009). The full version of the questionnaire includes 151 items. Two main SoMe scales are meaningfulness and crisis of meaning. Other items make 26 subscales reflecting different sources of meaning; each of them includes from 3 to 6 questions. These subscales are organized in 5 secondary scales: Horizontal self-transcendence (commitment to objectives beyond one's immediate needs); Vertical self-transcendence (orientation toward an immaterial, cosmic power); Self-actualization (employing, challenging, and fostering one's capacities); Sense of order (holding on to traditional values and morality, practicality, decency); Well-being of themselves and those around them (cultivating and enjoying life's pleasures in privacy and company). A Russian validation (Bolotova and Leontiev, 2016) which retained all 151 items confirmed the validity of two general and 5 secondary sources scales, but not of the 26 primary sources, which is why the latter were not used.

2 The diagnoses of the patients did not exclude their capability of giving informed consent personally.

TABLE 1 Reasons for living, meaningfulness, meaning sources and clinical appraisals in the three groups of patients.

	Suicidal attempts or self-harming behavior (BE)		Suicidal ideation (ID)		No suicidal thoughts or behavior (NO)		Fisher's F	Effect size η^2	Cronbach's alpha
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.			
RFL–Coping with Problems	81.70[a]	28.67	86.35[b]	29.28	106.12[a, b]	23.90	11.14**	0.13	0.95
RFL–Family Responsibility	29.46[a]	10.56	28.95	8.30	34.43[a]	7.68	5.06**	0.07	0.87
RFL–Relationship with Children	12.56	5.72	11.63	5.53	14.60	4.86	3.17*	0.04	0.87
RFL–Fear of suicide	21.48	9.51	23.57	8.82	20.75	8.13	0.77	0.01	0.76
RFL–Fear of social disaproval	9.22	4.67	8.74	4.60	10.60	3.79	2.04	0.03	0.73
RFL–Moral Reasons	11.44	7.08	11.26	6.22	14.37	5.87	3.25*	0.04	0.79
NOT - Meaningfulness	78.21	22.05	74.21	17.66	83.71	22.01	2.32	0.03	0.86
Alienation (vegetativeness)	41,19	15,35	45,54	15,24	41,45	16,16	0.818	0.01	0.94
SoMe–Meaningfulness	11.77[a]	6.43	14.83	6.19	15.88[a]	5.51	6.63**	0.08	0.61
SoMe–Crisis of meaning	12.98	7.60	14.10	5.83	11.53	7.02	1.60	0.02	0.75
SoMe–Vertical self-transcendence	21.49	7.92	22.86	6.37	23.99	8.36	1.38	0.02	0.80
SoMe–Horizontal self-transcendence	71.75[a]	19.49	81.57	18.51	83.22[a]	19.47	4.98**	0.06	0.89
SoMe–Self-transcendence–Total score	93.24[a]	24.43	104.43	22.53	107.20[a]	25.58	4.44*	0.06	0.81
SoMe–Self-actualization	137.43	37.10	145.22	31.42	140.30	31.44	0.47	0.01	0.85
SoMe–The sense of order	75.68[a]	19.17	79.17	16.83	84.41[a]	12.94	4.43*	0.06	0.81
SoMe–Well-being of themselves and those around them	134.64	29.18	137.64	27.57	137.43	28.55	0.15	0.00	0.84
Suicidal readiness	2.52	0.42	1.82	0.95	1.84	0.85	5.44**	0.36	0.93
Self-injuries and deviant behavior	1.52	0.73	1.07	0.61	1.34	0.73	2.08	0.24	0.91
Affective symptoms	2.74	0.35	2.30	0.76	2.57	0.56	2.94	0.28	0.78
Social support importance and deficit	2.33	0.53	1.61	0.68	2.18	0.56	8.50**	0.44	0.76
Acute stress symptoms	2.49	0.70	2.29	0.61	2.51	0.68	0.75	0.14	0.69

*$p < 0.05$, **$p < 0.01$. Values with the same superscript letter ([a, b]) significantly differ from each other by *post-hoc* Scheffe pairwise comparisons $p < 0.05$.

3. *Noetic orientations test (NOT)* (Leontiev, 1992) is a modification of the "Purpose in Life Test" (PIL) (Crumbaugh and Maholick, 1964). It includes 20 polar Likert-type statements with seven gradations for the answers. Its main scale (subscales were not used in this study) is a measure of life meaningfulness.
4. *Subjective alienation inventory* (Osin, 2007) was created on the basis of the alienation test (Maddi et al., 1979). It includes 60 items and measures four forms of alienation: vegetativeness, powerlessness, nihilism and adventurousness. These forms of alienation can be expressed in different areas of life: work, society, other people (close relationships), family and the person him/herself. Answers to questions are given as a percentage from 0 to 100%.

Additional measures:

5. *Subjective Happiness Scale* (Lyubomirsky and Lepper, 1999; Russian version by Osin and Leontiev, 2020). The scale consists of 4 items, rated on a seven-point Likert-type scale.
6. *Two scales of subjective vitality* (Ryan and Frederick, 1997; Russian version by Aleksandrova, 2014): the scales of subjective vitality as a state (Vt-s) and subjective vitality as a personal disposition (Vt-d). Each of them consists of 7 items, rated on a seven-point Likert-type scale.
7. *The hospital anxiety and depression scale (HADS)* (Zigmond and Snaith, 1983). This scale measures the two most common forms of psychological disorders in medical patients with 7 questions for anxiety and 7 items for depression, scoring the intensity of the symptoms from 0 to 3.

8. *Hardiness survey* (Maddi and Khoshaba, 2001; Russian version by Leontiev and Rasskazova, 2006). Hardiness as the integrative variable predictive of enduring stresses without health impairment is composed of three dispositional components: commitment, control, and challenge. The actual version used in the present study includes 45 four-point Likert-type items (from 1 = No to 4 = Yes).
9. *The Beck Cognitive Insight Scale (BCIS)* (Beck et al., 2004; Russian version by Rasskazova and Pluzhnikov, 2013). The BCIS consists of 15 four-point Likert-type items which measure Self-reflectiveness (9 items) and Self-certainty (6 items).
10. *Ways of coping questionnaire* (Folkman and Lazarus, 1980; Russian version by Kryukova and Kuftyak, 2007). The scale includes 50 four-point Likert-type items which assess 8 different types of coping: confrontation, self-distance, self-control, search for social support, taking responsibility, escaping, solution planning, and positive reappraisal.
11. *Action Control Scale* (Kuhl, 1994); Russian version by Wassiljev et al. (2011) the questionnaire consists of 36 items containing polar statements. The items are grouped into three scales: control over the action during planning, control over the action during the implementation, control over the action in case of failure.
12. *Tolerance for ambiguity* (McLain, 1993; Russian version by Leontiev et al., 2016). The scale consists of 22 seven-point Likert-type items.

Clinical appraisals

In order to evaluate the clinical condition of patients, a clinical checklist including 28 various characteristics was appraised by clinicians for each patient using 0–4 scale Likert scale. The structure of the checklist was elaborated by the first author together with the Head of the Federal Suicidological Center Vladimir Voitsekh and included the manifestations of self-destructive and deviant behavior (suicidal thoughts, actions, attempts, suicidal motives, episodes of alcoholism and drug abuse etc.), characteristics of emotional, cognitive, value, behavioral aspects (accentuations, self-blame, feeling of loneliness, depression, anhedonia, anger, perfectionism, rigidity of thinking, the importance of stress, feeling of social support, manifestations of religiosity etc.). Twenty-eight clinical characteristics were formulated for five domains (descriptive statistics and Cronbach's alphas are presented in Table 1): suicidal readiness (e.g., "Suicide is a protest", or "Suicide is a refusal reaction"), self- injuries and deviant behavior (e.g., "The desire to get a tattoo", or "Episodes of drug abuse"), affective symptoms (e.g., "Presence of selfincrimination ideas at the moment", or "Depression in the most recent period of time"), social support importance and deficit (e.g., "Dysfunctional (destructive) elements in the family", or "Deficit of communicability"), acute stress symptoms (e.g., "Personal stress", or "Psychalgia").

For technical reasons, full checklist data were available only for a subsample of the initial sample including 74 patients (35 without and 39 with suicidal intentions, 21 males and 53 females, mean age 31.49 ± 12.14 years). Due to smaller sample size for clinical appraisals we added them into separate analysis after the major part of results including the whole sample. There were no significant gender or age differences between the subsample and the initial sample.

Data processing

Data were processed in SPSS Statistics 23.0. Descriptive statistics and Cronbach's alphas are presented in Table 1. One-way ANOVA (with Scheffe's pairwise comparisons) was used to reveal differences between 3 groups of patients. In order to test H1 and H2, moderation analysis using regression was performed separately with each of the six reasons for living and their composite indexes as the outcome variables. At the first step, independent variables included dummy-coded indicators of the Groups BE and NO (group ID was the reference one). At the second step, we added centered variables of meaningfulness and meaning crisis. The third step included moderators computed by multiplying each group indicator with meaningfulness and meaning crisis. Finally, at step four we added into the equation the composite describing the interaction between meaningfulness and meaninglessness and three-level interactions of this composite with groups. We did not include age and gender as covariates while there were no relationships between them and reasons for life.

To reveal whether not only meaningfulness and crisis of meaning but also specific sources of meaning (e.g., its content) were important for RFL all the moderation analyses were repeated. As before, step 1 included dummy-coded group membership and step 2 included centered variables of crisis of meaning and meaningfulness as well as their interactions with group variables. However, unlike in the previous section, we used at step 2 stepwise analysis to reduce the number of variables that were unrelated to RFL. Step 3 included centered sources of meaning (horizontal and vertical self-transcendence, order, self-actualization and well-being). At step 4 we added their interactions with the dummy-coded group variables. At both steps only variables that predicted the dependent variable at least in one group remained in the equation. Thus, improvement of the model at step 3 indicated that there were sources of meaning that predicted RFL independently of general meaningfulness and meaning crisis. Improvement at step 4 indicated that there were meaning sources which were related to RFL only in some groups.

To reveal the relationships between clinical characteristics and RFL in the three groups of patients a series of seven separate moderation analyses (for each RFL) was performed. At the first

step we added dummy-coded variables to reflect clinical group membership (the group ID was the reference group) and all five clinical characteristics.

Results

Psychological resources and well-being in people suffering from profound crisis situations with or without suicidal intentions

The three groups of patients differed by four out of six scales of RFL Questionnaire (excluding Fear of Suicides scale and Fear of Social Disapproval scale) (Table 1). In general, readiness to live for moral reasons, responsibility for family, relationship with children and to cope with problems were the highest in the NO group and the lowest in the BE group. Similarly, three out of seven main scales of the Sources of Meaning Questionnaire (Meaningfulness, Horizontal Self-Transcendence, Order) differed across the groups: they were the highest in the NO group and the lowest in the BE group. Meaningfulness as measured by the NOT revealed the same pattern.

The groups did not significantly differ from each other ($p > 0.15$) on happiness, vitality, anxiety, depression, hardiness, cognitive insight, coping strategies, action control, subjective alienation, or tolerance to ambiguity.

In line with Schnell's hypothesis, meaningfulness and the crisis of meaning appeared as related but different constructs ($r = -0.57$, $p < 0.05$ in the NO group, $r = -0.57$, $p < 0.05$ in the ID group, $r = -0.21$, $p > 0.10$ in the BE group). Moreover, in the BE group this relationship was less prominent than in the NO group ($p < 0.05$) and marginally less prominent than in the group ID ($p < 0.10$).

Meaningfulness and crisis of meaning as predictors of reasons for living

According to moderation analysis, for all but one dependent variable only the first and the second steps reached significant changes in R^2 (Table 2). The coping with problems reason, the responsibility for family and children reasons, and the moral reason were higher in the NO group as compared to the other two groups which did not significantly differ from each other. All the patients with higher meaningfulness reported more RFL while higher crisis of meaning after adjusting on meaningfulness predicted lower scores on the coping with problems reason. Thus, the effect of crisis of meaning differed from the mere inverted effect of meaningfulness only with respect to the coping with problems reason.

There were significant moderation effects between meaningfulness and meaninglessness regarding moral RFL: the interaction between meaningfulness and crisis of meaning and its second order interactions with groups reached the level of significance $p < 0.05$ ($\beta = -0.81$, $p < 0.01$, $\beta = 0.62$, $p < 0.05$, $\beta = 0.67$, $p < 0.01$, respectively, $\Delta R^2 = 7.4\%$, $p < 0.05$). Simple regressions demonstrated that in the BE group moral RFL were related neither to meaningfulness, nor to crisis of meaning nor to their interaction. In the NO group more moral reasons were associated with higher meaningfulness ($\beta = 0.40$, $p < 0.01$) while in the ID group the disbalance between meaningfulness and crisis of meaning (e.g., both are high or both low) was related to less moral RFL ($\beta = 0.48$, $p < 0.05$).

We repeated all the analyses using other variables of meaningfulness and meaninglessness: Meaningfulness by NOT and Alienation (Vegetativeness) as alternative measures. For coping with problems and relationships with children, we found the same positive relationship between meaning in life and reasons to live. However, we did not find three-level interactions for moral reasons to live.

In should be noted that for the coping with problems reason after adding interactions of meaningfulness by NOT and vegetativeness with groups of patients there was a clear negative relationship between vegetativeness and life for coping with problems ($\beta = -0.55$, $p < 0.05$). However, this relationship was stronger in the BE group ($\beta = 0.42$, $p < 0.05$) as compared to both other groups. In other words, alienation was a more important negative factor of the coping with problems reason in patients with self-harming behavior than in the ID and NO groups.

Fear of suicide was not predicted by group or meaningfulness but it was positively related to the crisis of meaning after adjusting for dummy-coded groups ($\beta = 0.20$, $p < 0.05$, $\Delta R^2 = 3.8\%$, $p < 0.05$). Furthermore, fear of suicide was associated to alienation after adjusting for groups and meaningfulness by NOT ($\beta = 0.33$, $p < 0.01$, $\Delta R^2 = 10.5\%$, $p < 0.01$). Fear of social disapproval was not predicted by group, meaningfulness or crisis of meaning.

Sources of meaning as additional predictors of reasons for living

For all but one (fear of suicide) RFL a stepwise regression revealed sources of meaning that were associated to them after adjusting for dummy-coded groups, meaningfulness and meaninglessness (Table 3). Relationships with children and fear of social disapproval were higher in those with higher horizontal transcendence and lower self-actualization. The coping with problems reason was also higher in patients with higher horizontal self-transcendence while moral reasons were related to higher self-transcendence only in the NO group. In general, only fear of suicide and responsibility for family were not predicted by horizontal self-transcendence. However, responsibility for family was predicted by vertical self-transcendence. A similar pattern was found for moral reasons.

High self-actualization as a meaning source predicted low RFL in all cases but one (the coping with problems reason).

TABLE 2 Meaningfulness and crisis of meaning as predictors of reasons for living: results of hierarchical regression.

Dependent variables		Step 1		Step 2		Step 2–verification	
		BE group	NO group	Meaning-fulness (SoMe)	Crisis of meaning (SoMe)	Meaningfulness (NOT)	Alienation (vegetativeness)
RFL–Coping with problems	β	−0.07	0.34**	0.40**	−0.29**	0.48**	−0.04
	ΔR^2	15.8%**		31.6%**		24.9%**	
RFL–Responsibility for family	β	0.03	0.30*	0.29**	−0.07	0.13	−0.11
	ΔR^2	8.0%**		9.7%**		4.9%*	
RFL–Relationships with children	β	0.08	0.28*	0.47**	−0.11	0.38**	0.05
	ΔR^2	5.1%T		25.4%**		11.3%**	
RFL–Moral	β	0.01	0.24 T	0.20 T	−0.10	0.16	0.03
	ΔR^2	5.1%T		6.4%*		1.9%	

T–$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

For fear of social disapproval reason and, marginally significantly, for moral reasons, there were moderation effects: higher horizontal self-transcendence and lower self-actualization were related to these reasons only in the BE and NO groups, but not in the ID group. Lower coping with problems reason was predicted by higher well-being source of meaning in group BE ($\beta = -0.32$, $p < 0.01$, $\Delta R^2 = 5.5\%$, $p < 0.01$). Probably patients with experience of self-destructive behavior were more tolerant to poor well-being, as Joiner (2005) suggests. Although this interpretation is close to the ideas of learned helplessness and stress vulnerability, it should be noted that none of these factors predicted self-destructive behavior so the underlying mechanism could be different from those typically described in that context.

Thus, lower self-actualization and higher horizontal self-transcendence were related to more reasons for living in general, specifically moral reasons and fear of social disapproval in the BE and NO groups but not in the ID group.

The fear of suicide reason was not related to sources of meaning.

Relationships between sources of meaning and reasons for living after adjusting for clinical appraisals of the patients' conditions

Only one major effect of clinical characteristics was significant: actual stress was related to a higher fear of suicide RFL in all three groups. Accordingly, we removed them from the analyses and stepwise added all possible moderators describing the interactions between the five clinical characteristics and the two dummy-coded groups (i.e., 10 interactions). If significant interaction effects were found, the relevant clinical characteristic was added at step 1 to check whether the moderation effect would remain.

As can be seen from Table 4, neither clinical characteristics nor group membership predicted the coping with problems, moral or fear of social disapproval reasons. However, in all the cases there was a moderation effect: in patients of the BE group suicidal readiness was related to lower coping with problems, fear, and moral reasons. The coping with problems reason was also related to a lower social support deficit in the NO group.

It is interesting that no specific RFL were predicted by clinical characteristics.

The fear of suicide reason was higher in the BE group as compared to patients of the ID group ($\beta = 0.35$, $p < 0.05$, $\Delta R^2 = 20.4\%$, $p < 0.01$) and NO group ($\beta = -0.14$, n.s.). This result was not surprising taking into account that the experience of suicide was much more real for people who made an attempt (BE group). In all three groups there was a major effect of actual stress ($\beta = 0.26$, $p < 0.05$, $\Delta R^2 = 7.1\%$, $p < 0.05$): the higher the stress experienced by the patients, the higher was the fear of suicide RFL. This effect was not moderated by group.

The responsibility for their family and relationship with children reasons were unrelated to clinical characteristics in all the three groups.

Using a similar stepwise moderation analysis strategy, we tested whether meaningfulness remained a positive predictor for RFL in all the three groups after controlling for clinical characteristics. An additional aim was revealing possible interaction effects between group membership, clinical variables and meaningfulness. Only suicidal readiness and social support deficit were used in these analyses because they were associated with RFL and meaningfulness, as noted above.

After stepwise adjusting for group membership, suicidal readiness, social support deficit and their interactions ($R^2 = 26.3\%$, $p < 0.01$), meaningfulness still predicted coping with problems reason (baseline $R^2 = 41.1\%$, $p < 0.01$, after adding meaningfulness $\beta = 0.52$, $p < 0.01$, $\Delta R^2 = 21.1\%$, $p < 0.01$), relationship with children reason (baseline $R^2 = 9.8\%$, $p < 0.05$, after adding meaningfulness $\beta = 0.57$, $p < 0.01$, $\Delta R^2 = 27.4\%$, $p < 0.01$) and moral RFL (baseline

TABLE 3 The effects of sources of meaning on RFL in patients from different groups.

Dependent variables		Step 3				Step 4			
		SoMe–Horizontal self-transcendence	SoMe–Well-being	SoMe–Vertical self-transcendence	SoMe–Self-actualization	Interaction: BE group × Horizontal self-transcendence	Interaction: NO group × Horizontal self-transcendence	Interaction: BE group × Self-actualization	Interaction: NO group × Self-actualization
RFL–Coping with problems	B	0.21*	−0.15 T	–	–	–	–	–	–
	ΔR^2 (47.5%**)			3.1%*		–	–	–	–
RFL–Responsibility for the family	B	–	–	–	–	–			
	ΔR^2 (17.3%**)			11.7%**		–	–	–	–
RFL–Relationship with children	B	0.27*	–	–	–	–			
	ΔR^2 (32.2%**)			9.6%**		–	–	–	–
RFL–Fear of social disapproval	B	0.36**	–	–	−0.30*	0.47*	0.62*	−0.86**	−0.72**
	ΔR^2 (3.5%)			7.7%*		14.4%**			
RFL–Moral	B	0.16		0.37**	−0.46**	0.30	0.55*	−0.31	−0.43*
	ΔR^2 (12.4%)	23.6%**				4.4%			

T–$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

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TABLE 4 Clinical group and characteristics and reasons for living: the results of moderation analysis.

Independent variables in moderation analysis		RFL–Coping with problems		RFL–Fear of social disapproval		RFL–Moral	
		B	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1	BE group NO group	−0.13 0.16	22.0%*	0.36 0.37	8.9%	0.24 0.13	7.8%
	Suicidal readiness	−0.19		−0.02		−0.24	
	Social support deficit	−0.22					
Step 2	In BE group–Suicidal readiness	−0.79**	17.7%**	−0.75*	10.2%*	−0.67*	7.9%*
	In NO group–Social support deficit	−0.49*					

*$p < 0.05$; **$p < 0.01$.

$R^2 = 14.6\%$, $p < 0.05$, after adding meaningfulness $\beta = 0.34$, $p < 0.05$, $\Delta R^2 = 10.8\%$, $p < 0.05$) but not for responsibility for family, fear of suicide or fear of social disapproval reasons where the effect of meaningfulness did not reach $p < 0.05$ significance level after adjusting for clinical variables.

Discussion

Psychological predictors for suicidal ideation and attempts among people in crisis life situations. Differentiating between patients in crisis life situations who hold suicidal intentions and are at risk of suicide and those who are not is an important challenge. Although intuitively it seems obvious that suicidal ideation is a "first station" on the way to suicidal attempts, the approach of existential psychology suggests that suicidal ideation is not directly positively associated with the risk of suicidal behavior. As our data show, neither well- and ill-being measures (subjective happiness, subjective vitality, anxiety, depression), nor self-regulatory resources (action orientation, hardiness, coping strategies, tolerance for ambiguity), nor crisis of meaning and alienation differed between those patients who made suicidal attempts, those with suicidal ideation and those who came to crisis clinics by other reasons and who denied suicidal thoughts. Rather, the differences between these three groups referred to meaningfulness and reasons for living. This confirmed Hypothesis 1a and disconfirmed Hypotheses 1b and 1c.

It is interesting that reasons for living (especially the coping with problems reason) were higher in the NO group and hardly differed in the two other groups, while meaningfulness and some sources of meaning were equally high in the NO and ID groups and decreased in the BE group (Table 1). It looks as if the appearance of suicidal ideations covaried with a decrease in RFL and not in meaning, while the transition from suicidal ideation to suicidal attempts covaried with decreased meaningfulness (but not in increased alienation or crisis of meaning). It is a lowered positive meaning resource that seems to be most indicative of suicidal risk.

Clinically appraised suicidal readiness was higher in patients with suicidal attempts but did not significantly differ in the ID and NO groups (Table 1); it follows from this that in crisis situations suicidal ideation might not be indicative of suicidal risk. This partly confirmed Hypothesis 1. Moreover, patients with suicidal ideations were appraised by doctors as having the least social support deficit and marginally less affective symptoms.

Clear clinical "signs" of suicidal risk might be not very helpful in prevention because they are mostly based on already existing history of previous attempts, actual impulsivity and self-harming behavior. In other words, clinical appraisals seem to detect well suicidal risk in those who have already made suicidal attempts but fail to predict it in those who did not. In this context it is interesting that suicidal "readiness" was related to fewer reasons for living (especially coping with problems, moral reasons and fear of social disapproval) and lower meaningfulness, but in patients with suicidal attempts only.

The relations among meaningfulness, crisis of meaning, and reasons for living. While fewer reasons for living seem to be the major indicator of suicidal ideations and attempts, our further aim was revealing their psychological predictors. In line with Schnell's theory, in all the three groups meaningfulness predicted more positive reasons for living. These effects were replicated using other measures of meaningfulness and alienation (Tables 2, 3 Hypothesis 2 is partly confirmed).

The hypothesis stating that the crisis of meaning is an independent predictor for coping with problems that could not be reduced to meaningfulness, was supported for the coping with problems reason only. Moreover, when we used other measures, alienation predicted the coping with problems RFL only in the BE group. In this group meaningfulness and crisis of meaning were just weakly correlated with each other, indicating that both feelings of meaningfulness and crisis of meaning may be high or low at the same time in these patients. No clear evidence for possible interaction between meaningfulness and crisis of meaning was found or replicated using other measure. Thus, the 'disbalance' between meaningfulness and crisis of meaning in patients with suicidal attempts was not related to reasons for living.

The relationship between meaningfulness and most reasons for living remained significant after controlling for clinically appraised suicidal "readiness" and a social support deficit (Table 4; the first part of Hypothesis 3 confirmed). There was no interaction between clinical appraisals and meaningfulness (the second part of Hypothesis 3 disconfirmed).

The data obtained below are in line with the existentialist statement that thinking about a suicide option is not a pathological symptom unless these thoughts are converted into actions or become obsessive. Awareness of suicide as an option is a sign of mature self-reflection, a precondition of viewing one's life as an outcome of conscious choices rather than a succession of random events or fatal determinations. This self-reflection seems to be the key chain in this process which has no predetermined outcome. The impact of all the life circumstances, challenges, losses, traumas etc. is mediated by the personal meanings all these factors acquire in the context of the general life meaning.

It follows that prevention efforts are to be focused not at eliminating the factors "pushing" one to suicidal behavior, but rather at supporting inner strengths, conducive of a positive decision, to be. Clinicians could develop therapeutic strategies aimed at preventing suicidal thoughts and behaviors and improve the care management of suicidal patients through enhancing meaningfulness and reasons for living. Suicidal ideations might be thus transformed into saying "yes" to life and integrated on the existentialist basis into the positive vision of one's life. Such efforts are being elaborated first of all within Logotherapy, Dialectical Behavior Therapy, and Cognitive Behavioral Therapies (see, e.g., Linehan, 2015; Bakhiyi et al., 2016).

Conclusion

The data cast some light on the role of life meaning in suicide prevention. The role of meaningfulness as a buffering factor has received new support. Specifically, life meaningfulness predicted stronger reasons for living, while meaning deficit, or existential frustration (Frankl) seemed to be less critical. Qualitative characteristics of meaning in life in terms of its sources made some moderate contribution varying in the effect size. It follows that prevention efforts are to be focused not on eliminating the factors 'pushing' one to suicidal behavior, but rather on supporting inner strengths, conducive toward a positive decision, *to be*. A suicidal decision is made in a competition with the opposite option, saying Yes to one's life. Our data support the belief that positive buffers, first of all meaningfulness of life and reasons for living influence this critical choice probably more than anything else (at least, we do not know of data showing that anything else is more important). Meaningfulness and reasons for living justify the choice in favor of life and empower one to reject the option of killing oneself.

Limitations and perspectives

The data collection for this study was very complicated and took years. The results were encouraging; they seem to open interesting perspectives but hardly give definite answers. The key ideas underlying the study proved to be fruitful: the emphasis on meaning, the differentiation of positive and negative predictors (the former were stronger), the differentiation of suicidal behavior and mere ideation. Indeed, "though the physicality of death destroys man, the idea of death saves him" (Yalom, 1980, p.30).

The study had some important limitations. One is that we failed to use a follow-up assessment that would add much to our cross-sectional design. Secondly, although we used independent evaluation of the patients' clinical status, these evaluations were made by clinical staff who already knew of the patient's past suicide attempt history, and this knowledge likely contributed a substantial part of the variance of the clinical checklist scores.

New studies should address these limitations. A special task would be elaborating and testing interventions based on reflection upon the issue of suicide, as in psychotherapeutic approaches mentioned above.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

OK: data collection and research planning, DL: methodology, study design, and overall project administration, ER: controlled statistical analysis of the data, and OT was responsible for: literature overview and data administration. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Can there be overly meaningful lives? Conflicts between meaning in life and other values

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This is a philosophical paper that heeds psychological work on meaning in life, and hopes to acquaint both psychologists and philosophers more with each other's work and enhance a dialogue between them. Many works on meaning in life in philosophy and in psychology have already focused on the relations between meaning in life and specific values such as happiness (subjective wellbeing), authenticity, morality, knowledge, and artistic creation. This paper discusses the general structure of the relation between both objective and subjective meaning in life and other values, and emphasizes ways in which such values sometimes conflict with rather than enhance objective or subjective meaning in life. The paper argues that, because of such conflicts, there are cases in which we should refrain from augmenting the objective or subjective meaning in our lives and even seek to decrease it; there can be overly meaningful lives. The paper concludes with some practical implications of this discussion.

KEYWORDS

eudaimonic wellbeing, meaning in life, philosophy, subjective happiness, value

Introduction

This paper is written by a philosopher, not a psychologist. One of the paper's central aims, following Baumeister's (2022, p. 426) observation that "philosophy can learn from psychology . . . psychology can benefit much from continued input from philosophers," is to encourage both philosophers and psychologists working on meaning in life to become more acquainted with each other's work. I agree with Baumeister that researchers of meaning in life in both disciplines can learn much from familiarizing themselves with the work done in what might be called "the other discipline." Much of it may be new and perhaps seem odd, but it may bring to light and challenge long-held implicit presuppositions, suggest new paradigms, and introduce ideas for further research. This, then, is a philosophical paper that aims to heed psychological work on meaning in life, and hopes to acquaint both psychologists and philosophers more with each other's work and enhance a dialogue between them.

I should distinguish, however, the aim of the present paper from that of an important and interesting effort to create a new interdisciplinary field that would interweave psychological empirical measured evidence with philosophical assumptions and theories. For example, Cokelet and Fowers (2019) discuss, among other issues, the possibility of developing models that would respond to questions about the normative significance of virtues. Fowers et al. (2021) examine how positive psychology and personality psychology relate to virtue research in a way that treats virtue as empirically verifiable and measurable. Layder (2021) mentions, among other issues, the need to reject the distinction between theory and method, as well as to develop research strategies that link global properties of social reality with local properties of research data. Prinzing (2021) argues that much in positive psychology is implicitly value-laden anyway, and suggests that these values should be explicitly endorsed. It seems to me that, at present, it is too early to know whether this interdisciplinary subfield will indeed emerge. If it does, the discussion in this paper may prove to be relevant to it. However, for now, the discussion in this paper treats psychology of meaning in life and philosophy of meaning in life as distinct fields, and suggests that, as such, both philosophers and psychologists may find their thoughts and research enriched by learning of each other's work.

One general difference between much of the contemporary psychological and philosophical discussions of meaning in life (henceforth just "meaning") is that psychological discussions on meaning largely focus on *sensed* or *conceived* meaning, which philosophers often call "subjective meaning." Philosophical discussions, too, focus on subjective meaning, but also often on what they take to be objective meaning, which is the meaning that aspects of life are taken to have unrelated to their being sensed or conceived as meaningful. To clarify the distinction consider the example of Ignaz Semmelweis's life (Benatar, 2022, p. 435). Semmelweis insisted, against the accepted medical and scientific views of his time in the 1840s, that obstetricians should wash their hands between surgeries. His insistence, which pioneered modern antiseptic procedures, led to millions of lives being saved but also to his professional ostracization, a nervous breakdown, and forced hospitalization in a mental asylum. Many philosophers would hold that Semmelweis had an objectively meaningful life even if, historically or in a thought experiment, he experienced his life as meaningless. Semmelweis, or a version of him, may have had a subjectively meaningless but objectively meaningful life. Likewise, consider the example of a bored or depressed Mother Teresa (following Metz, 2013, p. 135). The historical Mother Teresa was, in fact, occasionally depressed or deeply anxious, feeling that she was not "in the grace of God" and describing herself as feeling lost and in darkness (Teresa and Kolodiejchuk, 2007). Perhaps she did not sense her life as meaningful at those times, but many philosophers of meaning in life would still take her life to have been objectively meaningful even at those times because of her impressive moral achievements and the many lives she saved. Even if all that were not true of the historical Mother Teresa, we can, as a thought experiment, think of someone else, a "version" of Mother Teresa who succeeded in saving a million lives while not taking her life to be meaningful (perhaps she just acted out of duty). Many philosophers of meaning in life would consider such a person to have had a subjectively meaningless but objectively meaningful life.

Just as there can be subjectively meaningless but objectively meaningful lives, so there can be subjectively meaningful but objectively meaningless lives. An example of the latter might be the life of a guru-worshiping cult member who loses his autonomy and critical thinking but gains a sharp sense of meaning when working hard to expand his dishonest guru's Rolls Royce collection. Likewise, consider a young person who joins the SS, experiencing a sharp sense of increased meaning while having his autonomy and critical thinking diminished in the military frameworks he is part of, fighting for a worthless, hideous cause, and committing terrible crimes. He, too, may have a subjectively meaningful and objectively meaningless life. This paper discusses both objective and subjective meaning.

While considering psychological and philosophical work, the paper elaborates on conflicts that can arise in various circumstances between objective and subjective meaning and other values or aspects of life, and thus on how lives can at times be overly objectively and subjectively meaningful. We want our lives to be meaningful, but that is not the only thing we want from them. We also want them to be, among other things, autonomous, authentic, interesting, happy, and moral, and to include love, knowledge, friendship, aesthetic experiences, and many other positive values. Several philosophical works have already focused on the relations between objective and/or subjective (henceforth just "objective or subjective") meaning and a specific value such as morality (Thomas, 2005), happiness (Metz, 2009), creativity (Matheson, 2016), love (Kronqvist, 2017), wonder (Schinkel, 2019), forgiveness (Allais, 2022), or gratitude (Manela, 2022). Likewise, several psychological works have already focused on the relation between (mostly subjective) meaning and a specific value such as happiness (subjective wellbeing) (Baumeister et al., 2013), creativity (Kaufman, 2018), optimism (Yu and Chang, 2019), gratitude (Kleiman et al., 2013), self-compassion (Suh and Chong, 2022), empathy (Komisar and McFarland, 2017), or authenticity (Lutz et al., 2022). The aim of this paper, however, is to discuss the general structure of the relation between objective or subjective meaning and other values, underscoring the ways in which other values and objective or subjective meaning sometimes conflict with and diminish

rather than enhance each other. Further, the paper argues that, because of these conflicts, there are cases in which we should refrain from trying to augment objective or subjective meaning in our lives and even seek to decrease them—there can be overly meaningful lives. Thus, this paper focuses on the more problematic side of meaning in life, which both psychological and philosophical research hardly discuss. The paper suggests that, although often helpful and positive, in some circumstances meaning can be harmful and problematic.

Conflicts between objective meaning and other values

In contemporary philosophical analyses of objective meaning, the most accepted view by far is that value primarily constitutes life's meaning (e.g., Hepburn, 2000, p. 262; Joske, 2000, pp. 287–290; Cottingham, 2003, p. 31; Brogaard and Smith, 2005, pp. 443–444; Wolf, 2010, pp. 13–33; Kauppinen, 2012, pp. 353–356, 361–367; Metz, 2013, pp. 220–239; Landau, 2017, pp. 6–16; for dissenting views, see Goldman, 2018, pp. 116–151; Repp, 2018; Seachris, 2019; Thomas, 2019; for replies defending the value view, see Metz, 2019, pp. 409–411; Landau, 2021). To make life meaningful, we try to increase the overall value in different spheres of life. These may include, for example, some or all of the following: aesthetic enjoyment, wisdom, morality, love, subjective happiness, and social recognition. When these or other spheres of value together show a sufficiently high degree of overall value, we take life to be meaningful. If they do not together pass some threshold of overall value, we do not take the life in which they appear to be meaningful. Different people have different views about which spheres of our lives are of value. For example, some may think that scholarship is but financial success is not a sphere of value. Others may take the opposite view or see both as spheres of value but one of them as more valuable and, thus, contributing more to life's meaning than the other. I will not discuss the specifics of these issues here; for the purposes of the present analysis, it is sufficient that the general structure of the relation between meaning and other values be accepted.

Note, however, that a life can have overall value sufficient to make it objectively meaningful even if many values appear in it only to a low degree or not at all, as long as some of the values that do appear in it are of a sufficiently high degree. For example, while we take music, literature, the visual arts, love, friendship, and knowledge to enhance objective meaning, we can also think of highly meaningful lives that incorporate very few or even one of these values. For instance, we would consider the life of Mother Teresa to have been objectively meaningful thanks to her moral achievements even if some or all of the other values mentioned above had been absent from her life or appeared just to a minimal degree. Similarly, we would consider Mozart's life to have been objectively meaningful thanks to his contribution to music even if he were friendless, loveless, showed no interest in other arts, and had no substantial knowledge in other fields such as science of mathematics.

Further, enhancing a certain value in a life will not always enhance the overall objective meaning in that life. Take, for example, Autonomy. Autonomy is a positive value, but there are cases in which people's autonomous choices decrease rather than increase their lives' objective meaning. Consider, for instance, a person who, upon gaining a higher sense of personal autonomy, or gaining more practical autonomy in her life, starts embezzling money from her clients and abusing her family, thus diminishing her life's objective meaning. Similarly, there are people whose lives become more objectively meaningful because their autonomy is diminished, that is, because they are forced to do certain things (as long as their degree of autonomy does not fall to a robot-like level). Consider a person who was drafted against his will to fight in World War II and because of this interacted with some deep and thoughtful people who taught him much, and moreover took part in a pivotal campaign and saved many lives, all of which considerably increased the objective meaning of his life. Had he not been drafted, all this would not have happened and he would have had a less objectively meaningful life. In some circumstances, then, autonomy and objective meaning are *competing* values and we have to choose whether we would prefer to diminish objective meaning and enhance autonomy or to diminish autonomy and enhance objective meaning.

Likewise, consider happiness (or subjective wellbeing), that is, the psychological state of contentment, lightness of heart, and cheerfulness. As a positive value, it seems that the more subjective happiness is present in a life, the more that life is objectively meaningful. Nevertheless, objective meaning and happiness do not always come together; people can lead unhappy but objectively meaningful lives. Take, for example, Søren Kierkegaard. His life seems to have been objectively meaningful: he published many important philosophical works, had an immense positive effect on both existentialist and religious thought and, through them, on the lives of many people, and proved to be probably one of the 20 most important Western philosophers who ever lived. Thus, he seems to have as good a claim as any to having led a very objectively meaningful life. However, according to his biographers, he led an unhappy, even tortured life (Hannay, 2003; Garff and Kirmmse, 2007). It is likely, of course, that he did experience some contentment because of the meaningful aspects of his life. But all in all, his life was not a happy one; he had a meaningful but unhappy life. Moreover, it seems that some of the qualities that made him unhappy also contributed to his accomplishments and, thus, to his life's meaning. Kierkegaard's extreme, perfectionist expectations of himself, relentless honesty with himself and others, and uncompromising nature arguably

made him unhappy, lonely, and tortured, on the one hand, but also a great, original philosopher on the other hand. It may well be that had he been less of a perfectionist, etc., his life would have been happier but less meaningful. The same seems to be true of Emily Dickinson. For the majority of her adult life, until her death at age 56, she lived in self-imposed reclusiveness. Her poetry—many of her almost 1800 poems discussing death or unfulfilled love—suggests that in many aspects of her life she was an unhappy person, something confirmed by her biographers (Sewall, 1998; Kirk, 2006). Yet, she is considered with good reason to be a unique and important poet and, thanks to that, to have had an objectively meaningful life. It seems that some of the emotional forces that led to her isolation and unhappiness, such as her extreme sensitivity, intensity, and uneasiness with people, also led her to write her exceptional poetry. Thus, although there are many circumstances in which subjective happiness and objective meaning do not compete but enhance each other, there are also circumstances in which increasing one decreases the other.

Similar relations exist between objective meaning and other values, such as authenticity, morality, truth, camaraderie, health, longevity, and love. All these values in many circumstances enhance life's objective meaning, yet in other circumstances conflict with it. We can think of circumstances in which, say, one's inauthentic appreciation of her supervisor's dull jokes could result in receiving an academic fellowship and, thus, an excellent education that would enable her to considerably increase objective meaning in her life. Somewhat similar examples, but with immoral behaviors (such as telling a small lie, committing a small theft, or failing to keep a promise), that allow one to receive an excellent education show that failures in moral behavior may sometimes enhance objective meaning, while holding to one's moral standards may in some circumstances decrease it. Objective meaning may in some circumstances also conflict with camaraderie: pursuing one's own interests or developing one's gifts to their maximum sometimes requires relative isolation and individual action that sets one apart from others. Likewise, when one sacrifices one's health or life for a noble cause, objective meaning competes with health and longevity. Mahatma Gandhi, Martin Luther King, Jr., Anwar Sadat, and Yitzhak Rabin are examples of people who would have had longer lives if they had not acted in ways that improved the world and rendered their lives more objectively meaningful. What has been shown in these examples is true also of the relation between objective meaning and other values; I have not so far succeeded in finding any value that does not in some circumstances enhance objective meaning yet in others decrease it.

But cases in which enhancing some values in life diminishes its objective meaning seem to conflict with what was explained above about the nature of life's objective meaning. If life's objective meaning is based on value, should we not expect the enhancement of value always to increase objective meaning? The reply is that values also affect each other, and when they diminish other values, they can also diminish objective meaning. Take, for example, love: suppose that one devotes time and energy to one's love life, so that there is now more love in one's life. Enhancing love may well enhance objective meaning, as there is now more value in one's life. Enhancing love may also enhance other spheres of value that enhance life's objective meaning: the love in one's life may increase optimism, goodwill, and energy, enabling one, say, to study better, appreciate natural beauty more deeply, and behave more morally toward others. However, in some circumstances, progress in the sphere of love may *decrease* the value in other spheres of value and, through them, the overall objective meaning of one's life. For example, one may, while focusing on love, disregard one's studies and discontinue one's supererogatory moral contributions. While the value in some spheres increases (and contributes positively to objective meaning), the value in other spheres may decrease to such an extent that the *overall* value, and therefore the objective meaning in one's life, diminishes. Of course, all other things remaining equal, increase in any value enhances objective meaning. But in almost all cases, all other things do *not* remain equal; they are affected in many ways, some of them positive, others negative. Thus, increase in a value can lead to a decrease in objective meaning and vice versa.[1]

Conflicts between subjective meaning and other values

Psychological research on what philosophers call subjective meaning suggests that it, too, can conflict with many values. Consider, first, happiness (or subjective wellbeing, understood as having more pleasant than unpleasant emotional states as well as a general positive assessment of one's life as being more emotionally pleasant than unpleasant). Baumeister et al. (2013) have shown that although subjective meaning and happiness are positively correlated, they are distinct, have many different predictors, and do not always coincide. For example, higher anxiety, stress, and worry associate with lower happiness but with higher subjective meaning. Thinking about the future (and, more generally, integrating past, present, and future) also link to higher subjective meaning but to lower happiness. Baumeister et al. (2013) also show that subjective meaning has more to do with being a giver rather than a taker whereas subjective happiness has more to do with being a taker rather than a giver. Expressing one's self relates to subjective meaning but hardly to happiness. In three percent of the reported cases

1 I have discussed here objective meaning in life as based on value in general, but what has been said here also holds, mutatis mutandis, for other and more specific views of objective meaning as based on value, such as Metz's (2013, pp. 219–248) fundamentality theory as well as Wolf's (2010) and Kauppinen's (2012) views.

subjective meaning was due to bad events that happened to participants in the survey (Baumeister et al., 2013, p. 515). Thus, notwisthstanding the considerable overlap between happiness and subjective meaning, enhancing one of them may decrease the other.

What Baumeister et al. (2013) found of the relation between subjective meaning, on the one hand, and happiness, worry, anxiety, tension, and bad events in life, on the other hand, also holds for the relation between subjective meaning and other values. In some cases, traumas lead to posttraumatic growth that enhances meaning (Cann et al., 2010; Triplett et al., 2012). Hatred toward other groups and institutions can stimulate subjective meaning (Elnakouri et al., 2022). Authoritarian worldviews predict meaning (Womick et al., 2019). King and Hicks (2021, p. 572) hypothesize that "one reason even maladaptive worldviews may be difficult to change is that they imbue life with meaning." We see, then, that in some cases higher subjective meaning conflicts with positive values and instead relates to negative ones.

This should not be surprising. Think, again, of the example of the guru-worshiper or the SS soldier whose lives show high subjective meaning but, relatedly, many negative values. Likewise, although the examples presented in the previous section focused on objective meaning, they also hold, with small changes, for subjective meaning. Kierkegaard or Dickinson (or people similar to them) may well have also strongly experienced subjectively meaningful lives through their intense (and possibly obsessive) commitment to their philosophy and poetry that cost them so much else in their lives. The examples in the previous section of the possible conflicts between objective meaning and authenticity, morality, camaraderie, and other values could also show, with small changes, how subjective meaning can conflict with many positive values and relate to negative ones.

It is easy to explain how this can happen. Most contemporary psychological discussions of subjective meaning emphasize purposefulness, significance/mattering, and coherence/comprehension as constituting subjective meaning (e.g., Steger et al., 2006; Heintzelman and King, 2014; George and Park, 2016; Martela and Steger, 2016). Purposefulness can coexist with and even can be enhanced by some degrees and types of negative values such as worry, anxiety, tension, pain, bitterness, hate, radical acceptance of authority, loneliness, or single-mindedness. For example, a person who is more worried, anxious, and single-minded may become more purposeful in her efforts to advance some good, or some bad (e.g., racist), political agenda. In some circumstances, purposefulness may also conflict with some positive values such as serenity, love, self-acceptance, happiness, spontaneity, or compassion. Negative values such as worry, anxiety, tension, pain, bitterness, hate, radical acceptance of authority, loneliness, or single-mindedness can similarly enhance behaviors that are impactful, that "matter," or are "of significance" to one's human and physical environment, and thus also contribute to one's sesnsing one's life as "mattering." Likewise, once the guru worshipper or the SS volunteer subdue their tendencies toward critical rationality, intellectual and emotional openness, and tolerance, accepting instead authoritarianism and blind commitment, they may sense their lives and the world around them as more coherent and comprehensible than before. In fact, critical thinking, openness, tolerance, and rejection of authoritarianism are likely to lead to more complex, nuanced, and uncertain worldviews, which may diminish one's ability to experience life and the world as simple and, as such, easily comprehensible and coherent. All this has to do with the fact that purposefulness, significance, and coherence are largely value neutral. They relate to both positive and negative values. Hence, in some cases, enhancing subjective meaning will come at the price of diminishing some other important values in life, and vice versa.

Conflicts between objective or subjective meaning and eudaimonic wellbeing

I have discussed up to now possible conflicts between objective or subjective meaning and a variety of values. But in recent years, a new important notion, *eudaimonic wellbeing*, has emerged in the psychological literature, and it might be thought that things are different with it. Eudaimonic wellbeing is distinguished from hedonic wellbeing: while the latter has to do with a high ratio of positive to negative affect and a high rate of satisfaction with one's life, the former has to do with what is conceived of as living well, realizing one's virtuous potential and fulfilling one's true nature (Deci and Ryan, 2008, pp. 1–2).[2] There are different conceptualizations of eudaimonic wellbeing. I will discuss here three of them, and argue that they, too, can conflict with objective or subjective meaning, so that increasing objective or subjective meaning may decrease eudaimonic wellbeing, and increasing eudaimonic wellbeing may decrease objective or subjective meaning.

Ryan et al. (2008) typify eudaimonic wellbeing as having to do with engaging in intrinsic rather than extrinsic goals (e.g., health, personal growth, community, and relationships rather than power, wealth, fame, and image), acting in autonomous and volitional rather than in controlled ways, and acting in ways that satisfy the psychological needs for competence, relatedness, and autonomy. But some of these qualities may well be in conflict with objective meaning. We would probably consider Shakespeare's life to be of high objective meaning even if we found that, to a significant degree, he wrote for the sake of extrinsic goals such as wealth or fame. It may well be

2 Note, however, that unless it is assumed that one's true nature is virtuous, fulfilling one's true nature may conflict with realizing one's virtuous potential.

that increased interest in extrinsic goals such as wealth and fame, which would have diminished eudaimonic wellbeing, would have led him to create even more or better work, while diminished interest in wealth or fame, which would have enhanced his eudaimonic wellbeing, would have led him to a lower volume and poorer quality of work. His interest in art for art's sake, or perhaps in personal growth, as intrinsic goals might have been low and insufficient to motivate him to achieve what he did.

We would also take Shakespeare's life to be objectively meaningful even if we learned that he did not create wholly autonomously or volitionally but partly compulsively, perhaps feeling that he just had to write or that a muse was creating through him. Diminishing his possible compulsiveness and increasing his volitional and autonomous behavior might have enhanced his eudaimonic wellbeing but decreased meaning (since he might have chosen to focus less on his art and thus create less), while increasing his compulsiveness might have diminished his eudaimonic wellbeing but made his life more objectively meaningful. Likewise, we would continue to see Shakespeare's life as objectivley meaningful even if we discovered that he was a loner who did not act in ways that satisfied his psychological need for relatedness. Again, in some cases and circumstances, encouraging him to stop being a loner and to satisfy his psychological need for relatedness could have increased his eudaimonic wellbeing but decreased objective meaning in his life (since he would have spent more time with friends and less on artistic creation).

In various circumstances, the version of eudaimonic wellbeing Ryan et al. (2008) present will also be in conflict with subjective meaning. The guru-worshiper or the SS soldier may have such a strong sensation of meaning in their lives because they forgo their autonomy and volitional behaviors by succumbing completely to and identifying with some leader's will, thus acting in controlled and heteronomous ways. Had they been more autonomous in thought and in deed, they might have not been so focused on the goal set by their leaders, the world might have made less sense to them, and they might have had less impact on their environment (or "mattered" less), and also sensed their lives as less purposeful, comprehensible, and "mattering." Thus, their lives would have been of higher eudaimonic wellbeing but of lower subjective meaning. Again, in some cases, we would have to choose between enhancing objective or subjective meaning, on the one hand, and enhancing eudaimonic wellbeing, on the other. Enhancing one of them will decrease the other.

Ryff and Singer (2008, pp. 20–23) discuss eudaimonic wellbeing as consisting of autonomy, self-acceptance, positive relations with others, personal growth, purpose in life, and environmental mastery. As just shown when discussing Ryan et al. (2008), autonomy (with eudaimonic wellbeing) can decrease while objective or subjective meaning increases and vice versa. And the examples of Kierkegaard and Dickinson (or versions of them) suggest that it is possible to have lives in which self-acceptance and positive relations with others decrease (and, thus, eudaimonic wellbeing decreases) while objective or subjective meaning increases, and vice versa. Thus, again, for some people, in some circumstances, higher meaning would come at the price of lower eudaimonic wellbeing, and higher eudaimonic wellbeing at the price of lower meaning.

Waterman et al. (2008) relate eudaimonic wellbeing to activities that have to do with self-determination, activities that lead agents to feel fulfilled, and activities that are expressive of who their agents really are. The notion of self-determination that Waterman and colleagues employ seems quite similar to that of autonomy discussed above. The examples of Kierkegaard and Dickinson (or versions of them) suggest that it is possible have a life of high objective or subjective meaning while feeling quite unfulfilled. Feeling unfulfilled may even motivate one to achieve and excel (thus gaining higher objective meaning) in the hope that this may finally lead to experiencing fulfillment. Feeling unfulfilled may also direct one to focus on purpose, "mattering," and comprehension, in the hope that experiencing high subjective meaning may compensate for the lack of a sense of fulfillment. Likewise, the SS soldier and the guru-worshiper may well be acting in ways that are expressive of who they really are. The former may have a murderous, sadist, highly aggressive personality, and the latter an obedient, gullible, and eager to please personality. Thus, their acting in ways that enhance their eudaimonic wellbeing may diminish objective meaning in their lives, and vice versa. Again, eudaimonic wellbeing can conflict with both objective and subjective meaning.

Conflicts between objective and subjective meaning

Up to now, I have discussed ways in which objective or subjective meaning can conflict with *other* values. But it is worth noting that in some circumstances objective and subjective meaning also conflict with each other, so that increasing one of them decreases the other. Subjective meaning can enhance objective meaning since it can be seen as part of what makes life objectively meaningful (Metz, 2013, pp. 183–184), and the effort to maintain subjective meaning can lead people to behave in objectively meaningful ways. But subjective meaning can also diminish objective meaning. As the examples of the guru-worshiper and the SS soldier show, in order to maintain strong subjective meaning people sometimes behave in ways that render their lives *less* objectively meaningful. Sought or experienced subjective meaning can easily lead people astray. We would also see the life of the SS soldier as less objectively meaningful if he experienced his actions as meaningful than if he experienced his actions as non-meaningful. And just as subjective meaning in some cases diminishes objective meaning, so objective meaning can in some cases diminish subjective

meaning. Consider a person who performs a heroic act against a tyrant and is consequently put for a long time in solitary confinement that leads her to experience her life as meaningless.

Deciding between meaning and other values

When meaning and other values conflict, we have to make choices. Much in these decisions depends on the specific circumstances and on the particular degrees of meaning and of the other values at stake. Let us take first, again, objective meaning. Consider the cases of Kierkegaard and Dickinson. Given a choice between educating a child either into a Kierkegaard or into a person (call him Kierkegaard*) whose life is much subjectively happier yet somewhat less objectively meaningful than Kierkegaard's, most would likely prefer the latter option. Perhaps, if the choice were between a Kierkegaard and a happy but very stupid and vulgar Kierkegaard*, we would prefer Kierkegaard. But we would not prefer Kierkegaard if the alternative were a plausibly intelligent and cultured Kierkegaard* who has a much happier but less objectively meaningful life than Kierkegaard's. Some may have different intuitions and still prefer Kierkegaard's life to that of Kierkegaard*. But they, too, could fill in the specific details such that they would prefer a particular version of Kierkegaard* to Kierkegaard. By decreasing the difference in life's objective meaning between Kierkegaard* and Kierkegaard, so that Kierkegaard*'s life is almost as objectively meaningful as Kierkegaard's, and by increasing the difference in happiness, so that Kierkegaard*'s life is much happier than Kierkegaard's, there would be a point at which probably almost all would opt for increasing happiness even if it entailed decreasing objective meaning. The same, I believe, is true of Dickinson. Most, I believe, would prefer to educate their daughter to be less tortured, intense, and unhappy than Dickinson was, even if that meant that she would end up with a somewhat less objectively meaningful life. We will not always opt for objective meaning rather than happiness. The same is true of objective meaning vs. authenticity, longevity, love, and all the other values mentioned above, including eudaimonic wellbeing.

I suggest that the same holds for subjective meaning. It, too, is important and valuable, but when in conflict with other values, it does not override, at any degree, any other degree of other values (or their combination). Consider, again, the cases of Kierkegaard and Dickinson, now focusing only on the subjective meaning they may have experienced. I believe that most, again, would prefer not to raise a child to be as lonely, tense, and upset as Kierkegaard and Dickinson were, even if we knew that this would allow them to experience their lives as highly subjectively meaningful. As with objective meaning above, we could play with the degrees of subjective meaning and of the other values. Likewise, we would not want to raise a child who would be a guru-worshiping fanatic or a *Führer*-dedicated SS soldier even if that would allow them very strong, prolonged, experiences of meaning. Subjective meaning is important and valuable. But it is not always, and at any degree, more important than other values, including those that constitute eudaimonic wellbeing, in any degree or combination.

But how, in cases of conflict, do we choose between (or find the optimal balance of) objective or subjective meaning and other values? First, we tend to be willing to "pay" with a small decrease in one value if this leads to a significant increase in another value. For example, we would tend to agree to a small decrease in objective or subjective meaning if that would allow us a very large increase in happiness, and vice versa. Consider a person who volunteers in a foreign country for an important philanthropic cause. She does not enjoy her volunteer work because she is overly stressed and homesick. But she knows that her special skill is desperately needed and produces much good so that her volunteer work renders her life both objectively and subjectively meaningful to a high degree. If the degree of attained objective or subjective meaning had been lower or the degree of unhappiness higher, she might have not agreed to "pay" with happiness for the gained objective or subjective meaning as she does. Likewise, a person who considers whether to blow the whistle on his superiors, thus behaving morally but risking decline in the degree of the overall objective or subjective meaning in his life (because of the risk to his employment, peace of mind, relationships, and his ability to focus on his poetry), may judge that some degree of moral improvement is not worth the price in meaning while some other is.

Second, much depends on the estimation of the likelihood of success in the endeavor. The person who pays now with inauthenticity to achieve objective or subjective meaning in the future has to estimate how probable it is that, thanks to her pretended enjoyment of the supervisor's dull jokes, she will indeed receive the education she longs for. Likewise, a person who forgoes some of what he considers meaningful in his life in order to develop a love affair has to estimate how probable it is that the love will indeed develop and subsist.

Third, we work by thresholds. There is the threshold between what we take to be sufficient and insufficient objective and subjective meaning, as well as the threshold between what we take to be sufficient and insufficient happiness, morality, autonomy, and authenticity. When we feel quite happy, we may be ready to sacrifice more happiness than when we feel that we are on the verge of becoming unhappy; in other words, we may be more reluctant to sacrifice even a small amount of happiness if we think that doing so might result in falling below our threshold of happiness into what we consider unhappiness. The same would be true if we were slightly below rather than slightly above the threshold of happiness. We may feel that if we do not prefer happiness to objective or subjective meaning in such circumstances we will endanger our chances of crossing back over the threshold and recovering our happiness. However,

if we are farther down the scale of happiness, we may so despair of attaining happiness that we do not care about it much anymore and would be willing to give up even more happiness to attain more meaning.

In cases of conflict between meaning and other values, then, we should not always opt for meaning. In some cases, there are good reasons to prefer meaning, and in others, there are good reasons to prefer other values. This means that, contrary to common wisdom, we should not always try to maximize objective or subjectve meaning in our lives. In some circumstances, moreover, we should even try to decrease meaning.

Practical implications

The discussion presented in this paper also has some practical implications. First, since objective and subjective meaning have many possible sources, each of which can by itself make a life objectively or subjectively meaningful, it would serve one well to keep in mind that when some or many sources of meaning cease to be available, a sufficiently high degree of even one or two of the others can still maintain life as meaningful. This is an important point to remember for those who believe that their lives have become meaningless because sources of meaning that they have become habituated to, such as their career, artistic activity, love, or social activism, have ceased to be helpful or are no longer available. Although the shift to other sources of meaning can be difficult and unintuitive at first, it is important to remember that, after some time, these other sources for life's meaning may make life as, or even more, meaningful.

Second, it is important to distinguish well between subjective and objective meaning; they are distinct, and the presence or absence of one of them does not entail the presence or absence of the other. Thus, people who sense their lives as meaningless should note that their problem need not have to do with objective meaninglessness. As in the example of the depressed Semmelweis, it might be limited only to the subjective sphere. Likewise, those who sense their lives as highly meaningful will do well to critically examine whether their lives indeed are also objectively meaningful (as in the example of the guru worshipper). Strong sensations of meaning or of meaninglessness (as strong sensations and feelings in general) may decrease the tendency to think clearly and critically, thus lowering the ability to conceive correctly the degree to which life is also objectively meaningful or meaningless.

Third, the value in objective and subjective meaning notwithstanding, since they interrelate with other values both positively and negatively, those who want to increase objective or subjective meaning in their lives should examine whether they do not thereby too greatly diminish other values important to them (including their happiness or eudaimonic wellbeing). In objective and subjective meaning, too, more is not always better. We should try to strike a balance between objective or subjective meaning and other values that are important to us. This means that, in order not to diminish too strongly other values, in some circumstances we should refrain from enhancing objective or subjective meaning beyond a certain degree, and in others even diminish them if this is necessary to allow us to enjoy some other values. We should acknowledge that there can be overly meaningful lives.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Have a good day! An experience-sampling study of daily meaningful and pleasant activities

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We organize our daily lives with a relatively high degree of freedom. Some things must be done; others are optional. Some we find meaningful, some pleasant, some both, and some neither. The present study looks at such evaluations of daily activities and how they relate to perceived meaning in life. Sixty-two students from an Austrian university first completed the *meaningfulness* scale from the Sources of Meaning and Meaning in Life Questionnaire (SoMe). They then participated in a 1-week experience-sampling assessment, wherein they completed a short questionnaire at five random time-points per day. They indicated their current activity and then reported, on a 6-point Likert scale, how pleasant and meaningful they perceived it to be. Activities could thus be categorized as meaningful, pleasant, both, or neither. Results reflected that activities grouped under *culture/music, communication, intimacy,* and *sports* are experienced as both highly meaningful and pleasant. A two-level hierarchical linear regression suggested that people with high trait meaningfulness experience their daily activities as more meaningful than people with lower trait meaningfulness if they also enjoy what they are doing. People with low trait meaningfulness, however, tended to experience their daily activities as rather meaningless, even if they enjoyed them very much. Thus, when looking for advice on how to have a good day, clarifying one's meaning in life seems to represent the best starting point.

KEYWORDS

meaning in life, meaningfulness, pleasure, everyday life, activity, hierarchical meaning model, experience sampling, arts

Introduction

In Western Countries, daily life is largely de-traditionalized; social norms leave large parts of private life untouched. Thus, when determining what makes life meaningful, the classical authorities (such as the state or the church) have lost their power over the individual. When it comes to managing our daily lives, we are mostly left to our own devices. Moreover, in heavily individualistic societies, lifestyle choices are multi-optional: Members can—and must—choose from an overwhelming number of possibilities like

lifestyles, jobs, relation types, etc. (Gross, 1994). Yet individuals are not offered answers on how to achieve a good life in the eudaimonic sense (i.e., a meaningful life), and so they instead strive for maximizing pleasure (Christensen, 2017; Schnell, 2022). Exclusive pursuit of pleasure can take on an addictive nature (Bechara, 2005), and bring about unhappiness (Mauss et al., 2011, 2012; Ford et al., 2014, 2015), whereas a meaningful life is associated with many positive outcomes, of which happiness appears to be a by-product (Schueller and Seligman, 2010; Vötter and Schnell, 2019a). People who have a stronger sense of meaning in life tend to be, not only happier, but also more socially involved and engaged (Stavrova and Luhmann, 2016). Furthermore, they are more hopeful and optimistic (Damásio et al., 2013); feel more self-determined (Kashdan and Breen, 2007); are more self-forgiving (Vötter and Schnell, 2019b); have higher self-efficacy, resilience, and self-regulation; and are better able to motivate, activate, calm themselves, direct their attention, and cope with failure (Hanfstingl, 2013; Sørensen et al., 2019; Schnell and Krampe, 2020, 2022). The correlates of trait meaningfulness are thus well-researched. However, less is known about how people experience meaning during individual activities or over the course of a day (King and Hicks, 2021).

Why is it worth investigating meaning in everyday life?

Several studies indicate that meaning is not a stable construct, but changes from moment to moment and from day to day (King et al., 2006; Choi et al., 2017; Martela et al., 2018). Newman et al. (2021) observed that it made a difference whether people were asked to rate the meaningfulness of their lives as a whole or across just one day. In particular, the degree of reported meaning differed significantly between these conditions. This may have been due to memory effects, which according to Newman et al. have a major influence on one's evaluation of life as meaningful. It also seems that peak experiences—such as graduation, marriage, or childbirth—are considered when assessing the meaningfulness of one's life. For these reasons, global judgments of meaning significantly overestimate meaning judgments collected *in situ* (Newman et al., 2021).

What makes a good day?

As to the question of what makes a good day, one possible answer could lie in our activities: how we experience them and why we engage in them. In an experience-sampling study, Huta and Ryan (2010) revealed that people mostly reported either hedonic or eudaimonic motives for their activities, but not both at the same time: those two motive types were negatively correlated on the within-person level. When the scores were aggregated to obtain between-person estimates, however, hedonic and eudaimonic motives were correlated positively. This suggests that people who are highly motivated by eudaimonic pursuits also tend to report hedonic interest. In the long run, a combination of both motive types predicted higher levels on several measures of wellbeing. This finding was confirmed by Delle Fave et al. (2011); they demonstrated that the people who experienced the highest levels of wellbeing, physical and mental health, and life satisfaction were those who sought pleasure and meaning simultaneously. Christensen (2017) offers a neuroscientific explanation for the benefits of engaging in both meaningful and pleasant activities: Two systems associated with pleasure and meaning can be distinguished in the brain. The first is the "A-system" consisting of amygdala, posterior ventromedial prefrontal cortex (VMPFC), and striatum (including nucleus accumbens). It functions as the brain's reward system and is responsible for maximizing feelings of immediate gratification. Secondly, there is the "I-system" consisting of the insula, anterior VMPFC, hippocampus, dorsolateral prefrontal cortex, and anterior cingulate cortex; it is responsible for maximizing deferred reward and personal growth. Exclusively pleasant activities (e.g., eating fast food or watching a trivial film) activate the A-system, whereas activities that are typically associated with meaningfulness (e.g., studying or working) activate the I-system (Bechara, 2005; Rolls, 2015). Christensen (2017) argues that ideally, these two systems should be activated simultaneously. The A-system tempts us to do the same activities repetitively, but this can lead to dependence on maladaptive reward-seeking strategies, such as smoking cigarettes, eating fast food, or gambling. However, if we exclusively seek out activities which trigger the I-system, it can cause a loss of desire for these activities and hinder their execution, even though the relative benefits for mental and physical health are clear. For this reason, she posits that we should connect the A- and I-systems by engaging in activities which are not only conducive to wellbeing, but which also create a desire to repeat them. She concludes her argument with the so-called "arts hypothesis." It suggests that only the arts are perceived as meaningful and pleasant at the same time, since they activate both the A- and I-systems. However, this overemphasis of the arts is viewed critically by others, since no receptor or area in the brain has yet been discovered to respond solely to the arts (Skov and Nadal, 2018). Offering a similar two-path approach, Choi et al. (2017) illustrated that various activities could be differentially—but not exclusively—associated with meaning and *happiness*. By their account, people can perceive different undertakings as having one of four possible permutations of these two elements: happy-meaningful, happy-meaningless, unhappy-meaningful, or unhappy-meaningless.

In consideration of these dual-aspect (eudaimonic-hedonic) paradigms, the present study focused on the experience of activities as pleasant and/or meaningful. We first tested the aforementioned arts hypothesis, which suggests that only artistic activities are experienced as both pleasant and meaningful at the same time (hypothesis 1). In doing so, we also examined whether experiences of meaningfulness and pleasantness can occur simultaneously in activities, as indicated by Choi et al.'s (2017) finding concerning happiness and meaning (hypothesis 2).

The hierarchical meaning model

The Hierarchical Meaning Model (HMM) by Schnell (2009, 2014, 2021) is a pyramid model in which the upper levels influence the lower levels, and vice versa. The top of the model represents meaning in life, operationalized by the two dimensions of meaningfulness and crisis of meaning. This is followed by the sources of meaning, goals, actions, and perception. In the present study, we focus on the influence of meaningfulness on actions and perception. According to the HMM, people with a high degree of trait meaningfulness should experience their daily activities as more meaningful than people with low trait meaningfulness (hypothesis 3). As shown by King et al. (2006) and Martela et al. (2018), positive feelings also contribute to the experience of meaning. We therefore also investigated the extent to which perceived state pleasantness—as an indicator of positive affect—predicts the perception of state meaningfulness and vice versa. For both analyses, the moderating effect of trait meaningfulness was tested: Given varying degrees of trait meaningfulness, how does the evaluation of the meaningfulness of activities differ, depending on their pleasantness? And how does the evaluation of the pleasantness of activities differ, depending on their meaningfulness (exploratory analysis 1)? Finally, we explored whether people with high (contrasted with low) trait meaningfulness differed in the type of activities performed (exploratory analysis 2). These results may be particularly informative regarding the practical question of how to live a eudaimonic daily life.

Materials and methods

Samples

In a pretest, $N = 30$ students (70% female, mean age 22 years, SD = 1) participated in a 1-week diary study. At the end of each day, they had the task of listing, in a digital document, the activities they had engaged in that day. The totality of all mentioned activities was then summarized and categorized by the last author and a colleague. A catalog of 13 activity types ensued: study, work, household, eating, resting, watching TV, sports, reading, communication, culture/music, intimacy, transit-time, and other. In the following step, this catalog was used in the Experience-Sampling Method (ESM) study presented here. A sample of $N = 62$ students (80% female, mean age 23 years, SD = 4) were involved in this study. No sample size planning was done prior to the survey; instead, the aim was to recruit as many participants as possible.

Procedure and measures

The participants first completed the meaningfulness scale from the Sources of Meaning and Meaning in Life Questionnaire (SoMe, Schnell and Becker, 2007), using a paper-pencil version. They then participated in a 1-week ESM study, wherein we used a palmtop for collecting the data. This device beeped five times a day at random times to prompt participants to respond to a short survey. At these time-points, they were then asked to select the type of activity in which they were currently engaged from the pretest-derived list, and then subjects were to rate, on a Likert scale from 0 (*strongly disagree*) to 5 (*strongly agree*), how meaningful and how pleasant they perceived the activity to be. Pleasantness was measured by a single item ("It is pleasant."), whereas the meaningfulness of the activity was assessed by a five-item scale, adapted from the SoMe (Schnell and Becker, 2007). The items on this adapted version were: "I experience it as meaningful.," "It fits my life task.," "It fulfils me.," "It makes me feel like I am part of something bigger.," and "It has a deeper meaning.."

Results

The gathered data were analyzed using *R-Studio* version 4.2.0. and *IBM SPSS Statistics* version 26. The following software packages in *R-Studio* were used: *ggplot2* (Hadley, 2016), *lme4* (Bates et al. 2018), *interactions* (Long and Long, 2019), *nlme* (Pinheiro et al. 2017), *psych* (Revelle, 2018), *dplyr* (Wickham et al. 2019b), and *tidyverse* (Wickham et al. 2019a).

Descriptive statistics

The ESM survey had a response rate of 85% for the entire week and across all subjects. The number of observations, means, standard deviations, skewness, kurtosis, range, and Cronbach's alpha is presented in Table 1. Skewness and kurtosis values for all variables indicated a near-normal data distribution (<|2|, George and Mallery, 2020). Inter-variable correlations ranged from $r = 0.10$ to $r = 0.66$ (see Table 2). Applying a cutoff score of 3 for perceived state pleasantness/meaningfulness (Schnell, 2010), participants experienced 52% of their activities as pleasant and 40% of their activities as meaningful.

Table 3 shows the proportion of variance at the between-person (level 2) and within-person (level 1) levels for state meaningfulness and state pleasantness. The data are organized in

TABLE 1 Descriptive statistics for trait meaningfulness, state meaningfulness, and state pleasantness.

Scale	*n*	*M*	SD	Skewness	Kurtosis	Cronbach's alpha
Trait meaningfulness	62	3.30	0.98	−0.41	−0.60	0.82
State meaningfulness	1,863	2.55	1.20	−0.03	−0.70	0.87
State pleasantness	1,863	3.40	1.34	−0.64	−0.23	–[a]

n = datapoints, *M* = mean, SD = Standard deviation. Range for all scales: 0–5.
[a]One item only.

TABLE 2 Intercorrelations of trait meaningfulness, state meaningfulness, and state pleasantness.

Variables	Trait meaningfulness	State meaningfulness
State meaningfulness	0.37**	
State pleasantness	0.10**	0.44**

**$p < 0.01$.

TABLE 3 Proportions of variance at the between-person (level 2) and within-person (level 1) levels for state meaningfulness and state pleasantness.

	State meaningfulness	State pleasantness
Person (level 2)	38%	14%
Situation (level 1)	62%	86%
Total	100%	100%

Situation (level 1) nested in persons (level 2).

a hierarchical dataset, where situations (level 1) are nested within persons (level 2). Most of the variance in state pleasantness (86%) and, to a lesser degree, in state meaningfulness (62%) can be attributed to situational variation (within-person variance). Comparatively, more than a third (38%) of the variance in state meaningfulness could be explained by individual differences (between-person variance).

Hypothesis 1

Hypothesis 1—the arts hypothesis—postulated that only cultural activities are experienced as both highly meaningful and highly pleasant. We tested whether the participants assessed cultural activities as more meaningful and pleasant than all other activities by conducting two two-level hierarchical linear regression models (HLM), in which level 1 represented situations and level 2, persons. The activity "culture/music" served as a reference group for all other activities. An activity was considered different from culture/music if the unstandardized regression coefficients were significantly different. The final model contained a random intercept, which allowed activities to vary from person to person, and since there were no continuous predictors in the model, the slope could not be random and was thus fixed. Activity types constituted the independent variable, while state meaningfulness and state pleasantness served as the dependent variables. Although there was evidence of heteroscedasticity, HLM is considered a relatively robust procedure (Darandari, 2004). All other relevant assumptions of this statistical model were tested prior to analysis and were deemed to have been satisfied, as supported by the values in Table 1. The results, as shown in Table 4, indicate that cultural activities were indeed experienced as meaningful and pleasant simultaneously. However, this combination was not unique to cultural pursuits, as it was also observed for three other types of activities, namely: communication, sports, and intimacy.

Hypothesis 2

The next hypothesis aimed to check the assumption that activities can be experienced as both meaningful and pleasant, which was examined with the same analyses used to test Hypothesis 1. The data modeled and reported in Table 4 supports this assumption, and Table 5 shows which types of activities were considered meaningless-unpleasant, meaningful-unpleasant, meaningless-pleasant, and meaningful-pleasant.

Hypothesis 3

Our third hypothesis intuited that people high in trait meaningfulness also tend to perceive their momentary engagements as more meaningful. To address the multi-level structure of this research question, we again utilized a two-level hierarchical linear regression. Level 1 represented situations and level 2, persons, with the situations level nested within persons. Trait meaningfulness served as a predictor for the outcome variable, state meaningfulness. Given that correlation analyses indicated a positive relationship between state meaningfulness and state pleasantness, the latter was included as a covariate. As suggested by Antonakis et al. (2021), we further controlled for person-average pleasantness. The final model (model 4) allowed the person level to have a random intercept of the outcome variable, state meaningfulness, and the regression slopes were allowed to vary freely from one participant to the next. The results from this analysis (as presented in Table 6) indicate that trait meaningfulness ($b = 0.25$, SE = 0.05, 95% CI [0.14, 0.35], $p < 0.001$); person-average pleasantness ($b = 0.51$, SE = 0.09, 95% CI [0.33, 0.70], $p < 0.001$); and state pleasantness ($b = 0.30$, SE = 0.03, 95% CI [0.24, 0.36], $p < 0.001$) all predicted the experience of situations as meaningful—independently of the activity types in which participants engaged.

Exploratory analysis 1

We followed up the previous findings with an exploratory analysis, wherein we investigated whether state pleasantness was predictive of perceived state meaningfulness, when an individual's degree of trait meaningfulness is considered as a qualification of the model from hypothesis 3. This analysis was designed to elucidate the relationship between the predictor variable (trait meaningfulness) and its covariates (person-average pleasantness and state pleasantness). The final model 6 (see also Table 6) was a cross-level interaction model with trait meaningfulness (level 2) as a moderator for the relation between state pleasantness (level 1) and state meaningfulness (level 1). According to this model, the

TABLE 4 Descriptive statistics of state meaningfulness and state pleasantness across daily activities and results of the two two-level hierarchical linear regressions with the outcome variables state meaningfulness and state pleasantness predicted by daily activities, all at level 1, nested in persons at level 2.

				State meaningfulness				State pleasantness			
	N	*n*		*M*	SD	*b* (SE)	95% CI	*M*	SD	*b* (SE)	95% CI
Culture/music	34	60	(3.27%)	3.24	0.94			4.13	0.92		
Communication	52	212	(11.55%)	3.01	1.23	−0.11 (0.12)	[−0.35, 0.13]	4.33	0.82	−0.09 (0.16)	[−0.40, 0.22]
Doing housework	45	101	(5.50%)	1.83	0.96	−1.41 (0.14)***	[−1.67, −1.15]	2.12	1.27	−2.10 (0.17)***	[−2.44, −1.76]
Eating	59	184	(10.02%)	2.63	1.03	−0.63 (0.12)***	[−0.87, −0.39]	4.11	0.92	−0.16 (0.16)	[−0.47, 0.15]
Intimacy	17	30	(1.63%)	3.21	1.27	−0.03 (0.19)	[−0.39, 0.34]	4.17	1.15	−0.19 (0.24)	[−0.66, 0.27]
Other	43	124	(6.75%)	2.00	1.26	−1.07 (0.13)***	[−1.32, −0.81]	3.26	1.46	−0.92 (0.17)***	[−1.25, −0.59]
Sports	22	35	(1.90%)	3.40	1.27	0.09 (0.18)	[−0.26, 0.44]	4.26	0.85	−0.09 (0.23)	[−0.54, 0.36]
Reading	25	46	(2.51%)	2.92	1.06	−0.43 (0.16)**	[−0.74, −0.11]	4.02	0.93	−0.36 (0.21)	[−0.76, 0.05]
Relaxing	59	218	(11.87%)	2.25	1.10	−0.87 (0.12)***	[−1.11, −0.64]	3.95	1.25	−0.20 (0.16)	[−0.51, 0.10]
Studying	61	458	(24.95%)	2.93	1.03	−0.16 (0.11)	[−0.38, 0.06]	2.62	1.18	−1.61 (0.15)***	[−1.90, −1.33]
Transit-time	50	127	(6.92%)	2.18	1.16	−1.08 (0.13)***	[−1.33, −0.83]	2.90	1.22	−1.39 (0.17)***	[−1.71, −1.06]
Watching TV	52	162	(8.82%)	1.61	1.00	−1.50 (0.13)***	[−1.75, −1.26]	3.84	1.09	−0.42 (0.16)**	[−0.73, −0.10]
Working	21	79	(4.30%)	2.60	1.47	−0.26 (0.15)	[−0.55,0.03]	2.89	1.26	−1.13 (0.19)***	[−1.50, −0.76]
Total	62	1,836	(100%)	2.55	1.20			3.40	1.34		

N = number of subjects who carried out the activity; *n* = number of occurrences of the activity; *M* = mean; SD = standard deviation; b = unstandardized regression coefficients for state meaningfulness and pleasantness at level 1; SE = Standard Error; 95% CI = 95% Confidence Intervals of regression coefficients for state meaningfulness and pleasantness. $^{**}p < 0.01$, $^{***}p < 0.001$. −2*Log Likelihood (−2LL) of the final model of state meaningfulness = 4,619.84*** and −2LL of state pleasantness = 5,462.28***. Pairwise comparisons of −2LL by ANOVAS were used to determine model gains. Activities were effect coded. The activity "culture/music" was used as the baseline. The final model had a random intercept with activities as predictor. Activities (level 1) were nested in persons (level2). Intercept with 95% CI for state meaningfulness = 3.15 (0.14)*** [2.87, 3.43]; intercept with 95% CI for state pleasantness = 4.22 (0.15)*** [3.93, 4.52].

TABLE 5 Four types of activities: pleasant-meaningful, unpleasant-meaningful, pleasant-meaningless, unpleasant-meaningless.

	Unpleasant activity	Pleasant activity
Meaningless activity	Doing housework, other, transit-time	Eating, relaxing, reading, watching TV
Meaningful activity	Studying, working	Communication, culture/music, intimacy, sports

tendency to experience situations as meaningful was only positively predicted by the interaction of trait meaningfulness and state pleasantness ($b = 0.07$, SE = 0.03, 95% CI [0.01, 0.13], $p < 0.05$) As this cross-level interaction remained significant after including the interaction between trait meaningfulness and person-average pleasantness on level 2, it can be deemed a true cross-level interaction (Antonakis et al., 2021).

Figure 1 illustrates the interaction between the independent variable (state pleasantness) and the moderating variable, trait meaningfulness. The Johnson Neyman plot (Figure 2) indicates significant results for all parts of this interaction, except for the lowest section: For moderator (trait meaningfulness) values below 1.17, state pleasantness did not significantly interact with trait meaningfulness. In other words, the more the activities were perceived as pleasant, the more they tended to also be experienced as meaningful. This correlation was clearly more pronounced among participants who tested high for trait meaningfulness. Among those with low trait meaningfulness, state meaningfulness did not covary with state pleasantness. With regard to absolute values, the data show that individuals with low trait

TABLE 6 Two-level linear regression results; outcome variable: state meaningfulness.

	Model 1	Model 2	Model 3	Model 4[a]	Model 5	Model 6[b]
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)	*b* (SE)
Level 2 (person)						
Intercept	2.55 (0.10)***	1.07 (0.28)***	−1.12 (0.39)**	−1.01 (0.32)**	−0.78 (0.89)	−0.50 (0.89)
Trait meaningfulness (tm)		0.45 (0.08)***	0.34 (0.06)***	0.25 (0.05)***	0.17 (0.28)	0.10 (0.28)
Person-average			0.75 (0.11)***	0.51 (0.09)***	0.44 (0.27)	0.52 (0.27)
pleasantness (pap)						
Interaction (level 2)						
tm*pap					0.02 (0.08)	0.00 (0.08)
Level 1 (situation)						
State pleasantness (sp)				0.30 (0.03)***	0.30 (0.03)***	0.07 (0.11)
Cross-level interaction						
tm*sp						0.07 (0.03)*
Model fit						
−2LL	5,195.09	5,169.94***	5,136.24***	4,759.35***	4,759.27	4,754.2*

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; *b* = unstandardized regression coefficients, SE = standard error, −2LL = −2*Log Likelihood. Pairwise comparisons of −2LL by ANOVAS were used to determine model gains. Model 1 = Intercept-Only-Model with random intercept per person, Model 2 = Random Intercept with trait meaningfulness (level 2) as predictor with random intercept per person, Model 3 = Random Intercept with trait meaningfulness (level 2) and person-average pleasantness per person as predictor (level 2) with random intercept per person, Model 4 = Random-Slope Model with trait meaningfulness (level 2), person-average pleasantness (level 2) and state pleasantness (level 1) as predictors with random intercept per person and state pleasantness as random slope, Model 5 = Random-Slope Model with trait meaningfulness (level 2), person-average pleasantness (level 2), state pleasantness (level 1) and the interaction on level 2 between trait meaningfulness and person-average pleasantness as predictors with random intercept per person and state pleasantness as random slope, Model 6 = Random-Slope Model with trait meaningfulness (level 2), person-average pleasantness (level 2), state pleasantness (level 1) and the cross-level interaction between trait meaningfulness (level 2) and state pleasantness (level 1), interaction on level 2 between trait meaningfulness and person-average pleasantness as predictors with random intercept per person and state pleasantness as random slope.

[a]Final model, hypothesis 3.

[b]Final model, exploratory analysis 1.

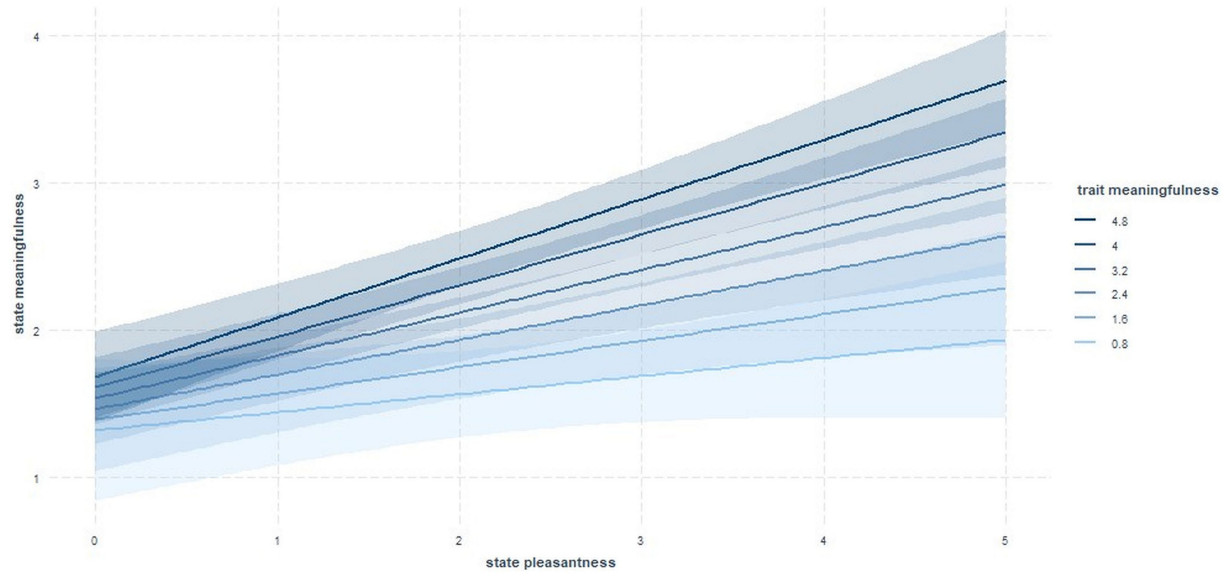

FIGURE 1
Interaction of trait meaningfulness and state pleasantness in the prediction of state meaningfulness.

meaningfulness (<3) viewed their present endeavors as little meaningful on the whole (average scores did not exceed 2.9, see Figure 1), even if they also rated those same actions as very pleasant.

In a similar vein, we examined whether state meaningfulness tended to predict reported state pleasantness, when we have accounted for the participant's trait meaningfulness. The final model incorporated state meaningfulness as random slope and

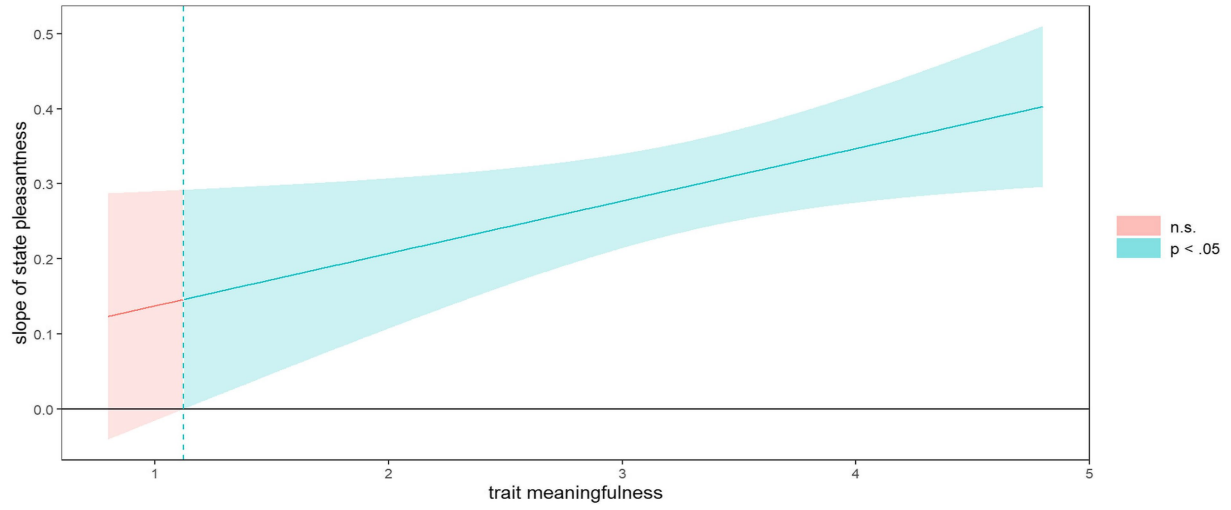

FIGURE 2
Johnson Neyman plot of interaction trait meaningfulness and state pleasantness.

TABLE 7 Two-level linear regression results; outcome variable: state pleasantness.

	Model 1	Model 2	Model 3	Model 4
	b (SE)	*b* (SE)	*b* (SE)	*b* (SE)
Level 2 (person)				
Intercept	3.40 (0.07)***	2.94 (0.24)***	2.34 (0.20)***	2.15 (0.23)***
Trait meaningfulness		0.14 (0.07)	−0.11 (0.07)	−0.11 (0.06)
Person-average meaningfulness			0.56 (0.08)***	0.12 (0.08)
Level 1 (situation)				
State meaningfulness				0.49 (0.04)***
Model fit				
−2LL	6,109.94	6,106.06*	6,072.34***	5,738.30***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$; *b* = unstandardized regression coefficients, SE = standard error, −2LL = −2*Log Likelihood. Pairwise comparisons of −2LL by ANOVAS were used to determine model gains. Model 1 = Intercept-Only-Model with random intercepts per person, Model 2 = Random Intercept with trait meaningfulness (level 2) as predictor with random intercepts per person, Model 3 = Random Intercept with trait meaningfulness (level 2) and person-average meaningfulness (level 2) as predictor with random intercepts per person, Model 4 = Random-Slope Model with trait meaningfulness (level 2), person-average meaningfulness (level 2) and state meaningfulness (level 1) as predictors with random intercepts per person and state meaningfulness as random slope.

random intercepts per person; the predictors modeled were trait meaningfulness, person-average meaningfulness, and state meaningfulness. The analysis yielded no significant model gain by adding the interaction between state meaningfulness and trait meaningfulness. As Model 4 in Table 7 shows, state pleasantness was positively predicted by state meaningfulness ($b = 0.49$, SE = 0.04, 95% CI [0.41, 0.58], $p < 0.001$), but not by trait meaningfulness nor by person-average meaningfulness.

Exploratory analysis 2

Finally, by means of a Chi-square test, we tested whether people with a high level of trait meaningfulness (scores ≥ 3; *cf.* Schnell, 2010) engaged in more pleasant-meaningful activities, i.e., those found in the evaluation of hypothesis 1 (e.g., *culture/music, communication, intimacy, sports*; see Table 5). The results indicated that this was not the case: Participants with high trait meaningfulness did not seem to differ significantly from participants with low trait meaningfulness in terms of the frequency of carrying out activities typically rated as pleasant-meaningful.

Discussion

Based on the combination of a questionnaire survey and a 1-week experience-sampling study, our data provided several insights into how people with high trait meaningfulness spend and experience their days. Depending on the type, activities were experienced as meaningless-unpleasant, meaningful-unpleasant, meaningless-pleasant, or meaningful-pleasant. Our analysis results led to a rejection of Christensen's (Christensen, 2017) hypothesis that only artistic activities are experienced as both pleasant and meaningful. Instead, the data implied that not just culture and music are experienced as simultaneously meaningful and pleasant, but also doing sports, sharing intimacy, and communicating. Similar results were reported by Choi et al. (2017) for combinations of happiness and meaningfulness. They found that various activities such as cooking, dating, eating, sports, playing an instrument, praying,

reading, shopping, socializing, traveling, walking, communicating, and volunteering were associated with both meaning and happiness at once. To observe a common denominator, pleasant-meaningful activities all seem to be self-selected (leisure) activities. This ties in with findings from Martela et al. (2018), who suggested that the fulfillment of basic psychological needs (autonomy, competence, and relatedness) predicts daily meaningfulness.

In contrast to state meaningfulness (62%), state pleasantness was more affected by the current situation (86%). This suggests that state pleasantness is more volatile than state meaningfulness. This might be one of the reasons why the pursuit of happiness has been found to cause unhappiness (Mauss et al., 2011, 2012; Ford et al., 2014, 2015), as people who only chase quick happiness are much more dependent on factors that are external to themselves – and thus, beyond their control. Further research should clarify this volatility hypothesis.

A substantial overlap between situational pleasure and meaning was indicated by the positive correlation ($r = 0.44$) between state pleasantness and state meaningfulness. This result fits in with previous research on the close connection between positive feelings and meaning (King et al., 2006; Hicks et al., 2012; Tov and Lee, 2016; Chu et al., 2020; Miao and Gan, 2020).

Trait meaningfulness and state meaningfulness were moderately correlated ($r = 0.37$) with each other. This suggests that people with a higher sense of meaning in life also perceive their daily activities as more meaningful; but neither can evaluations of meaning in life be determined from momentary experiences, nor vice versa. A similar conclusion was already reached by Newman et al. (2021) with reference to global and repeated daily assessments of meaning. Moreover, in both Newman et al. (2021) and the present data, global judgments overestimated aggregated daily and situational states. When assessing global meaning in life, people appear to adopt a meta-perspective that allows them to weight and re-evaluate individual experiences (Schnell, 2021). In the assessment of everyday situations, i.e., immersed in the midst of life, this perspective seems to be often unavailable—which is also reflected in the fact that these situations are assessed as less meaningful overall.

Then, we confirmed through mixed-model analysis that one's perceived meaning in life statistically predicts the way in which they experience everyday activities. Our reported evidence for hypothesis 3 provides further empirical support for the HMM by Schnell (2009, 2014, 2021), which states that a general sense of meaning increases the perception of daily actions as meaningful. The moderator analysis for the prediction of state meaningfulness revealed another interesting result: When the interaction of state pleasantness and trait meaningfulness was included, the respective unique contributions of the two variables were no longer significant. This leads us to qualify the results for hypothesis 3: people with high trait meaningfulness do not always perceive activities as more meaningful, but rather, only when they are experienced as at least somewhat pleasant. Unpleasant activities are, in principle, more likely to be regarded as meaningless, irrespective of a person's general sense of meaning in life. The significant predictor person-average pleasantness suggests that, overall, people who generally enjoy their pursuits are prone to also find them more meaningful. Nevertheless, the interaction between person-average pleasantness and trait meaningfulness was not significant, which is an indicator that we found a true cross-level interaction between trait meaningfulness and state pleasantness. We interpret this finding to indicate that trait meaningfulness predicts daily actions (in the sense of the HMM) regardless of whether people generally enjoy their daily actions more or less.

Whereas Halusic and King (2013) concluded that pleasure is sufficient, but not necessary, for the experience of state meaningfulness, our data suggest that positive feelings might be predictive of perceiving activities as meaningful (at least among people with high trait meaningfulness), but they are not sufficient. People with low trait meaningfulness evaluated their daily activities as low in meaning, even if they experienced them as very pleasant.

Conversely, the pleasantness of an activity was predicted by one's tendency to experience that same activity as meaningful, but not by trait meaningfulness, nor by their interaction. This suggests that meaningful activities are often experienced as pleasant as well. In these cases, we might apply Klinger's (Klinger, 1998) explanation: positive feelings have a confirmatory utility for experiencing meaning. They provide positive feedback that something meaningful has been accomplished.

When we finally explored the question if people high in trait meaning engaged more often in meaningful-pleasant activities (sports, communication, culture/music, and intimacy), we found this to not be the case. Rather, it seems that people with high trait meaningfulness simply judge their everyday activities to be more meaningful than people with low meaning in life, even if both groups find their activities equally pleasant. Alternatively, it might be the case that people with high trait meaningfulness do not just value these same activities as more meaningful, but that they choose more meaningful ways to do them: for example, they could choose an interesting rather than a boring job, or they choose something fascinating and meaningful to read or watch rather than reacting to notifications on social media or zapping on TV. Further research is necessary to clarify this. In summary, these new results provide further empirical evidence for the Hierarchical Meaning Model by Schnell (2009, 2014, 2021): Meaning in life has a top-down effect on our activities and on our perception. Because the assessment of trait meaningfulness chronologically preceded the ESM study, a strong meaning in life can be said to cause (in the sense of Granger causality; Granger, 1969), the experience of daily activities as meaningful.

Limitations

The results reported here are based on a sample of young, educated, white people. Therefore, they cannot be generalized to other populations. Most participants reported a relatively high trait meaningfulness. A possible explanation for the insignificant results in the Johnson Neyman analysis for trait meaningfulness scores lower than 1.17 might be the fact that only very few people had such low levels of trait meaningfulness. It is striking, however, that the

participants experienced a large part of their activities as meaningless. This raises the question of whether this is typical for students, for the specific age group, or other reasons. A replication of the study using a heterogeneous sample would therefore be useful. Another limitation is the assessment of state pleasantness by one item only. Although the reliability of this measure might thus be questionable, the use of single items for narrow and unambiguous constructs is increasingly seen as acceptable (*cf.* Allen et al., 2022). Moreover, several activities like intimacy ($n = 30$), sports ($n = 35$), and reading ($n = 46$) were observed on a low incidence basis. Further replications should thus validate these results.

Finally, the data were collected through self-report questionnaires, and it is not clear how much the subjects were biased by the survey itself. In most cases, people are unaware of the meaningfulness of their lives, and meaning becomes questionable primarily only in times of crisis (Schnell, 2021). By repeatedly asking about the meaningfulness of activities, several times a day and over the course of a week, an artificial situation is created that does not normally occur among people who are not in a crisis of meaning.

Conclusion

Returning to the initial question of how modern individuals can achieve a good life without the guidance of external authorities, it seems less relevant *what* activities they perform in their everyday life. Instead, it seems more important to know *why* they do them, in order to be able to frame them in a generally present sense of meaning in life. What matters is therefore to develop one's personal meaning in life. For individuals in modern, highly individualistic societies, condemned to freedom (Sartre and König, 2014), meaning in life is no longer an object to be found in sacred texts, social norms, or traditions, but an attitude to be trained and elaborated. If they then manage to enjoy what they are doing as well, days full of good moments are not only possible, but very likely.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

CK analyzed the data and wrote the first draft of the manuscript. TS conceptualized the study, collected the data, and revised the manuscript. Both authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Awareness of meaning and quest for meaning: The mechanisms between future orientation and prosociality among youth during pandemic

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Introduction: The positive relationship between future orientation and prosocial tendency has been consistently reported. However, the possible mechanism has not been examined yet. Previous research revealed the positive relationship between future orientation and meaning in life, as well as between meaning in life and prosocial tendency. Hence, it is hypothesized that the two components of meaning in life (presence of meaning and search for meaning) possibly mediate the relationship between future orientation and prosocial tendency.

Methods: During the first half of 2020, 430 Hong Kong youths aged 15–35 (male: 30.5%; female: 69.5%) were recruited to participate an online cross-sectional survey. The survey included three scales: (1) The Scale for Measuring Adult's Prosocialness, (2) Consideration of Future Consequence Scale, and (3) Meaning in Life Questionnaire.

Results: The key findings showed that: (1) females had higher level of prosocial tendency than males, and (2) significant partial mediating effects of both presence of meaning and search for meaning on the relationship between future orientation and prosocial tendency. Nevertheless, the multi-group mediation model did not show significant gender difference.

Discussion: These findings implied that future-oriented and meaning-focused interventions could possibly enhance youth's sense of meaning in everyday life and foster their meaning searching tendency, which further strengthen the positive effect of their future orientation on prosocial tendency, even during life adversities.

KEYWORDS

meaning in life, presence of meaning, search for meaning, future orientation, prosocial tendency, Chinese youth

1. Introduction

The total number of volunteers and the total time spent on volunteering showed a decrement trend globally. As compared to the time before COVID-19 pandemic, a lower volunteer rate in Australia was observed (Biddle and Gray, 2022), and the service time of United States volunteers decreased by 66% (Fidelity Charitable, 2020). During pandemic, more than a half of the non-government organizations have limited resources for operation (Sterling Volunteers, 2021). In Hong Kong, there was a sharp falling in the volunteer service hours in 2020 with a decrease of 13 million hours as compared to 2019 (Volunteer Movement, 2020). The decline of prosocial behaviors reflects the decreasing tendency to help people or fewer chances to perform prosocial acts due to limited operation of non-government organizations.

Prosocial behaviors other than helping behaviors are also particularly essential for a society, for instance, cooperation is a need for the survival of human beings. Prosocial behaviors work as a "social glue" that allows people to cooperate with harmony and productivity (Lay and Hoppmann, 2015). Furthermore, prosocial behaviors can support human beings to face global crises such as COVID-19 pandemic. For instance, employing protective measures is regarded as a form of prosocial behavior due to the other-orientated motivation to help reducing the infection and transmission of COVID-19 (Dinić and Bodroža, 2021).

Previous research has shown that future orientation is positively associated with prosociality (Strathman et al., 1994; Moore et al., 2001; Strobel et al., 2013; Li et al., 2019). Furthermore, meaning in life has been shown to be positively related with prosocial tendency (Lin, 2019; Liu and Zhang, 2020). Considering the rapid drop of prosocial acts globally during pandemic and the importance of cooperation to face life challenges, it is important to investigate the possible factors and mechanisms for enhancing prosociality when facing challenges and adversities in everyday life. It is not surprising that thinking about the future can contribute to prosocial tendency as a prosocial act may involve the trade-off between limited short-term benefits and greater long-term benefits (Romer et al., 2010). However, although the long-term benefits of a prosocial act can be greater, these benefits may not be meaningful to an individual. Therefore, it is possible that, after thinking about the consequences of a particular prosocial act, the individual evaluates whether the outcomes are meaningful or not according to his/her meaning system to decide whether to perform the prosocial act. And that is a meaning making process that assigns meaning to the events and stimuli (Märtsin, 2019). Also, meaning in life involves the integration and comprehension of the anticipated future to construct meaning in life. Nevertheless, the possible mediation effect of meaning in life in the relationship between future orientation and prosociality has not been examined yet. Hence, an investigation of this proposed mediation model can provide some recommendations for enhancing prosociality of young adults. Hence, the main purpose of this study is to examine whether the two components of meaning in life, presence of meaning and search for meaning, can significantly mediate the relationship between future orientation and prosocial tendency.

2. Literature review

2.1. Prosocial tendency

Prosocial acts refer to human behaviors that eliminate suffering and promote well-being of others, and prosocial tendency reflects how likely an individual would perform a prosocial act (Eisenberg and Miller, 1987; Caprara et al., 2005). There is a variety of prosocial behaviors, like offering help to others, benevolent actions, and collaboration with others. Interestingly, recent research (Dinić and Bodroža, 2021) argued that adopting protective measures against COVID-19 transmission should also be regarded as a type of prosocial behavior during the pandemic since the motivation behind these acts is to protect others from infection.

Furthermore, Eisenberg et al. (2002) have demonstrated that prosocial behaviors were crucial for increasing social bonding and relatedness, maintaining social harmony, and supporting the development of the individuals and the society. Prosociality is also highly related to psychological wellbeing, happiness, and life satisfaction (Lauri and Calleja, 2019). Furthermore, prosociality can be one of the protective factors against negative psychological outcomes like depression and anxiety (Raposa et al., 2016; Taylor et al., 2017) and negative behavioral outcomes like substance abuse (Carlo et al., 2011). Therefore, prosocial tendency appears to be an influential factor for mental wellness.

2.2. Future orientation and prosocial tendency

Future orientation describes how often and how likely an individual thinks about and adjusts oneself for the future (Nurmi, 2005; Seginer, 2009). Particularly, individuals with higher level of future orientation are more likely to consider future, anticipate future outcomes, and have a plan before any actions; whereas those with lower level of future orientation are more likely to focus on the present and immediate consequences and do not want to think or plan ahead for the future (Nurmi, 2005; Seginer, 2009). Importantly, future orientation is associated with emotional, attitudinal, cognitive, behavioral aspects of an individual, and involves the process of decision making (Nurmi, 2005). Therefore, future orientation is closely linked to people's optimistic or pessimistic thoughts in their daily lives. Various terms like future time orientation, possible future self, future time perspective, and consideration of future consequences have been used interchangeably to conceptualize future orientation (Seginer, 2009).

Empirical research showed that future orientation is associated with prosociality. Moore et al. (2001) find that thinking about possible future manifested in delayed gratification which supports one's prosocial behaviors, for instance, sacrificing one's current needs to benefit others' needs. Furthermore, future orientation has been found to be a key predictor of prosociality (Strathman et al., 1994; Strobel et al., 2013), the mediators on the relationship between awe and prosocial behavior (Li et al., 2019) and the mediator between reputational motivation and prosocial behavior (Choi, 2020). Furthermore, higher level of future orientation helps individuals to resist the temptation to have immediate rewards for a greater reward in the future (Romer et al., 2010). Nevertheless, future-based cost-effect analysis is not sufficient to explain all prosocial behaviors; for instance, devoting oneself to the propagation of religion can provide others with mental comfort and inner peace, but the missionary does not receive any substantial rewards. One important question should be stressed here is what make people to have such costly prosociality. Given that religion is one of the sources constructing meaning in life (Fletcher, 2004), meaning in life is a possible reason fostering people to do these prosocial acts.

2.3. Meaning in life: The presence of and the search for meaning

Meaning in life is a subjective feeling and experience of the sense of significance and worthiness toward oneself, the life, and the world, and involves sensemaking to interpret and organize stimulations and personal experiences (Steger, 2009). Three constructs of meaning in life are proposed – comprehension, purpose, and significance (Steger, 2009; George and Park, 2016; King and Hicks, 2021). First, comprehension refers to the consistency of how an individual interprets, comprehends, and integrates, his/her experiences, the self, and the world. Second, purpose refers to the perception that an individual is moving toward to valued goals. Third, significance refers to the belief that an individual is important, and influential to others and the world.

Furthermore, Steger et al. (2006) suggested that presence of meaning and search for meaning reflected the two dimensions of meaning in life. Presence of meaning in life demonstrates the perceived meaningfulness, worthiness, and importance. On the other hand, search for meaning in life reflects the tendency to seek, develop, and enhance the understanding and the sense of meaning in life. Steger et al. (2006) suggested that the presence of meaning and search for meaning are not mutually exclusive. That is, people who have higher level of the presence of meaning can have either high or low level on the search for meaning, and vice versa.

Chu and Fung (2021) proposed two types of meaning searching process: growth searching and deficiency searching. Growth searching is to deepen the understanding and look for further meaning with well-established sense of meaning, whereas deficiency searching is to reduce the anxiety resulted from the lack of the sense of meaning. Distress may be the short-term effect of deficiency searching, especially during life adversities when there is a lack of the awareness of meaning. In the long-run, people who adopt deficiency searching are more likely to experience the sense of meaning as compared to those who have lower motivation to search for meaning (Chu and Fung, 2021). The two types of searching process can also be considered as a continuous meaning making process. That is, people with low level of presence of meaning usually experience deficiency searching and establish sense of meaning in the long run; then, once an individual establishes a sense of meaning, growth searching process is adopted for further development of meaning or searching for other meaning. Most importantly, this continuous and dynamic searching process of meaning in life (Brown, 2000; Seligman, 2004; Chu and Fung, 2021) can further develop and deepen meaning from focusing on oneself to others, supporting and sustaining the belief of the significance of one's existence (Steger, 2012; King and Hicks, 2021).

2.4. Meaning in life and future orientation

Research revealed that future orientation was associated with the presence of meaning in life (Hicks et al., 2012; Baumeister et al., 2020; Miao et al., 2021). Theoretically, the constructs of meaning in life are relevant to future orientation. "Comprehension" involves the integration of the past, present, and the anticipated future, and "purpose" involves goals setting and plans that help to achieve goals; the belief that one's long-lasting influence (i.e., "significance") is also related to future anticipation (Steger, 2009; George and Park, 2016; King and Hicks, 2021). Thus, future-orientated individuals tend to have higher sense of meaning due to the increased sense of comprehension, purpose, and significance derived from thinking about future, anticipating the future, and planning for the future.

Moreover, future orientation also strengthens meaning searching tendency. Leshkovska and Shterjovska (2014) argued that future time perspective contributed to the tendency to search for further or deeper meaning in life. Also, youths are more likely to search for meaning from the future goals to develop a sense of purpose and significance to overcome the rumination of negative past experiences (Leshkovska and Shterjovska, 2014).

2.5. Meaning in life and prosocial tendency

Studies (Van Tongeren et al., 2016; Klein, 2017) revealed that prosocial acts fostered the presence of meaning by increasing the sense of self-worth, self-transcendence, and relationship satisfaction. Nevertheless, more studies proposed a reversed relationship between the presence of meaning and prosocial tendency. Previous research found that meaning could significantly enhance youths' volunteering beliefs, tendencies, and behaviors (Law and Shek, 2009) and boosted adolescents' altruism

(Shek et al., 1994). Furthermore, meaning in life can promote civic engagement *via* participating in voluntary organizations and increase sense of social connectedness (Routledge and FioRito, 2021). As aforementioned, meaning in life *per se* involves self-transcendent property which highlight the perceived significance and influence of oneself to the others and the world (Steger, 2009; George and Park, 2016; King and Hicks, 2021). Researchers (Brown, 2000; Seligman, 2004) also suggested that meaning in life involved the contribution to people or things other than oneself. Therefore, it is not surprising that presence of meaning positively predict prosocial tendency.

The positive association between meaning in life and prosocial tendency indicates that people searching for meaning would engage in prosocial acts to experience meaningfulness. Particularly, meaning-seekers show the strong intention to engage in civic activities (Lin, 2019) because these activities can enhance their sense of meaning through increasing social connectedness (Ohmer, 2007), self-esteem (Brown et al., 2012), and sense of competence in organizing their lives (Zimmerman and Rappaport, 1988), which are highly associated with meaning in life (Heine et al., 2006). In addition, meaning-seekers engage in high-cost prosocial acts like kidney donation (Dakin et al., 2021) probably because these prosocial behaviors with higher costs are viewed as having more valuable and significant meaning (Olivola and Shafir, 2011; Inzlicht et al., 2018).

2.6. Future orientation, meaning in life, and prosocial tendency

Ellis (1991) ABC model has been widely used for the conceptualization of psychopathology, which highlights the irrational belief regarding events on contributing maladaptive behavioral and mental consequences (Bernard et al., 2010). Nevertheless, the model not only provides the conceptualization for problem behaviors and mental illness, but also motivates adaptive behaviors (e.g., Malkinson, 2010), and even wellness (Bernard et al., 2010). The model consists of three components - activating event (A-component), belief (B-component), and consequences (C-component). The A-component stands for any external and internal activating events, and the B-component refers to the interpretations and understandings of activating events; further, based on the interpretation and understandings made, an individual is likely to act or to react as C-component (Ellis, 1991).

The present study suggests that the relationships among future orientation, meaning in life, and prosocial tendency can be conceptualized with Ellis (1991) ABC model (see Figure 1). Considering future orientation provides rich internal stimulations (e.g., goal seeking, anticipated future, and possible self), future orientation can be considered as the source of A-component. Furthermore, meaning in life can be considered as the B-component. Belief is defined as the subjective feelings and cognition regarding oneself and the environment around (Ajzen, 1995), which is highly similar to the construct of meaning in life defined by Martela and Steger (2016). Comprehension is about making sense of and having a sense of predictability and recognizability toward oneself, one's life, and the world, whereas purpose and significance are about the value judgements on what is good, and valuable (Martela and Steger, 2016). It is worth noting that the sense of comprehension, and value judgements are belief, which represents unique and subjective understanding and interpretations for everything. Additionally, to decide whether the future outcomes are meaningful and valuable, one likely refers to his/her meaning system to make such judgements (Märtsin, 2019). Hence, given meaning in life by itself as a set of beliefs, and the process of meaning making, it is plausible that meaning in life is the B-component. On the other hand, the tendency to search for meaning can be motivated by anticipating future (Leshkovska and Shterjovska, 2014). Therefore, it is likely that both the presence of meaning and search for meaning are the B-component. Furthermore, considering the self-transcendent nature of meaning in life (Brown, 2000; Seligman, 2004), and the meaning-enhancing effect of prosociality (Zimmerman and Rappaport, 1988; Ohmer, 2007; Brown et al., 2012; Lin, 2019), those with higher levels of the presence of meaning and/or search for meaning, are more likely to have higher prosocial tendency. Alternatively, when the possible outcomes of a particular prosocial act are judged to be valuable and meaningful, an individual is more likely to have a higher level of prosocial tendency to perform the act. And the increased prosocial tendency and prosocial acts are the C-component.

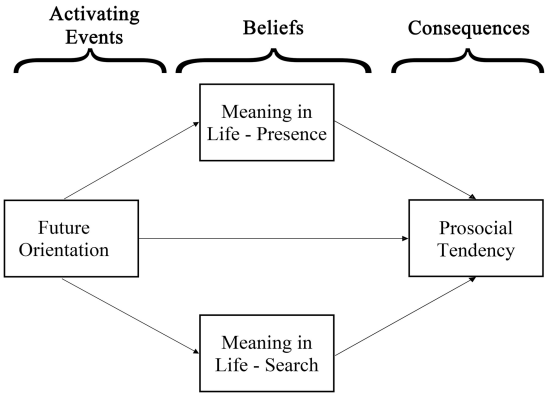

FIGURE 1
A hypothetical model for the relationships among major variables based on the ABC model (Ellis, 1991).

2.7. The present study

The present study aims to investigate the relationships among future orientation, meaning in life, and prosocial tendency. Future orientation, as the activating events, can increase the source to comprehend one's living, set life direction, and establish the belief of one's importance, so as to construct a sense of meaning. Furthermore, the presence of meaning, as the belief, fosters prosocial tendency due to the self-transcendence nature of meaning in life. Meanwhile, future

orientation can contribute to one's meaning-searching tendency to seek greater and bigger meaning and gain deeper understanding of meaning in life. Consequently, due to this urge for a sense of meaning, a meaning-seeker is more likely to have high prosocial tendency. Thus, the increased prosocial tendency is the consequence of the presence of meaning and search for meaning generated by future orientation. Notably, the presence of meaning contributes to prosocial tendency due to the other-orientated meaning, whereas the search for meaning contributes to prosociality due to the need for establishing greater meaning. Hence, presence of meaning and search for meaning can be considered as two independent mediating processes. Therefore, the hypotheses of the present study include: (1) future orientation has significant positive relationship with prosocial tendency, (2) presence of meaning significantly mediates the relationship between future orientation and prosocial tendency, and (3) search for meaning significantly mediates the relationship between future orientation and prosocial tendency.

3. Materials and methods

3.1. Participants

An online survey was administrated from February to June 2020 during the first wave of COVID-19 pandemic in Hong Kong. Through snowball and convenient sampling, 465 respondents were initially recruited, but then 14 participants were excluded because they did not complete the survey and 17 participants were excluded because the time duration for completing the survey was less than 180 s (3 min). Furthermore, two underaged (<15 years old) and two overaged respondents (>30 years old) were also excluded. Therefore, the final valid data contained 430 Hong Kong youth participants (see Table 1 for major characteristics) with an age range from 15 to 30 years old ($M = 22.96$, $SD = 3.19$). The age distribution was 11.4% for 15–19 years old, 60.5% for 20–24 years old, and 28.1% for 25–30 years old. Approximately 30.5% of the participants were males ($n = 131$) and 69.5% were females ($n = 299$). Most of the participants hold a bachelor's degree ($n = 375$, 87.5%), and were students ($n = 224$, 52.1%). According to the 2021 population census report conducted by the Census and Statistics Department, The Government of the Hong Kong Special Administrative Region Census and Statistics Department (2022), the total number of youth population (aged 15–30) was 1,149,503. The age distribution was 23.0% for 15–19 years old, 28.4% for 20–24 years old, and 48.6% for 25–30 years old. 51.4% of the population aged 15–30 were female. The group of 20–24 years old was over-sampled in this sample because more emerging adults were recruited in the present study.

TABLE 1 Major characteristics of participants.

Demographic Variables	*n*	%	*M* (*SD*)	Range
Gender				
Male	131	30.5		
Female	299	69.5		
Age			22.96 (3.19)	15–30
Education				
Secondary 1–3	5	1.2		
Secondary 4–6	22	5.1		
Bachelor	375	87.2		
Master or above	28	6.5		
Job status				
Student	224	52.1		
Full-time job	158	36.7		
Part-time job	18	4.2		
Self-employed	3	0.7		
Unemployed	26	6.0		
Other	1	0.2		

3.2. Measures

The online survey consisted of four parts including demographics, the Consideration of Future Consequence Scale (Joireman et al., 2012), the Meaning in Life Questionnaire (Steger et al., 2006), and the Scale for Measuring Adult's Prosocialness (Caprara et al., 2005). The online survey was conducted with Chinese versions. The required and collected demographic data included age, gender, education level, and job/study status.

The consideration of future consequences subscale of Consideration of Future Scale (Joireman et al., 2012) was used to measure the degree to which an individual think about the future consequences. The scale consists of five items and the respondents answered each item on a 7-point scale – from 1 (Extremely Uncharacteristic) to 7 (Extremely Characteristic). The reliability of the scale in the present study was.77.

The Meaning in Life Questionnaire (Steger et al., 2006) was adopted to measure the two dimensions of the meaning in life, that is, presence of meaning and search for meaning. The presence of meaning indicates the extent to which an individual experience or feels his/her life is worthy, meaningful, and significant, whereas the search for meaning indicates the tendency to search for meaning in life. Both the presence of and the search for meaning subscales consist of five items respectively, and the respondents rated from 1 (Absolutely Untrue) to 7 (Absolutely True). The reliability of the presence subscale in the present study was 0.88, and that of the search subscale was.88.

The Scale for Measuring Adult's Prosocialness (Caprara et al., 2005) was used to measure the prosocial tendency of an individual. It is worth noting that the scale measures prosocial tendency, but not actual prosocial behaviors. The scale includes 16 items rated from 1 (Never) to 5 (Always). The reliability of the scale in the present study was 0.92.

TABLE 2 Demographics and *t*-test for possible gender differences in major variables.

Variable	All subjects	Male	Female	*t*	*df*	95% CI	
	M (*SD*)	*M* (*SD*)	*M* (*SD*)			LLCI	ULCI
Age	22.96 (3.19)	23.07 (3.49)	22.92 (3.05)	0.455	428	−0.505	0.810
PT	59.11 (9.16)	57.58 (10.29)	59.78 (8.55)	2.140*	212.174	−4.218	−0.173
FO	23.99 (4.52)	24.13 (4.31)	23.93 (4.62)	0.422	428	−0.732	1.132
MILP	23.21 (6.05)	22.98 (6.78)	23.31 (5.71)	−0.476	214.254	−1.660	1.014
MILS	26.20 (4.95)	25.83 (5.25)	26.37 (4.82)	−1.033	428	−1.555	0.484
Group size	$N = 430$	$N = 131$	$N = 299$				

PT, prosocial tendency; FO, future orientation; MILP, the presence of meaning in life; MILS, the search for meaning in life. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

3.3. Procedures

The link to the online survey was sent *via* email and social media messages to universities students and the public, and the receivers were requested to share the link if possible (snowball sampling). Prior to filling the survey, each respondent was required to read the informed consent form and indicate their consent to participate in the study. After obtaining the consent form, each participant was required to complete the online questionnaire with the measures described above. The collected data were analyzed using SPSS 26 and AMOS 22 statistical packages. The correlation analysis of the key variables was conducted to examine the bivariate relationships among future orientation, presence of meaning, search for meaning, and prosocial tendency. Then, a path analysis was employed to test the hypothetical model with two mediators (presence of meaning and search for meaning) on the relationship between future orientation and prosocial tendency, respectively. Finally, multiple-group path modeling analysis was conducted to investigate whether there are differential path estimates between males and females for the two mediators.

4. Results

4.1. Descriptive statistics

Tables 1, 2 show the descriptive statistics of all measures for the final sample, and Table 2 shows the results of the independent sample t-tests on major measures between males and females. The prosocial tendency of females ($M = 59.78$, $SD = 8.55$) was significantly greater than males ($M = 57.58$, $SD = 10.29$), $t\ (212.17) = -2.14$, $p = 0.03$. However, no significant gender differences were found on future orientation ($t\ (428) = 0.42$, $p = 0.67$), presence of meaning ($t\ (214.25) = -0.48$, $p = 0.63$), and search for meaning ($t\ (428) = -1.03$, $p = 0.30$).

Further, the correlations among the measures for the entire sample is presented in Table 3. Future orientation was significantly and positively correlated with prosocial tendency ($r = 0.341$, $p < 0.001$), presence of meaning ($r = 0.326$, $p < 0.001$), and search for meaning ($r = 0.303$, $p < 0.001$). Also, prosocial tendency was positively correlated with presence of meaning ($r = 0.329$, $p < 0.001$), and search for meaning ($r = 0.318$, $p < 0.001$). Furthermore, presence of meaning was positively correlated with search for meaning ($r = 0.170$, $p < 0.001$).

TABLE 3 Pearson's correlation coefficient of the questionnaire measures.

Variable	FO	MILP	MILS	PT
FO	-			
MILP	0.326***	-		
MILS	0.303***	0.170***	-	
PT	0.341***	0.329***	0.318***	-

$N = 430$; PT, prosocial tendency; FO, future orientation; MILP, the presence of meaning in life; MILS, the search for meaning in life. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

4.2. Path analysis

Figure 2 shows the results of path analysis of the hypothesized model for the full sample. The hypothetical path model had very good-fit, $\chi^2\ (1, N = 430) = 2.673$, $p = 0.102$; $\chi^2/df = 2.673$; GFI = 0.997; AGFI = 0.969; TLI = 0.947; CFI = 0.991; RMSEA = 0.062, with 95% C.I [0.000, 0.158]. The direct effect of future orientation on prosocial tendency was significant ($\beta = 0.141$, 95% CI [0.098, 0.190], $p < 0.001$). Then, future orientation significantly predicted presence of meaning ($\beta = 0.326$, 95% CI [0.238, 0.408], $p < 0.001$) and search for meaning ($\beta = 0.303$, 95% CI [0.212, 0.386], $p < 0.001$) and prosocial tendency ($\beta = 0.201$, 95% CI [0.112, 0.292], $p < 0.001$); presence of meaning ($\beta = 0.227$, 95% CI [0.140, 0.313], $p < 0.001$) and search for meaning ($\beta = 0.220$, 95% CI [0.135, 0.306], $p < 0.001$) significantly predicted prosocial tendency. The mediation model is significant ($\beta = 0.141$, bias-corrected and accelerated confidence interval [0.098, 0.190], $p < 0.001$). Concerning the significant direct effect and indirect effect of future orientation on prosocial tendency, the dimensions of meaning in life partially mediate the relationship. We further conducted a multi-group analysis to test any gender differences for the parameter estimates on the hypothesized model. Figures 3, 4 show the hypothetical mediation models for male and female sample, respectively. Results showed that there was no gender difference for the multi-group mediation model ($\Delta\chi^2(df = 5) = 7.786$, $p = 0.168$).

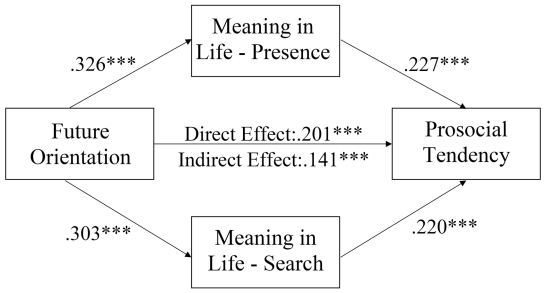

FIGURE 2
A hypothetical model for the relationships among major variables. *p<0.05; **p<0.01, ***p<0.001.

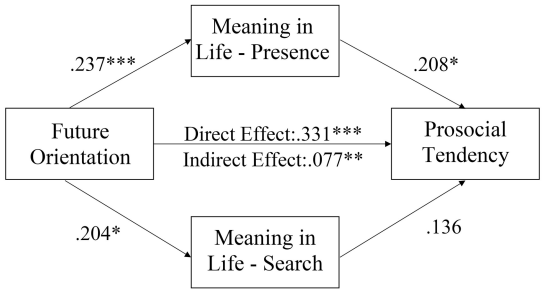

FIGURE 3
A hypothetical model for the relationships among major variables (male sample). *p<0.05; **p<0.01, ***p<0.001.

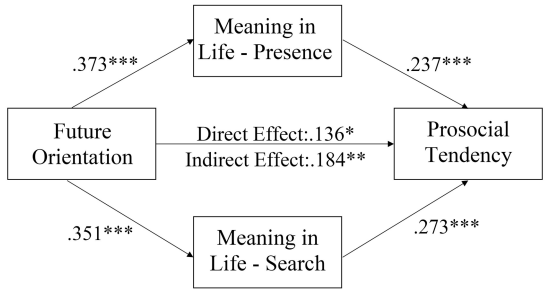

FIGURE 4
A hypothetical model for the relationships among major variables (female sample). *p<0.05; **p<0.01, ***p<0.001.

5. Discussion

This study investigates the mediation roles of presence of meaning and search for meaning in the relationship between future orientation and prosocial tendency with Hong Kong youth during the first wave of pandemic. The findings of this study supported all the hypotheses, and no gender difference was found. The results of path analysis indicated the significant partial mediation effects of presence of meaning and search for meaning on the relationship between future orientation and prosocial tendency. Particularly, these results indicated that people with higher level of future orientation are more likely to have higher level of presence of meaning and/or search for meaning and, further, have higher level of prosocial tendency. In other words, the positive relationship of future orientation with prosocial tendency are partially explained by the presence of meaning and the search for meaning. These findings are consistent with the previous studies regarding the positive associations between future orientation and presence of meaning (Hicks et al., 2012; Baumeister et al., 2020; Miao et al., 2021), and search for meaning (Leshkovska and Shterjovska, 2014) as well as the positive associations between prosocial tendency and presence of meaning (Van Tongeren et al., 2016; Klein, 2017; Liu and Zhang, 2020), and search for meaning (Zimmerman and Rappaport, 1988; Ohmer, 2007; Brown et al., 2012; Lin, 2019; Dakin et al., 2021).

Theoretically, ABC model (Ellis, 1991) is proposed in this study for interpreting the mediation model of meaning in life on the relationship between future orientation and prosocial tendency. For the activating events, young people with higher future orientation tend to anticipate future and imagine possible self, which are the internal stimulations that act as the source for the belief on meaning-making. Those future anticipations and imaginations motivate Chinese youth to experience a sense of meaning and construct a belief regarding one's meaning or the reflection of one's meaning system. One can feel the sense of meaning because of the internal stimulations, the level of presence of meaning would be further enhanced. Alternatively, it is also possible that the youth refer to their meaning to decide whether the possible future outcomes are meaningful and valuable, which is a meaning making process (Märtsin, 2019). On the other hand, if one lacks the sense of meaning in the present life, the future simulations could contribute to the meaning searching motivation and tendency, from deficiency search to growth search in meaning through a self-transcendent process (Chu and Fung, 2021). Also, search for meaning include the belief of the existence of meaning rather than meaninglessness. As a result, future orientation of youth can further enhance their prosocial tendency through cultivating their awareness of the presence of meaning and the urge to search for greater and bigger meaning through a self-transcendent process and reframe a sense of meaning in their life.

Although the results also found females were more likely to have higher level of prosocial tendency than males which is consistent with the previous studies (e.g., Beutel and Marini, 1995; Beutel and Johnson, 2004; Carlo et al., 2012), the multiple-group path modeling analysis did not find any gender differences for the hypothetical mediation model. Also, the present study did not find any gender differences on future orientation (e.g., Greene and Wheatley, 1992; Mello and Worrell, 2006; Borowsky et al., 2009) and the two components of meaning in life (e.g., Yu et al., 2017; Dhanjal, 2019; Xi et al., 2022) proposed found in previous studies.

A possible explanation is the raised awareness and improvement of gender equality in Chinese societies. Several previous studies suggested that gender differences on future orientation (Seginer, 1988; Nurmi et al., 1995; Seginer and Halabi-Kheir, 1998) and meaning in life (Grouden and Jose, 2014) could

be explained by gender inequality and cultural socialization. The insignificant gender differences on future orientation, meaning in life, and the hypothetical model, suggesting that both male and female youth in Hong Kong are raised in a society with relatively better gender equality. However, females show higher prosocial tendency than males in this study, and that can possibly be explained by the neurological differences. Particularly, females were found to have higher level of inter-hemispheric and modular connection than males (Ingalhalikar et al., 2014), so that the region related to social cognition can be activated more easily due to the connectivity. Hence, females are more likely to have higher level of prosocial tendency than males (Glimcher and Fehr, 2013). However, future neuropsychological studies should be conducted to futher investigate this possible explanation.

The ABC model (Ellis, 1991) on the relationships among future orientation, meaning in life, and prosocial tendency provides a framework to understand how one's anticipation of future and interpretation the meaning of the daily life events can influence his/her prosocial attitudes and behaviors. The anticipated future or imagined possible self are the daily life stimulators for the youths. Even youths with low level of future orientation, and facing life adversities (e.g., pandemic) would think about the future. Hence, the future in mental representation *per se* is the daily source of the presence of meaning, and the fuel to the meaning searching motivation, and this iterative awareness of meaning, meaning-searching, and meaning-making process in everyday life can further enhance the prosocial tendency. In other words, the enhancement on presence of meaning and search for meaning can explain and strengthen the effect of future orientation on prosocial tendency.

6. Implications

The findings of the present study implied that promoting and enhancing the meaningful life of youth through thinking about their future can help them to cultivate their sense of comprehension, significance, and purpose in their daily lives, and motivate them to seek for greater meaning in the process, which further strengthen their tendency to engage in prosocial acts. For example, requesting youth to write their best possible selves during life difficulties and adversities may help to enhance their future orientation (King, 2001). Most importantly, the best possible selves reflect the youths' meaning in life and value as the imagined future consists of the achievements of life goals (King, 2001). Also, meaning centered interventions provide reflective space for youth to freely explore their meaning in life (Lim and Kang, 2018). Therefore, by highlighting the meaning reflected in the best possible selves, youth can increase their sense and awareness of meaning in their daily life and be motivated to search for greater or other-oriented meaning, which in turn further increase their prosocial tendency. Furthermore, confronting daily crises like financial difficulties, relational dissolutions, or global crises like pandemic, youth can explore meaning of these adversities and develop their meaning from anticipating future, which can contribute to their prosocial tendency to help the needy to overcome the diversities and promote growth.

7. Limitations and future direction

The present study has two major limitations. First, the recruited participants were mainly youths in Hong Kong, so the findings and implications of the study cannot be generalized to the youth in other Chinese societies. Furthermore, given the cross-sectional nature of this study, no causal relationships among future orientation, meaning in life, and prosocial tendency could be claimed. Therefore, a longitudinal study with meaning-focused future-orientation intervention to enhance youth's prosociality must be rigorously designed and validated to testify the implications of the current study.

In conclusion, findings of the present study support that the mediating roles of presence of meaning and search of meaning on the relationship between future orientation and prosocial tendency. In other words, through meaning-focused future-oriented interventions, it is possible to enhance youth to experience their daily life as meaningful and further search for deeper and greater meaning in their present lives. Also, even facing life adversities and difficulties, enhancing the sense of meaningfulness and promoting meaning-seeking tendency by thinking and anticipating future, can increase youth's prosocial tendency and actions to contribute to the harmony and development of family, community, and society to face any life and global crises and challenges facing in our everyday life.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Human Research Ethics Committee of the Hong Kong Shue Yan University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

W-KL contributed to study conceptualization, results interpretation, data analysis and writing the original manuscript. C-KC contributed to survey design, administration and overseeing of the research, revision and editing of the manuscript. K-HN contributed to data analysis. C-FRC contributed to survey design. NS contributed to scale validation. C-SY contributed to revising and editing the manuscript, and checking of citations and references. K-WL contributed to checking of citations and references, and

generation of tables and figures. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Leisure and meaning in life

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How people engage in leisure is an important but frequently underappreciated aspect of meaning in life. Leisure activities range from highly engaging and meaningful to subjectively trivial. Leisure itself is largely defined by meaning: The essence of leisure lies less in the specific activity than in the subjective perception of freedom, choice, and intrinsic motivation. People desire their lives to be meaningful, and leisure activities offer varying degrees of satisfying the basic needs for meaning (here covered as purpose, value, efficacy, and self-worth). Leisure activities vary along multiple conceptual dimensions, such as active vs. passive, seeking vs. escaping, solitary vs. interpersonal, and we consider the implications of these for meaningfulness. The most common leisure activity in modern society, watching television, encapsulates some of the paradoxes of leisure and meaningfulness. The study of how leisure enhances meaning in life is rich and ripe for future research.

KEYWORDS

leisure, meaning, well-being, health, activity involvement, boredom, intrinsic motivation, serious leisure

Introduction

Research has abundantly confirmed the importance of both interpersonal relationships and work to the meaning of many lives (Bellah et al., 1985; Stillman et al., 2009; Lambert et al., 2010). More precisely, meaning is often found in interpersonal relationships, especially strong and close ones, as well as in meaningful work. However, the contribution of work to life's meaningfulness is highly variable. Some people find it highly engrossing, fascinating, and rewarding, while others see it as little more than a tedious activity necessary to provide money to support life. Indeed, a surprisingly large category of people describes their work as "bullshit jobs" and think society would be perfectly well off if their job did not even exist (Graeber, 2013, 2018). For such individuals, family, romance, and other forms of social contact loom as the primary source of meaning.

In this article, we seek to examine another possible source of meaning in life: leisure. While for most people, leisure remains secondary to work in terms of priority, it can nevertheless infuse substantial amounts of meaning into life, along with boosting happiness and satisfaction. We seek to explain just how leisure contributes to satisfying people's needs for meaningfulness. For example, meaningfulness often emerges from close relationship bonds, and leisure is an avenue for doing activities with friends and family (e.g., Crandall, 1979; Iso-Ahola, 1980, 1999). However, it is important to add that leisure activities are also done alone or in formal social contexts with weak interpersonal relationships, such as acquintances in structured programs.

When work is unsatisfying, leisure can potentially help fill the gap in meaningfulness, but it can also be meaningful in its own right. Although we focus on leisure's potential contribution to meaning in life, we do not want to imply that work and interpersonal relationships, on their own without leisure, would not play an important role in people's search for meaning in life. They certainly are important contributors, but we wish to highlight how and why leisure can

make its own contribution. This is important because scholars, especially psychologists, have paid very little attention to the relationship between leisure and meaning in life. In contrast, some sociologists (e.g., Coalter, 1999, p. 513) have acknowledged psychological aspects and centrality of leisure choices and their "situated meaning."

Examination of the relationship between leisure and meaning in life is important not only for its own sake but also, for better understanding the complexity and breadth of meaning in life in general. Furthermore, the examination is important now in the aftermath of the wide-spread effects of the COVID-19 pandemic (e.g., remote work). Much has been said about the so-called Great Resignation or "quiet quitting" from jobs. Could leisure replace work or provide opportunities for doing something one always wanted to do and thereby help make his/her life more meaningful?

Along with the great resignation, there is a trend of adopting shorter workweeks without pay cuts. In Iceland, 86% of workers are expected to adopt a 4-day workweek based on the experimental findings, and Belgium announced that employees are allowed to request compressing their work hours into 4 days. In the U.S. Congress, a bill has been introduced to reduce all standard workweeks to 32 hours. All of this has a potential to increase leisure's importance to meaning in life.

Recent years have seen researchers shift away from a focus on the meaning *of* life to meaning *in* life (e.g., Steger et al., 2006; Steger, 2009; George and Park, 2016; Martela, 2020). The difference is in the amount of integration required: A meaning of life presumably integrates much of the life, including most or all of the important parts, whereas meaning in life can be limited to one domain and can comfortably ignore large and important aspects of the life's meaning. Finding meaning in life is a less grandiose aspiration than determining the meaning of a life or indeed of all life. This shift increases the possibilities for recognizing and studying the contribution of leisure pursuits. Although leisure may not rise to the level of providing the meaning of life for most people, it can provide substantial increases in the amount of meaning *in* a life. Our focus is to advance understanding of leisure's potential to enhance meaning in life. Nevertheless, we stipulate that leisure can enhance the meaning of life also. For example, millions of people around the world spend their leisure in volunteer work helping the poor, serving the church, or improving the environment, and that provides not only meaning in but meaning of life for them.

Another important point is that leisure does not have to make unique contributions to meaning in life. Kelly and Kelly (1994) provided evidence that the meanings people find in leisure often overlap with what they find elsewhere (e.g., in work and family). Nevertheless, leisure can still contribute important and substantial amounts of meaningfulness.

The paper will proceed as follows. First, we consider the defining characteristics of leisure. Next, we review evidence relevant to the question of how leisure can satisfy people's various needs for meaning. Following this generally positive appraisal of how leisure contributes meaning, we review evidence concerning several problematic aspects of the meanings in leisure. Television watching, in particular, is often rated as low in meaningfulness and happiness, yet it has often been found to be the most frequently reported form of leisure in modern life. We then cover evidence about several key dichotomies in leisure, including solitary versus interpersonal leisure, casual versus 'serious' leisure, and whether leisure is primarily an escape from something else or is sought and valued in its own right. We then conclude with some broad observations.

What is leisure?

Leisure can be defined by what it is and what it is not. First, leisure can be most easily defined by what it is not: It is not work, nor does it include other activities required for survival. Instead, leisure has traditionally been defined in three ways: As an activity or as time left over after work or as a subjective preception and experience (Iso-Ahola, 1980). Most agree that it cannot be defined as an activity because any activity could sometimes be defined as leisure. It does not make sense to define leisure in terms of time left after work either, because time does not tell us anything about meaning, antecedents and consequences of behaviors done after work. If a person spends many hours watching TV but does not like it, it is a poor leisure experience (Kubey and Csikszentmihalyi, 2002). There are numerous behaviors (e.g., chores, child care) undertaken after work that can be characterized as nonwork or free time, but few people would define them as leisure. There is a difference between the mere nonworking hours and extraction of meaning from these hours.

Multiple studies (e.g., Iso-Ahola, 1979, 1980; Shaw, 1985; Mannell et al., 1988) have shown that leisure is a psychological entity overwhelmingly defined by people's perceptions of freedom. In other words, a sense of freedom more than anything else defines what leisure is to people. Importantly, leisure means freedom to choose to do or not to do something. Otherwise a sense of obligation arises and a sense of leisure is lost. Thus, the etymological roots of the word "leisure" are linked to the concept of freedom. Freedom to choose allows people to pursue their values, goals, and identities (Schwartz, 2004). Even though perceived freedom is a necessary condition for leisure, it does not guarantee a high-quality experience. One can freely choose to go and watch a basketball game, but if his/her team loses, this leisure experience would predictably be rated poor (Madrigal, 2003). It should also be noted that not all scholars, especially sociologists (e.g., Rojek, 2010), agree with our social psychological approach to defining leisure.

Nevertheless, research suggests that an opportunity for freedom and choice is valuable in and of itself because a choice provides the means for exercising control over one's environment, thereby suggesting that the need for freedom and choice is biologically based. To this extent, Leotti and Delgado (2011) showed that the mere anticipation of personal involvement in an activity through freedom of choice recruited affective and motivational brain circuitry, specifically corticostriatal circuitry known to be linked to reward processing. Research has further shown the fundamental importance of freedom, in that individuals prefer freedom to choose even when it impairs their social welfare and can lead to tragic medical decisions (Botti and Iyengar, 2006; Botti et al., 2009).

The second most important characteristic behind the concept of leisure is intrinsic motivation, followed by "work-relation" and "goal-orientation." In other words, it is freedom rather than lack of it, intrinsic rather than extrinsic motivation, final goals rather than instrumental goals, and low work-relation rather than high work-relation which increased people's perceptions of leisure (Iso-Ahola,

1979). While the effects of the latter two were statistically significant, their effects on the perceptions were negligible compared to the former two, especially a sense of freedom. What this means is that any so-called leisure activity can turn into work-like activity when it is forced or has no sense of freedom associated with it.

In their classic study, Csikszentmihalyi and Graef (1979) showed that even such a supposedly pleasant leisure activity as being in a restaurant can be turned into anything but leisure when people are required to be there. All of this is also consistent with the research on the "overjustification" phenomenon which has shown that initially intrinsically motivating activities become work-like when they are externally sanctioned or extrinsically motivated (Deci, 1971; Lepper et al., 1973; Deci et al., 1999). According to Csikszentmihalyi and Graef's (1980) data, sports and games are activities in which people feel most free.

In short, leisure cannot be defined as an "activity," such that some activities are leisure activities while others are not, because almost any activity can be experienced as either leisure or work, depending on perceptions of freedom. The definition of leisure therefore resides more in the person's attitudes toward and feelings about the activity, rather than in the activity itself. Freedom and intrinsic motivation contribute to the understanding of leisure as something that the person wishes to do and feels free to decide whether to do it or not.

It should also be noted that not only an opportunity to choose to do something in free time makes that chosen activity leisure but also a choice not to do something is an expression of freedom (Iso-Ahola, 2013). Thus, freedom gives people a license not to exercise!

It is easier to provide examples than a definition. Thus, leisure activities include hobbies, rest, entertainments, games, and sports (both as participants and spectators). Travel is also a popular leisure activity. Consumption of food, alcohol, and drugs is also a popular form. For all of these and others, the feeling of being free to do it or not do it is what makes it leisure. Travel can be required by work, and taking drugs may be required by addiction, and so forth, in which case they lose the character of leisure.

Regardless, the essence of leisure resides in its subjective meaning, as was well demonstrated empirically by Tonietto et al. (2021). Their findings indicated that perceiving leisure as wasteful correlated with lower happiness and greater depression, anxiety, and stress. Furthermore, priming the belief that leisure is wasteful reduced enjoyment of leisure. Unfortunately, in the achievement-emphazing society like the U.S., priming productivity at the expense of leisure is common, and the utility of leisure is seen as the relief it affords from costly cognitive control in labor-leisure relationships and tradeoffs (Kool and Botvinik, 2014).

Yet, research has shown the benefits of mentally disengaging from work during off-time. Individuals who are able to detach themselves from work during their off-job hours report higher life satisfaction and well-being and fewer symptoms of psychological strain (Sonnentag, 2012). Moreover, there appears to be a curvilinear relationship between attachment from work during nonwork time and task performance such that both high and low levels of detachment were associated with poor task performance (Fritz et al., 2010). This would seem to suggest that both too much and too little psychological separation between work and leisure is not good for employees' well-being and job performance.

Leisure and needs for meaning

We turn now to the core question of how leisure activities can contribute to meaning in life (if not of life). The underlying premise is that people are broadly motivated to find or instill meaning in their lives (Steger, 2009; Park, 2010). We enquire, therefore, how leisure pastimes may help accomplish this.

Meaning in life can be characterized as among those desirable things that many people want but are not sure quite what it is. Frankl's (1976/1959) pioneering work on meaningfulness emphasized purpose as a fundamental and central form of meaning. Seeking to elaborate the notion of meaning motivation, Baumeister (1991a) proposed four somewhat distinct needs for meaning: Purpose, value, efficacy, and self-worth. Hence one way to elucidate the contribution of leisure to meaning is to analyze how various leisure activities address and potentially satisfy these four needs.

The four needs for meaning are a heuristic scheme. George and Park (2016) suggested purpose, mattering, and coherence, which initially seem different but on closer inspection are quite similar. (For example, value might seem to be missing from George and Park's scheme, but they stipulate that the purposes must have value, and moreover, value is relevant to mattering.) A more thorough examination of how the different lists of meaning needs are actually quite similar can be found in Baumeister (2023).

Purpose

Purpose means that the present activities draw meaning from the future, such as aspirational goals or fulfillment states. Leisure activities vary widely as to how purposive they are. The single most common leisure pastime in modern Western civilization is watching television, which typically is lacking in either goals or fulfillment states. (That may explain why television watching is rated as among the least satisfying or pleasant of daily activities; Kubey and Csikszentmihalyi, 2002). At the opposite extreme, creative hobbies such as playing a musical instrument or painting have abundant goals and sometimes offer fulfillment states (i.e., the ecstasy of artistic creation).

Goals in leisure pursuits can be short-term, long-term, or both. As examples of short-term goals, sports, games, and athletic pursuits often come with proximal goals, such as winning the game, finishing the climb or hike, or solving the puzzle. Nevertheless, these activities are psychologically meaningful because there is often a strong relationship between challenge and enjoyment in them. Abuhamdeh and Csikzentmihalyi's (2012) data showed that the challenge-enjoyment relationship is strongest for intrinsically motivated, goal-directed activities. The authors suggested that the motivational context (intrinsic-extrinsic motivation) and the nature of the activities (goal-directed or not) have to be considered to understand optimal challenges in sports and games and other leisure activities.

To be sure, leisure can involve long-term goals as well. So-called serious leisure (see later section) often is serious precisely because of commitment to long-term goals, such as playing in a local band or volunteering to help the environment. Moreover, even when the goals in leisure pursuits may be short-term, people repeat their leisure activities. For example, they do not just play tennis one time but rather tend to play frequently or even regularly. If done with family and good friends, leisure

activities can become meaningful additions to people's lives. Thus, they do not act as if the activity has enabled them to reach a goal — they may select the same sort of goal the next time they play. Short-term goals may not contribute much to the meaningfulness of a life as a whole, but they can add plenty of meaning into the life along the way. (They may try to win each tennis game; after all, scoring and winning are inherent to the game.) In contrast, some leisure activities do involve longer-term purposes. For example, singing in a choir or volunteering for community service may be undertaken month after month, year after year. The participation can be cumulative, such as enabling the choir to flourish or helping a series of individuals to have a better life.

Value

Philosophical and sociological conceptions of value can be quite complex. Heinich (2020) has observed, among other insights, that it is best to focus on how individuals bestow or judge value, rather than treating value as an inherent property of things. Assignment of value combines properties of the object, characteristics of the person making the judgment, and the situational context. She resists reducing value to morals or to normative guides on how to act. Ultimately, she says, value is neither objective, nor subjective, nor arbitrary. In contrast, consumer psychologists tend to start by equating value with the monetary price of an item, but a more in-depth analysis of what consumers value led Almquist et al. (2016) to delineate 30 different elements of value, which can be sorted roughly into four master categories: Functional value, emotional value, life changing value, and social impact.

These apply to leisure in different ways. Leisure is not generally functional, although the leisure enthusiast may pay close attention to which products and accessories are most functional. (As example, note the ongoing refinements in skis over the past half century, which have made skiing much easier and more pleasant.) Emotional value is presumably the most frequent reason that people choose particular forms of leisure, including even the wish for vicarious emotional experience from watching television. Life change may occur, such as if dabbling in guitar to relax after work gradually moves into cultivation of musical talent and public performance. Last, some people may choose forms of leisure that have positive social impact, such as helping the homeless or volunteering at a recycling center.

Whereas Almquist et al. (2016) sought to cover the operation of values in consumer purchases, and Heinich (2020) undertook to analyze all forms of value, our emphasis is on how leisure contributes to the value aspect of meaning in life. The need for value is a matter of finding a way to regard oneself and one's life as good. Some leisure pursuits enable one to claim value based on belonging to a socially admired category of persons (e.g., musician, painter, sailor, athlete), while others contribute to the betterment of society (e.g., volunteer work). Or, to put it another way, all theorists and measures include purpose as vital to meaning in life – but purposes are not all equal, and most people seek purposes that have positive value.

The origins of the concept of leisure (including the etymology of the word) involve being freed from the duties, obligations, and other necessities of life. This reflects a simple view of life as divided into things one must do in order to survive and things that one wishes to do. Self-determination theory (Deci and Ryan, 1985) began with research on the difference between intrinsic and extrinsic motivation. Working to make a living is essentially extrinsic because it is driven by external demands. In contrast, leisure is assumed to be largely intrinsically motivated. Freed from the necessity to comply with external demands, one is able to do what one wishes to do. The essence of intrinsic motivation is that one performs the activity for its own sake, such as for the inherent pleasure of doing it, rather than to achieve external goals. Sailing provides a useful example. At some times and places, sailing was a crucial way to travel. One sailed in order to reach a destination so as to pursue one's business there. It was a means to an end. In contrast, the modern recreational sailor often has no destination in mind and sails for the pure joy of the activity. Typically, one sails from one's dock or harbor out into open water, cruises around for a while, and then returns to the starting point.

The value of work as a centerpiece of life has eroded among an increasingly greater number of people. Some people are willing to forfeit or forgo a substantial amount of their salary for more free time, and half of all American workers would choose a different type of work if they had to do it all over again (Marin and Gegax, 1997). At the same time, research has shown that involvement in meaningful nonwork activities helps people to detach from paid work, which in turn is associated with greater well-being (Sonnentag, 2012). When combining all of this with research showing that people overwhelmingly prefer experiences over possessions (Van Boven and Gilovich, 2003; Carter and Gilovich, 2012), it becomes clear that people are yearning for more meaning to their lives through means other than work, most notably through leisure that enables them to do personally meaningful activities.

However, it is not a question of substituting leisure for work but rather, providing an additional source for meaning in life. The problem is that 51% of the U.S. employees, according to a 2014 Gallup poll, do not feel involved in, enthusiastic about and committed to their work or workplace (and 17.5% "actively disengaged") and would rather do something else if they could (Adkins, 2015). But because most people cannot switch jobs, they are stuck and in a way, forced to turn to other sources of meaning in life, such as activities done with friends and family. It, then, is not surprising that people value experiences much more highly than material possessions (Van Boven and Gilovich, 2003; Hunnicutt, 2020). A recent study found that valuing one's experiences is positively correlated with perceptions of meaning even after controlling for purpose, mattering and coherence (Kim et al., 2022).

Thus, the contribution of leisure activities to value in life is complex and multifaceted. Some pastimes have a strong moral component, such as volunteer work. By working to help people less fortunate than oneself, or to clean up the environment, or to save animals, or to help one's church, people can add value to their lives. In contrast, watching television, indulging in alcohol or drugs, or prostitution would seemingly add little value. Indeed, such leisure pastimes are regarded by some as destructive and unhealthy activities that detract from the total value for individuals and society. It must be acknowledged, though, that even these seemingly unhealthy activities have some remeeding value, in that they can positively contribute to mental health and positive emotion in the short term.

Efficacy

Efficacy refers to the sense that one is making a difference, that one's actions accomplish something. This is absent from some leisure activities, but is central to others, such as the examples of tennis and sailing. Thus, activities vary in how conducive they are in facilitating

a sense of accomplishment, a sense of using one's abilities to accomplish something personally and interpersonally meaningful and worthwhile. Learning to play a musical instrument or a skill-based sport requires practice so as gradually to build up one's abilities. Successfully playing a complex piece on the piano or skiing down a steep hill seems likely to furnish a sense of efficacy, even if they fail to have any discernible or lasting effect on the external world. Likewise, winning a chess or card game furnishes a sense of efficacy, even if there are no lasting consequences (either for self or society).

At the same time, the complexity of leisure is apparent. Even those activities that do not seem to be 'wholesome' can be efficacious. For example, listening to music can improve one's mood and thereby mental health in the short term. Similarly, moderate or social drinking can facilitate or "lubricate" meaningful social interactions (Crandall et al., 1980). Thus, it is more constructive to look at these types of activities in terms of their harmfulness than making moral judgments about them. Almost any leisure activity can be harmful when taken to the extreme (e.g., marathon running). Again, the essence of leisure does not lie in the activity but rather, in its subjective meaning.

It can be considered remarkable how many leisure activities embody the cultivation of efficacy for tasks and skills that have no pragmatic utility in normal life. Many sports rely on highly specialized muscular skills that bear no resemblance to any earnest activity. Unlike swimming and jogging, which have at times some practical utility in being able to move about in water or on land, tennis and basketball rely on cultivating fine motor skills that are useless for anything else. Nevertheless, the satisfaction of achieving efficacy at these activities can presumably add meaning to life. It has been found that "serious leisure" (i.e., time spent above an individual's average) was positively related to work-related self-efficacy (Kelly et al., 2020). This presents intriguing possibilities for future research: Does leisure contribute significantly to meaning in life on its own or does leisure enhance work performance and self-efficacy and thereby increase meaning in life (a mediation effect)?

Self-worth

The fourth need for meaning involves finding some way to view oneself as a person of worth. This typically derives from comparison to others: By pursuing valued goals in an efficacious manner, one achieves self-worth. In practice, Baumeister (1991a) observed that this often takes the form of feeling superior to others. In any case, some leisure sports offer opportunities to feel good about oneself. Again, the morally virtuous leisure activities furnish a sense of being a good person (both in one's own mind and sometimes in other people's estimation). Likewise, the amateur athlete or artist can enjoy successes along with admiration of others.

To be sure, in principle the boost to self-worth does not have to rely on social comparison. Merely performing a leisure activity for its own sake could increase a sense of self-worth, especially if the activities are based on using one's skills (Csikszentmihalyi et al., 1977; Sheldon et al., 1996; Reis et al., 2000). Furthermore, an Australian study showed that those unemployed individuals who engaged in challenging activities, both social (e.g., sport and dancing) and solitary (e.g., hobbies, reading), reported higher levels of self-esteem than those unemployed whose leisure was dominated by "doing nothing" and watching TV (Winefield et al., 1993). This clearly demonstrates the potential of leisure activities adding meaning to people's lives and for maintaining their self-worth, even for unemployed individuals. In general, self-esteem is linked to actual and anticipated evaluations of self by others (e.g., Leary and Baumeister, 2000).

In Veblen's classic (Veblen, 1953/1899) analysis of the leisure class from the gilded age (late 19th century), self-worth was presumably a central motivation among the people he observed. The purpose of conspicuous consumption was to garner the admiration and perhaps envy of others. Notably, conspicuous consumption does not establish worth via virtuous deeds, successful achievements, or skillful performances. Rather, it showcases one's wealth, presumably invoking the assumption that rich people are the elite of society. If nothing else, one envies them for their wealth, and being envied may contribute to a sense of superiority. However, engagement in leisure is not just a matter of flaunting one's social status, or only a matter of intrinsic reasons. At times and in certain situations, both intrinsic and extrinsic motivators are present in leisure pursuits (Mannell and Bradley, 1986; Mannell et al., 1988).

Problematic aspects of seeking meaningfulness in leisure

Thus far we have argued that various forms of leisure can satisfy the needs for meaning — some far more than others. Having elucidated the positive case for leisure' contribution to meaningfulness, we turn now to some of the problems that may reduce such contribution.

As stated earlier, freedom is the essential, defining feature of leisure. Freedom is highly desired, and in general people express a pervasive and sometimes strong wish for greater freedom (Iso-Ahola, 1980; Mannell et al., 1988). Yet when they get freedom, they often seem not to know what to do with it (Csikszentmihalyi, 1999), resulting in boredom in leisure among other things (Iso-Ahola and Weissinger, 1987, 1990). This suggests that people often find extrinsically motivated activities, including work, to be burdensome, even aversive, but they wish to not have to do what others tell them to do. When they obtain freedom, however, they may find themselves at a loss as to what to do instead of extrinsically mandated activities. In fact, Mannell and Bradley's (1986) experiment showed that individuals who believe that they have less control in their lives find free time threatening and therefore achieve high quality experiences in more structured and restricted settings. Consistent with this, it has been found that perception of having too much leisure time correlates with lower subjective well-being (Sharif et al., 2021). The fact that an average American spends 3–5 h per day watching TV, depending on demographic groups studied (Grontved and Hu, 2011; ATUS, 2018), may in part reflect a psychological threat that leisure poses to many because of not knowing what to do with unstructured free time. This and other paradoxes are inherent in television watching. We begin this section with a consideration of this popular leisure activity.

Television watching, leisure, and meaning in life

Among modern citizens in western civilization, watching television stands out as the most frequent leisure activity and indeed

one of the main ways that people spend their time (mainly after work and sleep). According to the American time use survey (ATUS, 2018), an average American spends 55% if his/her leisure time watching TV, with the number of hours varying from 2 h 46 min to even 8 h depending on the groups of individuals studied. In general, the older, less educated and less affluent people watch more TV. Research has shown that such a prolonged TV watching is associated with an increased risk of type 2 diabetes, cardiovascular disease, and all-cause mortality (Grontved and Hu, 2011). It should be added that it is not just TV watching but spending an inordinate amount of time daily peering at smartphones (5 h on average) that makes people passive participants in leisure. Although we focus on TV watching in this analysis, it should not be forgotten that the total "screen time" is much greater than the mere hours of TV watching. Thus, TV watching understates the time spent in passive activity.

The high amount of television watching would be readily understandable if television watching were the most pleasant and satisfying of activities. But it is not. If anything, people report surprisingly low happiness, satisfaction, and meaningfulness associated with watching television. Using the experience sampling method, Kubey and Csikszentmihalyi (2002) found that heavy viewers (more than 4 h per day) enjoyed TV watching less than light viewers (less than 2 h/day), with the authors suggesting that twinges of unease and guilt in part depreciate the enjoyment. The heavy viewers also felt more anxious and less happy (than the light viewers) in unstructured situations, such as doing nothing, daydreaming or waiting in line. Something other than the quest for deeply rewarding leisure activities must explain the high amount of viewing.

Before dismissing television as a futile, self-defeating exercise of misguided quest for satisfaction, however, it is necessary to acknowledge that television audiences may derive some meaning from watching, even if it is not immediately obvious. Intellectuals and even ordinary people may not notice the meaningfulness of television watching or may be reluctant to admit it, possibly based on a stigmatizing stereotype that watching television is an unproductive activity. Television watching does furnish people with a sense of freedom, with the "felt freedom" in TV watching being only second to sports and games, and third after sports/games and reading in "I wanted to do it" (Csikszentmihalyi and Graef, 1979, 1980).

Another potential benefit of watching television is social connection. As already noted, people rate connecting socially with other people as a major source of meaningfulness (e.g., Lambert et al., 2010). Gabriel, et al. (2020) showed that people often feel a strong sense of connection with others while watching television, especially when watching in the presence of others. This included even strangers, that is, people felt a social bond with others who were watching the same event. This fact may contribute to the often-remarked finding that people prefer to watch sports events live rather than after a delay (e.g., Vosgerau et al., 2006) — presumably because when watching the show live, they know that many others are also watching exactly the same contest and having similar reactions. In connection with this, some commentators have suggested that the proliferation of television choices has actually contributed to the fragmentation of modern society. Murray's (2012) book Coming Apart, which analyzed the disintegration of social cohesion in modern America, began its analysis with the night before the assassination of president Kennedy — when roughly a third of Americans were all watching the same show (*The Beverly Hillbillies*). Modern on-demand streaming services make it much easier for a viewer to choose to watch a favorite show at any time that is convenient, but perhaps in the process some connection to others in society is lost.

There may well be a second, occasionally even more important contribution to meaning by television watching (Gabriel et al., 2016). Watching may immerse the viewer in what Gabriel et al. dub "surrogate social worlds." Favorite television shows involve regular viewers in the fictional web of social relationships among the main characters. Although these relationships are not real, viewers may lose sight of that fact. Gabriel et al. point out that the human brain is not adapted to make strong distinctions between what is real and what is imaginary. People watch these favorite shows especially when they are feeling lonely, which is one indication that watching can provide a sense of belongingness. Experimental studies have confirmed that reflecting on threats to close relationships led to feelings of rejection, bad moods, and temporary loss of self-esteem – but reflecting on one's favorite television shows eliminated those effects (Derrick et al., 2008).

In some cases, people develop what Gabriel et al. (2016) label "parasocial relationships," the feeling that one has a personal connection either to a character on a fictional show or the actor or actress who portrays that character. Such a one-sided interpersonal bond presumably provides a sense of meaning despite the apparent futility of having a relationship with someone who does not know you exist.

Ease and convenience may well contribute to the high rate of television watching despite its frequently meager returns on meaningfulness. Most modern citizens have access to television. Watching it requires relatively little in the way of active decision or effort. Iso-Ahola (2015) has noted that work and other demanding activities can induce a state of ego depletion, that is, temporarily reduced willpower emanating from work results in a decrease in self-control and executive function (e.g., Baumeister and Vohs, 2016). For a depleted individual, watching television may appeal because it makes relatively few demands. Motivating oneself to engage in strenuous sport or musical practice may seem extra difficult to them, whereas turning on the television is quite easy. People may often say (Kaplan and Berman, 2010) that they believe they should not watch so much television and should engage in productive or constructive activities instead, but in a depleted state, their self-control to live up to those goals is reduced, and perhaps the appeal of a pastime that makes no executive demands on the self is extra salient.

Indeed, a growing body of research suggests that "people are unable to resist spending more time engaging in this activity (TV watching) than they would consider healthy or desirable" (Kaplan and Berman, 2010, p. 49). As Kubey and Csikszentmihalyi (2002) reported, for many TV watching borders being an addiction, in the words of one respondent: "If television is on, I just cannot take my eyes off it, I do not want to watch as much as I do, but I cannot help it, I feel hypnotized when I watch television." Viewing begets more viewing, as the authors suggested. Finally, Csikszentmihalyi et al. (1977) reported that such important indicators of psychological well-being as mental alertness, sense of control, sense of competence, and sense of challenge were at their lowest when watching TV, while these indicators were at their highest when playing sports and games.

All of this evidence points out that the best leisure experiences are freely chosen activities in which people can use their skills and meet challenges. So, for example, recreational tennis and racquetball players do not choose to play against those who are much better or much

worse but rather, those who are equal in skills or slightly better. Such opponents push one to the outer limits of his/her skills and provide a balance between challenges and skills, a prerequisite for "flow" experiences (Csikszentmihalyi, 1999). These experiences are based on "active" involvement rather than being passively absorbed in receiving information. Their range varies greatly from sports and games to travel and painting. They do not have to be physically demanding activities, but merely cognitively engaging like in reading interesting novels. Social interaction is a big part of leisure and may in part be so because it is a cognitively stimulating activity, an "active" activity.

Active versus passive

An ironic paradox of leisure participation, however, is that while *active* activities like sports and games help satisfy the basic needs and provide rewarding and meaningful daily experiences, people spend most of their free time in *passive* activities like TV watching — even while describing them as the worst experiences (Kubey and Csikszentmihalyi, 2002). In contrast, a long line of research (Iso-Ahola, 1997) has shown that those who maintain an *active* leisure lifestyle and actively participate in specific activities have higher perceived physical, mental, and social health. Roberts et al. (1989) found that people with a "rich" leisure pattern (i.e., more varied and frequent involvement than the average for the sample) were the healthiest group, whereas those with "impoverished" leisure were least healthy of all participants in their study. Participants' health status was a combination of four physical health indicators and two self-ratings of health. Other studies (London et al., 1977) have shown a significant positive relationship between leisure participation and indicators of mental health (i.e., reduced depression and anxiety). To be sure, this does not exclude reciprocal causality, in that healthy people are better able to engage in various leisure activities.

Nevertheless, the Roberts et al. study and other similar studies indirectly reveal leisure's important contribution to meaning in life, namely, through close relationships and social interaction. To be sure, friendships can be established and meaningful social interactions had at work, but most of the time and for most people, meaningful social relationships take place in leisure time, be it family activities or doing something with good friends. Thus, it is not surprising that social relations/interaction and how time is spent correlate highest with happiness, with social interaction being fundamental and "necessary" for happiness (Baumeister and Leary, 1995; Diener and Seligman, 2002; Diener et al., 2018). Nor is it surprising that social connection is a major determinant of morbidity and mortality (Rook, 2015; Holt-Lunstad, 2021) and that social connection mediates the effect of positive affect on physical health, that is, as positive emotions increase so do positive social connections, resulting in better physical health (e.g., Kok et al., 2013).

Social leisure

A critical dimension of leisure is that it is largely a social experience and phenomenon (e.g., Crandall, 1979; Crandall et al., 1980). Samdahl (1991) found that some type of social interaction occurred in 54.4% of the occasions labeled leisure, and much of this (44.7%) was characterized by informal social interaction. Many studies (e.g., Larson et al., 1986; Argyle, 1992) have reported that having friends and companions with whom to do enjoyable activities together is related to higher psychological well-being. Similarly, another study (Graef et al., 1983) found that "socializing" was as intrinsically motivating as other "active leisure" pursuits, and provided high levels of happiness. In order to achieve these benefits, however, it is important that people are able to regulate their social contacts and interactions; regulation of social interaction is "an optimizing process" (Altman, 1975) in which people have to be able to control when and with whom to socially interact, sometimes shutting themselves off from others and at other times opening up themselves for interpersonal contacts. This also means that being alone is not necessarily a negative thing—as long as people choose it. A recent study by Uziel and Schmidt-Barad (2022) supported these ideas by demonstrating that people rate themselves as unhappiest when they do not choose to be others but still end up in unwanted social situations. But occasional times being alone bring happiness as long as it is freely chosen.

Social interaction is both motivation for and benefit of leisure participation (Iso-Ahola, 1999). Sheer socializing with friends and companions becomes motivating and rewarding at the same time, whether it is escaping routine social contacts (i.e., work mates and family members) or seeking interpersonal rewards from doing things with best "buddies." Copp (1975) reported that for hunters, being with friends was as important as getting away from the usual social contacts. This regulation enabled them to achieve an optimal and ideal level of desired social contact and interaction. It is then not surprising that Crandall (1979) concluded that the "best" leisure activities are those that involve activity *and* friends. Its is worth noting that the greatest amount of time with family members was spent in maintenance and passive activities (e.g., TV watching), while active pursuits were much more frequent with friends, with more positive experiences realized with friends rather than with family members (Larson et al., 1986). This, then, expresses the essence of leisure: doing what one wants to do in his or her free time and doing it with whom and when he or she wants to (Iso-Ahola, 1999). Unquestionably, such leisure adds a significant amount of meaning to one life.

Seeking versus escaping

Besides social connection and social interaction, leisure contributes to meaning in life through psychological benefits derived from free-time engagement. Mannell and Reid (1993) studied 416 Canadian managers and professionals to determine how they organize work and leisure in their lives and psychological benefits they derive from both. Results revealed that group differences could be accounted for by two independent factors: the extent to which these managers used leisure rather than work to seek out personal and interpersonal rewards and satisfactions, and the extent to which they used leisure rather than work to escape personal and interpersonal environments. In other words, improved psychological well-being is attained when people use their leisure time to seek personal rewards (e.g., a sense of competence through sports and games) and simultaneously escape personal difficulties and problems, as well as to seek interpersonal rewards (e.g., friends' company) and simultaneously escape the routine interpersonal world (e.g., workmates and family members).

As such, results supported a 2-vector theory of leisure motivation (Iso-Ahola, 1989, 2022), according to which people use leisure to seek

personal rewards from engagement and to simultaneously escape personal problems and the routine environment (not just work) on one hand and to use leisure to seek interpersonal rewards by doing things with friends but simultaneously escaping or leaving the routine interpersonal world behind on the other. In other words, leisure engagement brings meaning to people's lives, because it enables them to pursue personal rewards in skillful activities and interpersonal rewards in social interaction with friends, but also at the same time allows them to escape or leave behind every day personal issues and usual interpersonal contacts. Indeed, Baumeister (1991b) proposed that the modern self can be burdensome and stressful, and people have acquired a wide assortment of activities specifically designed to escape from self-awareness.

The fact that Mannell and Reid's and others' (e.g., Snepenger et al., 2006) data have strongly supported the theory suggests that through the two dimensions (seeking and escaping), participation in leisure activities adds significantly to people's felt meaning in life. Thus, in leisure, individuals can pursue such intrinsic rewards as self-development and feelings of competence and interaction with friends, as well rewards from being able to leave behind the usual personal environment and perhaps forced interpersonal contacts (e.g., workmates). A recent study showed that freely chosen social interaction had the strongest positive correlation with subjective well-being, sense of meaning, and perceived control, but being with others not by choice had the strongest negative relationship with subjective well-being (Uziel and Schmidt-Barad, 2022). It is proposed that of the two dimensions, seeking rather than escaping is more conducive to meaning in life, but this remains to investigated empirically.

Serious versus casual leisure

We have emphasized how diverse leisure pursuits are. One important dimension along which they vary is seriousness. Some leisure pursuits may be trivial and frivolous, such as playing a Sudoku game to pass the time, others may become quite serious, such as the amateur musician who spends hours practicing each day, joins an ensemble or local band, follows a long-term plan for skill improvement, and performs for paying audiences. The latter may still regard music as a hobby and rely on his "day job" for most of his income and to support his family. As another example, there are people who occasionally play a game of cards for fun — and others who play almost every day after work, systematically hone their skills, and seek out intense competition in national tournaments. This is particularly true of playing video games. Playing these games is an interesting case because of its increasing popularity among youth and because one can turn into a professional and earn lucrative living doing so. Undoubtedly, many, if not all, began playing these games for sheer intrinsic interest, but for some it grew into a serious leisure activity, and for the best, a profession on its own.

According to Stebbins (1992, p. 3), serious leisure is "the systematic pursuit of an amateur, hobbyist or volunteer activity that participants find so substantial and interesting that they launch on a career centered on acquiring and expressing its special skills, knowledge and experience." It is the opposite of casual leisure (e.g., TV watching and eating) that is not classifiable as amateur, hobbyist or career volunteering. Although serious leisure can be anything from amateur astronomy and archeology to barbershop singing and highly committed community service (e.g., volunteer work at a food bank), what is common to all participants in these activities is strong identification with and deep meaning derived from their pursuits.

However, it should be noted that Stebbins' idea of serious leisure has not been accepted without criticism. Veal (2016) has suggested that serious leisure and casual leisure are not binary categories, but instead, serious leisure should be viewed as a continuum. (We find this point persuasive; most psychological phenomena exist on continuums.) Accordingly, most leisure activities are participated in with varying degrees of seriousness.

Serious leisure is different from project-based leisure (Stebbins, 2005), which refers to one-time special leisure occasions, like attending festivals and graduations or preparing and attending birthdays and Christmas get-togethers (baking, decorating etc.). Although such leisure episodes can be rewarding and meaningful, their effects on meaning in life are likely to be short-term compared to serious leisure. However, for many parents and grandparents, life's meaning is in seeing and experiencing their children's and grandchildren's growth and achievements. To them, leisure occasions (e.g., birthdays) become special and memorable, adding significantly to meaning in life even if they are not experienced as often and regularly as serious leisure pursuits (e.g., volunteering).

Serious leisure is similar to "recreation specialization" that has mainly been studied in outdoor contexts among boaters, hunters, fishermen, campers, and birdwatchers. Essentially, the person is highly devoted to a particular leisure activity. The recreation specialist engages repeatedly and regularly in that activity, as opposed to having different leisure activities. Obviously, devotees of serious leisure typically do the same. Specialized recreation may differ from serious leisure in that many participants in specialized recreation do not seek to cultivate advanced levels of skill. They may favor a particular hobby or activity and even feel personally invested in and committed to it (e.g., social bridge and dancing; Scott and Godbey, 1992, 1994; Brown, 2007), but they tend to eschew skill development and expertise in them. In other words, people participate in these activities regularly to derive enjoyment from being able to use their skills in freely chosen activities and good social company, while not striving to become highly skilled competitors and experts. As an example, one of the present authors has skied regularly for many years and gives priority to good skiing opportunities, but makes hardly any effort to improve his skills, being comfortable identifying himself as a permanently intermediate level skier.

Serious leisure can satisfy all four of the needs for meaning, and not just on a temporary basis but over a long period of time. Undoubtedly, it contributes considerably more meaning to life than casual leisure. Specifically, serious leisure pursuits involve purposive activity, with goals and anticipated fulfillments extending far into the future. It becomes a key source of value in the person's life (and we assume it is typically consonant with the person's other main values). Most serious leisure pursuits provide a sense of efficacy, whether from skillful performance or virtuous community service. Last, we suspect people are typically proud of their serious leisure activities, so that any drive toward self-worth gains some satisfaction that way.

Serious leisure typically enjoys several additional features of meaningfulness. To become serious, the leisure activities must resonate with the self, and expressing the self is one component of meaningfulness (see Baumeister et al., 2013). Thus, they are chosen carefully based on the self. This personal meaningfulness can even enable some serious leisure activities to replace work as the most

meaningful aspect of life other than family and social relations, as Stebbins (1992) showed with amateur archeologists and astronomers. We speculate that the rise of the internet has increased these capabilities, because they make it easier for the amateur to connect with others who share that passion and make it possible to spend countless hours in such online activity. Playing video games attests to this point.

In many cases, the person forms social relationships with others who share the same activity, whether it be amateur astronomy or birdwatching, and relationships contribute meaning. Meaning is also crucial in integrating experience across time (Baumeister and Vohs, 2016). Serious leisure activities often require substantial commitment over long periods of time. Mere quantity of time is, of course, not sufficient to qualify an activity as serious leisure. To return to the obvious example: On average, people spend more time watching television than in any other activity, and few people regard television watching as either a serious leisure pursuit or a personally meaningful and satisfying activity. As another example, "hanging out" and associated drug use is common among youth.

Research has shown that involvement in serious leisure correlates positively with meaning in life, personal growth and improved health, enhanced social relationships, positive affect and life satisfaction, and work-related self-efficacy (e.g., Baldwin and Norris, 1999; Kim et al., 2011, 2015; Heo et al., 2013; Phillips and Fairley, 2014; Kelly et al., 2020). All this evidence suggests that leisure pursuits, especially serious leisure, can significantly add to meaning in life, if not meaning of life, and even compensate for barren work. The ideal situation, of course, would be that both work and leisure together (or separately) increase the meaning in and of life.

Discussion and conclusions

The essence of leisure is not in the activity but rather in its subjective meaning. In particular, what makes something qualify as leisure is that it is experienced as free choice, where intrinsic motivation can be the deciding factor (unlike most work). In general, people express a high desire for freedom — yet when they get more free time, they often do not know what to do with it, so many leisure hours are dissipated in trivial and unsatisfying pursuits such as watching television. For many (though certainly not all) people, the desire for freedom may often be more a matter of wishing to be free of the external demands of work than to be able to engage in a particular activity. This tension is evident in one of the basic dimensions along which leisure pursuits vary, that is, escaping rather than seeking. Personal meaning is undoubtedly involved in both: One wishes to escape from work and other activities that are experienced as extrinsically motivated, or one seeks pleasure and sometimes meaning by engaging in activities that one regards as strongly intrinsically motivated. Escapist motivations for leisure are also suggested in the widespread prevalence of passive leisure activities, in contrast to the more active sorts of leisure. Yet the active ones are generally rated as more fulfilling than the passive ones.

Leisure has some power to add meaningfulness to life, but only if it is not seen as wasteful. Research has shown that those who believe that leisure is wasteful score lower in happiness and well-being and higher in depression, anxiety, and stress (Tonietto et al., 2021). Perceiving leisure as wasteful obviously indicates that leisure is not seen to contribute to life's meaningfulness. Yet, leisure may be particularly appealing to those individuals for whom work (and perhaps family) fail to provide satisfactory levels of meaningfulness. In terms of Baumeister's (1991a) four needs for meaning, leisure offers some opportunities to satisfy each of them. In leisure, purposes tend to be short term, such as skiing down the slope or winning the game, but some can engage longer-term and thus more meaningful goals. How values are reflected in leisure pursuits may be a promising topic for future research, but the role of value is evident in the greater valuation of experiences as compared to owning possessions (Van Boven and Gilovich, 2003). Moreover, volunteer work and other morally virtuous leisure activities seem highly likely to increase meaning. Many active leisure pursuits involve skills, the exercise of which undoubtedly furnishes a sense of efficacy. The volunteer work would likewise be an important basis for the sense that one's leisure activities are making a positive difference in the world. Last, self-worth can be bolstered by leisure activities that enable competitive success, virtuous contribution to the betterment of society, and possibly other pathways.

Our analysis suggests multiple directions for future research. First steps would include directly testing hypotheses that participation in (some) leisure activities is linked to higher meaningfulness in life—and, importantly, demonstrating which leisure pursuits cause people to experience more meaningfulness, and why so. A related hypothesis would be that people who report higher search for meaning (as contrasted with the presence of meaning) may take up particular leisure pursuits in order to satisfy that unmet need for meaning. Additional hypotheses would be that meaningfulness is particularly gained by leisure pursuits that are long-term rather than short-term, interpersonal rather than solitary, active rather than passive, and seeking rather than escapist. The relationship between leisure and meaning in life also raises interesting theoretical questions. Assuming that meaning in life consists of components (mainly work, family/interrelationships, and leisure), Are the effects of these components additive or interactive? Or, are the effects compensatory? And what are their relative weights? How does leisure's contribution compare to that of work and interrelationships – and how does this contribution vary as a function of situations and groups of individuals?

Although the time available for leisure has fluctuated widely throughout human history and prehistory (Hunnicutt, 2020), and across different cultures and walks of life, leisure appears to be here to stay as an important fixture of modern life. And whereas the available time for leisure has varied in both directions, the diversity of opportunities for leisure pursuits has expanded dramatically. How people choose to spend their leisure time is a highly variable but important form of self-expression — and, ultimately, a variable but sometimes important contribution to the meaningfulness in and of life.

Author contributions

Both authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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A growing concern for meaning: Exploring the links between ego development and eudaimonia

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Introduction: Eudaimonia, in contrast to hedonia, is theorized to be a more complex type of positive functioning that involves personal growth and is guided by the pursuit of meaning. However, the existing evidence linking eudaimonia to personality development is rather scarce. To fill this gap, we aimed to explore whether ego development is related to eudaimonic well-being and eudaimonic orientations, most notably, the concern for meaning: we explored both the quantitative differences in the presence of meaning and the search for it, as well as qualitative differences in lay theories of meaning.

Methods: Russian-speaking volunteers recruited online ($N = 364$, aged 18 to 85, 63% female) completed measures of ego development (Washington University Sentence Completion Test), meaning in life (Meaning in Life Questionnaire), lay theories of meaning (and original 20-item measure), hedonic and eudaimonic motives for activities (HEMA), and well-being (Mental Health Continuum—Short Form).

Results: Ego development emerged as a weak, but significant positive predictor of well-being and this effect was fully mediated by the presence of meaning and eudaimonic motives. Latent profile analysis of the items tapping into lay theories of meaning revealed four distinct individual approaches to meaning that mainly differed in the subjective importance and salience of meaning. Participants with stronger concern for meaning revealed higher scores on ego development, both presence and search for meaning, eudaimonic motives, and well-being.

Discussion: The results add to the evidence concerning the links between ego development and well-being and are in line with the theoretical view of eudaimonia as a process of growth guided by personal concern for meaning. The findings suggest that eudaimonia might be more easily attained by individuals at higher stages of personal development.

KEYWORDS

ego development, eudaimonic orientations, implicit theories of meaning, lay theories, personal growth

Introduction

Hedonia and eudaimonia

The research into eudaimonia and hedonia began with the question of whether they are different types of wellbeing or different pathways people use to seek wellbeing (Ryan and Deci, 2001; Kashdan et al., 2008). Recent theories and empirical findings suggest that eudaimonia and hedonia can be conceptualized as two distinct processes of positive functioning: they are both positively related to trait wellbeing indicators but are associated with different activities, motivational orientations, and emotional states (Huta, 2016; Vittersø, 2016, 2018).

Despite the rapidly growing popularity of this research field, consensus concerning an exact definition of eudaimonia is yet to be reached. Huta and Waterman (2014) carried out a systematic review of 11 existing models of eudaimonia and discovered two elements universally present in all of its definitions: growth (self-realization, self-actualization, development of potentials, full functioning, maturity) and meaning (purpose, long-term perspective, caring about and contributing to the broader context). To achieve conceptual clarity, they propose to distinguish eudaimonic orientations and behaviors (i.e., ways of living or a good life) from eudaimonic experiences and functioning (i.e., forms of wellbeing) (Huta and Waterman, 2014; Huta, 2016).

Our approach to eudaimonia and hedonia is informed by two theoretical contexts that offer symmetrical definitions of the two constructs. According to the Functional Wellbeing Approach (Vittersø, 2016, 2018), hedonic wellbeing is a subjective experience of pleasure or satisfaction that reflects homeostatic stability achieved by satisfying one's needs. Eudaimonic wellbeing, in turn, comprises experiences such as interest, engagement, curiosity, and awe, and reflects change or growth process associated with overcoming challenges. According to Vittersø (2018), the trait element of eudaimonic wellbeing is personal growth (Vittersø and Straume, 2017), which needs to be defined using both subjective and objective criteria and cannot be fully captured by self-reports. Another model distinguishing eudaimonia and hedonia at the level of trait-like motivational orientations was proposed by Huta (2016). She differentiates hedonic motives, which comprise striving for pleasure and comfort, avoidance of distress and negative emotions, from eudaimonic motives comprising the pursuit of personal growth, meaning, authenticity, and excellence.

These two models appear to complement each other, providing a clear distinction between eudaimonia and hedonia at the trait and state levels. Eudaimonia emerges from these models as a more complex and resource-demanding type of positive functioning based on effortful action in pursuit of meaning or virtue, in contrast to hedonia, which is relatively effortless and more readily available in many life situations. Therefore, eudaimonia might be based on more complex cognitive processing and more mature personality structures, processes, and resources developed throughout the lifespan. In the present research, we aimed to explore the relationships of eudaimonic orientations and eudaimonic wellbeing with personal growth and development.

Developmental basis of eudaimonia

The idea that eudaimonia (understood in terms of orientations or wellbeing outcomes) is related to maturity has been proposed by several authors (Bauer, 2016; Law and Staudinger, 2016; Ryff, 2016). Bauer and McAdams (2010) and Bauer (2016) defined eudaimonic growth as a process of a parallel increase in subjective wellbeing (SWB) and psychosocial maturity understood as complexity and integration in the ways of thinking about one's life. More recently, Bauer et al. (2015) have differentiated two interrelated motivational facets of eudaimonic growth, reflective (aiming to develop new perspectives on oneself, others, and life), which is more strongly associated with indicators of psychosocial maturity, and experiential (aiming to cultivate meaningful activities and relationships), more strongly related to wellbeing outcomes.

However, empirical support for the link between eudaimonia and maturity is still scarce, as the latter is rather difficult to measure. According to Bauer et al. (2015), maturity is an umbrella term that covers a range of constructs describing distinct yet related aspects of cognitive and personality development (such as wisdom, self-actualization, moral reasoning, and ego development, among others). The challenges of measuring these notions with self-report instruments have been discussed extensively (Nisbett and Wilson, 1977; Kunzmann, 2019): King (2011) notes that scholars tend to blur the lines between the conscious feelings of personal growth and the more objective personality development that do not necessarily have much to do with each other. In operationalizing maturity, we relied on Loevinger's (1976) Ego Development (ED) theory which unifies cognitive and personality development and proposes an elaborate performance-based empirical operationalization of maturity.

According to Loevinger (1976), ego is a holistic construct representing the structural unity of personality organization that unifies both the integrative processes a person uses to deal with life experiences and the frame of reference she/he subjectively imposes on these experiences to create meaning. The ED theory describes a sequence of nine developmental stages or levels (labeled E1–E9) that reflect a progressive reorganization of the self and are defined by characteristic features of impulse control and moral character, cognitive style, interpersonal style, and conscious preoccupations.

The first, symbiotic, stage of ego formation (E1) is pre-conscious and is not accessible for assessment. At the earlier, Impulsive (E2) and Self-Protective (E3) stages, individuals are predominantly self-focused and are preoccupied with bodily feelings and with controlling their environments in order to obtain gratification. At the Conformist (E4) stage, individuals identify with the group, rely on rules and conventions in shaping their behavior, and are preoccupied with appearance and belonging. The Self-Aware (E5) stage brings in a limited awareness of possible exceptions, as well as of one's individuality and inner life. It is followed by the Conscientious (E6) stage when individuals start to rely on self-evaluated standards and ideals and to think beyond their personal concerns. The Individualistic (E7) stage brings in a sense of one's personality as a whole, as well as recognition of that of others, and a preoccupation with finding a balance between one's needs, wishes, and obligations. At the Autonomous (E8) stage, individuals become aware of the complexity of social interactions and are able to acknowledge and accept unresolvable conflicts, develop a broader scope of concern and focus on the search for self-fulfillment. The Integrated (E9) stage corresponds to Maslow's view of a self-actualizing person and involves the search for identity. To assess the ED level, Loevinger developed the Washington University Sentence Completion Test (WUSCT; Hy and Loevinger, 1996), a projective measure with extensive evidence of reliability and validity (Gilmore and Durkin, 2001).

Within the field of eudaimonia, ED has been proposed as a measure of psychosocial maturity or practical wisdom that reflects eudaimonic functioning (Bauer, 2016; Huta, 2016). Indeed, the descriptions of stages in ED theory indicate that the behaviors and motivations described within various models

of eudaimonia (such as the pursuit of excellence, authenticity, autonomy, personal growth, autotelic engagement, and acceptance of reality) (Huta and Waterman, 2014) become increasingly salient throughout the progression from conventional to post-conventional ED stages (E5–E9). Nevertheless, despite the strong theoretical affinity between these two research fields, the empirical evidence concerning the links between eudaimonia and maturity is still limited. We aimed to contribute to this body of evidence by investigating the associations of ego development with the eudaimonic motivational orientations (most notably, concern for meaning) and with the wellbeing outcomes of eudaimonic functioning.

Ego development and the growing concern for meaning

Within Loevinger's approach, "ego" is understood as the underlying principle in personality organization that develops and generates coherent meaning: "the search for coherent meanings in experience is the essence of ego or ego functioning, rather than just one among many ego functions" (Hy and Loevinger, 1996). The levels of ED reflect distinct forms of meaning-making, templates, or frameworks that individuals continuously apply to their experiences. As the ED level increases, individuals gradually progress from a rigid and simplified understanding of the world (e.g., dichotomous "good vs. bad" evaluations) to increased complexity and integration of thinking about oneself and others. Instead of accepting culturally programmed meanings, they become increasingly aware of themselves as meaning-makers and conscious of their own meaning-making activity and its limits (Loevinger, 1976; Hauser, 1993; Cook-Greuter, 1999).

Based on ED theory, one can expect that at higher ED stages the theme of meaning becomes increasingly salient with the search for meaning emerging as a conscious concern. Many prominent theories of meaning emphasize its universal aspects: for instance, Frankl (1969) believed that the search for meaning is a basic and primary motivation, therefore, the question of meaning is inevitably faced by every human being. Many other theorists also viewed the need for meaning, understood either as a cosmic, self-transcendent purpose or frame of orientation, or a more mundane, existential meaning related to the value behind one's everyday actions, as a universal human need (Baumeister, 1991; Längle, 2005; Fromm, 2011). However, some authors suggested that the need for meaning or purpose only emerges at higher levels of personality development (Jung, 1954; Maslow, 1971). The latter stance seems to be more in line with recent empirical findings revealing "existential indifference": some individuals report an absence of meaning and no desire to seek it (Schnell, 2010). Still other existentialist and psychodynamic approaches to meaning suggest that it emerges with time as a general direction of actions taken and decisions made by an individual and may only be consciously recognized in retrospect (Adler, 1958; Maddi, 2012).

This diversity of views leads to the question of whether ego development involves facing the problem of meaning as a personal and conscious problem. This question is further complicated by the very ambiguity of the concept of meaning, which may manifest itself in emotional experiences, such as the meaningfulness or significance of one's actions or life as a whole, in cognitive constructions, such as views regarding one's life purpose or direction, in motivational processes, such as actual or possible goals, and in one's behavior, as an emergent direction of one's actions and daily activities (Leontiev, 2013; Martela and Steger, 2016). The common self-report instruments measuring meaning often focus on some of these aspects or rely on a subjective understanding of the term "meaning" (Brandstätter et al., 2012), adding further to the confusion.

In the present study, we sought to explore whether individuals at different levels of ED would exhibit differences in their understanding of the concept of meaning and in their views regarding its importance. To address the individual diversity of views regarding meaning, we complemented quantitative assessment of the presence and search for meaning with a novel instrument exploring the qualitative differences in lay (implicit) theories of meaning using the person-oriented approach (Bergman and Magnusson, 1997). We used a set of items tapping into the nature of meaning, its origins and availability, as well as its necessity for human life and its personal salience, in order to uncover holistic distinct patterns (or common types) of view regarding meaning—implicit theories of meaning.

Ego development and wellbeing

Given that eudaimonia comprises ways of behaving and forms of wellbeing (Huta, 2016), we approach the final question, whether ego development brings about higher wellbeing. This question has been a matter of considerable debate. According to Loevinger (1968), ego development is "conceptually distinct" from the health-illness dimension, and it is only at the low end of the ED continuum that a "direct relation between ego development and mental health, adjustment or pathology is found" (Loevinger, 1968, p. 170). She suggested that while lower ED stages tend to be associated with maladjustment, the kinds or symptoms of psychopathology tend to differ at different ED stages; correspondingly, the criteria of mental health have to differ as well with the conventional criteria of mental health only applying to individuals at higher ED stages (Loevinger, 1968, 1976).

Empirical data are generally consistent with these ideas: numerous studies show that higher ED levels are associated with greater internalization of distress and readiness for psychotherapy (Noam, 1998; Duffy et al., 2017), however, the associations of ED with wellbeing measures found in different studies are very modest in magnitude, rarely attaining $r = 0.20$, or even non-existent (Noam, 1998; King and Hicks, 2007; Bauer and McAdams, 2010; Bauger et al., 2021). Until meta-analytic studies are conducted, it is hardly possible to conclude whether ego development is completely independent of wellbeing and psychological adjustment (Noam, 1998; King and Hicks, 2007), but, at least, their associations appear too weak to be routinely detected, given typical sample sizes in the field.

If higher complexity and maturity are supposed to facilitate self-regulation, coping, and adjustment, why are the links between ED and wellbeing so weak? One possible explanation is that

pronounced changes in wellbeing may only pertain to the highest ED stages (Bauer, 2011; Bauer et al., 2011) that are rarely found in the general population. In addition, higher complexity associated with these stages brings about greater awareness of conflict and the desire for self-actualization might result in more difficulty fitting in with the social system (Maslow, 1971; Pals and John, 1998): the processes of growth and adjustment are different and may not always lead in the same direction (Law and Staudinger, 2016).

Another explanation is that the changes in wellbeing associated with maturity are more qualitative than quantitative (Fossas, 2019) and are related to the more objective (i.e., activity) aspects of positive functioning than to its subjective perception. Certainly, subjective wellbeing measures (Diener, 2009) have numerous advantages, one of them being content-free (Sheldon, 2018), in line with Loevinger's (1968) early idea that the definition of mental health should not be broadened. However, they tend to contain a mixture of phenomenological indicators of hedonic and eudaimonic states (Vittersø, 2016) and also fail to address complex emotions, such as awe, elevation, or fulfillment (Huta, 2013). Extending self-report measures to address the diverse facets of positive functioning may not solve the problem either: similar subjective evaluations of autonomy, competence, relationships, etc. at different ED levels may conceal the differences in the complexity of their objective manifestations and/or in the subjective criteria used to evaluate them. However, the issue of measurement of eudaimonic wellbeing is far from being resolved at present.

Given the scarcity of existing evidence concerning the link between wellbeing and ED, we sought to re-examine it in a new cultural setting using measures of eudaimonic wellbeing and eudaimonic orientations.

Study aims

We focused on two principal aims:

Firstly, we aimed to explore the associations of ED with wellbeing, meaning in life, and hedonic and eudaimonic motives. Building on Bauer (2011), we hypothesized that ED should be positively associated with eudaimonic wellbeing and that their shared variance should be fully mediated by eudaimonic orientations (meaning and eudaimonic motives) that become more prominent as one attains maturity.

Secondly, we aimed to explore the associations of ED with lay theories of meaning in life and views regarding its importance. Based on existing theory (Loevinger, 1976; Cook-Greuter, 1999), we expected that higher ED levels would be associated with a greater diversity of views regarding the nature of meaning and higher importance ascribed to meaning.

Methods

Participants and procedure

The study used a cross-sectional design in a sample of 364 Russian-speaking adults, 133 male and 231 female, between 18 and 85 years old ($M = 30.1$, $SD = 11.5$). Most participants (88.5%) had higher education or were current students (33.5% with a Bachelor's degree, 40.7% with a Master's degree, and 14.3% with an advanced degree). Initially, we had aimed for a minimum $N = 193$ allowing us to detect a typical effect size ($r = 0.20$) with 80% power. However, given the high response rate and the possibility of weaker effects, we opted to collect as large a sample as possible, achieving 80% power for weaker effects ($r = 0.15$, according to sensitivity analysis) with our final sample size.

The research was conducted in accordance with the Declaration of Helsinki. Participants were anonymous volunteers invited *via* social networks and online communities to take part in an online survey of views on life meaning and personality traits. After providing their informed consent and completing the questionnaires, they could opt-in to receive an update on the study results; no remuneration of any kind was provided. The study protocol was approved by the HSE University Psychology Research Ethics Committee.

Instruments

Washington University Sentence Completion Test

The WUSCT (Loevinger, 1985; Hy and Loevinger, 1996; Russian validation: Leontiev and Kostenko, in preparation) includes 36 open-ended sentences (e.g., "When people are helpless…") the respondents are asked to complete. During scoring, each response is assigned an ED level ranging from E2 (Impulsive) to E9 (Integrated), and the whole protocol is assigned an "impressionist" rating. The WUSCT has high reliability and extensive evidence of construct, predictive, and discriminant validity (reviewed in Gilmore and Durkin, 2001).

In the present study, we used a short form of the WUSCT including the first 18 items (Holt, 1980; Loevinger, 1985). First, each protocol was scored by an experienced rater with 4 weeks of training. Next, the scoring was checked by another rater with several years of experience in coding the WUSCT. Next, we used the item sum score approach recommended by Hy and Loevinger for the 18-item version to generate the total protocol rating (TPR) for each individual (essentially, a sum score of the items). Finally, we used the sum rule (Loevinger, 1998) to classify the protocols into discrete ED stages. Spearman correlation of impressionist rating with the TPR and the ED score based on the sum rule was $\rho = 0.89$ and 0.88, respectively ($p < 0.001$).

Hedonic and Eudaimonic Motives for Activities-Revised

Hedonic and Eudaimonic Motives for Activities-Revised (HEMA-R) (Huta, 2015) consists of 11 items rated on a 5-point scale. The instructions for the trait version ask to rate the degree to which the participants approach their activities with each of the intentions listed. Six items assess hedonic motives reflecting the pursuit of pleasure and relaxation (sample item: "Seeking to take it easy") and five items assess eudaimonic motives reflecting the pursuit of authenticity, excellence, and growth (sample item: "Seeking to do what you believe in"). The internal consistency coefficients for all the study measures are given in Table 1.

TABLE 1 Descriptive statistics for the individuals at different ego development stages, *M* (SD).

	Pre-conventional E2–E3 ($N = 28$)	Conformist E4 ($N = 57$)	Self-aware E5 ($N = 138$)	Conscientious E6 ($N = 98$)	Post-conventional E7–E9 ($N = 41$)
Hedonic motives	5.25 (0.95)	4.93 (1.12)	4.92 (0.93)	5.14 (0.93)	5.08 (0.83)
Eudaimonic motives	5.30 (1.03)	5.38 (0.92)	5.40 (0.90)*	5.73 (0.74)***	5.85 (0.68)**
Presence of meaning	4.22 (1.40)	4.08 (1.79)	4.35 (1.49)	4.47 (1.51)	4.82 (1.45)
Search for meaning	4.41 (1.29)	3.88 (1.50)	4.38 (1.33)*	4.42 (1.50)	4.40 (1.34)
Emotional wellbeing	3.50 (1.37)	3.56 (1.36)	3.71 (1.29)	3.87 (1.19)*	3.98 (1.09)
Social wellbeing	2.79 (1.03)	2.84 (1.05)	2.87 (0.99)	2.92 (1.01)	3.27 (1.13)*
Psychological wellbeing	3.51 (1.17)	3.49 (1.05)	3.61 (1.12)	3.66 (0.98)	3.87 (1.04)
MHC total score	3.25 (1.07)	3.27 (0.99)	3.37 (0.99)	3.44 (0.87)	3.68 (0.96)*

The ED stages were determined based on sum rule (Loevinger, 1998). Significance of the difference between the combined score of individuals at this and the subsequent stages from that of the individuals at prior stages combined (Welch's t-test): $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Mental Health Continuum—Short Form

Mental Health Continuum—Short Form (MHC-SF) (Keyes et al., 2011; Russian validation: Zemojtel-Piotrowska et al., 2018) includes 14 items reflecting various experiences of wellbeing whose frequency over the past month the participants are asked to rate using a 6-point scale. The items tap into emotional wellbeing (happiness, interest, and satisfaction), social wellbeing (social contribution, integration, growth, acceptance, and coherence), and psychological wellbeing (self-acceptance, environmental mastery, positive relations, personal growth, autonomy, and purpose in life).

Meaning in Life Questionnaire

Meaning in Life Questionnaire (MLQ) (Steger et al., 2006; Russian version: Osin et al., 2014) is a brief measure of meaning with 10 items rated on a 5-point scale. It includes two five-item subscales, Presence of Meaning (sample item: "My life has a clear sense of purpose") and Search for Meaning (sample item: "I am seeking a purpose or mission for my life").

Implicit Theories of Life Meaning

Implicit Theories of Life Meaning (ITLM) (Osin et al., 2014) is a semantic-differential-type measure that attempts to capture the diversity of individual views concerning the nature, origins, and necessity of meaning in life. It includes 20 items (six unipolar and 14 bipolar ones) rated on a 5-point scale and reflecting the diversity of existing theoretical positions on the meaning of life (the complete list of items is given in Table 2).

Given that the views concerning life meaning may have complex and individually-specific structure, the ITLM items are not grouped into scales, but, rather, are supposed to be analyzed using a person-oriented approach methodology. A previous study (Osin et al., 2014) using hierarchical cluster analysis has found four groups of individuals with distinct approaches to meaning (viewing meaning as a goal or direction of life, as a subjective experience, as something vague but potentially useful, and as an absurd question). The groups also showed predictable differences in the scores on explicit measures of life meaning and personality resources. In the present study, we used a more robust Latent Profile Analysis (LPA) methodology to uncover the structure of views regarding life meaning.

Data analysis

Nineteen participants failed to complete one or more measures or provided invalid responses (following Curran, 2016, we screened out responses from participants who provided the same answer to a series of 10 or more questions). The number of missing responses ranged from 2 to 14 per measure (two for WUSCT and MHC-SF, seven for MLQ, and 14 for HEMA). Little's MCAR test was not significant, indicating that the data were missing completely at random. As a result, we opted to use weighted least squares estimation in Mplus for the latent variable models and to report pairwise *N* for the analyses based on observed variables.

First, we explored pairwise associations between ED stages and the other study variables. The results based on the three versions of WUSCT scoring (Total Protocol Rating, discrete score based on sum rule, and impressionist scoring of the whole protocol) were convergent. We calculated correlations of the ED scores with the other variables, and compared individuals at different ED stages using one-way ANOVA.

Next, we tested the mediation models using SEM in Mplus 8.4 with the WLSMV estimator for categorical items. We used conventional criteria to evaluate fit indices (Hu and Bentler, 1999), interpreting them in combination (Brown, 2015). First, we tested a theoretical measurement model for each questionnaire using ICM-CFA and ESEM (the parameters of measurement models are given in Supporting Information). Next, we proceeded by testing structural models where the association of ED with a latent wellbeing factor defined by the three MHC subscale scores was mediated by HEMA and MLQ scales. In each case, we tested a partial mediation model with correlated mediators and applied the Wald test to find out whether constraining the direct path from ED to MHC to zero would adversely affect the model fit.

To investigate the existence of distinct lay theories of life meaning, we applied latent profile analysis in Mplus to the 20 ITLM items. The variables were modeled as ordered categorical. We used 10,000 random starts with 50 initial stage iterations and

TABLE 2 Descriptive statistics and correlations for the study measures.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Ego development (TPR)												
2. Ego development (Sum rule)	0.96**											
3. Hedonic motives	0.01	0.07										
4. Eudaimonic motives	0.21**	0.19**	0.29**									
5. Presence of meaning	0.13*	0.11*	0.07	0.52**								
6. Search for meaning	0.11*	0.09	−0.07	0.08	−0.12*							
7. Emotional wellbeing	0.11*	0.11*	0.16**	0.43**	0.53**	−0.05						
8. Social wellbeing	0.10	0.09	0.09	0.34**	0.48**	0.02	0.60**					
9. Psychological wellbeing	0.09	0.09	0.11*	0.47**	0.59**	−0.05	0.73**	0.65**				
10. MHC-SF total wellbeing	0.11*	0.12*	0.13*	0.47**	0.61**	−0.03	0.85**	0.86**	0.92**			
11. Gender (0 = male, 1 = female)	0.13*	0.08	−0.05	0.03	0.05	0.18**	0.18**	0.18**	0.09	0.16**		
12. Age	−0.01	−0.03	−0.21**	0.10	0.23**	−0.08	0.21**	0.20**	0.25**	0.25**	0.10*	
13. Education	−0.01	−0.02	−0.12*	0.10	0.16**	−0.03	0.14**	0.11*	0.14**	0.15**	0.06	0.52**
α	0.89	n/a	0.74	0.69	0.90	0.86	0.82	0.70	0.78	0.89		
M	4.92	5.20	5.02	5.53	4.41	4.33	3.75	2.92	3.63	3.40		
SD	0.55	1.15	0.95	0.87	1.53	1.39	1.26	1.03	1.07	0.97		

*$p < 0.05$.
**$p < 0.01$.
Pairwise N ranges from 345 to 362. Spearman correlations are given for categorical variables (ego development based on sum rule and education).
n/a – not available: the score based on sum rule is a discretization of the Total Protocol Rating (TPR) score.

2,500 final stage optimizations. In choosing a model, we relied on entropy, information criteria, likelihood ratio tests (Asparouhov and Muthén, 2012), and theoretical interpretability in combination. We compared models with two–five latent classes. With five classes, the model became unstable and showed poor convergence (45% of initial-stage solutions failed to converge). The model fit statistics (given in Supporting Information) generally favored models with a larger number of classes, except for BIC and VLMRT, which suggested two and three classes, respectively. Based on the combination of statistical criteria, model convergence, and theoretical considerations, we opted for the model with 4 latent classes.

In order to interpret the class profiles, we compared the groups based on the most likely class membership on the ITLM items using Kruskal–Wallis ANOVA. To establish significant pairwise differences between the groups, we used the Conover-Iman *post-hoc* test procedure (Conover and Iman, 1979) with Benjamini-Hochberg correction (Benjamini and Hochberg, 1995) for multiple comparisons implemented in the R package PMCMR. Finally, we compared the groups on the other variables using ANOVA with the Tukey *post-hoc* test.

Results

Ego development and eudaimonia

In terms of the distribution of individuals across the ED stages, the sample was consistent with existing findings, revealing a prevalence of conventional ego stages (see Table 1). The modal category was E5 "Self-aware" (38.1%), followed by E6 "Conscientious" (27.1%) and E4 "Conformist" (15.7%). The proportions of individuals scoring at post-conventional (E7–E9) and pre-conventional (E2-E3) stages were fairly low (11.3 and 7.7%, respectively).

The distribution of mean scores across the groups of individuals with different ED levels is given in Table 1. Only the difference in eudaimonic motives was significant across the five groups ($F_{(4,343)} = 4.29$, $p = 0.002$, $\eta^2 = 0.048$) with Tukey *post-hoc* test indicating higher scores ($p < 0.05$) in the groups E6 "Conscientious" and E7–E9, compared to E5 "Self-Aware."

The correlations (presented in Table 2) revealed weak positive associations of ED with eudaimonic motives, presence of meaning, search for meaning, emotional wellbeing, and the total MHC-SF score. Eudaimonic motives were the strongest correlate of ED. Predictably, eudaimonic motives and the presence of meaning were correlated with each other and with wellbeing. Search for meaning was only associated with ED and, inversely, with the presence of meaning. Hedonic motives only showed weak positive associations with emotional and psychological wellbeing.

Demographic variables (gender, age, and education) revealed weak associations with the study variables. Wellbeing tended to be higher in female participants, older adults, and those with higher education. The presence of meaning was only positively associated with age and education, whereas female participants showed higher scores on the search for meaning scale. Hedonic motives were weaker in older participants and those with higher education. ED was only marginally related to gender with higher scores in female participants.

Mediation models

The first model, where the association between ED and wellbeing was fully mediated by hedonic and eudaimonic motives, fit the data well [$\chi^2 = 749.10$, df = 457, $p < 0.001$; CFI = 0.940; RMSEA = 0.042, 90% *CI* (0.036, 0.047); SRMR = 0.053]. Hedonic motives were not significantly associated with ED [$a_1 = 0.076$, 95% *CI* (−0.025; 0.177), $p = 0.139$] and wellbeing [$b_1 = -0.089$, 95% *CI* (−0.223; 0.046), $p = 0.196$]. Eudaimonic motives, in turn, were predicted by ED [$a_2 = 0.257$, 95% *CI* (0.150; 0.363), $p < 0.001$] and predicted wellbeing [$b_2 = 0.647$, 95% *CI* (0.496; 0.799), $p < 0.001$]. The specific indirect effect of ED on wellbeing mediated by eudaimonic motives was significant [$a_2b_2 = 0.166$, 95% *CI* (0.083; 0.250), $p < 0.001$], and the Wald test supported the full mediation hypothesis [χ^2 (1) = 0.42, $p = 0.52$].

The second model, where the association of ED and wellbeing was mediated by the presence of meaning and the search for meaning, also showed a good fit to the data [$\chi^2 = 779.78$, df = 428, $p < 0.001$; CFI = 0.958; RMSEA = 0.048, 90% *CI* (0.042, 0.053); SRMR = 0.052]. ED was a significant predictor of both presence of meaning [$a_1 = 0.147$, 95% *CI* (0.040; 0.253), $p = 0.007$] and search for meaning [$a_2 = 0.119$, 95% *CI* (0.016; 0.222), $p = 0.024$]. Wellbeing, however, was only predicted by the presence of meaning [$b_1 = 0.680$ (0.606; 0.755), $p < 0.001$], but not by the search for meaning [$b_2 = 0.071$ (−0.016; 0.158), $p = 0.111$]. The specific indirect effect of ED on wellbeing mediated by the presence of meaning was significant [$a_1b_1 = 0.100$, 95% *CI* (0.026; 0.174), $p = 0.010$] and the Wald test, again, supported full mediation [χ^2 (1) = 0.09, $p = 0.77$].

Finally, we explored whether eudaimonic motives and the presence of meaning would independently contribute to explaining the shared variance of ED and wellbeing in a single model. The fit indices and parameters of this parallel mediation model are given in Figure 1. Predictably, the Wald test supported full mediation [χ^2 (1) = 0.10, $p = 0.76$]. Both specific indirect effects of ED on wellbeing mediated by the presence of meaning [$a_1b_1 = 0.076$, 95% *CI* (0.017; 0.134), $p = 0.011$] and by eudaimonic motives [$a_2b_2 = 0.061$, 95% *CI* (0.014; 0.109), $p = 0.011$] were significant and comparable in magnitude. The results were substantially the same when each of the three MHC scales was modeled individually as a latent dependent variable (full mediation with both indirect effects significant and in the 0.060–0.080 range).

Following the Reviewers' suggestions, we tested two additional models. In the first model, we entered demographic variables as covariates of all four latent factors to control for their effects. The model fit the data well [$\chi^2 = 718.09$, df = 509, $p < 0.001$; CFI = 0.973; RMSEA = 0.034, 90% *CI* (0.028, 0.039); SRMR = 0.055]. Out of demographic variables, only gender emerged as a significant positive predictor of ED ($\beta = 0.146$, $p = 0.006$) and wellbeing ($\beta = 0.147$, $p = 0.001$) and only age emerged as a predictor of the presence of meaning ($\beta = 0.204$, $p < 0.001$). Nevertheless, the estimates of direct and indirect effects did not change substantially: again, both specific indirect effects of ED on wellbeing mediated by the presence of meaning [$a_1b_1 = 0.069$, 95% *CI* (0.017; 0.122), $p = 0.010$] and by eudaimonic motives [$a_2b_2 = 0.065$, 95% *CI* (0.017; 0.113), $p = 0.008$] were significant and comparable in magnitude.

We also tested an alternative model with serial partial mediation, where ED predicted eudaimonic motives, which, in turn, predicted the presence of meaning, and the latter predicted wellbeing. This serial mediation model (see Figure 2) was mathematically equivalent, whose fit indices are presented in Figure 1. The estimate of the specific indirect effect reflecting serial mediation of the effect of ED on wellbeing by eudaimonic motives and the presence of meaning was statistically significant [$a_1b_1c_1 = 0.082$, 95% CI (0.039; 0.125), $p < 0.001$]. However, the Wald test rejected the full mediation hypothesis [χ^2 (3) = 9.95, $p = 0.02$] due to a significant direct effect of eudaimonic motives on wellbeing ($b_2 = 0.247$, $p < 0.001$).

Ego development and lay theories of life meaning

Descriptive statistics and correlations with ED for the individual items tapping into lay theories of meaning are given in Table 3. Correlation analysis has revealed that individuals with higher ED levels are more likely to understand meaning as a rational idea or an emotional subjective experience (items 1 and 2). They are more likely to see meaning as a possibility that can be accomplished (item 10), a reality that is created and shaped by one's conscious choices, rather than a given that does not depend on the person(items 11 and 14). Finally, individuals at higher ED stages are more likely to see the question of meaning as a personally important and reasonable one, rather than useless or impossible to answer (items 6, 16, 17, 19).

The results of latent profile analyses revealed four latent profiles, and we created four participant groups based on their most likely class membership. Scores on all but three items tapping into lay theories of meaning (2, 13, and 15) differed significantly across the groups. The strongest differences were observed for items 5 ("Meaning is… An illusion, as life is absurd"), 6 ("Meaning is… A question useless to ponder on"), 16 ("The question of meaning… is a reasonable/pointless question"), 17 ("…has a lot to do/nothing to do with me"), and 19 ("…can/cannot be answered") reflecting the personal salience of meaning. The mean scores reflect a more optimistic picture of views regarding life meaning in groups 3 and 4 and a more negative picture in the other two groups.

Participants in groups 1 and 2 tend to hold more negative views of meaning. They are less likely to understand meaning as a goal or a general direction of life (items 3, 4) and are more likely to think of it as an illusion (item 5) or as a question that is useless to ponder, because finding an answer is impossible (items 6, 19). They tend to view life meaning as something that is peculiar to a select few individuals (items 8 and 15), that can exist regardless of human choices (item 14), and is not necessary for life (item 9). The question of meaning appears to them as something they personally are not concerned with (items 17 "has nothing to do with me" and 18 "does not bother me at present").

However, there are also important differences between these two groups. Participants in group 1 hold more extreme negative views dismissing the importance of meaning (items 16 "a pointless question" and 18 "does not bother me at present"). They also tend to see it as a given that does not depend on us and that might be common and universal for everyone (items 10 "is a given that does not depend on one" and 11 "one can discover or understand it"). These individuals distance themselves from meaning and, following Schnell (2010), we labeled this group "Indifference to Meaning."

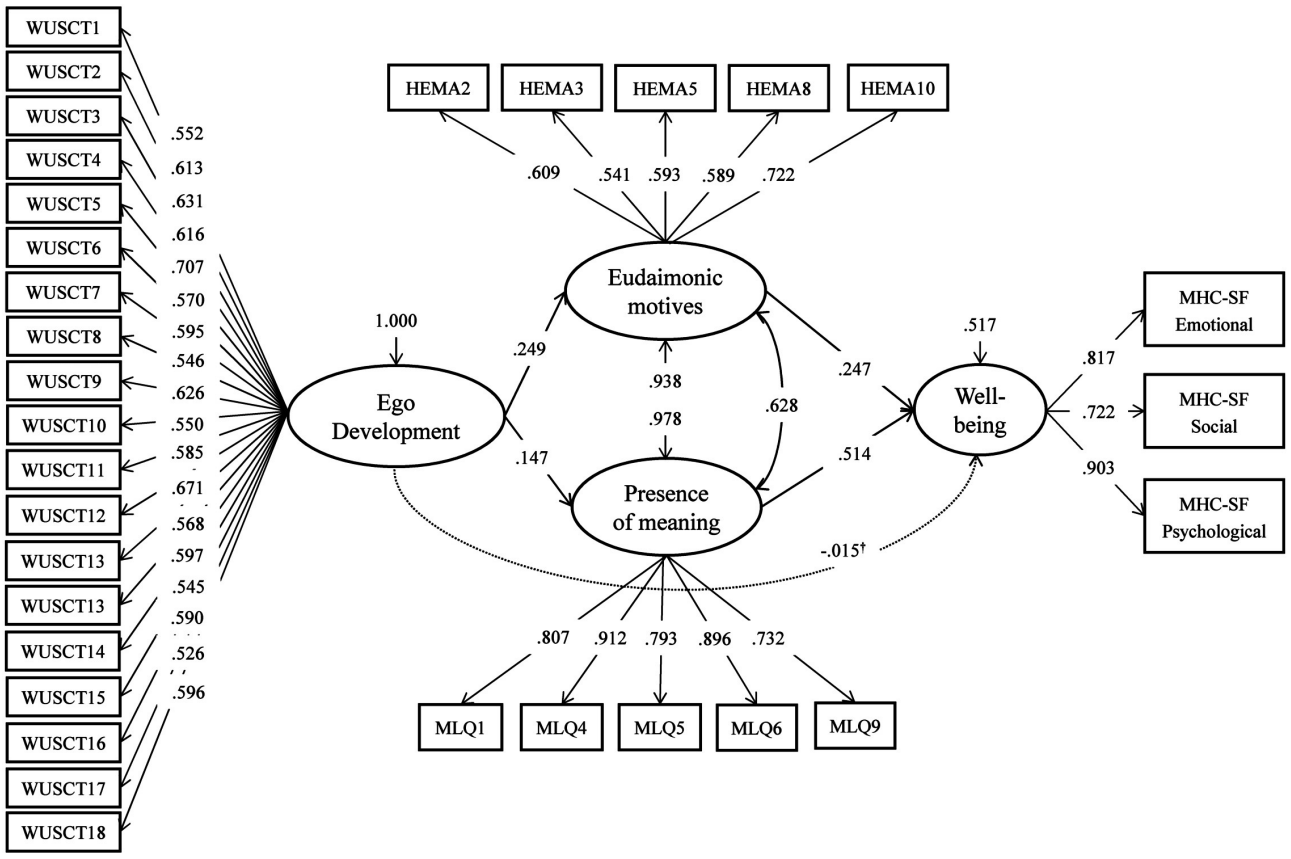

FIGURE 1
Parameters of the parallel mediation model. $\chi^2 = 627.22$, df = 428, $p < 0.001$; CFI = 0.973; RMSEA = 0.036, 90% *CI* (0.030; 0.042); SRMR = 0.048. Standardized coefficients are shown; all the parameters are significant at $p < 0.05$, except for those marked†.

Participants in group 2, however, are less likely to dismiss the question of meaning as a pointless one or one that does not bother them (items 16 and 18). They believe that meaning can only be felt or experienced, rather than rationally understood (item 7), but that it has to be created, rather than found (item 11). Based on this combination of a personal take on meaning and uncertainty regarding its existence, importance, and nature, we labeled group 2 "Ambivalence about Meaning."

Participants in groups 3 and 4 tend to view meaning as a goal or a direction of human life (items 3, 4) that is real, rather than illusory (item 5). For them, meaning is necessary for one's life (item 9), it can be understood, rather than only felt (item 7), and this understanding is available to every person (item 8). The question of meaning is a reasonable and personally relevant one (items 16–19).

There are, again, some notable differences between these two groups. Participants in group 3 are somewhat less optimistic about the possibility of finding an answer to the question of meaning (item 19) and are more likely to consider the possibility of it being pointless (items 6 and 16). They are also somewhat less certain that meaning is relevant to their life (item 17) and dependent on their actions; instead, they are more likely to see it as a given that does not depend on one (item 10), that is common and universal (item 12), and that exists regardless of one's choices (item 14). For them, meaning appears to be real, but not necessarily vitally important or requiring any action. We labeled group 3 "Acceptance of Meaning." Finally, participants in group 4 are more likely to see meaning as a conscious notion (item 1). They experience the question of meaning as a reasonable and useful question (items 6, 16) that can be answered (item 19) and that is directly related to their own lives (item 17). They see meaning as an individually-specific reality (item 12), a possibility that can be accomplished by the person, rather than a given (item 10), and as something that emerges as a result of one's life choices (item 14). Based on this existential view of meaning, we labeled group 4 "Seeking Meaning."

There were no significant differences in education or age across the groups. However, gender distribution was not uniform [χ^2 (3) = 19.43, $p < 0.001$, Cramer's $V = 0.29$]: there was a higher prevalence of female participants in group 3 "Acceptance of Meaning" (77.3%) and a higher prevalence of male participants in polar groups 1 "Indifference to Meaning" and 4 "Seeking Meaning" where female participants only comprised 51.2 and 52.8%, respectively. The gender distribution in group 3 "Ambivalence about Meaning" (61.2% of female participants) was close to the sample average.

The distribution of ED levels in the four groups with different lay theories of meaning did not significantly differ from uniform, based on the chi-square test [χ^2 (12) = 18.64, $p = 0.098$, Cramer's $V = 0.13$]. However, it did not appear to be random (see Table 4):

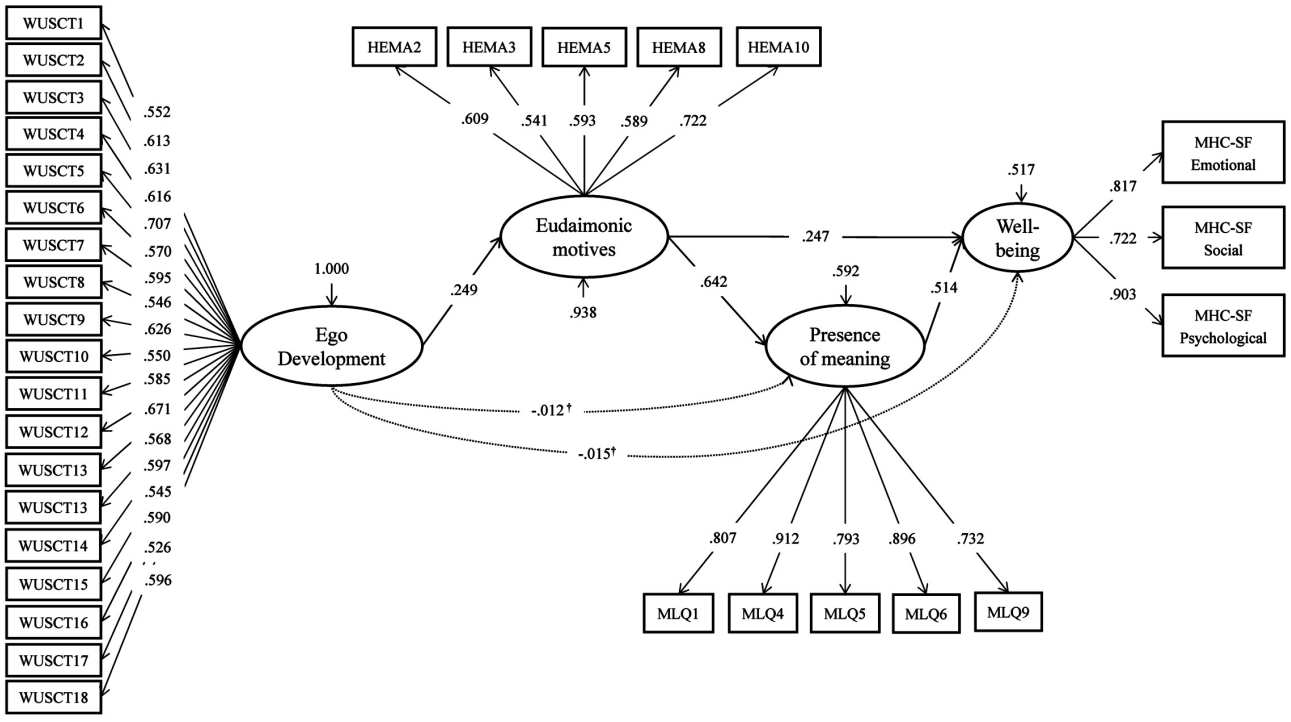

FIGURE 2
Parameters of the serial mediation model. $\chi^2 = 627.22$, df = 428, $p < 0.001$; CFI = 0.973; RMSEA = 0.036, 90% *CI* (0.030; 0.042); SRMR = 0.048. Standardized coefficients are shown; all the parameters are significant at $p < 0.05$, except for those marked†.

the prevalence of E2–E3 and E4 decreased and that of E5, E6, and E7–E9 increased in a perfectly monotonous manner from group 1 to group 4, in line with the increasing salience of meaning.

A comparison of the groups on the other psychological variables is given in Table 5. The differences across the groups were significant for all variables, except for hedonic motives. The ED level based on the Total Protocol Rating was lowest in the "Indifference" group and highest in the "Acceptance" and "Seeking" groups. Predictably, the "Indifference" and "Ambivalence" groups had lower scores on the presence of meaning and search for meaning scales, as well as social wellbeing and overall wellbeing (interestingly, participants in the "Indifference" scored lowest on the search for meaning and highest on hedonic motives, whereas those in the "Ambivalence" group scored lowest on the presence of meaning, wellbeing, and eudaimonic motives; however, the pairwise differences between these groups suggesting potentially different patterns of a meaning crisis were not statistically significant). In addition to higher ED, individuals in the "Acceptance" and "Seeking" groups reported a higher presence of meaning and search for meaning, as well as higher wellbeing. Again, the picture was somewhat more positive in the "Seeking" group, but none of the pairwise differences between the two groups with a positive approach to meaning was significant.

To quantify the non-linear monotonous increase of scores in groups in line with the increasing salience of meaning, we also calculated Spearman correlations between the profile number and the self-report measure scores (see Table 5). The results indicate that the progression from group 1 to group 4 is associated with an increase in the presence of meaning, search for meaning, eudaimonic motives, ego development, wellbeing, and a decrease in hedonic motives.

Discussion

The theories in the field of eudaimonia and ED aim to describe and explain overlapping phenomena of positive functioning that characterize a mature personality. However, until recently, the evidence of the empirical links between the models in the two fields was limited. Our study built on earlier work by Bauer and McAdams (2010) and Bauer et al. (2011) that revealed weak positive associations of ED with current wellbeing and extended it by confirming these associations using measures of eudaimonic wellbeing. Unfortunately, the modest sample size and the small number of individuals ($N = 7$) at the most advanced (E8–E9) ED stages did not allow us to fully replicate the findings of Bauer et al. (2011) who suggested that higher levels of wellbeing might only be observed at these stages. However, we observed a modest, yet significant difference in wellbeing scores between individuals at post-conventional stages (E7–E9) and those at earlier stages (E2–E6) ($d = 0.33$, $p = 0.046$).

In terms of effect size, the association of ED and wellbeing we found ($r = 0.11$–0.12) is in line with past studies, where the correlations of ED and psychosocial maturity with wellbeing have typically ranged from $r = 0.00$ to $r = 0.22$ (Bauer and McAdams, 2010; Bauger et al., 2021). The Eudaimonic Activity Model (Sheldon, 2018; Martela and Sheldon, 2019) proposes that subjective wellbeing can serve as a universal criterion of a life going

TABLE 3 Descriptive statistics and Spearman correlations with ED ($N = 362$) for the ITLM items.

	M (SD)	Mean in group				E^2	ρ_{ED}
		1	2	3	4		
Life meaning is...							
1. An idea, a conscious notion	3.59 (1.20)	3.60_{ab}	3.22_{a}	3.53_{a}	3.96_{b}	0.068***	0.13*
2. An experience, a feeling	3.60 (1.22)	3.59_{a}	3.57_{a}	3.69_{a}	3.53_{a}	0.002	0.14**
3. Presence of a goal in life	3.78 (1.15)	3.20_{a}	3.47_{a}	4.01_{b}	3.95_{b}	0.063***	−0.06
4. A general direction of one's life	3.76 (1.12)	3.50_{a}	3.36_{a}	4.01_{b}	3.89_{b}	0.063***	−0.02
5. An illusion, as life is absurd	2.40 (1.40)	3.55_{a}	3.33_{a}	1.85_{b}	1.91_{b}	0.234***	−0.02
6. A question useless to ponder on	2.15 (1.33)	3.63_{a}	3.17_{a}	1.74_{b}	1.28_{c}	0.432***	−0.14**
Life meaning...							
7. Is possible to understand … Is only possible to feel, experience	3.02 (0.98)	3.10_{a}	3.55_{b}	2.94_{a}	2.66_{a}	0.116***	−0.06
8. Every person has it … Few people have it	3.26 (1.36)	3.85_{a}	3.56_{ac}	3.01_{b}	3.10_{bc}	0.056***	−0.07
9. Is necessary for one's life … Is possible to live without	3.07 (1.27)	3.93_{a}	3.69_{a}	2.71_{b}	2.68_{b}	0.166***	0.04
10. Is a given that does not depend on one … Is a possibility one can accomplish	4.00 (1.02)	3.37_{a}	3.95_{ab}	3.90_{b}	4.42_{c}	0.100***	0.22***
11. One has to create it … One can discover or understand it	3.17 (1.06)	3.53_{a}	2.82_{b}	3.20_{a}	3.28_{a}	0.046**	−0.14**
12. Is specific to each individual …Is common, universal	2.07 (1.06)	2.28_{ab}	1.94_{ab}	2.19_{a}	1.94_{b}	0.022*	−0.09
13. Can only be present if found consciously … Can be present even if one never thought about it	3.34 (1.12)	3.33_{a}	3.41_{a}	3.36_{a}	3.25_{a}	0.001	0.01
14. Emerges as a result of one's deliberate choices … Exists regardless of one's choice	2.64 (1.02)	2.90_{a}	2.70_{a}	2.81_{a}	2.29_{b}	0.062***	−0.17**
The question of meaning...							
15. Is faced by every person … Is only faced by few people	2.76 (1.11)	3.12_{a}	2.88_{a}	2.59_{a}	2.74_{a}	0.021	0.03
16. Is a reasonable question … Is a pointless question	2.33 (1.09)	3.78_{a}	2.93_{b}	2.21_{c}	1.44_{d}	0.477***	−0.13*
17. Has a lot to do with me … Has nothing to do with me	1.91 (1.09)	2.93_{a}	2.52_{a}	1.74_{b}	1.25_{c}	0.301***	−0.20***
18. Is bothering me at present …Does not bother me at present	2.96 (1.38)	3.90_{a}	3.22_{b}	2.72_{c}	2.66_{c}	0.084***	−0.09
19. Can be answered … Is impossible to find an answer to	2.45 (1.14)	3.46_{a}	3.29_{a}	2.32_{b}	1.56_{c}	0.398***	−0.18***
20. Emerges when life goes well …Emerges when something goes wrong in one's life	3.37 (0.75)	3.60_{a}	3.47_{a}	3.28_{a}	3.32_{a}	0.026*	−0.08

For bipolar scales, the anchors for 1 and 5 are given in this sequence and separated by an ellipsis. E^2–Epsilon-squared effect size estimate (Tomczak and Tomczak, 2014) with significance level of the Kruskal–Wallis test (*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$). ρ_{ED}–Spearman correlation with ED based on the sum score criterion (Loevinger, 1998). Class means that do not share the same letter in the subscript are significantly different according to the Conover-Iman *post-hoc* test with Benjamini-Hochberg correction. Group labels: 1—"Indifference," 2—"Ambivalence," 3—"Acceptance," and 4—"Seeking".

well that reflects whether people's psychological needs are satisfied by rewarding experiences arising from eudaimonic activities. We side with that idea with one reservation: the activities needed to experience the same subjective state of basic needs satisfaction and wellbeing may qualitatively differ across individuals and within-person, across ages, as a function of the level of cognitive complexity and personality maturity that is captured by the ED model. SWB and eudaimonic subjective experiences, such as meaningfulness, provide subjective evaluations of whether the direction one is currently following in life is in line with one's deeper personal priorities and aspirations, but hardly allow one to evaluate how far one has progressed along the path of self-actualization, wherein one's needs, priorities, and aspirations continuously evolve (Maslow, 1971). In this sense, measures of psychosocial maturity and wellbeing appear to be complementary indicators reflecting related yet different aspects of life going well and, therefore, they are not supposed to correlate strongly.

Both of our hypotheses concerning the presence of meaning and eudaimonic motives as mediators of the relationship between ED and wellbeing were supported, indicating that all the variance

TABLE 4 Prevalence of individuals at different ED stages in each latent class.

ED level	Prevalence of ED level in lay theory of meaning group, *N* (% of group)				
	1 "Indifference" ($N = 41$)	2 "Ambivalence" ($N = 84$)	3 "Acceptance" ($N = 132$)	4 "Seeking" ($N = 105$)	Sample average, %
E2–E3	6 (14.6%)	8 (9.5%)	10 (7.6%)	4 (3.8%)	7.7%
E4	12 (29.3%)	16 (19.1%)	20 (15.2%)	9 (8.9%)	15.7%
E5	12 (29.3%)	31 (36.9%)	51 (38.6%)	44 (41.9%)	38.1%
E6	8 (19.5%)	22 (26.2%)	35 (26.5%)	33 (31.43%)	27.1%
E7-E9	3 (7.3%)	7 (8.3%)	16 (12.1%)	15 (14.3%)	11.3%

The ED stages were determined based on the sum rule (Loevinger, 1998).

TABLE 5 Cluster means and one-way ANOVA results for the study measures.

	1 "Indiff." ($N = 41$)	2 "Ambiv." ($N = 85$)	3 "Accept." ($N = 132$)	4 "Seeking" ($N = 106$)	$F(3)$	η^2	ρ
1. Ego development (TPR)	4.68_a	4.86_{ab}	4.96_b	5.02_b	4.52^{**}	0.036	0.18^{**}
2. Hedonic motives	5.36_a	5.08_{ab}	4.99_{ab}	4.90_b	2.42^{x}	0.021	-0.12^{*}
3. Eudaimonic motives	5.57_{ab}	5.21_a	5.50_{ab}	5.81_b	7.37^{***}	0.062	0.24^{***}
4. Presence of meaning	4.07_{ab}	3.69_a	4.47_{bc}	4.96_c	12.07^{***}	0.093	0.28^{***}
5. Search for meaning	3.51_a	3.98_{ab}	4.52_{bc}	4.64_c	9.33^{***}	0.073	0.24^{***}
6. Emotional wellbeing	3.39_a	3.49_a	3.92_a	3.88_a	3.53^{*}	0.029	0.15^{**}
7. Social wellbeing	2.75_{ab}	2.58_a	3.03_b	3.13_b	5.70^{**}	0.046	0.19^{***}
8. Psychological wellbeing	3.51_{ab}	3.30_a	3.65_{ab}	3.92_b	5.74^{**}	0.046	0.20^{***}
9. MHC total score	3.21_{ab}	3.08_a	3.49_{bc}	3.63_c	6.14^{***}	0.049	0.21^{***}

$^{*}p < 0.05$.
$^{**}p < 0.01$.
$^{***}p < 0.001$.
$^{x}p = 0.066$.
Means that do not share a subscript letter are significantly different based on Tukey HSD *post-hoc* test ($p < 0.05$). The df for error is 358 for MHC and ED, 353 for MLQ, and 346 for HEMA.
ρ–Spearman correlation between the group number (i.e., its rank in terms of concern for meaning) and the variable score.

shared by ED and wellbeing is explained by trait-level indicators of eudaimonic orientations. The positive association of ED with eudaimonic motives is in line with the idea that ED and growth orientation accompany each other (Bauer, 2011). Our data suggest that the increase in eudaimonic motives might be related to the transition from the Self-Aware (E5) to the Conscientious (E6) stage ($d = 0.45$, $p < 0.001$). The causal links between these processes are far from clear: the only longitudinal study to date (Bauer and McAdams, 2010) has only tested one direction of causality, showing that intellectual growth motives predict later ED. Unfortunately, the present study is limited by its cross-sectional design, but we hope that our findings may encourage future integration between these research areas.

The associations of ED with the presence of meaning and the search for it are also noteworthy. First, although the presence of meaning and the search for meaning are negatively correlated, ED is positively associated with both, reminding of Frankl's (1969) idea that existential meaning is different in every life situation and meaningful life involves actively searching for it every day. The latent profile analysis results corroborate these findings by showing that the two groups with a positive view of meaning in life, as well as higher ED and wellbeing scores, are characterized by a combination of the presence of meaning and the search for meaning. Only the presence of meaning, however, has emerged as a significant mediator of the ED—wellbeing relationship, suggesting that it is not the process of searching for meaning, but its outcome—a vision of one's life goal and priorities—that may bring the wellbeing benefits of eudaimonic growth. The choice between the parallel and the serial mediation models, which emerge as equivalent interpretations of our cross-sectional data, depends on whether one places the presence of meaning within the domain of eudaimonic orientations (on a par with eudaimonic motives) or within the domain of eudaimonic experiences (in terms of Huta, 2016) expected to emerge as outcomes of eudaimonic orientations. We believe that the MLQ operationalisation of this construct taps into both and that more recent, theoretically refined measures, such as the 3DM (Martela and Steger, 2022), could help to model meaning more discriminately.

Regarding the ED theory, the results offer new empirical evidence to specify the idea of meaning production, which is one of the foundations of growth that happens as the ED level increases (Loevinger, 1976). Our data reveal noticeable changes in the processes and outcomes of meaning production at higher ED levels: rather than being an abstract question or a universal given, meaning becomes a tangible and a personally experienced possibility constituting an integral part of one's daily life. Past studies have revealed that individuals at post-conventional ED stages exhibit higher levels of self-reflection (Pfaffenberger et al., 2011;

Kostenko and Leontiev, 2018) and report more positive experiences of solitude (i.e., viewing solitude as a resource for self-knowledge and self-development—Ishanov et al., 2018) that could provide conditions for meaning-making.

The profiles we have identified contribute to this line of research, providing more insight into the inner dynamics of personality development. Increasing concern for meaning, viewing it as a reality, rather than an illusion, and a possibility, rather than a given, was associated with ED and wellbeing. The findings suggest that the presence of meaning and the search for meaning, despite being negatively correlated in the total sample, are both prerequisites for eudaimonic life that combines growth and wellbeing: indeed, as Frankl (1969) suggested, meaning cannot be found once and for all, one has to search for it anew in every life situation. The finding that hedonic motives mostly fail to exhibit negative associations with ED and meaning-related variables is consistent with the findings showing that pleasant life and meaningful life are relatively independent, rather than mutually exclusive pathways to wellbeing (Huta and Ryan, 2010; Schueller and Seligman, 2010).

Naturally, the present research has numerous limitations. First of all, the cross-sectional design does not allow making inferences concerning the temporal sequence and causality of changes in ED and eudaimonic functioning. Second, larger samples are needed to make reliable conclusions about individuals at post-conventional stages. Third, the changes in the patterns of meaning-making may not be the same across cultures. Fourth, MLQ and HEMA are limited in their validity, given the rich and multifaceted nature of meaning and eudaimonia as psychological constructs (Leontiev, 2013; Huta and Waterman, 2014; Martela and Steger, 2016). Future studies using more rigorous designs and sampling strategies, comprehensive measures, and more diverse cultural settings are needed to replicate and generalize these findings.

Nevertheless, we believe that the results show that the notion of eudaimonic functioning may explain the elusive associations between wellbeing and personality development. Existing work on ED suggests that self-report questionnaires may fail to capture the growing complexity associated with this process. The findings revealing the independent mediating effects of meaning and eudaimonic motives reveal perspectives for future studies that could shed more light on the mysterious process of attaining psychosocial maturity.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found at: https://osf.io/pja8d/?view_only=7cd4719c4f144b77a4a5b92e53d970c4.

Ethics statement

The studies involving human participants were reviewed and approved by HSE University Psychology Department Research Ethics Committee. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

EO and EV contributed to conception and design of the study and performed the statistical analyses. EV collected the data. VK and EV coded the WUSCT protocols. EO wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.958721/full#supplementary-material

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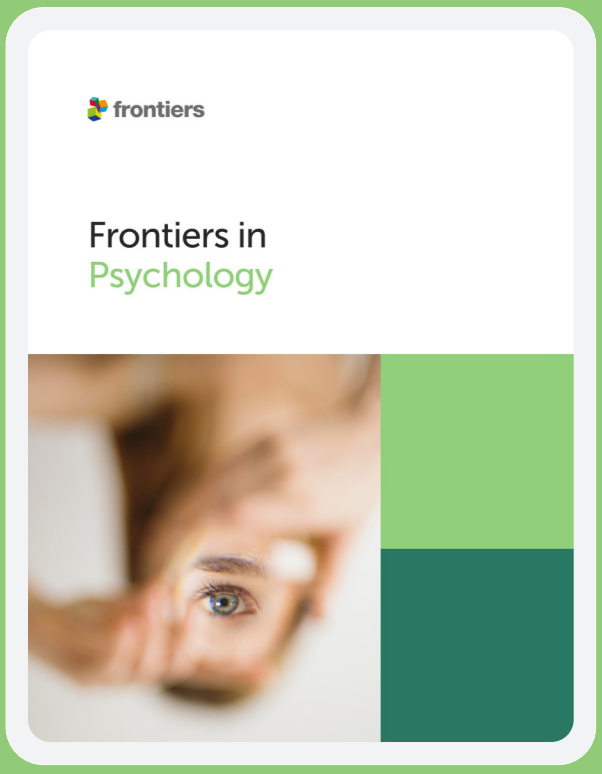

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