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What do people find most meaningful? How representations of the self and the world provide meaning in life

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Abstract

Objective: Recent theories propose that global meaning in life (MIL) is based on feelings of coherence, purpose, and existential mattering. MIL has also been linked to mental representations—for example, beliefs, values, attitudes, and identities—that serve as "meaning frameworks" for interpreting the world and oneself. Combining these proposals, we predicted that beliefs, values, attitudes, and identities would foster a sense of MIL to the extent that they provide feelings of coherence, purpose, and existential mattering.

Method: Using multilevel path analysis, we tested within-person associations of coherence, purpose, and existential mattering with a sense of MIL across three studies (Study 1:208 US MTurk workers; Study 2:106 UK university students; Study 3:296 from a UK nationally representative Prolific sample). We explored the generality of these associations across mental representation types and individual differences.

Results: Participants derived greater MIL most strongly from mental representations that provided sense of purpose, followed by existential mattering. Sense of coherence was less robustly related to MIL across mental representation types and religious orientation.

Conclusions: Integrating prior theorizing on MIL, we conclude that mental representations function as "meaning frameworks" to the extent that they provide feelings of purpose, mattering, and, sometimes, coherence.

KEYWORDS

coherence, existential mattering, meaning frameworks, meaning in life, purpose

1 | INTRODUCTION

Meaning in life (MIL) is a key aspect of human wellbeing (Huta & Waterman, 2014) that is both conceptually and empirically distinguishable from related wellbeing constructs such as life satisfaction or positive and negative affect (Tov & Lee, 2016; Vohs et al., 2019). MIL research has often focused on people's subjective, abstract appraisals

regarding whether their life as a whole is meaningful, that is, *sense of MIL* (e.g., Steger et al., 2006), and recent research has begun to identify key predictors of individual differences in sense of MIL (e.g., Costin & Vignoles, 2020; George & Park, 2017). However, people also judge aspects *within* their lives as more or less meaningful; in everyday language, people talk about meaningful occupations (e.g., being a medical doctor), or meaningless pastimes (e.g., watching daytime television), and another line of research has explored people's lay theories of what makes their lives meaningful (e.g., Wong, 1998). Notably, individuals ascribe more or less meaning to different aspects of their world-views and their self-views; for instance, people perceive some aspects of their identities as more meaningful than others, and they typically perceive their more meaningful identity aspects as more self-defining (Vignoles et al., 2006). Yet, no previous research, to our knowledge, has looked systematically at what features of mental representations, such as beliefs, values, attitudes, and identities, predict perceiving them as more meaningful.

Here, we used a novel within-person methodology to identify the bases on which people imbue their beliefs, values, attitudes and identities with higher or lower perceived meaningfulness. Combining insights from individual differences (Costin & Vignoles, 2020; George & Park, 2017), phenomenological (Wong, 1998), and social cognitive literatures (Heine et al., 2006; Van den Bos, 2009), we predicted that beliefs, values, attitudes, and identities would foster a sense of MIL to the extent that they provide feelings of coherence, purpose, and existential mattering. We also tested whether our findings would hold across mental representation types and individual differences (e.g., religiosity).

1.1 | Predicting individual differences in sense of MIL

Measuring a sense of MIL arguably relies on participants having a shared definition of "meaning" (Leontiev, 2013), and so researchers have tried to explain what experiences and psychological states or traits might inform MIL evaluations (for an overview, see Schnell, 2011). Some of the suggested predictors of MIL are related to fundamental psychological processes. Basic psychological needs for autonomy, competence, and relatedness are seen as prerequisites for living a full, satisfying life (Deci & Ryan, 2000), and fulfillment of these is linked to seeing one's life as meaningful (Martela et al., 2017). People also need to see themselves positively (Sedikides & Gregg, 2008; Sedikides & Strube, 1997); high self-esteem provides existential assurance when faced with death-thoughts (e.g., Harmon-Jones et al., 1997) and is associated with a higher sense of MIL (e.g., Steger et al., 2006). Furthermore, self-continuity (i.e., the feeling that one's past, present, and future are connected), and distinctiveness (i.e., seeing oneself as distinguished from others) have been identified as fundamental human needs and linked to experiences of meaningfulness (Sedikides & Wildschut, 2018; Vignoles, 2009).

More recently, reviews of precursors of MIL suggested that MIL can be understood as primarily deriving from three bases: coherence, purpose, and existential mattering (George & Park, 2016; Martela & Steger, 2016). *Coherence* (also called "comprehension"; George & Park, 2016) is about perceptions of order, but specifically applied to self-related experiences; thus, coherence involves "making sense of one's experiences in life" (Reker & Wong, 1988, p. 220). *Purpose* refers to having an overarching life aim that subsumes and organizes other goals (McKnight & Kashdan, 2009). Finally, *existential mattering* (also called "significance"; Martela & Steger, 2016) is an evaluation that one's life is worth living and matters on a wider scale (George & Park, 2014, 2016). All three proposed bases of meaning have been correlated with a sense of MIL (George & Park, 2017), but recent evidence suggests that individual differences in sense of MIL are based most strongly on a sense of existential mattering, and, to a lesser extent, on coherence and purpose (Costin & Vignoles, 2020). To complement this body of research, we propose a detailed examination of within-person variation in MIL across facets of an individual's lived experience: Do tripartite accounts explain how beliefs, values, attitudes, or identities are seen as more or less meaningful?

1.2 | Meaning frameworks: Mental representations of the world and the self

An alternative approach to understanding a sense of MIL focuses on the aspects of their lives that people find most meaningful. People's core beliefs, values, attitudes, and identities may serve as *meaning frameworks*—lenses through which they can view and interpret the world and themselves (Clifton et al., 2019; Koltko-Rivera, 2004), thus providing a basis for experiencing MIL. Philosophers have sometimes defined the experience of MIL as a subjective attraction to that which is objectively attractive (May, 2015; Wolf, 2010), but criteria for defining what is objectively attractive will likely remain elusive (Haidt, 2010; Koethe, 2010). Hence, meaning frameworks, influenced by cultural factors and shared within communities (e.g., religious belief), may provide grounds for determining worthwhile endeavors. According to this view, meaning frameworks would serve to organize people's experiences—for example, what is moral or immoral? pleasant or unpleasant?—and link people's lives

to important goals whose fulfillment would have certain symbolic value (Vess, 2013). An initial attempt to identify meaning frameworks comes from studying people's lay theories of which aspects of their lives provide MIL. Mixed methods approaches have yielded lists of experiences that may contribute to meaningfulness; these often coalesce around themes of family and relationships, spirituality, and certain personal characteristics such as creativity (Delle Fave et al., 2013; Steger et al., 2013; Wong, 1998). However, these studies do not explain why these particular themes, and not others, would be sources of MIL.

Mental representations of the world or of the self may act as meaning frameworks because they provide a sense of coherence. Studies have shown that undermining coherence even through subtle disruptions such as encountering reverse-colored playing cards, can trigger psychophysiological responses indicative of aversive arousal (e.g., Sleegers et al., 2015). When the discrepancies are more serious, such as a traumatic event perceived as violating either one's beliefs or goals, then the effects may also be more severe—such as experiencing posttraumatic stress disorder symptoms (Park et al., 2012). Individuals report a higher sense of MIL after exposure to stimuli that correspond to pre-existing mental representations, compared to stimuli that do not: For instance, when shown pictures of trees arranged in a seasonal order, as opposed to a random order, participants reported higher MIL (Heintzelman et al., 2013).

Based on the tripartite accounts of MIL reviewed above, coherence may not provide the whole story of what makes mental representations meaningful. Previous research has found weak or inconsistent links between individual differences in coherence and subjective evaluations of MIL (Costin & Vignoles, 2020). Moreover, complex mental representations, such as beliefs, values, attitudes, and identities, may be better at simultaneously providing coherence, purpose, and existential mattering, and, therefore, may be most relevant to a sense of MIL. For instance, successfully identifying a piece of furniture as a "chair" may not make one's life more meaningful, whereas believing that people have free will is more likely to do so (Bergner & Ramon, 2013; Crescioni et al., 2015).

1.3 | Current research

Integrating tripartite perspectives on MIL with the body of work on meaning frameworks would help answer questions that neither perspective can answer on its own. Tripartite models may provide an explanation for when mental representations act as meaning frameworks, whereas meaning frameworks may allow tripartite models to move beyond overall judgments of MIL and provide a more fine-grained analysis of meaningful life aspects. Hence, rather than an individual differences approach predicting who perceives their life as more meaningful compared to others, we adopted a within-person methodology seeking to predict which of their mental representations individuals would see as more meaningful than others. Our central prediction was that participants would find more meaningful those of their beliefs, values, attitudes, and identities that provided a stronger sense of coherence (H1), purpose (H2), and mattering (H3). A secondary aim was to explore to what extent our findings would generalize across types of mental representation and across individuals with different beliefs, values, attitudes, and levels of MIL.

To test this, we conducted three studies using a combined idiographic-nomothetic approach, whereby each participant first specified a series of their mental representations and then rated each of their own mental representations on a common set of dimensions. Participants specified mental representations for each of the following 12 domains: national identity, religious identity, role identities in relation to two important others, family identity, socioeconomic beliefs, free will/determinism beliefs, beliefs about human nature, abortion attitudes, death penalty attitudes, personal values, and moral values. The domains were selected because either (a) in previous research, people have affirmed their pre-existing commitments within these domains as compensatory responses to existential or coherence threats (e.g., McGregor et al., 2001), or (b) they have been previously linked to sense of MIL either directly (e.g., Crescioni et al., 2015) or indirectly—for example, moral values differ by political orientation, and conservatives report higher MIL (Graham et al., 2009; Newman et al., 2019). Participants rated each mental representation for meaningfulness, coherence, purpose, and mattering. All materials and data can be accessed at https://doi.org/10.17605/OSF.IO/VAZ2Y

2 | STUDY 1

In Study 1, we performed an initial test of our predictions (H1–H3), while also controlling for the extent to which mental representations fulfilled six important psychological needs: belonging, self-esteem, self-efficacy, distinctiveness, self-continuity, and personal control (Galinsky et al., 2012; Vignoles, 2011). As described earlier, these psychological needs have been linked to between-person differences in sense of MIL. Furthermore, they have been shown to vary at the within-person level in ratings of identity aspects (Droseltis & Vignoles, 2010; Vignoles et al., 2006). Given recent tripartite accounts of MIL, we predicted that participants would find more meaningful

mental representations that provided a stronger sense of coherence, purpose, and mattering, even while controlling for the fulfillment of these other important psychological needs. We also explored whether our substantive findings would generalize across mental representation types (beliefs vs. values vs. attitudes vs. identities), across individual differences in the overall level of MIL, and across individual differences in mental representation content.

In previous research, identity aspects that fulfill important psychological needs have been perceived as more central (e.g., Vignoles et al., 2006). Similarly, we expected that psychological need fulfillment and, in particular, meaningfulness would in turn predict the perceived importance of mental representations. This allowed us to explore additionally whether coherence, purpose, and existential mattering would predict perceived importance independently of meaningfulness—suggesting that the three dimensions may serve important functions, beyond their contributions to MIL—or whether coherence, purpose, and mattering would only predict importance to the extent that they were linked to meaningfulness.

2.1 | Method

2.1.1 | Participants

We aimed initially for a sample size comparable to those successfully used in previous studies with similar multilevel designs (e.g., Droseltis & Vignoles, 2010; Vignoles et al., 2006, 2008). Based on previous research, we expected at least a small-to-medium effect size for the associations of coherence, purpose, and mattering with a sense of MIL (e.g., George & Park, 2017). Power analyses (described in the Results section) show that our achieved sample size was sufficient to detect small-to-medium effect sizes across all analyses.

We recruited US participants on Amazon MTurk (https://www.mturk.com) for a study about "beliefs and worldviews." Of 372 complete responses, 164 participants were removed for failing any one of the three attention checks embedded within the questionnaire (e.g., "Please select somewhat disagree"). Incorrect responses to these items were taken to indicate non-engagement with the task.[1]The final sample consisted of complete responses from 208 participants: 108 females, 98 males, and 2 self-identified as "gender queer." Ages ranged from 20 to 74 ($M = 38.46$, $SD = 13.22$). Most participants were Christian ($n = 92$), followed by atheists ($n = 51$) and agnostics ($n = 43$), with the remaining 22 participants identifying as Jewish, Muslim, Buddhist, or "Other" (specifying that they were "spiritual, but not religious," "Mormon," etc.). Most participants were in full-time employment ($n = 120$), followed by part-time or self-employed ($n = 50$), with the remaining participants either in education ($n = 24$) or retired/unemployed ($n = 14$).

2.1.2 | Questionnaire and procedure

The questionnaire comprised two sections. First, we collected information to determine participants' mental representations in relation to 12 domains: national identity, religious identity, role identities in relation to two important others, family identity, socioeconomic beliefs, free will/determinism beliefs, beliefs about human nature, abortion attitudes, death penalty attitudes, personal values, and moral values. Then, the elicited mental representations were displayed one at a time, in a randomized order, and participants rated each one for a sense of MIL and related constructs. Data and study materials for both Study 1 and Study 2 are available at http://doi.org/10.17605/OSF.IO/VAZ2Y

Eliciting mental representations

Table 1 shows all mental representation domains and response statements used. Participants first completed demographic information, which included questions about their religion and their nationality. Afterward, they were shown domain names one at a time, in a random order, followed by the instruction to select a statement that reflected their position in the respective domain. For most domains, participants were given an option to select "Other" and write their own statement in relation to the domain. Then, participants specified their role in relation to two important people in their lives. To maintain anonymity, family identity was not defined by participants (i.e., we did not ask participants to provide their family name). Instead, the mental representation set for all participants was "Being a member of my family."

Ratings of mental representations

Participants rated each of their 12 specified mental representations separately. Each of their mental representations was displayed at the top of a new screen, in random order, followed by a series of questions. We first asked about perceived importance, using an attitude importance measure, "How important is this to you personally?" (Skitka et al., 2005), with responses on a 5-point scale (1 = "Not at all important," 5 = "Extremely important").

Then, participants indicated how much they agreed or disagreed with a series of statements introduced after the stem "[Believing that/Valuing/Being] [mental representation] makes me feel [...]," using a 7-point scale (1 = *Strongly disagree*; 7 = *Strongly agree*). First, participants indicated their subjective sense of MIL provided by

TABLE 1 Mental representations domains with response statements displayed to participants, and corresponding theoretical sources

Domain	Response options	Theoretical sources
Free will/determinism beliefs	One has complete control over the decisions one makes; one can overtake any obstacles if they truly want to	Free will scales (Nadelhoffer et al., 2014; Paulhus & Carey, 2011); Social Axioms Survey, SAS II—Fate Control scale (Leung et al., 2012)
	One could have free will even if scientists discovered all of the laws that govern all human	
	Every event that has ever occurred, including human decisions and actions, was completely determined by prior events	
	Life is hard to predict because it is almost totally random; what happens to people is a matter of chance	
	Fate determines one's successes and failures	
	Other	
Beliefs about human nature	Powerful people tend to exploit others	Social Axioms Survey, SAS II—Social Cynicism scale (Leung et al., 2012)
	The only way to get ahead is to take advantage of others	
	People are inherently generous and kind-hearted	
	Most people mean well and can be trusted	
	Other	
Socioeconomic beliefs	It's probably a good thing that certain groups are at the top and other groups are at the bottom	Social Dominance Orientation (Jost & Thompson, 2000); beliefs in meritocracy (Zimmerman & Reyna, 2013)
	We would have fewer problems if we treated different groups more equally	
	Success depends more on the circumstances into which one is born than hard work	
	By working hard one can overcome most obstacles that life presents and make his or her own way in the world	
	Other	
Abortion attitudes	Abortion should be legal and readily accessible to people requesting it	Adapted from items used in McGregor et al. (2001)
	To protect the rights of the unborn baby, legal abortion should never be available	
	Abortion should only be allowed only in case of rape, incest, or life-threatening situations	
	Other	
Death penalty attitudes	A murderer deserves to die	Adapted from items used in McGregor et al. (2001)
	Capital punishment is absolutely never justified	
	Capital punishment is necessary for some crimes	
	Other	
Personal values	POWER (social power, authority, wealth)	Short Schwartz Value Survey (SSVS; Lindeman & Verkasalo, 2005); based on Schwartz's (1992) Value Theory
	ACHIEVEMENT (success, capability, ambition, influence on people and events)	
	HEDONISM (gratification of desires, enjoyment in life, self-indulgence)	
	STIMULATION (daring, a varied and challenging life, an exciting life)	
	SELF-DIRECTION (creativity, freedom, curiosity, independence, choosing one's own goals)	
	UNIVERSALISM (broad-mindedness, beauty of nature and arts, social justice, a world at peace, equality, wisdom, unity with nature, environmental protection)	
	BENEVOLENCE (helpfulness, honesty, forgiveness, loyalty, responsibility)	

(Continues)

TABLE 1 (Continued)

Domain	Response options	Theoretical sources
	TRADITION (respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)	
	CONFORMITY (obedience, honoring parents and elders, self-discipline, politeness)	
	SECURITY (national security, family security, social order, cleanliness, reciprocation of favors)	
Moral values	One should avoid causing physical or emotional harm to others	Adapted from Graham et al. (2009); based on Moral Foundations Theory (Haidt & Joseph, 2004)
	One should not treat some people differently than others; all people's rights need to be respected and they should be treated fairly	
	One should be loyal and place the interests of the group above one's own	
	One should fulfill his or her duties and show respect for legitimate authorities	
	Traditions should be upheld as they serve important roles within one's community	
	When one makes moral judgments, one must also consider whether things rise to standards of purity and decency	
Role to important other 1 & 2	The name of a person important to you (e.g., Jim): _____	–
	Who you are in relation to that person (e.g., friend): _____	
Religious identity	Your religion: Atheist, Agnostic, Christian, Jewish, Muslim, Hindu, Buddhist, Other	–
National identity	Your nationality: _____	–
Family identity	Being a member of my family [fixed wording for all participants]	–

Note: For the option *Other,* participants wrote their own statement.

this mental representation ("a sense of meaningfulness in my life"). Next, participants rated to what extent they agreed that each mental representation made them feel "a sense of purpose and direction in my life" (sense of purpose), "that my life matters in the grand scheme of things" (sense of existential mattering) and "a sense of order and coherence in my life" (sense of coherence). Finally, to measure the fulfillment of other psychological needs, we included similarly phrased items measuring self-esteem ("positive about myself"), self-efficacy ("competent"), belonging ("included with others"), distinctiveness ("distinctive"), and self-continuity ("connected to my past and my future"), as well as a measure of personal control ("a sense of control"; adapted from Kay et al., 2008; Thomas et al., 2017; Vignoles et al., 2006).

2.2 | Results and discussion

2.2.1 | Analytical approach

Given the nested data structure, we tested predictions of within-person variance in sense of MIL using multilevel modeling (Hox, 2010). Multilevel path analyses were performed using MPlus Version 8 (Muthén & Muthén, 2017). All models were estimated using full maximum likelihood. All within-person ratings were centered around their individual mean so that: (a) the within-person effects would not be confounded with the between-person effects, and (b) tests of cross-level moderation would not be confounded with between-person interactions (Hofmann & Gavin, 1998; Vignoles et al., 2006).

To control for any systematic (i.e., shared across participants) variation in sense of MIL across the 12 mental representations domains, we dummy coded the 12 domains at Level 1. This resulted in 11 dummy variables with "Death penalty" as the reference domain—chosen because of having the lowest average sense of MIL in Study 1 ($M = 3.69$). These dummy coded variables were included in all models. The centering and dummy coding decisions described above were followed across all studies in this paper.

Sensitivity power analysis showed that our achieved sample size was sufficient to detect even small effect sizes across our main analyses. When determining sample size in nested data (mental representations within individuals) with only lower-level predictors and no random slopes, traditional sample size estimations (e.g., Cohen, 1992) can be used, provided they are adjusted for the nested data structure (Hox, 2010) using the intraclass correlation coefficient (i.e., a measure of the dependence of observations within individuals). Since we centered our measures around individual means, the intraclass correlation is 0. This results in

a straightforward sensitivity calculation showing that, with 95% power and a significance level of .05, assuming a maximum of 3 predictors and 17 control variables, we could detect an effect size as small as $f^2 = .01$.

2.2.2 | Main findings

Level 1 units were mental representations ($N = 2{,}495$) and Level 2 units were individuals ($N = 208$). The baseline model with only dummy-coded mental representation domains as predictors accounted for 26.1% of within-person variance in sense of MIL. Paths from the mental representation domains to the sense of MIL in baseline models across all studies are included in Table 2. As shown in Table 3, intercorrelations between coherence, purpose, mattering and sense of MIL ratings were high (.74 to .83). Nevertheless, when partialling out the effect of mental representation domain, the residual covariances were lower (.65 to .78), suggesting that the high zero-order correlations are partly due to participants consensually rating certain domains systematically higher and other domains lower across all three dimensions and sense of MIL. The partial correlations are similar to previous individual-level findings showing that these MIL-related constructs are not redundant despite their substantial overlap (Costin & Vignoles, 2020; George & Park, 2017).

As illustrated in Figure 1, we specified Model 1 by using the baseline model and adding within-person paths from coherence, purpose, and mattering to sense of MIL. This was a perfect-fitting saturated model. Sense of MIL was positively predicted by purpose, $\beta = .38$, $p < .001$, 95% CI [.33, .43], mattering, $\beta = .28$, $p < .001$, 95% CI [.24, .32], and, more weakly, by coherence, $\beta = .16$, $p < .001$, 95% CI [.12, .20], thus supporting our three main hypotheses. This model accounted for 68.9% of within-person variance in sense of MIL.

In Model 2, we showed that coherence, purpose, and mattering continued to predict sense of MIL while controlling for the fulfillment of other important psychological needs (belonging, self-esteem, self-efficacy, distinctiveness, self-continuity, and personal control), thus continuing to support our main hypotheses. All path coefficients are reported in Table 4. Sense of MIL was also predicted by self-esteem, and, more weakly, by self-continuity. This model accounted for 71.1% of within-person variance in sense of MIL—an increase of just 2.2% over Model 1.

2.2.3 | Exploring the generality of our findings

Having shown that mental representations were perceived as most meaningful to the extent that they provided a sense of purpose, mattering, and to a lesser extent, coherence, we now explored whether our findings would differ by (a) mental representation type, and (b) individual-level characteristics (e.g., religious orientation, overall levels of MIL). In these models, we did not include the six additional psychological needs explored in Model 2 as they made a relatively minor incremental contribution to explained variance in sense of MIL above coherence, purpose, and mattering. Moderation was tested by running nested-model comparisons between a constrained and an unconstrained model across levels of each moderator. Because this method involved running multiple significance tests, we controlled for inflated Type I error, by applying Benjamini and Hochberg's (1995) false discovery rate (FDR) procedure, which involves adjusting the significance threshold sequentially to account for the number of tests performed. A full report of all moderation analyses in this paper can be found in Supporting Information B.

Moderation by mental representation type

We tested whether the links from coherence, purpose, and mattering to sense of MIL would vary across the four mental representation types, that is, beliefs (socioeconomic beliefs, free will/determinism beliefs, beliefs about human nature), values (personal values, moral values), attitudes (abortion attitudes, death penalty attitudes), or identities (identity roles to two important others, family identity, national identity, religious identity). Pathways to sense of MIL showed variation across mental representation types, but purpose and mattering remained significant predictors throughout. Coherence predicted sense of MIL for beliefs and identity aspects, but not for attitudes and values.

Moderation by individual-level characteristics

Then, we tested the moderating effects of individual differences based on selected mental representations content (e.g., religious orientation, free will belief). At Level 2, we created categorical variables to capture individual differences in the selected mental representation within a subset of domains as well as differences in individuals' tendency to make consistently low or high meaningfulness attributions. We tested for cross-level moderation of the paths from coherence, purpose, and mattering, to sense of MIL, splitting the data on each of the individual differences variables and performing multi-group comparisons. Pathways from coherence, purpose, and mattering to sense of MIL did not differ significantly as a function of free will beliefs, outlook on human nature, or growth versus self-protection values. Moral value orientation emerged as a significant moderator, where coherence was only a significant predictor for those choosing

TABLE 2 Standardized paths from the dummy-coded mental representation domains to sense of MIL in the baseline models for all three studies and descriptive statistics for MIL-related variables

	Path coefficients for sense of MIL			Means (SDs)				
Domain	***b***	***β* [95% CI]**	***p***	**Sense of MIL**	**Coherence**	**Purpose**	**Mattering**	**Experiential appreciation**
Study 1								
Role to important other 1	2.24	.42 [.37, .46]	<.001	5.94 (1.38)	5.82 (1.27)	5.74 (1.36)	5.64 (1.46)	–
Personal values	2.17	.40 [.36, .45]	<.001	5.87 (1.30)	5.86 (1.20)	5.90 (1.18)	5.53 (1.49)	–
Role to important other 2	2.10	.39 [.34, .43]	<.001	5.79 (1.31)	5.57 (1.34)	5.52 (1.42)	5.51 (1.48)	–
Family identity	1.82	.34 [.29, .38]	<.001	5.51 (1.72)	5.51 (1.76)	5.38 (1.78)	5.41 (1.81)	–
Moral values	1.79	.33 [.29, .38]	<.001	5.49 (1.35)	5.39 (1.35)	5.24 (1.45)	5.07 (1.60)	–
Socioeconomic beliefs	1.50	.28 [.23, .32]	<.001	5.20 (1.56)	5.17 (1.59)	5.18 (1.56)	4.99 (1.69)	–
Free will/determinism beliefs	1.14	.21 [.17, .26]	<.001	4.84 (1.73)	4.85 (1.83)	4.78 (1.80)	4.71 (1.82)	–
Religious identity	1.08	.20 [.15, .25]	<.001	4.77 (1.81)	4.89 (1.83)	4.70 (1.91)	4.65 (2.01)	–
National identity	0.78	.14 [.01, .19]	<.001	4.47 (1.78)	4.63 (1.79)	4.35 (1.78)	4.24 (1.83)	–
Abortion attitudes	0.32	.06 [.01, .10]	.012	4.01 (1.66)	3.97 (1.72)	3.77 (1.67)	3.94 (1.78)	–
Beliefs about human nature	0.22	.04 [−.01, .09]	.079	3.92 (1.78)	3.91 (1.83)	3.76 (1.80)	3.77 (1.86)	–
Death penalty attitudes	–	–	–	3.69 (1.72)	3.80 (1.77)	3.34 (1.61)	3.69 (1.78)	–
Study 2								
Role to important other 1	2.06	.40 [.34, .46]	<.001	6.10 (1.18)	5.84 (1.24)	5.81 (1.22)	5.85 (1.45)	–
Role to important other 2	1.70	.33 [.27, .39]	<.001	5.75 (1.30)	5.52 (1.27)	5.40 (1.48)	5.61 (1.36)	–
Personal values	1.71	.33 [.27, .39]	<.001	5.75 (1.06)	5.28 (1.29)	5.61 (1.19)	5.20 (1.33)	–
Family identity	1.64	.32 [.26, .38]	<.001	5.69 (1.31)	5.37 (1.36)	5.46 (1.37)	5.52 (1.42)	–
Moral values	1.36	.27 [.21, .33]	<.001	5.41 (1.16)	5.05 (1.23)	5.16 (1.26)	4.79 (1.36)	–
Socioeconomic beliefs	0.81	.16 [.10, .22]	<.001	4.86 (1.62)	4.42 (1.63)	4.82 (1.63)	4.46 (1.70)	–
Abortion attitudes	0.44	.09 [.03, .15]	.005	4.49 (1.53)	4.34 (1.47)	4.04 (1.36)	4.25 (1.51)	–
Free will/determinism beliefs	0.43	.08 [.02, .14]	.007	4.47 (1.69)	4.07 (1.78)	4.35 (1.66)	4.26 (1.69)	–
Death penalty attitudes	–	–	–	4.05 (1.43)	4.00 (1.42)	3.79 (1.31)	4.01 (1.53)	–
dentity	−0.12	−.02 [−.08, .04]	.438	3.92 (1.65)	4.20 (1.63)	4.11 (1.70)	3.85 (1.66)	–
National identity	−0.14	−.03 [−.09, .03]	.370	3.91 (1.51)	3.79 (1.60)	3.75 (1.54)	3.65 (1.44)	–
Beliefs about human nature	−0.36	−.07 [−.13, −.01]	.023	3.69 (1.62)	3.54 (1.58)	3.47 (1.55)	3.26 (1.50)	–
Study 3								
Role to important other 1	2.09	.42 [.38, .45]	<.001	6.18 (1.05)	5.83 (1.21)	5.85 (1.21)	5.83 (1.34)	5.92 (1.12)
Role to important other 2	1.87	.37 [.34, .41]	<.001	5.96 (1.29)	5.48 (1.40)	5.59 (1.41)	5.68 (1.39)	5.59 (1.36)
Personal values	1.85	.37 [.33, .41]	<.001	5.94 (0.96)	5.45 (1.22)	5.63 (1.21)	5.34 (1.29)	5.58 (1.29)
Family identity	1.73	.35 [.31, .38]	<.001	5.82 (1.43)	5.55 (1.44)	5.59 (1.53)	5.59 (1.56)	5.44 (1.51)
Moral values	1.39	.28 [.24, .31]	<.001	5.48 (1.28)	5.23 (1.23)	5.10 (1.30)	4.95 (1.46)	5.04 (1.33)
Socioeconomic beliefs	1.10	.22 [.18, .26]	<.001	5.18 (1.54)	4.74 (1.55)	4.97 (1.59)	4.66 (1.57)	4.80 (1.57)
Free will/determinism beliefs	0.75	.15 [.11, .19]	<.001	4.84 (1.53)	4.54 (1.63)	4.77 (1.58)	4.57 (1.61)	5.04 (1.37)
Religious identity	0.39	.08 [.04, .11]	<.001	4.47 (1.68)	4.57 (1.66)	4.47 (1.66)	4.35 (1.71)	4.78 (1.59)
Beliefs about human nature	0.25	.05 [.01, .09]	.009	4.34 (1.78)	4.09 (1.68)	3.97 (1.68)	3.99 (1.77)	4.03 (1.78)
National identity	0.12	.02 [−.01, .06]	.203	4.21 (1.68)	4.10 (1.59)	3.91 (1.62)	3.72 (1.61)	4.19 (1.65)

TABLE 2 (Continued)

Domain	Path coefficients for sense of MIL			Means (SDs)				
	b	*β* [95% CI]	*p*	Sense of MIL	Coherence	Purpose	Mattering	Experiential appreciation
Abortion attitudes	0.12	.02 [−.01, .06]	.229	4.20 (1.48)	3.98 (1.38)	3.83 (1.43)	4.01 (1.52)	3.97 (1.44)
Death penalty attitudes	–	–	–	4.09 (1.42)	4.04 (1.46)	3.61 (1.40)	4.01 (1.52)	3.69 (1.48)

Note: Reference mental representation domain is Death penalty. Mental representations in descending order of sense of MIL means in each of the three studies.

TABLE 3 Study 1 correlations between all within-person ratings

	Variable	1	2	3	4	5	6	7	8	9	10	11
1	Importance	–	.60	.51	.53	.48	.36	.53	.45	.35	.34	.37
2	Sense of MIL	.68	–	**.65**	**.72**	**.69**	.43	.63	.49	.43	.46	.46
3	Coherence	.60	**.74**	–	**.78**	**.70**	.42	.60	.52	.44	.48	.52
4	Purpose	.62	**.80**	**.83**	–	**.77**	.44	.65	.52	.48	.51	.50
5	Existential mattering	.58	**.77**	**.77**	**.83**	–	.42	.61	.50	.50	.45	.50
6	Belonging	.45	.54	.53	.54	.53	–	.56	.46	.37	.43	.39
7	Self-esteem	.61	.72	.69	.74	.70	.64	–	.63	.52	.48	.55
8	Self-efficacy	.52	.58	.59	.60	.58	.51	.69	–	.52	.45	.60
9	Distinctiveness	.45	.56	.56	.60	.57	.47	.63	.59	–	.51	.52
10	Self-continuity	.44	.59	.60	.63	.61	.55	.60	.51	.62	–	.42
11	Control	.44	.53	.58	.57	.55	.44	.61	.65	.58	.47	–

Note: Below the diagonal: zero-order correlations; above the diagonal: residual covariances after controlling for mental representation domain. All correlations were significant at $p < .001$. Correlations for MIL ratings and potential bases of MIL judgments in bold. All correlations were significant at $p < .001$.

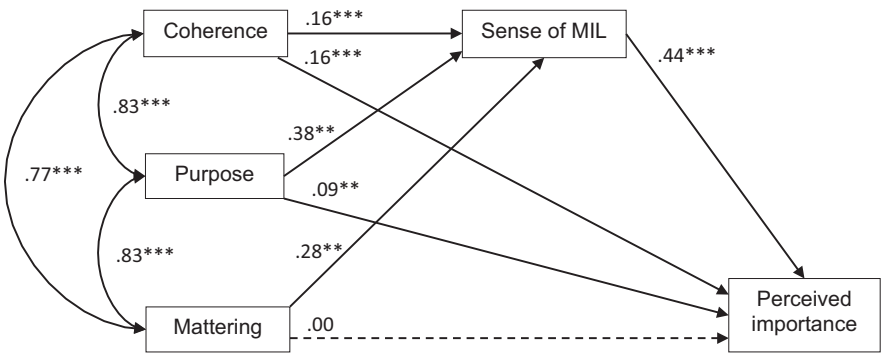

FIGURE 1 Study 1 Model 1 showing paths from coherence, purpose, and mattering to sense of MIL and perceived importance. Path models showing standardized path coefficients. Dummy coded mental representations are included in the model but not displayed for ease of interpretation. Solid lines show significant paths and dotted lines show non-significant paths. $^{**}p < .01$; $^{***}p < .001$

an individualizing foundation (Harm/care, Fairness/reciprocity) as opposed to a binding foundation (Ingroup/loyalty, Authority/respect, and Purity/sanctity; Haidt, 2008). Religion was also a significant overall moderator yielding an ambiguous result: The pathway from coherence to MIL did not reach significance among agnostics, but nor was this pathway significantly weaker among agnostics than among atheists or religious participants. We also found some differences of emphasis as a function of level of MIL, and social versus personal-focused values, but coherence, purpose, and mattering remained significant predictors of MIL throughout these analyses.

2.3 | Predicting perceived importance of mental representations

To further explore the role of the three proposed meaning bases for how mental representations are perceived, we tested whether coherence, purpose, and mattering would

TABLE 4 Study 1 paths from coherence, purpose, and mattering to sense of MIL, on their own (Model 1), and while controlling for the satisfaction of other psychological needs (Model 2)

Predictor	*b*	*β* [95% CI]	*p*
Model 1			
Coherence	.16	.16 [.12, .20]	<.001
Purpose	.37	.38 [.33, .43]	<.001
Existential mattering	.29	.28 [.24, .32]	<.001
Sense of MIL	–	–	–
Model 2			
Coherence	.11	.11 [.07, .15]	<.001
Purpose	.29	.30 [.25, .34]	<.001
Mattering	.23	.22 [.18, .26]	<.001
Belonging	.03	.02 [−.01, .05]	.129
Self-esteem	.21	.19 [.15, .23]	<.001
Self-efficacy	.02	.02 [−.02, .05]	.273
Distinctiveness	−.01	.00 [−.04, .03]	.809
Self-continuity	.04	.04 [.00, .07]	.034
Control	.01	.01 [−.02, .04]	.576
Sense of MIL		–	–

predict perceived importance of mental representations through sense of MIL. To test this, we added perceived importance as an outcome of the other variables in Model 1, and Model 2. All three proposed bases of meaning predicted importance indirectly through MIL, but coherence and purpose also predicted perceived importance directly. When controlling for the fulfillment of other psychological needs in Model 2, a similar pattern emerged, but now purpose predicted perceived importance only indirectly. A full report of these mediation models can be found in Supporting Information C.

2.4 | Summary

Study 1 provided first evidence that mental representations are judged as more meaningful if they give a sense of coherence (H1), purpose (H2), and mattering (H3). Purpose and mattering predicted MIL across all analyses. These findings persisted when controlling for the fulfillment of other psychological needs that contribute to one's wellbeing (e.g., self-esteem), and they held across mental representation types, as well as individual differences in religious orientation, lower and higher overall meaningfulness attributions, and in all further moderation analyses (see Supporting Information B). In contrast, coherence predicted the sense of MIL (H1) only when participants rated beliefs and identities, rather than values or attitudes, and this pathway did not reach significance among agnostics.

Study 1 findings also suggest that coherence and purpose may serve important functions in addition to their role in the experience of MIL, whereas mental representations associated with mattering may be important specifically because they grant a sense of MIL. Coherence predicted perceived importance independently of meaningfulness, suggesting that coherence may be important for reasons not related to MIL. Similarly, purpose directly predicted perceived importance in the model that only included the three facets of MIL. As the direct path became non-significant when controlling for the fulfillment of other psychological needs, this suggests that the importance of purpose outside its relation to MIL may overlap with the satisfaction of one or more of the other psychological needs measured.

3 | STUDY 2

Study 1 was our first study in a novel area, and so in Study 2, we aimed to replicate the key findings among a different sample (university students) within a different cultural context (UK). US culture emphasizes mastery values (i.e., values related to self-assertion and goal pursuit) more than other cultures (Schwartz, 2006), which might have explained the prominent role of purpose for a sense of MIL in Study 1. Although similar, UK culture has a greater focus on intellectual and emotional autonomy values (Schwartz, 2006). Moreover, UK participants—perhaps especially university students—are less likely to be religious than US participants (Evans, 2018). In addition, students represent a younger age group than MTurk workers. Around 70% of those enrolling in higher education in the UK were 24 or younger (Higher Education Statistics Agency, 2019) whereas the average US MTurk worker is around 35–36 years old (Burnham et al., 2018). Being less religious and younger is associated with lower meaning in life (Hicks & King, 2008; Steger et al., 2006, 2009). Hence, replicating the pathways from coherence, purpose, and mattering to the sense of MIL among a younger, less religious sample with potentially different value priorities would provide evidence of the robustness of our findings.[2]

The current design asks participants to make metacognitive judgments (i.e., to think about the content of their thoughts). Hence, in addition to replicating our Study 1 moderation analyses, we also tested whether associations between dimensions and sense of MIL would generalize as a function of individual differences in self-reflection (i.e., how much participants think about their thoughts and feelings) and self-insight (i.e., how much participants perceived they were aware of their thoughts and feelings).

3.1 | Method

3.1.1 | Participants

In Study 1, the smallest substantive effect in the main analysis was for coherence which accounted for 2.1% of variance in sense of MIL ($f^2 = 0.07^3$). A sample size of 16 participants yielding 188 mental representations would be required to observe the same effect using a significance level of .05 and with 95% power. In order to allow for potential case exclusions due to careless responding tendencies and for data splitting in order to test moderation effects, we aimed to over-recruit.

We recruited 188 responses from UK university students enrolled in a psychology course in exchange for research participation credits. We applied the same exclusion criteria as in Study 1 and removed 82 participants who failed any of the two attention checks embedded within the questionnaire. The final sample consisted of 106 participants yielding 1,272 mental representations: participants were 87 females, 18 males, and one who identified as "non-binary." Participants were aged between 18 to 27 years ($M = 19.55$, $SD = 1.49$), predominantly British ($n = 88$), with most identifying as atheist ($n = 64$) or agnostic ($n = 14$).

3.1.2 | Questionnaire and procedure

The procedures for eliciting mental representations were the same as in Study 1. We also used the same items to capture ratings of sense of coherence, purpose, mattering, and MIL for each mental representation. In addition, we measured self-reflection (12 items, e.g., "I frequently take time to reflect on my thoughts"; $\alpha = .92$) and self-insight (7 items, e.g., "I usually know why I feel the way I do"; $\alpha = .81$; Grant et al., 2002), using a 7-point scale (1 = *Strongly disagree*; 7 = *Strongly agree*).

3.2 | Results and discussion

3.2.1 | Main findings

Specified models had 1,272 Level 1 units (mental representation) and 106 Level 2 units (individuals). The baseline model with only mental representation domains predicting sense of MIL accounted for 34.1% within-person variance. As shown in Table 5, intercorrelations between coherence, purpose, mattering, and sense of MIL ratings as well as their residual covariances after controlling for mental representation domains were comparable to those observed in Study 1 (cf. Table 3).

TABLE 5 Correlations between all within-person ratings in Study 2

	Variable	1	2	3	4
1	Sense of MIL	–	.59	.66	.59
2	Coherence	.71	–	.68	.55
3	Purpose	.77	.76	–	.61
4	Existential mattering	.71	.68	.72	–

Note: Below the diagonal: zero-order correlations; above the diagonal: residual covariances after controlling for mental representation domain. All correlations were significant at $p < .001$.

Sense of coherence, purpose, and existential mattering were added as predictors of sense of MIL to the baseline model. As in Study 1, sense of MIL was most strongly predicted by purpose, $\beta = .37$, $p < .001$, 95% CI [.31, .42], followed by existential mattering, $\beta = .23$, $p < .001$, 95% CI [.18, .28], and coherence, $\beta = .20$, $p < .001$, 95% CI [.15, 25]. This model accounted for 67.3% of within-person variance in sense of MIL.

3.2.2 | Exploring the generality of our findings

As in Study 1, we conducted a series of moderation analyses to test the generality of our findings across mental representation types, and individual differences.

Moderation by mental representation type

We tested whether the paths would differ by mental representation type. While associations between the sense of MIL and each of the three predictors varied in strength across mental representation types, coherence, purpose, and mattering all remained significant regardless of whether participants were rating beliefs, values, attitudes, or identities.

Moderation by individual-level characteristics

We used the same approach as in Study 1, creating categorical variables capturing individual differences based on mental representation content. In addition, we created Level 2 categorical variables for self-reflection and self-insight tendencies by splitting participants around median self-reflection scores and median self-insight scores. Pathways from coherence, purpose, and mattering to the sense of MIL did not differ significantly as a function of overall MIL attributions, outlook on human nature, social versus personal values, or as a function of self-reflection or self-insight tendencies. There were some differences in strength of associations as a function of free will belief and religiosity. Coherence, purpose

and mattering remained significant predictors of MIL throughout these analyses, with two exceptions. First, the path from coherence to MIL was not significant for participants with a personal rather than a social focus in their selected values, but, as mentioned earlier, there was no evidence of overall moderation. Second, as in Study 1, the pathway from coherence to MIL was not significant across all religious categories—this time, it was non-significant among religious people. This pathway was not significantly weaker than for the other two religious groups.

3.3 | Summary

Using a different sample (students at a UK University), we replicated the findings from Study 1: all three dimensions of coherence (H1), purpose (H2) and existential mattering (H3) uniquely predicted the sense of MIL. These findings did not vary significantly by individual differences in self-reflection and self-insight. Of the three dimensions, coherence was again less reliably predictive of sense of MIL, with religious participants seemingly not relying on sense of coherence for judging the meaningfulness of their mental representations. As in Study 1, sense of mattering and purpose remained significant predictors of MIL in all analyses.

4 | STUDY 3

While Study 1 and Study 2 suggested that our findings would generalize to different samples, neither of our samples were representative of the general population of their respective countries. US MTurk workers and UK university students tend to be younger, more educated, less religious, and more liberal than the average US/UK person (Dinham et al., 2017; Hanel & Vione, 2016; Paolacci & Chandler, 2014). As such, we preregistered Study 3 (https://bit.ly/2W6iJAN) aiming to confirm our pattern of findings using a nationally representative UK sample.

We also aimed to test whether our pattern of results would remain after controlling for a recently proposed fourth dimension of MIL: experiential appreciation (EA)—describing the extent to which one finds value and enjoyment in one's experiences (Flanagan et al., 2019). Experiential appreciation has been found to contribute to between-person sense of MIL independently of the other three dimensions. We tested whether EA would predict within-person sense of MIL, and whether the original three dimensions would remain predictive after including EA in the model.

4.1 | Method

4.1.1 | Participants

As explained in Study 2, finding our smallest substantive effect only required a small sample of 188 mental representations (or 16 participants). When splitting data into categories to explore the generality of our findings, we also aimed to have sufficient participants in our smallest group—the smallest grouping averaged across Study 1 and Study 2 included 6.93% of total participants (see Supporting Information B). Assuming similar groupings in our sample, we would need to have at least 231 participants for adequately powered tests. We over-recruited, hoping to have 300 complete responses in the final sample (after exclusions).

We recorded 414 complete responses on Prolific (https://www.prolific.co/) from a nationally representative UK sample cross-stratified by age (18–27, 28–37, 38–47, 48–57, and 58+), gender (male and female), and ethnicity (White, Mixed, Asian, Black, and Other). As specified in the preregistration, we applied the same exclusion criteria from Study 1 and Study 2 to remove 118 participants who failed any of the two attention checks embedded within the questionnaire. The final sample consisted of 296 participants: 151 females, 143 males, and two participants who identified as "non-binary." Participants were aged between 18 to 82 years ($M = 44.58$, $SD = 15.78$), predominantly White ($n = 242$), followed by Asian ($n = 21$), Black ($n = 15$), Mixed ($n = 14$), as well as two participants who classified themselves as "British/Turkish" and "Arab," respectively, and two participants who preferred not to say ($n = 2$). Most participants identified as atheist ($n = 121$) or agnostic ($n = 49$). Unsurprisingly, most religious participants identified as Christian ($n = 94$) with the remaining 32 identifying as Muslim, Jewish, Hindu, Buddhist, or self-specified as "spiritual."

4.1.2 | Questionnaire and procedure

The procedure for eliciting mental representations was the same as in Study 1 and 2 and used the same items for coherence, purpose, mattering, and MIL. We added an additional rating of experiential appreciation associated with each mental representation ("an appreciation for the beauty and variety of my life experiences").

Because data were collected in July 2021 during the COVID-19 pandemic, we also asked questions about participants' subjective concerns about the pandemic by adapting items from existing measures (Sloan et al., 2021; Taylor et al., 2020): fear of contamination (3 items, $\alpha = .81$, e.g., "I am worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus"), traumatic stress (3 items, $\alpha = .86$, e.g., "I had trouble

concentrating because I kept thinking about the virus"), and altruistic concern (3 items, $\alpha = .86$, e.g., "I am worried about other people in the UK becoming ill from COVID-19").[4]

4.2 | Results and discussion

4.2.1 | Main findings

Specified models had 3,552 Level 1 units (mental representation) and 296 Level 2 units (individuals). The baseline model with only mental representation domains accounted for 29.9% within-person variance. As shown in Table 6, the pattern of correlations between coherence, purpose, mattering, and sense of MIL was similar to that obtained in the previous two studies (cf. Tables 3 and 5). As expected, experiential appreciation was also strongly correlated with all other dimensions and sense of MIL.

When adding coherence, purpose, and mattering as predictors of sense of MIL to the baseline model, we found similar a pattern as in the previous two studies: sense of MIL was most strongly predicted by purpose, $\beta = .41$, $p < .001$, 95% CI [.37, .44], followed by mattering, $\beta = .17$, $p < .001$, 95% CI [.14, .21], and coherence, $\beta = .17$, $p < .001$, 95% CI [.14, .21]. This pattern of findings persisted after controlling for experiential appreciation; sense of MIL was predicted by purpose, $\beta = .36$, $p < .001$, 95% CI [.32, .40], mattering, $\beta = .13$, $p < .001$, 95% CI [.10, .17], and coherence, $\beta = .15$, $p < .001$, 95% CI [.12, .19]. Interestingly, experiential mattering was also a unique predictor, $\beta = .13$, $p < .001$, 95% CI [.10, .17].

4.2.2 | Exploring the generality of our findings

Moderation analyses were conducted as in Study 1 and Study 2.

TABLE 6 Correlations between all within-person ratings in Study 3

	Variable	1	2	3	4	5
1	Sense of MIL	–	.58	.65	.56	.53
2	Coherence	.68	–	.72	.64	.58
3	Purpose	.75	.79	–	.69	.64
4	Existential mattering	.68	.73	.77	–	.61
5	Experiential appreciation	.65	.68	.74	.70	–

Note: Below the diagonal: zero-order correlations; above the diagonal: residual covariances after controlling for mental representation domain. All correlations were significant at $p < .001$.

Moderation by mental representation type

As in Study 2, associations between the sense of MIL and coherence, purpose, and mattering varied in strength across mental representation types, but all three predictors remained significant regardless of whether participants were rating beliefs, values, attitudes, or identities.

Moderation by individual-level characteristics

Pathways from coherence, purpose, and mattering to the sense of MIL did not differ significantly as a function of overall MIL attributions, different COVID-19 fears and concerns, religiosity, free will belief, moral orientation values, outlook on human nature, or social versus personal values. There were some differences in strength of association as a function of growth versus self-protection focus. Nevertheless, all three dimensions remained significant predictors of MIL across all analyses with one equivocal exception: those with binding moral foundations did not seem to rely on mattering when making MIL judgments, but this path was not significantly weaker than for those with individualizing moral foundations and so the nonsignificant path for this relatively small subset of our sample may have been a Type II error.

4.3 | Summary

Using a nationally representative UK sample, we replicated findings from the previous two studies: coherence (H1), purpose (H2), and existential mattering (H3) uniquely predicted sense of MIL. These findings persisted even after controlling for a potential fourth dimension of MIL: experiential appreciation—which also emerged as a unique predictor. Purpose remained the strongest predictor of MIL, but it was less clear whether mattering remained uniformly predictive of meaning frameworks; we did not find evidence that those who made moral judgments based on ingroup/loyalty, authority/respect, or purity/sanctity relied on mattering when judging the meaningfulness of their mental representations.

5 | GENERAL DISCUSSION

Across three studies we attempted a much-needed integration between research on meaning frameworks and on predictors of sense of MIL. By using recent tripartite models of MIL (George & Park, 2016; Martela & Steger, 2016), we showed which mental representations act as meaning frameworks: those that provide sense of purpose (H2) and, less consistently, coherence (H1) and existential mattering (H3). Concurrently, our findings extend ongoing efforts to understand what predicts MIL.

Previous studies have focused on predicting individual differences in overall life judgments of MIL (e.g., George & Park, 2017). Here, we found evidence that coherence, purpose, and mattering predict sense of MIL when this is assessed at a lower level of construal than overall life judgments—that is, when looking at meaningful aspects *within* people's lives.

5.1 | The role of coherence, purpose, and mattering for meaning frameworks

Purpose (H2) showed the strongest and most consistent associations with the sense of MIL. These associations persisted when controlling for the fulfillment of other psychological needs that contribute to one's wellbeing (e.g., self-esteem), and they held across mental representation types, as well as individual differences in religious orientation, lower and higher overall meaningfulness attributions, and in all further moderation analyses (see Supporting Information B).

Mattering (H3) followed a similar pattern to purpose, but showed weaker associations—this differs from individual-level findings where mattering emerged as the key predictor of sense of MIL (Costin & Vignoles, 2020). One explanation could be that dimensions are differentially important depending on levels of abstraction. Beliefs, values, attitudes, and identities may be meaningful primarily to the extent that they are seen to further life goals, whereas one's life, judged in its entirety, may be judged as meaningful mainly to the extent that it is seen as mattering within a grander framework (i.e., the Universe).

Despite the extensive focus on coherence in the literature on MIL (e.g., Heintzelman & King, 2014) and meaning frameworks (e.g., Heine et al., 2006), H1 received only partial support. The contribution of coherence to sense of MIL was significant overall, but not robust across mental representation types and across groups of participants. Coherence, in the broader sense of the word, is likely a feature of the formation and maintenance of all mental representations, since humans may be fundamentally attuned to see patterns, make predictions, and update those predictions (Clark, 2013). Nevertheless, it is unclear whether explicit reports about the coherence of mental representations describe the same experience as that induced by the more subtle primes used in the meaning literature—for instance, in research showing that exposure to familiar visual or textual patterns increases sense of MIL (Heintzelman et al., 2013). Alternatively, individuals may be more likely to form meaning frameworks from mental representations that grant coherence when a person's sense of coherence is low or undermined (e.g., Heine et al., 2006). Opportunities to make life feel more coherent might seem less appealing to those who have already achieved some baseline level of perceived coherence.

5.2 | Theoretical and methodological implications

Unlike other research into situational meaning that looked at concrete occurrences (e.g., traumatic events; Park et al., 2012) or specific life domains (e.g., engagement in work activities; Steger et al., 2012), mental representations are universal and pervasive within people's lives. Certain types of mental representations about the world as a whole may be stable across situations, consistent across time, and may shape personality (see primal world beliefs; Clifton et al., 2019). Showing that mental representations can serve as meaning frameworks suggests new ways in which MIL judgments could shape behavior—between beliefs, values, attitudes, and identities that each prescribe different ways of behaving, would a person be more likely to act in line with a more meaningful mental representation than a less meaningful one?

The within-person technique used in our studies has important theoretical and methodological advantages above modeling relationships between meaning bases and sense of MIL at the individual level (cf., Costin & Vignoles, 2020; George & Park, 2017). Because participants made ratings of multiple mental representations, rather than judging the meaningfulness of their lives as a whole, they were less likely to anticipate the focus of our analyses. Consequently, our results are less likely to be explained by socially desirable response styles that often contaminate self-report measures of positive psychological functioning (Heintzelman et al., 2015). Concurrently, a statistical focus on within-person variation insulates results from individual differences in scale usage, such as acquiescent responding (i.e., "the tendency to agree with questionnaire statements regardless of content"; Winkler et al., 1982, p. 555).

5.3 | Limitations and future directions

Despite these advantages of our within-person design, some limitations should be addressed in future work. First, in the interest of reducing respondent fatigue, we used single-item measures of meaning variables. When measuring complex psychological constructs, single-item measures are often less reliable and capture less information

(Bergkvist & Rossiter, 2007; Loo & Kelts, 1998). However, in some cases, they can capture psychological phenomena as reliably as their multi-item counterparts (e.g., self-esteem; Robins et al., 2001). Existing measures of sense of MIL feature redundancy in their item content (e.g., "My life as a whole has meaning," "My entire existence is full of meaning"; Costin & Vignoles, 2020; Wong, 1998), which may suggest that single-item measures could be appropriate alternatives to the full scales. Second, the current within-person correlational findings should be supplemented with experimental or longitudinal research with causally sensitive designs to capture the relationships between meaning dimensions and sense of MIL (see Supporting Information D for some preliminary evidence).

6 | CONCLUDING REMARKS

People perceive the world and themselves through mental representations of varying types and content. These culturally and socially defined lenses through which we see the world and ourselves can provide existential comfort and grant assurance of our place within the world, making us feel not only that life is coherent and orderly, but also that there are important goals that can give us a sense of purpose, and that our lives can matter despite evidence to the contrary. In so doing, these world-views and self-views provide the foundation on which we construct meaningful lives.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTIONS

Vlad Costin: conceptualization (lead), data management (lead), formal analysis (lead), funding acquisition (equal), methodology (equal), original draft preparation (lead). Vivian L. Vignoles: supervision (lead), review & editing (lead), methodology (equal), conceptualization (supporting), formal analysis (supporting).

ETHICS APPROVAL STATEMENT

All studies in this paper received ethical approval from the Sciences & Technology Cross-Schools Research Ethics Committee (C-REC) of the University of Sussex.

DATA AVAILABILITY STATEMENT

Data, study materials, and study 3 pre-registration are available at http://doi.org/10.17605/OSF.IO/VAZ2Y.

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ENDNOTES

[1] Across all three studies, we also ran our main analyses after applying more lenient exclusion criteria, where participants were retained if (a) they failed one or no attention checks (all studies), or (b) they failed two or fewer attention check (Study 1). Regardless of exclusion criteria, the substantive pattern of results remained the same (see Supporting Information A).

[2] Initially, we also hoped to collect longitudinal data in Study 2. However, the second wave of our study coincided with the onset of the COVID-19 pandemic in the UK and we were able to collect only 19 usable responses at Time 2. Hence, we report the Time 1 data only in this paper. Cross-lag analyses between Time 1 and Time 2 responses are reported in Supporting Information D, but should be interpreted with caution given the sample size.

[3] Calculated using Cohen's f^2 formula for calculating local effect size (Cohen, 1988; Selya et al., 2012):

$$f^2 = \frac{R^2_{AB} - R^2_A}{1 - R^2_{AB}}$$

Here, R^2_{AB} is the proportion of variance accounted for by a set of variables that include the target predictor (B), whereas R^2_A is the proportion of variance accounted for by all other variables not including B.

[4] For exploratory reasons, we also measured whether participants were self-isolating or shielding and perceived pandemic seriousness and perceived changes to lifestyle due to the pandemic.

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