

Annual Review of Psychology The Science of Meaning in Life

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Abstract

Meaning in life has long been a mystery of human existence. In this review, we seek to demystify this construct. Focusing on the subjective experience of meaning in life, we review how it has been measured and briefly describe its correlates. Then we review evidence that meaning in life, for all its mystery, is a rather commonplace experience. We then define the construct and review its constituent facets: comprehension/coherence, purpose, and existential mattering/significance. We review the many experiences that have been shown to enhance meaning in life and close by considering important remaining research questions about this fascinating topic.

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INTRODUCTION

A science of meaning in life faces enormous challenges. Meaning in life occupies the center of contradictory ideas, paradoxes, and definitional ambiguities. It is, at once, a myth or illusion (Camus 1955, Yalom 1980), a wholly esoteric preoccupation (Baumeister 1991, Taylor 1989), a rare and remarkable quality attained only through right and virtuous action (e.g., Ryan & Deci 2001, Ryff & Singer 2008, Seligman 2002), and a necessity of life and a central human motivation [Frankl 1984 (1946)]. In short, meaning in life is an ineffable mystery, at once nothing and everything.

One way to escape these quandaries is to focus on prepositions, separating the meaning of life from the meaning in life. The meaning of life implies one principle that somehow provides a final answer, the profound secret through which human life, at last, makes sense or matters. In contrast, when we talk about meaning in life, we are talking about an experience, a mental state. Klinger (1977, p. 10) captured this idea:

The meaningfulness of someone's life cannot be inferred just from knowing his or her objective circumstances. Meaningfulness is something very subjective, a pervasive quality of a person's inner life. It is experienced both as ideas and as emotions. It is clear, then, that when we ask about the meaningfulness of someone's life we are asking about the qualities of his or her inner experience.

Surely conclusions drawn about meaning as a subjective experience will be less profound or final than conclusions about the meaning of life. However, thinking about the experience of meaning

as a subjective state allows us to consider the ways in which this experience might be useful, that is, the ways in which it might influence cognition and behavior toward adaptive outcomes.

Treating meaning in life as a subjective experience renders the construct more tractable. Yet, research on this experience has often focused on its absence. Perhaps because the scientific study of meaning in life was born with the publication of Viktor Frankl's [1984 (1946)] seminal volume, *Man's Search for Meaning*, scholarly attention has often been directed toward those times when life circumstances move people to seek meaning or engage in meaning making. Certainly, it seems unlikely that a science of anything could emerge from research focused on its absence (King 2012, King et al. 2016).

Even focusing on the experience of meaning in life when it is present cannot fully rescue meaning in life from the exalted quagmire in which it has languished. What is this experience? Where does it come from? Progress in answering these questions has been hindered by the placement of the experience of meaning in life on a pedestal in the pantheon of well-being constructs (e.g., Huta & Waterman 2014, Ryff & Singer 2008). Compared to a happy life, the meaningful life has been portrayed as somehow better, rarer, and more morally upstanding (Ward & King 2016a).

The mystique attached to meaning in life means that attempts to measure and define it are likely to be met with dissatisfaction, if not outright suspicion (Heintzelman & King 2013a). Decisions about what matters to the experience of meaning in life are affected by the vaunted nature of the construct and the unspoken beliefs about its nature. As an example, consider that socioeconomic status (SES) is positively related to meaning in life (e.g., Kobau et al. 2010). Because this link flies in the face of assumptions about meaning in life as somehow beyond the quotidian aspects of existence, researchers routinely treat SES as a control variable. Yet, research shows that SES functions similarly to religious faith and social relationships as a source of meaning in life (Ward & King 2016b).

Understanding meaning in life requires that we surrender the vague, mysterious domain of the meaning of life to philosophers and theologians and instead satisfy ourselves with a more circumscribed terrain. The science of meaning in life, as a subjective experience, begins with the assumption that people experience to varying degrees something they recognize as meaning in their lives and they can report on that experience. To understand this experience, we must listen without prejudice to what the data tell us about this subjective state, even when they challenge our assumptions and nudge meaning in life off its grand pedestal among the goods of life. In this review, then, with these cautions in place, we share the science of meaning in life that has emerged from such a modest focus. We begin where the science began, measuring and mapping the experience of meaning and its associations with important life outcomes. Only then do we proffer a definition of the construct and review its facets. We then consider the experiences that make life meaningful. We close by considering important research questions on this topic.

MEASURING MEANING IN LIFE, WHATEVER THAT IS

For many years, researchers sidestepped the definitional ambiguity of meaning in life using measures that relied on people's intuitive sense of the meaning of the terms "meaning" and "purpose." Two early self-report measures include the Purpose in Life test (PIL; see Crumbaugh & Maholick 1964) and the Seeking of Noetic Goals scale (SONG; see Crumbaugh 1977). The PIL seeks to capture the sense that life is meaningful with items such as "My personal existence is: 1 (meaningless, without purpose) to 7 (purposeful, meaningful)." The SONG seeks to measure the longing for meaning with items like "I think about the ultimate meaning of life" and "I feel that some element which I cannot quite define is missing from my life." The Sense of Coherence scale (SOC; see Antonovsky 1993) is designed to tap three facets: meaningfulness, comprehensibility,

and manageability. A sample item includes "I imagine that my life in the future will be ... full of meaning or purpose versus totally without meaning or purpose." These early measures proved problematic for a variety of reasons. Perhaps most importantly, both the PIL and SOC are permeated with positive mood (King et al. 2006, McGregor & Little 1998). For example, both scales include items about everyday tasks being "a source of pleasure and satisfaction."

A landmark event in the science of meaning in life was the introduction of the Meaning in Life Questionnaire (MLQ) by Steger et al. (2006). The MLQ has two subscales measuring the presence of meaning (like the PIL) and the search for meaning (like the SONG). Like its predecessor, the presence of meaning subscale of the MLQ includes face-valid items that employ the terms "meaning" and "purpose" without defining them (e.g., "I understand my life's meaning," "I have discovered a satisfying life purpose"). Although the MLQ presence subscale is positively correlated with positive mood (e.g., Womick et al. 2019), MLQ items, at least, do not refer to enjoyment or pleasure. The MLQ presence of meaning subscale has emerged as the most widely used measure of meaning in life (Brandstätter et al. 2012).

Surely, including the name of an ambiguous construct (i.e., "meaning") in the items measuring that construct is problematic (George & Park 2016, Leontiev 2013). Nevertheless, the MLQ presence of meaning scale allowed researchers to address central questions about the experience of meaning in life, whatever people mean by that (Hicks & King 2009b).

Global reports of meaning in life are certainly related to important positive life outcomes (for reviews, see King et al. 2016, Steger 2012). Based on outcomes as varied as cardiovascular disease (e.g., Kim et al. 2019a), mortality (Boyle et al. 2009), age-related cognitive decline and risk for Alzheimer's disease (Boyle et al. 2012), burnout (Hooker et al. 2020), social appeal (Stillman et al. 2011), net worth (Hill et al. 2016), incidence of psychological disorders (e.g., Owens et al. 2009, Steger & Kashdan 2009), risk of physical disability (Mota et al. 2016), and suicidal ideation (Corona et al. 2019), those who report a high sense of meaning in life appear to be better off than others. Many of these associations come from longitudinal and prospective designs. In the United Kingdom, such results led to calls for the inclusion of measures of meaning in life in national surveys. Recently, Steptoe & Fancourt (2019) reported the results of such a survey (N > 7,000 older adults) including the item "To what extent do you feel the things you do in your life are worth-while?" (rated on a scale from 1 to 10). Item ratings prospectively predicted numerous positive outcomes over 4 years, including faster gait speed, better social connections, better employment outcomes, lower alcohol use, and lower risk of divorce.

Without question this literature is characterized by the use of global and often imperfect measures, and research is needed to identify mechanisms by which meaning in life is associated with positive outcomes. Nevertheless, a multitude of studies conclude that whatever people mean when they say their lives are meaningful has important implications. Links to physical health and survival suggest that meaning in life might serve an adaptive function. Of course nothing that is (literally) adaptive—essential to survival—can be hard to come by (Halusic & King 2013). Theorists have often declared meaning in life to be rare or even impossible. Is it? We address this question next.

To find out how meaningful life is, on average, Heintzelman & King (2014a) gathered descriptive statistics from various data sets including measures of meaning in life. Drawing on large-scale representative surveys, they found the levels of meaning in life espoused were typically rather high, above the midpoint of the rating scales used. For example, the Centers for Disease Control and Prevention administered three items from the MLQ presence subscale to a representative sample of North Americans (N > 5,000; Kobau et al. 2010). Average endorsement was significantly higher than the midpoint rating scale. For instance, the item "My life has a clear sense of purpose" (which had the lowest average endorsement) was rated a 4 or 5 on a 1–5 scale by nearly 60% of the sample. Beyond the United States, a Gallup World Poll conducted on representative samples of

132 nations included the item "Does your life have a special purpose or meaning?" and averaging across nations, 91% of the pollees responded in the affirmative (Oishi & Diener 2014).

Ratings of average meaning in life derived from research were similarly high. Of the 122 means identified in all available studies employing the MLQ (based on 27,635 participants), just 10 fell below the midpoint of the rating scale. These descriptive statistics do not simply reflect reports from college students. People in many life circumstances (e.g., those diagnosed with serious psychological disorders, women with breast cancer, and individuals in treatment for addiction or hospitalized for serious health issues) report meaning in life significantly above the midpoint of the rating scale (Heintzelman & King 2014a). Thus, meaning in life is apparently commonplace and the average life is pretty meaningful. This conclusion suggests that the meaningful life is not a rare accomplishment but rather, potentially, the default state.

With regard to the correlates of meaning in life and its general characteristics, researchers have made important contributions relying on self-report scales that contain the words "meaning" and "purpose." This work supports the assumption that meaning in life is important but challenges the assumption that it is rare. As research has accumulated, scholars have called for greater attention to the conceptualization of meaning, its components, and their measurement (George & Park 2016, Heintzelman & King 2013a, Leontiev 2013, Martela & Steger 2016). At last, an adequate conceptual definition has emerged, as we consider next.

CONCEPTUALLY DEFINING MEANING IN LIFE AND ITS FACETS

Although defining meaning in life has been difficult, scholarly definitions share common features. For example, King and colleagues (2006, p. 180) summarized scholarly definitions of meaning as follows: "Lives may be experienced as meaningful when they are felt to have significance beyond the trivial or momentary, to have purpose, or to have a coherence that transcends chaos." Similarly, Steger (2012, p. 165) defined meaning as "the web of connections, understandings, and interpretations that help us comprehend our experience and formulate plans directing our energies to the achievement of our desired future. Meaning provides us with the sense that our lives matter, that they make sense, and that they are more than the sum of our seconds, days, and years."

Both of these definitions reflect the current scholarly consensus that comprehension (or coherence), purpose, and existential mattering (or significance) constitute three primary components of meaning in life (e.g., Heintzelman & King 2014a, Martela & Steger 2016, Steger 2012). Psychometric studies indicate that each of these facets feeds into a global sense of meaningfulness (George & Park 2017, Krause & Hayward 2014). Two scales have been introduced to measure the facets of meaning separately (Costin & Vignoles 2020, George & Park 2017). By examining each of these components, researchers hope to tackle issues associated with the definitional ambiguity of global meaning in life judgments, and more precisely to integrate research on existential meaning with the existing literature (George & Park 2016). Below we briefly review the conceptual definitions of these facets of meaning and research supporting their function as underpinnings of meaning in life.

Comprehension/Coherence

Humans are motivated to understand and make sense of their lives and the world more broadly (e.g., Fiske 2018, Yalom 1980). The perception of comprehension, or coherence, in life captures this cognitive component of meaning in life (Heintzelman & King 2014b). At its most basic level, coherence arises when one understands experience—when a person feels they "get it" (Hicks et al. 2010a). When people perceive that they know how people, ideas, objects, and other things are connected (Heine et al. 2006), life makes sense (Baumeister & Vohs 2002). The experience of

comprehension of life is the perception that one is able to make sense of the past, present, and imagined future aspects of their life and integrate their life story into a coherent whole (George & Park 2016, McAdams & Olson 2010). Items measuring comprehension include "I can make sense of the things that happen in my life" and "Looking at my life as a whole, things seem clear to me" (Costin & Vignoles 2020, George & Park 2017).

Focusing on the comprehension aspect of meaning, the (feeling of) meaning-as-information model (Heintzelman & King 2014b) views the subjective state of meaningfulness as providing information about the extent to which the world and experience make sense. This perspective relies on James's (1893) notion of the "feeling of right direction" as an indicator of the subjective rationality of experience. Tying the experience of meaning to the adaptive processes of associative learning and the automatic detection of covariation in the environment (Turk-Browne et al. 2008), this perspective suggests that when the environment is predictable and rich with systematic associations, the feeling of meaning is likely to be high. When meaning in life is low, it signals the need to seek out patterns and associations. From this perspective, just as moods provide important information that directs thoughts and activities (Schwarz & Clore 1988), so too does the feeling of meaning. Similarly, Baumeister & von Hippel (2020) argue that its relevance to the making of connections explains the potential adaptive function of meaning itself (see also Heintzelman & King 2013b).

In general, the inability to comprehend one's environment is believed to cause considerable psychological distress (e.g., Pyszczynski & Taylor 2016). Traumatic events can undermine worldviews (Janoff-Bulman 1985), and attempting to make sense of the trauma can increase stress (Silver et al. 1983), depression (Coleman & Neimeyer 2010), and posttraumatic stress symptoms (Updegraff et al. 2008). Conversely, understanding trauma is associated with greater psychological recovery after trauma (e.g., Davis et al. 1998). For example, in a seminal paper examining the role of meaning making in the aftermath of 9/11, Updegraff and colleagues (2008) showed that those who reported finding meaning in the event reported less stress compared to those who did not. Thus, searching for meaning in trauma may lead to psychological stress but there is potential for greater recovery, including enhanced feelings of meaning in life (Park 2010), when sense is ultimately made.

Senseless tragedies can spur the need to make meaning. However, such experiences are not the norm. The vividness of these events notwithstanding, most of the time the world does make sense. After all, daily life is embedded in a world of invariants—a world of natural laws and imposed routines that provide a generally predictable existence (King 2012). The inherent comprehensibility of most of life may help to explain the widespread experience of meaning in life. Surely, the human capacity to make sense of experience is present throughout life. Infants demonstrate a basic understanding of how the world works at a very young age (e.g., Liu et al. 2019). The notion that old, automatic processes underpin the feeling of meaning is supported to some extent by research showing that the meaning in life is associated with intuitive (rather than effortful) information processing (Heintzelman & King 2016).

If comprehension is a central feature of meaning in life, when experiences make sense life should feel more meaningful. Some experimental research supports this idea. For example, Heintzelman et al. (2013) found that people reported higher meaning in life after exposure to stimuli presented in a coherent way (e.g., photographs of trees presented in the order of the seasons or groups of words that shared close semantic relationships) compared to exposure to stimuli

¹The comprehension aspect of meaning is also incorporated in the Meaning Maintenance Model (Heine et al. 2006). However, because this model focuses on automatic, nonconscious processes, it is less relevant to the subjective feeling of meaning.

that were less coherent. Simple features of the environment that influence processing fluency, such as the font size of items on the MLQ, can boost meaning in life (Trent et al. 2013).

Comprehension is also relevant to the ways behavior promotes meaning in life. The enactment of ritual may mitigate negative feelings by promoting a sense of control (Norton & Gino 2014). On a more mundane level, research shows that the momentary experience of meaning in life is higher when people are engaged in their daily routines than otherwise (Heintzelman & King 2019). Certainly, the notion that routine can quietly enhance meaning in life helps to explain the commonplace nature of the experience. If the myriad regularities of life—from sunrises and sunsets to days of the week, from morning coffees to favorite TV shows—contribute to its meaning, it is not surprising that life is pretty meaningful.

Purpose

Purpose in life has often been treated as synonymous with meaning in life. Purpose reflects the feeling that one's behavior is guided by personally valued goals (Klinger 1977, McKnight & Kashdan 2009). Purposeful goal pursuits are often consistent with core aspects of identity and may contribute to the development of self-knowledge itself (Bronk 2011). Although goals and motivation are central to the concept of purposeful living, purpose in life encompasses more than goal pursuit. As McKnight & Kashdan (2009, p. 242) state, "purpose is a central, self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning." Overarching purpose leads to efficient self-regulatory strategies, rendering relevant proximal goals salient and facilitating decision making (Baumeister 1991) and resulting in greater goal commitment and engagement (George & Park 2016). Questionnaire items tapping purpose include "I have a good sense of what I am trying to accomplish in life" and "I have certain life goals that compel me to keep going" (Costin & Vignoles 2020).

Life purposes often represent abstract, long-term, intrinsically valuable goals and aspirations (Klinger 1977). They serve as "lynchpin[s] of psychological organization" (Klinger 1998, p. 44) that influence daily behaviors, thoughts, and feelings. For example, classic studies showed that people often dream and daydream about valued goals, and these goals influence the content of thoughts more generally (Klinger & Cox 2011). In addition, the feeling of purpose in life has a profound influence on subjective experience. For example, purpose enhances the feeling that one is engaged in life; one's intentions and actions are perceived as meaningful and may even help make life itself feel worthwhile (Scheier et al. 2006). Purpose gives us a reason to get up in the morning (Ryff 1989).

Empirical research overwhelmingly supports the idea that purpose influences many aspects of health and well-being. Much of the research supporting the importance of meaning in life to functioning has employed measures that include items primarily about purpose. For example, self-reports of purpose predict physical health, including mortality rates, resilience in the face of adverse situations, delayed onset of a host of health problems, and health-related behaviors (see, e.g., Hill & Turiano 2014, McKnight & Kashdan 2009, Steger 2012).

Existential Mattering/Significance

The notion of existential mattering or significance refers to the extent to which a person believes their life counts—i.e., that their existence has and will have a lasting impact on the world. Mattering is tied to the belief that one's existence will continue to influence others across time and space. Items tapping a sense of existential mattering include "Whether my life ever existed matters even in the grand scheme of the universe" and "Even considering how big the universe is, I can say that my life matters" (Costin & Vignoles 2020, George & Park 2017).

Certainly, compared to assessing comprehension and purpose, assessing existential significance via self-report might seem heretical. How can anyone know if their life will have a lasting impact? After all, as Sartre (1956, p. 615) noted, "man is a useless passion. It is meaningless that we live and it is meaningless that we die." Even the rare person who demonstrates unabated purpose throughout their life can only do so much, and any resulting contributions will likely be completely forgotten after a brief lapse of time. Moreover, holding the belief that one's life will have such a profound impact may be viewed as profoundly narcissistic (Schaw 2000).

Many theorists suggest that people have a need to feel that their lives matter (e.g., Becker 1973, George & Park 2016, Yalom 1980). The sense that one's life matters in a grand way may be an example of a protective positive illusion. Alternatively, existential mattering may be akin to a sense of generativity and of leaving a legacy for future generations (e.g., de St. Aubin 2013). Of course, as with all other subjective judgments, the key here is not whether ratings reflect reality but whether they reflect a person's subjective assessment.

Experimental findings show that undermining perceptions of mattering detracts from meaning in life (Zhang et al. 2019). For example, the experience of being forgotten leads to lower meaning in life (compared to being remembered; see Ray et al. 2019). Strong evidence for the importance of mattering to meaning is provided by research on social exclusion. The most consistent effect of social exclusion (manipulated in a number of ways) is a drop in feelings that one's existence matters (e.g., Williams 2012).

The definition and measurement of existential mattering may raise concerns that it implies a narcissistic delusion. However, to date, no evidence indicates that, in healthy samples, feeling too significant leads to negative outcomes (in fact, narcissism appears to share positive relationships with all three facets of meaning in life; see Womick et al. 2020). Rather, feelings of insignificance predict profoundly negative outcomes, including suicidal ideation and attempts (e.g., Heisel & Flett 2004, Kleiman & Beaver 2013). In addition, antisocial and risky behaviors may arise from the motivation to show others that one matters (Rosenberg & McCullough 1981). Finally, significance quest theory (e.g., Kruglanski et al. 2009) argues that suicidal terrorist attacks are inspired by feelings of insignificance and the desire to have a lasting impact on the world.

Remaining Issues in the Definition and Facets of Meaning in Life

Although the facets of comprehension, purpose, and significance are prominent in definitions of meaning in life, much remains to be learned about these facets and their roles in the experience of meaning. Like global meaning in life, each facet warrants empirical scrutiny. A host of topics remain for future research. First, is one facet more central or foundational than the others? Heintzelman et al. (2013) suggested that coherence might be viewed as the most foundational aspect of meaning. After all, if the world is essentially chaotic, how could a person hope to pursue goals or experience significance? Some studies suggest that the three facets contribute equally to a sense of meaning in life (George & Park 2016). However, other research shows that mattering is a stronger predictor of global meaning in life than either comprehension or purpose (Costin & Vignoles 2020). Indeed, Costin & Vignoles (2020) found that feelings of significance prospectively predicted both overall meaning and feelings of purpose and coherence. In addition, the authors found that comprehension/coherence—the feeling that life makes sense—may be better understood as an outcome rather than an antecedent of the experience of meaning.

Another important direction for future research is probing the discriminant validity of the facets of meaning. Do the facets of meaning emerge from different experiences, and are people able to report on them as unique experiences? Certainly, the facets are empirically and conceptually related. Purposes, for instance, lend a coherent through line to existence, giving our lives

beginnings, middles, and ends. Goal achievement likely serves not only purpose but also significance. In addition, research should examine whether the facets of meaning are, in fact, uniquely about meaning and not about other aspects of well-being.

Of course, we might question whether these facets fully exhaust the domain of meaning in life. To illustrate, it is possible that current research focuses too much on how one perceives themselves to matter in the grand scheme of things and neglects the contribution that experiences that matter have on individuals' perception of meaning. That is, in addition to the belief that one's actions matter to others, people's perceptions that their experiences are intrinsically valuable might also uniquely contribute to the experience of meaning in life. This idea jibes with Martela & Steger's (2016, p. 532) definition of mattering (which they call significance) as "a sense of life's inherent value and having a life worth living." While existential mattering certainly contributes to a life worth living, the perceived value and significance one finds in their experiences is also considered fundamental to the experience of meaning in life [Frankl 1984 (1946)]. As Hocking (1957, p. 82) noted, "the simple going-on of living has an intrinsic satisfaction of its own, which philosophers commonly forget, but which is never far from the surface of common sense." Recent findings support the idea that researchers should consider both how much a life is felt to matter to others and how much people appreciate their life experiences when examining meaning in life (Li et al. 2020). Each of these types of significance uniquely contributes to meaning in life even after controlling for levels of comprehension and purpose.

WHAT MAKES LIFE MEANINGFUL?

If meaning in life is a commonplace experience, then the things that help make life meaningful must be part and parcel of everyday existence. Research shows that they are. Below we review variables theorized to lead to the experience of meaning in life. This list is not exhaustive but represents the most empirically supported antecedents of meaning in life. While some of these variables are sometimes perceived as intrinsic to the experience of authentic meaning [e.g., satisfying social connections or the belief that one is helping to actualize God's plan; see Baumeister 1991, Frankl 1984 (1946)], empirical data have yet to clarify whether any of these variables is more central to the construct. Instead, research shows that these antecedents elicit a subjective sense of meaning in life regardless of one's standing on other variables, raising the possibility there are multiple pathways to the experience of meaning.

Positive Affect

Recall that the earliest assessments of meaning in life were strongly related to positive affect. The inclusion of feelings of enjoyment and pleasure in assessments of meaning in life may reflect an important feature of the experience of meaning itself. Indeed, positive affect (i.e., feelings of happiness, cheerfulness, enjoyment, fun) is a robust, if controversial, antecedent of meaning in life. Like comprehension, purpose, and significance, positive feelings are represented in naïve theories of meaning in life (Ebersole 1998). In one study (Lambert et al. 2010), participants were asked to rank 12 different sources of meaning (e.g., friends, religious faith, achievements, self-worth) based on the extent to which they influenced their experience of meaning in life. Happiness was second only to family in these rankings.

Positive affect shares a robust positive correlation with meaning in life (Chu et al. 2019, Hicks et al. 2012, King et al. 2006, Miao & Gan 2019, Tov & Lee 2016). This relationship does not appear to be explained by the use of mood as a heuristic. Instructions to answer a meaning-in-life questionnaire carefully and thoughtfully led to an even stronger relationship between positive mood and meaning in life (compared to instructions to respond rapidly; see Trent & King 2010). Perhaps

most crucially, experimental studies show that positive mood manipulations enhance meaning in life. From listening to happy music to writing about a happy memory or an imaginary accomplishment to reading the funnies in the newspaper, positive mood inductions enhance meaning in life (Hicks et al. 2010a, King et al. 2006, Ward & King 2016b).

To get a sense of how deeply positive affect is entangled with meaning in life, consider a daily diary study reported by King and colleagues (2006, study 2). Over 5 days, participants produced daily ratings of positive and negative affect and meaning in life. At the end of the study, they made retrospective ratings of experienced meaning in life that week. The strongest predictor of retrospective meaning in life was not daily meaning in life but rather daily positive mood.

The correlation between positive mood and meaning in life is not accounted for by shared variance with other putatively more meaningful sources of meaning in life. State and trait measures of positive affect, more times than not, uniquely predict meaning in life even after accounting for other theorized sources of meaning such as religiosity, self-esteem, autonomy, competence, social belongingness, and global cognitive focus (e.g., Hicks & King 2007, 2008, 2009a). Indeed, rather than explaining the link between positive mood and meaning in life, research shows that these putatively more meaningful variables serve as moderators of that relationship. The general pattern of results shows that those high on such sources of meaning in life report high meaning in life regardless of positive mood. In contrast, those low on such sources of meaning report meaning in life as a function of positive mood. For example, religious faith and social relationships are robust correlates of meaning in life (as reviewed below). Yet, individuals who are low on these important aspects of life report high meaning if they are in a good mood (e.g., Hicks & King 2007, 2008, 2009a). It is possible to be unhappy and report high meaning in life if one has a deep faith or close social ties; but it is also possible to report high meaning in life simply as a function of being in a good mood. Thus, positive mood is sufficient but not necessary for life to feel meaningful (Halusic & King 2013).

Meaning in life is positively associated with age (Steger et al. 2009). Recent research suggests this relationship is curvilinear, approximating a J-shaped curve (Krause & Rainville 2020), with the link between meaning in life and age becoming particularly strong in the later years of life. Similarly, the link between meaning in life and positive affect appears to increase with age (Hicks et al. 2012). In a recent experience sampling study, Chu et al. (2019) showed that low-activation positive affect, in particular, was more strongly related to meaning in life among older (versus younger) people. These findings fit well with socioemotional selectivity theory (Carstensen et al. 1999), which argues that with age and limited time, individuals are more likely to find meaning in positive emotional experiences.

Positive affect can promote meaning in situations that might otherwise disrupt it. For example, Rivera et al. (2020) examined how awe affects meaning in life. Although awe experiences are considered positive, they often include a mix of positive and negative (e.g., fear, anxiety) emotional reactions. Two defining characteristics of awe, the inability to fully comprehend the experience and the feeling of a small (i.e., insignificant) self, might be expected to decrease meaning in life. Across four experiments, Rivera et al. (2020) found that an awe manipulation increased both positive affect and feelings of a small self. Both variables indirectly mediated the influence of awe on meaning in life: Small-self feelings decreased meaning in life whereas positive affect enhanced it. Thus, positive affect may support and enhance meaning in life even in the presence of negative events and feelings.

These varied sources of evidence point to the possibility that positive affect warrants consideration as a central aspect of meaning in life. This idea is not new. William James (1893), for example, noted how the appreciation of the innate pleasures in life can lead to the experience of meaning. Similarly, Yalom (1980, p. 437) suggests one approach to experiencing meaning is "simply to live

fully, to retain one's astonishment at the miracle of life, to plunge oneself into the natural rhythm of life, to search for pleasure at the deepest possible sense."

The notion that positive affect can contribute in a substantive way to meaning in life is at odds with predominant ideas about well-being. Positive affect is emblematic of hedonic well-being (i.e., a happy life; see Kahneman et al. 1999). Meaning in life is a prototypical example of eudaimonic well-being (i.e., the well-being that emerges from actualizing one's potentials or satisfying organismic needs; see Huta & Waterman 2014, Ryff & Singer 2008). The strong link between positive affect and meaning in life suggests that the hedonic versus eudaimonic distinction may not carve the good life at its joints (a point we revisit below).

Social Connections

The idea that our social relationships directly influence the subjective meaningfulness of existence is incontrovertible. As social animals, we are inherently motivated to form secure social bonds (e.g., Ryan & Deci 2001), and we reap psychological rewards when our belonging needs are met (e.g., Baumeister & Leary 1995). In fact, perceptions of social relatedness are one of the strongest determinants of psychological well-being (e.g., Ryan & Deci 2001), whereas social isolation often leads to depression and other negative outcomes (e.g., Williams 2012). Social relationships provide a context for all three facets of meaning in life. They organize our experience, imbue our lives with purpose, and allow our lives to matter.

The experience of meaning is often found and created through interdependence with others. Although culture provides us with a shared reality that enables us to make sense of the world, our specific social relationships are most relevant to subjective feelings of meaning. For example, parenthood or caring for a loved one who is dying from a terminal illness can certainly bring clarity to one's purpose in life. Similarly, the perception that one's life matters is often contingent upon the belief that one's actions have helped to make the world a better place for others. As de St. Aubin (2013, p. 248) concludes, "the dynamics of generativity are heavily implicated in many of the meaning making paths adults traverse. It is one of the developmental forces that shapes and is shaped by faith, work, love, community engagement, suffering, and death . . . adults experience meaning via generativity." Moreover, our close relationships also help us restore meaning during tumultuous times. When life challenges us, we often turn to close others to make sense of the situation. Talking or sharing stories with others, in turn, helps us reappraise the situation more positively and understand ourselves more broadly (McAdams & Olson 2010).

Cross-sectional and daily diary studies show that feelings of belonging or other positive social interactions (e.g., social support) predict reports of meaning in life above other covariates (e.g., Hicks & King 2009a, Hicks et al. 2010b). For example, Martela et al. (2018) demonstrated that perceptions of both social relatedness and beneficence (i.e., the belief that one has had a positive impact on others) uniquely predicted meaning in life even when accounting for other basic psychological needs and moods (see also Zhang et al. 2019, study 3). Belongingness also predicts the ability to articulate the meaningfulness of one's life, and manipulations aimed at enhancing feelings of belongingness increase the belief that one's life is meaningful (Lambert et al. 2010). Lay beliefs converge with these findings, showing that many people explicitly indicate that social relationships serve as a primary source of meaning in their lives (see, e.g., Lambert et al. 2013).

Religion and Worldviews

Worldviews are overarching belief structures that provide a sense of how the world works. Worldviews help people answer the fundamental questions of life (Koltko-Rivera 2004). Clearly, such overarching belief structures should play a role in the experience of meaning in life: They help us

make sense of experiences, they tell us what goals have value, and they provide us with a place in the grand scheme. They are, of course, the meaning structures thought to be toppled by traumatic events.

For many people, religious faith serves as an important worldview and source of meaning in life. Religion not only helps people experience meaning in life, but, for many, it provides them the answer to the meaning of life by laying out guidelines for how to live and allowing one to immerse themselves in God's plan. Religious faith can be seen to impinge on all three aspects of meaning. Religious beliefs serve as a functional meaning-making system (Park 2005), helping people make sense of pain and suffering and the inevitable end of existence. Religious doctrine helps people connect their thoughts and behaviors to a much larger context, often leading to a strong sense of identity and providing a clear sense of purpose (e.g., Park 2005). As Tolstoy [1983 (1882), p. 24] wrote in his treatise on meaning in life, "whatever answers faith gives, regardless of which faith, or to whom the answers are given, such answers always give an infinite meaning to the finite existence of man; a meaning that is not destroyed by suffering, deprivation or death." Moreover, religious practice can facilitate coherence by providing structure and routine—a regularity to life (e.g., Heintzelman & King 2019), a shared sense of reality through doctrine and ritual (e.g., Norton & Gino 2014), and an opportunity to develop strong interpersonal bonds not only with a deity but also with fellow ingroup members. In essence, like social relationships, religious faith is poised to enhance all of the facets of meaning in life.

Religiosity is positively related to meaning in life (e.g., Dar & Iqbal 2019, Davis & Hicks 2013). This relationship is found across diverse age ranges (e.g., Krause 2003) and even in places where religious faith is not normative (e.g., Shiah et al. 2015). Accumulated evidence demonstrates that meaning life is the mechanism underlying the relationship between religious faith and other aspects of well-being (Dar & Iqbal 2019, Steger & Frazier 2005, Womick et al. 2019, You & Lim 2019).

Although they have received scant empirical attention, nonreligious worldviews might also serve as sources of meaning in life. A recent program of studies showed that right-wing authoritarianism is positively related to meaning in life, and this relationship is not accounted for by personality traits, information processing styles, cognitive ability, religiosity, or other well-being measures (Womick et al. 2019). Although worldviews might seem most relevant to the meaning facet of comprehension, Womick and colleagues found that the authoritarian worldview predicted meaning in life primarily as a function of existential mattering.

Understanding the link between nonreligious worldviews and meaning in life is important because these overarching beliefs or meaning structures have often been suggested to serve existential functions (e.g., Janoff-Bulman 1985, Routledge & Vess 2018)—an assumption that has rarely been tested directly. In addition, and paradoxically, theory and research show that people cling even to maladaptive worldviews (Swann & Read 1981). One reason even maladaptive worldviews may be difficult to change is that they imbue life with meaning.

The Self

Feeling a strong connection to one's self may also help us make sense of our lives. Often understanding one's self goes hand in hand with an overarching sense of purpose, as it helps identifying what one is meant to do (e.g., McAdams & Olson 2010). A rich literature speaks to the role of autobiographical memories in helping us find purpose and coherence in our lives (e.g., James 1893, Pasupathi 2001). Specifically, having a coherent life story provides a sense of purpose and coherence in life because "this process is psychologically integrative, weaving the event into a broader web of meaning, and in doing so, it supports a sense of purpose and fosters a sense of unity"

(Adler et al. 2016, p. 165). This idea is supported by research showing that depressed participants who completed an intervention focusing on integrating negative experiences into their life stories reported higher levels of meaning in life after the intervention (Bohlmeijer et al. 2008).

The importance of being oneself or being in touch with one's true self is a popular theme, and research supports the idea that such experiences can make life meaningful. For example, true self-knowledge predicts meaning in life over and above many other covariates, including self-esteem (Schlegel et al. 2009). Experimental studies show that meaning in life is enhanced by reminders of aspects of one's true self-concept (even when those aspects are flaws; see Schlegel et al. 2009). The subjective ease with which one can think of aspects of the true self enhances meaning in life (Schlegel et al. 2011). Longitudinal findings reveal that college students who feel alienated from their true selves often report not understanding why they should pursue their studies (i.e., those pursuits feel meaningless; see Kim et al. 2018).

In a similar vein, many scholars posit that authenticity is crucial to a meaningful existence (e.g., McGregor & Little 1998, Ryan & Deci 2001). Early research supported these ideas, showing that narratives describing meaningful experiences often contain themes of feeling connected to one's self (compared to themes of self-disconnection in narratives of meaninglessness; see Debats et al. 1995). Goals associated with core aspects of the self predict the feeling of purpose in life (e.g., McGregor & Little 1998). A host of studies demonstrated a strong relationship between behaving authentically and meaning in life (Rivera et al. 2019, Sutton 2020).

The meaning-in-life literature is hardly unusual in leading to the conclusion that behaving authentically is an important aspect of well-being. Yet it is important to bear in mind that the injunction to "just be yourself" may be a complicated bromide for those with stigmatized identities (Ryan & Ryan 2019). For people who exist in unjust social systems, who face the challenges of prejudice and negative stereotypes, authenticity may be a complicated path to meaning in life.

Mental Time Travel

A diverse line of literature suggests that the ability to mentally project one's self in the past, in the future, and even into alternative realities can enhance the feeling that life is meaningful. Although each of these lines of research offers unique perspectives about why this type of mental imagery enhances meaning in life, inherent and often explicit in each of them is the idea that placing one's self in a different reality can facilitate strong connections between one's current and distal selves, creating a sense of self-continuity and coherence.

With regard to the past, recent studies demonstrate that nostalgic memories serve a meaning-making function (e.g., Sedikides & Wildschut 2018). Nostalgia is defined as a "sentimental longing for one's past" (Sedikides & Wildschut 2018, p. 48). Nostalgic memories are closely tied to central aspects of the self and are, thus, inherently meaningful. Theory and research suggest these types of memories help us maintain and enhance the global feeling that life is meaningful. Correlational evidence, for example, shows that both the frequency with which one experiences nostalgia and the extent to which certain stimuli (e.g., the scent of an apple pie) elicit nostalgic feelings predict self-reports of meaning in life. Using a diverse set of manipulations, from reimagining the nostalgic memory to listening to sentimental music, experimental studies similarly found that the experience of nostalgia helps protect people from potential threats to meaning and increases global meaning in life as well as a sense of self-continuity, the motivation to complete one's goals, and the belief that one's work matters (for reviews, see Juhl & Routledge 2013, Sedikides & Wildschut 2018). Nostalgia does not just help maintain and enhance global meaning in life; nostalgic memories contribute directly to coherence, purpose, and mattering. Importantly, a recent series of studies suggested that these conclusions may apply only to nostalgic memories that are generated in the

lab and not to naturally occurring feelings of nostalgia, which are linked instead to negative feelings and lower well-being, including lower meaning in life (Newman et al. 2020).

Imagining one's self in the future is also linked to meaning in life. This relationship is perhaps unsurprising, given that valued goals are inherently future oriented. Prospection, or thinking about one's self in the future, often involves the weaving of important events across time (Baumeister et al. 2016). Studies have shown that the extent to which people are able to link the future with the past and the present is correlated with the experience of meaning. Using an experience-sampling methodology, Baumeister et al. (2020) demonstrated that participants rated thoughts about the future as more meaningful than thoughts about the present. Other studies have shown that imagining a future meaningful event (i.e., turning a new decade in age) leads people to reflect over their entire life (e.g., Kim et al. 2019b). This further suggests that thinking about the future has the potential to feel meaningful because it often leads to a feeling of coherence among varied aspects of life.

The subjective quality of one's mental image may determine how much meaning the specific mental simulation will generate. For example, Waytz et al. (2015) found that detailed and vivid mental simulations were more likely to lead to enhanced meaning in life compared to less detailed thoughts. They also found that enhanced connectivity of the medial temporal lobes network was associated with self-reports of meaning in life. This latter finding is important because this area of the brain is associated with both mental time travel and vivid and detailed episodic memories (for a review, see Szpunar 2010).

In a direct test of the idea that the quality of one's thoughts increases perceptions of meaning, Vess and colleagues (2018) had people think of themselves either at a place that would be easy to visualize (e.g., their hometown) or at a place difficult to visualize (e.g., a jungle or on another planet). In one study, they found that participants in the familiar condition reported that their mental images were more detailed and vivid, which indirectly mediated the effect of the condition on meaning in life. Further, in a separate study, the authors showed that self-continuity mediated the relationship between the subjective quality of one's thoughts and meaning in life (Vess et al. 2018). Thus, the vividness of one's mental images indicates that one has made strong, coherent connections between aspects of one's self across time and space.

Mortality Awareness

No treatment of the experience of meaning in life would be complete without considering death. Death can be viewed as the ultimate proof that there is no meaning in life. Thinking about death can make anyone question whether their life is truly meaningful. After all, as Tolstoy [1983 (1882), p. 35] contemplated, "is there any meaning in [one's] life that will not be destroyed by [one's] inevitably approaching death?". The relationship between mortality awareness and meaning is at the heart of many perspectives in existential philosophy [e.g., Heidegger 1982 (1927)]. These perspectives often overlap to suggest that acknowledging one's inevitable demise, paradoxically, has the potential to lead people to live a more authentic and meaningful existence (DeCarvalho 2000). Perspectives in the psychological sciences draw similar conclusions. For example, socioemotional selectivity theory states that as people perceive their time as limited, they tend to prioritize more meaningful goals and activities, such as enjoying time with close others or appreciating the intrinsically valuable offerings of the world (e.g., Carstensen et al. 1999).

Terror management theory (TMT) is the most prominent theory in psychology to explicitly address the link between mortality awareness and meaning (see Routledge & Vess 2018 for a review). According to TMT, awareness of mortality has the potential to evoke paralyzing anxiety. From this perspective, we fend off this terror by investing in cultural worldviews (and self-esteem),

attaching our existence to structures whose existence transcends our time on earth. Experimental research supports the basic tenets of TMT by showing that people are more likely to cling to their worldviews after subtle reminders of their mortality, suggesting that those worldviews help buffer the dread of nonexistence. Meaning in life has not typically been included as an outcome of TMT studies. Some research shows that subtle reminders of death can enhance meaning in life (King et al. 2009), but other studies produce more nuanced conclusions. For instance, research demonstrates that a number of individual differences (e.g., need for structure, perceived progress on important long-term goals) moderate the influence of typical TMT manipulations on meaning in life (e.g., Vess et al. 2009, 2017).

Certainly, consciously reflecting on one's mortality can sound a wake-up call that it is time to start living a more meaningful existence (Seto et al. 2016). For example, the dual-existential systems model (Cozzolino 2006) states that explicit thoughts of death have the potential to trigger many growth-oriented processes, such as greater spirituality and more concern with intrinsic goal pursuits (Cozzolino 2006). These findings are consistent with data showing that those who have had a near-death experience often report greater fulfillment in their goal pursuits, are less influenced by others' opinions, and are more spiritual and live a more meaningful existence compared to before the experience (see Martin et al. 2004 for review).

In sum, the awareness that life is finite—that even very good lives will end—does not inevitably destroy meaning in life. Rather, the fact that life ends appears to enhance its value or preciousness, potentially enhancing its ultimate subjective meaning. Given the clear relevance of existential meaning in the context of death and dying, additional research informed by the science of meaning in life is clearly needed in areas such as palliative care and end-of-life decision making.

REMAINING RESEARCH QUESTIONS

This review of the meaning-in-life literature is a testament to the strides psychologists have made toward understanding this elusive construct. Next, we outline a few fundamental questions about the experience of meaning in life that await thorough empirical attention.

Are the Correlates of Meaning in Life Unique Among Well-Being Measures?

The voluminous literature linking subjective reports of meaning in life to important outcomes rarely involves concern for the unique contribution of meaning in life over and above other aspects of well-being (e.g., mood, self-esteem, life satisfaction, optimism, etc.). It is important that future research seek to bring clarity to the entire array of well-being variables, identifying those outcomes that are a potential consequence of specific aspects of well-being. To be clear, we are not advocating the kind of battle over shared variance (and celebration of multicollinearity) that has typically characterized attempts to show that there is one true well-being variable that matters to positive life outcomes. Rather, acknowledging that there are many goods in life is important, and understanding how and when each matters to functioning is a worthwhile goal.

The literature on meaning in life reviewed here suggests that current conceptual frameworks, including the distinction between eudaimonic and hedonic well-being, are simply inadequate when it comes to understanding experiences like meaning in life. The idea that there are a good and a less good type of happiness fits with a psychological conceptualization of classic philosophical notions of the good life. However, this conceptualization is challenged by the science of meaning in life, as research suggests that it does not capture the many good lives that appear to exist nor the ways that well-being is experienced by people in their everyday lives.

Does Situational Meaning Relate to Meaning in Life?

People can find meaning in experiences and they can find meaning in life as a whole. Is a meaningful life a collection of continuous meaningful events? Further, does the creation of meaning in an experience enhance the experience of meaning in life? These levels of meaning—the meanings of specific experiences and global perceptions of life's meaningfulness—have not been well integrated in research.

Park (2010) undertook the ambitious task of integrating research on meaning making in the context of trauma with the global experience of meaning in life. Her meaning-making model outlines how both trying to make sense and making sense of traumatic experiences can influence the experience of meaning in life. She concluded that empirical work was needed to more thoroughly test the model. Unfortunately, a decade later we have yet to make significant progress in understanding how situational meaning-making processes undermine or enhance the experience of meaning in life.

Moreover, perhaps because research on this topic often focuses on negative life events, situational meaning is typically assessed only using items reflecting coherence (e.g., "This event makes sense to me"), even though people also equate the significance of an event with its meaningfulness. Does the perception that one's experience is significant, or matters, contribute to the overall feeling of meaning in similar or different ways compared to the perception that the experience makes sense?

The experience of meaning in life may well exist even in the presence of distressing circumstances (Heintzelman & King 2014a, Womick et al. 2019). This experience may serve as a resource in coping with negative events. Edwards & Van Tongeren (2020) found that the experience of meaning in suffering mediated the effects of suffering on other aspects of well-being. Experiencing meaningless events may not imply experiencing one's life as meaningless.

How Does Work Contribute to Meaning in Life?

Given the percentage of our lives spent at work, a better understanding of how our work influences our sense of meaning is warranted (Ward & King 2017). Work environments can provide us with many opportunities to cultivate meaning in our work and in life in general (e.g., Dik et al. 2013). For example, overcoming obstacles and achieving awards can help instill confidence that our actions are valuable and matter to others. The workplace can also provide us with clear goals that we, at times, connect to higher-level purposes (e.g., helping to benefit the greater good; see Steger & Dik 2010). Importantly, this domain-specific meaning often contributes to global perceptions of meaning (e.g., Dik et al. 2013).

Although research shows that finding meaning in one's work predicts both personal and organizational benefits (e.g., Dik et al. 2013), less is known about the characteristics of the organization that help foster a sense of meaning in life. For example, are some leadership styles better at helping employees perceive their work as meaningful compared to others? Do certain characteristics of the work environment enhance the feeling of meaning, such as breaks that encourage play or social interactions?

What About Meaninglessness and the Search for Meaning?

Our mission in this review has been to illuminate the experience of meaning in life when it is present. Nevertheless, there is variability in meaning in life. Some people experience meaninglessness, and understanding that experience remains an important goal for research. Is the experience

of meaninglessness, in specific situations and in life, the same as scoring low on a measure of meaning in life? What experiences lead to feelings of low meaning in life? One important such experience might be boredom. Scholarly definitions of boredom often refer explicitly to experiences lacking in meaning or purpose (e.g., van Tilburg et al. 2013). Yet boredom hardly captures the full breadth of meaninglessness. The science of meaning in life has benefited from more qualitative investigations of people's nominations of meaningful experiences. Similar data may be helpful in mapping more fully the domain of meaninglessness.

Relatedly, a better understanding of the human search for meaning remains an important goal. Research using the search-for-meaning subscale of the MLQ shows that those who report searching for meaning are often low in other aspects of well-being and high on measures of rumination and neuroticism (Steger et al. 2008). Using lagged analyses of daily reports, Newman et al. (2018) provided evidence that searching for meaning led to later enhanced presence of meaning in life, suggesting that within persons, the search for meaning may not simply indicate negative affectivity. These results support the intuitively appealing idea that the search for meaning might actually lead to the experience of meaning in life. Nevertheless, when and for whom the search for meaning matters in human life remain something of a mystery.

How Is Meaning in Life Reflected in Brain Processes?

Focusing on meaning in life as a subjective state implies the deep relevance of consciousness itself to the experience of meaning (Heintzelman & King 2013b). Yet, little research has sought to uncover a neuroscience of meaning in life. Some research shows that individuals who endorse high levels of well-being, including purpose, are characterized by prefrontal asymmetry (i.e., a relatively greater activation in the left prefrontal region compared to the right one; see Urry et al. 2004)—and this pattern is thought to indicate approach motivation. Research on mental simulation reviewed above suggests the role of connectivity in the medial temporal lobes. In addition, a recent ERP study has showed that individual differences in the experience of meaning in life predict lowered conflict-related responses while considering the self-relevance of health messages (Kang et al. 2019). Based on the idea that meaning is about connection, Heintzelman & King (2014b) speculated that brain areas involved in the perception of association (basal ganglia) and the subjective experience of reward (the orbitofrontal cortex) might play a role in the experience of meaning, particularly comprehension. They suggested, as well, that due to its role in stimulus salience, dopamine may be implicated in the experience of meaning. These ideas suggest that we might think about psychopathology that involves dysfunctional salience (e.g., psychosis) as dysregulated feelings of meaningfulness.

As the logistics of brain imaging become more appropriate for studies of individual differences (i.e., including large samples), the integration of meaning-in-life measures in neuroimaging studies could profoundly affect the science of meaning in life. To the extent that neuroscience has accumulated a knowledge base about the functions of brain regions, understanding how these relate to the experience of meaningfulness could transform our understanding of what, precisely, meaning in life involves.

Are There Objective Cues to the Meaningful Life?

Interestingly, self-reports of meaning in life converge with peer (Steger et al. 2006) and observer (Stillman et al. 2011) reports. Moreover, self-reporting meaning in life is associated with being viewed as more socially appealing (Stillman et al. 2011). Such findings not only lend support to the validity of self-reports of meaning in life but they also inspire additional research questions,

namely, what social cues convey information about a person's meaning in life? Can these cues be distinguished from other characteristics?

CONCLUSION

Despite the many ambiguities shrouding the experience of life as meaningful, scientists have learned a great deal about this experience. First, global self-reports of meaning in life predict a host of important functional outcomes. In addition, research has provided a sense of what meaning in life is and where it comes from. Meaning in life is a subjective sense that one's life makes sense, has purpose, and matters to others. Each of these aspects of meaning can emerge from everyday experiences such as the enactment of routines, the pursuit of goals, and engagement in social relationships. Meaning in life appears to be somewhat commonplace: On average, people rate their lives as pretty meaningful. The things that make life meaningful are resources that are widely available to most people—including being in a good mood, engaging in social relationships, and having religious faith. The commonplace nature of meaning in life and its strong relationship to positive affect may surprise psychologists, but many of the conclusions that science offers about meaning in life are likely neither counterintuitive nor surprising to most anyone else. Everyday people appear to be living lives of meaning despite the best efforts of academic psychologists and philosophers to persuade them that meaning in life is rare or that there is, in fact, no meaning life.

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LITERATURE CITED

Adler JM, Lodi-Smith J, Philippe FL, Houle I. 2016. The incremental validity of narrative identity in predicting well-being: a review of the field and recommendations for the future. Personal. Soc. Psychol. Rev. 20(2):142–75

Antonovsky A. 1993. The structure and properties of the sense of coherence scale. *Soc. Sci. Med.* 36(6):725–33 Baumeister RF. 1991. *Meanings of Life*. New York: Guilford

Baumeister RF, Hofmann W, Summerville A, Reiss PT, Vohs KD. 2020. Everyday thoughts in time: experience sampling studies of mental time travel. Personal. Soc. Psychol. Bull. 46(12):1631–48

Baumeister RF, Leary MR. 1995. The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117(3):497–529

Baumeister RF, Vohs KD. 2002. The pursuit of meaningfulness in life. In *Handbook of Positive Psychology*, ed. CR Snyder, SJ Lopez, pp. 608–18. Oxford, UK: Oxford Univ. Press

Baumeister RF, Vohs KD, Oettingen G. 2016. Pragmatic prospection: how and why people think about the future. Rev. Gen. Psychol. 20(1):3–16

Baumeister RF, von Hippel W. 2020. Meaning and evolution: why nature selected human minds to use meaning. Evol. Stud. Imagin. Cult. 4(1):1–18

Becker E. 1973. The Denial of Death. New York: Free Press

Bohlmeijer ET, Westerhof GJ, Emmerik-de Jong M. 2008. The effects of integrative reminiscence on meaning in life: Results of a quasi-experimental study. *Aging Ment. Health* 12(5):639–46

Boyle PA, Barnes LL, Buchman AS, Bennett DA. 2009. Purpose in life is associated with mortality among community-dwelling older persons. *Psychosom. Med.* 71(5):574–79

Boyle PA, Buchman AS, Wilson RS, Yu L, Schneider JA, Bennett DA. 2012. Effect of purpose in life on the relation between Alzheimer disease pathologic changes on cognitive function in advanced age. *JAMA Psychiatry* 69(5):499–506

- Brandstätter M, Baumann U, Borasio GD, Fegg MJ. 2012. Systematic review of meaning in life assessment instruments. Psycho-Oncology 21:1034–52
- Bronk KC. 2011. The role of purpose in life in healthy identity formation: a grounded model. *New Dir. Youth Dev.* 132:31–44
- Camus A. 1955. An Absurd Reasoning: The Myth of Sisyphus and Other Essays. New York: Vintage
- Carstensen LL, Isaacowitz DM, Charles ST. 1999. Taking time seriously: a theory of socioemotional selectivity. Am. Psychol. 54(3):165–81
- Chu STW, Fung HH, Chu L. 2019. Is positive affect related to meaning in life differently in younger and older adults? A time sampling study. J. Gerontol. Ser. B. In press. https://doi.org/10.1093/geronb/gbz086
- Coleman RA, Neimeyer RA. 2010. Measuring meaning: searching for and making sense of spousal loss in late-life. *Death Stud.* 34(9):804–34
- Corona CD, Van Orden KA, Wisco BE, Pietrzak RH. 2019. Meaning in life moderates the association between morally injurious experiences and suicide ideation among US combat veterans: results from the National Health and Resilience in Veterans Study. *Psychol. Trauma* 11(6):614–20
- Costin V, Vignoles VL. 2020. Meaning is about mattering: evaluating coherence, purpose, and existential mattering as precursors of meaning in life judgments. J. Personal. Soc. Psychol. 118(4):864–84
- Cozzolino PJ. 2006. Death contemplation, growth, and defense: converging evidence of dual-existential systems? Psychol. Ing. 17:278–87
- Crumbaugh JC. 1977. The seeking of noetic goals test (SONG): A complementary scale to the purpose in life test (PIL). 7. Clin. Psychol. 33(3):900–7
- Crumbaugh JC, Maholick LT. 1964. An experimental study in existentialism: the psychometric approach to Frankl's concept of noogenic neurosis. *J. Clin. Psychol.* 20:200–7
- Dar KA, Iqbal N. 2019. Religious commitment and well-being in college students: examining conditional indirect effects of meaning in life. 7. Relig. Health 58(6):2288–97
- Davis CG, Nolen-Hoeksema S, Larson J. 1998. Making sense of loss and benefiting from the experience: two construals of meaning. J. Personal. Soc. Psychol. 75(2):561–74
- Davis WE, Hicks JA. 2013. Judgments of meaning in life following an existential crisis. See Hicks & Routledge 2013, pp. 163–74
- de St. Aubin E. 2013. Generativity and the meaning of life. See Hicks & Routledge 2013, pp. 241-55
- Debats DL, Drost J, Hansen P. 1995. Experiences of meaning in life: a combined qualitative and quantitative approach. *Br. 7. Psychol.* 86(3):359–75
- DeCarvalho RJ. 2000. The growth hypothesis and self-actualization: an existential alternative. *Humanist. Psychol.* 28:59–66
- Dik BJ, Byrne ZS, Steger MF. 2013. Purpose and Meaning in the Workplace. Washington, DC: Am. Psychol. Assoc.
- Ebersole P. 1998. Types and depth of written life meanings. In *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*, ed. PTP Wong, PS Fry, pp. 179–91. Mahwah, NJ: Lawrence Erlbaum Assoc.
- Edwards ME, Van Tongeren DR. 2020. Meaning mediates the association between suffering and well-being. *J. Posit. Psychol.* 15(6):722–33
- Fiske ST. 2018. Social Beings: Core Motives in Social Psychology. New York: Wiley
- Frankl VE. 1984 (1946). Man's Search for Meaning. New York: Washington Square Press. Rev. updat. ed.
- George LS, Park CL. 2016. Meaning in life as comprehension, purpose, and mattering: toward integration and new research questions. *Rev. Gen. Psychol.* 20:205–20
- George LS, Park CL. 2017. The multidimensional existential meaning scale: a tripartite approach to measuring meaning in life. J. Posit. Psychol. 12:613–27
- Halusic M, King LA. 2013. What makes life meaningful: Positive mood works in a pinch. In *The Psychology of Meaning*, ed. KD Markman, T Proulx, MJ Lindberg, pp. 445–64. Washington, DC: Am. Psychol. Assoc.
- Heidegger M. 1982 (1927). Being and Time, transl. J Macquarrie, E Robinson. New York: Harper & Row
- Heine S, Proulx T, Vohs K. 2006. The meaning maintenance model: on the coherence of social motivations. Personal. Soc. Psychol. Rev. 10:88–110
- Heintzelman SJ, King LA. 2013a. On knowing more than we can tell: intuition and the human experience of meaning. 7. Posit. Psychol. 8:471–82

- Heintzelman SJ, King LA. 2013b. The origins of meaning: objective reality, the unconscious mind, and awareness. See Hicks & Routledge 2013, pp. 87–99
- Heintzelman SJ, King LA. 2014a. Life is pretty meaningful. Am. Psychol. 69:561–74
- Heintzelman SJ, King LA. 2014b. (The feeling of) meaning-as-information. *Personal. Soc. Psychol. Rev.* 18:153–67
- Heintzelman SJ, King LA. 2016. Meaning in life and intuition. J. Personal. Soc. Psychol. 110:477-92
- Heintzelman SJ, King LA. 2019. Routines and meaning in life. Personal. Soc. Psychol. Bull. 45:688-99
- Heintzelman SJ, Trent J, King LA. 2013. Encounters with objective coherence and the experience of meaning in life. *Psychol. Sci.* 24:991–98
- Heisel MJ, Flett GL. 2004. Purpose in life, satisfaction with life, and suicide ideation in a clinical sample. J. Psychopathol. Behav. Assess. 26(2):127–35
- Hicks JA, Cicero DC, Trent J, Burton CM, King LA. 2010a. Positive affect, intuition, and feelings of meaning. J. Personal. Soc. Psychol. 98(6):967–79
- Hicks JA, King LA. 2007. Meaning in life and seeing the big picture: positive affect and global focus. Cogn. Emot. 21(7):1577–84
- Hicks JA, King LA. 2008. Religious commitment and positive mood as information about meaning in life. 7. Res. Personal. 42(1):43–57
- Hicks JA, King LA. 2009a. Positive mood and social relatedness as information about meaning in life. J. Posit. Psychol. 4(6):471–82
- Hicks JA, King LA. 2009b. Meaning in life as a subjective judgment and a lived experience. Soc. Personal. Psychol. Compass 3(4):638–53
- Hicks JA, Routledge C, eds. 2013. The Experience of Meaning in Life: Classical Perspectives, Emerging Themes, and Controversies. New York: Springer
- Hicks JA, Schlegel RJ, King LA. 2010b. Social threats, happiness, and the dynamics of meaning in life judgments. Personal. Soc. Psychol. Bull. 36:1305–17
- Hicks JA, Trent J, Davis WE, King LA. 2012. Positive affect, meaning in life, and future time perspective: an application of socioemotional selectivity theory. Psychol. Aging 27(1):181–89
- Hill PL, Turiano NA. 2014. Purpose in life as a predictor of mortality across adulthood. *Psychol. Sci.* 25(7):1482–86
- Hill PL, Turiano NA, Mroczek DK, Burrow AL. 2016. The value of a purposeful life: Sense of purpose predicts greater income and net worth. J. Res. Personal. 65:38–42
- Hocking WE. 1957. The Meaning of Immortality in Human Experience. Westport, CT: Greenwood
- Hooker S, Post R, Sherman M. 2020. Awareness of meaning in life is protective against burnout among family physicians: a CERA study. Fam. Med. 52(1):11–16
- Huta V, Waterman AS. 2014. Eudaimonia and its distinction from hedonia: developing a classification and terminology for understanding conceptual and operational definitions. *J. Happiness Stud.* 15(6):1425–56
- James W. 1893. The Principles of Psychology, Vol. 1. New York: Holt
- Janoff-Bulman R. 1985. The aftermath of victimization: rebuilding shattered assumptions. In *Trauma and Its Wake*, ed. CR Figley, pp. 15–35. Bristol, PA: Brunner/Mazel
- Juhl J, Routledge C. 2013, Nostalgia bolsters perceptions of a meaningful self in a meaningful world. See Hicks & Routledge 2013, pp. 213–26
- Kahneman D, Diener E, Schwarz N, Eds. 1999. Well-Being: Foundations of Hedonic Psychology. New York: Russell Sage Found.
- Kang Y, Strecher VJ, Kim E, Falk EB. 2019. Purpose in life and conflict-related neural responses during health decision-making. Health Psychol. 38(6):545–52
- Kim ES, Delaney SW, Kubzansky LD. 2019a. Sense of purpose in life and cardiovascular disease: underlying mechanisms and future directions. Curr. Cardiol. Rep. 21(11):135
- Kim J, Christy AG, Schlegel RJ, Donnellan MB, Hicks JA. 2018. Existential ennui: examining the reciprocal relationship between self-alienation and academic amotivation. Soc. Psychol. Personal. Sci. 9(7):853–62
- Kim J, Seto E, Schlegel RJ, Hicks JA. 2019b. Thinking about a new decade in life increases personal self-reflection: a replication and reinterpretation of Alter and Hershfield's 2014 findings. J. Personal. Soc. Psychol. 117:e27–34

- King LA. 2012. Meaning: effortless and ubiquitous. In *Meaning, Mortality, and Choice: The Social Psychology of Existential Concerns*, ed. M Mikulincer, P Shaver, pp. 129–44. Washington, DC: Am. Psychol. Assoc.
- King LA, Heintzelman SJ, Ward SJ. 2016. Beyond the search for meaning: the contemporary science of meaning in life. Curr. Dir. Psychol. Sci. 25:211–16
- King LA, Hicks JA, Abdelkhalik J. 2009. Death, life, scarcity, and value: an alternative approach to the meaning of death. Psychol. Sci. 20:1459–62
- King LA, Hicks JA, Krull JL, Del Gaiso AK. 2006. Positive affect and the experience of meaning in life. J. Personal. Soc. Psychol. 90(1):179–96
- Kleiman EM, Beaver JK. 2013. A meaningful life is worth living: meaning in life as a suicide resiliency factor. Psychiatry Res. 210(3):934–39
- Klinger E. 1977. Meaning and Void: Inner Experience and the Incentives in People's Lives. Minneapolis: Univ. Minn. Press
- Klinger E. 1998. The search for meaning in evolutionary perspective and its clinical implications. In The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications, ed. PTP Wong, PS Fry, pp. 27–50. Mahwah, NJ: Erlbaum
- Klinger E, Cox WM. 2011. Motivation and the goal theory of current concerns. In *Handbook of Motivational Counseling: Goal-Based Approaches to Assessment and Intervention with Addiction and Other Problems*, ed. WM Cox, E Klinger, pp. 3–47. New York: Wiley Blackwell
- Kobau R, Sniezek J, Zack MM, Lucas RE, Burns A. 2010. Well-being assessment: an evaluation of well-being scales for public health and population estimates of well-being among US adults. Appl. Psychol. Health Well-Being 2:272–97
- Koltko-Rivera ME. 2004. The psychology of worldviews. Rev. Gen. Psychol. 8:3-58
- Krause N. 2003. Religious meaning and subjective well-being in late life. J. Gerontol. Ser. B Psychol. Sci. Soc. Sci. 58(3):S160–70
- Krause N, Hayward RD. 2014. Assessing stability and change in a second-order confirmatory factor model of meaning in life. J. Happiness Stud. 15(2):237–53
- Krause N, Rainville G. 2020. Age differences in meaning in life: exploring the mediating role of social support. Arch. Gerontol. Geriatr. 88:104008
- Kruglanski AW, Chen X, Dechesne M, Fishman S, Orehek E. 2009. Fully committed: suicide bomber's motivation and the quest for personal significance. Political Psychol. 30:331–57
- Lambert NM, Stillman TF, Baumeister RF, Fincham FD, Hicks JA, Graham SM. 2010. Family as a salient source of meaning in young adulthood. J. Posit. Psychol. 5(5):367–76
- Lambert NM, Stillman TF, Hicks JA, Kamble S, Baumeister RF, Fincham FD. 2013. To belong is to matter: Sense of belonging enhances meaning in life. *Personal. Soc. Psychol. Bull.* 39(11):1418–27
- Leontiev DA. 2013. Personal meaning: a challenge for psychology. J. Posit. Psychol. 8:459–70
- Li Z, Lui Y, Peng K, Hicks JA. 2020. Developing a quadripartite existential meaning scale and exploring the internal structure of meaning in life. J. Happiness Stud. In press. https://doi.org/10.1007/s10902-020-00256-2
- Liu S, Brooks NB, Spelke ES. 2019. Origins of the concepts cause, cost, and goal in prereaching infants. *PNAS* 116(36):17747–52
- Martela F, Ryan RM, Steger MF. 2018. Meaningfulness as satisfaction of autonomy, competence, relatedness, and beneficence: comparing the four satisfactions and positive affect as predictors of meaning in life. *J. Happiness Stud.* 19(5):1261–82
- Martela F, Steger MF. 2016. The three meanings of meaning in life: distinguishing coherence, purpose, and significance. J. Posit. Psychol. 11(5):531–45
- Martin LL, Campbell WK, Henry CD. 2004. The roar of awakening: mortality acknowledgment as a call to authentic living. In *Handbook of Experimental Existential Psychology*, ed. J Greenberg, SL Koole, T Pyszczynski, pp. 431–48. New York: Guilford
- McAdams DP, Olson BD. 2010. Personality development: continuity and change over the life course. *Annu. Rev. Psychol.* 61:517–42
- McGregor I, Little BR. 1998. Personal projects, happiness, and meaning: on doing well and being yourself. 7. Personal. Soc. Psychol. 74:494–512

- McKnight PE, Kashdan TB. 2009. Purpose in life as a system that creates and sustains health and well-being: an integrative, testable theory. *Rev. Gen. Psychol.* 13(3):242–51
- Miao M, Gan Y. 2019. How does meaning in life predict proactive coping? The self-regulatory mechanism on emotion and cognition. J. Personal. 87(3):579–92
- Mota NP, Tsai J, Kirwin PD, Sareen J, Southwick SM, Pietrzak RH. 2016. Purpose in life is associated with a reduced risk of incident physical disability in aging US military veterans. *Am. J. Geriatr. Psychiatry* 24(9):706–14
- Newman DB, Nezlek JB, Thrash TM. 2018. The dynamics of searching for meaning and presence of meaning in daily life. *7. Personal.* 86(3):368–79
- Newman DB, Sachs ME, Stone AA, Schwarz N. 2020. Nostalgia and well-being in daily life: an ecological validity perspective. J. Personal. Soc. Psychol. 118(2):325–47
- Norton MI, Gino F. 2014. Rituals alleviate grieving for loved ones, lovers, and lotteries. *J. Exp. Psychol. Gen.* 143(1):266–72
- Oishi S, Diener E. 2014. Residents of poor nations have a greater sense of meaning in life than residents of wealthy nations. *Psychol. Sci.* 25:422–30
- Owens GP, Steger MF, Whitesell AA, Herrera CJ. 2009. Relationships among posttraumatic stress disorder, guilt, and meaning in life for military veterans. *7. Trauma. Stress* 22:654–57
- Park CL. 2005. Religion and meaning. In Handbook of the Psychology of Religion and Spirituality, ed. RF Paloutzian, CL Park, pp. 295–314. New York: Guilford
- Park CL. 2010. Making sense of the meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events. Psychol. Bull. 136(2):257–301
- Pasupathi M. 2001. The social construction of the personal past and its implications for adult development. Psychol. Bull. 127(5):651–72
- Pyszczynski T, Taylor J. 2016. When the buffer breaks: disrupted terror management in posttraumatic stress disorder. Curr. Dir. Psychol. Sci. 25(4):286–90
- Ray DG, Gomillion S, Pintea AI, Hamlin I. 2019. On being forgotten: Memory and forgetting serve as signals of interpersonal importance. 7. Personal. Soc. Psychol. 116(2):259–76
- Rivera GN, Christy AG, Kim J, Vess M, Hicks JA, Schlegel RJ. 2019. Understanding the relationship between perceived authenticity and well-being. Rev. Gen. Psychol. 23(1):113–26
- Rivera GN, Vess M, Hicks JA, Routledge C. 2020. Awe and meaning: elucidating complex effects of awe experiences on meaning in life. Eur. 7. Soc. Psychol. 50(2):392–405
- Rosenberg M, McCullough BC. 1981. Mattering: inferred significance and mental health among adolescents. Res. Community Ment. Health 2:163–82
- Routledge C, Vess M, eds. 2018. Handbook of Terror Management Theory. London: Academic
- Ryan RM, Deci EL. 2001. On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. Annu. Rev. Psychol. 52:141–66
- Ryan WS, Ryan RM. 2019. Toward a social psychology of authenticity: exploring within-person variation in autonomy, congruence, and genuineness using self-determination theory. Rev. Gen. Psychol. 23(1):99–112
- Ryff CD. 1989. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. J. Personal. Soc. Psychol. 57(6):1069–81
- Ryff CD, Singer BH. 2008. Know thyself and become what you are: a eudaimonic approach to psychological well-being. *J. Happiness Stud.* 9:13–39
- Sartre J-P. 1956. Being and Nothingness. New York: Philos. Libr.
- Schaw JA. 2000. Narcissism as a motivational structure: the problem of personal significance. *Psychiatry* 63:219–30
- Scheier MF, Wrosch C, Baum A, Cohen S, Martire LM, et al. 2006. The life engagement test: assessing purpose in life. *J. Behav. Med.* 29(3):291–98
- Schlegel RJ, Hicks JA, Arndt J, King LA. 2009. Thine own self: true self-concept accessibility and meaning in life. 7. Personal. Soc. Psychol. 96(2):473–90
- Schlegel RJ, Hicks JA, King LA, Arndt J. 2011. Feeling like you know who you are: perceived true self-knowledge and meaning in life. *Personal. Soc. Psychol. Bull.* 37:745–56
- Schwarz N, Clore GL. 1988. How do I feel about it? Informative functions of affective states. In Affect, Cognition, and Social Behavior, ed. K Fiedler, J Forgas, pp. 44–62. Toronto: Hogrefe Int.

- Sedikides C, Wildschut T. 2018. Finding meaning in nostalgia. Rev. Gen. Psychol. 22(1):48-61
- Seligman MEP. 2002. Authentic Happiness. New York: Free Press
- Seto E, Hicks JA, Vess M, Geraci L. 2016. The association between vivid thoughts of death and authenticity. Motiv. Emot. 40(4):520–40
- Shiah YJ, Chang F, Chiang SK, Lin IM, Tam WCC. 2015. Religion and health: anxiety, religiosity, meaning of life and mental health. J. Relig. Health 54(1):35–45
- Silver RL, Boon C, Stones MH. 1983. Searching for meaning in misfortune: making sense of incest. J. Soc. Issues 39(2):81–101
- Steger MF. 2012. Experiencing meaning in life: optimal functioning at the nexus of spirituality, psychopathology, and well-being. In *The Human Quest for Meaning: Theories, Research, and Applications*, ed. PTP Wong, pp. 165–84. New York: Routledge. 2nd ed.
- Steger MF, Dik BJ. 2010. Work as meaning: Individual and organizational benefits of engaging in meaning-ful work. In Oxford Handbook of Positive Psychology and Work, ed. PA Linley, S Harrington, N Garcea, pp. 131–42. New York: Oxford Univ. Press
- Steger MF, Frazier P. 2005. Meaning in life: one link in the chain from religiousness to well-being. J. Couns. Psychol. 52(4):574–82
- Steger MF, Frazier P, Oishi S, Kaler M. 2006. The meaning in life questionnaire: assessing the presence of and search for meaning in life. 7. Couns. Psychol. 53(1):80–93
- Steger MF, Kashdan TB. 2009. Depression and everyday social activity, intimacy, and well-being. J. Couns. Psychol. 56:289–300
- Steger MF, Kashdan TB, Sullivan BA, Lorentz D. 2008. Understanding the search for meaning in life: personality, cognitive style, and the dynamic between seeking and experiencing meaning. *7. Personal.* 76:199–228
- Steger MF, Oishi S, Kashdan TB. 2009. Meaning in life across the life span: levels and correlates of meaning in life from emerging adulthood to older adulthood. J. Posit. Psychol. 4(1):43–52
- Steptoe A, Fancourt D. 2019. Leading a meaningful life at older ages and its relationship with social engagement, prosperity, health, biology, and time use. PNAS 116(4):1207–12
- Stillman TF, Lambert NM, Fincham FD, Baumeister RF. 2011. Meaning as magnetic force: evidence that meaning in life promotes interpersonal appeal. Soc. Psychol. Personal. Sci. 2(1):13–20
- Sutton A. 2020. Living the good life: a meta-analysis of authenticity, well-being and engagement. Personal. Individ. Differ. 153:109645
- Swann WB, Read SJ. 1981. Self-verification processes: how we sustain our self-conceptions. J. Exp. Soc. Psychol. 17(4):351–72
- Szpunar KK. 2010. Episodic future thought: an emerging concept. Perspect. Psychol. Sci. 5(2):142-62
- Taylor C. 1989. Sources of the Self: The Making of the Modern Identity. Cambridge, MA: Harvard Univ. Press
- Tolstoy L. 1983 (1882). A Confession, transl. D. Patterson. New York: W.W. Norton & Co.
- Tov W, Lee HW. 2016. A closer look at the hedonics of everyday meaning and satisfaction. *J. Personal. Soc. Psychol.* 111(4):585–609
- Trent J, King LA. 2010. Predictors of rapid vs. thoughtful judgments of meaning in life. *J. Posit. Psychol.* 5:439–51
- Trent J, Lavelock C, King LA. 2013. Processing fluency, positive affect, and meaning in life. J. Posit. Psychol. 8:135–39
- Turk-Browne NB, Scholl BJ, Chun MM, Johnson MK. 2008. Neural evidence of statistical learning: efficient detection of visual regularities without awareness. *7. Cogn. Neurosci.* 21:1934–45
- Updegraff JA, Silver RC, Holman EA. 2008. Searching for and finding meaning in collective trauma: results from a national longitudinal study of the 9/11 terrorist attacks. 7. Personal. Soc. Psychol. 95(3):709–22
- Urry HL, Nitschke JB, Dolski I, Jackson DC, Dalton KM, et al. 2004. Making a life worth living: neural correlates of well-being. *Psychol. Sci.* 15(6):367–72
- van Tilburg WAP, Igou ER, Sedikides C. 2013. In search of meaningfulness: nostalgia as an antidote to boredom. *Emotion* 13:450–61
- Vess M, Hoeldtke R, Leal SA, Sanders CS, Hicks JA. 2018. The subjective quality of episodic future thought and the experience of meaning in life. *J. Posit. Psychol.* 13(4):419–28

- Vess M, Rogers R, Routledge C, Hicks JA. 2017. When being far away is good: exploring how mortality salience, regulatory mode, and goal progress affect judgments of meaning in life. Eur. J. Soc. Psychol. 47(1):82–91
- Vess M, Routledge C, Landau MJ, Arndt J. 2009. The dynamics of death and meaning: the effects of death-relevant cognitions and personal need for structure on perceptions of meaning in life. J. Personal. Soc. Psychol. 97(4):728–44
- Ward SJ, King LA. 2016a. Socrates' dissatisfaction, a happiness arms race, and the trouble with eudaimonic well-being. In *Handbook of Eudaimonic Well-Being*, ed. J Vittersø, pp. 523–31. New York: Springer
- Ward SJ, King LA. 2016b. Poor but happy? Money, mood, and experienced and expected meaning in life. Soc. Psychol. Personal. Sci. 7:463–70
- Ward SJ, King LA. 2017. Work and the good life: how work can promote meaning in life. Res. Organ. Behav. 37:59–82
- Waytz A, Hershfield HE, Tamir DI. 2015. Mental simulation and meaning in life. J. Personal. Soc. Psychol. 108(2):336–55
- Williams KD. 2012. Ostracism: the impact of being rendered meaningless. In Meaning, Mortality, and Choice: The Social Psychology of Existential Concerns, ed. M Mikulincer, P Shaver, pp. 309–24. Washington, DC: Am. Psychol. Assoc.
- Womick J, Atherton B, King LA. 2020. Lives of significance (and purpose and coherence): narcissism, meaning in life, and subjective well-being. *Heliyon* 6(5):e03982
- Womick J, Ward SJ, Heintzelman SJ, Woody B, King LA. 2019. The existential function of right-wing authoritarianism. J. Personal. 87:1056–73
- Yalom ID. 1980. Existential Psychotherapy. New York: Basic Books
- You S, Lim SA. 2019. Religious orientation and subjective well-being: the mediating role of meaning in life. 7. Psychol. Theol. 47(1):34–47
- Zhang H, Sang Z, Chan DKS, Schlegel RJ. 2019. Threats to belongingness and meaning in life: a test of the compensation among sources of meaning. *Motiv. Emot.* 43(2):242–54



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