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The weight of being: Psychological perspectives on the existential moment

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ABSTRACT

As the prefrontal cortex expanded in human evolution, so too did the capacity for nesting basic biological goals within more complex systems of behavioral organization. This increased ability for abstraction brought with it the challenge of deciding how to interpret the personal significance of any given experience. The human brain appears to manage this increased complexity by defining meaning in relation to one's currently adopted goals. When encountering goal-related information, arousal and exploratory systems become engaged, such that information is processed more thoroughly. As a consequence of this enhanced attention and arousal, neural plasticity is facilitated, allowing motivationally relevant experiences to have a stronger influence on an individual's neural organization. To borrow a gravitational metaphor, the existential weight, or significance, of a particular moment will determine the strength of that moment's influence on an individual's life. Human experience thus appears to be curved around fluctuations in the existential weight of being.

Personal meaning is often understood in terms of a gravitational metaphor. The English language is laden with terms like "heavy," "weightiness," or "gravitas" to describe events or situations with substantive personal and social significance. In contrast, words such as "lightness" are used to describe experiences with only fleeting significance (e.g., Kundera, 1987). Because such metaphors can be useful in organizing our thoughts about a particular domain (Gentner, 2003; Lakoff & Johnson, 1980), the current paper aims to extend and elaborate upon the gravitational metaphor of personal meaning. In

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particular, ideas from Psychology, Philosophy, and Neuroscience are used to demonstrate how this gravitational metaphor can further our understanding of the subjective landscape of human experience. The result is a neuropsychological framework for understanding the "weight" of being.

1. The prefrontal cortex and the higher-order regulation of behavior

One of the defining characteristics of human evolution is that the human brain has a much larger prefrontal cortex (PFC) relative to that of other animals. While the overall size and complexity of the central nervous system tends to increase with phylogenetic development (Swanson, 2003), the PFC appears to have developed most extensively in humans. Even in animals with larger brains than ours, such as the blue whale or the elephant, the size of the PFC relative to the rest of the brain is smaller than it is in humans (Deacon, 1997; Jerison, 1997). A primary role of the PFC is to organize thoughts, behavior, and emotion in line with achieving one's current goals (Miller & Cohen, 2001). The PFC accomplishes this by selectively biasing neural signals in the rest of the brain to ensure that the appropriate behavioral responses are given to ongoing changes in sensory input. What this means is that the PFC allows current plans and situational cues to modify patterns of stimulus-response associations and behavioral output. Whereas a more basic nervous system would only be able to create associations between a particular stimulus and an associated behavioral response, the PFC allows for the same stimulus to be treated in multiple different ways depending upon the current state of the organism. Consequently, the expanded human PFC affords a greater range of cognitive and behavioral flexibility.

Although human behavior is still regulated by phylogenetically older motivation systems, the PFC helps to nest these basic biological instincts within a set of higher-order goals (Swanson, 2000). Thus, while some goals may seem to be relatively abstract or symbolic, they are ultimately instantiated by the same subcortical motivational systems that regulate the biological needs of the organism. These needs include metabolic demands (food and water intake), affiliative needs (sex, social acceptance), security needs (safety from harm), and exploratory needs. As the attainment of biological needs becomes more complex, nervous systems must develop into more highly differentiated networks of goal-directed activity. An infant, for example, has only a rudimentary behavioral network in place for satisfying basic needs, and depends on the support and nurturance of others in the environment. As a child becomes more independent, however, it must learn to develop more complex and differentiated behavioral routines in order to achieve its goals in a particular environmental context (e.g., learning how to behave appropriately in order to secure social acceptance). Over time, an individual's basic motivations will be differentiated into a variety of behavioral schemes for goal-attainment (Piaget & Inhelder, 1969). Consequently, what may appear on the surface to be the pursuit of relatively abstract goals (e.g., working for a promotion, forging an identity) are in fact cultural strategies for satisfying different motivational systems. As discussed later, these abstract goals can eventually be experienced as more important than the biological motives from which they initially emerged.

2. Expanded horizon of interpretation & existential ambiguity

Although the greater complexity of the human nervous systems has allowed for increases in cognitive and behavioral flexibility, it has also led to certain negative consequences. In particular, the ability to flexibly reinterpret sensory information in terms of different processing goals and behavioral contingencies can lead to great difficulty in identifying and understanding the personal significance of any given experience. Consequently, humans have an expanded horizon of interpretation compared to other animals. In Heidegger's hermeneutic phenomenology, the horizon of interpretation describes the realm of possible meanings that can be derived from any experience (Heidegger, 1962). This horizon is a function of both the current knowledge state of the individual and the phenomena that he or she encounters. Phylogenetically older animals (and perhaps even brain regions) appear to have a more limited horizon of interpretation, in that sensory information is sorted into a smaller number of predefined categories (e.g., something to be eaten, something to be avoided, etc.) Greater cognitive complexity in the human brain allows a broader range of interpretive frames to be applied to an event, each one producing a different subjective meaning. The consequent ambiguity in determining the

meaning of one's experiences can result in substantial existential uncertainty. Such uncertainty can be unsettling for the simple reason that the motivational significance and appropriate behavioral response to ambiguous information remains unclear. Thus, the expanded cognitive complexity and PFC in humans gives rise to questions of meaning.

3. Goal-directed behavior

Humans appear to reduce this interpretive complexity by structuring perception, cognition, emotion, and action around the achievement of different goals. Because understanding the "objective" meaning of an event is a philosophical and psychological impossibility (Nagel, 1986; Peterson, 1999), only that information which is relevant to our current processing goals is extracted from the environment (Nørretranders, 1998). In this sense, the meaning that is derived from an experience is always in relation to a particular goal. Understanding the subjective meaning of an individual's experiences thus requires us to first understand the goal structures that he or she is engaged with (Baumeister, 1991; Little, 1998). Researchers have conceptualized such goal structures as hierarchical networks of behavioral patterns (Austin & Vancouver, 1996; Carver & Scheier, 1998). At the top of this hierarchy is the end-state of the goal itself, while each of the lower levels of the hierarchy features the behavioral routines that are necessary to achieve the higher-level goals. For example, if the high-level goal is to graduate from university, the lower levels would include behavioral routines such as "getting good grades" or "learning the course material." Each of these sub-goals would in turn be comprised of even more lower-level behaviors that are needed to carry them out (e.g., "studying for the exam" or "reading the textbook"). The lowest levels of the goal-hierarchy consist of the specific motor movements that are involved in performing a given action.[1]

The highest levels of a particular goal-hierarchy may be relatively concrete, such as "clean the room," or more abstract, such as "be a good father." In the case of more abstract goals, there are a greater number of lower-level scripts and behaviors comprising the higher-order abstraction. So, for instance, "be a good father" has much broader implications for behavior than does the straightforward goal of "clean the room." For this reason, the higher levels of an individual's goal hierarchies are also likely to be more highly valued. Such goals become more important than basic biological goals because they relate to a larger number of situations. While the goal of "satisfying hunger" is clearly important for survival, it is always bound to a particular situation and metabolic need. In contrast, the goal of "getting a good job" is part of a larger network of behavioral organization that allows for one's hunger to be satisfied across a much larger span of time and multiple instances of hunger. Similarly, the goal of "being a good person" is a strategy for ensuring that all of one's various needs will be met across a large number of situations. In this context, high-level goals appear to be akin to values or meta-goals, which outline the more specific goals that an individual should adopt (Campbell, Christopher, & Bickhard, 2002).

The highest-level goals in one's hierarchy are often described as "being" goals, in contrast to lower-level "doing" goals (Vallacher & Wegner, 1985). Because high-level goals regulate activity in large networks of behavior across a variety of situations, they play a central role in an individual's identity and life experience. Consequently, people are often highly motivated to preserve these higher-order abstractions, even if they are no longer effective guides for behavior (Peterson & Flanders, 2002). For example, an individual who has always dreamed of being a famous movie star will direct all of his or her behavioral patterns towards this higher-order goal. However, it would be a major blow to the self if that higher-order goal were threatened, so it is likely to be upheld despite the dismal chances of success and repeated negative feedback. Because high-level goals act as organizing principles around which meaning is constructed, the sudden removal of these goals can result in tremendous anxiety, uncertainty, and temporary loss of personal meaning (Janoff-Bulman, 1992; Peterson, 1999).

[1] Interestingly, goal hierarchies appear to be roughly organized along the anterior-posterior axis of the brain's frontal lobe. While simple motor movements are handled by primary motor cortex, they are organized into more complex patterns of behavior by premotor cortex and the supplementary motor area. These action patterns are in turn engaged by the PFC during more complex goal pursuit (Fuster, 2000). Increasingly complex goals appear to rely upon more anterior regions of the PFC (Koechlin, Basso, Pietrini, Panzer, & Grafman, 1999).

It is also important to note that goal structures need not be entirely conscious for them to influence an individual's cognitive function or experience of meaning. Many researchers have demonstrated that goal-directed behavior can operate completely outside of an individual's awareness. In such cases, an individual's cognitive and behavioral patterns will be structured towards the attainment of a goal that the individual himself was not aware of pursuing (Aarts, 2007; Bargh & Chartrand, 1999; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001). Indeed, from a developmental perspective, most goals are initially pursued with a lack of self-awareness, with conscious representations of these goals only emerging over time and reflection (Campbell & Bickhard, 1986). Thus, it is entirely possible for an individual to believe that he is pursuing one goal when in fact he is unconsciously pursuing another. Note also that individuals can simultaneously pursue multiple goals, so it need not be that only a single concern has control over the cognitive system in any given moment. Rather, the strength of a particular goal in shaping someone's subjective experience will be a function of its relative activation in relation to the person's other goals, which may be simultaneously influencing the experienced meaning of events (Austin & Vancouver, 1996). If only a single goal is strongly active, it will establish the dominant interpretive frame by which meaning is constructed; if multiple goals are strongly active, there will be a greater plurality of experienced meanings. Interestingly, the strength of a particular goal system does not seem to depend on whether or not the individual is aware of it (Bargh et al., 2001). It would appear instead that the strength of a goal depends only on the relative activation of its associated neural circuitry, whether or not this is accompanied by conscious awareness (Aarts & Dijksterhuis, 2000; Altmann & Trafton, 2002).

4. Meaning & neural plasticity

Goal structures organize the processing of sensory information by selectively deploying attention towards goal-relevant stimuli (Miller & Cohen, 2001). Thus, for instance, someone with the goal of finding food will have an enhanced perception of food-related objects, a greater accessibility of food-related words, and will experience emotional responses to events that help or hinder the goal of food acquisition. Importantly, however, not all goals will produce the same degree of emotional response when progress is advanced or thwarted. It is the goals that are the most central to an individual's behavioral organization that are likely to produce the strongest affective responses during progress towards or away from the goal (Carver & Scheier, 1998; Fridja, 1988).[2] What is considered "meaningful" is thus any information which relates to the attainment of one's currently adopted goals. The more important the goal is to the individual (i.e., the more the person identifies with the goal and the more central the goal is as a dominant interpretive framework), the more any event pertaining to that goal will be experienced as personally meaningful.

The brain ensures that appropriate responses are made to goal-relevant events by engaging arousal and exploratory systems when exposed to goal-related information (Panksepp, 1998). As a consequence, goal-related information becomes processed more thoroughly than non-relevant information, and stronger affective experiences are generated in the presence of such information. Neurochemically, this process is instantiated by phasic bursts of Dopamine, Acetylcholine, and Noradrenaline in response to motivationally relevant stimuli or events. The release of these neuromodulators produces important cognitive and affective consequences, such as reinforcement of the behaviors that led to goal-attainment, selective attentional enhancement of the relevant sensory information, and the enhanced formation of emotional memories (Everitt & Robbins, 1997; Hamann, 2001; Schultz, 1998). The release of these neuromodulators not only affects the current mental state of the individual (altering arousal levels and affective experience), but also facilitates neural plasticity (instantiated as long-term structural changes associated with memory formation and the modification of behavioral patterns). Therefore, during subjectively important and meaningful events, the sensory environment has a stronger impact on the individual's neural organization, thereby exacting a disproportionately large influence on one's life trajectory.

[2] Under normal circumstances, the most important goals will tend to be the higher-order ones at the top of the goal--hierarchy. Note, however, that if one's basic biological goals are threatened (e.g., by famine or violence), the affective urgency of more rudimentary self-preservation will take precedence, and will accordingly gain control of behavior.

5. The weight of being and existential relativity

The "existential weight" of a given moment can be understood as the extent to which it relates to the highest levels of one's goal structures. Weighty moments are those in which one's deepest goals and values are affected, paralleled by consequent bursts of neurochemical activity in the brain. The increased neural plasticity as a result of these neurochemical bursts implies that such events are "meaningful" precisely because they have a stronger influence on one's behavioral and neural organization. The subjective meaning of one's experiences will thus fluctuate across the lifespan as different situations are encountered and different goals are adopted. Even the same historical moment will adopt different meanings as interpreted from the perspective of different goals.

An implication of this view is that human experience can best be understood as operating across five dimensions: three dimensions of space, a fourth dimension of time, and a fifth dimension of human meaning. Any particular event in space and time can still be reinterpreted along the dimension of meaning, with important consequences for the experience of the event and its influence on the individual. To extend the gravitational metaphor, the existential "weight" or "gravitas" of an experience will determine the strength of that moment's influence on an individual's life, mediated through increases in neural plasticity. Just as space-time is curved around large masses in the General Theory of Relativity (Weinberg & Dicke, 1973), so too is human experience curved around fluctuations in the existential weight of being, with "weighty" moments having a disproportionate impact on a person's life. Such a perspective can be understood as an "Existential Theory of Relativity." In a strict four-dimensional model of human existence, individuals simply navigate their spatial environments across the lifespan. However, acknowledging the importance of subjective meaning as an additional dimension of human experience accommodates the fact that not all moments are created equal, and indeed some will have a much stronger influence than others.

Such a view is supported by research on life narratives, which are the personal and collective stories that we create in order to make sense of our experiences (McAdams, 2001). Both cultural and personal histories are characterized by "watershed" moments, which are events that had a strong influence in shaping a developmental trajectory. Such moments, according to the current view, carried more weight than the many other moments that weren't as influential. For instance, many individuals would report the birth of their first child as a life-altering experience and powerful source of meaning. This event can be understood as having a "gravitational pull" in a number of ways. First, an individual's memories and personal narratives will continually revisit the experience, such that it is more likely to become a defining event in the self-narrative. Second, the experience has important implications for one's life goals, making it an event around which behavior will subsequently be organized. Third, the release of neuromodulators during the experience will have allowed that particular moment to have a stronger influence on the individual's neural organization. In this sense, the most meaningful experiences are those that profoundly change an individual.

6. Individual differences

Because the significance of an experience is always determined in relation to a set of goals, different people can have varying interpretations of the same event. Important experiential differences will also occur depending on whether someone adopts a narrowly defined goal or an open-ended goal. For instance, an individual who has adopted a narrowly defined goal such as "making money" has limited the realm of important events to those which relate to personal finance. Any experience that does not relate to the achievement of this goal will receive less neurocognitive processing, and consequently is more likely to be ignored and forgotten. Such an individual will experience less meaning in life, as the range of potentially relevant information is vastly constricted (cf. Kasser & Ryan, 1993). If, however, an individual adopts an open-ended goal such as "discovering the meaning of life," every single moment could provide potentially relevant information and thereby be tagged as personally meaningful. The quest for meaning is thus self-reinforcing, as simply adopting the goal can expand the domain of potentially important and meaningful events. The provision of such open-ended goals appears to be one of the mechanisms by which spiritual disciplines provide meaning and "weight" to daily experiences (cf. Emmons, 1999). The organizing goals in these cases would be to connect with some form of transcendent reality or abide by an ethical code, each of which is broad enough to infuse daily life with a greater sense of importance.

Research in personality psychology suggests that there are certain individuals who are more likely to adopt narrow or open-ended goals. In particular, the personality trait of Openness to Experience is related to the adoption of more open-ended goal structures (Roberts & Robins, 2000). Individuals with higher levels of this trait perceive a broader range of meanings in their environment, and consequently demonstrate greater plasticity in their cognitive organization (DeYoung, Peterson, & Higgins, 2005; Peterson & Carson, 2000). According to the gravitational model, this greater receptivity to meaning produces an experience of more "weight" in one's life. Because Open individuals are likely to experience a greater range of meanings and cognitive transformations in a given period of time, they will in a sense have travelled a greater subjective, experiential distance by the end of the lifespan.

Interestingly, the greater cognitive flexibility and perception of meaning associated with Openness appears to be partially mediated by the same neurochemical systems that fire in response to subjectively meaningful events. Specifically, Openness is related to heightened activity in the mesocortical dopaminergic system (DeYoung et al., 2005). To the extent that this neuromodulatory system plays an important role in gating the perception of novel meanings (Lubow & Gewirtz, 1995), Open individuals may be neurochemically predisposed to perceive greater meaning in the environment. Such a neurochemical disposition can be induced pharmacologically by dopaminergic agonists such as Cocaine. After consuming Cocaine, information in the environment that was previously ignored may suddenly appear to be extremely interesting and full of meaning (Weiner, Lubow, & Feldon, 1988). Even if the experiences will be reappraised as meaningless once the drug has worn off, they will still have been accompanied by the subjective experience of meaning, and will have had a strong influence on the person's neurocognitive organization (indeed, the neural changes as a result of taking such drugs are largely responsible for their addictive properties; see Robinson & Berridge, 2000). In the extreme case of excessive dopaminergic activity, which appears to be one of the contributors to Schizophrenia, there is also an excess of meaning perceived in the environment (Moser, Hitchcock, Lister, & Moran, 2000). In this case, as in some drug-induced forms of psychosis, the standard cognitive filters of the environment are not operating properly, leading to a flood of sensory information along with rapidly shifting meanings. Such a state can be understood as one of "excess meaning," where too much significance is read into every aspect of sensory experience.

7. Ethical implications

Existential philosophers have noted the consequences of living a life of "heaviness" compared to a life of "lightness." Taken to the extreme in the idea of eternal return, in which every moment is lived as though it would be repeated indefinitely, Nietzsche described living with the heaviest weight as both a burden and a great affirmation of existence (Nietzsche, 1974). To experience this weight is to feel that there are real, significant consequences to one's actions. Living life in such a manner places a great deal of moral responsibility with the individual. Conversely, to believe that there are no meaningful consequences to one's actions is to forfeit all ethical responsibility. Interestingly, researchers have recently begun to demonstrate that a belief in determinism, or the insignificance of one's own actions, can lead to reductions in morally responsible behavior (Vohs & Schooler, 2008). What is of particular interest here is that if personal meaning is always defined in relation to a goal structure, individuals without clear goals may feel less ethical responsibility than their more focused counterparts. Not only would such individuals feel less personal meaning during their experiences, but they would also feel less responsibility with regards to their actions. Simply put, there is less pressure to act in the appropriate manner if there is no investment in a goal structure. To the extent that someone does identify with a set of goals, they should feel a greater sense of meaning and purpose in life (e.g., Emmons, 1986; McGregor & Little, 1998), but also a greater responsibility for achieving that purpose. When a person's goals are broadly defined, such as in "the search for truth," life can be experienced as though every moment matters.

8. Obsession and addiction

Greater personal responsibility, if taken too far, can also lead to obsession and addiction. The more that an individual believes in his or her goal structure, the more imperative it will seem to act

towards the goal. Taken to the extreme, this can result in a complete negligence of other life domains that don't directly relate to the goal (Shah, Friedman, & Kruglanski, 2002). Many great thinkers and artists have fallen into this category, where the goal of truth or beauty is established as the absolute value, and pursuit thereof is consequently the only morally justifiable action. Although this type of single-minded goal pursuit can be intensely meaningful, it is at the expense of other goal domains. This type of single-minded obsession with strong sources of meaning appears to be a consequence of the pharmacology of goal pursuit. In particular, dopaminergic circuitry is involved in the incentive motivation towards achieving a desired goal (Berridge & Robinson, 1998). Movement towards a goal results in phasic bursts of dopaminergic activity, which acts to strengthen the behavioral networks that produced the desired outcome and also to encourage further goal-directed movement. Many addictive drugs are able to gain control of behavior by "hijacking" this incentive motivation system (Montague, Hyman, & Cohen, 2004). A similar process may also occur when an individual becomes obsessed with any domain of goal pursuit. When a goal is considered to be extremely personally valuable, cognitive resources are taken away from anything that doesn't lead to achievement of the goal (Redish & Johnson, 2007). Thus, to live with great weight can easily lead to obsession, especially when only a single goal domain is adopted. Whether the goal is artistic expression, financial gain, or philosophical inquiry, the degree to which it is a source of meaning may parallel the extent to which it can become all-consuming.

9. Goal conflict and existential angst

To the extent that an individual's goals are not in perfect alignment, there will be competing frameworks for interpreting the meaning of any given experience. For instance, someone who just received an important promotion might be conflicted about the motivational significance of the event, because it could potentially mean that less time can be spent with his or her family. In other words, competing goal systems can lead to competing interpretations of the same sensory information. This interpretive ambiguity appears to be an aversive state, and people will generally work to resolve this type of conflict (Festinger, 1957). Individuals high on trait Neuroticism appear to be especially sensitive to this type of interpretive uncertainty (Hirsh & Inzlicht, 2008).[3] In the current framework, the anxiety associated with interpretive ambiguity is the result of two or more conflicting "gravitational pulls," each of which is trying to define the meaning of an experience. This idea is compatible with connectionist accounts of semantic processing, in which potential meanings act as "attractor basins" that guide the processing of information (Rodd, Gaskell, & Marslen-Wilson, 2004). To the extent that competing goals promote multiple interpretations of a single event, more experiential uncertainty should occur. Existential uncertainty and the resulting anxiety may thus be usefully reduced by clarifying the goal structures that guide behavior, thereby providing a more clearly defined framework for interpreting the meaning of one's experiences.

10. Summary

The gravitational metaphor for the experience of meaning is useful when contrasting moments of profound significance with those of fleeting importance. The present model extends and elaborates upon this metaphor, drawing upon work in philosophy and neuroscience to propose a psychological explanation for the weight of being. One of the benefits of this framework is that it begins to outline the psychological parameters of personal meaning, along with some of its ethical, emotional, and experiential consequences. Such an approach is in line with the growing emphasis in psychology that humans can best be understood as meaning-making creatures (Bruner, 1990; Deacon, 1997; Heine, Proulx, & Vohs, 2006; McAdams, 1997; Peterson, 1999). Understanding the processes by which meaning is created, along with the role that personal meaning plays in psychological functioning remain important topics for future research and discussion.

[3] There also appear to be cultural differences in the handling of such ambiguity (Peng & Nisbett, 1999).

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