Neural and Motivational Mechanics of Meaning and Threat

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Every action that we take is grounded in an elaborate web of beliefs and goals. Take the simple act of opening a door. Such an act depends on our beliefs about what lies beyond the door, as well as what is available to us in our current location. At an even more basic level, our attempt to open the door is rooted in a belief that we understand how a door works, and are capable of using it. Furthermore, without the goal of pursuing something beyond the door, the act of opening the door would probably not take place. Of course, we are usually unaware of the precursors of our actions as we make them—we do not contemplate our presuppositions about the operation of doors or the contents of what lie beyond them before we open them. Nevertheless, when these presuppositions are challenged, their existence and importance come quickly into relief. Imagine you open a door expecting a women's bathroom and you run into a man on his way out. In this case, your observation has come into conflict with your belief, and you are forced to pause and reconsider your course of action; the incoherence between your beliefs, goals, and observations has rendered you unable to act effectively until the discrepancy is resolved. This coherence that has been disrupted—what we will refer to as "meaning"—is the basis for our effective interaction with the world.

The meaning of 'meaning,' in both everyday parlance and scientific discourse, has been a perennial topic of discussion. Whereas the word is often equated with the value or significance of life events, Dilthey proposed that meaning arises when we consider the connectedness between life events; "the individual moment has meaning through its connection with the whole, through the relation of past and future, of

individual existence and humanity" (Dilthey, 1910/2002, p. 253). Along these lines, meaning has been defined as "mental representations of relationships between committed propositions" (Proulx & Heine, 2010, p. 8) and as "consonance among the temporally extended and contextually distributed elements of the self" (McGregor & Little, 1998, p. 496). This basic human need for "systems of relations" (Camus, 1955, p. 10) is widely recognized, but what is its function?

The answer, we propose, is that meaning is required for action. As such, we will define meaning as coherence between beliefs, salient goals, and perceptions of the environment that provides a foundation for our interactions with the world. Without this coherence, our actions would be ineffective, random and disconnected from our surroundings. We further propose that meaning is not strictly a cognitive or perceptual phenomenon; there can be an identifiable affective experience as well. We can speak of a 'feeling of meaning' much like we can speak of a feeling of satiety. Generally, we pay more attention to our state of satiety when we are hungry. Similarly, we do not always notice a feeling of meaning, but we usually recognize when it has been disrupted, and we feel good when it is restored. This conceptualization of meaning draws heavily on the insights of others (e.g. Festinger, 1957) who have observed that disrupting the balance between these elements gives rise to feelings of distress and anxiety – a sense that "something isn't right" – followed by attempts to restore coherence.

Conflict among beliefs and actions is now widely recognized in social psychology as an important force guiding human behavior, in large part because of the influential work of Leon Festinger. Festinger (1957) was one of the first to investigate the mental state, termed "cognitive dissonance," that we experience when our cognitions are not

aligned with their actions. Consistent with the way we have talked about meaning threats as anxiety-producing events, cognitive dissonance is characterized by negative emotional arousal (Elliot & Devine, 1994; Cooper, Zanna, & Taves, 1978). This sense of dissonance, or imbalance, also arises when our attitudes do not accord with those of the people around us (Heider, 1958). For example, if a good friend scoffs at our favorite book, we question our beliefs (in either our friend or the book) in order to restore a sense of consistency. These ideas have received more recent treatment in various theoretical models which hold that we have an implicit drive to maintain meaning (Heine, Proulx, & Vohs, 2006; Peterson, 1999), certainty (van den Bos, 2009; McGregor, 2006b), self-image (Steele, 1988), control (Kay, Gaucher, Napier, Callan, & Laurin, 2008), or symbolic immortality (Greenberg, Pyszczynski, & Solomon, 1986). The common thread running through these fluid compensation models is that we have a desire to maintain order and consistency in our lives, and that threats to this order are often met with reactive efforts to restore it (Proulx & Heine, 2010; Steele, 1988). While the lexicons used to describe these models vary, convincing evidence suggests that they describe the same fundamental process (e.g., McGregor, Zanna, Holmes, & Spencer, 2001; Proulx & Heine, 2010; van den Bos, 2009). Consistent with this line of reasoning, there appear to be common brain mechanisms involved in the recognition of and response to conflict in these varied domains.

Meaning in the Brain

The various fluid compensation models of meaning share two common features: 1) some kind of threat to meaning, and 2) some process of ameliorating the threat. In this section we will focus on two corresponding processes in the brain: 1) the ACC becomes

active when our meaning frameworks have been disrupted, and 2) approach motivational systems help to resolve incoherence and relieve distress (Figure 1).

The Anterior Cingulate Cortex (ACC)

The ACC, considered part of the brain's limbic system, has been implicated in a wide variety of cognitive and affective processes including attentional control, emotion regulation, motivation, and error detection (see Bush, Luu, & Posner, 2000, for review). Activity in the ACC is commonly assessed by observing event-related potentials (ERPs) – distinctive patterns of electrical activity at the scalp. The ACC gives rise to two ERPs: the error-related negativity (ERN), which occurs when people make mistakes (Dehaene, Posner, & Tucker, 1994; Falkenstein, Hohnsbein, Hoorman, & Blanke, 1990; Gehring, Goss, Coles, Meyer, & Donchin, 1993); and the feedback-related negativity (FRN), which occurs when people are given negative or uncertain feedback about their response (Hirsh & Inzlicht, 2008; Miltner, Braun & Coles, 1997). Here, we focus on the ACC as an important brain region for detecting threats to meaning because of its role in identifying occasions when our actions have unexpected consequences.

Traditional accounts of ACC function describe the brain region as a conflict-monitor (Carter, Braver, Barch, Botvinick, Noll, & Cohen, 1998; Botvinick, Braver, Barch, Carter, & Cohen, 2001). According to this model, the ACC plays an important role in identifying when there is competition between multiple possible actions, and thereby signaling the need for cognitive control. In other words, the ACC is responsible for indicating when we are unsure about what action to take. Evidence for this model comes from numerous studies demonstrating that the ACC becomes more active when people have to override prepotent responses tendencies (Casey et al., 1997; Pardo, Pardo,

Janer, & Raichle, 1990), when they have to choose between two equally desirable responses (Frith, Friston, Liddle, & Frackowiak, 1991; Peterson, Fox, Posner, Mintun, & Raichle, 1988), and when they make mistakes (Falkenstein et al. 1990, Gehring, et al., 1993). Once the ACC has detected conflict, it recruits cognitive control resources that serve to prioritize one main goal and suppress distractors – for example, focusing on the central symbol and ignoring peripheral symbols in the flanker task. Thus, the ACC notifies us when conflict occurs so that coherence can be restored and we can continue to act effectively.

Emerging evidence, however, is beginning to show that the ACC is active in situations that go beyond response-conflict and errors, and may be more broadly viewed as an indicator that our actions are not having the effects that we expect. Gentsch et al. (2009) demonstrated that both self-generated errors and externally-generated errors (resulting from a supposed "technical malfunction") increased ACC activity. This suggests that the ACC is not simply indicating when an error has occurred, but when an outcome is unexpected. Additional compelling evidence that the ACC responds to expectancy violation rather than errors comes from research showing that the FRN can be elicited by positive feedback when the person is expecting negative feedback and vice versa (Oliveira, McDonald, & Goodman, 2007). These important lines of research highlight the role of the ACC in processing meaning threats – the ACC is active when our understanding of our relationship with the outside world is called into question, when our actions are not having the expected effects.

If ACC activity is involved in the detection of unanticipated action consequences, it should be linked with a common affective response to expectancy violations–anxiety

(Barlow, 1988; Plaks & Stecher, 2007). Indeed, there is increasing evidence that the ERN is strongly associated with affect, particularly distress and anxiety (Bush et al., 2000). For example, the more we are bothered by failures on a task, the larger the ERN to those errors (Hajcak, Moser, Yeung, & Simons, 2005). Even when we have not made a mistake, if our response results in us losing money we exhibit ACC activity (Gehring & Willoughby, 2002). ACC activity has been associated with a stronger skin conductance response (Hajcak, McDonald, & Simons, 2003) and a more pronounced defensive startle response (Hajcak & Foti, 2008), while ACC damage causes flat affect and a lack of distress (Corkin, Twitchell, & Sullivan, 1979; Critchely et al., 2003). For these reasons, the ERN has been labeled as a neural "distress signal" (Bartholow et al., 2005, p. 41).

In sum, converging evidence is beginning to highlight the ACC as a brain region that helps us monitor the consistency between our beliefs, observations, and goals. By detecting instances when there is incoherence, the ACC gives rise to distress, an emotion we are motivated to ameliorate. Much like the feeling of hunger, the ACC provides a signal that something is wrong, along with an unpleasant affective experience, and thus motivates us to make things 'right'.

Approach Motivational Systems

Once a meaning threat has been identified, our brain takes action to resolve the inconsistency. Here, we suggest, approach motivation plays a key role. In general, motivations can be classified in one of two categories: approach or avoidance. We either want to approach a desired goal or avoid an undesirable outcome. Approach motivation involves goal-pursuit, behavioral activation, and sensitivity to reward, whereas avoidance motivation is characterized by withdrawal, behavioral inhibition, and sensitivity to

punishment (Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004; Coan & Allen, 2003; Davidson, Ekman, Saron, Senulis, & Friesen, 1990; Elliot, 1997; Gable, 2006; Gray & McNaughton, 2000; Harmon-Jones & Allen 1997; Higgens Roney, Crowe, & Hymes 1994; Wacker, Chavanon, Leue, & Stemmler, 2008). Moreover, these basic motivational directions are reflected in patterns of asymmetrical frontal cortical activation – left-frontal activity with approach, and right-frontal activity with avoidance (Davidson, 1995; Harmon-Jones, 2004).

Two related models speak to the role of approach motivation in reactions to threat: the action-based model of dissonance (e.g., Harmon-Jones, & Harmon-Jones, 2008), and reactive approach motivation (RAM; e.g., McGregor, Nash, Mann, & Phills, 2010). According to the action-based model, dissonance reduction serves to facilitate effective action (Harmon-Jones & Harmon-Jones, 2008). Thus, approach motivational states, which are associated with behavioral activation and action, should encourage threat-reduction. Evidence stemming from this model demonstrates that putting people in an approach-motivated state facilitates greater efforts to change their beliefs to fit their behavior, thereby restoring consistency (Harmon-Jones & Harmon-Jones, 2002; Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008; Harmon-Jones, Schmeichel, Inzlicht, & Harmon-Jones, 2011). For instance, in one study participants were put in an approach-motivated state by having them describe a project they wanted to complete and the steps they would take to complete it (Harmon-Jones et al., 2008). Participants in this condition, compared to control conditions, were more likely to say that an experiment they had previously chosen to participate in was better than other alternatives that they turned down. In other words, participants in an approach-motivated state were more

likely to try to fit their beliefs (i.e. their attitude about the experiment) with their behaviors (i.e. their choice to do that experiment over the other options).

In the precursor to their RAM model, McGregor et al. (2001) proposed that we react to meaning threats by turning to alternative goals or beliefs, a process termed compensatory conviction. Importantly, such compensatory responses appear to accompany a basic shift to approach motivation. For instance, threatening people with uncertainty was found to cause increases in implicit, explicit, and neural indices of approach motivation (McGregor et al., 2010; McGregor et al., 2009). In this model, then, approach motivation helps people focus on and pursue new goals.

Common to both models is a focus on approach motivation as a key component in anxiety-, threat-, and dissonance-reduction processes. Approach motivation serves to narrow our attentional focus, reducing the effect of distracting or conflicting information (Gable & Harmon-Jones, 2008; Gable, & Harmon-Jones, 2010). Recent research has demonstrated that brain measures reflecting dispositional or trait levels of approach motivation are associated with reduced ERN amplitude, corroborating the idea that when we are in approach motivational states our responsiveness to inconsistent information and uncertainty is reduced (Nash, McGregor, & Inzlicht, 2010). Furthermore, trait approach motivation is associated with higher levels of well-being (Urry et al., 2004). Thus, approach motivation serves to reduce paralyzing feelings of uncertainty and anxiety by restoring effective action.

Evidence for the Function of Meaning

So far, we have defined meaning as consonance among salient beliefs, goals, and perceptions of the environment, and reviewed ACC and approach motivation links to

meaning-related processes. In this section, we provide support for the notion that such consonance is essential for effectively action by summarizing evidence from the social psychology and social cognitive neuroscience literature. Specifically, we outline research in support of three basic propositions that guide our theorizing: 1) coherence is generally related to effective goal pursuit, 2) threats to coherence are anxiogenic and interfere with goal-directed action, and 3) threats to coherence prompt ameliorative responses that allow for the resumption of effective activity toward goals.

Coherence, Meaning, and Action

McGregor and Little (1998) drew on Dilthey's (1910/2002) theorizing that people will *feel* meaningful to the extent that there is coherence among self-elements (e.g., competencies, guiding values, defining memories, etc.) across time and context. In two studies, McGregor and Little demonstrated that self-reported meaning was positively associated with the extent to which people rated their personal projects (Little, 1983) as being important, something they were committed to, and reflecting their guiding values and own identity. The authors interpreted these personal project dimensions as reflecting the coherence of self-elements. Thus, to the extent that peoples' personal projects were consistent within the self-system, meaning was experienced.

In a similar line of research, Sheldon and Kasser (1995) assessed participants' personal strivings (Emmons, 1986) and asked them to rate the extent to which they perceived their strivings as helping them move toward six culturally-valued possible futures (e.g., intimacy and friendship, attractive physical appearance). In their first study, Sheldon and Kasser (1995) found that vertical coherence, or the extent to which participants' goals were linked to bringing about desirable possible futures, was the sole

significant predictor of vitality, a feeling of being globally alive and energized (Ryan & Frederick, 1997). In Study 2, vertical coherence of "intrinsic" possible futures (i.e., inherently satisfying futures) was positively related to engaging in "meaningful" (e.g., discussing one's life with another) vs. "distracting" (e.g., watching television) daily activities. So to the extent that people viewed their goals as helping them maintain a coherent link between current and desired states, they felt vital and engaged purposive daily activities.

Some recent research suggests that consonance might be amenable to change in the laboratory. Recently, Kray and colleagues (2010) demonstrated that counterfactual thinking about key life events increased the meaning in life derived from those events. The researchers also found that the link between counterfactual thinking and meaning was mediated by perceptions of fate. In terms of the current theorizing, these results could be taken to suggest that counterfactual thinking increases coherence across time and context, creating a "meant-to-be-ness" in the self and its fit in the temporally distributed environment, and thus leads to increased feelings of meaning.

The research reviewed so far mostly speaks to the link between coherence and *experienced* meaning, but what does this integrity mean for behavior? Following Carver and Scheier's (1998) control theory of motivation, Sheldon (2004) proposed that actions are most likely to succeed when they concord with abstract goals (e.g., when the more concrete goal of "drive to work" functionally aligns with the more abstract goal to "be good at one's job"). In a test of this notion, Sheldon and Elliott (1999) examined goal attainment as a function of coherence, which they termed self-concordance, or the extent to which goals participants were pursuing reflected enduring values and interests. They

found that goal self-concordance was positively related to sustained effort toward the goal, which in turn predicted goal attainment. Self-concordance also seems to empower people to overcome obstacles when life gets difficult. Lydon and Zanna (1990) found persistence in the face of adversity only on goals that cohered with participants' most important personal values. In sum, these results support the claim that coherence provides a basis for effective action, as it sustains motivational energy to approach goals, which in turn leads to successfully attaining those goals.

Meaning Threats and Distress

Imagine that you are at home in your living room, and have been reading most of the night on the couch. You now want to prepare to go to bed, but have not been in your bedroom since you got home from work. You place your book on the end table and get up and open the bedroom door. Upon opening the door, you see that your room has been completely re-arranged—your dresser is where your bed used to be, and your night-table is upside-down. Before initiating behavioral or attributional efforts to lend coherence to the scene (e.g., verifying no one else is in the room, thinking about whether anyone might want to play a prank on you), what initial flicker of emotion might you be feeling?

If you imagined (or actually experienced) a pang of anxiety, then your response is in line with what numerous models of threats to meaning would predict. When people come across a situation that challenges beliefs about themselves, the environment, or their relation to the environment (Heine, et al., 2006), particularly in ways that interfere with salient goals (Nash, McGregor, & Prentice, 2011), they become anxiously preoccupied with the meaning threat, at least until the deficit to meaning can be managed directly or ignored by engagement in a domain that is not as perilous.

Similarly, when goals are fraught with personal conflict, people tend to remain anxiously preoccupied with them until an avenue for meaning can found. Participants who completed an exercise that led them to ruminate about an uncertain dilemma in their lives remained highly preoccupied and anxiously aroused with the dilemma after completing other research materials. However, participants who were allowed to write about how they had acted consistently with a self-selected value and intended to continue to do so in the future were no more preoccupied or anxious than participants who had not been led to ruminate on their dilemma (McGregor et al., 2001). Writing about meaningful convictions, successes, and group identifications similarly eliminated anxious preoccupation with personal goal conflicts (McGregor, 2006b; McGregor & Marigold, 2003; McGregor et al., 2005).

Moreover, some support has recently been generated for the notion that disruptions to meaning are most poignant when they interfere with salient goals. When goals are first implicitly primed and then threatened, participants report feeling particularly *anxious* and *uncertain*, compared to participants who face the same goal threats without the relevant goal primes (Nash, et al., 2011). Although there is some evidence to suggest that threats that are unrelated to goals can also cause compensatory reactions (e.g. Proulx & Heine, 2008), it appears that threats that specifically impair goal-pursuit may be the most unsettling. This supports our contention that meaning is required for effective action. How, then, do people manage these feelings and return to effectively pursuing goals?

Responding to Threats to Resume Pursuit

People bother to deal with meaning threats because threats feel unpleasant, and generate emotions like uncertainty and anxiety. We hold that in order to get rid of these negative feelings, people re-engage approach-motivation, a positively valenced state well-suited to quell aversive emotions and allow for confident goal pursuit. We have begun to generate empirical support for the notion that when people respond to threats, they often enter an approach-motivated state that facilitates goal pursuit. Such reactions not only provide relief from an experiential standpoint, but they also facilitate goals.

In one study, participants high in self-esteem, who had been previously shown to be particularly reactive under threat (see McGregor, 2006a), exhibited greater approach-motivation-related brain activation (relative left frontal F7/F8 EEG activity) after a threat. Further, in a series of studies, McGregor and colleagues (2010a) provided evidence that people responded to threats by activating approach motivation, as measured by a line bisection task (Study 1), an approach motivation IAT (Study 2), and approach motivation for personal projects (Study 3). These studies converge on the idea that people cling to their meaningful ideals and worldviews because doing so promotes approach motivation and relieves anxiety.

Other research converges on the notion that restoring coherence allows for effective action. For example, people who are dispositionally high in approach motivation appear to reduce cognitive dissonance more efficiently than those low in dispositional approach (Harmon-Jones et al., 2010). These results further suggest that approach-motivated states might facilitate the restoration of coherence and "running"

with one's decisions to achieve focal goals (cf. Harmon-Jones & Harmon-Jones, 2008; Harmon-Jones et al., 2008).

So far we have seen that meaning can help people move effectively toward desired end states, that disrupting meaning can cause distress, and that people seek to manage threat-induced distress by throwing themselves into single-minded goal-pursuit or idealism. One particularly interesting avenue of applying the theoretical perspective developed so far is provided by religion. Following James' (1902/1958) dictum that religion helps to make "the sand and grit of self-hood disappear" (p. 240), our laboratories have explored whether religion might provide an effective framework for obtaining and maintaining meaning. Next, we explore evidence that religion serves an anxiolytic function as a calming beacon of consonance.

Religion and Meaning Frameworks

Religious systems are well suited to prescribe meaning. Most religious systems help believers to make sense of the world in the context of one's goals. And if one is uncertain what those goals should be, the religious system can be petitioned for guidance. Further, recent research has begun to uncover the apparent anxiolytic function that religion provides. Religious people live longer and healthier lives (Powell, Shahabi, & Thoresen, 2003; Seybold & Hill, 2001), but what can psychological science tell us about these trends? We contend that it is through religion's meaning-providing function that its adherents benefit on a day-to-day, and even moment-to-moment basis.

One key function of religion is its ordering of the perceptual world in ostensibly predictable ways. For example, invoking "God's will" as an explanation for an unexpected occurrence can reduce anxiety (Park, 2005). Might religiosity lead to a

sanguine state wherein everything appears to be right and good? And if so, how might we examine such a research question? As noted above, the ACC acts as the brain's alarm system in response to uncertainty and conflict. Might it be, then, that religiosity increases the threshold for what the brain deems a conflicted state of affairs? This seems to be the case. In two studies, Inzlicht, McGregor, Hirsh, and Nash (2009) demonstrated that religion (as assessed by two different measures) was negatively related to error-related negativity in the ACC. Extending this research in an experimental paradigm, Inzlicht & Tullett (2010) demonstrated that priming religion for believers decreased ERN amplitude. Together, these studies suggest that religious belief is generally negatively related to anxiogenic neurological processes and that engaging religious belief can situationally alter these processes (for believers).

This suggests that after meaning threats, religious ideals may help shelter people from anxiety. Indeed, McGregor, Nash, and Prentice (2010) demonstrated that, under threat, people navigated anxious uncertainty by increasing their endorsement of religiously zealous statements, such as "I would support a war that defended my religious beliefs." These results were specific to religious belief and not mere superstition (Study 1), and it was only participants who were dispositionally approach motivated who reacted to the threats with compensatory religious idealism (Study 2). Further, participants who already had avenues for channeling their approach motivation in their daily lives (i.e., being committed to their personal goals) did not respond in a religiously zealous manner (Study 3). Together, these findings suggest that people use religion to maintain meaning when it is challenged, and are buffered against threats if they are already vigorously approaching their daily goals.

How might this research help to understand phenomena outside of the laboratory? In a study of bereaved parents, Murphy, Johnson, & Lohan (2003) found that religious coping in response to the death of a child was a fairly strong predictor of making sense out of the negative events. This sense-making, in turn, predicted better long-term adjustment both physically and psychologically. Similarly, anthropological studies during the Israel-Lebanon war of 2006 (Sosis, 2007), indicate that women who lived in the north of Israel turned to religion, by citing biblical psalms, when they faced the uncertainty of missile attacks; and when they did, this relieved their feelings of anxiety and uncertainty. The lab-based research cited above can help shed light on findings like these. Although the loss of a child and the possibility of rocket attack are certainly traumatic and not easily managed, invoking religious explanations and coping strategies may help to efficiently restore predictability to the world and provide explanations for why the events occurred. This restored coherence, in turn, would allow for more optimal engagement with self and world and produce the optimal coping observed in the long term. Alternatively, a more palliative mechanism may be that religious ideals may reliably provide a haven of single-minded, motivational insulation from distress arising from incoherences in the temporal world. It is conceivable that such palliative uses of religion may provide anxiolytic value in the short term, but become maladaptive if chronic use blinds individuals to broader temporal-social considerations (e.g., religious extremism).

Conclusion

In this chapter, we have attempted to provide an account of how we process threats to meaning. The ACC, serving to detect violations of consonance, is at least one brain region involved in signaling a lack, or loss, of meaning. Its activity is experienced as a

feeling of anxiety – an uncomfortable uncertainty about what to do next – which motivates us to restore coherence. The subsequent threat-reduction process is characterized by approach-motivated processes and corresponds to left-frontal cortical asymmetry as our attention narrows and we prepare to act. More broadly, meaning frameworks–concrete systems of explanation that reduce the ambient uncertainty in the world around us–can help to buffer against the anxiety produced by meaning threats. These systems have been shown to be associated both with approach motivated processes, and with the reduction of ACC activity and anxiety in the face of threat.

The ideas outlined here are a first step in providing a neural account of what happens when our beliefs, perceptions and goals–the precursors of our actions – are out of sync, and how our brain addresses these conflicts and repairs the foundation for our interactions with the world. While work on the neurological consequences of meaning systems is still in its early stages, it should prove an interesting endeavour to discover which facets of these systems actually function to buffer from anxiety in the face of threat. Along these lines, recent research has hinted that one key component may be the assurance that we are actually capable of understanding the world around us, and that we are not simply lost in a sea of randomness (Tullett, Inzlicht, & Kay, 2010). In addition, it will be important for future research to explore how other neural processes, for instance the orienting response (Sokolov, 2002) or the P300 (Courchesne, Hillyard, & Galambos, 1975; Squires, Squires, & Hillyard, 1975), may be involved in identifying violations of coherence, and perhaps also in recruiting approach motivational resources to bring about resolution. Such research would bring us closer to outlining a common mechanism – or

perhaps a set of distinct mechanisms – that allow us to overcome the many sources of

uncertainty in the world we live in.

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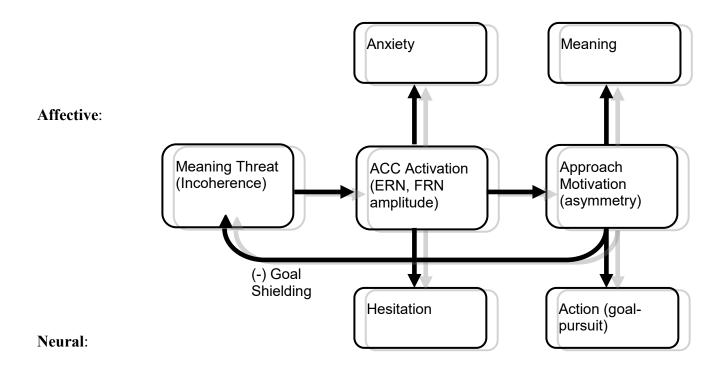
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Figure 1. When we experience meaning threats to coherence we are warned about these inconsistencies by the ACC, which causes us to feel anxiety and to inhibit our actions (to hesitate). The prefrontal cortex then kicks in to help resolve the inconsistency (directly or indirectly), and to inhibit processing of dissonant information via goal shielding. As a result, we feel a restored sense of meaning and resume goal-pursuit. Meaning acts as the "go" signal for action.

Affective:

Neural:

Behavioral: