Reconsidering the Neuroevolutionary Framework of the SEEKING System: Emphasizing Context Instead of Positivity

Commentary by Todd B. Kashdan (Fairfax, VA)

Wright & Panksepp make an important contribution by presenting their neuroevolutionary model of the SEEKING system. This system allows for the eager anticipation and discovery of various resources needed for survival, propagation, and personal growth (Panksepp, 2011; Panksepp & Moskal, 2008). In this article, attention is drawn to salient characteristics of the SEEKING system that have been left out of this theoretical account. Instead of focusing on the mental content inherent to the SEEKING system (emotions, sensations), I argue for the need to delineate contextual factors that influence the activation of this system. Furthermore, I comment on the problems of bypassing the uniqueness of human beings for a framework of SEEKING that is relevant for all mammalian species. Finally, I revisit the claim that the SEEKING system entails primal positive emotions by detailing the distress or pain that often occurs during meaning-making efforts. A functional contextual approach, which addresses when the SEEKING system helps an individual make progress toward personally meaningful goals and when this system disrupts these desired efforts, may be more promising for science and clinical work.

Keywords: curiosity; SEEKING; functional contextualism; distress tolerance

Human beings possess an innate desire to find meaning that promotes the creation of knowledge, competence, and personal growth (Baumeister, 1991; Frankl, 1963). To find or create meaning, human beings require the proper neurobehavioral mechanisms. Meaning-making would come to a halt without the ability to conjure up ideas about what the future might hold, be curious about one's surroundings and inner world (thoughts, feelings, memories), and explore these events (Kashdan & McKnight, 2010; McKnight & Kashdan, 2009).

I agree with Jason Wright and Jaak Panksepp that something akin to a SEEKING system, which subsumes each of these behaviors, would be of great evolutionary advantage in terms of survival and propagation. The aim of this commentary is to increase the precision of what is meant by a seeking or exploratory system. Instead of referring to seeking as a "primal positive emotional system" (Panksepp, 2005, 2011), I argue for a functional contextual approach. Simply expressed, of greatest clinical relevance is understanding when the SEEKING system helps an individual make progress toward personally meaningful goals and when this system disrupts these desired efforts.

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Mental content vs. context

Psychology has made great strides in developing evidence-based interventions for a wide range of disorders including anxiety disorders, mood disorders, and eating disorders (Abramowitz, Deacon, & Whiteside, 2011; Barlow, 2008). Most of these treatments are based on the assumption that human suffering can be reduced by directly changing the form and/or frequency of negative cognitions (e.g., Dobson & Dozios, 2010). Based on this model, therapists attempt to understand and influence how people interpret the events in their lives. When a therapist believes that a client's set of assumptions about him/herself, the world, and his/her future is "distorted," the therapist in turn is given assistance in how to challenge and alter mental content (e.g., Beck, Rush, Shaw, & Emery, 1979). Common techniques include assisting clients in (1) psychoeducation about the causes of suffering; (2) monitoring of negative events, beliefs about events, and emotional reactions to them; (3) restructuring thoughts to be less negative and more grounded in reality (e.g., accurate judgment of the probability of flubbing a public speech and the costs of such a failure); (4) gradual exposure to feared stimuli, with the aim of reducing emotional reactivity; and (5) scheduling activities that increase reinforcement and/or engagement with personally meaningful goals.

Meta-analyses suggest that cognitive-behavioral therapy procedures, particularly exposure-based approaches, generally outperform wait-list and placebo groups, as well as other psychosocial and pharmacological interventions (Butler, Chapman, Forman, &

Beck, 2006). A closer examination suggests that approximately 40–60% of clients at posttreatment can be described as being at a level of functioning that is significantly closer to that of healthy individuals than to that of those suffering from disorder (Jacobson, Follette, & Revenstorf, 1984). However, this means that the other 40–60% of clients are showing change that cannot be described as practically or clinically significant. For these reasons, some researchers and clinicians challenge the assumption that altering mental content is the mechanism for improving the human condition (e.g., Hayes, 2004).

There is a lack of evidence that altering the balance of negative to positive cognitions is what mediates client improvement in therapy (Longmore & Worrell, 2007). From the perspective of functional contextualism, it is more useful to identify when emotions and beliefs interfere with progress toward personally meaningful goals *and to directly target that interference* rather than the emotions or beliefs themselves (Biglan & Hayes, 1996; Gifford & Hayes, 1999). Instead of focusing on the valence of emotions or reality basis of beliefs, therapists working from a functional contextual perspective assist clients in contacting their deepest, central values and assessing their own progress toward (and struggles with) these abstract life aims (Wilson & Sandoz, 2008).

Interventions have been designed to increase engagement in the ultimate concerns of an individual—behaving in a way that is consistent with his or her deepest, central values—regardless of the emotions or beliefs he or she may experience (Hayes, Strosahl, & Wilson, 1999, 2011). This is made possible through the development of four skills: (1) defusion: changing the role of unhelpful thoughts, beliefs, and memories such that they do not dominate attention or other behaviors when present; (2) acceptance: making room for painful feelings, urges, and sensations such that they can come and go without a struggle; (3) perspective-taking: shifting points of view among different times, situations, and persons in a way that broadens experience; and (4) present-moment awareness: being fully engaged with openness and curiosity as events unfold (Hayes, Strosahl, & Wilson, 2011).

As these skills develop, unwanted mental content is not treated as requiring alteration or avoidance. Instead, clients experience and respond to thoughts, feelings, sensations, and memories in new ways. When the internal struggle for more positive and less negative mental content is abandoned, efforts can shift to contacting central values and pursuing goals aligned with these values. For instance, instead of targeting a reduction in negative, delusional thoughts in a client with schizophrenia, the aim would be to reduce the impact of those thoughts and encourage values-consistent choices. Defusion, acceptance, perspective taking, and awareness skills promote flexible ways of being in the world such that meaningful goal-striving can occur even in the presence of pain.

Clarifying the nature of the SEEKING system

The SEEKING system, as defined by Panksepp and colleagues, overlaps with the capacity of an individual to maintain the quest for a satisfying, engaging, meaningful life despite the inevitability of pain. According to Wright & Panksepp, humans and other mammalian creatures "show increased interaction with and exploration of the environment when the SEEKING system is chemically or electrically aroused, and the psychological urge evoked is one of positive euphoria accompanied by increased engagement with all of the life-supporting 'affordances' of the world." In prior work, Panksepp (2011) has emphasized that the activation of this general-purpose, appetitive motivational system spontaneously leads individuals to experience highly aroused interest or curiosity. It is this psychological manifestation of SEEKING that I turn to, as it provides a more precise understanding of how (1) SEEKING is necessary for survival and personal growth and (2) SEEKING can serve as a backdoor route to fulfill a person's psychological, physical, and social needs when related systems such as FEAR are activated (Deci & Ryan, 2000).

One of the difficulties of understanding the SEEKING system is that much of the supporting evidence stems from experimental work with laboratory mammals that have simpler minds than humans (see Wright & Panksepp). Humans have a unique ability to contact and learn from contingencies that are not immediately present (Hayes, Barnes-Holmes, & Roche, 2001). The ability to imagine scenarios that involve happiness, suffering, and mortality changes the function of the SEEKING system. For instance, it is useful with humans to distinguish between two aspects of curiosity,[1] which is the motivational state inherent to the SEEKING system (Panksepp, 2011; Panksepp & Moskal, 2008; Tomkins, 1962).

[1] For historical reasons, certain research traditions favor *curiosity* (e.g., behaviorists, personality science), whereas others favor *interest* (e.g., fields of education and affective science). Similarly, curiosity is often used in reference to stable individual differences but interest in reference to momentary states. The underlying appetitive, motivational state is the same (for a review, see Silvia, 2006, chap. 9); thus, I use them as synonyms in this article.

Bottom-up curiosity is driven by immediate data and a history of reinforcement of exploratory behavior. A novel, complex, unexpected, or uncertain event results in a sense of wonder and a desire to explore it. For instance, your romantic partner comes home from their law-firm position dressed as a centaur playing the lyre (and it isn't Halloween). Nobody has to remind you to be intrigued, orient attention, and probe further—the experience of curiosity will be rapid and reflexive. Your curiosity is comparable to curiosity elicited in a laboratory rat when the light changes color or a new hopper is installed. Introduction of a novel stimulus elicits curiosity and evokes exploratory behavior. This direct-contingency account is consistent with how individuals typically define curiosity (Loewenstein, 1994; Silvia & Kashdan, 2009; Spielberger & Starr, 1994). Likewise, the SEEKING system has been defined as being activated by novel stimulation.

What is often forgotten, especially when the scope of the analysis extends beyond human beings, is that curiosity can also be wielded intentionally in a *top-down* manner. Top-down curiosity involves purposely holding a state of awareness and openness in any given moment. For instance, when sitting down for dinner with the family, instead of resorting to the trite and contrived everyday conversation, you might pay careful attention to the subtle cues of what other people are feeling, what might be on their minds, and how you are being received. You intentionally explore what is unique in this particular moment without expecting or pursuing any specific answer or result beyond the experience itself. Unlike the lab animal, your exploration may persist even when you contact pain. Your search for the unfamiliar in the seemingly familiar is part of a larger behavioral pattern that is reinforced by engagement in the search itself. This is a class of behavior that is uniquely human and distinctive of meaning-based living (Wilson & DuFrene, 2009; Wilson, Sandoz, Kitchens, & Roberts, 2010).

It is this form of top-down curiosity that can lead to an attitudinal transformation toward people and situations that are encountered regularly and without introspection (Kashdan, 2009). For instance, there is evidence that curiosity leads to less defensive reactions to mortality salience cues (Kashdan, Afram, Brown, Birnbeck, & Drvoshanov, 2011) and less aggression in response to provocation (Kashdan et al., in press). By separating the SEEKING system into bottom-up and top-down functions, researchers and practitioners can gain greater clarity about the nature of curiosity and exploration, as well as clinical strategies that can be undertaken to increase effective goal-related behavior and a subsequent meaningful life.

Revisiting the positive emotional core of SEEKING

I applaud Wright & Panksepp for describing suffering associated with overactivation of the SEEKING system, including mania, obsession, and a wide range of addictive behaviors. Despite recognition of these tipping points (of too much SEEKING), I believe that the authors overstate empirical support for the coupling between the SEEKING system and positive emotional states (enthusiasm, euphoria, PLAY). I believe this could be extended and elaborated. For humans, curiosity and exploration may be inevitably associated with painful consequences. For one, novelty itself is challenging. We seek experiences that are consistent with our narratives about ourselves, others, and the world, and we experience a level of distress when they must be revised (Loevinger, 1987; Piaget, 1952). In addition, curiosity and exploration put us at increased risk for contacting both rewarding and aversive consequences (Kashdan & Rottenberg, 2010; Loewenstein, 1994). We humans can find pain inside the loveliest of moments. It may be that the same system that allows for new and meaningful experiences in routine or familiar situations also allows for the stressful transitions that are often required for personal growth to occur.

In fact, the pursuit of meaning may put us at particular risk for pain. Following loss and adversity, the meaning-making process often requires periods of distress (Joseph & Linley, 2006). Similarly, questioning of beliefs, identity, or personal goals is rarely described as a positive emotional experience. Contacting values may necessarily mean contacting our own vulnerabilities (Wilson & Sandoz, 2008). The ability to tolerate the inherent distress of exploring new, complex, or challenging events might even be a required attribute for the SEEKING system to move from an exploratory urge to effective action (Silvia, 2006, 2008).

Overall, I believe the evidence is less than compelling for describing the SEEKING system as a primal positive emotional system. Moreover, the use of a positive emotional descriptor can lead scientists and practitioners to overlook component parts and contextual influences of the SEEKING system.

New insights on the benefits of seeking

From an evolutionary perspective, the acquisition of new experiences and knowledge is essential for survival. But to benefit from these experiences, human beings and other animals cannot be in a perpetual state of novelty seeking. Equal attention must be granted to

synthesizing and making sense of incoming information. These incubation periods, which are essential to personal growth, require the deactivation of the SEEKING system. In a similar vein, individuals need to be able to cope with boredom, which is often a springboard to learning new information and competencies.

As an alternative to cataloging clinical disorders that reflect an overactive (e.g., substance-use disorders) or underactive (e.g., major depressive disorder) SEEKING system, I believe a more complete and beneficial analysis would result from an account of divergent functions of the SEEKING system as they relate to specific contexts. Despite decades of research on curiosity, seeking, and exploring, more studies are needed that address these variants of dynamic change over time instead of simplistic assessments of active/inactive brain systems. This includes careful manipulation of the contexts that might result in functional changes in SEEKING. Consider two examples: Under what conditions does activation of the SEEKING system result in contact with painful emotions? How can these conditions be manipulated to facilitate curious exploration despite contact with pain?

Functional contextualism emphasizes the importance of analyzing behavior in terms of its function in specific contexts (Pepper, 1942). Applications of functional contextualism in human cognition suggest that human beings are relatively ineffective at altering the mind directly with psychological strategies (Hayes, Barnes-Holmes, & Roche, 2001). Applications of functional contextualism in psychotherapy suggest that a more efficacious strategy is to manipulate context in order to change the function of the mind so that individuals can behave in ways that are aligned with deeply held values regardless of the contents of consciousness (Hayes, Strosahl, & Wilson, 2011). When the SEEKING system enables these value-congruent behaviors, the system can be viewed as helpful; when the SEEKING system interferes with these behaviors, the system can be viewed as unhelpful. Clarifying the contexts when the SEEKING system facilitates and thwarts value-congruent behavior will serve to increase the precision of the basic science and broaden the scope of subsequent clinical applications.

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