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Exploring the roles of approach and avoidance in depression: An integrative model

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ABSTRACT

Human behavior can be organized around two fundamental motivational principles: the desire to approach positive outcomes and the desire to avoid negative outcomes. Both approach and avoidance motivation are relevant to a range of psychopathology, including depression. However, with some notable exceptions, avoidance processes have been underemphasized in the literature on motivational processes in depression. This review will examine the roles that approach and avoidance play in depression and will present an integrative model of approach and avoidance processes in depression. Both approach deficits and avoidance motivation are argued to play a role in limiting positive experiences and reinforcement for non-depressed behavior, contributing to the onset and maintenance of depression. In addition, avoidance processes are argued to play a role in negative information processing biases that may increase vulnerability to the onset and recurrence of depression. Lastly, avoidance processes and dysregulation in the connections between the approach and avoidance systems may contribute to depression by promoting inappropriate perseveration in the pursuit of unattainable approach goals. Theoretical rationales and empirical evidence for each of these roles are presented. Understanding the roles that both approach and avoidance play in depression may help to inform current conceptualizations of depression and improve treatment outcomes.

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Unipolar depression is the leading cause of disability in middle and high income countries (e.g., World Health Organization, 2008) with lifetime prevalence estimated at 16.2% (Kessler et al., 2003). Depression incurs significant social and financial costs in the form of impaired relationships, lost productivity and wages (Pincus & Pettit, 2001), and significant disability (Dunlop, Manheim, Song, Lyons, & Chang, 2005). Several models of depression have focused on the role that both decreased approach and increased avoidance play in the onset and maintenance of depression (Ferster, 1973; e.g., Hopko, Lejuez, Ruggiero, & Eifert, 2003; Jacobson, Martell, & Dimidjian, 2001; Lewinsohn, 1974; Martell, Addis, & Jacobson, 2001). However, motivational research often focuses on approach deficits in depression, downplaying the importance of avoidance processes. This paper will present an integrative model of both approach and avoidance processes in depression. This model

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argues that avoidance is relevant to depression in several distinct ways. First, as suggested by past research, avoidance may contribute to depression by limiting access to sources of positive reinforcement. Avoidance may also promote negative information processing biases, a possibility that has not been explored in the literature. Lastly, avoidance processes and dysregulation in the connections between the approach and avoidance systems may allow approach perseveration (i.e., the continued pursuit of unattainable goals) to go unchecked, a factor that may be relevant to the onset and maintenance of depression (e.g., Pyszczynski & Greenberg, 1987a, 1987b). This model is the first to consider all of these disparate, yet related, processes in concert and to integrate these processes with possible biological substrates.

1. Approach and avoidance motivation

Before examining the roles of approach and avoidance in depression, it is important to consider current theoretical models of approach and avoidance and how these constructs relate to affect and emotions. Several research groups have suggested that desires to approach positive outcomes and avoid negative outcomes are fundamental human motives embodied in separate motivational systems. The approach system is variously referred to as the behavioral activation system, behavioral approach system, and behavioral facilitation system while the avoidance system has been referred to as the behavioral inhibition system and the behavioral withdrawal system (Carver, 2006). Approach and avoidance tendencies have also been described in terms of promotion (of positive outcomes) versus prevention (of negative outcomes; Higgins, 1997) and in terms of efforts to reduce self discrepancies (Higgins, 1987). Four prominent models of approach and avoidance have emerged: Gray's (1987b, 1990) reinforcement sensitivity theory, Carver and Scheier's (1990) cybernetic control theory, and Higgins' (1987, 1997) self discrepancy and regulatory focus theories. Each of these models will be described in turn.

1.1. Models of approach and avoidance

While the distinction between approach and avoidance is one of the oldest concepts in psychology (Elliot & Covington, 2001), Gray's (1987b, 1990) reinforcement sensitivity theory helped to bring these concepts back into the mainstream. This theory posits existence of three motivational systems: the behavioral activation system (BAS), the behavioral inhibition system (BIS), and the fight/flight system (FFS). The BAS, activated by signals of reward and non-punishment, elicits approach behavior and emotions of hope, elation, and relief while the BIS, activated by signals of conditioned punishment and non-reward, novelty, and innate fear stimuli, elicits behavioral inhibition, increased arousal and vigilance, selective attention, and anxiety. The FFS, activated by unconditioned punishment and non-reward, elicits aggression or escape (e.g., Gray, 1987b; Gray, 1990). Later amendments saw the FFS activated by signs of immediate present threat and eliciting freezing, defensive avoidance, and escape, while the BIS was activated by conflict between concurrent goals, inhibiting ongoing behavior and resolving goal conflict (favoring avoidance) by promoting exploration to obtain new goal-relevant information and by increasing the weight given to affectively negative information (Gray & McNaughton, 2000; see also Smillie, Pickering, & Jackson, 2006).

The BAS is thought to involve a number of cortical and sub-cortical structures, including the entorhinal cortex, amygdala, thalamus, caudate-putamen, nucleus accumbens, globus pallidus, subicular area, superior colliculus, penduclopontine nucleus, septohippocampal system (SHS), and prefrontal cortex (PFC). Glutamate, dopamine (DA), and gamma-aminobutyric acid (GABA) have been linked to approach motivation (Gray, 1987a, 1990). The BIS is based largely in the SHS, which includes the medial and lateral septal areas, hippocampus, dentate gyrus, entorhinal cortex, subicular area, posterior cingulate cortex, anteroventral thalamus, locus coeruleus, raphe nuclei, mammillary bodies, and PFC. GABA, norepinephrine (NE), and serotonin are implicated in the BIS (Gray, 1986, 1987a, 1990). Projections from the subiculo-accumbens to the caudate-putamen, PFC, and cingulate cortex also serve the BIS by interrupting motor programs and influencing perceptual functioning (Gray & McNaughton, 2000). Lastly, the FFS includes the amygdala, the ventromedial hypothalamus, and the central gray of the mid-brain, with GABA, serotonin, and endorphins implicated in regulation of the FFS (Gray, 1987a).

Importantly, these systems interact, with reciprocal inhibitory links allowing each system to suppress the others (Gray, 1987b). Corr's (2001, 2002b) joint subsystems hypothesis argues that both the BAS and BIS can facilitate approach and avoidance tendencies (respectively) and have antagonistic effects on the opposing tendencies. Behavior, particularly during goal conflict, is determined by activation in both the BIS and the BAS, with higher appetitive responses and positive emotions when BAS activation is high and BIS activation is low and higher aversive responses and negative emotions when the converse is true. Corr (2002b) provided support for this hypothesis, finding interactive effects of the BIS and BAS on both fear potentiation and punishment avoidance.

Carver and Scheier's (1990) control-theory focuses more directly on self-regulation, arguing that approach and withdrawal tendencies are embodied in partially distinct discrepancy reducing (approach) and discrepancy enlarging (withdrawal) action feedback loops. Individuals monitor their actions, compare what they see to salient reference values (i.e., goals), and take steps to reduce (or enlarge) the sensed discrepancy between their current state and the reference value (Carver, 2006). Affect conveys information about goal progress (Carver, 2001) and controls a sense of urgency towards goals (Carver & Scheier, 2008). When goal progress exceeds a criterion, positive feelings and confidence result, while progress falling below a criterion results in negative feelings and doubt (Carver, 2004). Affect, in turn, modifies behavioral output, increasing or withdrawing effort when negative affect (NA) is experienced and decreasing and reallocating effort when positive affect (PA) is experienced. This, in turn, modifies affective responses (Carver, Avivi, & Laurenceau, 2008).

Higgins (1987, 1997) has also developed theories of approach and avoidance. Self-discrepancy theory argues that individuals are motivated to reach a state where their self-concept (i.e., actual self) matches personally relevant ideal selves (representing hopes, aspirations, or wishes) and ought selves (representing duties, obligations, and responsibilities; Higgins, 1987). Ideal self-regulation involves pursuing positive outcomes and maps onto approach motivation, while ought self-regulation involves avoiding negative outcomes (i.e., mismatches to ought selves), mapping onto and predicting avoidance motivation (Higgins, Roney, Crowe, & Hymes, 1994). Higgins (1997) regulatory focus theory also has clear ties to approach and avoidance (Crowe & Higgins, 1997), with a promotion focus orienting individuals towards obtaining (and avoiding the absence of) positive outcomes and linked to approach while a prevention focus orients individuals towards avoiding negative outcomes and is linked to avoidance (e.g., Leone, Perugini, & Bagozzi, 2005). Higgins' theories are complementary; ideal self-regulation is thought to involve a promotion focus while ought self-regulation involves a prevention focus (Higgins, 1997).

1.2. Approach, avoidance, and psychopathology

Both approach and avoidance have been linked to a range of psychopathology. High BAS sensitivity (an index of approach tendencies) has been linked to drug and alcohol abuse (Johnson, Turner, & Iwata, 2003), bipolar disorder, hyperactive-impulsive ADHD symptoms, psychopathy, and bulimia, while low BAS sensitivity has been linked to depression (see Bijttebier, Beck, Claes, & Vandereycken, 2009 for a review) and social anxiety (Coplan, Wilson, Frohlick, & Zelenski, 2006; Movius & Allen, 2005). High BAS sensitivity has also been linked to antisocial, borderline, and histrionic personality features while low BAS