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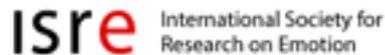
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# What is Approach Motivation?

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## Abstract

We discuss some research that has examined approach motivational urges and how this research clarifies the definition of approach motivation. Our research and that of others have raised doubts about the commonly accepted definition of approach motivation, which views it as a positive affective state triggered by positive stimuli. We review evidence that suggests: (a) that approach motivation is occasionally evoked by negative stimuli; (b) that approach motivation may be experienced as a negative state; and (c) that stimuli are unnecessary to evoke approach motivation.

## Keywords

anger, approach motivation, emotion, startle eyeblink

Science relies on definitions, ideally ones that can be empirically tested. In this article, we question the most commonly accepted definition of approach motivation and propose an alternative. Most contemporary psychological scientists define approach motivation as the impulse to go toward positive stimuli, where stimuli are external goal objects (Lang & Bradley, 2008). In contrast, we define approach motivation as *the impulse to go toward*, without specifying the valence of stimuli toward which the impulse is directed, indeed, without the requirement of any evoking stimulus.

Whereas the commonly accepted definition focuses on stimuli evoking motivation (Lang & Bradley, 2008), we posit that approach motivation may arise from *internal* processes at the trait (Gray & McNaughton, 2000) or state (Panksepp, 1998) level. We emphasize this point because definitions that posit that the organism has the impulse to move toward stimuli imply that these stimuli are necessary causes of motivation. Also, contrary to the commonly accepted definition, we posit that approach motivation may be experienced as a negative affective state. In what follows, we elaborate on this definition and our reasons for it.

In our view, any conception of approach motivation should apply to both human and nonhuman animals. If approach and avoidance are fundamental capabilities of an organism capable of movement, then we assume that these motivational systems are continuous from simple to more complex species. Behavioral

capabilities are more complex and nuanced in more complex animals, such as humans, but there should be continuity in evolved motivational systems. Thus, we question models of approach motivation that rely on human capacities such as verbal thought and cognitive framing, if similar processes would not operate in our nonhuman relatives.

Some scientists define motivation in terms of goals (Scholer & Higgins, 2008). In our opinion, goals can be rather cold cognitive constructs that may evoke motivational urges, but they are not motivation. Motivation can be analyzed at multiple levels of analysis, from relatively low levels to higher levels (Elliot, 2008). Motivation may involve or be associated with a variety of processes, such as attention and the development of plans, but we focus on the urge to act. By this view, simply moving toward an object would not entail approach motivation if no motivational urge were present. Motivation is not synonymous with behavior; motivation impels the organism to behave, but other considerations (e.g., motivations) may prevent the behavior from occurring. Moreover, moving toward an object in an effort to escape, as in defensive aggression (see following lines), is not motivated by approach, because the motivational urge is avoidance.

In this article, we discuss some research on approach motivational urges and how it clarifies the definition of approach motivation. We focus on approach motivation (rather than avoidance motivation) because our research over the last 10 or

so years has focused on approach motivation. We review evidence that supports our broad and concise definition of approach motivation (*the impulse to move toward*) by suggesting: (a) that approach motivation may be evoked by negative stimuli; (b) that approach motivation may be experienced as a negative affective state; and (c) that stimuli are unnecessary to evoke approach motivation.

### Approach Motivation May Be Evoked by Negative Stimuli

The emotion of anger is often triggered by negative stimuli and anger is often associated with approach motivation (Carver & Harmon-Jones, 2009), which suggests that unpleasant stimuli can evoke approach motivation. Anger often results from a disruption of approach; the original frustration–aggression hypothesis of Dollard, Miller, Doob, Mowrer, and Sears (1939) recognized this. This goal–frustration state of anger then results in increased approach motivation as the organism attempts to regain the goal. A number of empirical results support this conceptualization (see review by Carver & Harmon-Jones, 2009).

The distinction between offensive and defensive aggression, a fundamental distinction in nonhuman animal research, illustrates how approach motivation can be evoked by unpleasant stimuli. Offensive aggression is associated with anger and “involves attack without attempts to escape from the object being attacked” (Moyer, 1976, p. 187). In the rat, “Offense involves approach locomotion and the bite-and-kick attack” (Adams, 2006, p. 306). In contrast, defensive aggression is associated with fear, attempts to escape, and attack only if escape is impossible (Adams, 2006). In offensive aggression, “the attacker jumps or lies across the back of the opponent and bites the opposite flank,” whereas in defensive aggression, “the lunge-and-bite attack which is directed at the face or other protruding part of the opponent” occurs only if escape is unsuccessful (Adams, 2006, p. 306). Offensive aggression is often evoked by placing a rat (intruder) into the home cage of another rat (resident). The resident often responds to the intruder with offensive aggression. In a provocative demonstration of the appetitive nature of offensive aggression, Lagerspetz (1969) found that offensively motivated rats would cross a pain-inducing electrified grid to attack another rat. Defensively motivated rats would not do so, as their aggression is in the service of attempts to flee.

In rhesus monkeys, defensive aggression is associated with greater relative right frontal cortical activation and higher levels of cortisol, whereas offensive aggression is associated with higher testosterone levels and lower cortisol levels (Kalin, 1999). Research with rodents has suggested that the posteroventral medial amygdala and dorsomedial ventromedial hypothalamus are more important for regulating aggression in defensive contexts, whereas the posterodorsal medial amygdala is more important in offensive contexts (Nelson & Trainor, 2007).

If angry approach only occurred in goal-blocking situations, then it would be economical to argue that angry approach is

aimed toward a positive outcome, regaining the lost object (Carver & Harmon-Jones, 2009). However, angry approach may occur as a result of a wider array of triggers (Berkowitz & Harmon-Jones, 2004). For instance, when individuals are instructed to adopt physical expressions of anger (even when the individuals are unaware that they are creating anger expressions), they show angry physiological and cognitive responses that appear approach oriented (Coan, Allen, & Harmon-Jones, 2001; Keltner, Ellsworth, & Edwards, 1993). Thus, we suggest that anger may evoke approach motivation even in situations that do not involve removing an obstacle to obtain a desired outcome.

Does anger always orient the individual toward positive outcomes? One of the primary motivational imperatives of anger is to attack the source of anger (Berkowitz, 2012). However, anger often motivates the organism to temporarily abandon the original goal in order to attack the angering stimulus. This suggests that anger is not always directed toward a positive outcome. Although individuals may occasionally enjoy harming a person or object that has angered them, empirical evidence does not suggest that individuals need to enjoy anger or aggression in order for anger to be linked with indices of approach motivation (E. Harmon-Jones, 2004). In fact, the subjective experience of anger is rated as quite unpleasant (E. Harmon-Jones, Harmon-Jones, Amodio, & Gable, 2011).

### Approach Motivation May Be Experienced Negatively

Several theories posit that approach motivation is experienced as positive affect and avoidance motivation is experienced as negative affect (Lang & Bradley, 2008; Watson, Wiese, Vaidya, & Tellegen, 1999). The approach motivation evoked during viewing of pleasant stimuli (attractive nudes, desserts) is associated with positive affect. However, approach motivation, even when directed toward an affectively positive stimulus, is not always experienced as a pleasant state. The relationship between approach motivation and positivity is often curvilinear. For example, social approach motivation, at moderate levels, is associated with feelings of pleasant anticipation, but at high levels it is experienced as loneliness and separation distress (Panksepp, 1998).

Another exception to the principle that approach motivation is a positive state is anger, a negative affect that is often associated with approach motivation (Carver & Harmon-Jones, 2009). Animal behavior research suggests that anger is linked to approach motivation. In one study, mice were selected according to high- or low-exploratory temperament. Then they were tested in other behavioral tasks. Compared with low-exploratory mice, high-exploratory mice displayed less evidence of anxiety in a light/dark task and the elevated plus maze, demonstrated greater locomotion in an open field, and improved their performance across trials in an appetitive-stimulus maze. Most important, high-exploratory mice were aggressive in the intruder test, whereas low-exploratory mice were nonaggressive or submissive (Kazlauskas et al., 2005).

These animal behavior results have been conceptually replicated in human studies. In 4- to 9-year-old children, approach/positive anticipation, frustration/anger, and overt aggression were assessed using mothers' reports (Deater-Deckard et al., 2010). Approach/positive anticipation and frustration/anger were directly (as opposed to inversely) correlated with each other and with overt aggression. Consistent evidence has been obtained in adult humans, revealing that both state and trait self-reported anger are associated with other measures of approach motivation. Trait behavioral activation sensitivity (BAS), measured with the approach motivation scale of Carver and White (1994), correlates directly with trait (E. Harmon-Jones, 2003) and state anger (Carver, 2004), despite the lack of semantic overlap between the BAS and anger scales. That is, all BAS items assess responses to positive reward cues rather than frustration or anger.

Other studies have revealed that anger relates directly with *positive activation* (PA) as measured by the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The items on the PANAS PA scale, selected via principal components analysis (Watson et al., 1988), are: active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong; and the items on the *negative activation* (NA) scale concern mostly fear and anxiety. Watson et al. (1999, p. 827) wrote: "we now view these dimensions as reflecting two basic biobehavioral systems of activation." They relabelled these constructs positive and negative activation.

In two studies, students were exposed to a radio editorial that evoked anger: the editorialist disparaged university students (E. Harmon-Jones, Harmon-Jones, Abramson, & Peterson, 2009; E. Harmon-Jones, Vaughn-Scott, Mohr, Sigelman, & Harmon-Jones, 2004). In response to the editorial, anger and PA were directly correlated, anger and happiness were inversely correlated, and happiness and PA were directly correlated. Two subsequent studies replicated this pattern of results and eliminated alternative explanations that suggested that the anger-PA relationship was simply due to arousal and that the anger-PA relationship was due to anger being experienced as a positive feeling (E. Harmon-Jones et al., 2009). In these studies, statistically controlling for happiness increased the size of the correlation between PA and anger. In other words, when the positivity of PA was removed by controlling for happiness, anger correlated even more strongly with PA. Studies using trait measures have conceptually replicated these results (E. Harmon-Jones & Harmon-Jones, 2010). These results suggest that the PA scale likely measures approach motivation that can be positive or negative in valence.

The salience of the evaluative dimension (positive vs. negative valence) in self-reports tends to obscure content that is more closely related to motivation. The "balanced PANAS" was created by adding an antonym with the same valence as the original word for each PANAS item (Pettersson & Turkheimer, 2013). For example, the opposite of *hostile* was *meek*, and the opposite of *excited* was *laid-back*. Participants' endorsement of these items clustered strongly by valence, and not by content. When the variance due to valence was controlled for statistically,

however, items assessing anger (*hostile, irritable*) clustered close to items assessing approach-related positive affect (*proud, excited, strong*). Furthermore, these approach-related items clustered far away from both positive and negative items suggesting vigilance, including *guilty, ashamed, alert, and attentive*. These results not only support the idea that anger is related to approach, but also that the relationship between anger and approach is often obscured because valence is represented more strongly than content in self-reports (see also E. Harmon-Jones et al., 2009; E. Harmon-Jones & Harmon-Jones, 2010).

Anger is associated with approach motivation, even when approach motivation is measured at the reflex level. The inhibition of the startle eyeblink during pleasant stimuli has been interpreted as an appetitive response. Lang, Bradley, and Cuthbert (1990, p. 381) wrote: "when a foreground stimulus engages an appetitive response, a negative probe of that foreground should prompt a reflex of lower amplitude." In one study, individual differences in self-reported trait emotions were examined in relation to the emotion-modulated startle-eyeblink response (Amodio & Harmon-Jones, 2011). Trait anger, enjoyment, and surprise were each associated with smaller startle blinks during appetitive but not aversive pictures. These results suggest that trait anger, although experienced as a negative emotion, is associated with an approach-related motivational response.

Other evidence that anger shows similarities to approach-motivated positive states comes from research on the facial expression of determination. Determination is a positive, approach-motivated affect (Watson et al., 1988). The word "*determination*" appears on the PANAS, so it correlates highly with ratings of other positive, approach-related states such as interested, enthusiastic, and excited. Determination is also reported when positive approach motivation is activated (C. Harmon-Jones, Schmeichel, Mennitt, & Harmon-Jones, 2011; E. Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008). However, perceivers confuse facial expressions intended to communicate determination with facial expressions intended to communicate anger. Furthermore, the intensity of perceived anger and determination are highly correlated: the more intense a determination expression is perceived, the more it appears anger-like (C. Harmon-Jones, Schmeichel, Mennitt, & Harmon-Jones, 2011).

Even when approach does correspond to a positive stimulus or experience, the intensity of positivity often does not match the intensity of associated approach motivation. The distinction of liking and wanting illustrates this (Berridge, Robinson, & Aldridge, 2009), as does research examining physiological and cognitive responses to different types of positive stimuli (Gable & Harmon-Jones, 2010; Lang & Bradley, 2008). Together with research on anger, this research reveals that positive affective valence needs to be held conceptually distinct from approach motivation.

Does the aforementioned consideration of anger require a complete shift in how approach motivation is conceptualized, or is anger an exceptional case? Anger is not unique in being a negatively valenced state associated with approach motivation.

Our review emphasizes anger because much research has examined anger. However, other negatively valenced emotions and unpleasant stimuli can be associated with approach. For example, research has revealed that the feeling of guilt is associated with relative left frontal cortical activity (a correlate of approach motivation) when individuals strive to make reparations (Amodio, Devine, & Harmon-Jones, 2007). Also, several studies have demonstrated that dissonance reduction, which is associated with negative affect, is related to approach motivation (e.g., C. Harmon-Jones, Schmeichel, Inzlicht, & Harmon-Jones, 2011). Separation distress is an intensely unpleasant affective state associated with approach-motivated seeking and calling for the lost attachment figure (Ainsworth & Bell, 1970). Furthermore, in addition, binge eating, and pathological gambling, individuals crave stimuli that no longer bring them pleasure (Berridge et al., 2009). These few examples are not intended to be comprehensive. Approach states in which the evoking stimuli, the state itself, or both, are unpleasant are likely quite common.

### Stimuli Are Unnecessary to Evoke Approach Motivation

As noted before, individuals differ in their baseline levels of approach motivation. Relatedly, evidence suggests that approach states are not always triggered by goals; they can occur due to internal psychophysiological processes. That is, approach motivation may arise within the organism, motivating it to seek out stimuli to approach. We emphasize these points because although much research has suggested that chronic dispositions and bodily manipulations influence approach motivation (E. Harmon-Jones, Gable, & Price, 2011; see review by Price, Peterson, & Harmon-Jones, 2012), these results have not informed definitions of motivational direction that emphasize end-states, reference points, or goals (Lang & Bradley, 2008).

Panksepp's (1998) model, based on nonhuman animal data, proposes a SEEKING system, which is closely related to approach motivation. The SEEKING system is responsible for energized exploratory and search behaviors and investigation, and it does not need to be stimulated by a positive incentive. In humans, drugs that activate the dopaminergic system, such as amphetamines, can trigger the SEEKING system (Panksepp, 1998). Other nongoal stimuli, such as changes in brain chemistry due to fluctuations in light, may also trigger the SEEKING system. For example, research has found that time of day and time of year interact to influence asymmetric frontal cortical activity (a correlate of approach motivation), such that fall mornings are associated with less relative left frontal cortical activity compared to other seasons/times (Peterson & Harmon-Jones, 2009).

Other evidence suggests that approach motivation could arise from manipulations of the face and body. As reviewed before, the posing of facial expressions of approach emotions evokes increased relative left frontal cortical activity, a variable related to approach motivation (Coan et al., 2001). More recently, we found that reclining backward, a posture associated with low

approach motivation, caused participants to have less relative left frontal cortical activity as compared to leaning forward. Sitting upright fell between these two conditions, as predicted (Price & Harmon-Jones, 2010).

Along with these results, much past research has revealed that scores on self-report measures of trait approach motivation relate to resting, baseline measures of asymmetric frontal cortical activity (Davidson, 1998; Harmon-Jones, Gable, & Peterson, 2010). These results also suggest the possibility of motivational temperaments influencing baseline measures in the absence of goals. A preexisting temperament, rather than goals, may motivate one to seek out a stimulus to rage at or lust after.

### Summary and Conclusion

In conceptualizing approach motivation and conducting research on it with human participants, we attempt to integrate research and theory derived from nonhuman animal research and models. Humans are acutely aware of the conscious experience of good versus bad (positive vs. negative), and can easily verbalize these valenced experiences. Humans, however, may have less conscious awareness of motivational direction and the intensity of motivational states. This may begin to explain why most contemporary models of approach-avoidance motivation confound approach with positivity and avoidance with negativity.

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