



# Approach motivation and positive affect

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Motivation is an essential part of positive affect which is often overlooked by emotion scientists. In this article we aim to show commonalities and differences between approach motivation and positive affect and highlight dissociations between these often-confounded phenomena. We will start by providing (working) definitions of concepts related to approach motivation and positive affect. We will then discuss how approach motivation can be unique from positive affect and how extreme levels of approach motivation can disassociate from positive affect. This will be followed by a short review on how approach motivation as one dimension of positive affect impacts cognitive scope. Finally, we will address how differential aspects of reward prospect relate to approach motivation and positive affect and modulate their impact on cognition.

### Addresses

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Motivation is an essential part of positive affect. Indeed, some have argued it is important for taxonomically differentiating between positive emotions. Yet, motivation is often overlooked by most emotion scientists. One reason for this may be the lack of clarity when it comes to defining approach motivation as it relates to positive affect. Our aim in writing this paper is to focus on the conceptualization of motivation and its relation to positive affect in the hope of laying a common ground for future research on motivation and positive affect.

### Definition of approach motivation

We define approach motivation as the impetus to move towards, or the drive to approach. We choose this definition because it incorporates evidence demonstrating that

both positive (e.g. excitement) and negative (e.g. anger) states can be approach motivating [1,2<sup>•</sup>]. Also, this definition allows that individuals can have approach motivation without a specific target (e.g. object) of the approach motivation. And, it circumvents the circularity problem of object-directed definitions of approach motivation (e.g. the incentive to move toward an incentive). Also, object-directed definitions must incorporate objective and independent assessments that the object is incentivizing before determining approach motivation to the object.

It is also important to note that approach and avoidance motivation are commonly associated with emotion [3–7,8<sup>•</sup>]. In fact, affective valence (positive versus negative subjective experience) is so intertwined with approach and avoidance motivation (positive affect with approach motivation, and negative affect with avoidance motivation) that the two are frequently confounded [9,10]. However, much research has established this is not always the case — negative emotion such as anger may cause approach motivation, and not all positive affects evoke the same intensity of approach motivation [11<sup>•</sup>]. While approach motivation and positive affect are often co-occurring, the focus of the current article is to highlight dissociations between these often-confounded phenomena.

### Defining concepts related to approach motivation

When preparing this short review on approach motivation and positive affect, we (P.G. and G.D.) realized that we use different conceptualization of motivation in relation to positive affect.<sup>3</sup> And, we realized that these different conceptualizations and nomenclatures come at potentially high costs for all researchers interested in research questions of the nature of positive affective states, and more generally the effects of positive affect on cognition and behavior. Not only do we run the risk of missing important information when communities do not interact, we may also misjudge the reliability of our findings. In fact, part of the replication crisis might also be due to idiosyncratic definitions and fuzzy usage of concepts and methodological approaches, making it also a *conceptual crisis* (c.f. see Refs. [12,13]). **Table 1** therefore harbors a

<sup>3</sup> In our early discussions about this article, we realized that we avoided certain terms in our veins of research because of the difficulty distinguishing reward or positive affect from approach motivation. We were also surprised and embarrassed at the tiny overlap between references within our publications, given the actual overlap with respect to research questions and findings. The reason seemed to be mutual ignorance. After better understanding each other's perspectives, we were able to synthesize a common definition.

**Table 1**

**Concepts and working definitions. The main concepts of interest will be addressed more thoroughly in the main text**

Concept	Working definition
Approach motivation	Impetus to move towards.
Motivational intensity	The strength to approach or avoidance. A dimension of positive and negative affect.
Positive affect	A facet of affect, varying in (positive) valence, arousal, and motivational intensity inherent in conscious experience.
Positive valence	A dimension of positive affect related to the subjective experience of pleasure.
Arousal	Another dimension of affect. Neural and physiological activity resulting from diverse physiological and psychological stimuli (e.g. drugs, physical activity, emotion). Confounded with motivation, but does not have a direction.
Pre-goal positive affect	Affect in <i>anticipation</i> of goal accomplishment, goes along with high intensity approach motivation
Post-goal positive affect	Affect in <i>response</i> to goal accomplishment, goes along with low intensity approach motivation
Cognitive scope	disposition towards narrowed (local) or broadened (global) information acquisition
Flexibility	adjusting thinking and processing styles to meet task demands
Reward prospect	Pre-knowledge about reward availability
- Contingent on performance criterion	Anticipation of an incentive for good performance
- Non-contingent on performance	Anticipation of an unconditional gift
Effort	Labor one is willing or able to put into a task

(non-exhaustive) glossary of concepts with provisional working definitions.

### Does approach motivation require an object?

Perhaps because approach motivation is often associated with positive stimuli, prominent theory about approach motivation frequently include the need for a positive external object [4]. Indeed, our own view of each other's' program of research was that the other felt an object (e.g. reward) was required for approach motivation to occur. However, a closer inspection of the evidence reveals that approach motivation does not always need to be directed to an object. Motivation evoked by internal states and traits would not be dependent on an external object or reward. Prominent theories of internal states [14], and traits [15] emphasize the motivation to approach varies between organisms and does not depend on external objects. For example, performance in relation to others is internalized and tied to self-efficacy, making expectancy intrinsically oriented [16,17]. Also, manipulating body postures (e.g. leaning versus reclining) enhances approach motivation [18]. The same holds true for reward prospect. (External) cues that announce reward availability for good performance are a convenient tool to manipulate motivation in the lab, but the intrinsic reward — like

the prospect to excel oneself or someone else's performance also increases motivation. In sum, evidence suggests that external rewards are not necessary to create approach motivation.

### Approach motivation unique from positive affect

Approach motivation is not always connected with positive affect. As mentioned previously, examining positive affects by their motivational components help to distinguish between unique positive affects, suggesting that approach motivation should be considered as an important, but distinct component from positive affect. To distinguish approach motivation from positive affect, past research has manipulated approach motivation independently of affective valence. Specifically, Gable and Harmon-Jones (2008, Study 4; [19]) and Gable and Poole (2012, Study 2; [20]) experimentally manipulated approach motivation while viewing dessert pictures (a positive affect manipulation) by giving participants the expectancy to consume dessert items in pictures, or not. The expectancy to act increased approach motivation intensity, as measured by a narrowed attentional focus, shortened perceptions of time, and increased excitement/enthusiasm. The approach motivation manipulation of expectancy-to-consume, however, did not influence general positive affect (e.g. feeling glad) relative to the no-expectancy condition, suggesting that approach motivation was increased without an increase in general positive affect. Moreover, approach motivation is not always tied to positive states, and can be observed in negative states, too [21]. This is seen in certain negative emotions, such as anger [22] or sadness [23] evoking approach motivation. Examining approach motivation within positive affect is important to distinguishing between positive emotions. Indeed, emotions that vary in the intensity of approach motivation have different physiological and behavioral characteristics, but not necessarily different subjective characteristics.

### Extreme approach motivation: dissociating motivation from positive affect

Prominent theories of emotion posit that under normal, adaptive functioning, approach motivation and positive affect are connected. Perhaps this is because most past work has investigated low levels of approach motivated positive affect. At these low levels, the subjective positive experience of positive emotions and approach motivation are closely related. However, under more extreme or abnormal motivational states the association between approach motivation and positive affect begin to separate.

The need for social contact is approach motivating. At moderate levels, this need is associated with positive affect. However, intense levels of social approach motivation are experienced as distress and loneliness as current surveys during a pandemic with social distancing measures in place confirm [24]. During intense craving

states, individuals may experience strong approach motivation without experiencing an increase in positive valence. In addiction, individuals crave stimuli (e.g. drugs, binge eating, pathological gambling) that no longer bring them pleasure [25]. This work suggests that initially, liking for the substance and activity may increase with approach motivation. However, as consumption continues, approach motivation (wanting) continues to increase, while liking begins to decrease. These results suggest that over time, addiction processes independently influence approach motivation and liking in opposite direction. The turning point may be reached when the original wanting turns into a need.

Another example is in individuals with bi-polar disorder. During manic episodes, individuals will often experience intense approach motivation. This intense approach may be accompanied by feelings of euphoria, but individuals in manic states also frequently report frustration and anger [26]. Under intense states of approach motivation, individuals may be equally likely to experience positive and negative affects, suggesting the link between approach motivation and positive affect may be less strong under abnormal levels of approach motivation.

Despite prominent theory linking approach motivation and positive affect, these few examples suggest that approach motivation and positive affect may digress at extreme levels of motivational intensity. Perhaps positive affect is predominant when approach motivation is weak. However, when approach motivation is high, such as in social separation, manic episodes, or addiction, the distinction between approach motivation and positive affect becomes more pronounced.

#### Approach motivational intensity as a dimension of positive affect

Most past research examining affective states focused on the dimension of valence, but positive (and negative) affect can also vary on the dimension of motivational intensity. In the case of positive affects, some are low in approach motivation (e.g. feeling serene), and some are higher in approach motivation (e.g. feeling enthusiastic). Positive affective states higher in approach motivation often occur in the pursuit of a goal (pregoal; [27]). In contrast, positive affective states low in approach motivation occur after a goal has been achieved (postgoal).<sup>4</sup> Since approach motivation and positive affect are closely connected, it is hard to disentangle what is cause and consequence. Does the sight and smell of a warm and crusty soft pretzel trigger approach motivation and only the consumption (or the anticipation thereof) then

triggers positive affect? Or does the mere presence of a favorite food directly trigger both, positive affect and approach motivation? While there exists a lot of literature on the relationship between stimuli evoking positive or negative valence (e.g. reward/punishment) and approach behavior [28–30], whether and when positive affect comes into play is less clear.

Recent evidence suggests that positive affect high versus low in approach motivation has differential effects on cognitive scope and information processing [31]. The motivational intensity model of cognitive scope suggests that high approach-motivated affects narrow cognitive scope, while low approach-motivated affects broaden cognitive scope. For example, research has found that high approach-motivated affect narrows attentional scope, facilitates better memory for centrally presented information, shortens time perception, and narrows cognitive categorization. Additionally, narrowing of cognitive scope appears to engage neural circuitry associated with high approach motivation, further suggesting high approach motivation drives narrowing of cognitive scope in positive affect [31]. In contrast, low approach-motivated affects broaden cognitive scope facilitating better memory for peripherally presented information [32–34].

High approach-motivated affects likely narrow cognitive scope in order to facilitate the pursuit and acquisition of desirable goals by preparing an individual for tenacious goal pursuit. A narrow cognitive scope focuses cognitive resources on the desired object or goal and increases the likelihood of goal attainment [35<sup>•</sup>]. In sum, approach motivation appears to be an important dimension for distinguishing between positive affects.

#### How does reward prospect relate to approach motivation?

Approach motivation seems closely related to the motivation that is triggered by reward prospect. But then how is reward prospect different from approach motivation? Like approach motivation, reward prospect is associated with positive affect even though this link is only indirect (c.f. see Ref. [36]). Whenever you receive a reward for good performance, it makes you feel good. In fact, you may already feel good when you know that a reward is at stake, that is, the mere prospect of reward will motivate you to do better in a given task in order to then receive the reward. We mostly speak of reward prospect in the context of instrumental behavior: A certain behavior is shown in order to receive a reward (which can be extrinsic or intrinsic in nature). In this context, an important distinction is reward contingency. Only if reward is provided conditional on a certain performance criterion, this reward will increase the effort given to the task. Unconditional reward, provided independent from task performance, given as a gift, has in fact opposing effects on a broad range of cognitive processes, rather mirroring the

<sup>4</sup> Notably, what one of us was calling high approach motivation is what the other would call reward motivation. And what one of us was calling low approach motivation, the other thought of as an open-minded state experienced in conjunction with mild positive affect.

effects of positive affect low in approach motivation (for reviews see Refs. [37–40]). To give some examples how the prospect of reward modulates cognitive control: performance contingent reward prospect increases proactive control, the usage of context information and improves cognitive stability; by contrast, performance non-contingent reward prospect reduces proactive control and increases cognitive flexibility [40–43]. And these latter effects have also been found under positive affect with low motivation (in the absence of reward manipulations (see Refs. [44,45] for recent reviews). Since both performance contingent and non-contingent reward prospect are typically accompanied by positive affect, it is critical to consider the origin of positive affect when predicting its impact on cognitive control.

Another important aspect of reward prospect is its subjective experience: only participants who feel pleasantly challenged by reward cues (that depend on a certain performance criterion) show the aforementioned reward effect on performance, whereas participants who experience reward cues as pleasant but random gains, show the influence of positive affect [46].<sup>5</sup> This work highlights the important interplay of performance and reward on approach motivation. For example, before completing a task (pregoal) where they could gain a reward, people are high in approach motivated positive affect [47]. However, before completing a task where they could not gain a reward, people are low in approach-motivation and do not feel an increase in positive affect. Although both states are performance dependent, only the reward contingent task enhanced approach motivation and positive affect. After completing the task (postgoal), people are low in approach motivation, but high in positive affect if they received a reward.

Behaviorally, individuals are faster to respond in pregoal states than postgoal states, without committing more errors. Calcott (in revision) [48] examined the differential effects of reward prospect (pregoal) and reward reception (postgoal) and found selective speeding only in reward prospect trials. Individuals show a narrowed cognitive (attention and memory) scope in pregoal states, but a broadened cognitive scope in postgoal states. Other evidence has examined a rapid neurophysiological response related to reward feedback called the Reward Positivity. Enhancing approach motivation using many types of rewards (e.g. monetary, goal accomplishment, social competition, revenge; [21,34,35<sup>••</sup>]) before completing a task

<sup>5</sup> In the Müller *et al.* study [46], participants received cues that announced a reward for fast and correct responses. In a post-experimental interview, the participants were asked how they had perceived the cues. And those who experienced them as ‘nice to have’ showed a different performance pattern (comparable to non-contingent reward manipulations) as compared to those who experienced the rewards as competition (comparable to performance contingent reward manipulations).

amplifies the Reward Positivity, suggesting approach motivation enhances the value of rewards.

## Conclusion

This short overview hopefully has shown that it is important to distinguish between approach motivation, positive affect and reward. Approach motivation and positive affect are often co-occurring and much of the past research tends to confound the two. However, positive affect and approach motivation are dissociable from each other when manipulated independently and when approach motivation occurs at extremely high levels. In addition, evidence suggests that approach motivation can vary within different positive affects, suggesting that motivational intensity is an important dimension of positive affect.

Specifically, when it comes to the modulation of behavior, there is converging evidence showing that positive affect high in approach motivation and performance contingent reward, both increase cognitive stability, goal-maintenance, and narrow cognitive scope. In contrast, positive affect low in approach motivation, non-contingent reward, and unconditional pleasant experiences of mild positive affect increase flexibility and broaden attentional scope (see Ref. [49] for detail). The evidence thus far seems to converge with the everyday intuition that ‘really wanting something’ (being in state of high approach motivation or aiming for a reward for good performance) helps focusing on our goals. Whereas a state of low approach motivation and mild positive affect (be it as a result of random reward or otherwise positive stimulation) serves as a safety signal, allowing for a broadened attentional scope and higher flexibility.

Clear definitions of approach motivation and associated terms are critical to understanding the dissociation between approach motivation and positive affect. And while not every researcher in the field of cognition–emotion–motivation interactions might agree with the definitions proposed here, we hope to have raised awareness for the importance of conceptual clarifications to further the understanding across research communities. Seeing how approach motivation is distinct from positive affect in different areas of research has benefitted our own understanding. We hope future work will be able to do the same.

## Conflict of interest statement

Nothing declared.

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