

Emotion regulation choice: the role of orienting attention and action readiness

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People frequently do not regulate their emotions even when doing so would be adaptive. Further, people often use maladaptive emotion regulation strategies, despite knowledge of more adaptive strategies. We propose that such anomalies can be explained at least in part by the orienting attention/action readiness (OAAR) framework according to which people are more likely to implement a particular emotion regulation strategy when (1) they direct a sufficient level orienting attention towards initiating it, and/or (2) they have a sufficient level of action readiness with respect to that strategy because they have recently/frequently implemented it in similar contexts. We provide evidence for the OAAR framework and discuss how it might be leveraged to promote more effective regulation of undesirable emotions.

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Emotions have been called the ‘wisdom of the ages’ (p. 820) [1] since they are thought to represent the ‘evolved mind’s bet’ about maximally adaptive responses to frequently recurring environmental contexts (p. 117) [2]. However, while emotions are frequently adaptive, they can sometimes elicit responses that are undesirable in a particular context. In such circumstances individuals may choose to regulate their emotions.

Emotion regulation (ER)

Emotion regulation may be defined as the activation of a goal to modify which emotion one has, when one has the emotion, or how one experiences or expresses the emotion [3]. The process model of emotion regulation [4,5], enumerates five families of emotion regulation strategies. *Situation selection* refers to seeking out or avoiding certain

stimuli (e.g., avoiding an uncomfortable party). *Situation modification* refers to altering the situation so as to modify its emotional impact (e.g., changing the discussion from politics to the weather). *Attentional deployment* involves the selective direction of attention to alter emotion (e.g., focusing on background scenery during a horror movie). Distraction is a common strategy in this category. *Cognitive change* involves changing the meaning of the situation to change its impact (e.g., thinking of a failed exam as an opportunity for improvement). Reappraisal is a common strategy in this category. Finally, *response modulation* involves adjusting the response tendencies associated with an active emotion (e.g., not allowing oneself to cry despite feeling very sad). Suppression is a common strategy in this category.

Two puzzles related to emotion regulation

Imagine a manager getting angry about a subordinate’s performance on the job. In this situation, the manager faces two choices: he could stay with his current state and leave the anger episode to unfold without intervening; alternatively, he could launch a regulatory process to change the trajectory of the emerging anger episode. This latter option is logically most likely to occur when the manager feels that his anger is misplaced and/or undesirable in the present context. In such circumstances, we might predict that the manager would regulate his emotions (assuming that he has the ability to do so). However, people often do not regulate their emotions — even when the emotions are undesirable and they have the ability to regulate them.

This observation was empirically demonstrated in a decision context in which participants were asked to watch negatively valenced affective images in a series of trials [6]. On each viewing, they had the option of electing to reappraise in order to decrease negative affect and thus derive hedonic benefits. The cost of choosing to reappraise was a simple button press requiring negligible effort. The task was designed to ensure that participants had no instrumental motives to maintain negative emotions and were able to implement reappraisals. Surprisingly participants elected to reappraise in only 16% of trials. This brings us to our first puzzle concerning emotion regulation: Why do people frequently not regulate their emotions when they have an opportunity to do so?

Our second puzzle concerns emotion regulation choice. Different strategies have been shown to have different affective, cognitive, and social consequences [4,5]. For

example, increased use of suppression is associated with elevated negative affect [7*,8*], memory impairment [9], and high social costs. Partners of suppressors report less comfort and ease with their interaction partner [10]. Importantly, the costs that have been associated with instructed suppression in the laboratory are also present when suppression is used spontaneously in everyday life [11].

On the other hand, increased use of reappraisal is associated with decreased negative affect [4,12,13], decreased startle and autonomic responses [14,15], few if any memory impairments, and social facilitation [5*,16]. Importantly, comparable effects have been observed when research participants spontaneously use reappraisal, either in a negative-emotion eliciting situation in the lab [17], or in everyday life [8*,11].

Given such different consequences associated with different regulatory strategies, one might assume that people with experience would converge to use the right strategy in the right circumstance. However, this is frequently not the case. Individuals are known to persist with maladaptive emotion regulation strategies despite knowing that such strategies have undesirable consequences [18*,19]. For example, people persist with behaviors such as tobacco use, alcohol use, poor dietary habits, and a sedentary life-style — that may be understood, at least in part, as unhealthy ways of (explicitly or implicitly) regulating negative emotional states even when they are aware of the possibility of using more adaptive regulatory strategies [4,5*,20,21]. This brings us to our second puzzle: Why do people frequently not use adaptive emotion regulation strategies?

Both of these puzzles appear to be instances of agents not selecting emotion regulation behaviors that could maximize their value. We propose that both these puzzles may be ascribed to the influence of psychological variables that are not generally considered in the valuation calculus. Specifically, we shall focus on two variables, orienting attention, and action readiness.

The role of orienting attention and action readiness in emotion regulation

The most prominent models of attentional control have described orienting attention as being crucially linked with perception and action [22]. Individuals are quicker to perform various top-down actions when their attention is oriented toward an object and its associated actions. Levels of attention have been shown to fluctuate [23,24], and periods of high orienting attention are often replaced by periods in which individuals ‘zone out’ and do not pay attention to important cues in their environments, and therefore do not respond to them [25–27].

Although the importance of orienting attention has been demonstrated in some domains (e.g., orienting visual

attention has been shown to be an important determinant of simple choice [28,29]), orienting attention has not been directly considered in the context of emotion regulation decision making. We propose that if sufficient orienting attention is not directed toward the valuation of a regulatory option, then the value of the end-state will remain under-represented and no action will be initiated with respect to it — even though action would have been initiated had the attention-enabled valuation taken place.

Action readiness (AR) refers to the ease with which a specific action may be initiated, given the state of the individual immediately prior to that action. When AR levels are high, actions are initiated more readily than if AR levels are low. Levels of readiness for an action may be increased through recent and frequent implementation of that action [30].

In the context of emotion regulation, the action readiness of implementing a particular regulation strategy will increase with the recency and frequency of deploying that strategy in response to similar emotional circumstances/stimuli (e.g., a specific stressful event).

The role of action readiness is highlighted by studies that have demonstrated that previously encountered stimuli (e.g., words, faces, objects) elicit increased accuracy and increased speed of response during retrieval compared to stimuli that have not been encountered before [31]. Electrophysiological and fMRI findings suggest that such increased response efficiency may be driven by ‘tuning’ or ‘sharpening’ of the representation of the repeated stimulus [32,33] resulting in increased response readiness.

Further evidence for the effect of increased response readiness on behavior can be seen in priming literature, where studies that use primes that either closely resemble a desired action [34], or that result in the activation of networks that will be involved in future actions [35], demonstrate increased accuracy and initiation of behavioral responses. This can be seen as primes increasing action readiness, which in turn makes behavior more likely. Habits are another domain in which the high action readiness for certain actions can make engaging in the resulting behaviors both easy and near automatic [36], and/or difficult to break [37,38].

While such consequences of increased action readiness have been demonstrated in the cognitive domain (e.g., in the task-switching literature; [39]), they have not been analyzed for choices related to emotion regulation. However, an analysis of several real-world behavioral contexts suggest that action readiness may sometimes influence individuals to persist with inferior coping defaults even when proactive actions could have led to preferred outcomes [40]. For example, individuals sometimes retain action readiness for eating and consume foods well

past satiation [41]. In these cases, individuals often recognize the negative valuation of their default behavior (e.g., overeating), yet they continue in this behavior because of the high response readiness of their default behavior.

The orienting attention/action readiness (OAAR) framework

These constructs might help address the two puzzles described above. Perhaps people fail to regulate their emotions (puzzle 1) or engage in non-optimal emotion regulation strategies (puzzle 2) because (1) they direct insufficient orienting attention to the potential benefits of emotion regulation and/or the most adaptive emotion regulation strategy, or (2) they do not have sufficient levels of action readiness with respect to identifying opportunities to regulate and/or launching the most adaptive emotion regulation strategy in a given situation, or (3) both.

The orienting attention/action readiness (OAAR) framework considers orienting attention and action readiness, and specifies how they might work together to shape decisions related to emotion regulation. As discussed above, increasing orienting attention with respect to the outcomes associated with an action increases the likelihood of the performance of that action (main effect). Similarly, increasing action readiness with respect to an emotion regulation response increases the likelihood of its performance (main effect). Further, the OAAR framework proposes that there are also interactive effects of action readiness and orienting attention that shape the

probability of an action such as affect regulation being performed.

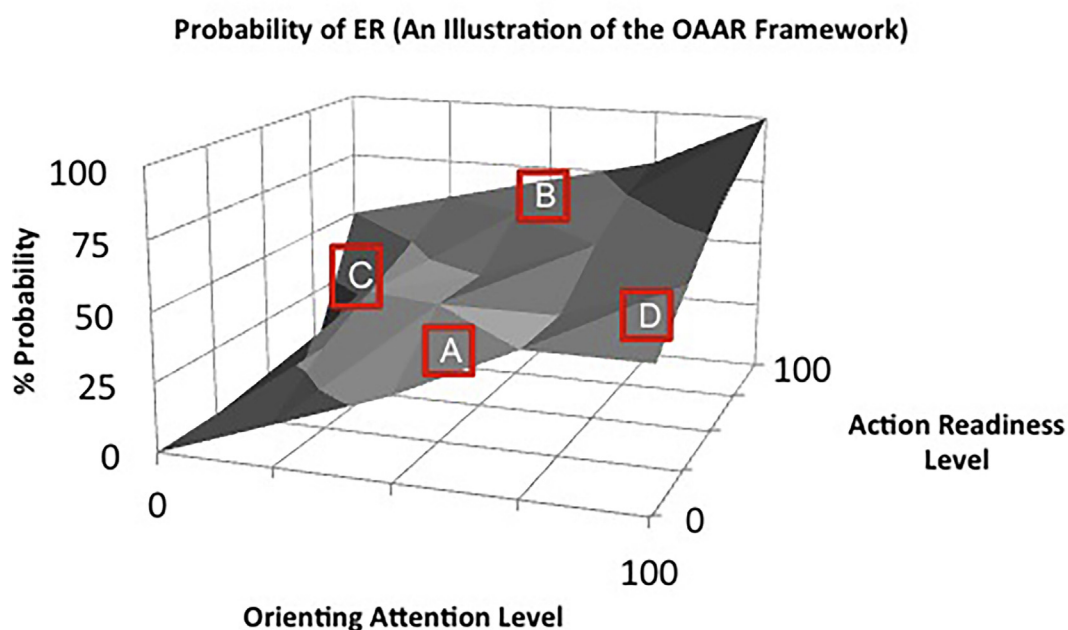
Consider the hypothetical space (suggested by prior literature and the OAAR framework) depicted in Figure 1. An identical level of orienting attention (e.g., for the points A and B) may have different effects depending on the level of action readiness. At low levels of action readiness (e.g., at A), the orienting attention may be extremely impactful, but less so at higher levels of action readiness (e.g., at B). Similarly, identical levels of action readiness may have differential effects based on the level of orienting attention (e.g., for points C and D).

Leveraging the OAAR framework to improve emotion regulation

If poor regulatory decisions are caused by insufficient levels of orienting attention and/or action readiness, then it is important to consider avenues that increase these levels in a simple and scalable fashion.

For example, to increase levels of orienting attention, participants could receive a unique and salient sound (occurring with pre-determined frequency) on their mobile-device. This sound could — via prior training — act as a cue to launch adaptive emotion regulation at the next opportunity. It could be delivered based on temporal patterns of recurring emotions tailored to that individual. Similarly, to increase levels of action readiness, participants could receive in-lab practice in regulating idiographic emotion triggers using adaptive forms of

Figure 1



The probability of initiating emotion regulation is a function of orienting attention and action readiness (points A–D are defined in the text).

emotion regulation. This initial practice would increase participants' readiness to proactively implement these practiced regulatory strategies.

Sequencing interventions involving orienting attention and action readiness could enable an optimal leverage of the interactive effects of these two variables. For example, evidence suggests [6,20] that people often do not use helpful emotion regulation strategies in contexts in which it would be useful to do so. Thus, early on in an intervention, levels of AR may be low. At these times, increasing orienting attention (e.g., via a phone sound) may be extremely impactful. Later in the potential intervention, it may be more productive to focus on action readiness — for example, via implementation intentions [42]. While we have specifically focused on emotion regulation, the principles of the OAR framework can be applied to other domains as well. For example, in the early stages of skill learning, orienting attention is paramount and required throughout the learning process, while as one continues to gain competence — or increases their action readiness — the function of orienting attention may shift toward being an initiator of behavior.

We believe that understanding the influence of orienting attention and action readiness in emotion regulation will lead to more adaptive regulatory choices, which in turn could spawn a virtuous cycle. Episodes of successful emotion regulation — enabled by manipulating these two variables — could increase individuals' self-efficacy regarding their ER capabilities. This may in turn lead to a greater degree of motivation, [43,44], in both personally leveraging the OAR framework and in pursuing more adaptive forms of emotion regulation. This in-turn could decrease individuals' relying on less adaptive and unhealthy forms of emotion regulation.

Conflict of interest statement

Nothing declared.

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