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Dissecting the Elephant: Cognition, Emotion, and Motivation as Distinct but Intertwined Entities

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Dissecting the Elephant: Cognition, Emotion, and Motivation as Distinct but Intertwined Entities

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Abstract

Cognition, emotion, and motivation are mental processes that can be separated conceptually, but show considerable overlap. Together with perception, they are typically, although not always, integrated in our mind. Based on definitions of the four processes, I derive conclusions about the amount and nature of overlap. Specifically, I argue that most motivational processes involve cognition, and that cognition typically is motivated. Similarly, motivation often comprises emotion, and emotions can include motivational components. Nevertheless, given that they represent different facets of the mental system, it is still useful to distinguish between the three constructs. In closing, I discuss implications for the assessment of motivation and for motivation interventions.

Cognition, emotion, and motivation make up our mental world, along with perception. However, these four mental faculties overlap more strongly than previously thought. Let us first look at usual definitions of the four constructs and then inspect their relations (Figure 1). In conclusion, I will outline implications for the assessment of motivation and for motivation interventions.

Definitions: Perception, Cognition, Emotion, and Motivation

Perception can be defined as mental representations of current reality, based on information that is provided through our senses. Perception can comprise both information about the external world, as provided, for example, through our visual and auditory senses, and information about the internal world within our body (intero- and proprioception). The term *cognition* comes in two variants in cognitive science. In the first, broader variant, all types of mental representations are called cognition. From this perspective, perception is one type of cognition. In the second, more specific variant, cognition denotes mental representations that go beyond sensory information by transforming such information or by representing past, future, or hypothetical reality. Using this variant, cognition is conceptually separate from perception. In the following, I will use the broader conception (perception as part of cognition) for the sake of simplicity; that is, by "cognition" I mean cognitive representations of sensory as well as non-sensory information.

The term *motivation* is used to depict mental processes that shape the goal direction, intensity, and persistence of behavior. As I explain in my contribution on the definition of motivation (Pekrun, 2021), prime examples are mental representations of desired states and actions, such as goals and intentions, which I propose to call *core motivation*. Given this definition, core motivation includes two components: a cognitive representation of states or actions, and the feeling of desire. As such, core motivation combines cognition and feeling. For example, motivation to meet a friend includes a cognitive anticipation of talking to the

friend (i.e., a cognitive representation of possible future reality), combined with the desire to see this possible reality become factual reality. The feeling component of motivation seems a necessary constituent of motivation – without desire, a cognitive representation of a possible action remains "cold" cognition. An open question is whether the feeling of desire alone would also be sufficient to constitute motivation (depicted as area #3 in Figure 1). If it is possible to sense desire without imagining wanted states or actions, then desire alone might be considered sufficient. An undirected desire to act in random ways, as in hyperactive and manic states, may be an example.

Finally, *emotions* are commonly defined as sets of coordinated psychological processes in response to subjectively important phenomena, such as important events (e.g., an exam, one's wedding), people (e.g., one's partner or children), or objects (e.g., one's home). The processes constituting emotion can include affective, cognitive, motivational, physiological, and expressive components (see Scherer & Moors, 2019). For example, anxiety comprises nervous, uneasy feelings (affective), worries about possible negative events (cognitive), motivation to avoid or prevent these events (motivational), physiological arousal (physiological), and anxious facial expression (expressive behavior). However, whereas the affective component is core to the concept of emotion, the other component processes need not be part of an emotional episode. All five are present in the prototypical case; in less prototypical cases, one or several of them may be lacking, such as lack of any specific cognitions when simply enjoying a bright sunny morning, or the sound of the waves lapping on the shore.

Relations Between the Constructs

From these definitions, it follows that motivation overlaps with cognition and emotion (see Figure 1). Let us first consider the overlap with cognition. Defined as mental representations of desired states and actions, core motivation includes one specific type of

cognition (area #5 in Figure 1). Cognitions that refer to other topics do not qualify as motivation (area #1). As such, from a cognitive perspective, the relation between the constructs might be conceptualized as a part-whole relation rather than a relation between separate entities. However, as outlined above, it is important to note that core motivation comprises one additional component that is specific to motivation and distinguishes it from other types of cognition, namely, the feeling of desire. Even cognitions related to actions do not qualify as motivation if there is no desire. For example, if I remember episodes from the past but do not feel any desire to act upon these memories, then the memories are cognition but not motivation. As such, there is overlap between motivation and cognition, but the two are still different constructs. Not all cognitions are motivation, and motivation does not consist of cognition alone.

Second, motivation also overlaps with emotion. Specifically, given that emotions can include motivational components (i.e., mental representations of desired states and actions), motivation can be part of emotion (area #6). However, although prototypical emotional episodes include motivation, emotions do not always include motivational components. For example, free-floating anxiety that does not relate to any specific object can come without any imagination of desired states or actions. Similarly, being in a joyful mood does not need to imply specific motivational tendencies. As such, there can be emotion without motivation (area #2). Given that negative emotions typically serve to prepare specific action (such as fight and flight in anger and anxiety, respectively), whereas positive emotions may serve to broaden one's cognitive horizon without any specific need for action (Fredrickson, 2001), emotion without motivation may be more frequent in positive emotions than in negative emotions. In sum, emotion can comprise motivation, but it can also come without motivation.

Conversely, although motivation is often part of emotion, it can also come without emotion (area #3). For example, I can desire to get my planned work done today, or to eat

because I am hungry, but my mental representation of these desired actions need not involve any specific emotions. As such, motivation and emotion are constructs that can be separated conceptually. They overlap, but one is not part of the other as in a part-whole relation. More typically, however, the two are integral components of one and the same psychological process, as is cognition. For example, the anxious wish of a student to avoid a pending exam is motivation, emotion, and cognition at the same time (Pekrun, 2006). While it is possible to decompose these components analytically, they are typically facets of one integrated system of mental and physiological processes (area #7). We can dissect the human mind (the 'elephant'), but need to be aware of its holistic, integrated nature.

Implications for Assessment and Intervention

The overlap between cognition, emotion, and motivation has important consequences for the assessment of these constructs and related intervention. Specifically, the close relations between motivation and emotion make it difficult, or even impossible, to assess them in empirically distinguishable ways. The overlap between the constructs is reflected in overlap between related measures. This is a problem for any research on the relations between emotion and motivation variables – to the extent that they measure the same phenomena, empirical relations between the measures may be boosted by overlap rather than reflecting relations between independent constructs.

For example, self-report measures of motivation often comprise items reflecting emotions, and self-report measures of emotion often include questions reflecting motivation. A case in point is measures of intrinsic motivation that include items asking for enjoyment. For example, the intrinsic motivation scale of the Intrinsic Motivation Inventory (IMI; McAuley et al., 1989) developed to measure motivational constructs of self-determination theory (Ryan & Deci, 2017) contains items such as, "I enjoyed doing this activity very much." Items of this type imply that motivation is measured through emotion. Conversely, emotion

measures such as the Achievement Emotions Questionnaire (AEQ; Pekrun et al., 2011) include items assessing the motivational component of emotions (e.g., "Certain subjects are so enjoyable that I am motivated to do extra readings about them" as an item assessing learning-related enjoyment) These items measure emotions through motivation. Furthermore, even if motivation items do not explicitly reflect emotion, and if emotion items do not explicitly mention motivation, items can be understood by respondents as referring to integrated motivation-emotion episodes rather than to separate processes.

The resulting construct overlap between measures presents a conundrum for researchers. To solve the problem, it would be possible (and is sometimes recommended) to leave out emotion items from motivation measures, and leave out motivation items from emotion measures. However, while such a procedure may render empirical scores and relations between variables that are less affected by overlap, it also implies reducing the construct validity of the measures. Reduced measures would be less suited to capture the richness of the multiple components of motivation and emotion.

Similarly, overlap between motivation and emotion affects the design, procedures, and outcomes of interventions. Designers of motivation interventions typically aim to change motivation and do not consider effects on emotion, and designers of emotion interventions aim to modify emotion and are less concerned about motivational effects. However, given the close relation between motivation and emotion, motivation interventions inevitably also affect emotion, and emotion interventions affect motivation. For example, attributional retraining which was conceptualized to change students' motivation likely also affects their emotions, thus possible being suited to change both motivation and emotion (see Perry et al., 2014).

The dual nature of motivation and emotion interventions also implies that interventions targeting motivation might have undesired effects on emotions, and interventions targeting emotion undesired effects on motivation. For example, if a motivation

intervention aims to boost the perceived value of actions and outcomes, we need to consider that high value can intensify not only motivation but also resulting emotions – both positive and negative. For example, increasing the importance of success and failure may not only strengthen students' achievement motivation but also their test anxiety.

Finally, similar principles hold for interventions targeting cognition, given the overlap between cognition, on the one hand, and emotion and motivation, on the other. Cognitive treatments aiming to change cognition, such as skills training to improve problem solving strategies, can at the same time exert effects on motivation and emotion. As such, we need to be aware of the overlap between the three constructs. This awareness is important when designing interventions because there may be effects in all three domains, rather than only effects in the target domain of the intervention.

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Figure 1

Cognition, Emotion, and Motivation: Conceptual Overlap
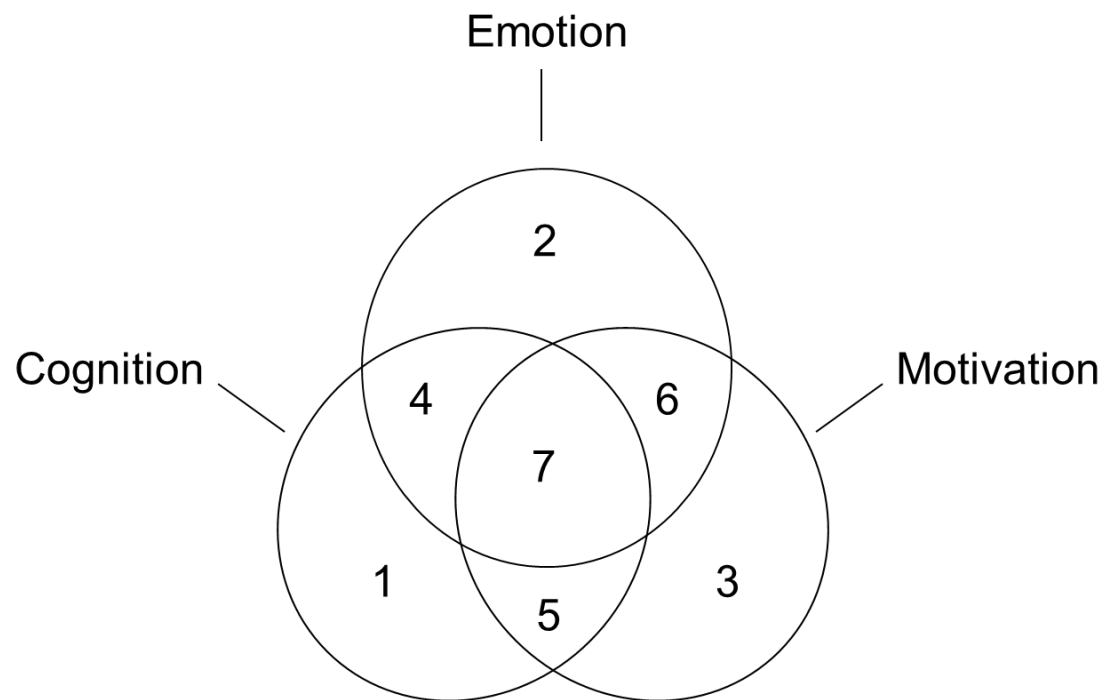
Note. The size of the seven sub-areas serves visibility but does not represent frequency of occurrence. Area #7 (representing cognition, emotion, and motivation as facets of an integrated process) is thought to be the most typical case.