Author Reply: Emotional Episodes Are Action Episodes

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Eder (2017) denounces boxology in mental-level explanations, the practice to represent mental mechanisms between inputs and outputs as a series of boxes (labeled nodes) that are connected with lines and arrows. Boxology can be a heuristic tool for analysis if it is done with the right units. We agree that boxing emotion is not helpful, but we do think there is merit in boxing other things. Boxing emotion suggests an entity view of emotion, that is, the view that the set of emotions is an adequate scientific set, with instances that share a deep commonality. Talk of the relation between emotion, motivation, and action and talk of emotional and behavioural systems presuppose such a view. For instance, when Gendolla (2017) writes that he misses a truly motivational perspective, one that stipulates the various ways in which emotion influences motivation, he presupposes that emotion and motivation are different things. Likewise, when Blakemore and Vuilleumier (2017), Hochstetter and Wong (2017), Nanay (2017), and Scarantino (2017) put forward emotions as causes of actions or as influences in various stages of action episodes, they presuppose that emotion and action are different things. The separation of emotion from motivation and from action is incompatible with the consensus in contemporary emotion theories that emotional episodes are comprised of multiple components, including goals and action. It has been argued, moreover, that identifying one or more of these components as "the emotion" is an arbitrary enterprise, and this entails that emotion cannot easily be put in a box (Moors, 2017).

We argued that an emotional episode is in fact an action episode or action cycle comprised of the following boxes: (a) the detection of a discrepancy between a first goal and a stimulus; (b) a second goal to reduce the discrepancy; (c) a third goal to either engage in a specific action, to choose a different first goal, or to bias interpretation of the stimulus depending on the utilities of these options; (d) an overt action (if this was selected in c); and (e) the outcome of this action, which forms the stimulus input to the next cycle. We also suggested that action cycles may range from being more to less emotional, based on the value of the first goal and hence the degree to which the stimulus is goal relevant. This fits with Nanay's (2017) position that no action cycle is completely nonemotional. Note that emotion is not seen here as an entity as captured in the noun "emotion" but rather as a mode of action captured in the adjective "emotional" (Schafer, 1976). As argued elsewhere (Moors, 2017), however, the criterion of goal relevance qualifies as a descriptive but not a scientific criterion for ranking action cycles from more to less emotional.

The boxes corresponding to the representations of values and expectancies of action outcomes do not invoke "a homunculus that ponders about the benefits and feasibility of an action course" (Eder, 2017, p. 335). These representations may be computed on the spot, but they may also be activated via associative mechanisms (e.g., de Wit & Dickinson, 2009). Eder's (2017, p. 335) proposal that "emotional appraisals can direct action through the interface of ideomotor mechanisms" seems to fit in the category of stimulus-driven processes. Although our model leaves room for stimulus-driven processes to determine behavior, we specifically hypothesised that goal-directed processes would be dominant.

The action cycle described before resembles the cycle proposed in predictive coding models (see Railton, 2017; Ridderinkhof, 2017), except that the former cycle starts with a discrepancy between a stimulus and a *goal*, whereas the latter cycle starts with a discrepancy between a stimulus and an *expectation*. Expectations differ from goals in that they do not have a value. People may expect a state of affairs that they do not care about. We therefore doubt that discrepancies with pure expectations will be sufficient to move the organism to action.

All mechanistic accounts, whether framed at a higher or lower level of analysis, put components into boxes (e.g., see also Ridderinkhof, 2017). Boxes can be numerous and relations among them need not be linear and feed-forward but may also be complex and backward. It is not because actions have outcomes and that these constitute the stimulus input to the next cycle that it is pointless to distinguish between the stimulus input and outcome of a single cycle (cf. Eder, 2017). Moreover, we argued

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that there are multiple action cycles, and that lower order cycles are hierarchically embedded in higher order cycles. Such a hierarchical organisation is not just appropriate when moving to higher levels but also to lower levels of analysis. The goal to flee can give rise to a sequence of lower order goals to move the legs in certain ways. These, in turn, give rise to even lower level motor representations (Mylopoulos & Pacherie, 2016).

This three-step cascade (higher order goals, lower order goals, motor representations) already partially fills the gap that Nanay (2017) identifies between the goal to act and the overt action, but not fully. He proposes to fill in the remainder of this gap by resorting to emotions. Here again, an underspecified emotion box is endowed with causal powers. But what if there is no gap to be filled? According to James's (1890) ideomotor principle, any action representation will be directly manifested in overt action unless it is overridden by a stronger, competing action representation. On this view, no additional fiat (or goal to act on the action representation) is required, and the risk for infinite regress (see Railton, 2017) is gracefully sidestepped.

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Author Reply: Affect, Value, Uncertainty, and Action

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Abstract

Value and uncertainty are the critical components of decision and action. To think of the affective system as at the core of action is to draw attention to the role of affect in representing and combining these two dimensions, and orchestrating a wide range of mental capacities—attention, perception, memory, inference, motivation, and monitoring—in light of these evaluative representations. The commentators have helpfully enriched our appreciation of the various ways in which affect can contribute to the attunement, cuing, motivation, control, and ongoing assessment of decision and action.

Keywords

affect, control, uncertainty, value

I'd like to thank the commentators for their thoughtful replies to our collection of articles on emotion and action. And I'm especially grateful to Gregor Hochstetter and Hong Yu Wong (2017) for their extended discussion of my article, "At the Core of our Capacity to Act for a Reason." Hochstetter and Wong underscore the important point that action, like most higher level psychological phenomena, involves a layered array of systems and processes, central and peripheral, direct and indirect. No single system is likely to suffice, and I certainly didn't take my claim that the affective system is "at the core" of our capacity to act for a reason to imply the affective system *suffices* to account for the complex phenomenon of action. For example, consider the complex "job description" for the circulatory system—to deliver oxygen, nutrients, antibodies, hormones, etcetera to the body, while removing various wastes and toxins. To say that the heart is at the core of the circulatory system is not to say that the heart alone fills this "job description," only that it plays a central, indispensable role in it. Why, if the affective system cannot by itself fill the "job description" for acting for a reason, might one say that it nonetheless lies at the core of that phenomenon?

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