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In response to: **A critique of motivation constructs to explain higher-order behavior: We should unpack the black box**
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Motivational constructs: Real, causally powerful, not psychologically constructed

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Andrea Scarantino

Abstract

Murayama and Jach criticize the use of high-level motivational constructs in psychology, urging psychologists to “unpack” the black box. These constructs are alleged to be “psychological constructions” with no causal powers of their own. I argue that this view is mistaken, and that high-level motivational constructs are causal even when unpacked in terms of underlying computational, algorithmic, and implementational processes.

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The positing of motivational constructs results from *black-box inferences*, which consist of surmising, upon observing causes generating effects in a system, that an intervening variable mediates between them (Sober, 1998). These inferences allow psychologists to posit that an organism does what it does because of *thirst*, *fear*, or *need for competence*, just as they allow biologists to posit *genes*, physicists to posit *protons*, and sociologists to posit *socioeconomic status* in their explanatory practices.

Murayama and Jach (M&J) criticize the use of high-level motivational constructs in psychology like *need for competence* or *need to belong*, urging psychologists to "unpack" the black box. What is the rationale for this unpacking? Marr (1982) distinguished three equally important levels of analysis: A *computational level* describing the function computed by a system, an *algorithmic level* describing the representations and algorithm used to compute such function, and an *implementation level* describing how the representations and algorithm are physically realized.

The authors declare allegiance to this framework, but add that, once a computational analysis has been offered, high-level motivational concepts lose their causal relevance – high-level motivational constructs are mere "psychological constructions" with no causal powers of their own. Given the centrality of the notion of psychological construction, the target article says regrettably little about it. The authors claim to echo constructionism about emotions, so we are left with the impression that what makes emotions psychologically constructed (if anything) is what makes motivational concepts psychologically constructed.

Some brief remarks on psychological construction appear in a discussion on *affiliative motivation*. Ordinary people observe one another, note a tendency to affiliate with certain social groups and make a black-box inference that people "have an affiliative…motivation." The problem is that affiliative motivation is not "itself represented in our mental computational processes," but results from "people's subjective construction of…mental processes, and should not be considered as the determinant of behavior." In other words, affiliative motivation is a psychological construction rather than a real cause, that is, just a convenient way for an external observer to interpret behavior. This analogy is problematic, because ordinary people and scientists are not engaged in the same activity when they make black-box inferences. Scientists posit motivational constructs which aspire to be scientifically explanatory; ordinary people posit motivational constructs which aspire to be explanatory in the folk psychological sense. The fact that a construct has its origin in ordinary language, as *affiliative motivation* does, does not settle the question of whether it has "theoretical status" in science.

Consider the ordinary language constructs of *water* and *air*. The difference between them is that water – defined as H_2O – can be embedded in chemically interesting generalizations, whereas air is too heterogeneous for that purpose, from which it follows that water has

theoretical status in chemistry, and air does not (Moors, 2022). This is precisely what psychological constructionists have argued for emotion concepts. On their view, the trouble with emotion concepts is not that they are naïve concepts, but that they are naïve concepts like *air* rather than like *water*: They do not share physical properties or mechanisms of interest to affective scientists and therefore are not natural kinds (Barrett, 2006; see Scarantino, 2015 for a response).

This constructionist punchline is missing entirely from the target article: No evidence is provided that motivational constructs do not allow for interesting psychological generalizations. On the contrary, the authors acknowledge that "motivation constructs… have great utility in that they can make generalizable predictions," they can "make our explanation parsimonious," and they "can inform researchers of potential intervention programs." This reads like a prima facie case for giving motivational concepts natural kind status in psychology, contrary to what psychological constructionsts have claimed about emotion concepts.

But M&J add that "we should not interpret these empirical findings as evidence that high-level motivation constructs directly cause behavior." They seem to assume that if there is a lower-level computational explanation available, the higher-level motivational explanation stops being causal. But what does it mean for A to cause B? The authors appear to endorse an *interventionist account* of causation, according to which A causes B just in case intervening on A is an *effective strategy* for changing B.

On this interventionist view, motivational constructs are straightforwardly causal: If you intervene on *thirst* (a low-level naïve motivational concept they have no qualms with), you can change drinking behaviors, and if you intervene on *need for competence*, you can change exploratory behaviors. Even if we follow M&J in presupposing that *need for competence* motivates by virtue of a *computational process* which pursues the rewarding value of information, it remains true that intervening on the need for competence is an *effective strategy* for changing exploratory behaviors.

M&J's argument also proves too much: It could be used to undermine the causal powers of computational variables themselves. If lower-level causal explanations exclude higher-level ones, we would have to conclude that the algorithmic and implementation processes underlying reward maximization deprive the computational variables of causal powers. Physical processes at the subatomic level may end up being the only genuinely causal processes on this view, assuming that there are no lower-level physical processes below them. I assume the authors would not welcome this implication.

I suggest that the trouble with *need for competence* is not that it lacks causal powers, but rather that it is too heterogeneous as a motivational construct, because it purports to explain behaviors as diverse as the exploration of potential majors by a university student

and the exploration of a maze by a rat. Such behaviors are fundamentally different not necessarily at the computational level – if we accept the ubiquity of reinforcement-learning models – but certainly at the algorithmic and implementation levels (cf. Piccinini, 2020).

To conclude, I agree that we should not limit our explanations of behavior to the mere positing of motivational constructs, and we should thoroughly investigate their lower-level realizers. The reason is that a full understanding of how causally powerful motivational constructs cause behavior demands figuring out their computational, algorithmic, and implementation dimensions, which can guide us to discovering the most fruitful natural kinds at different levels of behavioral explanation.

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