Motivation resides only in our language, not in our mental processes.

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Abstract

“Motivation” is one of the most popular and important concepts in psychology. But what is motivation actually? To answer the question, in this essay, I argue that motivation does not exist in our mental processes --- rather, motivation is a naïve linguistic expression that loosely represents emergent properties of underlying mental processes. Therefore, there are no definitive features of motivation, and there is no such entity in our mental processes. As an example, I showed that a reward-learning framework of knowledge acquisition can sufficiently describe autonomous behaviors often attributed to “need for competence”, without assuming the existence of such motivation. I further argue that the term motivation is so useful to explain behavior that it could often even stop us from thinking deeply about our mental processes, potentially preventing the mechanistic understanding of human mind.

Motivation is a naïve or folk concept. Long before researchers started studying motivation in a scientific manner, the word “motivation” existed. Therefore, we should not expect that there is a scientific definition of the term “motivation”. So my quick answer to the question of what motivation is, “we cannot define motivation”. Not surprising? Indeed, this is a bit of a boring answer to the question. But by realizing the fact that motivation is a naïve concept, you can get to a somewhat deeper answer to the question “what is motivation?”: In my view, motivation is a convenient word in our language that can explain a host of coherent subjective experiences but is actually not necessary to describe exact psychological mechanisms underlying human behavior. In other words, motivation does not exist as part of mental processes.

Rather than discussing my point at a high-level, let me illustrate it using one example. Think about “need for competence” in the self-determination theory. Need for competence (Deci & Ryan, 1985; White, 1959) is a popular construct of motivation, defined as people’s need to be capable of understanding and exerting an effect on surrounding environment (Legault, 2017). In short, it represents people’s innate motivation to feel competent. Numerous studies have found that need for competence is a critical motivational construct that predicts human behavior and psychological adjustments (e.g., subjective well-being).

I have no doubt about the explanatory power of this motivational construct. But let’s think more deeply about *how* people achieve such competence. Murayama et al. (2019; see also Murayama, 2019) offered a theoretical mechanistic framework to understand people’s autonomous behavior based on reward-learning models (Figure 1). This framework posits that people obtain a rewarding feeling by acquiring new knowledge (e.g., understanding a new concept in statistics). In other words, knowledge has rewarding value. In recent years researchers have proposed many computational models to understand what characterizes knowledge that is more rewarding than other types, but my intention is not to discuss these different models in detail (for an excellent review, see Oudeyer & Kaplan, 2009) --- this is irrelevant here.

According to the framework, when people are aware of the lack of certain knowledge (e.g., “I don’t understand multiple regression”), people have a (conscious or unconscious) cognitive representation of an expected rewarding value of the knowledge (e.g., “understanding multiple regression would make me feel better”). This initiates people’s information seeking behavior (e.g., reading a text book, listening to lecture, mentally trying to understand the concept, etc.). When this information seeking behavior is successful and people acquire some knowledge (“I understand this part a bit”), this gives them a rewarding feeling, which strengthens the represented value of the information seeking behavior. This increases the future likelihood of people engaging in the information seeking behavior again. As you may understand, the idea is based

on traditional behavioralism (i.e. reward strengthens behavior) but is different in many important ways.

Figure 1: Reward-learning framework of knowledge acquisition (adopted from Murayama et al., 2019).

First, as noted above, the source of rewarding feelings is not limited to extrinsic incentives such as food or money --- the framework posits that the evolutionary process has provided knowledge acquisition with inherent rewarding value (Gottlieb & Oudeyer, 2018). Second, unlike extrinsic rewards, the reward-learning based on knowledge acquisition has an inherent property that supports the sustainability of information-seeking behavior (Murayama et al., 2019). For example, the acquisition of new knowledge is likely to open up new questions that may stimulate further information seeking behavior (e.g., “what is the difference between multiple regression analysis and correlation analysis?”). Acquisition of new knowledge can also boost the rewarding value of new knowledge (e.g., “As I come to understand the basic concept of multiple regression, I better understand the value of learning more about it”). Third, new knowledge also increases people’s capability (or skills) of understanding more difficult concepts (e.g., “now I am ready to understand other linear models”), which can further facilitate information seeking behavior. When we self-regulate behavior based on extrinsic rewards (e.g., money), we need to have a constant supply of extrinsic rewards (e.g., if your company stops paying your salary, you would be demotivated). But reward-learning based on knowledge acquisition is more sustainable as the system itself works in a way that boosts the information-seeking behavior and the rewarding value of knowledge itself.

It is not important to understand the details of the framework for this essay. Also, the framework itself is not that novel of an idea. In recent years, researchers from interdisciplinary fields such as cognitive science, computational modelling, robotics, and neuroscience proposed a number of similar models to explain people’s autonomous behavior, and most of these models are computationally implemented (Baldassarre & Mirolli, 2013). Some are even implemented in robots (Adrien Baranes & Pierre-Yves Oudeyer, 2013). Figure 1 is just a rough summary picture of these various specific models.

The important point is that, when an agent behaves according to Figure 1, the agent actively seeks information and boosts its knowledge to understand the external world. The agent is autonomously engaged in making sense of the world, and it can also purposefully improve its skills to overcome challenge. That is, the agent looks as if it is motivated to satisfy a need for competence, even if need for competence is not represented in the model at all! Look at

Figure 1 again. There is no “need for competence” in Figure 1. There is also no box representing “motivation” in Figure 1. The framework describes a “mechanism” of how people engage in autonomous knowledge acquisition and the mechanism does not need any concepts of something like “need for competence” or “motivation”. Seeking competence is an emergent property of this mechanistic framework. This is what I mean by saying “motivation does not exist as part of our mental processes.” With the simple (and relatively uncontroversial) presuppositions that our decision making is guided by rewarding values and that knowledge itself carries a rewarding value, we can reasonably explain so-called “motivated behavior”, without using the term of motivation or need.

Some may argue that motivation is still implicit in the figure --- we need motivation as a concept that drives behavior in our mental processes. For example, you can argue that motivation is inherent in the vertical arrow between “awareness of knowledge gap” and “information seeking behavior” in Figure 1. I agree that initiation of behavior is realized by some physiological processes, but if we define motivation that way, we need to see underlying motivation in every decision-making and attentive behavior. This seems redundant and logically inconsistent to me. When we orient attention to an object that suddenly comes into our visual field, is this a manifestation of motivation? Many would say no. But if we need to suppose motivation to explain the initiation of information seeking behavior, logically we should also suppose motivation for this attentive behavior. This is a bit too much for me.

Need for competence is not the only example. For example, Shultz and Lepper (1996) proposed a connectionist model (aka. neural network model) that effectively implements cognitive dissonance in a computational manner and replicates a host of findings in the literature of cognitive dissonance (e.g., Festinger, 1957). According to the cognitive dissonance theory, humans have a fundamental motivation to reduce cognitive dissonance, which is often referred as “self-consistency motive” (e.g., Gecas, 1982). However, the computational model proposed by Shultz and Lepper explained the phenomena of cognitive dissonance without including such motivation.

So, if motivation does not exist in psychological mechanisms governing our behavior, what is motivation, then? Motivation is, in my view, a convenient linguistic construct that subjectively explains a coherent series of phenomena or subjective experiences without explicitly referring to underlying behavioral, psychological, and neural processes (see also Figure 1 in Chapter X, which graphically explains the point). We have little access to the psychological and neural mechanisms underlying our behavior (Kihlstrom, 1987; Nisbett & Wilson, 1977). When people are asked why they study statistics, I doubt they describe a model like Figure 1. I am sure that no one can provide a neural level explanation about why they study statistics. But people are extremely good at

providing an ad-hoc explanation of why. Motivation is a very convenient concept to provide such an ad-hoc explanation. Why do you study multiple regression analysis? Because I *want to* (i.e. have motivation to) learn new statistical methods. By answering such a manner, the person explains the reason while bypassing the underlying complicated psychological and neural mechanisms (such as Figure 1).

My argument comes down to the fact that motivation is simply a *hypothetical* construct for *explanation*, and there is no such entity. This point is well acknowledged: Berridge (2004) provides a nice reminder that motivation was historically a hypothetical construct to explain a set of behaviors in an efficient manner in the era of behaviorism. One of the oft-cited definitions of motivation by Pintrich and Schunk (2002) states that motivation is “the process whereby goal-directed activity is instigated and sustained” (p. 5), explicitly acknowledging that it is a hypothetical label attached to underlying psychological *process*. It should also be emphasized that the point I made applies to many of other psychological constructs such as emotion (see Chapter xx, where I discussed the same issue for the concepts of emotion and cognition), and the philosophical literature is well aware of it (e.g., Churchland, 1979; Danziger, 1990). However, we tend to forget this important point when studying motivation.

Now I hope you fully understand what I meant by the title “Motivation resides only in our language, not in our mental processes”. Note that I am not saying that we should stop studying motivation or abandon these concepts (i.e. need for competence) in our scientific inquiry. Admittedly, many of my studies examine motivation-related theoretical constructs (including need for competence!). They are practically useful level of explanation and using such hypothetical constructs, researchers have produced a lot of new hypotheses and have obtained interesting findings. These hypothetical constructs themselves (either assessed via self-report or experimentally manipulated) predict many real-life outcomes too.

But at the same time, the concept of motivation is so convenient that this often makes us stop thinking further. In my view, this is an underappreciated risk of using the concept of motivation that potentially hampers reaching a true understanding of so-called “motivated behaviors” (see also Brick et al., 2020; Fiske, 2020). It is rather ironic that the concept of motivation prevents us from truly understanding human motivated behaviors, but we should be aware of that danger. If Motivation X turns out to be an important factor to explain human behavior, researchers tend to generate hypotheses *given* the motivation (e.g., what are potential predictors or antecedents of Motivation X?). Most of the studies in the field of motivation science can be seen as included in this category. But it is also important to think about the mechanism of *how* Motivation X is *realized* in our mental processes. This type of approach or way

of thinking is relatively common in cognitive science, but I rarely see this discussed in the field of motivation science. I am hoping that this meta-theoretical essay gives motivation researchers an opportunity to expand how motivation should be studied in the future.

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