

not well chosen, but then the solution would be to come up with better ones, not to do away with high-level goals altogether. An alternative solution would be to view the goals for autonomy and competence as meta-goals that are at the service of, or assist in, the attainment of other, low-level goals. In this vein, the goal for autonomy can be considered as the goal to be allowed to *choose* one's own (low-level) goals and the goal for competence or control can be considered as the goal to *achieve* these (low-level) goals.

A second type of reduction that M&J seem to promote consists in a shift from motivation to cognition. The authors admit that in their computational process model, there are still rewards, which are representations of valued outcomes and hence motivational constructs. However, once the unpacking of the black box has arrived at its most concrete level of motivation, the authors argue that it makes little sense to continue calling this motivation. This reveals that the ideal to which they aspire is to ultimately reduce motivation to cognition. This is reminiscent of the attempt of predictive processing theory to reduce the explanation of behavior (and other phenomena such as perception and affect) to the confirmation and disconfirmation of expectations (Clark, 2013; Friston, 2009).

A third type of reduction that the authors seem to promote consists in gradually explaining away content or semantics. In standard mechanistic explanations in psychology, mechanisms between stimulus input and behavioral output are composed of representations with a content and a format (i.e., the structural parts) and operations acting on these representations (i.e., the activities or working parts) (Bechtel, 2008). The authors' ideal seems to be to reduce mechanistic explanations that consist of both contentful representations and operations to explanations that consist only of operations.

In conclusion, even if existing process theories of motivation have already made progress in unpacking the black box, it may be argued that there is always room for further unpacking at lower levels of analysis. Whether this shift to lower levels of analysis should include the rejection of high-level goals, the reduction of motivation to cognition, and the evolution toward content-less mechanistic explanations is open to debate, as is the level of analysis that will prove to be most fruitful for predicting and regulating behavior (Karoly, 1999).

Financial support. Preparation of this article was supported by grant C14/23/062 of the Research Fund of KU Leuven.

Competing interests. None.

References

- Bechtel, W. (2008). *Mental mechanisms: Philosophical perspectives on cognitive neuroscience*. Routledge. <https://doi.org/10.2478/disp-2008-0012>
- Clark, A. (2013). Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behavioral and Brain Sciences*, 36(3), 181–204. <https://doi.org/10.1017/S0140525X12000477>
- Friston, K. (2009). The free-energy principle: A rough guide to the brain? *Trends in Cognitive Sciences*, 13(7), 293–301. <https://doi.org/10.1016/j.tics.2009.04.005>
- Karoly, P. (1999). A goal systems-self-regulatory perspective on personality, psychopathology, and change. *Review of General Psychology*, 3(4), 264–291. <https://doi.org/10.1037/1089-2680.3.4.264>
- Moors, A. (2022). *Demystifying emotions: A typology of theories in psychology and philosophy*. Cambridge University Press. <https://doi.org/10.1017/9781107588882>
- Moors, A., Boddez, Y., & De Houwer, J. (2017). The power of goal-directed processes in the causation of emotional and other actions. *Emotion Review*, 9, 310–318. <https://doi.org/10.1177/1754073916669595>
- Murray, H. A. (1938). *Explorations in personality*. Oxford University Press.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford. <https://doi.org/10.1521/978.14625/28806>

Motivational whack-a-mole: Foundational boxes cannot be unpacked

Ezgi Ozgan  and Jedediah W. P. Allen* 

Department of Psychology, Bilkent University, Ankara, Turkey
ezgi.ozgan@bilkent.edu.tr
jallen@bilkent.edu.tr

*Corresponding author.

doi:10.1017/S0140525X24000517, e38

Abstract

The proposed “black-box” problem and its solution are drawn from the same substance-oriented framework. This framework's assumptions have consequences that re-create the black-box problem at a foundational level. Specifically, Murayama and Jach's solution fails to explain novel behavior that emerges through an organism's development. A process-oriented theoretical shift provides an ontological explanation for emergent behavior and eliminates the black-box problem altogether.

Murayama and Jach (M&J) critically evaluate psychology's explanatory use of high-level motivations as causes of complex behavior (i.e., the “black-box” problem). Their critique presents a valuable case for the need to focus on the concrete dynamics and causal relations of cognitive processes. The critical side of their argument helps clarify how descriptions of motivation interpreted as causal explanations are only apparent; however, their positive proposal simultaneously risks a continuation of the illusion through a new iteration of the problem. That is, their proposed solution seems to be built on the same theoretical foundations as the problem, and this might just exchange one large black box for several smaller ones.

M&J point to an *explanatory* illusion that there are properties being attributed to motivation that it does not possess. Instead, they propose to eliminate those properties from motivation altogether (Witherington, 2014). In turn, motivation is interpreted as a label for the composition of the causal relations amongst lower-level constructs that do the actual work of energizing (and explaining) behavior. Thus, motivation is merely a *container* with no causal (or explanatory) power over its contents and associated behavior – the motivation itself cannot explain behavior beyond its contents (Witherington, 2011). Consequently, M&J render motivation as an epiphenomenal outcome of the causal structures amongst lower-level constructs. Although they use the term “emergent” to describe motivation, it does not seem to be *ontological* emergence – because their definition of motivation lacks novel qualities that can causally affect the relations amongst the lower-level constructs (i.e., no downward causation; Witherington, 2011). There is degree-wise merit in M&J's solution since their proposed constructs – compared to motivations – have a more direct causal relation to the unfolding changes observed throughout a behavior. However, their solution assumes a foundational version of the same black-box problem – because the constructs and motivations are “just” foundational atoms at different scales, and the problems at the motivation level are

inherited by the lower levels. In other words, M&J's attempt to resolve the *explanatory* illusion of motivation results in a "solution illusion."

The key to their commitment to *foundationalism* and *epiphenomenal emergence* is an underlying substance-oriented framework (Bickhard, 2006). This framework is evident when they describe the "energization" aspect of motivation at the center of the *explanatory* illusion. This involves dependence on an external (or internal) impetus to initiate behavior (Bickhard, 2003). This assumption aligns with the inertness of atomism and sets the stage for M&J to assert two corollaries of a substance-oriented framework: *Compositional emergence* and *instrumental relations*. Atomism establishes the foundationalism part of their solution, where constructs are considered to possess greater explanatory power than any emergent qualities that motivation might offer (Allen & Bickhard, 2022). However, it is the two corollaries that ultimately make the solution to the black-box problem more apparent than real.

First, the *compositional ontology* of atoms underlies the lack of ontological emergence (Bickhard, 2006; Witherington, 2011). For M&J, due to the foundational atoms' surface togetherness, novelty is structural. This compositional quality is evident in the assertion that the causal relations of constructs can be a substitute for motivation (i.e., the [re]arrangement of foundational parts is the reason for the manifested difference among high-level concepts; Seibt, 2009). Based on this assumption, motivation does not possess any emergent qualities that could explain behavior beyond the foundational constructs; the entirety of the explanation takes place at the foundational level. Second, the assumption of *instrumental relations* is about the missing ontological ties amongst foundational parts. The foundation is the only existential reality, and no real phenomena could emerge through the relations of the parts (an implication of compositional ontology, Allen & Bickhard, 2022; Seibt, 2009). Thus, foundational parts can continue their existence in isolation and any relations they possess are strictly instrumental. This corollary is evident in the re-interpretation of the high-level motivation "need for competence" as a reward-learning model. Reward-learning models are developed within a computationalist approach – which explicitly assumes *instrumental relations* to govern the communication amongst parts to explain how behavior unfolds (Bickhard & Terveen, 1995).

Based on these substance-oriented corollaries, M&J adopt an epiphenomenal re-interpretation of motivation that precludes their solution from enabling qualitative emergence. That is, any computational substitute for motivation does not have the flexibility to explain novelty in behavior – that is, the presuppositions underlying the proposed causal relations cannot undergo development through constructive emergence (Allen & Bickhard, 2022). The explanatory power of any proposed model is constrained by the qualities of the foundational constructs – both ontological and relational. However, ontological emergence and constitutive relations (i.e., where the relation is intrinsic to the organization's existence and necessary for the continuity of the "parts") are necessary at the higher-level phenomena to explain any behavior that develops through learning (e.g., developmental changes in social understanding). Therefore, the limitation of the proposed solution to explain novel behavior leads to a *solution* illusion, a foundation-level black box that can never be unpacked (Allen & Bickhard, 2013).

The alternative solution to the black-box problem is a paradigm shift away from a substance-oriented framework. This would eliminate the black-box problem at all levels of behavioral complexity by replacing the atom-ontology of physical phenomena with process (van Geert & de Ruiter, 2022). Since processes

are inherently active, they must interact with each other (Bickhard, 2003). Thus, the "need" to energize behavior is an illusion since living organisms constantly behave due to their existence as processes. Consequently, motivation is not a *trigger* for behavior but a *selection* amongst potential ways of reorganizing the lower-level processes that constitute the organism. This definition of motivation is similar to the "direction" aspect of motivation mentioned by M&J. Motivation is part of the flow of control in terms of how the organism changes its processes through which the behavior itself emerges. In this sense, a process-oriented framework offers a form of explanation that renders both the black-box issue and its purported solution superfluous.

Financial support. This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

Competing interest. None.

References

- Allen, J. W., & Bickhard, M. H. (2013). Stepping off the pendulum: Why only an action-based approach can transcend the nativist-empiricist debate. *Cognitive Development*, 28(2), 96–133. <http://doi.org/10.1016/j.cogdev.2013.01.002>
- Allen, J. W., & Bickhard, M. H. (2022). Emergent constructivism: Theoretical and methodological considerations. *Human Development*, 66(4–5), 276–294. <http://doi.org/10.1159/000526220>
- Bickhard, M. H. (2003). An integration of motivation and cognition. In L. Smith, C. Rogers, & P. Tomlinson (Eds.), *Development and motivation: Joint perspectives* (pp. 41–56). British Psychological Society, Monograph Series II. <http://doi.org/10.53841/bpsmono.2003.cat529.5>
- Bickhard, M. H. (2006). Developmental normativity and normative development. In L. Smith, & J. Voneche (Eds.), *Norms in human development* (pp. 57–76). Cambridge University Press. <http://doi.org/10.1017/CBO9780511489778.003>
- Bickhard, M. H., & Terveen, L. (1995). *Foundational issues in artificial intelligence and cognitive science: Impasse and solution*. Elsevier Scientific.
- Seibt, J. (2009). Forms of emergent interaction in general process theory. *Synthese*, 166(3), 479–512. <http://doi.org/10.1007/s11229-008-9373-z>
- van Geert, P., & de Ruiter, N. (Eds.). (2022). *Toward a process approach in psychology: Stepping into Heraclitus' river*. Cambridge University Press. <http://doi.org/10.1017/9781108859189>
- Witherington, D. C. (2011). Taking emergence seriously: The centrality of circular causality for dynamic systems approaches to development. *Human Development*, 54(2), 66–92. <http://doi.org/10.1159/000326814>
- Witherington, D. C. (2014). Self-organization and explanatory pluralism: Avoiding the snares of reductionism in developmental science. *Research in Human Development*, 11(1), 22–36. <http://doi.org/10.1080/15427609.2014.874763>

Connecting theories of personality dynamics and mental computational processes

Juliette L. Ratchford^{a,b*}  and

Eranda Jayawickreme^{a,b} 

^aDepartment of Psychology, Wake Forest University, Winston-Salem, NC, USA and ^bProgram for Leadership and Character, Wake Forest University, Winston-Salem, NC, USA

julietteratchford@gmail.com

jayawide@wfu.edu

<https://jayawide.sites.wfu.edu/>

*Corresponding author.

doi:10.1017/S0140525X24000499, e39