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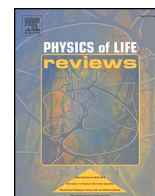
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## Comment

## Meta-control and navigating creative trade-offs: Comment on “A systematic framework of creative metacognition” by Lebuda and Benedek



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## ARTICLE INFO

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Lebuda and Benedek [1] provide a systematic and thorough framework for analyzing and studying creative metacognition. We agree that being creative necessarily involves meta-cognitive processes, and that the regulation of creative processes requires monitoring and control as well as meta-cognitive knowledge. Here we ask whether and how the proposed framework enables understanding of how people make fundamental trade-offs between originality and usefulness and between flexibility and persistence.

Creativity is commonly defined as the generation of ideas that are both novel *and* useful [2]. The first trade-off refers to findings that people have trouble combining originality and usefulness, both when generating ideas and when evaluating them. For example, Nijstad and colleagues [3] report a meta-analytic negative correlation of  $r = -0.42$  between idea originality and idea feasibility (an aspect of usefulness). Similarly, when evaluating and selecting ideas, people tend to focus on idea usefulness (i.e., does the idea solve the problem) and completely ignore originality; they, in fact, seem to associate originality with lack of usefulness [4]. Although originality and usefulness certainly can be combined, people often focus on one at the expense of the other [5].

The originality-usefulness trade-off is related to the production of output, and achieving a balance between the two should therefore benefit from knowledge about what is creative, and from response monitoring and control. Important questions in this regard are how these processes operate, which brain areas are involved, and how and when these monitoring or control processes are or are not biased towards originality or usefulness. More importantly, meta-cognitive research and theory may address how people manage to combine both. For example, paradoxical frames can enhance creativity because they allow for a simultaneous focus on originality and usefulness [5]. This raises the question how the meta-cognitive system allows individuals to achieve this.

The second trade-off (flexibility-persistence) is about strategies for creative production. According to the Dual Pathway to Creativity Model [3,6] the very same level of creativity can be achieved through cognitive flexibility on the one hand, and persistence on the other. When thinking in flexible ways, cognitive control is relaxed, and people relatively easily switch mental categories or problem approaches. When taking a more persistent approach, there is stronger cognitive control and less switching, and thinking in this way involves a more systematic and effortful search. In theory, creative performance benefits from a mixture of flexibility and persistence [6], yet these task strategies cannot be employed at the same time. Across time, individuals must find some balance between flexibility

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and persistence, and switch from one processing type to the other. This will require meta-cognitive monitoring and control (also see [7]).

In general, people associate creativity more with flexible than with persistent processing [8], which may suggest that they will be biased in their task strategies. However, although one may sit down and think hard and deep about something (i.e., “choose” to engage in persistent processing), it is unclear how people may “choose” to engage in more flexible processing. Whereas we know much about the internal (neurohormonal, affective, motivational) and external (social interaction dynamics, rewards) conditions that favor flexible processing [3,6,9], research is lacking on whether and how people “turn on” flexible processing at will. How the meta-cognitive system operates when it comes to task strategies, such as flexibility and persistence, and how people can switch among strategies is therefore still unclear. A theory of creative metacognition would benefit from more clarity in this regard.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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