

Reply to ‘Mere algorithms can be demotivating’

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Karumathil and Tripathi provide a critical commentary (Mere algorithms can be demotivating. *Nat. Rev. Psychol.* <https://doi.org/XXXX> (2022))¹ on our article on self-determination theory and the future of work (Gagné, M., Parker, S.K., Griffin, M.A. et al. Understanding and shaping the future of work with self-determination theory. *Nat Rev Psychol.* **1**, 378–392 (2022)).² Their critique centers around our statement that algorithms themselves do not shape workers' motivation, but it is rather how they are designed and used that matters.

As mentioned by Karumathil and Tripathi, algorithms are designed by humans who decide on their structure and parameters and provide the training data. In principle, algorithms can correct themselves through the collection of more data over time, with or without human intervention. In our article we focused on algorithm design, highlighting the role of technology designers in influencing user motivation.

Scholars consider technological determinism (viewing technology as an agentic entity with predetermined or unchangeable effects) a conceptual trap and an oversimplification of the reality of technological uses in organizations.³ By contrast, technological voluntarism claims that technology is completely devoid of any agency or intentions and cannot be viewed as more than a tool to enact human goals or intentions.⁴ The work design approach is rooted in a socio-technical systems approach which, located between those extremes, focuses on the interaction between human and technological systems.⁵ The advent of AI and self-learning algorithms certainly challenge these paradigms regarding technological agency⁶, but we still endorse a moderate perspective and believe in the human ability to leverage a responsible use of technology in organizations.

Our article did not discuss algorithmic bias in the context of employee selection. However, we agree with the concerns raised by Karumathil and Tripathi. Classical

regression-based algorithms (which predate the use of machine learning or AI) have long underpinned evidence-based best selection practice, but are now widely recognized as associated with disproportionate negative outcomes for minority applicants.⁷

We also agree with Karumathil and Tripathi that algorithms can cause passivity when they lack transparency and control. One challenge for technology designers is to embed design components that could make algorithmic learning more transparent to users: If algorithms are able to generate performance feedback for users, it should be possible to make them generate information that is intelligible to these users about how computations are adjusted. Managers can indeed shift accountability for decisions to algorithms, which is not unlike shifting responsibility to human authority (for example, upper-level managers). There is management research on how to empower and increase psychological ownership and accountability that can be used to inform the design of algorithms to mitigate such issues.^{8,9}

Algorithmic systems designed to manage workers are indeed designed to influence workers' behavior, but they vary in the methods they use to do so (for example, performance feedback, nudges to work longer hours, or compensation schemes). We therefore do not agree that algorithms are by nature manipulative (in the sense of being unfair or exploitative in their influence). However, we certainly agree that they can be designed by humans to be so, as per our plea to attend to how these technologies are designed and used.

Finally, the 'chilling effect' referred to by Karumathil and Tripathi refers to the reduced involvement of Wikipedia contributors following new surveillance legislation in the USA.¹⁰ This seems to reflect a decrease in perceptions of freedom of speech, which is not the same as feeling like the agent of your own behavior—the definition of autonomy in self-determination theory. Having personal data collected may or may not influence feelings of

autonomy, again depending on how the collected data is used. Hence, we stick to our statement that algorithms' effects on worker motivation depends on their design and use.

Achieving a genuinely sociotechnical approach is not easy, and we hope our article inspires researchers and practitioners to take up this challenge.

References

1. Karumathil, A. & Tripathi, R. Mere algorithms can be demotivating. *Nat. Rev. Psychol.* (2022).
2. Gagné, M. *et al.* Understanding and shaping the future of work with self-determination theory. *Nat. Rev. Psychol.* **1**, 378–392 (2022).
3. Orlikowski, W. J. & Scott, S. V. Sociomateriality: Challenging the separation of technology, work and organization. *Acad. Manag. Ann.* **2**, 433–474 (2008).
4. Strohmeier, S. Concepts of e-HRM consequences: a categorisation, review and suggestion. *Int. J. Hum. Resour. Manag.* **20**, 528–543 (2009).
5. Parker, S. K., Morgeson, F. P. & Johns, G. One hundred years of work design research: Looking back and looking forward. *J. Appl. Psychol.* **102**, 403–420 (2017).
6. van Rijmenam, M. & Logue, D. Revising the 'science of the organisation': theorising AI agency and actorhood. *Innovation* **23**, 127–144 (2021).
7. Sackett, P. R., Zhang, C., Berry, C. M. & Lievens, F. Revisiting meta-analytic estimates of validity in personnel selection: Addressing systematic overcorrection for restriction of range. *J. Appl. Psychol.* No Pagination Specified-No Pagination Specified (2021) doi:10.1037/apl0000994.
8. Raisch, S. & Krakowski, S. Artificial Intelligence and Management: The Automation–Augmentation Paradox. *Acad. Manage. Rev.* **46**, 192–210 (2021).

9. Grønsund, T. & Aanestad, M. Augmenting the algorithm: Emerging human-in-the-loop work configurations. *J. Strateg. Inf. Syst.* **29**, 101614 (2020).
10. Penney, J. W. Chilling Effects: Online Surveillance and Wikipedia Use. *Berkeley Technol. Law J.* **31**, 117–182 (2016).

Competing interests

The authors declare no competing interests.

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