

The cultural evolution of scientific practice - from simulation to experimentation

Initiative: Forschung über Wissenschaft

Ausschreibung: Forschung über Wissenschaft: Kooperationsprojekte

Bewilligung: 20.12.2023

Laufzeit: 4 Jahre

Science is built upon reliable findings, yet many results fail to replicate. Recent simulation studies have suggested that declining quality of scientific findings is a natural by-product of scientific evaluation and reward systems. Specifically, academic competition based on proxy measures has been proposed to lead to a process of cultural evolution, in which problematic scientific practices are automatically selected, whenever they entail slight advantages in terms of proxy performance. However, to the best of our knowledge, there is to date no experimental test of these predictions. This is problematic because simulations cannot establish causality and because human behavior can defy model predictions, which may hinge on simplifications such as the 'rational agent' model. In particular, the design of interventions might benefit from an experimental approach, that takes account of real human behavior. The projects proposes to test the predictions of prominent recent simulation studies experimentally, and to quantify the impacts of potential interventions. Specifically, it will explore how cultural evolution based on proxy measures shapes individual decision-making in three concrete scientific contexts, namely sample size choice, the use of generic terms and the choice of collaborators.

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