

Erosion of Scientific Integrity Fueled by Quantitative Evaluation Metrics

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In the last few years, the scientific community has been increasingly concerned by malpractice behavior, which does not fit the classic description of 'scientific misconduct' (summarized as 'falsification, fabrication, plagiarism' - FFP^[1]). Nevertheless, these practice appear to be not less threatening to the community as they come as a *steady erosion*, now evolving into a *landslide*. This concerns in particular 'CV polishing' by 'citation gaming' through excessive 'guest'- & 'hyper'-authorships and 'citation cartels',^[2] not only threatening the 'scientific currency' of reputation, but likewise assaulting the business model of data suppliers. In fact, a total of staggering 35% of the researchers were (increasingly) removed from 2021 to 2024 from Clarivate's 'highly cited researcher' (HCR) list due to violation of scientific integrity.^[3] The reason for this sharp increase in malpractice can be directly related to metrics-based quantitative evaluation,^[4] concerning both institutions and individual researchers. In fact, this follows perfectly - and frighteningly - Goodhart's law, which, applied to the current context, may read as '*all metrics of scientific evaluation are bound to be abused*'.^[5]



Car Stuck in Landslide,
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The seminar puts 'citation gaming' into the limelight, showing that malpractice behavior depends on whether the individual researcher stands on the *top* or the *bottom* of the *scientific food chain*. While researchers at the *bottom* are obliged to pimp up their CV by becoming prey to paper mills and predatory journals & conferences (all at public cost), as well as by excessive self-citation and creating national citation cartels,^[2] researchers at the *top* may follow more sophisticated measures, blessed by the 'Matthew effect'.^[6] This includes 'honorary' or 'guest' authorships, elaborated international 'citation cartels', and well paid lucrative ancillary revenues like 'gift affiliations' in Saudi Arabia, editor positions in predatory journals or decoy organizer & plenary speaker of predatory conferences.^[2] Equally, for all researchers, metrics-driven working & thinking fuels scientific hypes with short-term impact and leads to a *tsunami* of often worthless 'salami papers' of questionable content, which nobody is able to digest anymore. The (mostly private) publishers play a disturbing role in this game, fueling hypes and occasionally tolerating citation cartels, all to inflate the (short term) 'impact' of their journals; equally they encourage hyper-proliferation – at increasingly low standards, solely to satisfy shareholders' interests to maximize their already exorbitant profit margins,^[7] all on public costs.

We advocate for an end of scientific hyper-proliferation by returning to 'quality over quantity' in evaluation and publishing, based on the principles of modesty, integrity & autonomy, and to regain control on the definition of quality and impact, and the *modus operandi* of scientific communication. Only in doing so, science is able to retrieve its incorruptible voice in times of deep threats to our free societies.

^[1] see e.g. (a) DFG [Guidelines for Safeguarding Good Research Practice](#); (b) [European Code of Conduct for Research Integrity](#); (c) J. Mehlich, [Good Chemistry: Methodological, Ethical, and Social Dimensions](#), RSC Publishing 2021.

^[2] for further reading on relevant aspects, see link collection at www.uv.es/jogiers/ethics.html.^[3] (a) [Clarivate's 2024 HCR analysis](#); (b) see e.g. the [analysis in El País](#).^[4] see e.g. (a) Declaration on Research Assessment ([DORA](#)); (b) Coalition for Advancing Research Assessment ([COARA](#)); (c) J. Z. Muller, *The Tyranny of Metrics*, [Princeton University Press 2018](#).^[5] M. Biagioli, *Watch out for cheats in citation game*, [Nature 2016, 535, 201](#).^[6] see e.g. https://en.wikipedia.org/wiki/Matthew_effect.^[7] <https://en.wikipedia.org/wiki/Elsevier>.