Annotated bibliography on science

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Just triying to cite inline [1].

References

[1] Uri Alon. How to Build a Motivated Research Group. *Molecular Cell*, 37(2):151–152, 2010.

> Drawing on Decy and Ryan theory of self-determined behaviour, there are three conditions to be motivated: competence, autonomy and social connectedness. When chosing a project of a new member of a research group, these conditions are linked with talents and passions of the new member, and alignment of objectives with the research group, respectively. Author also offers advice to foster competence, autonomy and connectedness in the context of a research group.

[2] Christian Berggren and Solmaz Filiz Karabag. Scientific misconduct at an elite medical institute: The role of competing institutional logics and fragmented control. *Research Policy*, (December 2016):1–16, 2018.

> The paper analyzes a case of medical and academic misconduct, the Karolinska case, using a institutional theory framework. The case was about the practices of Paolo Macchiarini when developing a technique of artificial trachea transplant, which lead to the death of several patients. Authors research what factors lead to maintaining the misconduct a long time period, what actors lead to the exposure of the misconduct and the lessons learned for other insitutional settings. The case reveals a resource asymmetry between the market-oriented logic and medical and scientific logics. The market-oriented logic fosters academic institutions to focus their efforts to develop their brands and compete for resources.It also reveals the problem of fragmented control in the academic field. Following this market-research logic, the function of scientific quality control is judged as

less relevant, and it is outsourced to editors of academic journals. This leads to a fragmented control of scientific activity. Conversely, academic journals are also driven by a market-oriented logic, which may lead them to relax standards of peer reviewing, and an asymmetry between rapid entry (acceptance) and slow exit (retraction). It is significant that the most effective whistleblower of this case was a docummentary on a Swedish television.

[3] Arturo Casadevall and Ferric C. Fang. Reforming Science: Methodological and Cultural Reforms. *Infection and Immunity*, 80(3):891–896, mar 2012.

Authors assess critically the present state of science and advocate for its reform. This manuscript focus on methodological and cultural reforms. The cultural problems of science are: A workforce imbalance favouring male, senior researchers; favouring strong competition for funding and positions; and operating under the priority rule, where credit goes to the one that provides answer first. This culture leads to saturation of the peer review system, publication bias, taking conservative approaches to acquire funding and creating incentives for scientific misconduct. This culture drives the increase of honest and dishonest retractions, eroding the credibility of science. As methodological reforms, authors propose revision of criteria of promotion, re-embracing philosophy (logic, epistemology and ethics) in scientific training, enhanced training in probability and statistics, and use of checklist in publication workflow. As cultural reforms, they propose replacing competition by collaboration.

[4] Jonathan Drennan. Cognitive interviewing: Verbal data in the design and pretesting of questionnaires. *Journal of Advanced Nursing*, 42(1):57–63, 2003.

Cognitive interviewing (also known as verbal protocols and think-aloud interviewing) involves asking survey respondents to think out loud as they go through a survey questionnaire and tell them everything they are thinking. It is particularly useful when there is uncertainty on how respondents will answer questionnaires or doubt about their understanding of the wording of questions. Response problems can be: lexical, inclusion/exclusion (scope of the question), temporal, logical (questions with connecting words requiring more than one answer) and computational. Cognitive interview techniques are: probing (require informants to paraphrase questions in their own words), observing respondent's behaviour, and to encourage respondents to

verbalize their thoughts (think aloud) about the questionnaire. Problems found while answering the questionnaire can be classified in four headings: understanding, retrieval, judgement and response formatting.

[5] Ferric C Fang and Arturo Casadevall. Reforming Science: Structural Reforms. *Infection and Immunity*, 80(3):897–901, mar 2012.

Authors assess critically the present state of science and advocate for its reform. This manuscript focus on structural reforms, focusing on biomedical science in the United States. Many dysfunctional aspects of science are rational responses to scientist to incentives presented by the present system. These incentives are driven mainly by how governmental financial support is provided to scientists. Authors identify five structural problems. Inadequate funding is leading to a hyper-competitive scientific environment, and indirect costs are underestimated. Agencies reduce funding to investigator-initiated projects, favouring targeted research and big science, while the success of targeted research depends on previous funding on basic science. Many women and minorities achieve success in scientific career, leading to leaky pipelines in the scientific system. There is an increase of administrative burden to address concerns on animal welfare, patient safety and the accountability of public funds. The grant peer review system is not effective in ranking grant applications. In addition to obvious remedies, authors propose balancing and renewing the scuentific workforce, recognize the impact of basic research, restrict laboratory size, and undertake a scientific study of science.

[6] Klaus Fiedler. Tools, Toys, Truisms, and Theories: Some Thoughts on the Creative Cycle of Theory Formation. *Personality and Social Psychology Review*, 8(2):123–131, may 2004.

This article studies the creative process of theory formation, and how theoretical thinking can be instigated and trained. Drawing on Moscovici's approach to social influence of majorities and minorities, author sees theory formation as a dialectic interplay between conversion (break-up with existing theories by the minorities) and compliance (establishment of existing theories by the majority). Author also argues that theoretical thinking can be instigated and trained with game-like heuristics. Loosening games are pluralistic-competition, distal-import and paying around with tools and methods. Tightening

games are falsification and challenge (as in peer review), method-development and uncovering of pseudo-theories (quasi tautological theoretical constructions).

[7] Matti Vuorre and James P. Curley. Curating Research Assets: A Tutorial on the Git Version Control System. *Advances in Methods and Practices in Psychological Science*, page 251524591875482, apr 2018.

Git is a version control system designed to control the workflow of software development projects. Authors posit that Git can be also used as tools for controlling the workflow of a research project, allowing version control and sharing of data, analysis and documents. The GitHub website allows also collaboration among research teams, that can work on parallel versions of a similar project, which are later consolidated in GitHub.