To beat non-peer bureaucrats: the gains of being metric-wise

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Metric-wiseness
Observed differences in bibliometric knowledge among colleagues inspired us to define the concept of ‘metric-wiseness’ for researchers as: “a researcher’s capacity to use the characteristics and formats of scientometric indicators to present one’s true research value” (Rousseau & Rousseau, 2015). This definition is based on the related concept of ‘test-wiseness’. As stated by Millman et al. (1965, p.707), “test-wiseness is defined as a subject's capacity to utilize the characteristics and formats of the test and/or the test taking situation to receive a high score. Test-wiseness is logically independent of the examinee's knowledge of the subject matter for which items are supposedly measures.” Metric-wiseness is also logically independent of researchers’ scientific capacities regarding their subject matter for which the indicators supposedly measures. Being or not being metric-wise does not depend on the quality of researchers in their field. Being metric-wise could lead to an advantage for knowledgeable researchers over uninformed colleagues, even when they are of otherwise equal competence. This would lead to a situation where some teams advance faster than other ones. Combined with a Matthew effect (Merton, 1968), this situation would then continue to exist over time.

Influence of metric-wiseness on the research process
The decision of doing research and what type of research to pursue is determined by intrinsic motivational factors such as intellectual curiosity or a desire to create benefits to society and extrinsic factors such as a desire to increase one’s standing, to avoid failure or to obtain funding (Deci et al., 2001; Lach & Schankerman, 2008). We now develop a conceptual model to describe how metric-wiseness can influence the research process as well as researchers’ communication strategies. We identify two paths through which metric-wiseness can play a role and lead to behavioural changes in the research process.
As a first path, metric-wiseness can be seen as an additional tool that is useful in reporting one’s research portfolio. For example, it may be interesting to include journal indicators and citation counts from Scopus besides those from the Web of Science (WoS). Moreover, it is useful to know that Google Scholar records citation counts and indices for non-English publications and even working papers. This aspect is of particular importance for many colleagues performing research in the Social Sciences and in the Arts and Humanities.
A second, less desirable path through which metric-wiseness can change the research process is by crowding out intrinsic motivational factors for doing research. Thus research topics and publication avenues are no longer selected out of a desire to increase the pool of knowledge or to advance science, but to maximize a researcher’s bibliometric indicator levels. From this point of view only publications in journals with a high impact factor are worthwhile, while writing in other languages besides English is pointless.
Measuring metric-wiseness

Next, we develop a framework for measuring the degree of metric-wiseness of researchers. We start by identifying three possible ways in which metric-wiseness can be expressed: 1) using indicators, 2) misusing indicators, and 3) moving beyond indicators. Based on these insights, we propose a two-levelled approach to measure metric-wiseness. On a first level one just asks if the respondent is familiar with the concept of one or more popular indicators such as a journal impact factor. On a second level, we aim to identify the manner through which this metric-wiseness is expressed. To this end, we propose to use a multidimensional Likert-scale with several statements trying to measure three dimensions regarding indicators: technical knowledge, external pressure, and intrinsic motivation.

To illustrate the concept, we investigate the presence and impact of metric-wiseness in a sample of 140 agricultural economists. From this sample, we find that metric-wise respondents seem to be more motivated by a desire to contribute to scientific progress in their discipline and to improve their standing in their current institution. Moreover, we find that metric-wise respondents are significantly less likely to distribute their research findings to policy makers and practitioners in their field. Overall, the empirical results confirm that extrinsic motivators become more important for metric-wise researchers and may even point to a crowding out effect of intrinsic motivations in researchers’ decision making processes.

Conclusions

Due to the double sided nature of metric-wiseness, it is not a priori clear how institutions or evaluators should react. As long as metric-wiseness is seen as a tool to improve communication about a researcher’s portfolio, it is beneficial to stimulate knowledge of bibliometric indicators among researchers. For instance, it may be interesting to inform doctoral researchers on the what and how of the most frequently used indicators. When metric-wiseness leads to a crowding out effect, it should clearly be counteracted. A possible solution is to use not only quantitative measures for the assessment of researchers, but also qualitative measures, including peers in the process. As scientometric indicators, even synthetic ones, are never completely correct and at best probably approximately correct (PAC) (Rousseau, 2015) one always needs peers to include qualitative aspects in a research evaluation exercise. A purely bureaucratic and quantitative approach can never be beneficial for individual scientists and science in general.

References

Rousseau, R. (2015). Citation data as a proxy for quality or scientific influence are at best PAC (Probably Approximately Correct). Journal of the Association for Information Science and Technology (to appear), DOI: 10.1002/asi.23525