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

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Ronald Rousseau

STI Lugano, 2 September 2015
Impact factor?
Hirsch index?
Eigenfactor score?
...

Researcher

BEWARE OF
THE IMPACT
FACTOR

DORA declaration
Leiden Manifesto
...

“Not everything that can be counted counts, and not everything that counts can be counted”
Albert Einstein
<table>
<thead>
<tr>
<th>Indicator</th>
<th>1 - don't know</th>
<th>2 - notion</th>
<th>3 - description</th>
<th>4 - definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISI journal impact factor (Web of Science)</td>
<td></td>
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<tr>
<td>Source Normalized Impact per Paper - SNIP</td>
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<tr>
<td>Eigenfactor score</td>
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<tr>
<td>Scimago Journal Rank</td>
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<td>5-year synchronous journal impact factor</td>
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<td>Hirsch-index</td>
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Sample = 138 agricultural economists
Metric-wiseness

“a researcher’s capacity to use the characteristics and formats of scientometric indicators to present one’s true research value”

• Inspired by concept of ‘test-wiseness’ (Millman, Bishop & Ebel, 1965)
• Logically independent of the researcher’s scientific capacities
• Being or not being metric-wise does not depend on the quality of that researcher in his or her field
• Metric-wiseness consists of two parts
  o Knowing the existence and mathematical definition of scientometric indicators
  o Knowing these indicators’ proper use as a researcher (⇔ as an evaluator)
Metric-wiseness and the research process

Two paths:
1. Metric-wiseness as a communication tool
2. Metric-wiseness as a research motivation
Possible impact of metric-wiseness

1. Metric-wiseness as a communication tool
   - Leveling the playing field
   - Clearer picture of a researcher’s quality

2. Metric-wiseness as a research motivation
   - Risk of crowding out intrinsic motivation
   - Magnify adverse effects of ‘publish or perish’ culture
We defined a respondent to be metric-wise if he/she selected ‘I know this indicator, its meaning and calculation’ for at least one of the six scientometric indicators:

- ISI journal impact factor (Web of Science)
- SCImago journal rank (Scopus)
- 5-year synchronous journal impact factor (Web of Science)
- Hirsch-index (h-index)
- Eigenfactor score (Web of Science)
- Source Normalized Impact per Paper - SNIP (Scopus)

⇒ 62 of the 138 respondents (45%) could be labeled as ‘metric-wise’
Illustration – agricultural economists

- factors respondents consider when selecting a journal for the submission of a manuscript

- general standing of journal
- scope and orientation of the journal
- quality of the paper submitted
- impact factor of journal
- probability of acceptance
- level of submission fee
- past experiences with that particular journal
- opinion of co-authors
- time until a final decision is received
- quality of the expected referee reports
- opinion of colleagues
- other
- editorial board

% of respondents selecting this factor

- metric-wise
- not metric-wise
Expressions of metric-wiseness

• When a researcher is ignorant of the meaning and use of scientometric indicators, he or she cannot be metric-wise.

• Three possible expressions:
  o Using indicators
  o Misusing indicators
  o Moving beyond indicators

• Throughout their career paths researchers can express their metric-wiseness through different trajectories.
Measuring metric-wiseness

• We propose a two-leveled approach
  o Measure the respondent’s familiarity with the concept of one or more popular indicators such as a journal impact factor
  o Identify the manner in which metric-wiseness is expressed through a multi-dimensional Likert-scale
    1) technical knowledge,
    2) external pressure, and
    3) intrinsic motivation
Example of a scale measuring metric-wiseness

<table>
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<tr>
<th>Technical dimension</th>
<th>Suggested statements</th>
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<td>▪ On average older researchers have higher h-indices.</td>
<td>▪ Bibliometric indicators can easily be compared across disciplines.</td>
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<td>▪ Open Access journals never have a Garfield-Sher impact factor.</td>
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<td>▪ Citations received in conference proceedings should be included in an article’s total number of received citations.</td>
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<th>External dimension</th>
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<tr>
<td>▪ I feel completely free to publish my research in any way I want.</td>
<td>▪ My likelihood of being promoted depends only on the number of articles published in journals indexed in the Web of Science.</td>
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<td>▪ My likelihood of being promoted depends only on the number of articles published in journals indexed in the Web of Science.</td>
<td>▪ It is important to use social media (twitter, blogs...) to distribute the results of my research.</td>
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<td>▪ It is important to use social media (twitter, blogs...) to distribute the results of my research.</td>
<td>▪ My likelihood of being promoted depends mainly on the number of articles of which I am first or corresponding author.</td>
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<th>Intrinsic dimension</th>
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<td>▪ I select topics for research based on their potential to advance science.</td>
<td>▪ The quality of a researcher should be measured in relative terms within a field rather than in absolute terms.</td>
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<td>▪ A purely bureaucratic/automatic and quantitative approach to research evaluation is best for an individual researcher.</td>
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<td>▪ If I do not have the expertise to solve a particular problem, I do not hesitate asking a colleague to collaborate with me.</td>
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Reaction to metric-wiseness by evaluators

• Due to the multi-faceted nature of metric-wiseness, it is not a priori clear how institutions or evaluators should react

1. As a communication tool
   • Inform doctoral researchers on indicators
   • Standardize indicators
   • …

2. As a research motivation
   • Include qualitative measures of research quality
   • Detection of indicator manipulation
Conclusion

• The concept of metric-wiseness can be used to identify the different degrees of scientometric knowledge that researchers may possess

• Metric-wiseness is an idea that can only be made precise by a concrete measurement procedure

⇒ Challenge for the future

• The heterogeneity of scientometric knowledge can lead to strategic changes in researchers’ behavior
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