SCIENTOMETRIC performances

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University of Borås (Gothenburg)

Chalmers University of Technology
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Overview

1. The citation debate
   - *The classic debate*: Do citations indicate quality of research?
   - *Alt. perspective*: A ‘performative’ perspective’ on citations

2. General example:
   - Disciplinary practices of citing references

3. Citation ‘kinds’
   - Symbolic representations of subjects

4. What impact does indicator-based measures have?
   - Performativity, co-production and ‘citedness’
   - (At three levels: National, within academia and individual levels)

Focus on the *citation*, but it is argued that other bibliometric measures used in evaluation (e.g. *Journal Impact Factor, H-index*) are also implied.
Science Citation Index

• Introduced in *Science* 1955 by Eugene Garfield
  – The citation as a construction
• Citation ≠ reference

The citation

Quality indicator or measure of performance?

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From cited reference to citation

*Cited reference in text:* Garfield (1955) argued that the citation index could be viewed as an "association ideas index..."


*Citation in the citation index:*

GARFIELD E, 1955, SCIENCE, V122, P108
Conditions for transformation

1. The *citing* paper must be indexed in the citation index.

2. Normally, also the *cited* paper (that receives the citation) must be indexed.

3. The *cited reference* (in the citing paper) must be given correctly so that the reference could be matched to the cited paper.

= CITATION!
The citation as an indicator of quality

• Eugene Garfield (1963):
  – “One purpose of this communication is to record my forewarning concerning the possible promiscuous and careless use of quantitative citation data for sociological evaluations, including personnel and fellowship selection”
  
  – “Impact is not the same as importance or significance”

• At the same time, he also argued SCI to be used to evaluate Journal performance
  – Journal Impact Factor (JIF)

Kessler and Heart

• The warning reads: "CAUTION! Any attempt to equate high frequency of citation with worth or excellence will end in disaster; nor can we say that low frequency of citation indicates lack of worth."

Key arguments for using citations for evaluation

Classic debate:
• Citations as influence vs.
• Citations as indicator of rhetorics/persuasion

Citer motivations:
  – Negative citations
  – Perfunctory (slentrianmässig)
  – Redundant
• But of course also:
  – Conceptual/operational
  – Evolutionary or
  – Confirmational

(from a classification by Moravcsik and Murugusan, 1975)
Argument for the use of citation analysis as a quality indicator:

"The observation that citations indicate use, and therefore usefulness as well as impact, is the basic argument for using them as an indicator of quality."

Susan Cozzens middle ground:
• Citations as a measure of *visibility*

“being cited”

• However, most papers are not read at all. No matter what a paper did to the former literature, if no one else does anything else with it, then it is as if it never existed at all. You may have written a paper that settles a fierce controversy once and for all, but if readers ignore it, it cannot be turned into a fact, it simply cannot. (Latour, 1987, p. 40)
Citations as performativity - “being cited”

Traditionally:

– Citations as reward, (passive)
– Citation Index as representation of publication patterns

My proposal: **Performativity** of “being cited”

– What research work do citations do?
– Citations as construction and epistemological networking
– The citation viewed as an outcome of active achievement or “performance”
– Reflexive actors (researchers are active)

Citation index as a performative arena

– for publishers, authors, citers, publications and articles; indeed the whole “citation culture” (Wouters, 1999)
– Authors actively position themselves by choosing journal/field to publish in & research problems to publish on
– Making themselves “cite-able”
Tentative suggestions: Different roles

Different disciplinary uses of citations:

- In **Natural science**, citations mark *influence*
  • *(to a higher degree)*

- In **Social science**, citations mark *rhetorics*
  • Argumentative

- In **Humanities**, citations mark *textual aspects*:
  • ’conversation with the cited texts’
Part 2: Referencing practices

*In natural science, social science and the humanities*
Idealized contributions:

<table>
<thead>
<tr>
<th>Kind</th>
<th>Ideal contribution</th>
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</thead>
<tbody>
<tr>
<td>Natural science</td>
<td>Explanation</td>
</tr>
<tr>
<td>Humanities</td>
<td>Understanding</td>
</tr>
<tr>
<td>Social sciences</td>
<td>Intervention</td>
</tr>
</tbody>
</table>

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CULTURE OF CELLS AND PRIMARY ISLETS
The rat insulinoma cell line INS-1E [Merglen et al., 2004] (a kind gift from Professor Claus Wolkenstein) was used between passages 71–80.

Thapsigargin Down-Regulates Protein Levels of GRP78/BiP in INS-1E Cells
Victoria Rosengren,¹ Henrik Johansson,² Janne Lehtiö,² Liselotte Fransson,¹ Åke Sjöholm,¹ and Henrik Ortsäter¹*
¹Unit for Diabetes Research, Department of Clinical Science and Education, Södersjukhuset, Sjukhusbacken 10, Research Center 3rd Floor, Karolinska Institutet, 118 83 Stockholm, Sweden
²Science for Life Laboratory, Department of Oncology and Pathology, Karolinska Institutet, Alfa Floor 1, Tomtebodavägen 23A, 171 21 Stockholm, Sweden

ABSTRACT
Pancreatic β-cells have a well-developed endoplasmic reticulum (ER) and express large amounts of chaperones and protein disulfide isomerases (PDI) to meet the high demand for synthesis of proteins. We have observed an unexpected decrease in chaperone protein level in the β-cell model INS-1E after exposure to the ER stress inducing agent thapsigargin. As these cells are a commonly used model for primary β-cells and has shown to be vulnerable to ER stress, we hypothesize these cells are incapable of mounting a chaperone defense upon C57Bl/6J mice [Scandiv, Sweden] and maintained in culture as previously described [Sargsyan et al., 2008]. Animal handling was performed according to national law and approved by local ethical committee.
Actuality and knowability

DAVID J. CHALMERS

It is widely believed that knowledge is not knowable a priori for all such $p$, it is not knowable. In addition, one may also have to accept that provability (as usually understood) does not entail knowability. The sentence $p \leftrightarrow Ap$ is a theorem in many systems of ‘actually’-involving logic. If so, then the proposition $r \leftrightarrow Ar$ is provable, in the standard sense that there exists a proof of it. Nevertheless, $r \leftrightarrow Ar$ is not knowable, and also is not provable in the sense that someone could prove it: the proof cannot be used to gain knowledge of $r \leftrightarrow Ar$.

Given the surprising consequences, one may want to examine the options for responding to the argument in more detail. A number of the available options are tied to different available views of the semantics of ‘actually’ and of the way it behaves in epistemic and modal contexts.

What we might call the face-value view of ‘actually’ holds that there is a proposition expressed by ‘Ap’ such that ‘KAp’ and ‘□Ap’ are true iff this proposition is known or necessary (and likewise for other ‘A’-involving sentences). Given the face-value view, the conclusion (5) follows directly from the standard principles above ($Ap \rightarrow □Ap$, there can be no knowledge of false propositions) and the existence of a true proposition that satisfies (4).

2 For example, ‘$p \leftrightarrow Ap$’ is a theorem of Hazen’s (1978) natural deduction system SSA. Of course such systems will not have an unrestricted principle of necessitation for provable sentences. The standard notion of provability applies to sentences, but we can extend it to propositions by saying that a proof of a proposition $p$ in a system $L$ is an abstract sequence of interpreted sentences such that the sequence is a proof in $L$ (in virtue of the logical form of the sentences) of a sentence that expresses $p$. 
The problems with all these explanations are well-known. First, they reduce the agents to mere or less cultural or structural 'dupes' (Giddens, 1984). Instead of being able to choose, they have no choice at all, and therefore do not form a free society. According to Robert Putnam (1993), the reason Northern Italians trust each other can be traced back to political traditions established in the medieval city states, while Southern Italians have much less social capital, because no such-horizons were created. Malah (1999) puts it this way: the Northern idea is known as evolutionary game theory: the problems are (1) where do these ideas come from? and (2) what or who determines which ideas will dominate more or less cultural or structural 'dupes' (Giddens, 1984). In her work about the importance of ideas in major policy choices made by different European Social Democratic parties in the inter-war period, Berman argues that actors with different ideas will make different decisions, even when placed in similar environment (Berntsen, 1998; Ch. 2) put in his discussion about the role of ideas, while Scandinavians, according to Robert Putnam (1993) Russians have much less social capital, because no such-horizons were created. Malah (1999) puts it this way: the Northern idea is known as evolutionary game theory: the problems are (1) where do these ideas come from? and (2) what or who determines which ideas will dominate more or less cultural or structural 'dupes' (Giddens, 1984).
There are **Quantitative** differences
But what about **Qualitative** differences?

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Part 3: The citation as symbol

Means for identifying "visibility" of research
Citation indexes

Commercial

Freely available

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Figure 3: Number of scientific articles per year including the concepts of *terroris* and neuro*. N=208. Source: Web of Science, Timespan: 1989-2011.
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WoS: Citation report profiles
"Citation context analysis"
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<th>#</th>
<th>Date / Author / Journal</th>
<th>LCS</th>
<th>GCS</th>
<th>RQ</th>
<th>Box</th>
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<td>PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, AND USER ACCEPTANCE OF INFORMATION TECHNOLOGY</td>
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<td>2168</td>
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<td>Theory and practise of the g-index</td>
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<td>359</td>
<td>53%</td>
<td></td>
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<td>464</td>
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<td>6</td>
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<td>163</td>
<td>473</td>
<td>34%</td>
<td></td>
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<td></td>
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<tr>
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<td>ASK FOR INFORMATION-RETRIEVAL .1. BACKGROUND AND THEORY</td>
<td>144</td>
<td>393</td>
<td>37%</td>
<td></td>
</tr>
</tbody>
</table>

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[Please cite if used]
HistCite\textsuperscript{1}: citation maps (WoS data)

\[ \text{Nodes: cited documents} \]
\[ \text{Arcs: references} \]

\textsuperscript{1} http://www.histcite.com

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Citation kinds

Figur 28: *Självcitering* (3162).

Figur 29: *Citeringspar* (Ömsesidig referens) (2850, 2851).

Figur 30: *Ensamvägar.*
Scales of measurement

Work conducted w/ Christopher Kullenberg, GU: Co-production of Happiness research and society
Bibliographic coupling of sources

Work conducted w/ Christopher Kullenberg, GU:
Co-production of Happiness research and society

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Bibliographic coupling of sources

Qualitative clustering

Work conducted w/ Christopher Kullenberg, GU: Co-production of Happiness research and society

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Work conducted w/ Christopher Kullenberg, GU:
Co-production of Happiness research and society
Co word "heat map"

Visualisation shows 173 "relevant terms" (in 288 articles, 11,728 terms identified)
Geografisk representation

Present and future agenda

• Co-production of science and society
  – ‘citedness’; performativity: (c.f. Pickering, Knorr, Mackenzie, Callon, Latour, Jasanoff)
  – Happiness project (VR 2014-2017)

• **SSNA**: Social and Spatial Network Analysis
  – GIS – bibliometrics (c.g. Leydesdorff & Persson (2010))
  – ‘migration’ e.g. ‘brain drain’ of malaria researchers

• Information fusion
  – fusing data from different sources using statistical methods
  – topic modelling; sentiment analysis
  – **INCITE** project: Information Fusion as an E-Service in Scholarly Information Use (VGR 2013-14 + 2015-16)

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Performance based allocation models on three levels in Sweden

*Torn between qualitatively different systems of research impact measures*
Different measures on three levels

• National level (in Sweden):
  – Field normalized publication and citation measures

• Within (many) universities:
  – Norwegian "impact factor” model based on secondary peer review (BUT: See below for update)

• Individual level:
  – H-Index
Present performance based funding model (2008/2012)

**Basic funding (80 %)**

**Performance based share (20 %)**

1. External funding (50 %)
2. **Publication performance** (50 %) as normalized data for *publication & citation rates*

**Main features**

- Four year moving average
- Author fractionalization
- Normalization:
  - Publications: *Waring Distributions*
  - Citations: *Field Normalized Citation Level*
- Additional Weighting
  - Medicine + Technology: 1.0; Science: 1.5;
  - Social Sci + Humanities: 2.0; Other: 1.1


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Motives for weighting

- "We have made some runs when it comes to what effects different variants of the allocation system would give. /.../
- I can only say that a big problem for me was naked – would turn out negative for the humanities and social sciences. We introduced this doubling factor ‘to make sure to have a cupped, a protective hand, especially for the humanities.’
- We'll see how it goes.

Our assessment is that this multiplier 2 is sufficient to protect the humanities. I can not guarantee that it is so. Of course, we will follow up on it. But I think it will turn out positive.
- (Applause). "

The ’problem of the humanities’

Citing practices differ and are not comparable

– between different disciplines, e.g. natural sciences, social sciences & humanities

There is order of magnitude

– handled by weighting (normalization, fractionalization...)

But could these be compensated for?

– By quantitative measures?
– or qualitative measures?
Key points:

• Performance based share doubled (20 %)

• ‘Peer review’ instead of bibliometrics?
  – Cf, the British RAE/REF system or
    Univeritetskanslerämbetets ”kvalitetsutvärderingssystem för högre utbildning”

• But, implemented ”not before 2018”

• Meaning:
  – two general elections (2014, 2018)
  – one innovation bill (expected in 2016)
    • ...will pass before the new model is implemented.
Within universities  
(my assumption)

• A large number of universities within higher education sector have adopted a system based on the ‘Norwegian model’

• Allocation and re-allocation:
  – at the faculty level
  – department level
  – (individual level)
’Norwegian model’
(also used in Denmark and Finland)

• **Two dimensions:**
  – publication channel
  – level of the channel
    • (0: not scientific)
    • 1: ordinary scientific
    • 2: highly prestigious publication channels

<table>
<thead>
<tr>
<th>Publication channel</th>
<th>Level 1 (80%)</th>
<th>Level 2 (20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monograph</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Article in journal or serial publication</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Article in edited work</td>
<td>0.7</td>
<td>1</td>
</tr>
</tbody>
</table>

Arguably:
• ’Secondary peer review’
• ’Impact factor’ based system
Within universities

Swedish Academia

47 HEIs
27 awarding third cycle degrees (doctorates)
Preliminary findings - overview

• All universities – with the exception of Chalmers and Stockholm School of Economics - use bibliometric measures to some extent for resource allocation at one or several levels

• The types of measures and models used differs considerably, but models counting publication are more common than citation based models

• The largest and most diversified universities often use a range of measurements depending on faculty
<table>
<thead>
<tr>
<th>Publication based (10)</th>
<th>Citation based (2)</th>
<th>Combination of C &amp; P (11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blekinge Institute of Technology</td>
<td>Karolinska Institutet</td>
<td>Jönköping University</td>
</tr>
<tr>
<td>Halmstad University</td>
<td>KTH</td>
<td>Karlstad University</td>
</tr>
<tr>
<td>Linneaus University</td>
<td></td>
<td>Lund University</td>
</tr>
<tr>
<td>Luleå University</td>
<td></td>
<td>Linköping University</td>
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<tr>
<td>Mid Sweden University</td>
<td></td>
<td>Malmö University</td>
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<tr>
<td>Mälardalen University</td>
<td>Swedish University of Agricultural Sciences</td>
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<tr>
<td>Stockholms University</td>
<td>The Swedish School of Sport and Health Sciences</td>
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<tr>
<td>University of Gävle</td>
<td>Uppsala University</td>
<td>Örebro University</td>
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<table>
<thead>
<tr>
<th>Faculties (9)</th>
<th>Departments (16)</th>
<th>Individuals (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blekinge Institute of Technology</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Karolinska Institutet</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
| Jönköping University | X (fackhögskolor) | X  
| Karlstad University | X | X  
| KTH | X (schools) |  
| Linköping university | X (Health Science) |  
| Linneaus University | X | X*  
| Lund University | X |  
| University of Gothenburg | X |  
| Malmö University | X | X  
| Mid Sweden University | X |  
| Mälardalen University | X (research spec) |  
| Luleå University | X |  
| Stockholm University | X |  
| Swedish University of Agricultural Sciences | X | X (not formalized)  
| Södertörn University | X | X (social sciences?)  
| The Swedish School of Sport and Health Sciences | X |  
| University of Borås | X |  
| University of Gävle | X |  
| University of Halmstad | X (research area) |  
| Umeå University | X | X  
| Uppsala University | X* | X  

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Comparison Sw/No model

**Swedish model**

- **Transparency:**
  - Variables in the calculated model are relative
- **Selection:**
  - Only published material that is indexed in WoS ISI
- **Measure of quality**
  - Citation measures, field normalized
- **Source of data:**
  - Already available data (WoS ISI)

**Norswegian modell**

- **Transparency:**
  - Pre-determined ’point system’
- **Selection:**
  - More research channels (Monographs, conf. Proc, journal articles)
- **Measure of quality:**
  - ”Secondary peer review”
- **Sources of data:**
  - An authorization index must be created (Cristin, NSB) and publication lists must be updated.
Individual level

H-index

- Introduced as "an index to quantify an individual’s scientific research output" (Hirsch, 2005)

- Measure of *individual performance*

- Calculated as the break point value for an individual’s publications where No. of published papers meets frequency of citations

\[
'H' = \text{citations} = \text{published papers} = 13
\]
Constant flux of measures at all three levels

- National level (in Sweden):
  - Field normalized publication and citation measures
  - From 2018: Peer review – *Role of bibliometrics?*

- Within (many) universities
  - Norwegian “impact factor” model based on secondary peer review
  - Swedish citation based model (few Univ’s)
  - Or Both Swedish/Norwegian models

- Individual level
  - Norwegian
  - H-Index
Downside of the performative idiom

‘curriculum vitae AND h-index’

‘Gaming the system’

Techniques
• self (colleague) citation
• editor coercion
• citation cartels

Research policy advice:
Division of Analysis and Evaluation, GU
In response to university rankings:
• “another way of advancing on the list would be to appoint highly cited researchers, since they ‘bring with them’ their earlier citations…”

(Gunnarsson 2013, my translation)

False!
Dear Reviewer,

We are very grateful for all reviewers’ efforts and contribution to S[_____] and for taking time reviewing manuscripts. Both authors and reviewers are very important for the quality of the journal and without you we will not reach the goal of being the leading international journal of [ämnesområde].

We hope you will continue with your excellent work on S[_____] review and contribute to the journal. We would like to further develop the journal and therefore highlight the following issues:

As part of your review, please consider all of the following:
1. Manuscripts should not exceed 5000 words excl. abstract, references figures and tables
2. Maximum 5 tables and 3 figures are allowed.
3. Maximum 12 words in the manuscript title
4. Maximum 10 keywords related to the title, and the words should appear in the abstract
5. Manuscript should refer to at least one article published in S[____].
6. If you agree to review a paper it is expected that you will also review the revised version of the manuscript. This is important for the quality of the manuscript and for the authors
7. Maintain confidentiality and integrity in the professional publication
8. Follow the reviewers’ guidelines and give comments to author and/or the editor
9. References should reflect S[____]’s international audience
10. Be timely. If you are unable to review a paper please let us know immediately as this will help the process.

You can do this by logging into your account, clicking on the ‘Edit Account’ tab at the top right hand side of the page, next to the orange ‘Get Help Now’ tab and following the instructions.

Kind regards
Editor-in-Chief, Scandinavian Journal of [_____]
[_______], professor

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<table>
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3215 Entries
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5 sec
GU: 3
CTH: 1

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http://highlycited.com
Conclusion

• Bibliometrics in research evaluation:
  – Quantitative or
  – Qualitative solutions?
  – Prevalent both in ’citation’ & ’impact factor’ based models.

• ”Field normalization” and other bibliometric techniques solves quantitative aspects, but what about qualitative differences in citation practices?

• Individual performativity – incentives to publish
  – E.g. ”being cited” – how well researchers make themselves cite-able in citation based metrics.

• ‘Citedness’
Literature

- Kessler, M. M. & F. E. Heart (1962) 'Concerning the probability that a given paper will be cited', Report (Massachusetts Institute of Technology, Cambridge).
- Moed, H. F. 2005. *Citation analysis in research evaluation*. Dordrecht: Springer.
- Wouters, P. 1999. *The Citation Culture*. Diss: Faculteit der Scheikunde, Universiteit van Amsterdam.

Thank you!

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