

Academic Leadership and the Transition to Open Science

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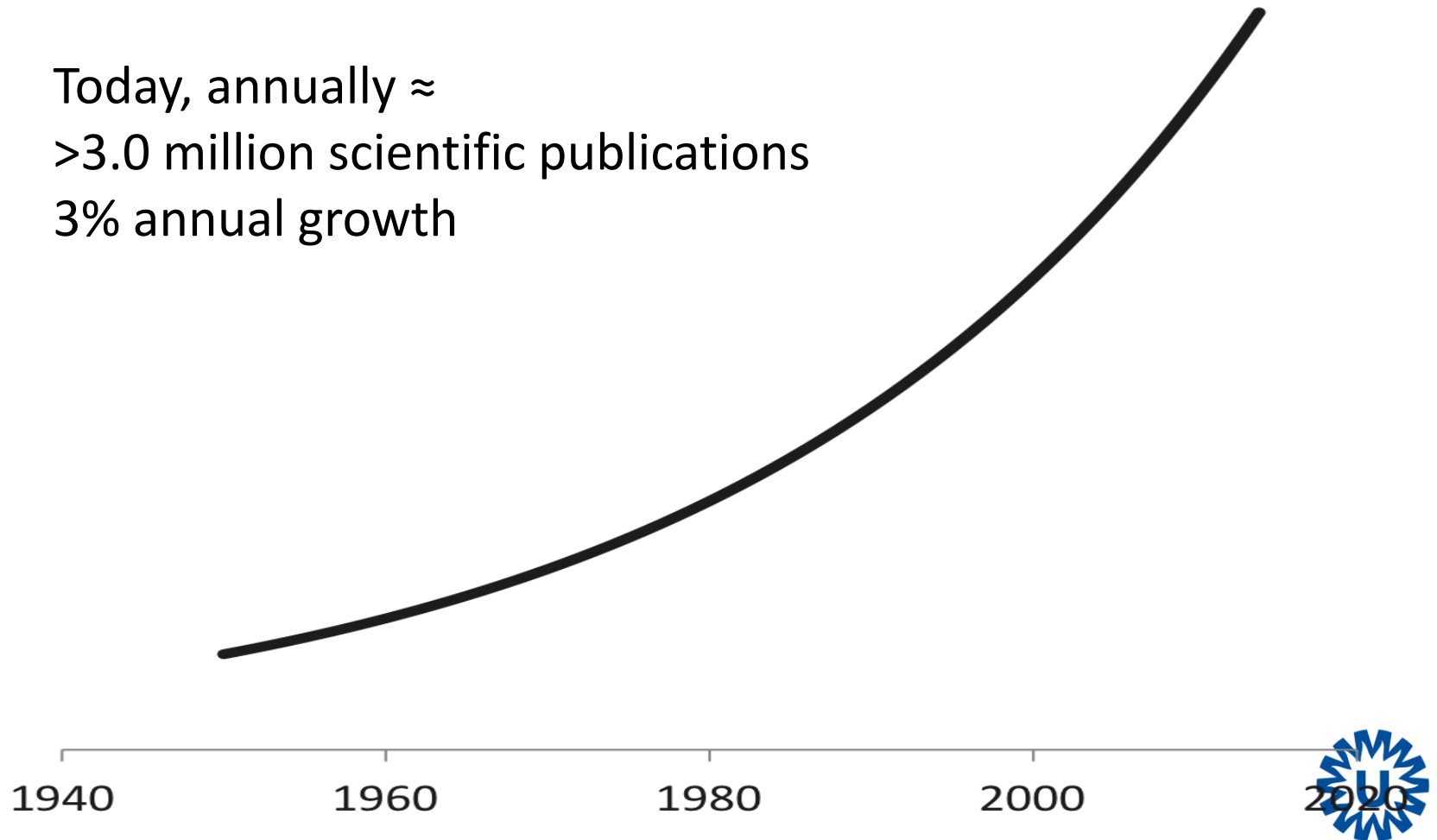
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www.scienceintransition.nl



Science as a social system in society has grown enormously since 1945

Today, annually $\approx$
>3.0 million scientific publications
3% annual growth



THE LANCET

A new Lancet Series



increasing value
reducing waste
in research

Significant systemic problems mostly because of various types of policies and wrong incentives:

85% of biomedical research investment—equating to \$200 billion of the investment in 2010—is wasted

Poor Reliability & Quality & Reproducibility

**Publication bias and biased research agenda
(negative results not reported, skewed problem choice)**

Lancet, January 2014, Ioannidis, Altman, Chalmers, Glaziou, Kleinerts & Horton et al.



The Scientific Field: How Scientist Get Credit

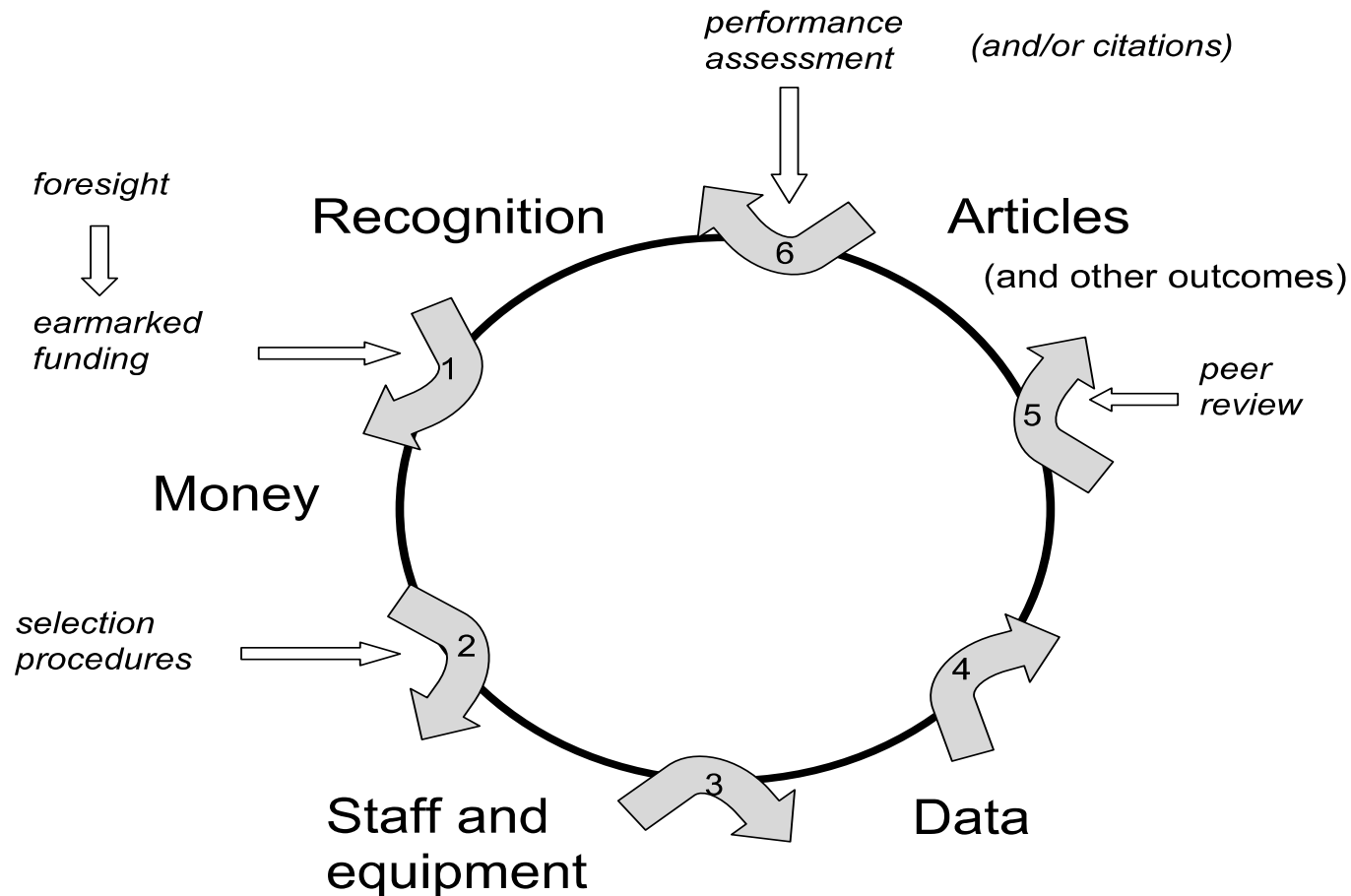


Figure 3. The credibility cycle, adapted from Latour and Woolgar (1986). Points at which organizational devices connect to the cycle are shown

Pierre Bourdieu, *Science of Science*, 2004

Hessels et al, *Science and public policy*, 2009

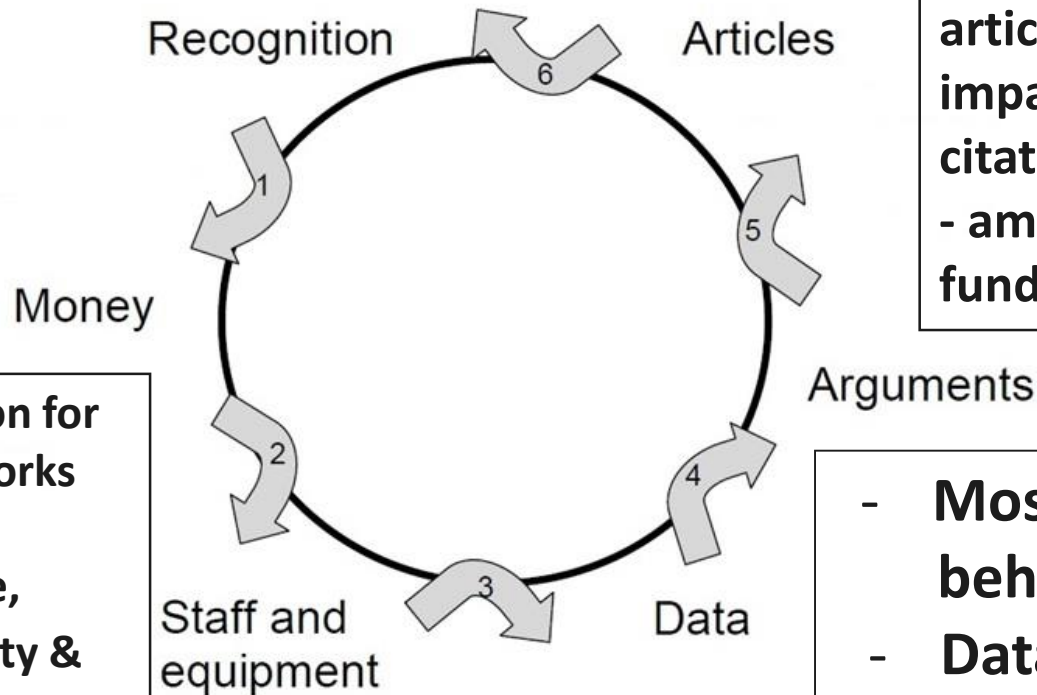


Problems of the Current Reward System in Science

Society is largely absent from the *credibility cycle*

Quality in Quantitative terms:

- number of articles, journal impact factor, citations, H-index
- amount of funding obtained



Hypercompetition for limited funds works against Team-Science, Multidisciplinarity & Diversity

- Most papers still behind paywalls
- Data not shared



Metrics Shapes Science 1

- Quality, relevance and impact are subordinate to *novelty and quantity*
- Short-termism and risk aversion in 4 years cycles
- Universities outsource talent management to funders based on flawed metrics instead of having a research strategy going with their mission



Metrics Shapes Science 2

- The national and institutional research agenda is not properly reflecting societal (clinical) needs and disease burden
- Open Science (responsible) research practices, stakeholder engagement, preregistration, FAIR DATA and Open Access are just 'nice to have'



Transition to Open Science to improve Quality, Impact and Integrity: we need a Systems Approach



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With Open Science we
have **NOW** the
opportunity to discuss
the roles and functions
of science in society.



Open Science as Game Changer? ...Where to? For Whom?

Norms of Academic Science:

(Merton 1942)

- **C** communism (or communitarianism)
- **U** universality: universal knowledge
- **D** disinterestedness: no personal stakes(except honour)
- **O** originality: NEW knowledge
- **S** scepticism: try to falsify

Post-Academic Science since 1980:

(Ziman 2000)

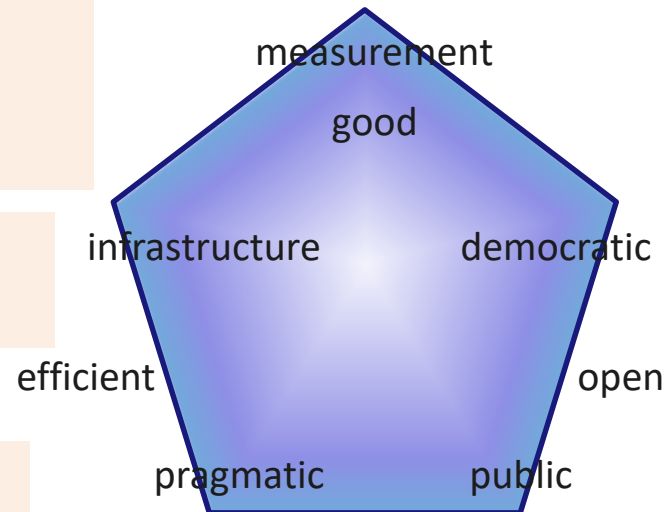
- **P** proprietary (IP, business opportunity)
- **L** local: related to local network of stakeholders
- **A** authoritarian: hierarchical control
- **C** commissioned (researcher is 'consultant')
- **E** expert: role is problem-solver



Five schools of thought on open science

Fecher, B., and Friesike, S. (2014). Open Science: One Term, Five Schools of Thought. In [Opening Science](#), S. Bartling, and S. Friesike, eds., pp. 17–47.

- better measurements and evaluation approaches
- improved tools and services
- Relevance: more efficient and effective research



equitable
distribution
of research benefits

accessible
and
comprehensible



<https://doi.org/10.6084/m9.figshare.5627503>

[Bianca Kramer](#) & [Jeroen Bosman](#), Utrecht University
Library [Knowledge Exchange](#)



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San Francisco Declaration on Research Assessment (2012)

Let's change
what we value
in research.



DORA

- **Quality in Quantitative terms:**
- **-number of articles,**
- **journal impact factor, citations,**
- **H-index**
- **-amount of funding obtained**





James Wilsdon et al, 2015



2015



2013





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and scientists in
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Transition to Open Science

- **Rewards and Incentives: Research Indicators and Next-Generation Meaningful Metrics**
- OA and the Future of Scholarly Communication
- European Open Science Cloud (EOSC)
- GO FAIR (Fair Open Data)
- **Research Integrity**
- Open Science Skills and Education
- Citizen Science, Public Participation

Taken from EU OSPP recommendations

https://ec.europa.eu/research/openscience/pdf/integrated_advice_opspp_recommendations.pdf



Granting Agencies and Funders cOAlitionS launched PlanS: Open Access and DORA assessment criteria*



** PlanS , Sept 2018, updated guidelines May 31, 2019*



Incentives and Rewards: EU OS Career Assessment Matrix

RESEARCH OUTPUT

Research activity
Publications
Datasets and research results
Open source
Funding Securing funding for open science activities

RESEARCH PROCESS

Stakeholder engagement/citizen science
Collaboration and Interdisciplinarity
Research integrity
Risk management

SERVICE AND LEADERSHIP

Leadership
Academic standing
Peer review
Networking

RESEARCH IMPACT

Communication and Dissemination
IP (patents, licenses)
Societal impact
Knowledge exchange

TEACHING AND SUPERVISION

Teaching
Mentoring

Supervision

PROFESSIONAL EXPERIENCE

Continuing professional development
Project management
Personal qualities

UMC Utrecht: Inclusive set of generic indicators for research quality and impact

Structure	Leadership & culture
	Collaborations with stakeholders
	Continuity and infrastructure
Process	Setting research priorities
	Posing the right questions
	Incorporation of next steps
	Design, conduct, analysis
	Regulation and management (OA, FAIR data sharing)
Outcomes	Research products for peers
	Research products for societal groups
	Use of research products by peers
	Use of research products by societal groups
	Marks of recognition from peers
	Marks of recognition from societal groups



Science in Transition in the UMC

Utrecht: Open Science

**Multidisciplinary
research facilitated**

**Diversify talent
management**

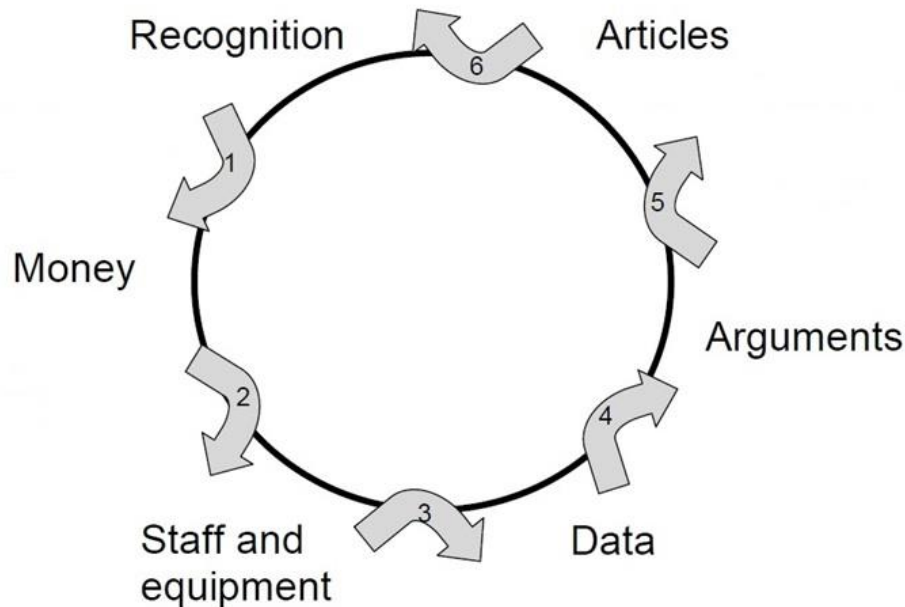
**Stakeholders involved in
prioritizing research**

**Evaluation by
hybrid panels**



Open Science: To improve quality and integrity at the personal level by systemic change

Engagement of societal stakeholders in problem choice



Inclusive indicators

Quality
Open Access
Societal Impact
Use in and outside academia

OPEN PEER REVIEW
POST PUB PEER REVIEW

FAIR data
sharing



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The Promise of Open Science

Open Science will:

- **At the organizational level improve academic culture and the daily practice of research**
- **Foster responsible research conduct and research integrity at several levels**
- **Will improve the interaction with society and increase the impact of science**

