

Title: Like penguins on an ice floe: The scary business of adopting open science practices

Date: Mar 26, 2018 10:00 AM

URL: <http://pirsa.org/18030098>

Abstract: In the talk I delineate a simple framework for open science and present empirical results on the adoption of open practices from my own research (+ others). The topics include data sharing, open access infrastructure, and replicability. I will show future perspectives for open science (including knowledge transfer and transdisciplinary research).



BENEDIKT FECHER

OPEN SCIENCE: A DRAMA IN THREE ACTS

OPEN RESEARCH: RETHINKING SCIENTIFIC COLLABORATION / PERIMETER INSTITUTE

WATERLOO / MARCH 26 / 2018

OPEN SCIENCE – A DRAMA IN THREE ACTS

ACT I HACKING THE IVORY TOWER?

WHAT IS OPEN SCIENCE? AND WHAT NOT?

ACT II LIKE PENGUINS ON AN ICE FLOE

INCENTIVES FOR OPEN RESEARCH (CASE: DATA SHARING)

ACT III QWERTY WORLDS

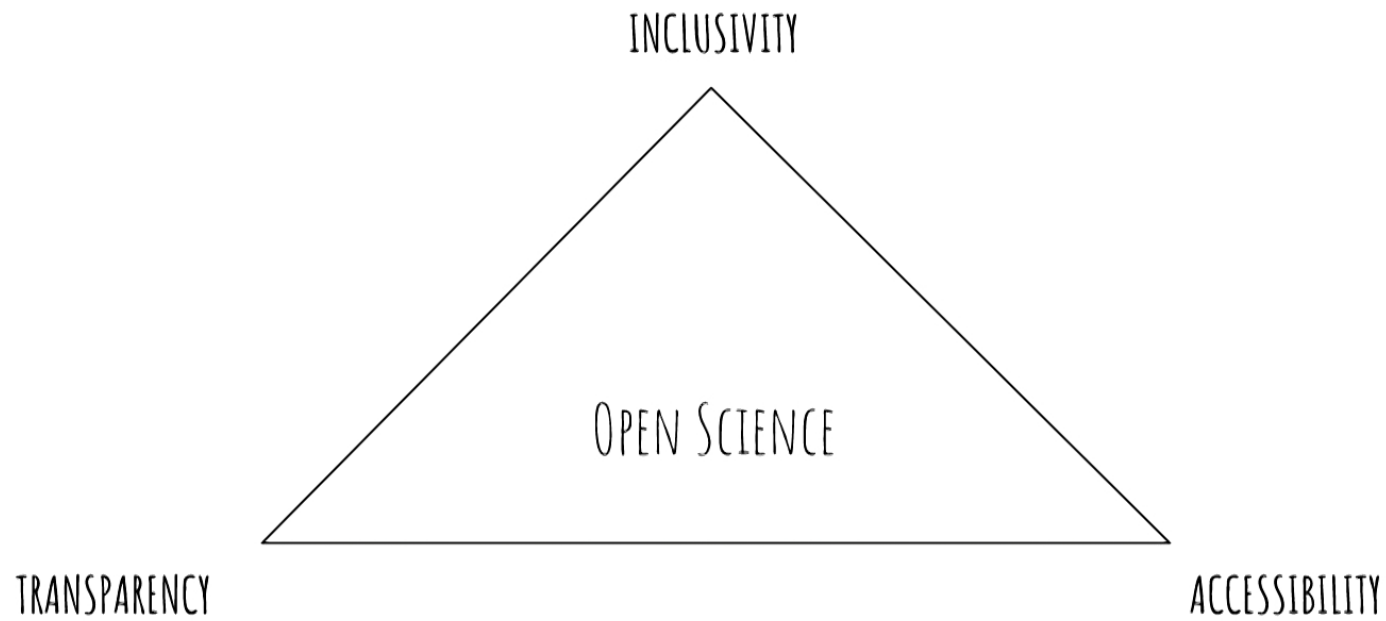
INFRASTRUCTURE IN OPEN RESEARCH (CASE: OPEN ACCESS)

A painting of a dimly lit interior, possibly a workshop or a study. In the center, a man with a long white beard and a dark robe sits on a wooden bench, looking down at his hands. To his right, a woman in a dark dress is kneeling, working on a small object on the floor. The room is filled with various objects, including a large wooden chest, a table with books, and a window in the background. The lighting is warm and focused on the figures, creating a sense of intimacy and concentration.

ACT I

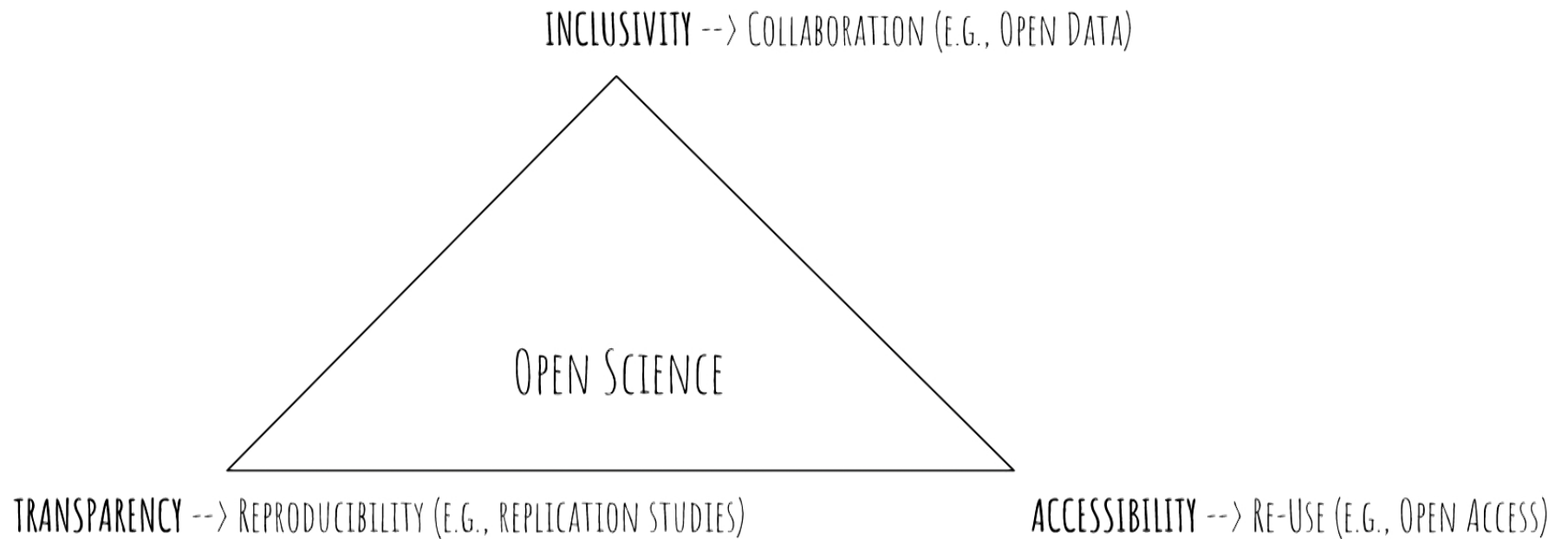
HACKING THE IVORY TOWER?

OPEN SCIENCE HAS THREE DIMENSIONS: INCLUSIVITY, TRANSPARENCY, ACCESSIBILITY.



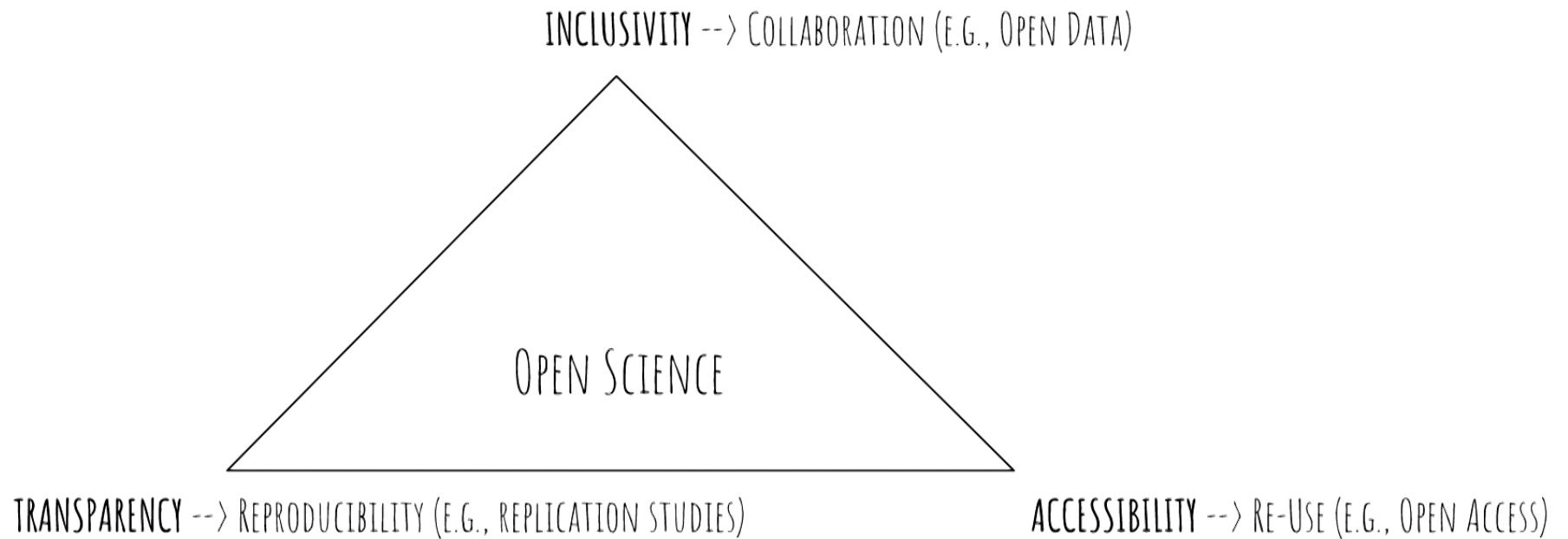
FECHER ET AL. (2018, FORTHCOMING)

IDEALLY OPEN SCIENCE MAKES RESEARCH BETTER AND MORE EFFICIENT.



FECHER ET AL. (2018, FORTHCOMING)

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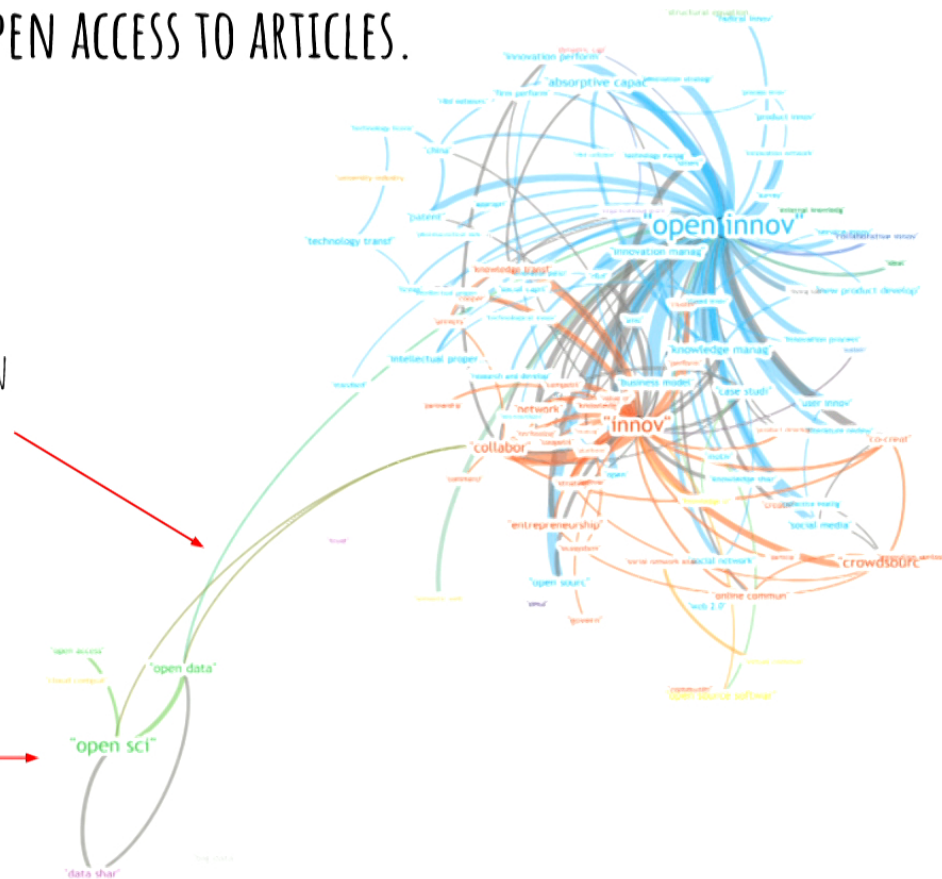


FECHER ET AL. (2018, FORTHCOMING)

OPEN SCIENCE IS DATA SHARING AND OPEN ACCESS TO ARTICLES.

FEW TO NO LINKS TO OPEN
INNOVATION

OPEN ACCESS, OPEN DATA &
MASS COMPUTING



OPEN DATA IS SUPPORTED BY FUNDERS AND POLICY MAKERS.

- OPEN ACCESS TO RESEARCH DATA DEEPLY ROOTED IN THE SCIENTIFIC SELF-CONCEPTION
 - MERTONIAN NORMS, E.G. COMMUNALISM, ORGANIZED SKEPTICISM
 - POPPER'S CRITICAL RATIONALISM, FALSIFIABILITY
- OPEN DATA / DATA SHARING POLICIES ADOPTED BY MANY FUNDERS
 - E.G. EUROPEAN RESEARCH COUNCIL, HORIZON2020, WELLCOME TRUST, ALL US FEDERAL AGENCIES (INCL. NSF AND NIH)
 - CANADA: CIHR, NSERC, SSHRC
- OPEN DATA AND SCIENTIFIC PROGRESS
 - EFFICIENCY, E. G., META-ANALYSIS
 - QUALITY, E. G., REPLICATION STUDIES



RESEARCHERS LIKE OPEN DATA TOO ...

Table 2: General perception towards open access to data

From: [A reputation economy: how individual reward considerations trump systemic arguments for open access to data](#)

On a scale from 1 to 5; 1= “Strongly disagree”—5= “Agree completely”	Observation	IRR * (%)	Mean	Standard deviation	[95% Conf. interval]		Responses in per cent:				
							Strongly disagree	2	3	4	Agree completely
“Researchers should generally publish their data”	1491	95	4.10	1.00	4.05	4.15	1.95	5.90	16.57	31.32	44.27
“I have more disadvantages than advantages when I share my data with others”	1419	91	2.32	1.16	2.26	2.38	28.61	33.19	21.35	11.49	5.36
“It deters me from publishing when a journal requires the publication of my data”	1412	90	1.94	1.14	1.88	2.00	48.30	25.71	13.95	7.86	4.18
“Openly available research data is a great contribution to scientific progress”	1449	93	4.34	0.94	4.29	4.39	1.73	3.80	11.32	25.05	58.11

FECHER ET AL. (2017)

... AND BELIEVE IT'S GOOD FOR SCIENTIFIC PROGRESS.

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FECHER ET AL. (2017)

BUT THEY RARELY SHARE THEIR DATA OPEN.

Table 3: “Have you ever shared your research data with others?”

From: A reputation economy: how individual reward considerations trump systemic arguments for open access to data

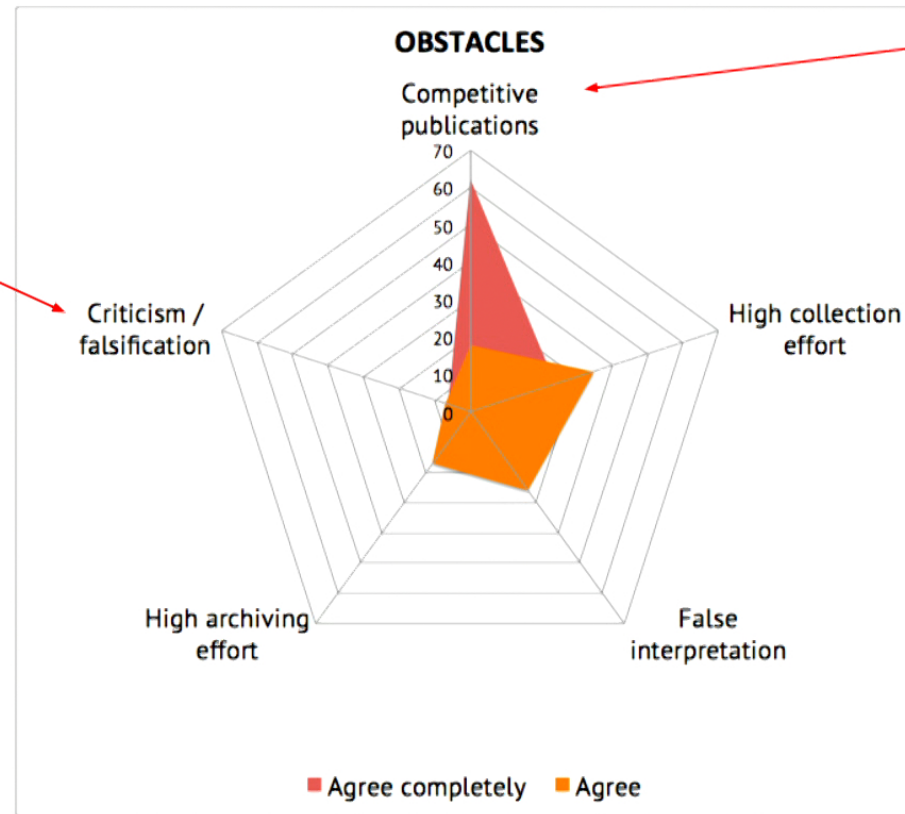
Binary, multiple choice; 1=selected; 0=not selected	Observation	Mean	Standard error	[95% Conf. interval]		Responses in percent:	
						Selected	Not selected
“Yes, with researchers who I know personally”	1564	0.58	0.12	0.56	0.61	58.06	41.94
“Yes, with researchers within my institute or my organization”	1564	0.49	0.13	0.47	0.52	49.36	50.64
“Yes, with researchers who work on similar topics”	1564	0.40	0.12	0.38	0.43	40.35	59.65
“Yes, with all non-commercial researchers”	1564	0.14	0.08	0.13	0.16	14.45	85.55
“With commercial researchers”	1564	0.06	0.01	0.05	0.07	5.88	94.12
“Yes, with the public”	1564	0.13	0.01	0.11	0.15	13.11	86.89
“No”	1564	0.16	0.01	0.14	0.18	16.30	83.70

FECHER ET AL. (2017)

THE REASON THEY DON'T SHARE IS BECAUSE THEY FEAR A COMPETITIVE DISADVANTAGE.

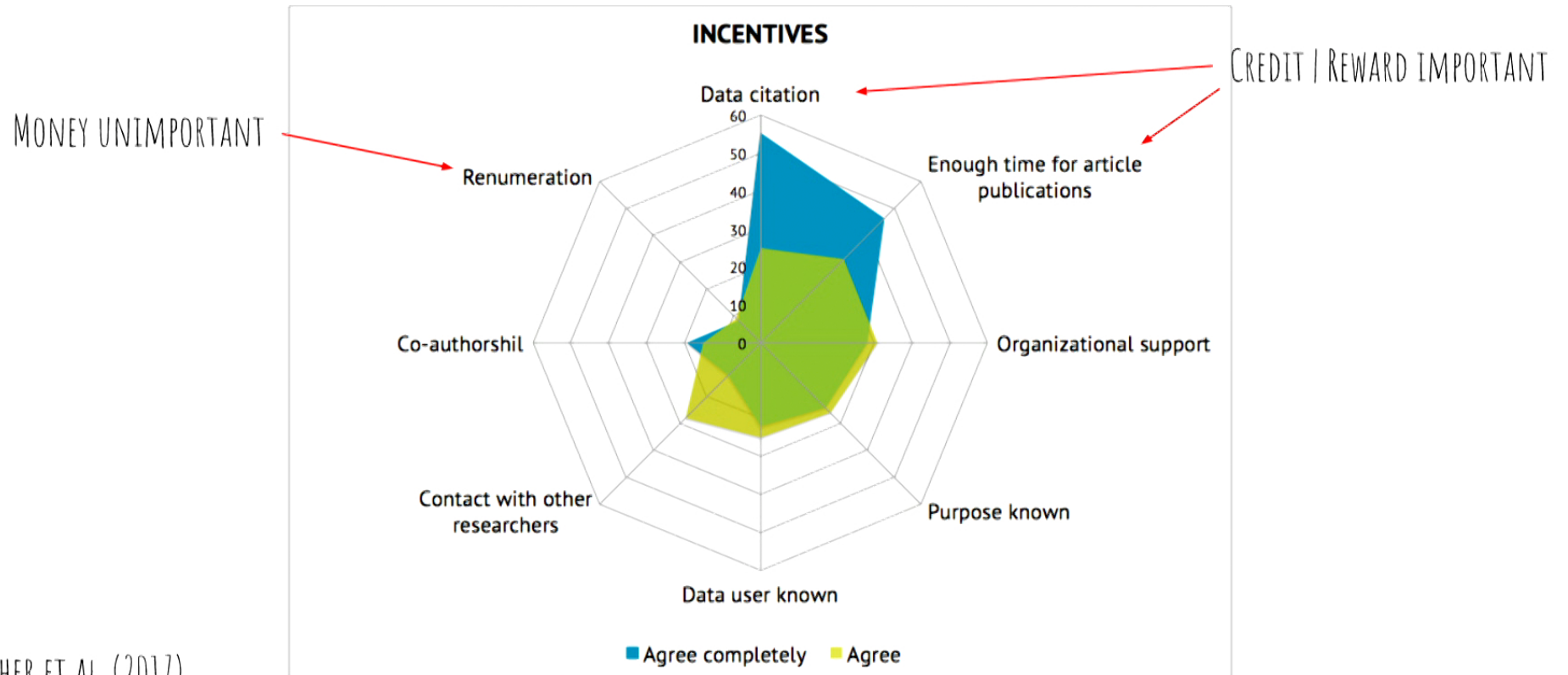
FALSIFICATION IS NOT AN
ISSUE

CREDIT / REWARD IMPORTANT



FECHER ET AL. (2017)

THEY WOULD POTENTIALLY SHARE MORE IF DATA SHARING RECEIVED MORE FORMAL RECOGNITION.




FECHER ET AL. (2017)

BUT: DATA IS NOT CONSIDERED A SCIENTIFIC PRODUCT ITSELF (YET).

AND WHAT ABOUT SOFTWARE / CODE,
RESEARCH INFRASTRUCTURE, TRANSFER
PRODUCTS?



A vintage black typewriter is the central focus, with a person's hands typing on the keyboard and adjusting a lever on the left. To the left of the typewriter is a white cup of black coffee on a saucer. The background is a light-colored wooden surface.

ACT II

A QWERTY WORLD

OPEN ACCESS IS SOON THE DEFAULT STATE.

- ALMOST HALF THE ARTICLES PUBLISHED ARE OPEN ACCESS
 - EUROPE: IN TOTAL 45%; GERMANY 45%; NETHERLANDS 58%
 - NORTH AMERICA: CANADA 49%; US 56% (ARTICLES PUBLISHED BETWEEN 2004 – 2011)
- MAJORITY (50+) OF ARTICLES PUBLISHED AS OA HAS BEEN REACHED IN GENERAL SCIENCE & TECHNOLOGY, IN BIOMEDICAL RESEARCH, BIOLOGY, AND MATHEMATICS & STATISTICS (FOR COMPARISON: SOCIAL SCIENCES 36 %)
- GREEN OA MOVES SLOWLY (2 % GROWTH RATE PER YEAR), GOLD AND HYBRID OA IS DRIVING IN THE FAST LANE (24% PER YEAR)
- CITATION ADVANTAGE (I.E., LAWRENCE 2001, ANTELMAN 2004)



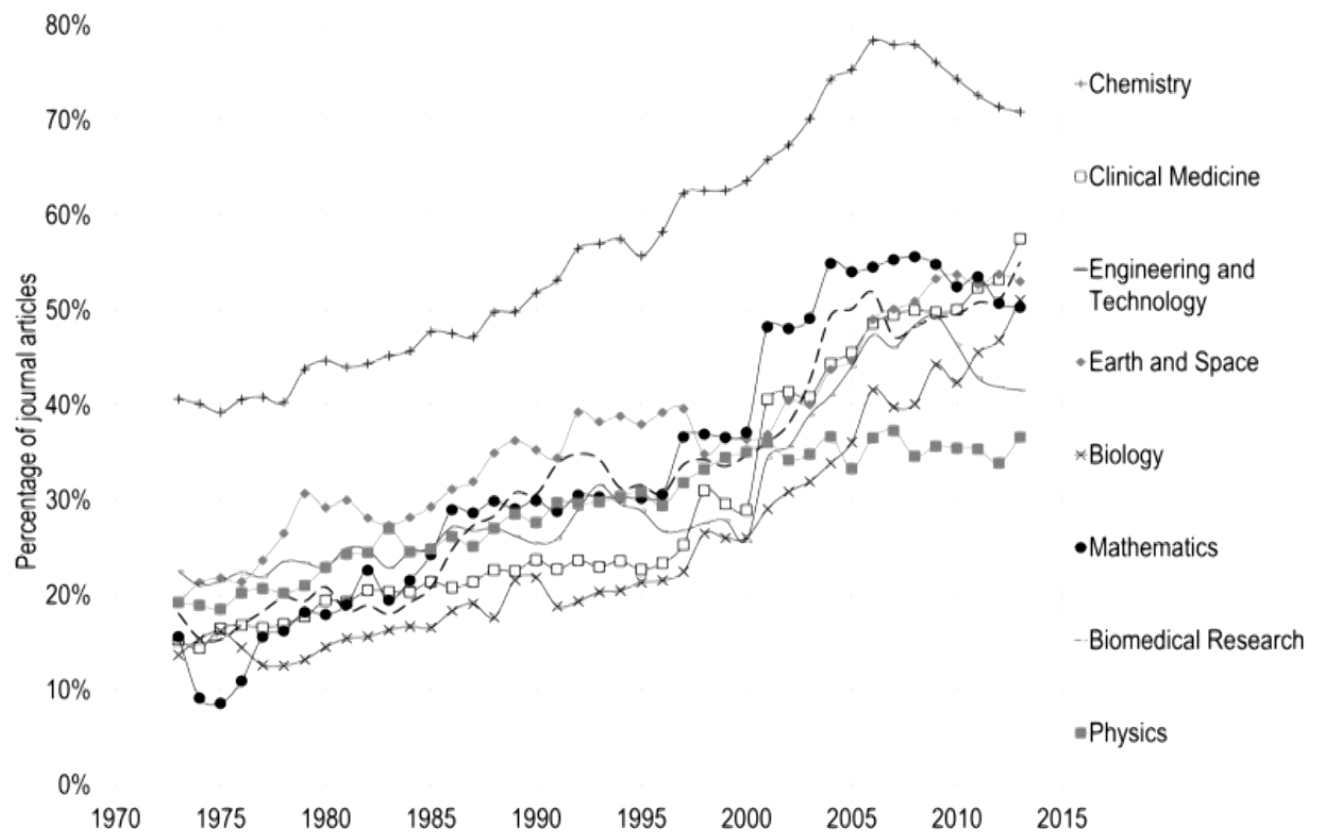
MAIN SOURCE

ARCHAMBAULT ET AL. 2013: PROPORTION OF OPEN ACCESS PEER-REVIEWED PAPERS AT THE EUROPEAN AND WORLD LEVELS—2004-2011

A FEW COMMERCIAL PLAYERS ORGANIZE ACADEMIC PUBLISHING.

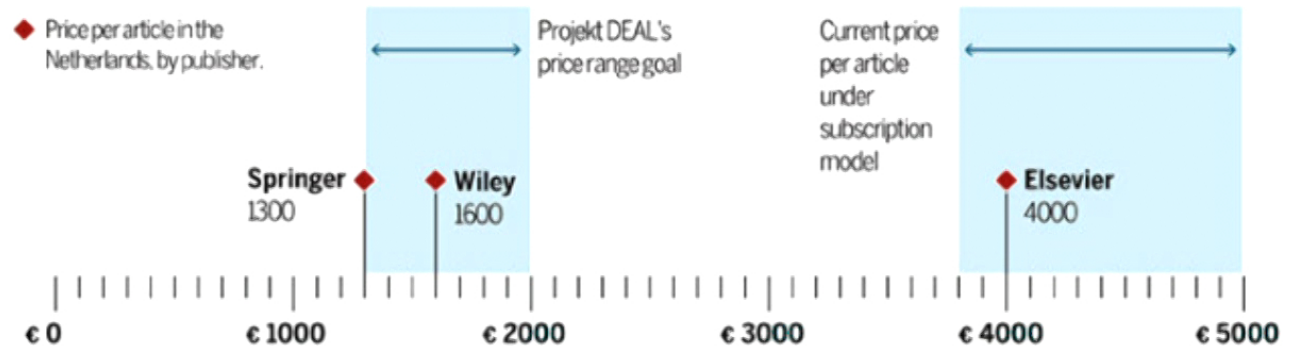
PERCENTAGE OF PAPERS PUBLISHED BY THE
FIVE MAJOR PUBLISHERS, BY DISCIPLINE
IN THE NATURAL AND MEDICAL
SCIENCES, 1973-2013

LARIVIÈRE ET AL. (2015)



A "BIG DEAL" IS A FLAT RATE TO PUBLISH OA AND READ FOR FREE.

BIG DEAL MEANS PAYING A LUMP SUM
IN ORDER TO PUBLISH ALL GERMAN
ARTICLES OA AND TO LET GERMAN
RESEARCHERS READ ARTICLES FREELY.



VOGEL & KUPFERSCHMIDT (2017)

BUT: A “BIG DEAL” COULD HAVE ADVERSE EFFECTS.

EXCLUSION OF RESEARCHERS FROM POORER INSTITUTIONS AND COUNTRIES

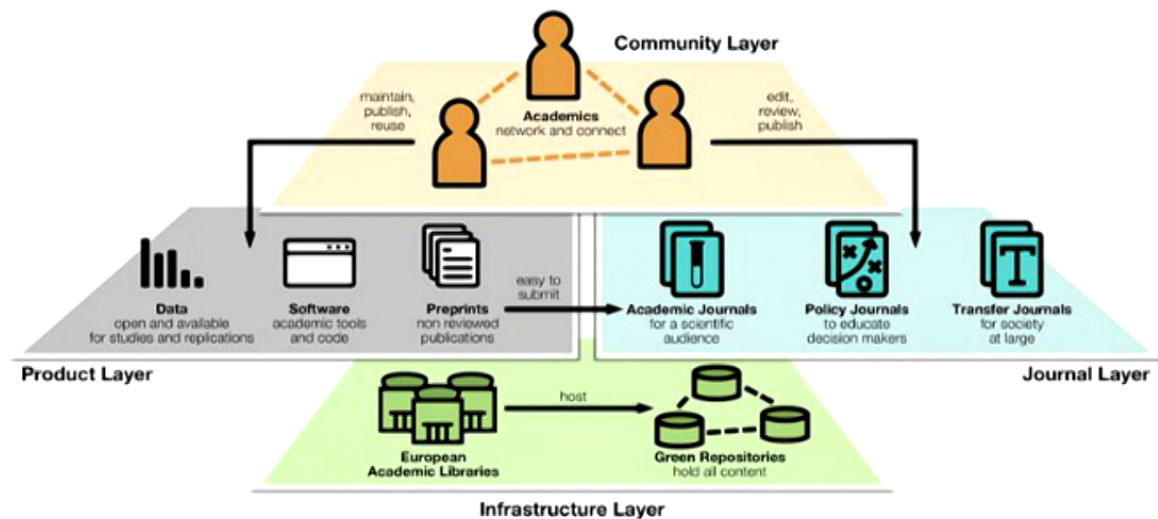
REPRODUCING DEPENDENCE ON THE ARTICLE

REPRODUCING DEPENDENCE FROM A FEW COMMERCIAL PUBLISHERS

FECHER ET AL. (2017)

OPEN SCIENCE IS ALSO ABOUT RECLAIMING THE INFRASTRUCTURE FOR THE SCIENTIFIC VALUE CREATION.

Public European Open Access Platform



AND WHAT ABOUT SOFTWARE / CODE,
RESEARCH INFRASTRUCTURE, TRANSFER
PRODUCTS?

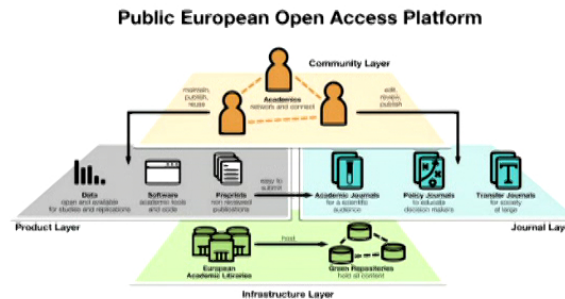
VOGEL & KUPFERSCHMIDT (2017)

FOR OPEN SCIENCE TO BECOME REALITY, WE NEED TO ...

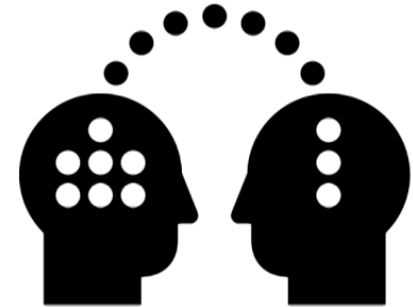
... MAKE IT WORTH IT



... CREATE PUBLIC INFRASTRUCTURES



... REFLECT ABOUT ITS ADDED SOCIAL VALUE



THANK YOU VERY MUCH.

GET IN TOUCH

BENEDIKT FECHER | FECHER@HIIG.DE

HUMBOLDT INSTITUTE FOR INTERNET AND SOCIETY