

Sauermann, Henry, “Discussion Points for Session 3: Social Constructs; in Particular: Incentives”

Changing the Conduct of Science in the Information Age

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Session 3: Social Constructs; in particular: incentives

	Data access	Knowledge access	Attribution
Pragmatic experience			
Technical constructs			
Social constructs			

What is the social optimum?

- Do we really know what is socially optimal? Ultimately, it is the maximum possible generation and use of knowledge.
- That means we should maximize the production and the use of knowledge. Key problem: Maximum use of knowledge means it should be freely accessible, but that typically means incentives for knowledge production are weak. Even if scientists are happy to give it away for free, other players in the value chain may not be.

So, who are the relevant actors, what are their roles and interdependencies? A simple model:

- Researchers: take research funding from universities and funding agencies, produce knowledge, submit to journals. Use other researchers’ output as input in their own work. Get paid and promoted for output that is attributed to them.
- Publishers: take submissions, provide quality control (via review), provide infrastructure for article (and data) storage and distribution. Can control publishing process, set standards etc. Make money from subscriptions.
- Funding agencies: take money from government (or other sources), pick promising projects, provide funding to researchers. Can control funding guidelines, disclosure requirements, can determine what kind of prior output counts for getting grants. Get budget for showing results from funded projects.
- University administrators: take money from government, funding agencies, and others. Provide research infrastructure to scientists. Can control tenure and promotion processes, determine what “counts”.
- Need to consider how technological progress (session 2) changes the roles and the incentives/costs/benefits of the various players.

The following table summarizes what this implies for incentives relating to data access, knowledge access, and attribution. It also lays out some implications and policy levers. Note: the purpose is to provide a template for our discussion, not to provide all the answers.

Actor/Role And interactions	Overall incentives and determinants of payoffs	Data access Social optimum: open access, high quality	Knowledge access Social optimum: open access, high quality	Attribution Social optimum: n/a; only indirect benefits
Individual scientists →create incentives for publishers (submissions) →create incentives for universities (accept jobs)	Money, recognition, job security, knowledge, enjoy research process, research funding <ul style="list-style-type: none"> • T&P process • Funding mechanisms • “intrinsic benefits” 	Goal: <u>use others’ data, do not share own UNLESS sufficient payoff to offset loss of pubs</u>	Goal: use others’ pubs, disseminate own; short cycle times; quality of sources	Goal: perfect attribution for own output
Publishers →can create publishing rules for scientists →control infrastructure	Profit <ul style="list-style-type: none"> • Subscriptions, Output quality • Subsidies • Cost 	Goal: increase journal quality through replicability, decrease cost	Goal: <u>set access and price such that profit is maximized</u> , quality	Goal: Perfect attribution for own output (impact factor etc.) <u>BUT reduce creation cost. Set and exploit proprietary standard.</u>
Funding agencies →co-determine payoffs for scientists and universities →can affect publisher profits (subsidies) →can create infrastructure	Budget <ul style="list-style-type: none"> • measurable knowledge creation 	Goal: make data widely available to maximize measurable outputs	Goal: Maximize diffusion/access, quality	Goal: perfect attribution BUT reduce processing cost (review process)
University administrators →co-determine payoffs for scientists	Research funding University ranking <ul style="list-style-type: none"> • Own or external ranking systems 	Goal: ?	Goal: Maximize diffusion/access	Goal: perfect attribution BUT reduce processing cost (T&P process)
Open Access Platforms as a possible alternative to publishers.	Maximize knowledge creation and use In reality, it will need funding and goals will depend on the funding mechanism.	Goal: Maximize access, quality	Goal: Maximize access, quality	Goal: Perfect attribution quality

<p>Insights</p>		<p>Goal conflict b/w scientists and others</p>	<p>Little goal conflict, except for publishers who want to optimize (vs. maximize) access. Perhaps different standards regarding what should be published (quality control).</p>	<p>Little goal conflict in the sense that all want good attribution. But different weights regarding what should "count" (function of quality and of the nature of contribution). Also, conflict over who controls/operates, pays for the system. KEY POLICY GOAL: one standard or at least interoperability (cross-walks)</p>
<p>Policy levers to think about...</p>		<p>→incentivize data sharing via T&P/funding criteria. Careful: Forced sharing reduces incentives to produce data to begin with →consider social value of generating data vs. pubs (big field differences) →consider different uses of data (with different costs/benefits): for replication/verification vs. for new research. Scientists more likely to share for verification purposes. →copyright and "fair use" policy for data?</p>	<p>→subsidize publishers to encourage more openness than would be profit maximizing? →rely on open (free?) platforms – but who pays for those? →exploit digital value chain to reduce cost – but still need competition to get publishers to lower prices. →consider new ways of ensuring quality of published output – perhaps quality ratings of scientific community (amazon-style?)</p>	<p>→subsidize publishers to set up a system vs. create a government run system (through funding agencies?) →create quality control/categories/ratings etc. to evaluate contributions (should be a flexible system that provides raw data – users can apply weights etc. depending on their own priorities) →support and enforce open vs. proprietary standard</p>

