Reforming the scientific publishing system

Open Access – Open Evaluation

(OA) (OE)

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The four pillars of open science

Open

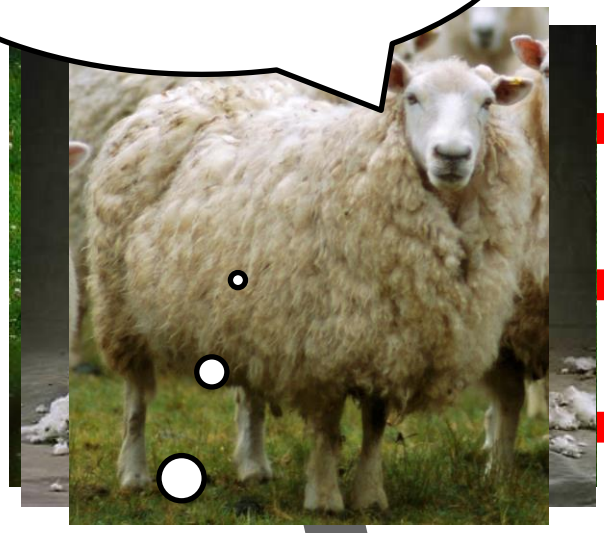
- transparent
- usable by others
- efficient communication
- improved community checking
- better community cognition
- faster scientific progress

sheep

publisher

I want open access!

OK!



subscription fee

open access fee

page charges

I'm cold! Where is my wool?

A publication system needs to provide two functions

(1) access to papers

open access (OA)

(2) evaluation of papers

open evaluation (OE)

Open access (OA)

“Gold”

gold for the publishing industry

Unnecessarily expensive.

“Green”

just put it on the web

Harnad 1994

Yes, but need guaranteed permanent accessibility and citability!

Digital object identifier (DOI)

digital [object identifier]

not [digital-object] identifier

Digital object identifier (DOI)

Getting a DOI and permanent archiving...

- classical journals
- alternative publishing industry
  - figshare (free)
  - The Winnower (small charge)
  - ...
- ***preprint servers***

OA with DOI: preprint servers

Am I allowed to post preprints?

Yes, definitely.

- All major journals, including *Nature, Science,* and most high-impact field-specific journals, support the posting of preprints.

- Benefits for journals, too:
  - minimise errors in final published version
  - boost early citations and thus the journal's impact factor

Sherpa Romeo website

http://www.sherpa.ac.uk/romeo

RoMEO Colour	Archiving policy
Green	Can archive pre-print *and* post-print or publisher's version/PDF
Blue	Can archive post-print (ie final draft post-refereeing) or publisher's version/PDF
Yellow	Can archive pre-print (ie pre-refereeing)
White	Archiving not formally supported

Sherpa Romeo website

http://www.sherpa.ac.uk/romeo

Journal:	**Nature** (ISSN: 0028-0836, ESSN: 1476-4687)
RoMEO:	This is a RoMEO **yellow** journal
Author's Pre-print:	✓ author **can** archive pre-print (ie pre-refereeing)
Author's Post-print:	**subject to Restrictions below**, author **can** archive post-print (ie final d
Restrictions:	• 6 months embargo
Publisher's Version/PDF:	✗ author **cannot** archive publisher's version/PDF
General Conditions:	• Authors retain copyright • Author's pre-print on arXiv or bioRXiv • Author's post-print on author's personal website, institutional reposito • Published source must be acknowledged • Must link to publisher version with DOI • Publisher's version/PDF cannot be used
Mandated OA:	Compliance data is available for 28 funders
Copyright:	Pre-publication policy - License to Publish - Manuscript Deposition Service
Updated:	09 Dec 2014 **Suggest an update for this record**

Costs & benefits of preprint posting

costs

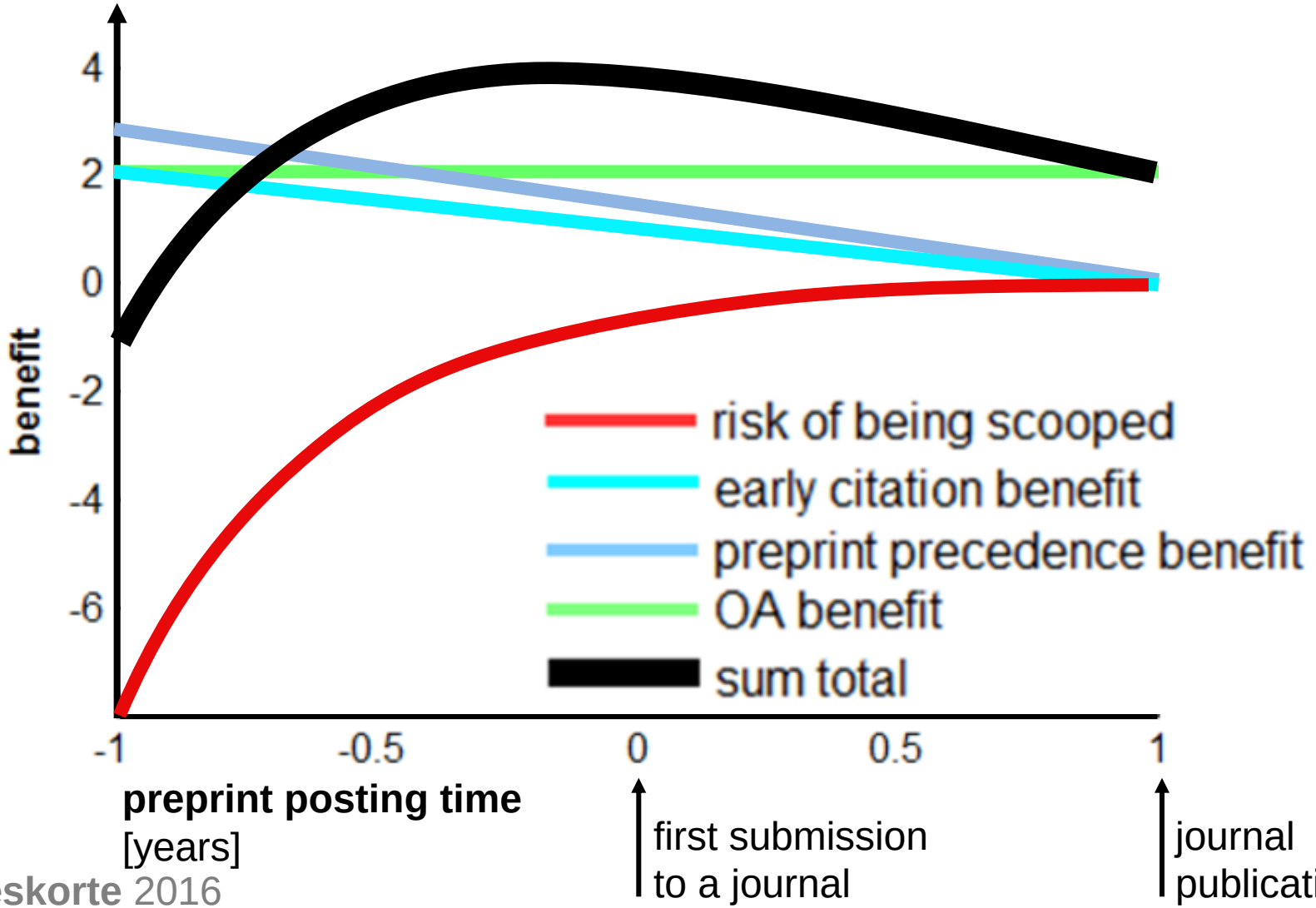
- **posting the preprint** (<30 min)
- **risk of getting scooped**

benefits

- **open access** (instant & permanent, DOI)
- **errors caught**
- **earlier citation**
- **preprint precedence**

Costs & benefits of preprint posting

as a function of time of posting



Kriegeskorte 2016

Open evaluation (OE)

post-publication, evaluative responses from peers

- **peer reviews**
- **peer ratings**

➔***explicit judgments***
(in contrast to article metrics like views, downloads, etc.)

➔***signed or anonymous***

Evaluation is the steering mechanism of science

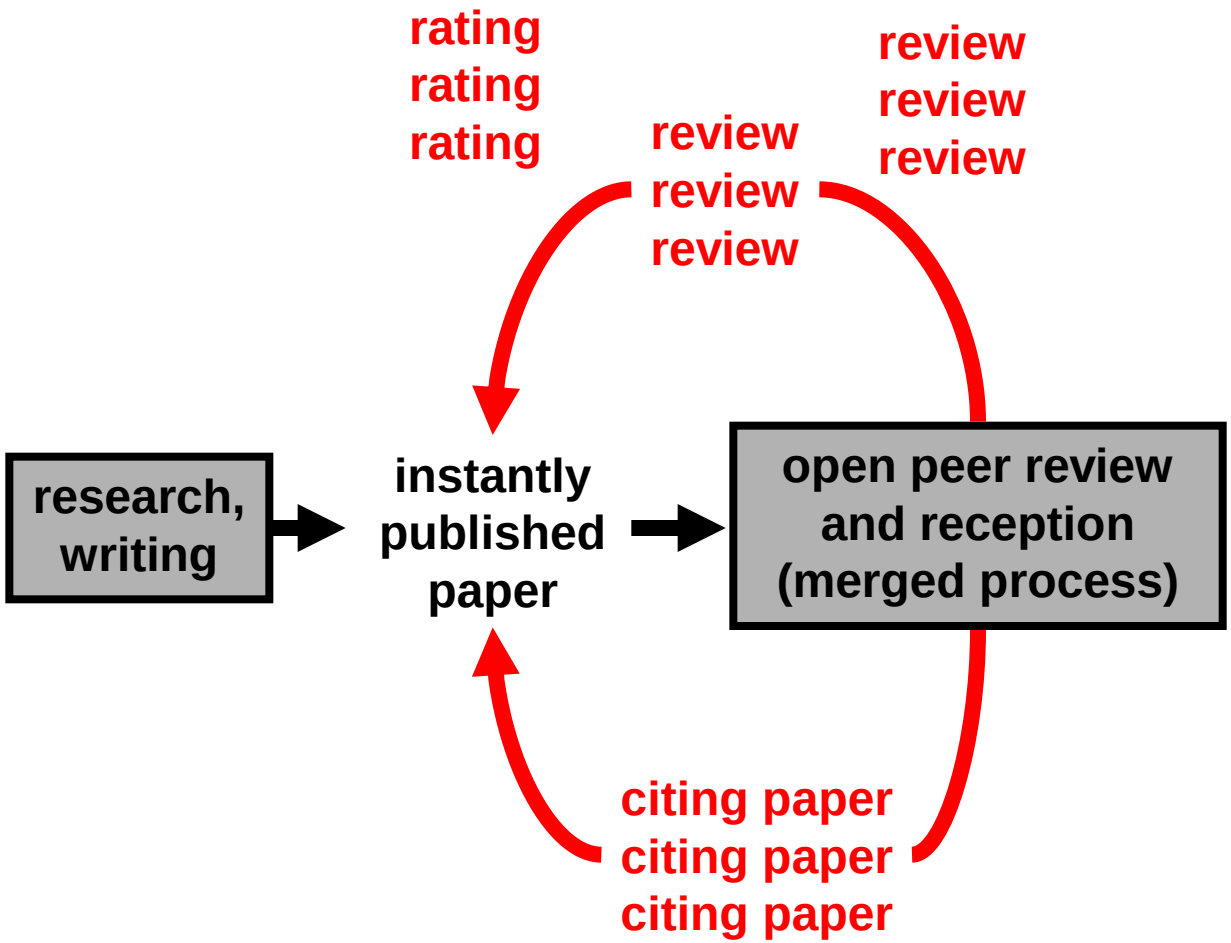
- steers the attention of scientists
- steers the direction of each field
- steers the progress of science
- steers public use of scientific results

Designing the collective cognitive process of the scientific community!

Current

10 years later
citations
1 year later
research, writing
unpublished paper
secret peer review
published paper
reception, citation
reviews
journal prestige

Future


rating
rating
rating
review
review
review
review
review
review
research, writing
instantly published paper
open peer review and reception (merged process)
citing paper
citing paper
citing paper

time
0 months
3 months
1-10 years

pre-publication review

➔ **publication <u>delayed</u>**
➔ **review process <u>closed</u>**

➔ **evaluation compromised**
- limited to chosen reviewers
- no public scrutiny

post-publication review

➔ **publication <u>instant</u>**
➔ **review process <u>open and transparent</u>**

➔ **evaluation reflects the field's deepest wisdom**
- broader and deeper
- all arguments heard
- all arguments under public scrutiny

The nature of a review

Current

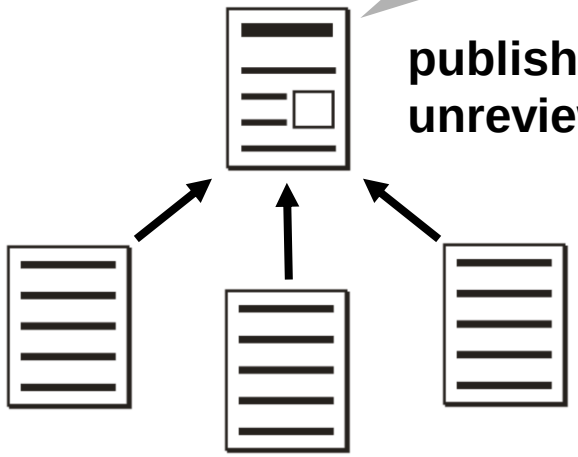
- secret communication to authors and editors
- decides about publication
- reviewer's motivation
  - selfless: scientific objectivity
  - selfish: science politics
- a weak argument can make or break a paper

Future

- open letter to the community
- evaluates published work
- reviewer's motivation
  - selfless: scientific objectivity
  - selfish: looking smart and objective in public
- an argument is as powerful as it is compelling

peer-to-peer editing

- authors ask a senior scientist to edit the paper
- editor chooses 3 reviewers and asks them to openly review the paper
- editor is named on the paper



published, author authenticated, unreviewed paper

published, author authenticated, reviews
(signed or unsigned)

peer-to-peer editing
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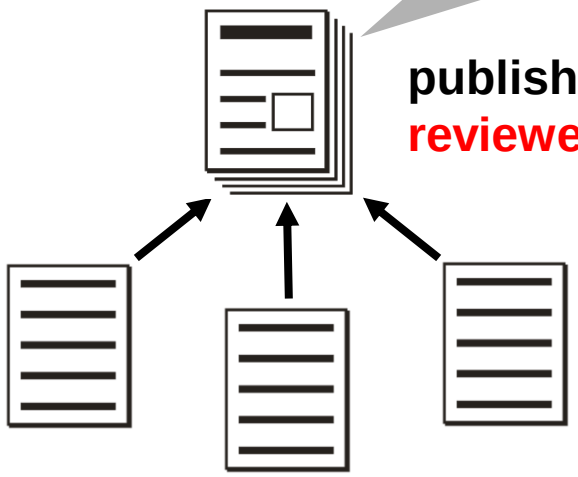
review
- **text**
- **numerical ratings**
  - **justification of claims**
  - **importance**
  - **originality**
  - **…**

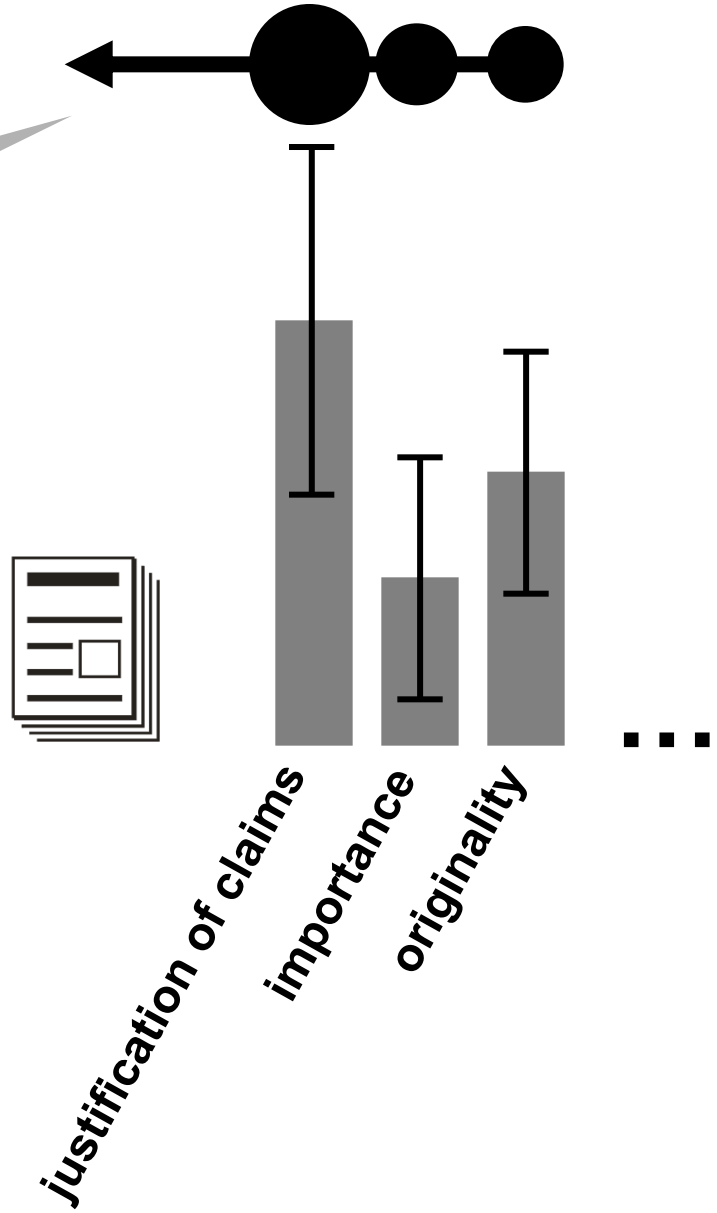


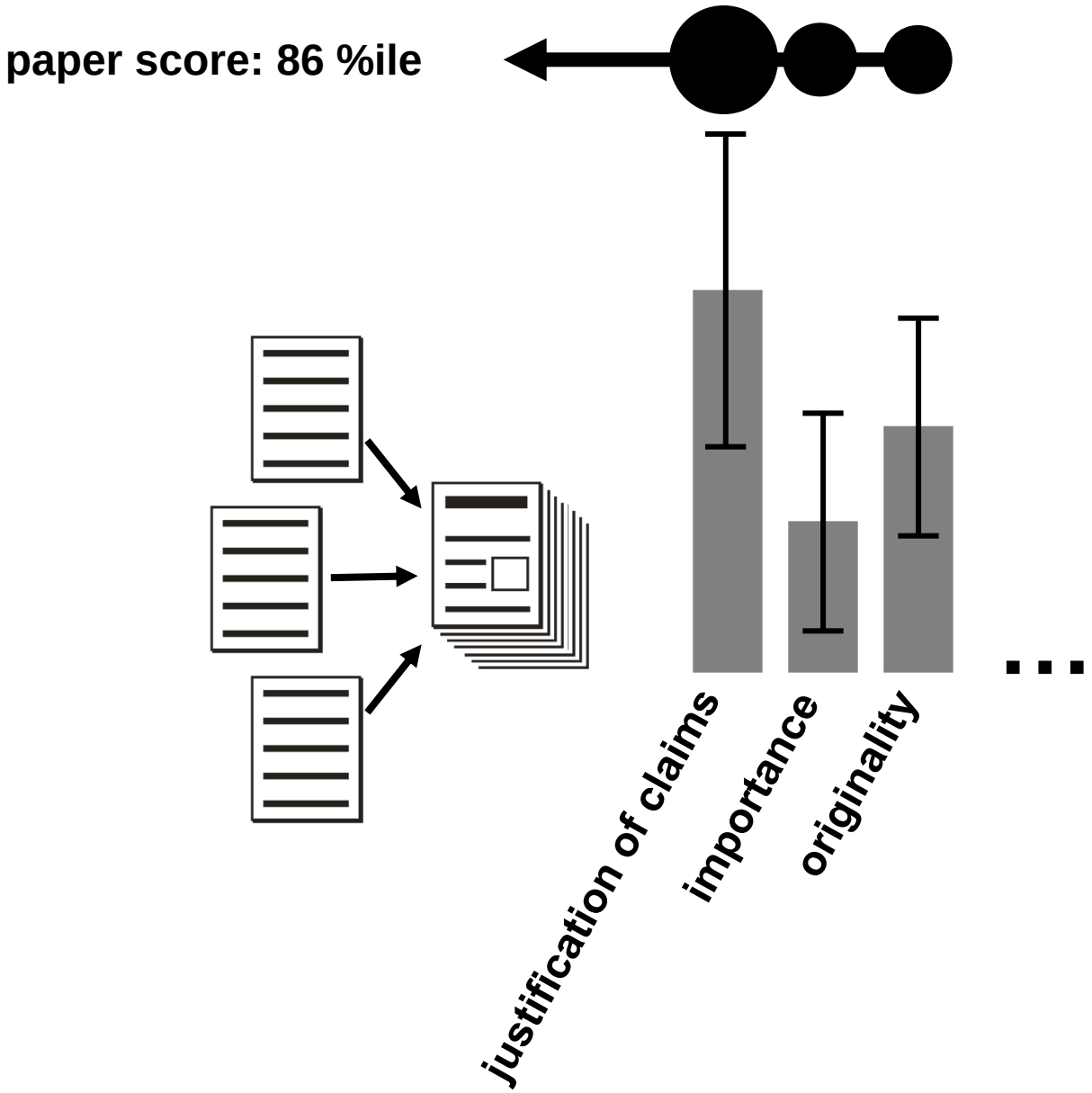
published, author authenticated, reviewed paper

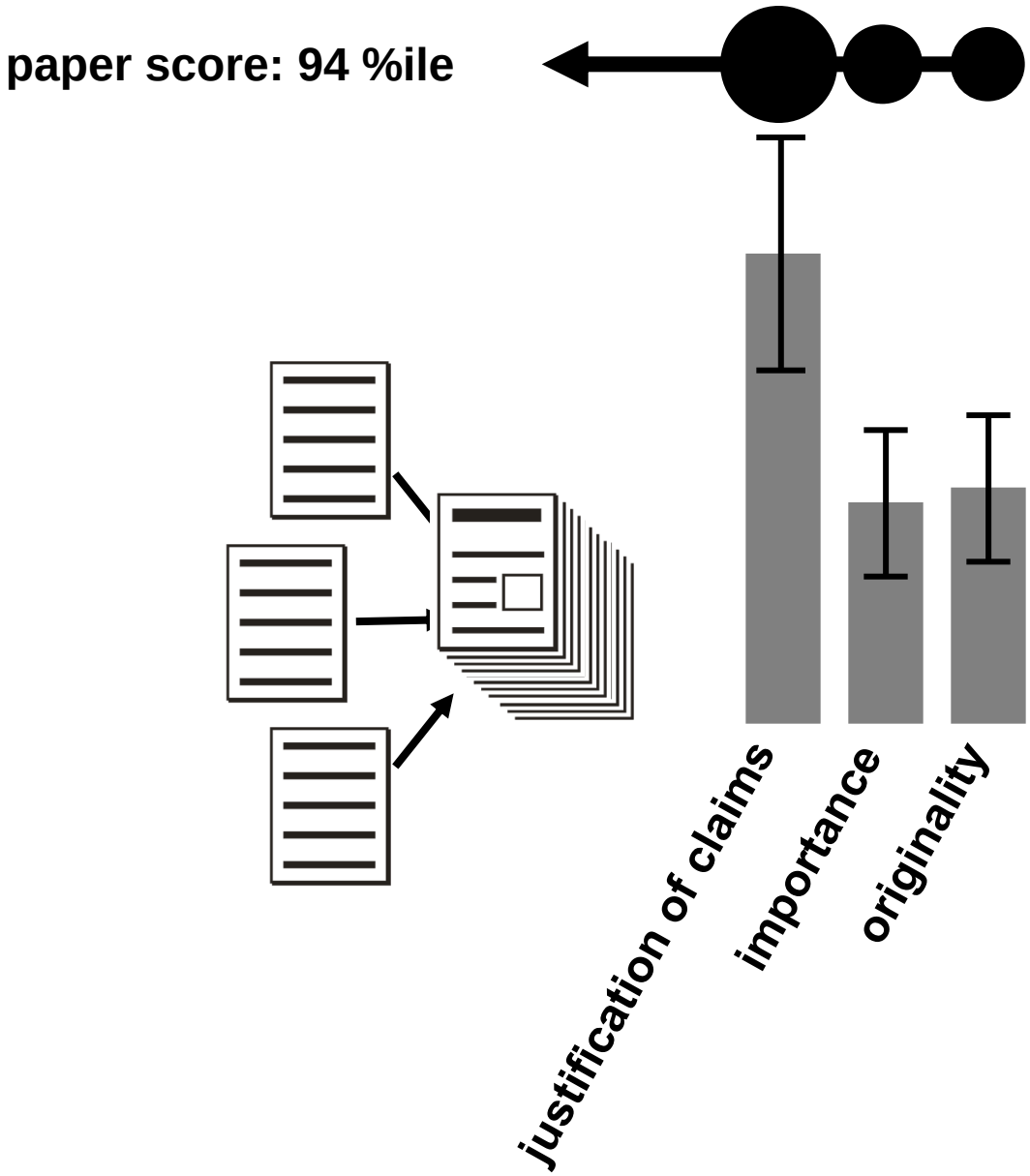
paper score: 86 %ile

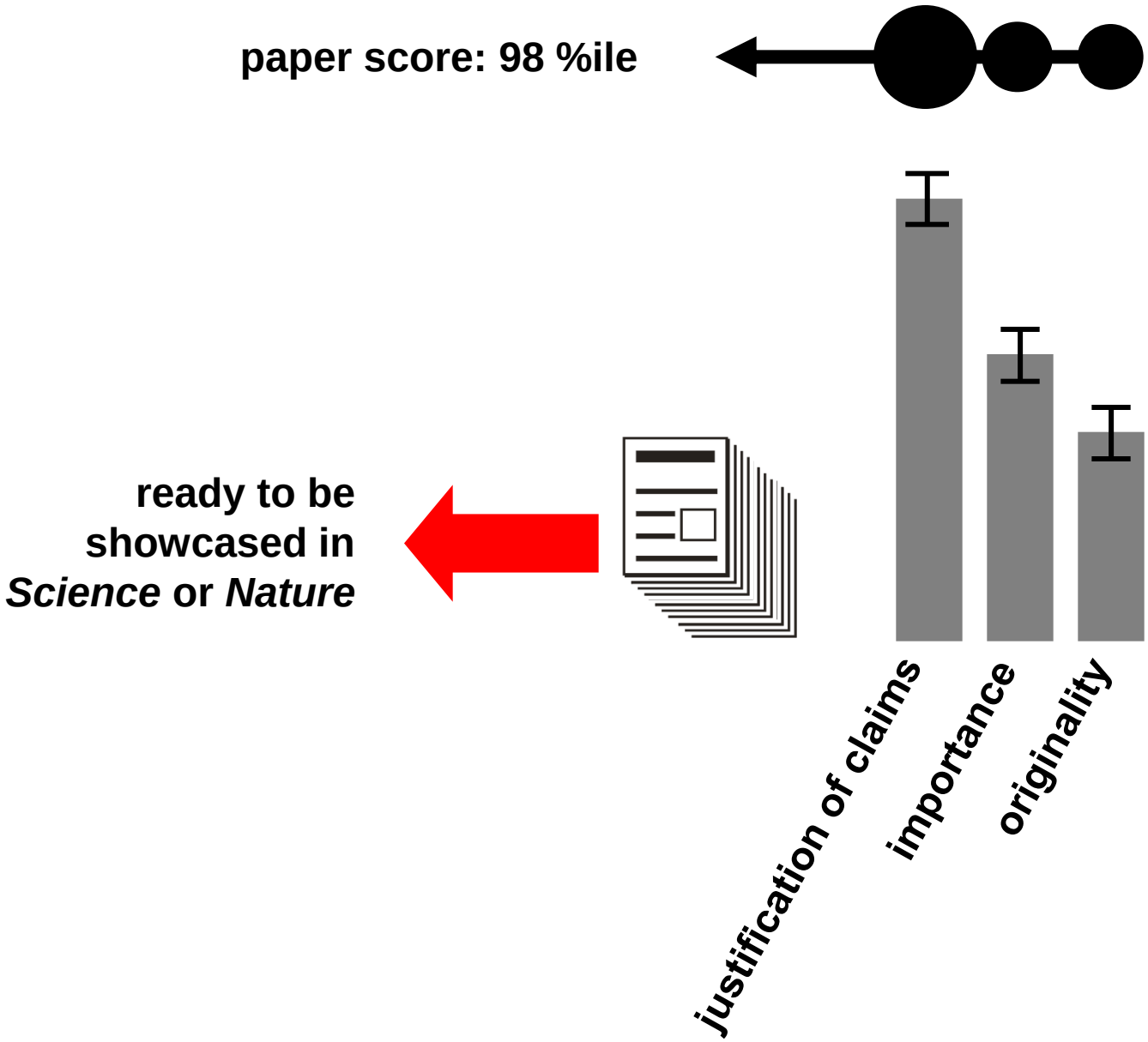
paper evaluation function (PEF)

- arbitrary function that scores papers based on the available meta-information
- simplest case: weighted average of review ratings
- individuals or groups can define PEFs to prioritize the literature according to their needs




paper score: 86 %ile
justification of claims
importance
originality
...


paper score: 94 %ile
justification of claims
importance
originality


paper score: 98 %ile
ready to be showcased in *Science* or *Nature*
justification of claims
importance
originality

Consensus points of 18 visions for OE

- The evaluation process will be totally transparent.
- Anyone can define a formula for prioritizing papers, fostering a plurality of evaluative perspectives.
- The system heavily relies on signed evaluations.
- Reviews and reviewers are meta-evaluated.
- The open evaluation process is perpetually ongoing, such that promising papers are more deeply evaluated.
- Formal statistical inference is a key component of the evaluation process.

Kriegeskorte et al. 2012 (Frontiers in Computational Neuroscience; Editorial summary of Ebook on Open Evaluation)

Until we have the perfect platform...

- post preprints (***instant OA***)
- use blogs and social media to share opinions and peer reviews (***instant OE***)

Create the culture of publishing you would like to see!

What I do

OA

- post all our work on open-access preprint servers
- read and cite papers on preprint servers

OE

- sign my reviews (all, including those leading to rejection of the paper)
- publish all my reviews on a blog as soon as I write them
  (I only review papers that are published as preprints!)
- write reviews as letters to the community
- title all reviews with the title the paper should have (TPSH)
- tweet with ratings about papers