Improving openness and reproducibility of scholarly research

Brian Nosek
University of Virginia -- Center for Open Science

Norms

Communality
Open sharing

Counternorms

Secrecy
Closed
<table>
<thead>
<tr>
<th>Norms</th>
<th>Counternorms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communality</td>
<td>Secrecy</td>
</tr>
<tr>
<td>Open sharing</td>
<td>Closed</td>
</tr>
<tr>
<td>Universalism</td>
<td>Particularism</td>
</tr>
<tr>
<td>Evaluate research on own merit</td>
<td>Evaluate research by reputation</td>
</tr>
</tbody>
</table>
Norms

Communality
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Universalism
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Disinterestedness
Motivated by knowledge and discovery

Counternorms

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Self-interestedness
Treat science as a competition
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Consider all new evidence, even against one’s prior work

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Invest career promoting one’s own theories, findings
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Quality

Counternorms

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Quantity
FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).
Incentives for individual success are focused on getting it published, not getting it right.
Technology to enable change

Training to enact change

Incentives to embrace change
<table>
<thead>
<tr>
<th>Name</th>
<th>Contributors</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileTest6Giga</td>
<td>Suhovecky</td>
<td>18 days ago</td>
</tr>
<tr>
<td>External Link to daspos</td>
<td>Meyers, Sallans + 8</td>
<td>22 days ago</td>
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<td>Container Strategies for Data and Software Preservation Works..</td>
<td>Gesing, Michael Hildreth + 42</td>
<td>a month ago</td>
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<td>John Wang, Gesing + 2</td>
<td>a month ago</td>
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<td>JHUTest3</td>
<td>Suhovecky, CurateND</td>
<td>a month ago</td>
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<td>Meyers, Johnson + 1</td>
<td>2 months ago</td>
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<tr>
<td>SHARE Data Model 2.0</td>
<td>Johnson, Spies + 1</td>
<td>3 months ago</td>
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<tr>
<td>The Open Science Framework (OSF) at Notre Dame: Connecting ...</td>
<td>Sallans, Meyers</td>
<td>6 months ago</td>
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</tbody>
</table>
OSF INSTITUTIONS

Will be added soon:

Universiteit Gent
Virginia Tech
University of Cape Town
University of Colorado Boulder

And interest from 50+ research universities and organizations
Content Experts

SOC ARXIV

engrxiv

Ψ Α Χ

PREPRINTS

Schol Comm Experts

Technical Experts

Services

Ecosystem

Data
The open archive of engineering.

Powered by OSF Preprints
Signals: Making Behaviors Visible Promotes Adoption

OPEN DATA

OPEN MATERIALS

PREREgisterED
<table>
<thead>
<tr>
<th>Journal</th>
<th>Articles reporting that data was available</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPS (N=104)</td>
<td>40%</td>
</tr>
<tr>
<td>DP (N=634)</td>
<td>20%</td>
</tr>
<tr>
<td>JEPLMC (N=483)</td>
<td>10%</td>
</tr>
<tr>
<td>JPSP (N=419)</td>
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</tr>
<tr>
<td>PSCI (N=838)</td>
<td>0%</td>
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</tbody>
</table>

% Articles reporting that data was available

- **1st Half 2012**
  - CPS: 40%
  - DP: 20%
  - JEPLMC: 10%
  - JPSP: 0%
  - PSCI: 0%

- **2nd Half 2012**
  - CPS: 40%
  - DP: 20%
  - JEPLMC: 10%
  - JPSP: 0%
  - PSCI: 0%

- **1st Half 2013**
  - CPS: 40%
  - DP: 20%
  - JEPLMC: 10%
  - JPSP: 0%
  - PSCI: 0%

- **2nd Half 2013**
  - CPS: 40%
  - DP: 20%
  - JEPLMC: 10%
  - JPSP: 0%
  - PSCI: 0%
ecosystem

UNIVERSITIES

PUBLISHING

FUNDERS

SOCIETIES
What can you do?

http://cos.io/

1. OSF Institutions for your researchers
2. Openness-Reproducibility Training Workshops
3. Encourage sharing preprints: http://engrxiv.org/
4. Consider incentives in hiring and promotion/tenure policies

Email: support@cos.io or nosek@virginia.edu
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