Scientific societies’ role in improving openness and reproducibility

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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.

Nosek, Spies, & Motyl, 2012
IS THERE A REPRODUCIBILITY CRISIS?

- 7% No, there is no crisis
- 3% Don’t know
- 52% Yes, a significant crisis
- 38% Yes, a slight crisis

1,576 researchers surveyed
HAVE YOU FAILED TO REPRODUCE AN EXPERIMENT?

Most scientists have experienced failure to reproduce results.

- **Chemistry**: 80%
- **Biology**: 70%
- **Physics and engineering**: 65%
- **Medicine**: 60%
- **Earth and environment**: 60%
- **Other**: 45%
The Kindergartener’s Guide to Improving Research
1. Show your work
2. Share
Open Access

Open Content

Open Process
Changing a Research Culture

- Make it required
- Make it rewarding
- Make it normative
- Make it easy
- Make it possible
Changing a Research Culture

- Infrastructure
- User Interface/Experience
- Communities
- Incentives
- Policy

- Make it required
- Make it rewarding
- Make it normative
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- Make it possible
Societies Shape Community Norms

1. Conference Programming
2. Society Magazines and Newsletters
3. Awards
4. Webinars and training events
5. Journal policies and good practice recommendations and white papers
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Signals: Making Behaviors Visible Promotes Adoption

Kidwell et al., 2016
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TOP Guidelines

http://cos.io/top/

1. Data citation
2. Design transparency
3. Research materials transparency
4. Data transparency
5. Analytic methods (code) transparency
6. Preregistration of studies
7. Preregistration of analysis plans
8. Replication
Some TOP Signatory Organizations

- AAAS/Science
- American Academy of Neurology
- American Geophysical Union
- American Heart Association
- American Meterological Society
- American Society for Cell Biology
- Association for Psychological Science
- Association for Research in Personality
- Association of Research Libraries
- Behavioral Science and Policy Association
- BioMed Central
- Committee on Publication Ethics
- Electrochemical Society
- Elsevier
- Frontiers
- MDPI
- Nature-Springer
- PeerJ
- Pensoft Publishers
- Public Library of Science
- The Royal Society
- Society for Personality and Social Psychology
- Society for a Science of Clinical Psychology
- Ubiquity Press
- Wiley
Societies can...

1. **Policy**: Become a TOP signatory
2. **Incentives**: Journal partner to pilot badges or Registered Reports
3. **Community**: Symposia at society meetings; Webinars/trainings; Open science stories in society magazine
4. **Infrastructure**: Partner for data/materials repository

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Slides available: [https://osf.io/5m4gw/](https://osf.io/5m4gw/)