

Improving Openness and Reproducibility of Scientific Research

Andrew Sallans
Center for Open Science

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Expanding Public Access to the Results of Federally Funded Research

FEBRUARY 22, 2013 AT 12:04 PM ET BY MICHAEL STEBBINS



Summary: The Obama Administration is committed to the proposition that citizens deserve easy access to the results of research their tax dollars have paid for. That's why, in a policy memorandum released today, OSTP Director John Holdren has directed Federal agencies with more than \$100M in R&D expenditures to develop plans to make the results of federally funded research freely available to the public—generally within one year of publication.

The Obama Administration is committed to the proposition that citizens deserve easy access to the results of scientific research their tax dollars have paid for. That's why, in a policy memorandum released today, OSTP Director John Holdren has directed Federal agencies with more than \$100M in R&D expenditures to develop plans to make the published results of federally funded research freely available to the public within one year of publication and requiring researchers to better account for and manage the digital data resulting from federally funded scientific research. OSTP has been looking into this issue for some time, soliciting broad public input on multiple occasions and convening an interagency working group to develop a policy. The final policy reflects substantial inputs from scientists and scientific organizations, publishers, members of Congress, and other members of the public—over 65 thousand of whom recently signed a *We the People* petition asking for expanded public access to the results of taxpayer-funded research.

To see the new policy memorandum, please visit: http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo

To see Dr. Holdren's response to the *We the People* petition, please visit: <https://petitions.whitehouse.gov/response/increasing-public-access-results-scientific-research>

Michael Stebbins is Assistant Director for Biotechnology at OSTP



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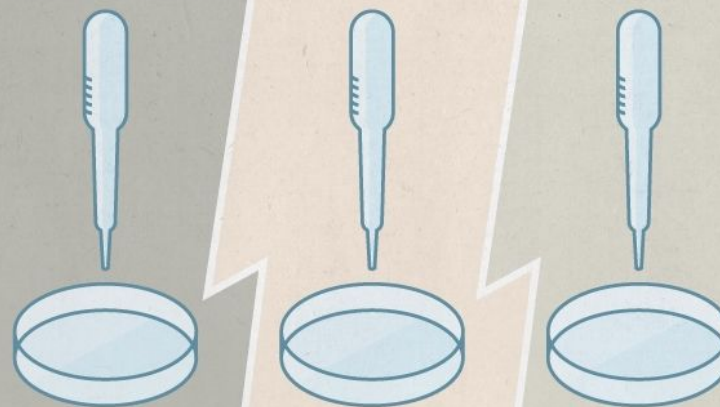
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SPECIAL

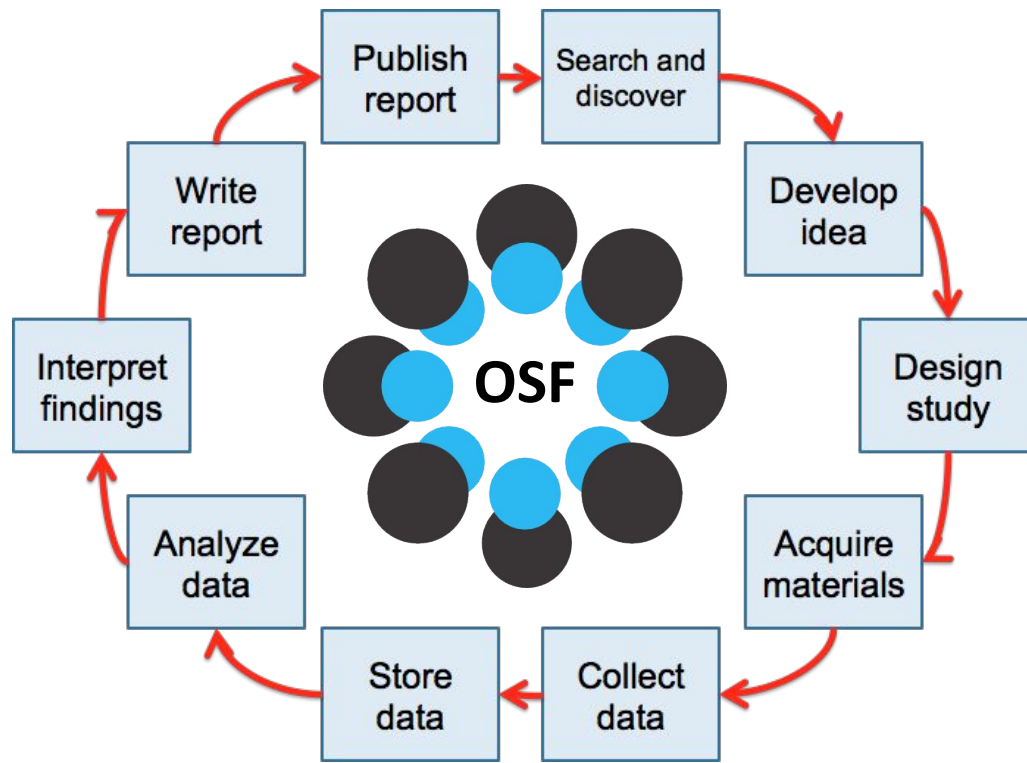
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CHALLENGES IN IRREPRODUCIBLE RESEARCH

Science moves forward by corroboration – when researchers verify others' results. Science advances faster when people waste less time pursuing false leads. No research paper can ever be considered to be the final word, but there are too many that do not stand up to further study.

There is growing alarm about results that cannot be reproduced. Explanations include increased levels of scrutiny, complexity of experiments and statistics, and pressures on researchers. Journals, scientists, institutions and funders all have a part in tackling reproducibility. *Nature* has taken substantive steps to improve the transparency and robustness in what we publish, and to promote awareness within the scientific community. We hope that the articles contained in this collection will help.

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More than just data access and sharing

Norms

Communality

Open sharing

Universalism

Evaluate research on own merit

Disinterestedness

Motivated by knowledge and discovery

Organized skepticism

Consider all new evidence, even against one's prior work

Quality

Counternorms

Secrecy

Closed

Particularism

Evaluate research by reputation

Self-interestedness

Treat science as a competition

Organized dogmatism

Invest career promoting one's own theories, findings

Quantity

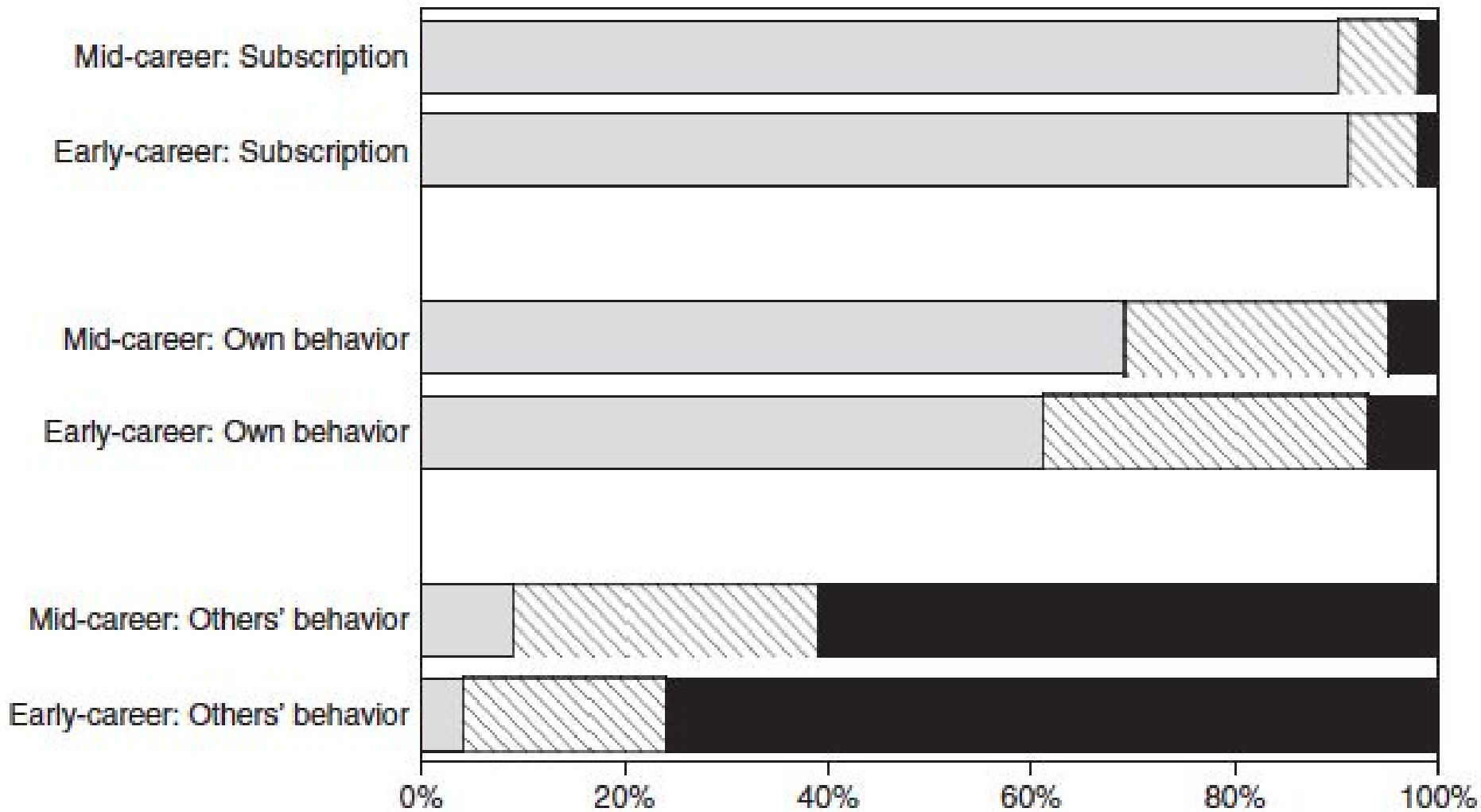


FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).

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Training to *enact* change

Incentives to *embrace* change

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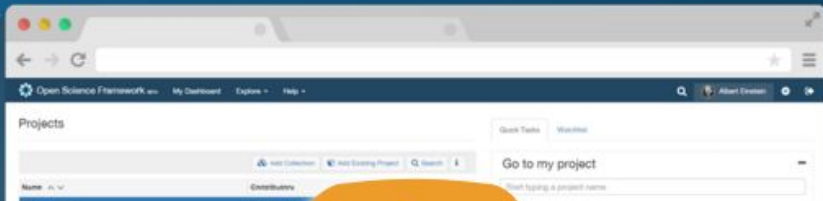
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free, open source



Put data, materials, and code on the OSF



Open Science Framework

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Andrew Sallans



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Revisions

Version ID	Date	User	Download	MD5	SHA2
2	2015-02-18 08:55 AM	Andrew Sallans	9	5449614541941c1964	c5b9946df2a8728a44:
1	2015-01-26 02:40 PM	Sara Bowman	2	ddef6d58cd6a9b53ee	b4b6e30e7140c76f58:

With hashes

Get a persistent identifier

Open Science Framework

My Dashboard Browse Help Andrew Sallans

Badges to Acknowledge Open Practices Files Wiki Analytics Registrations Forks Contributors Settings

Badges to Acknowledge Open Practices

Make Private Public 14 3

Contributors: Ben B. Blohowiak, Johanna Cohoon, Lee de-Wit, Eric Eich, Frank J. Farach, Fred Hasselman, Alex O. Holcombe, Macartan Humphreys, Melissa Lewis, Brian A. Nosek, Jonathan Peirce, Jeffrey R. Spies, Chris Seto, Sara Bowman, Don Green, Gustav Nilsson, Jon Grahe, Stephanie Wykstra, Alicia Hofelich Mohr, **Andrew Sallans**, Roger Giner-Sorolla, Timothy H. Parker, Wolfgang Forstmeier, Shinichi Nakagawa

Date created: 2013-02-19 12:19 PM | Last Updated: 2015-10-22 10:56 AM

Category: Project

Description: The aim is to specify a standard by which we can say that a scientific study has been conducted in accordance with open-science principles and provide visual icons to allow advertising of such good behaviours.

License: No license

Wiki

Openness is a core value of scientific practice. There is no central authority determining the validity of scientific claims. Accumulation of scientific knowledge proceeds via open communication with the community. Sharing evidence for scientific claims facilitates critique, extension, and application. Despite the importance of open communication for scientific progress, present norms do not provide strong incentives for individual researchers to share data, material...

Citation

osf.io/tvyxz

APA
Blohowiak, B. B., Cohoon, J., de-Wit, L., Eich, E., Farach, F. J., Hasselman, F., ... Nakagawa, S. (2015, October 22). Badges to Acknowledge Open Practices. Retrieved from osf.io/tvyxz

MLA
Blohowiak, Benjamin B et al. "Badges to Acknowledge Open Practices." Open Science Framework, 22 Oct. 2015. Web.

Chicago
Blohowiak, Benjamin B, Johanna Cohoon, Lee de-Wit, Eric Eich, Frank J Farach, Fred Hasselman, Alex O Holcombe, et al. 2015. "Badges to Acknowledge Open Practices." Open Science Framework. October 22. osf.io/tvyxz.

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Public



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3

Contributors: [Ben B. Blohowiak](#), [Johanna Cohoon](#), [Lee de-Wit](#), [Eric Eich](#), [Frank J. Farach](#), [Fred Hasselman](#), [Alex O. Holcombe](#), [Mansartan Humphrey](#), [Melissa Lewis](#), [Brian A. Nosek](#), [Jonathan Peirce](#), [Jeffrey R. Spies](#), [Chris Seto](#), [Sara Bowman](#), [Don Green](#), [Gustav Nilsson](#), [Jon Grahe](#), [Stephanie Wykstra](#), [Alicia Hofelich Mohr](#), [Andrew Sallans](#),

[Roger Giner-Sorolla](#), [Timothy H. Parker](#), [Wolfgang Forstmeier](#), [Shinichi Nakagawa](#)

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Citation

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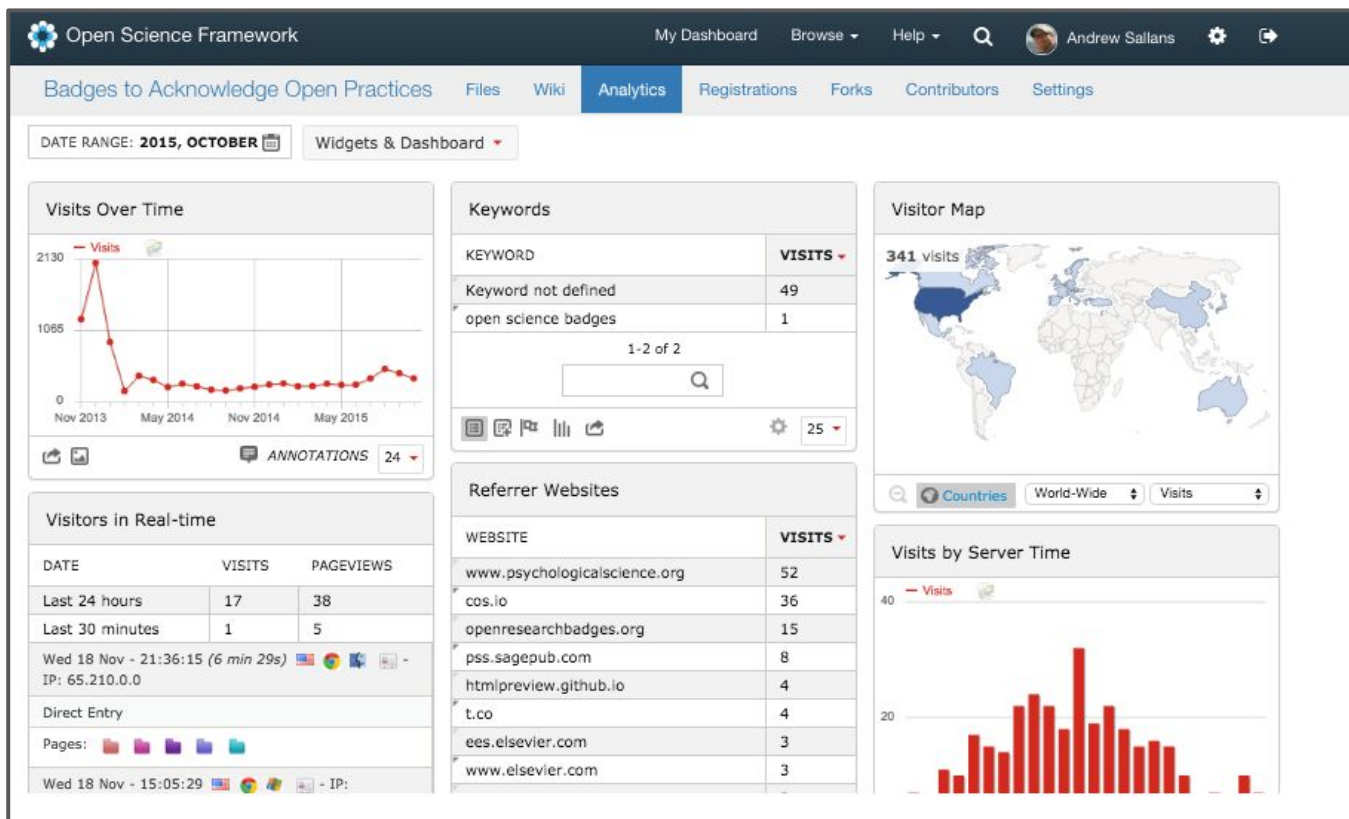
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Cohoon & Sallans

12 contributions

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See the impact



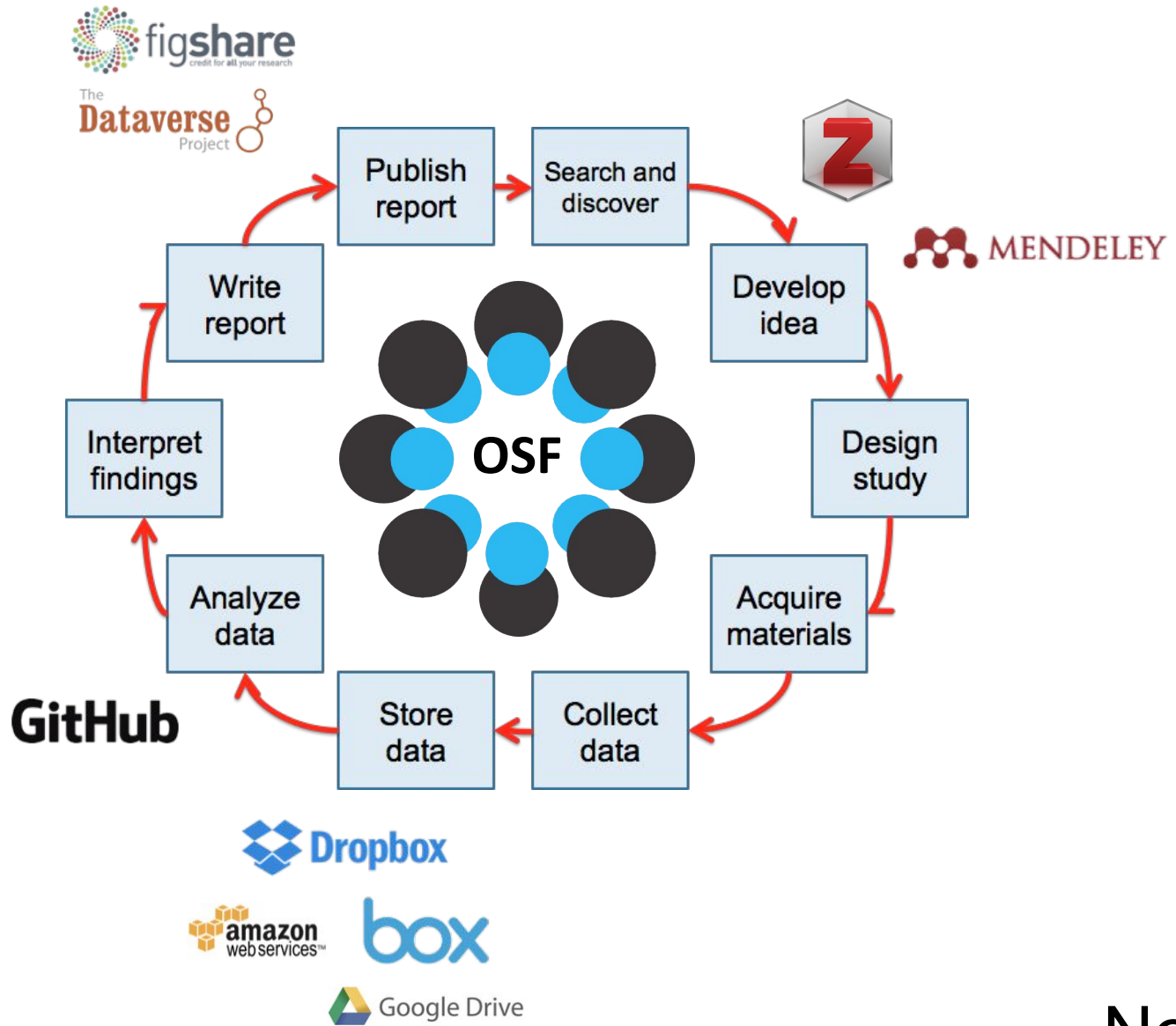
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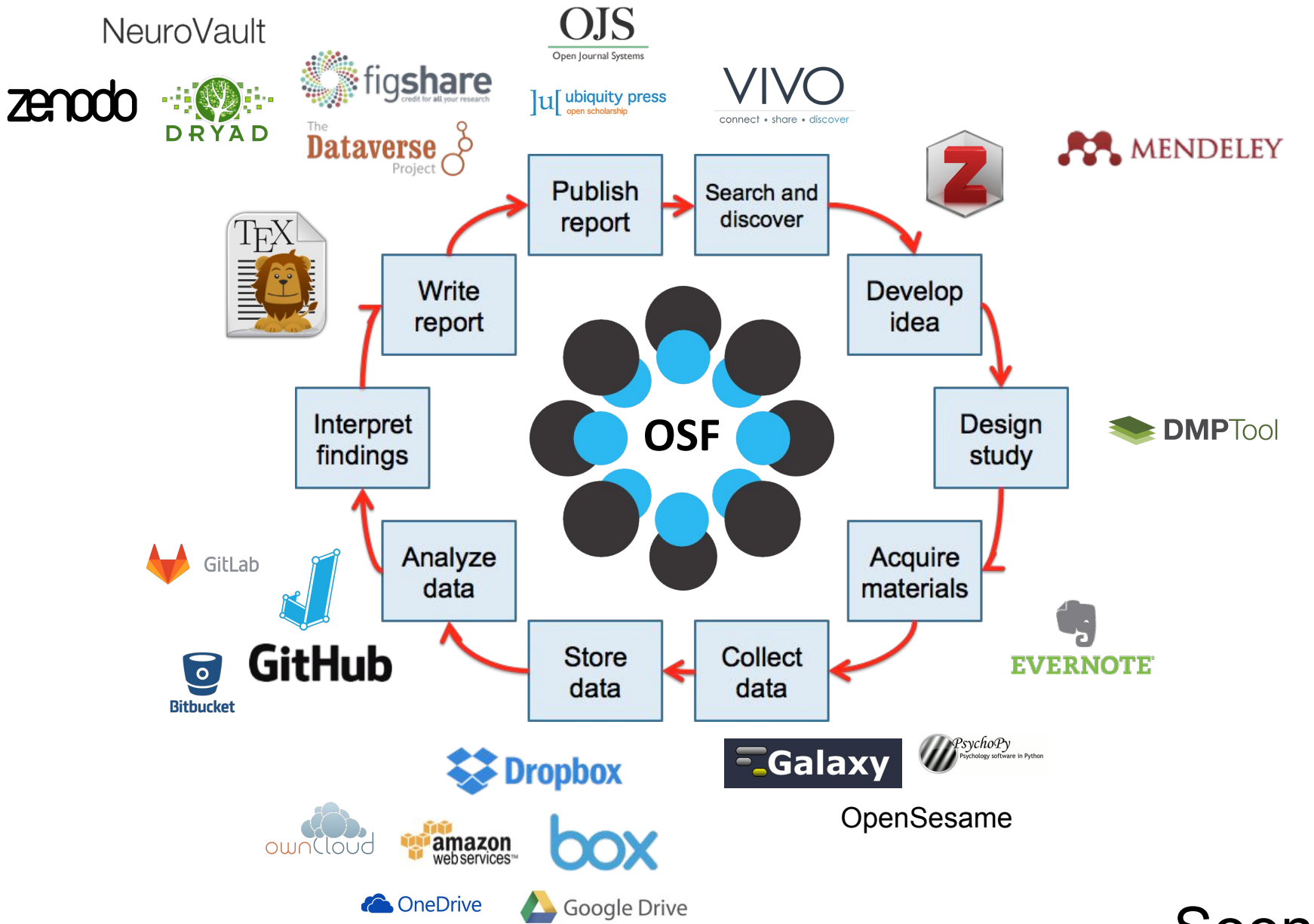
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Now



Soon

29 grants to develop open tools and services: <https://cos.io/pr/2015-09-24/>

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Scientists can improve the replicability of their own work through careful documentation, adherence to standards, and the use of open tools. We answer questions and provide training on open and reproducible tools, methodologies, and workflows. Some examples:

- ✓Using R
- ✓Conducting power analyses
- ✓Using the OSF
- ✓Learning Github
- ✓Conducting meta-analyses
- ✓Preregistering analysis plans

This service is provided in partnership with the [Berkeley Initiative for Transparency in the Social Sciences \(BITSS\)](#)



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Free training on how to make
research more reproducible
http://cos.io/stats_consulting



Transparency is a collective
action problem



Transparency and Openness Promotion (TOP) Guidelines

**Low barrier to entry
Modular**

Agnostic to discipline

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

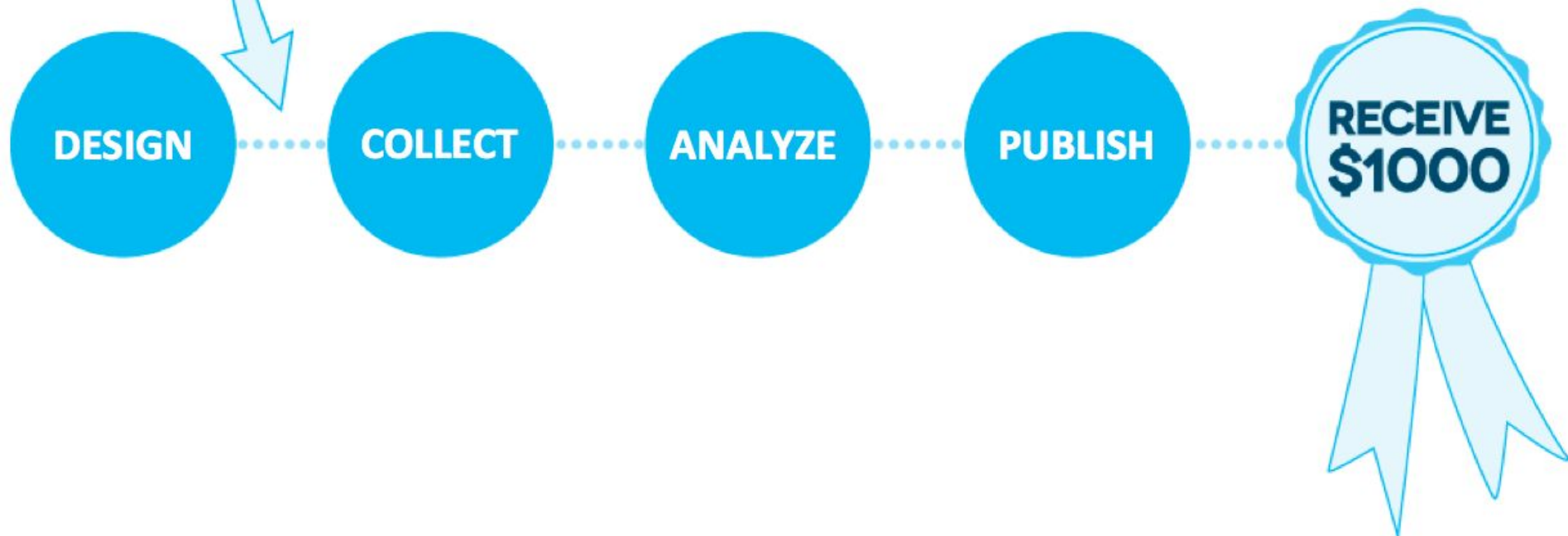
Signals: Making Behaviors Visible Promotes Adoption



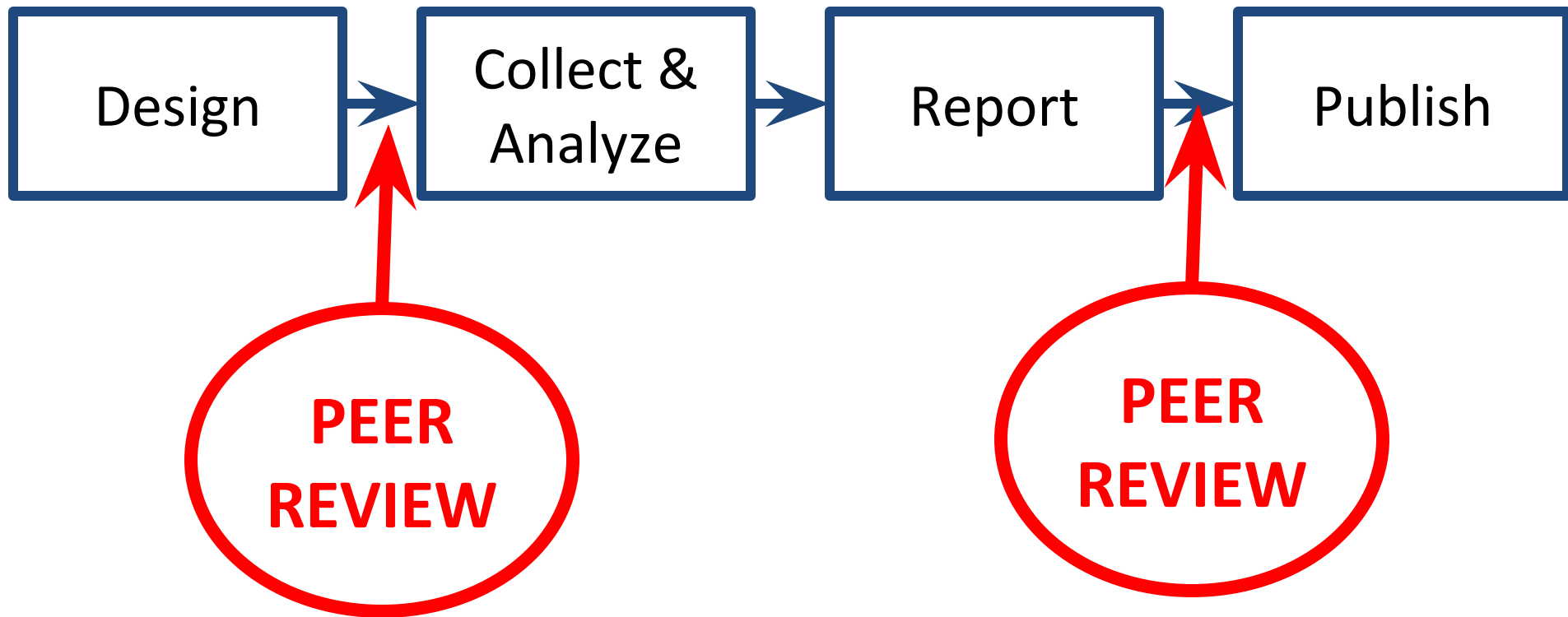
The \$1,000,000 Preregistration Challenge

Endorse TOP Guidelines
Badges for Open Practices
Registered Reports

PREREGISTER



Registered Reports

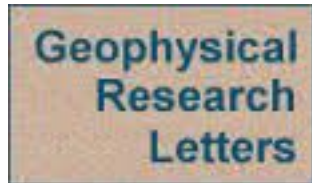


TOP Signatories

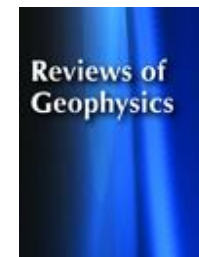
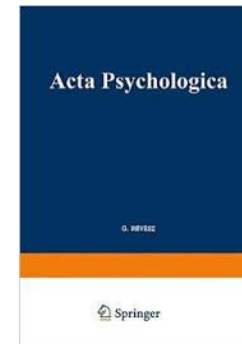
Journals, Organizations, Funders

Endorsement of principles + commitment to review for adoption

Over
535 journals
+
56 orgs



THE ROYAL SOCIETY



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Recommended Data Repositories

Scientific Data mandates the release of datasets accompanying our manuscripts, but we do not ourselves host data. Instead, we encourage submission of datasets to community-recognized repositories where possible, or to [general-science repositories](#) if no community resource is available. Repositories included on this page have been evaluated to ensure that they meet our requirements for data access, preservation and stability. Please be aware, however, that some repositories on this page may only accept data depositions from those with specific funding, or may charge for deposition of data. Please ensure you are aware of any deposition policies for your chosen repository. If your repository of choice is not listed please see our [guidelines for suggesting additional repositories](#).


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Technology to *enable* change

Training to *enact* change

Incentives to *embrace* change

Find this presentation at

<https://osf.io/wb2v7>

The screenshot displays the Open Science Framework (OSF) interface. At the top, the navigation bar includes the OSF logo, the text "Open Science Framework", and user options like "My Dashboard", "Browse", "Help", and a profile for "Andrew Sallans". Below this, a secondary navigation bar shows "Presentations" as the active tab, with other options like "Files", "Wiki", "Analytics", "Registrations", "Forks", "Contributors", and "Settings".

The main content area shows a file named "Sallans.MPSWorkshop.2015.11.19.pdf". To the right of the filename are action buttons: "Delete", "Check out", "Share", "Download", "View", and "Revisions".

On the left side, there is a sidebar with a search bar and a list of files under "OSF Storage". The list includes files such as "Bowman.ACS.2015.08.17.pptx", "Bowman.LJAF.2015.04.22.pdf", "Bowman.Ruttenberg.Charleston.2015.1...", "Bowman.SSP.2015.05.29.pptx", "Bowman.STM.2015.04.22.pdf", "Braswell.Ehsan.Pattison.OpenSource.C...", "Cohoon.Sallans.BITSS.2013.12.12.pptx", "Errington.UT.2014.10.23.pptx", "Errington CATS 2015.pptx", "Errington SLAS 2015.pptx", "geiger.intern_orientation.2015.05.19.pdf", and "geiger.pycon.2015.04.10.pdf".

The main content area displays a presentation slide. The slide features the logo of the Center for Open Science (COS), which consists of a stylized "C" and "S" with a cluster of blue dots between them. Below the logo, the text reads "CENTER FOR OPEN SCIENCE". The main title of the slide is "Improving Openness and Reproducibility of Scientific Research", and the presenter's name, "Andrew Sallans", is listed at the bottom. The slide viewer interface includes a "Page: 1 of 26" indicator and "Automatic Zoom" controls.

Questions: contact@cos.io