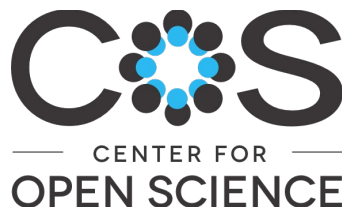


Measuring transparency and credibility of research

Brian Nosek

University of Virginia & Center for Open Science

<http://cos.io/>



The Transparency and Credibility Challenge

Reproducibility Project: Cancer Biology

Can't assess what was done to evaluate credibility and rigor

Barriers to Conducting Replications in Experiments

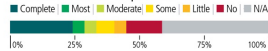
By research stage

COMPLETED

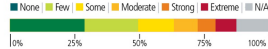
50 experiments

BARRIERS

Modifications implemented



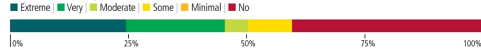
Modifications needed



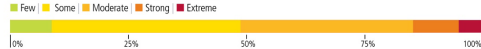
Reagents shared



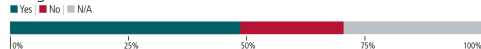
Authors helped



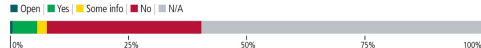
Protocol clarifications needed



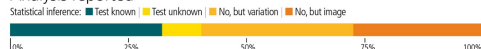
Reagents offered



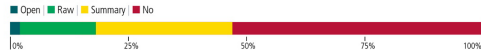
Code shared



Analysis reported



Data shared

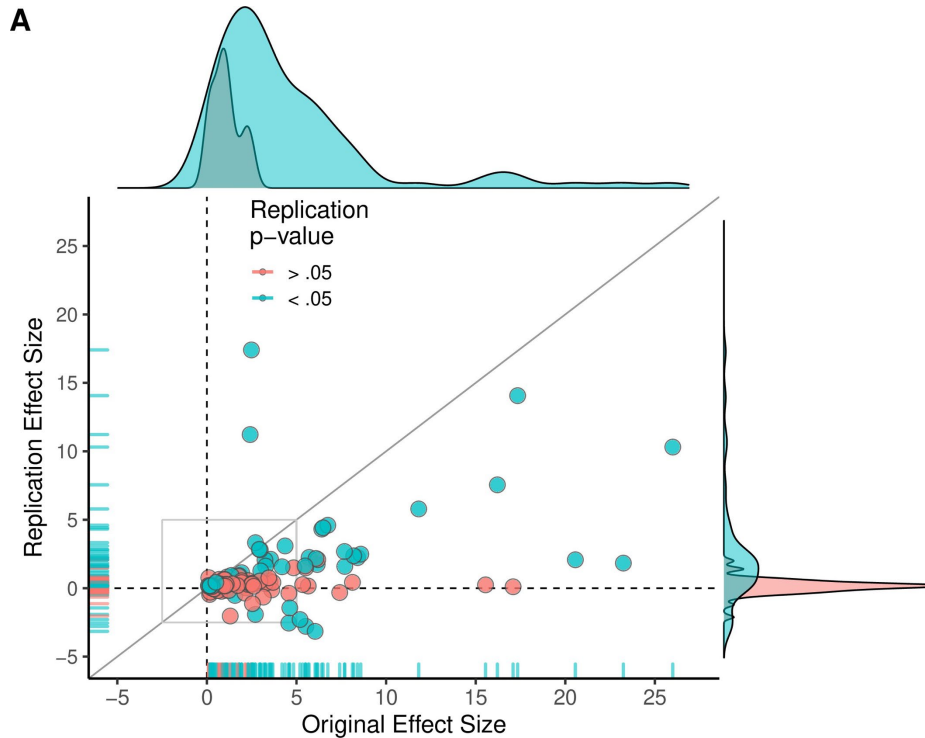


DESIGNED

193 experiments

When replications are conducted, credibility is lower than expected.

A



Measuring transparency and credibility

- *Transparency*
 - Frameworks
 - Surveys
 - Manual Coding
 - Machine Extraction
- *Credibility*
 - Surveys
 - Prediction Markets
 - Structured Elicitations
 - Machine Assessments (SCORE)



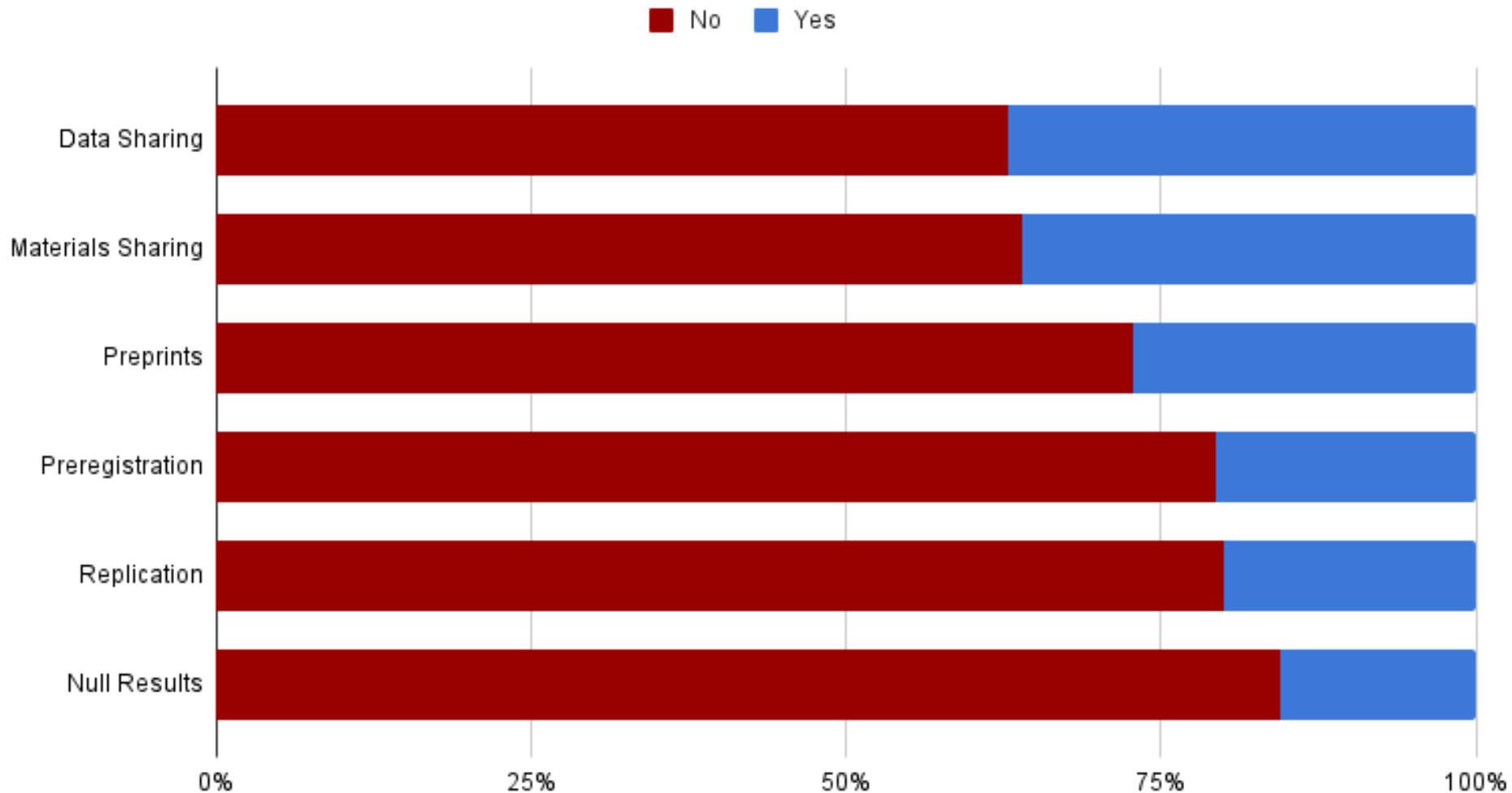
Transparency Frameworks

- [TOP](#): Transparency and Openness Promotion Guidelines
- [MDAR](#): Minimum reporting standards for life sciences
- Journal reporting checklists ([Nature](#), [STAR Methods](#))
- Reporting standards ([ARRIVE](#), PRISMA, CONSORT; [Equator Network](#))

Transparency Behavior Surveys

Open Scholarship Survey (<http://cos.io/oss>): Modular, open source

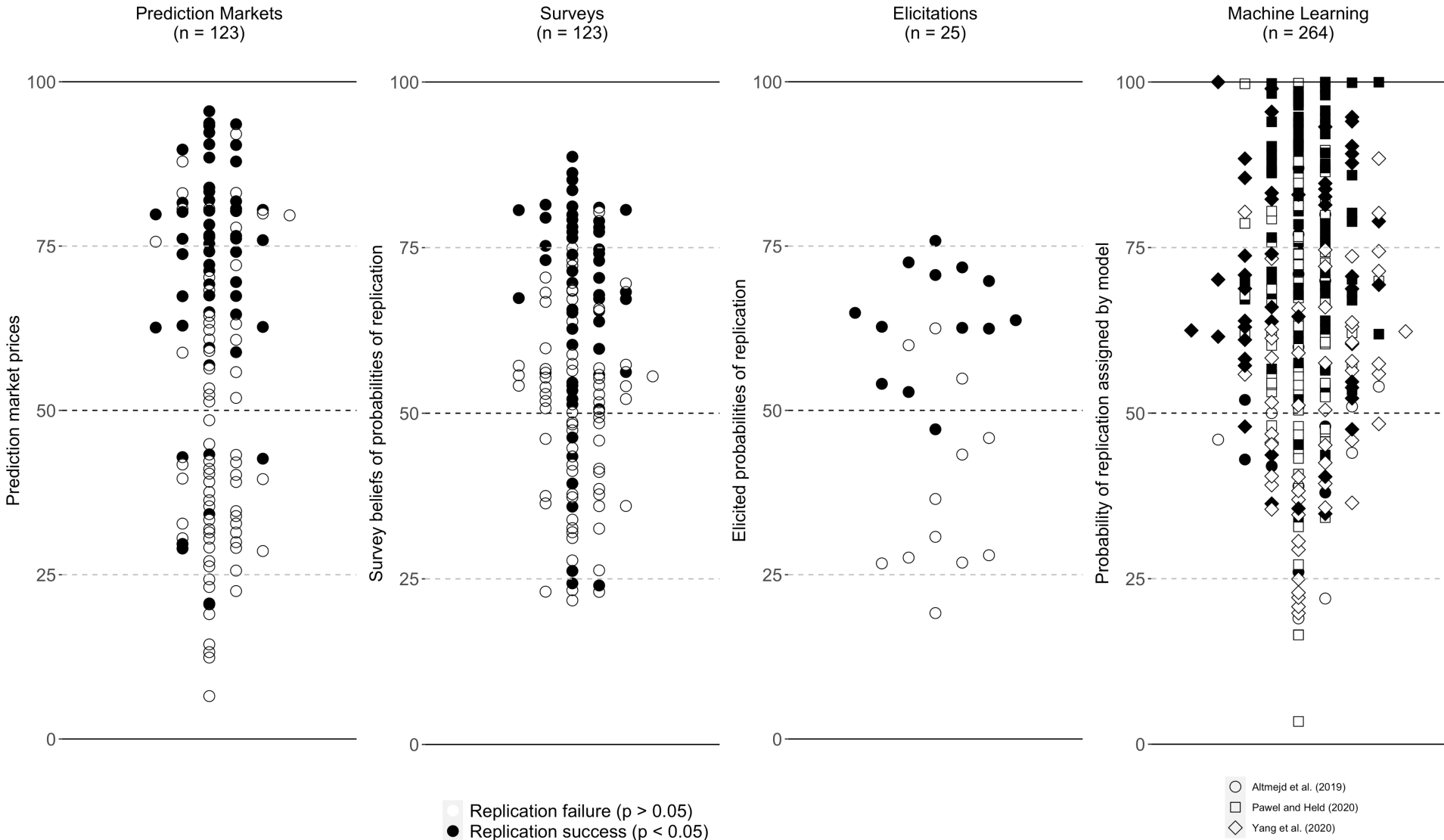
Open Scholarship in Most Recent Paper



Manual Coding and Machine Extraction of transparency from papers

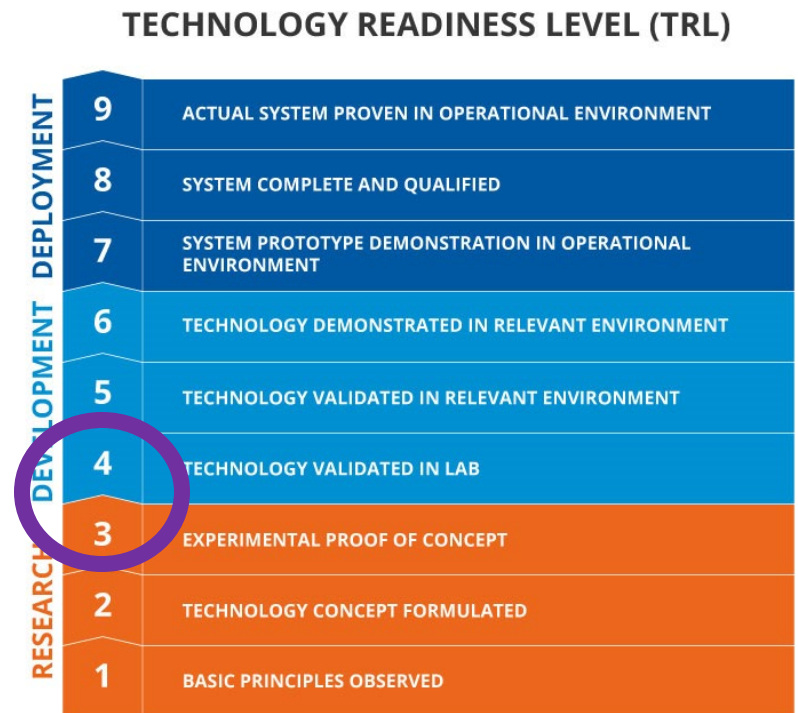
- *Manual coding*
 - Dozens of one-off research investigations
 - <https://www.socialsciencereproduction.org/>
- *Machine extraction*
 - [Ripeta](#): Ethical statement, funder disclosure, COI, data and code availability statements
 - [SciScore](#): MDAR, ARRIVE, blinding, randomization, resource identification

Credibility surveys, markets, elicitations, machines



Algorithm generated credibility scores

- DARPA [SCORE](#)
- Started 2019, ending 2022
- Social-behavioral sciences
- 3 independent algorithm teams
- >1000 researchers creating training and test data with 000's credibility ratings & 800 replications & reproductions
- To be open source
- Seeking funding for additional research and product development



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