

OPEN SCIENCE: THE SCIENCE OF THE FUTURE

Sharon Duffy, MLIS
Research Services Librarian
LSU Health Sciences Center – New Orleans
sduffy@lsuhsc.edu

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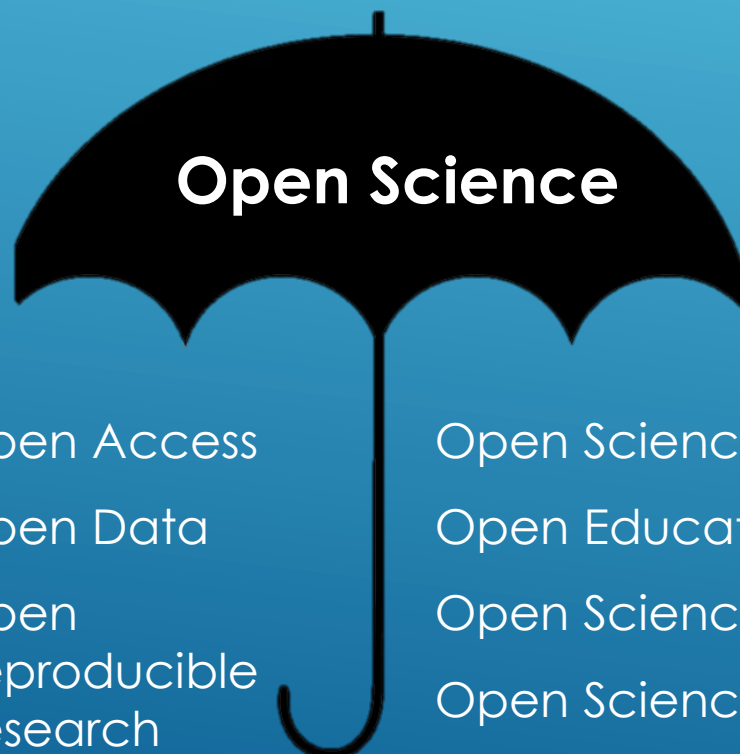


OBJECTIVES

- Define Open Science
- Fundamentals of Open Science
- The Research Cycle: Ideal vs Reality
- Importance of Transparency
- How We Can Get To Science 2.0
- Steps a Researcher Can Take Today

WHAT IS OPEN SCIENCE?

Open science is a philosophy and set of practices that promote open access to scientific research and data.



Open Access

Open Data

Open
Reproducible
Research

Open Science Policies

Open Educational Resources (OER)

Open Science Tools

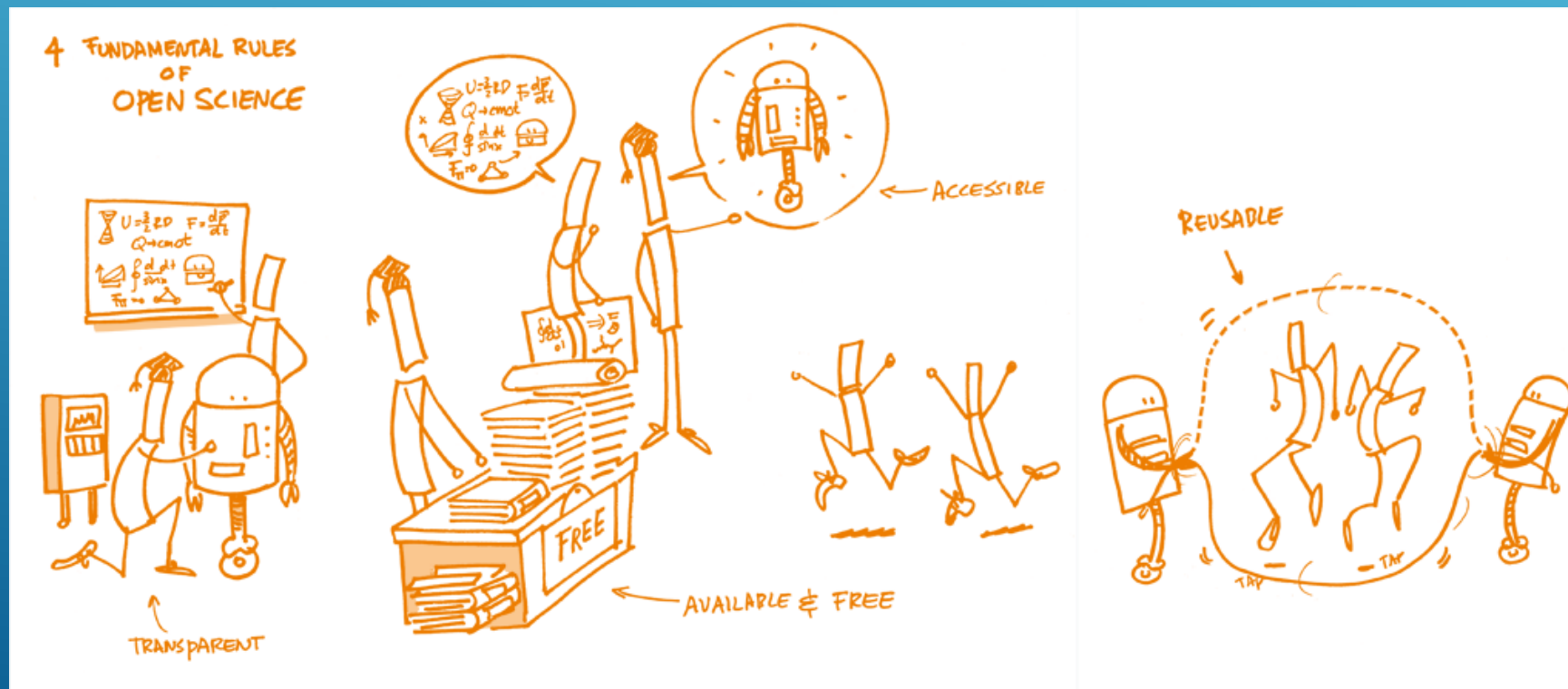
Open Science Evaluation



FUNDAMENTALS OF OPEN SCIENCE

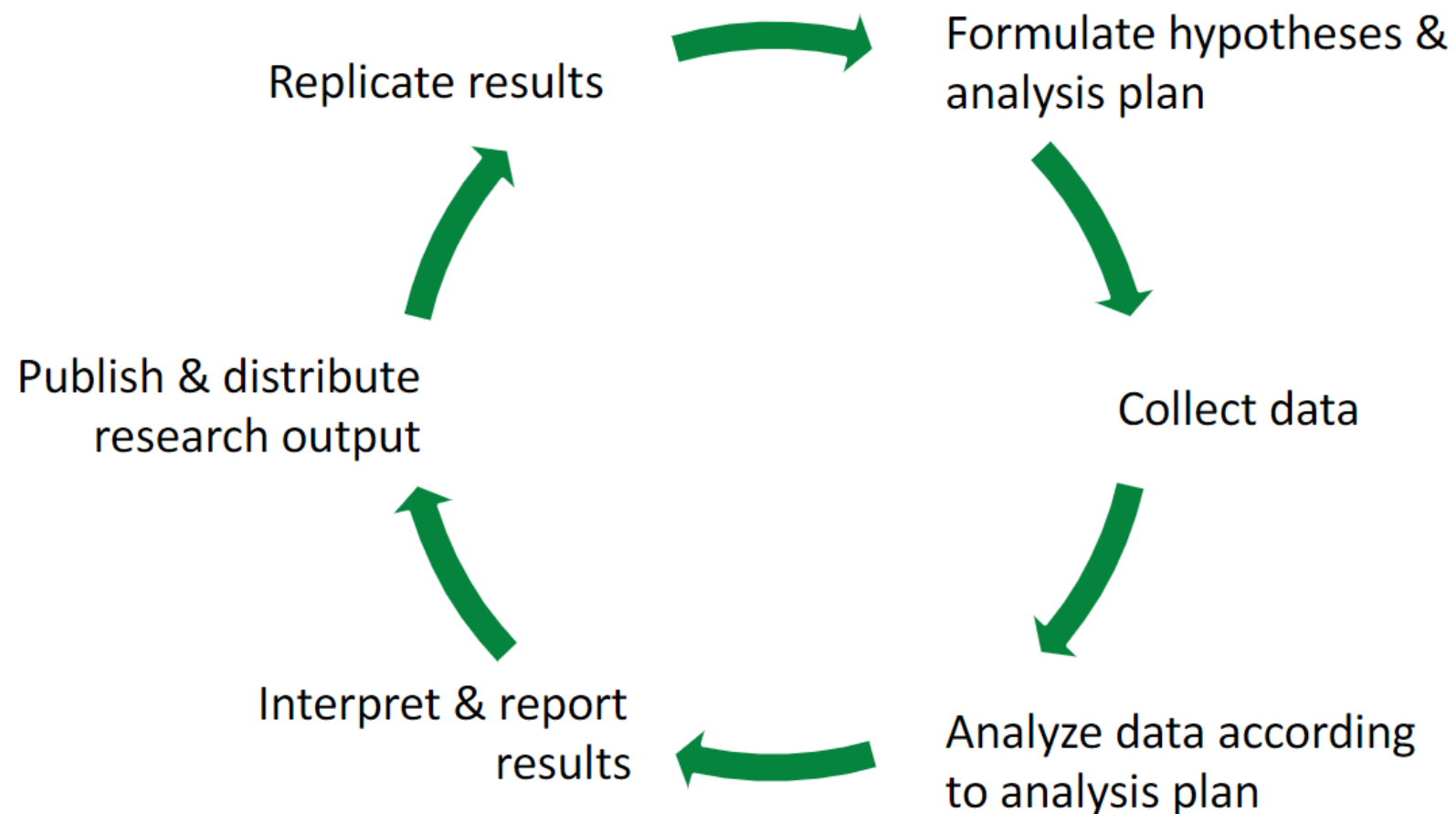
It is a transition to:

- More open and participatory way of conducting research, publishing results, and evaluating scholarly outputs.
- Transparency, Accessibility, Availability, and Reusability are cornerstones of this new approach.



WHY IS TRANSPARENCY IMPORTANT?

The Confirmatory Research Process



SCIENCE IS MESSY

How can you know that it does not look like this?

invent some shiny
new hypotheses

~~Replicate results~~

Formulate hypotheses &
~~analysis plan~~

Publish & distribute
research output

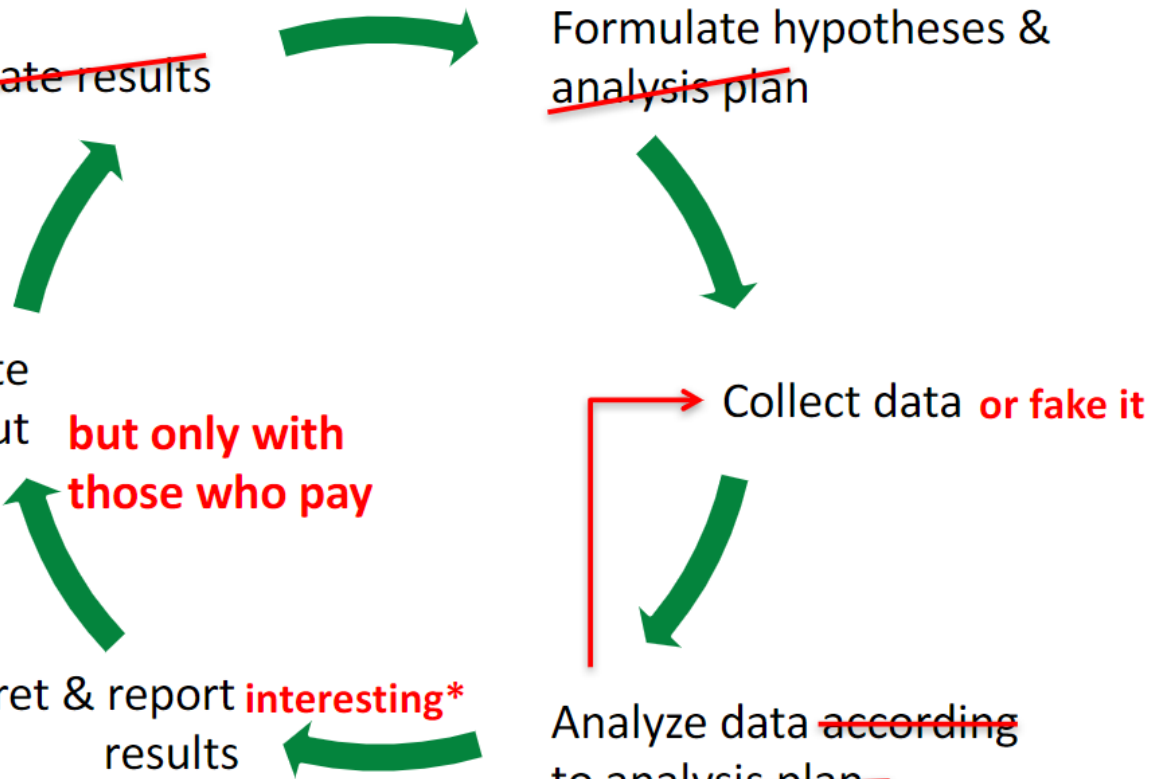
but only with
those who pay

Collect data **or fake it**

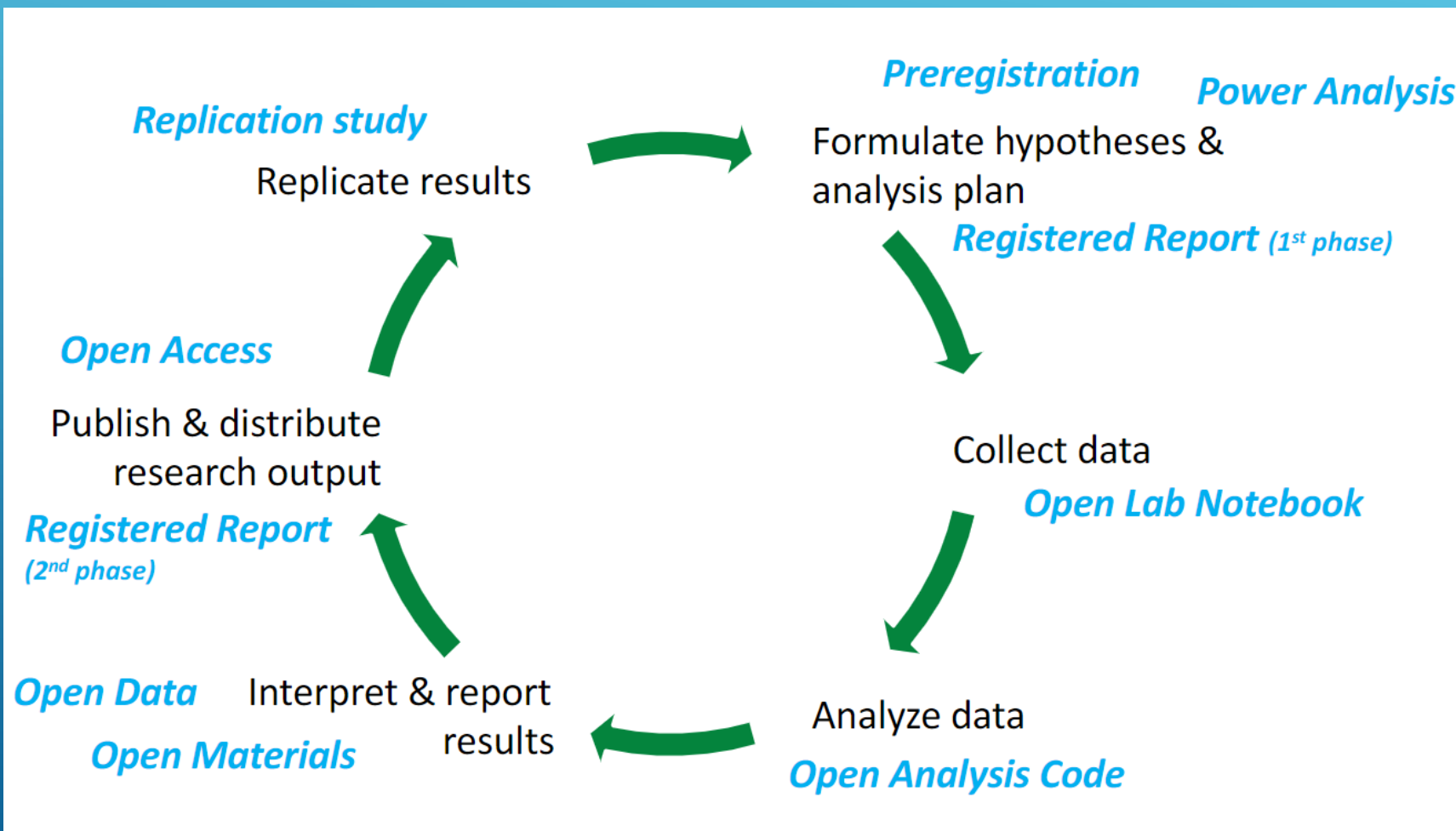
Interpret & report **interesting***
results

Analyze data ~~according~~
~~to analysis plan~~

* $p < .05$; that fit a theory; that are surprising / publishable...



HOW OPEN SCIENCE CAN HELP



TRANSPARENCY IS ESSENTIAL



Increase trust in
the scientific
process



Reduce waste
of public (and
private)
research dollars



Researchers
receive
constructive
feedback



More inclusive
and
international
reach

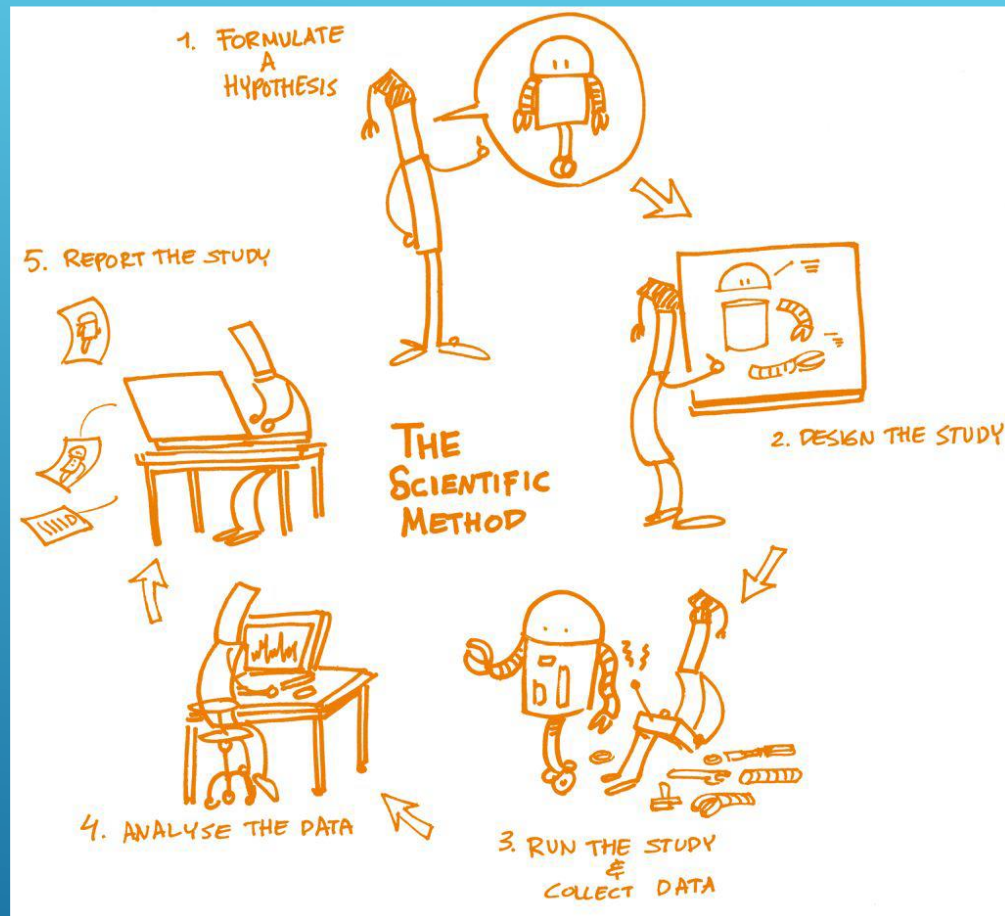


Leads to
increasing
speed of
discovery

SCIENCE 2.0

Science 1.0

gather data privately
 write journal article
 submit for peer-review
 peer-review
 gatekeepers
 publish or reject
 ↓
 information available to the public (or not?)



Science 2.0

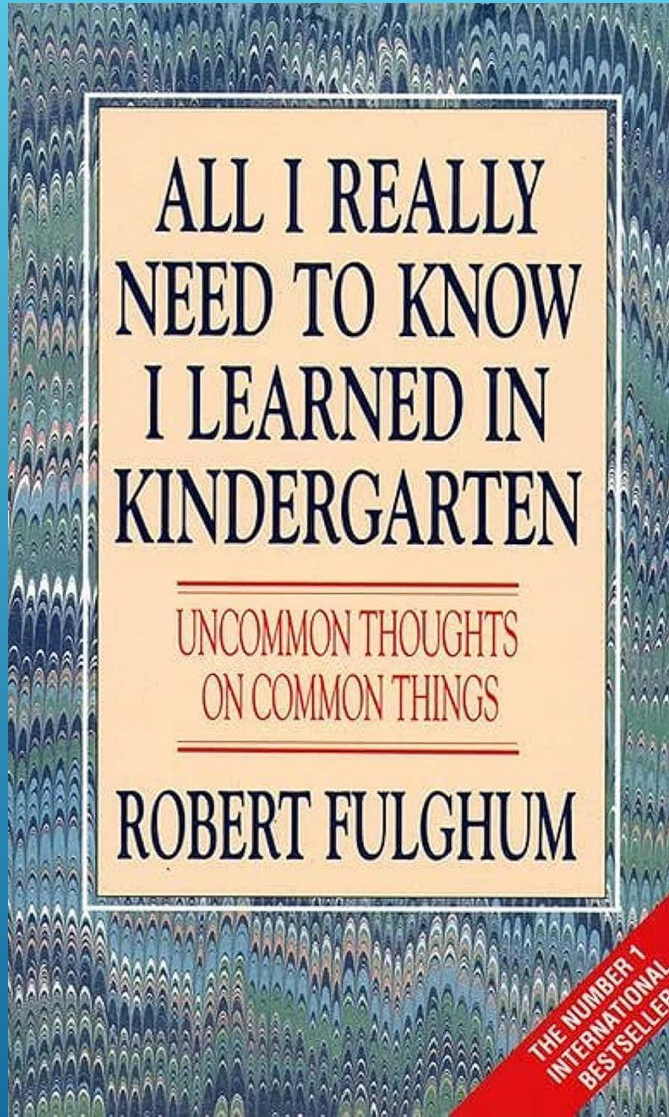
pre-register studies
 share ideas, methods, protocols, data via blogs, platforms, repositories
 submit preprints
 publish in blogs, wikis, and in journals
 information and data available to the public

WHAT CAN A SINGLE RESEARCHER DO?

- Be transparent with study materials, data, and software code
- Keep data well organized and share in a repository
- Pre-register their research protocols; share methodologies
- Choose to publish in Open Access journals
- Utilize Institutional Repositories
- Educate others

A published article is just the tip of the iceberg:

- ▶ *“An article about (a) computational result is advertising, not scholarship. The actual scholarship is the full software environment, code and data, that produced the result.”* – Buckheit & Donodo (1995)



- 1. Show your work**
- 2. Play fair**
- 3. Share**

THANK YOU!

- ▶ **Sharon Duffy**
- ▶ **Research Services Librarian**
- ▶ **LSU Health Sciences Center – New Orleans**
- ▶ **sduffy@lsuhsc.edu**

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