

# Next Steps in Field Experimentation



**J. Nathan Matias**  
**@natematias**  
**[citizensandtech.org](http://citizensandtech.org)**  
**[natematias.com](http://natematias.com)**

Cornell  
**CALS**

# What You Can Do With A Starting Knowledge



**Alexander Macgillivray**

Took a class in behavioral research in undergrad (Princeton)

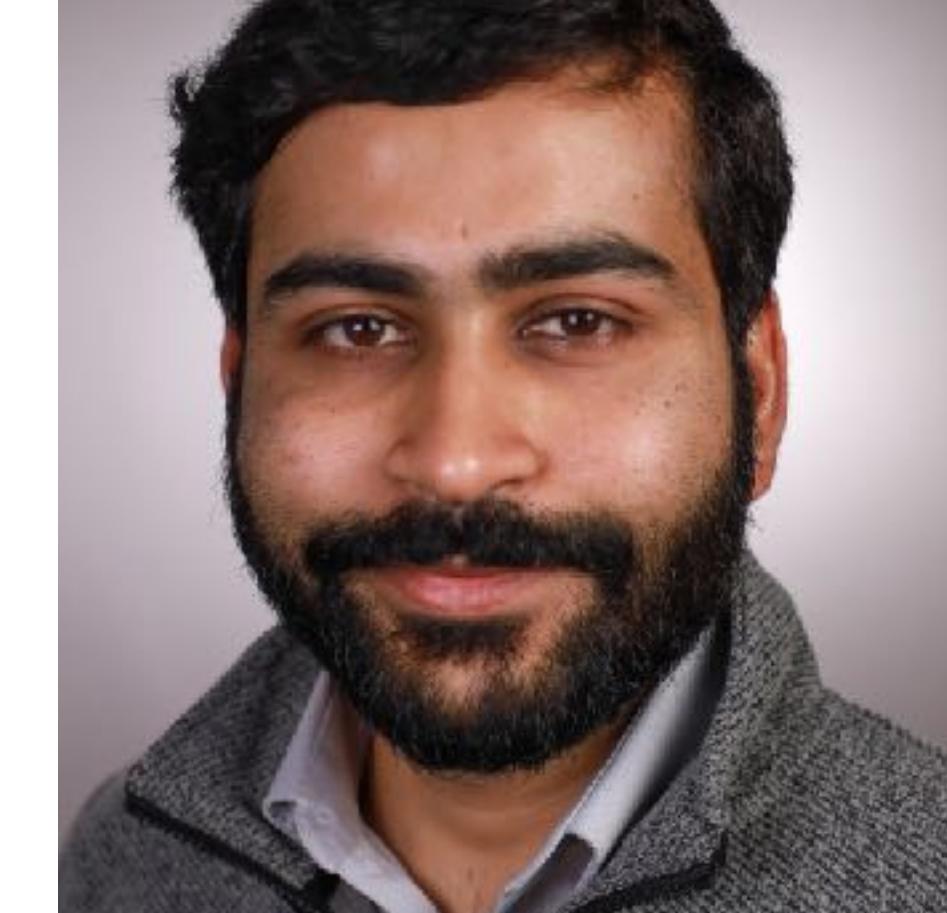
General Counsel of Google  
General Counsel of Twitter  
Deputy U.S.  
Chief Technology Officer



**Maggie Koerth Baker**

Studied Journalism & Anthropology at the University of Kansas

Science Writer for the New York Times  
  
Senior Science Reporter  
FiveThirtyEight



**Vineet Pandey**

B.E. BITS Pilani, India

Created “Gut Instinct”  
for anyone to test  
ideas about their own  
micro-biome

# What You Can Do With A Starting Knowledge



**Matt Wallaert**

Studied Psychology & Education @ Swarthmore

Dropped out of Cornell  
PhD in Social Psych

Microsoft's first Behavioral Scientist

Chief Behavioral Officer at Clover Health



**Esther Duflo**

Studied History & Economics @ Ecole Normale Supérieure  
PhD in Economics

MIT Economics Professor

Director, J-PAL  
Poverty Action Lab



**Leila Zia**

Studied Industrial Engineering, Sharif University of Technology

PhD at Stanford in Management Science

Head of Research  
Wikimedia Foundation

# What You Can Do With A Starting Knowledge



**Clarence Wardell**

B.S.E. CS at UMich  
PhD at Georgia Tech

Founded tinyGive  
Strategy & Management  
U.S. Digital Service

**Director of City Solutions**  
**What Works Cities**  
**Results For America**



**Jan Overgoor**

B.S. Computer Science  
University of Amsterdam

M.Sc in humanities + tech  
Stanford University

Data Scientist, Airbnb

PhD, studying police  
discrimination



**Hilary Mason**

B.A. in CS at Brown

Chief Data Scientist, [bit.ly](#)  
**Data scientist in residence**  
at Accel

**Co-founder of HackNY**

# Career & Community

# Current Career Directions

- **Tech industry** (high salary, low autonomy)
- Marketing / political **campaigning** (high salary, low autonomy)
- **Academia** (low/medium salary, high autonomy)
  - Great positions as staff researchers
  - **Policy evaluation** / analyst in government (medium salary, low autonomy) (higher salary if there's a tech angle)

# Future Career Directions

- Behavioral Product Design
- Behavioral Consumer Protection
- Tech industry policy & regulation

# Public Understanding of Science

- Reading journalism and participating in the democratic process
- Helping your local institutions (schools, churches, community associations) by & interpreting conducting experiments
- Broadening understanding of scientific research



# Communities of Experimentation



tech industry &  
infrastructure



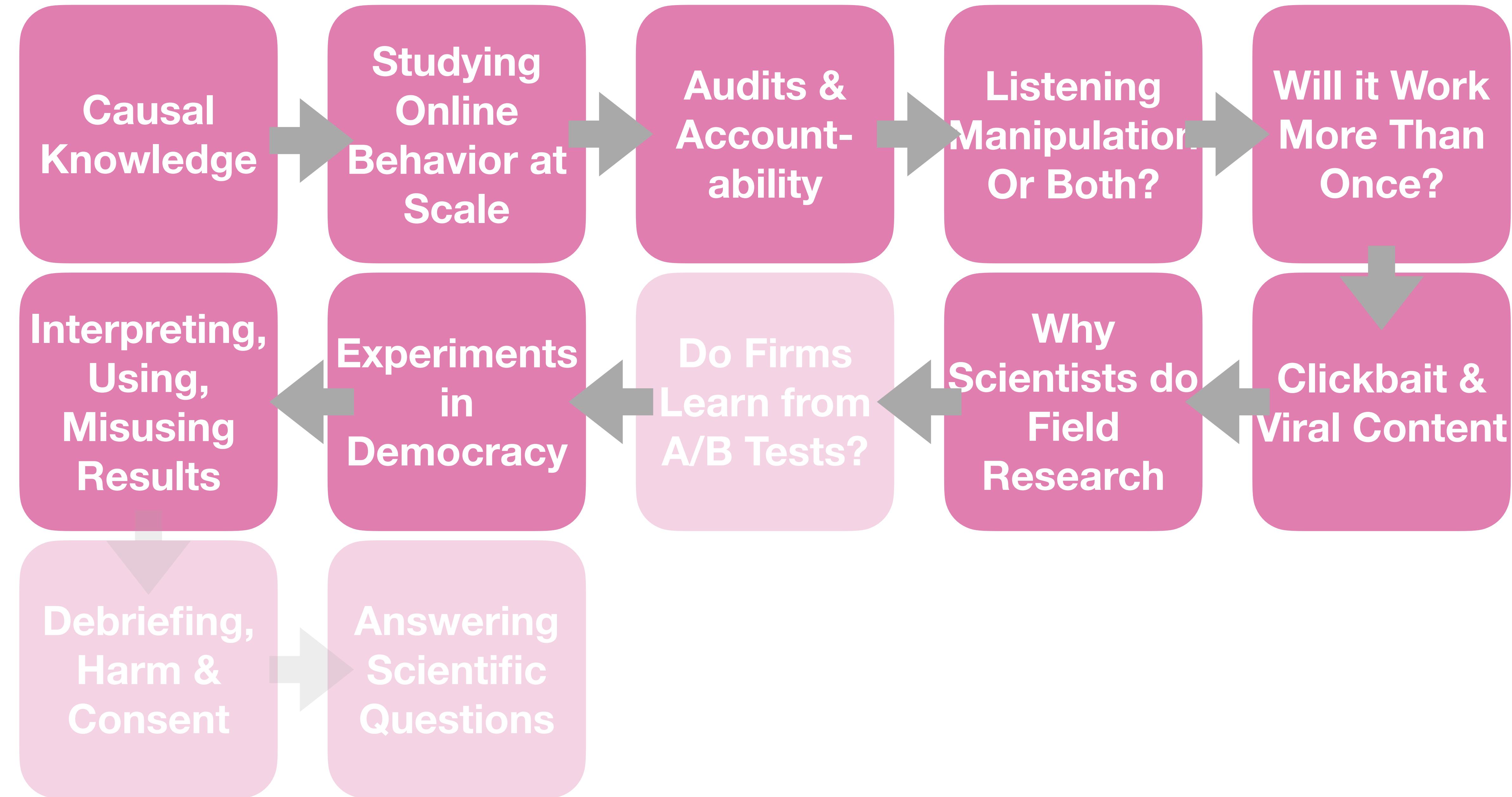
policy  
evaluation



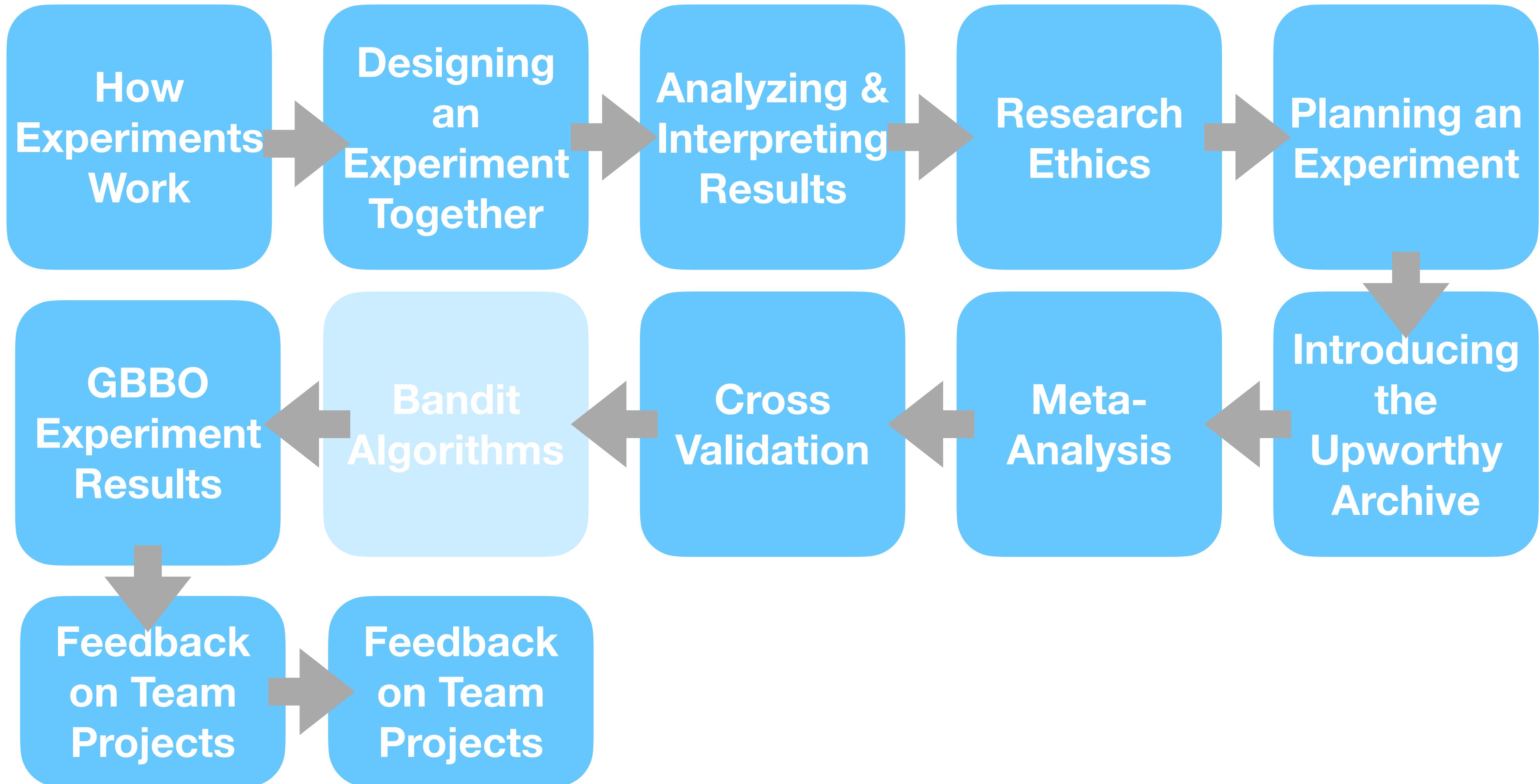
open science



# Continuing to Learn

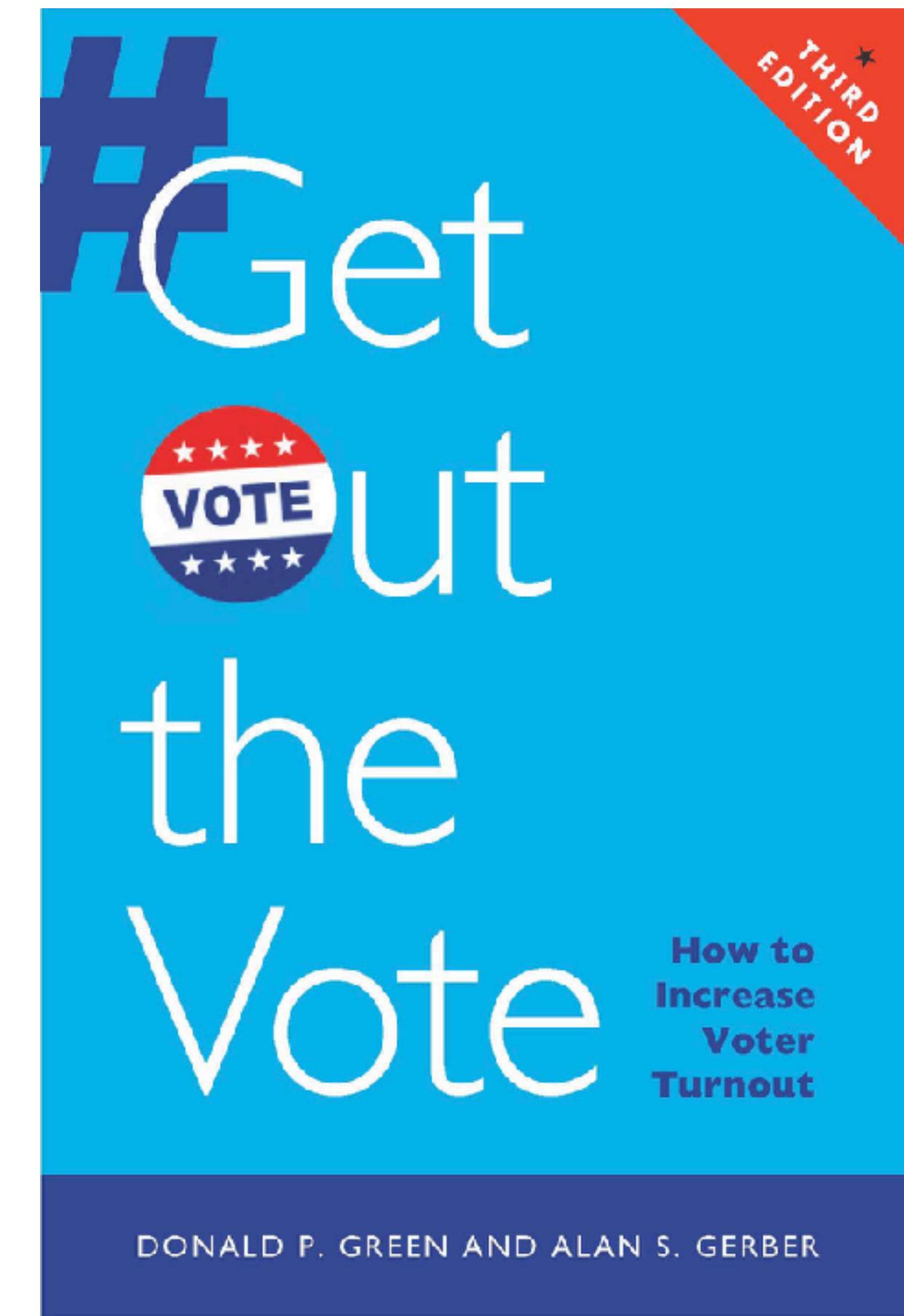
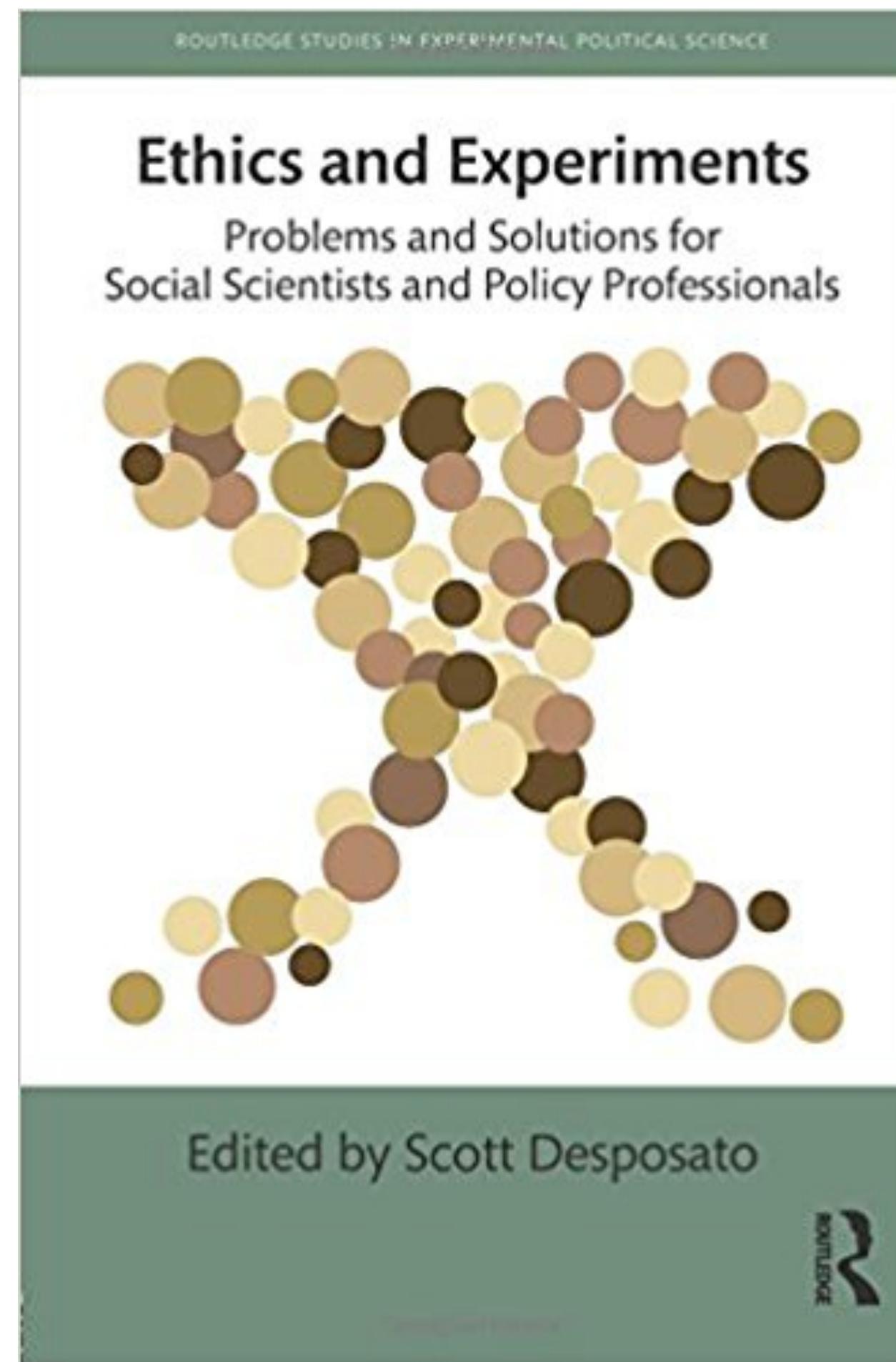
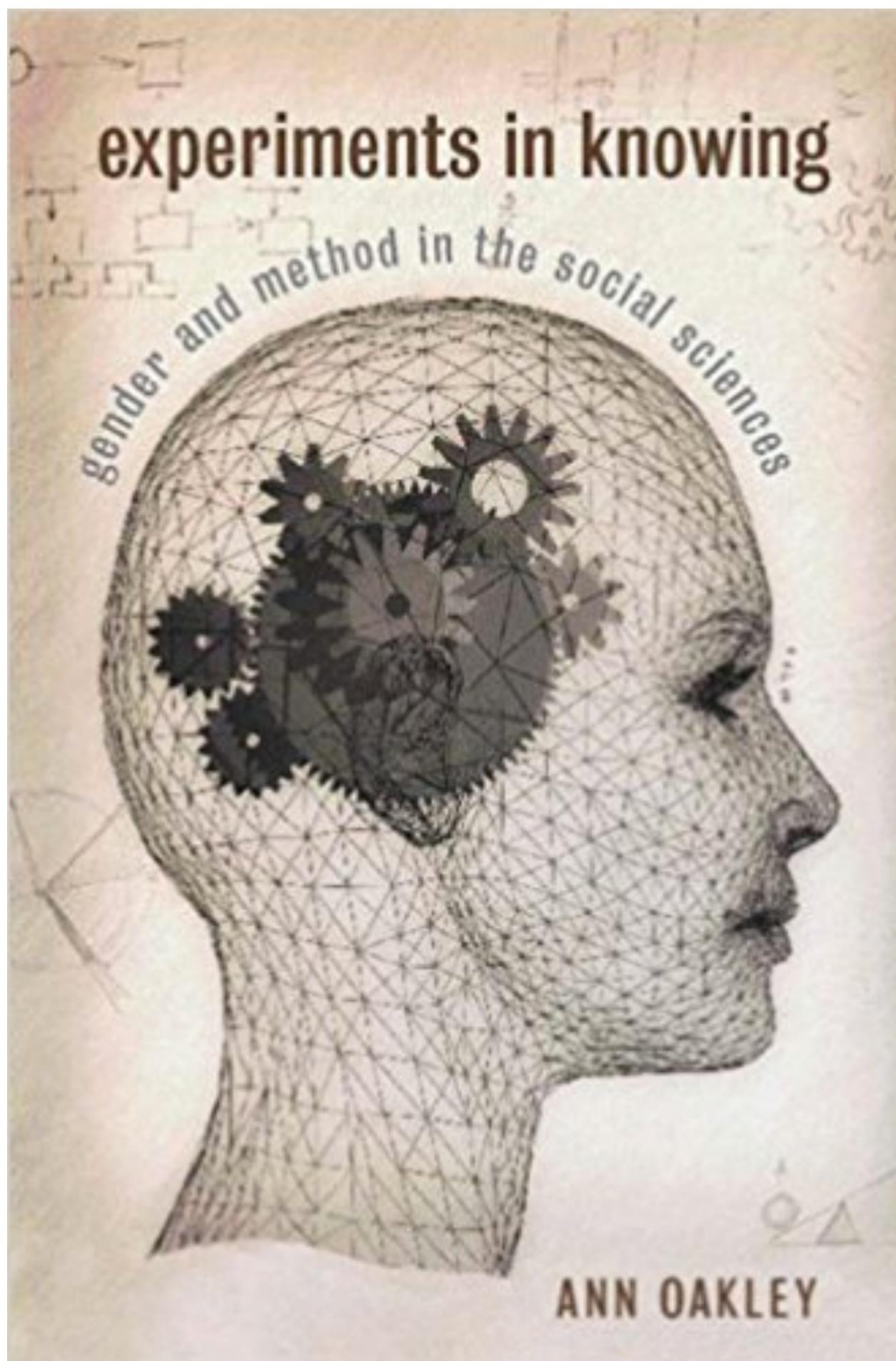


Next Steps in your Experimenting Journey



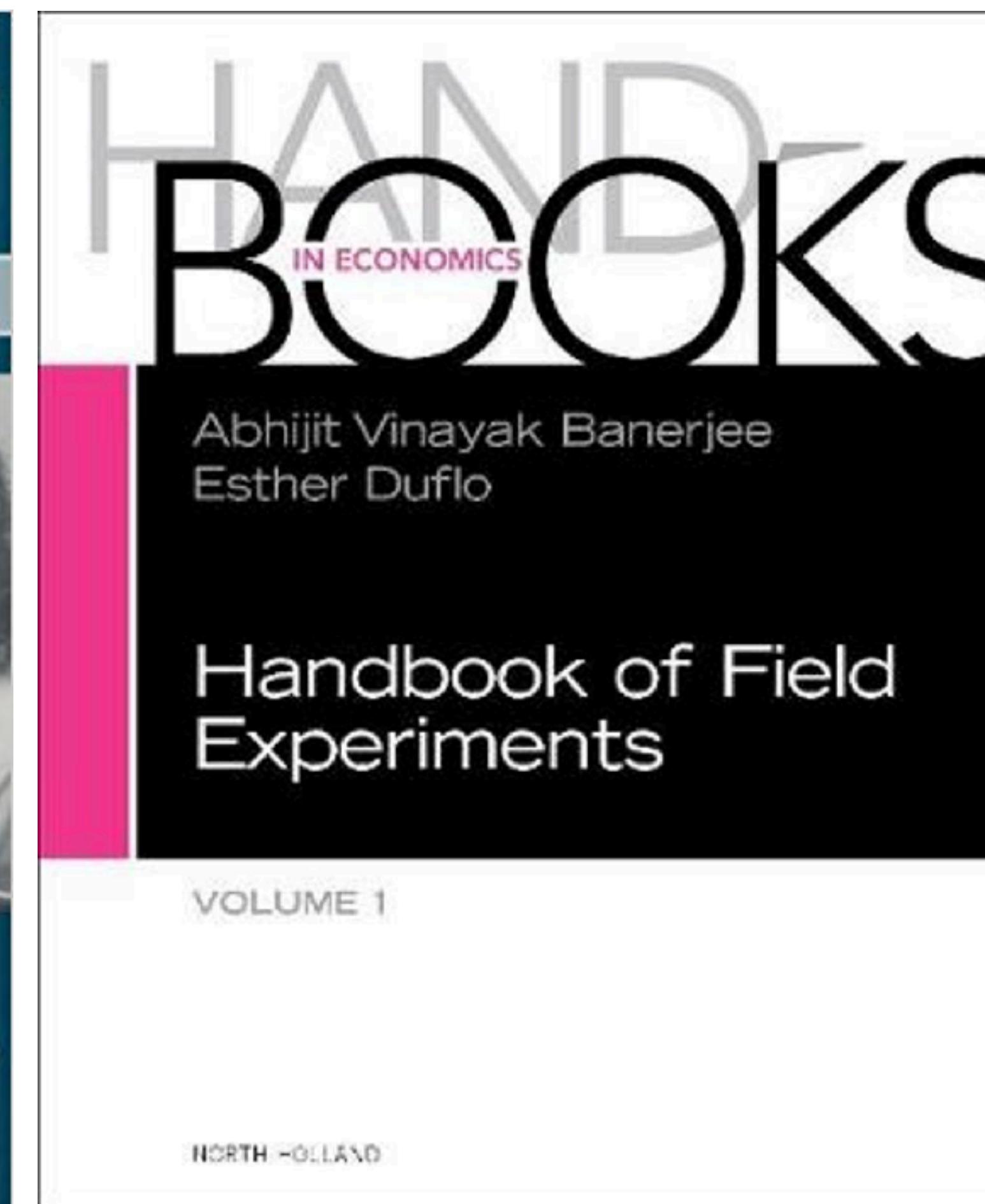
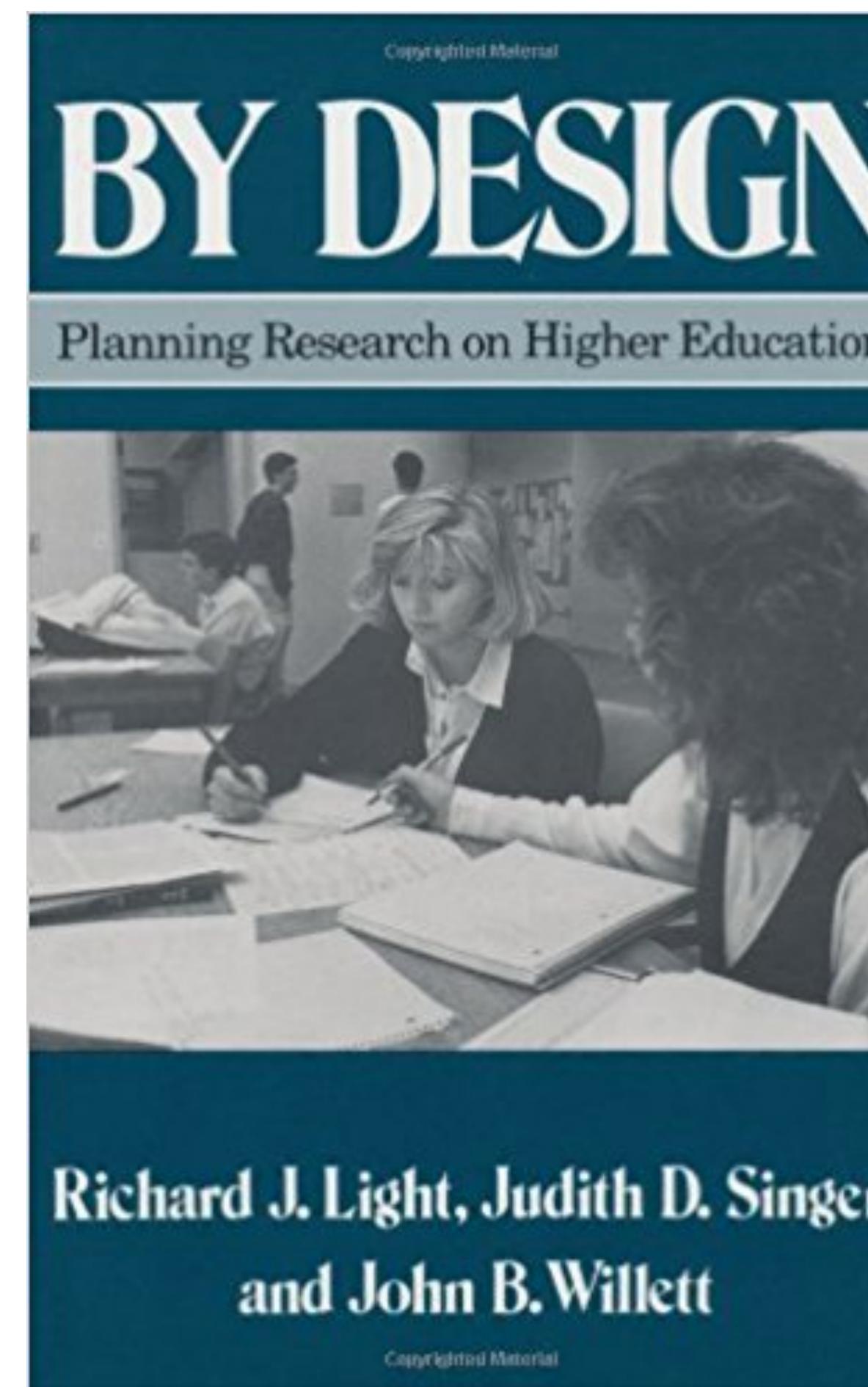
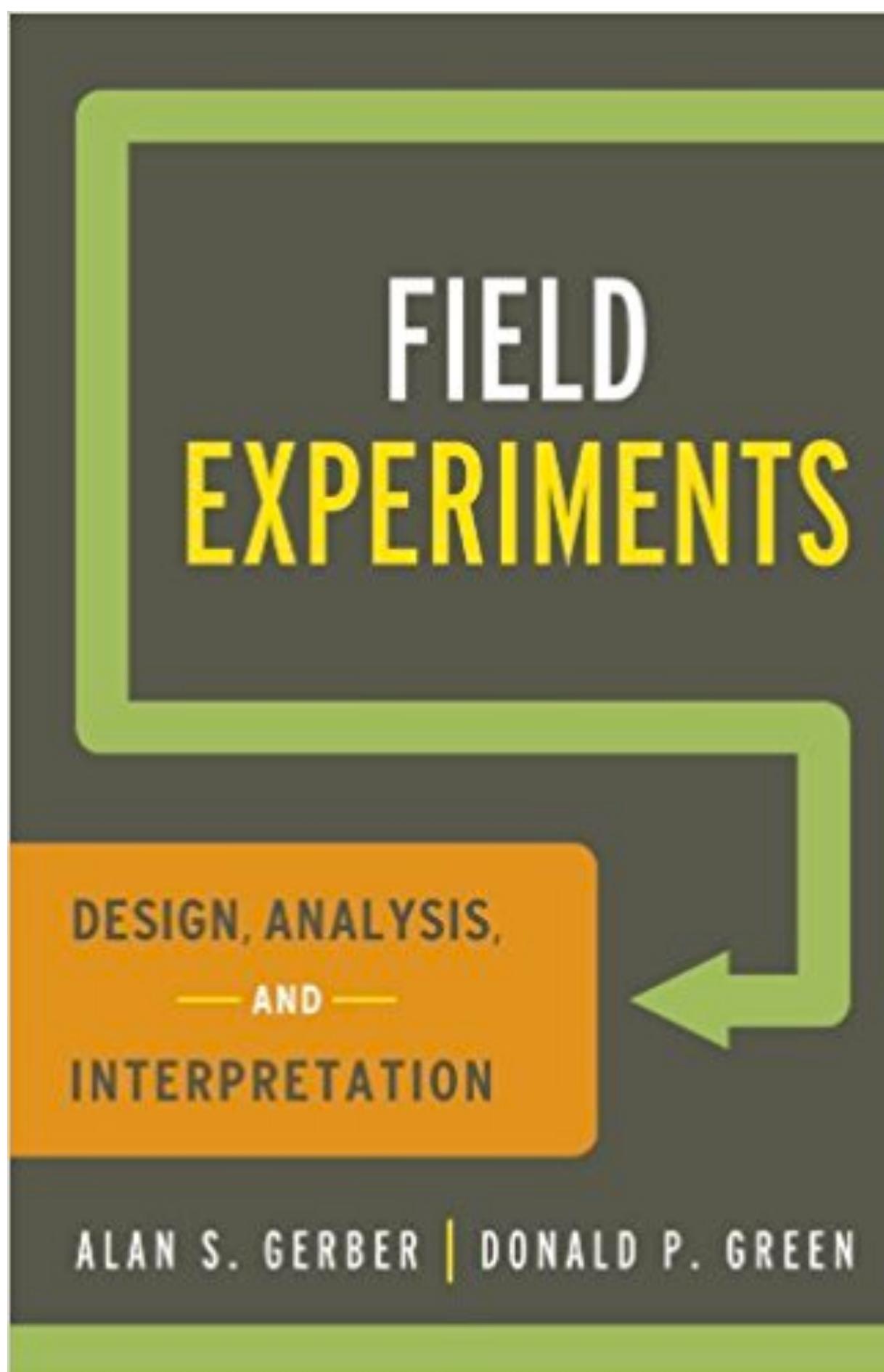
Next Steps in your Experimenting Journey

# Epistemology, Ethics, Examples



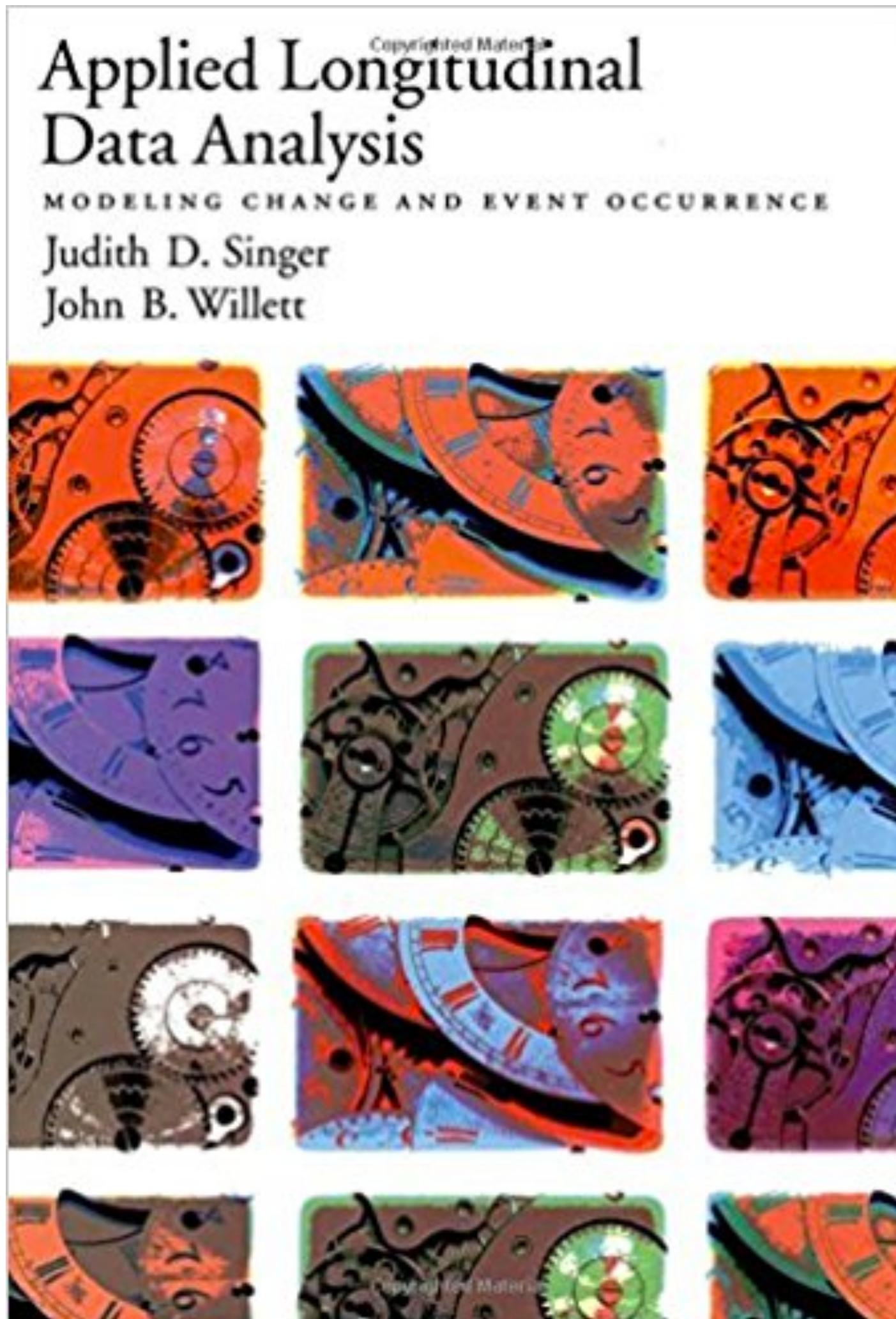
Next Steps in your Experimenting Journey

# Research Methods



Next Steps in your Experimenting Journey

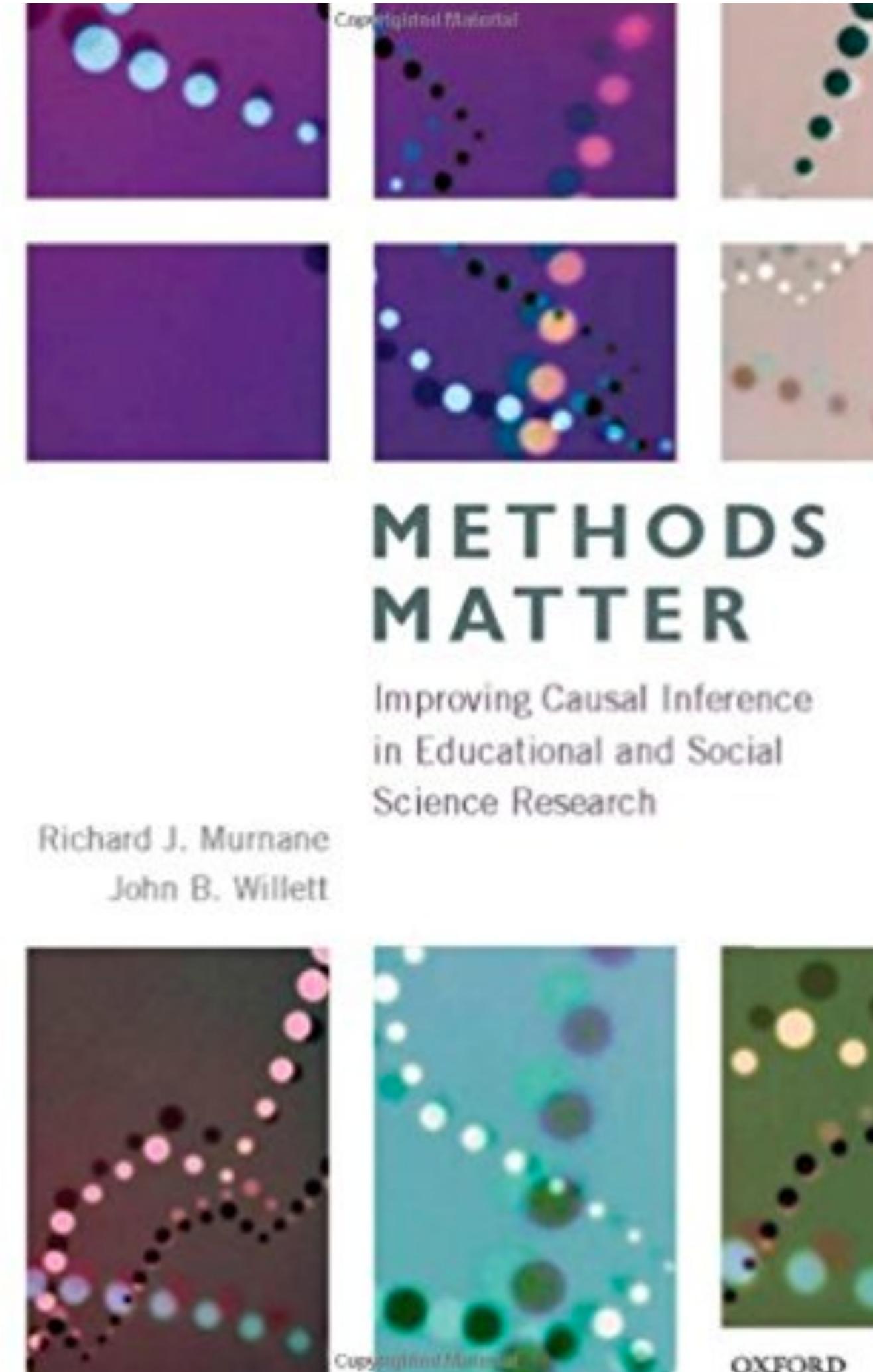
# Modeling Outcomes Over Time



Longitudinal effects within a person's experience, between people, and between groups.

Singer, Judith D., and John B. Willett. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford university press.

# “Natural” Experiments



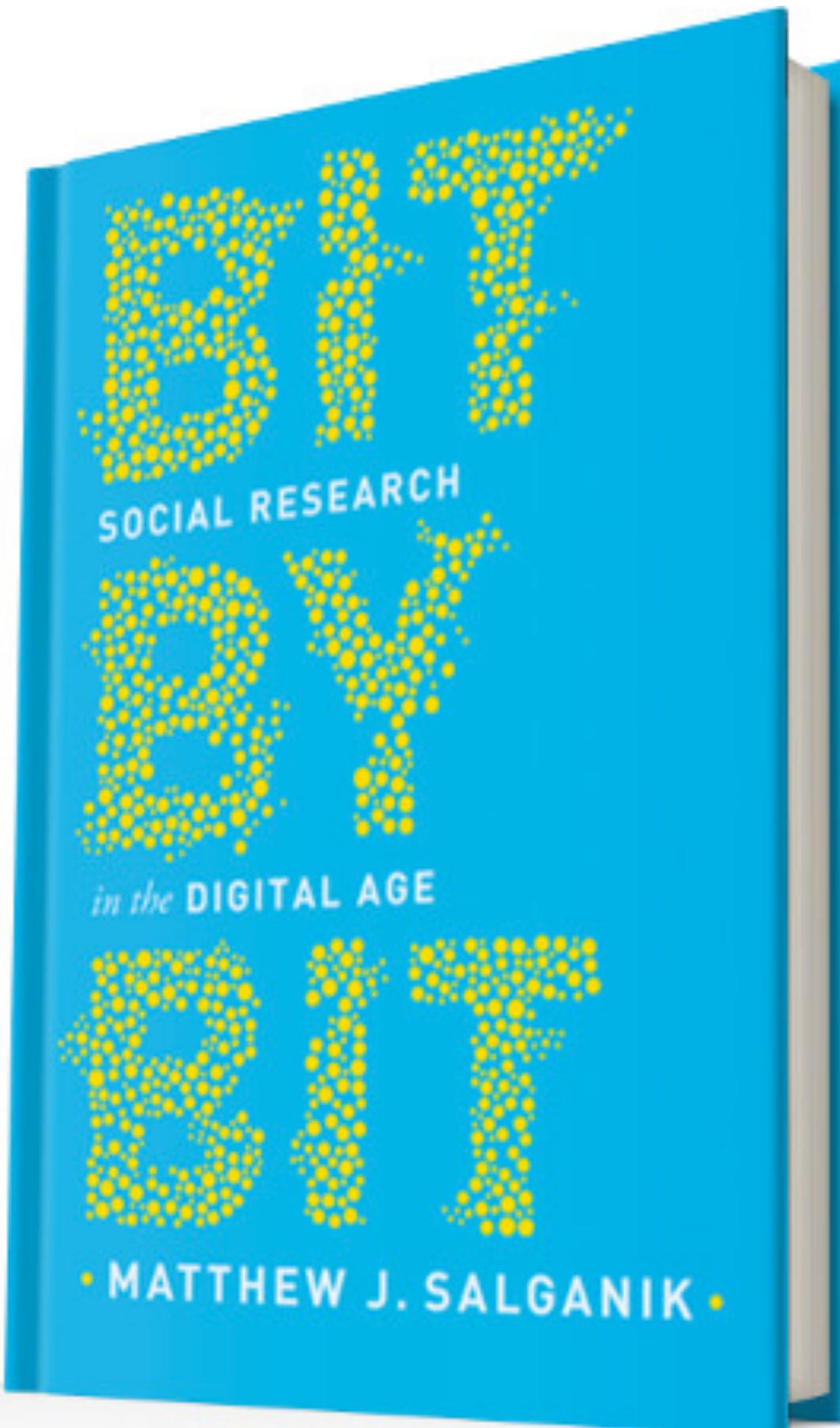
The relationship between theory and application in field experiments.

Overview of RCTs in education

Comparison to “Natural Experiments”

Murnane, Richard J., and John B. Willett. 2010. **Methods Matter: Improving causal Inference in Educational and Social Science Research**, Oxford University Press.

# Measuring Outcomes

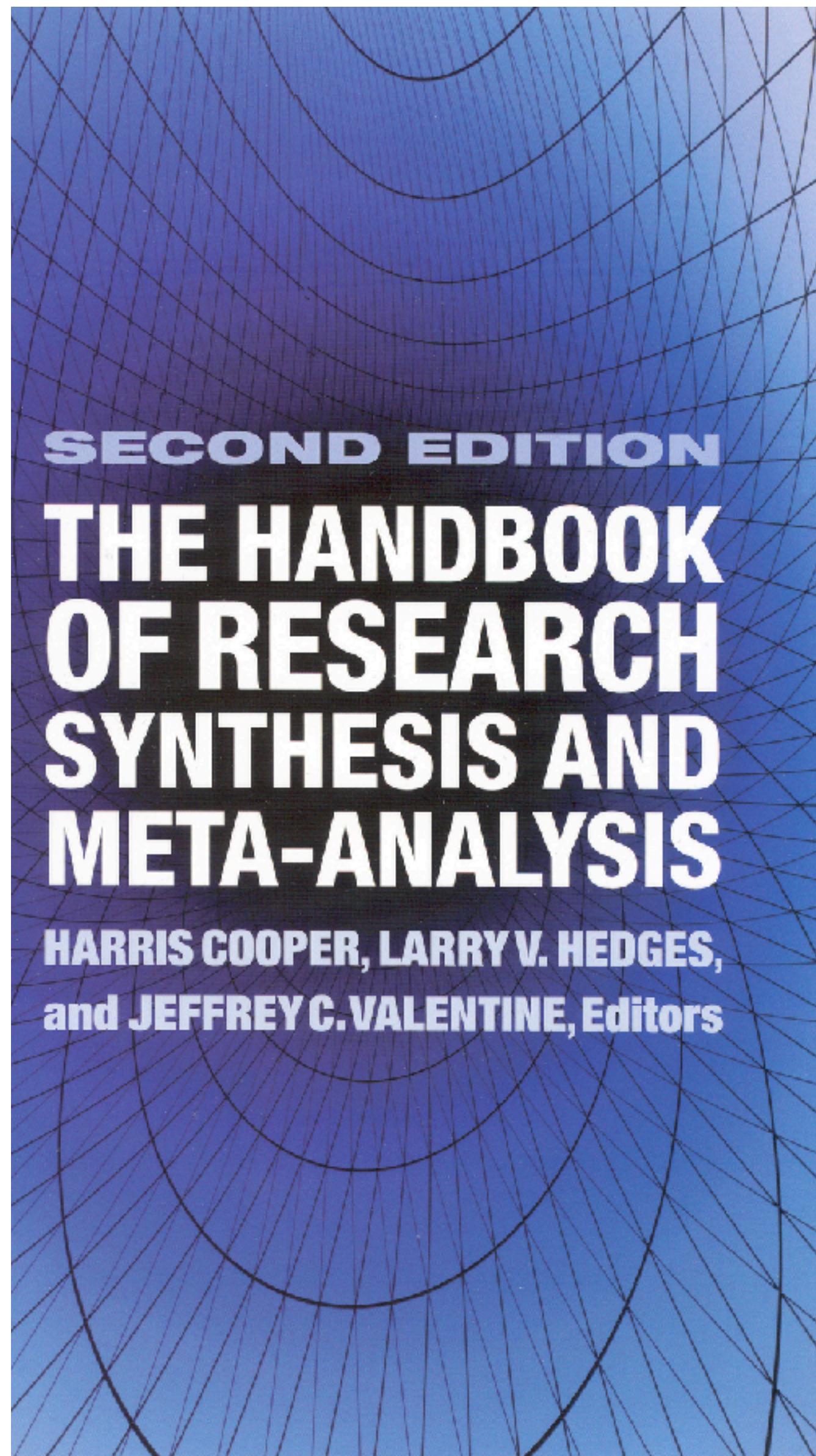


- Benefits and limitations of “Big Data”
- Observing behavior
- Asking questions

Important questions:

- Validating measurements
- **Knowing what your measurement is good for and its limitations**

Salganik, M. J. (2017). *Bit by bit: social research in the digital age*. Princeton University Press. Chicago



# Meta-Analysis & Systematic Review

Combining findings from many studies  
into narrative and statistical advice  
on the outcomes of an intervention:  
adjusting for cultural/time variation,  
different methods, and missing results

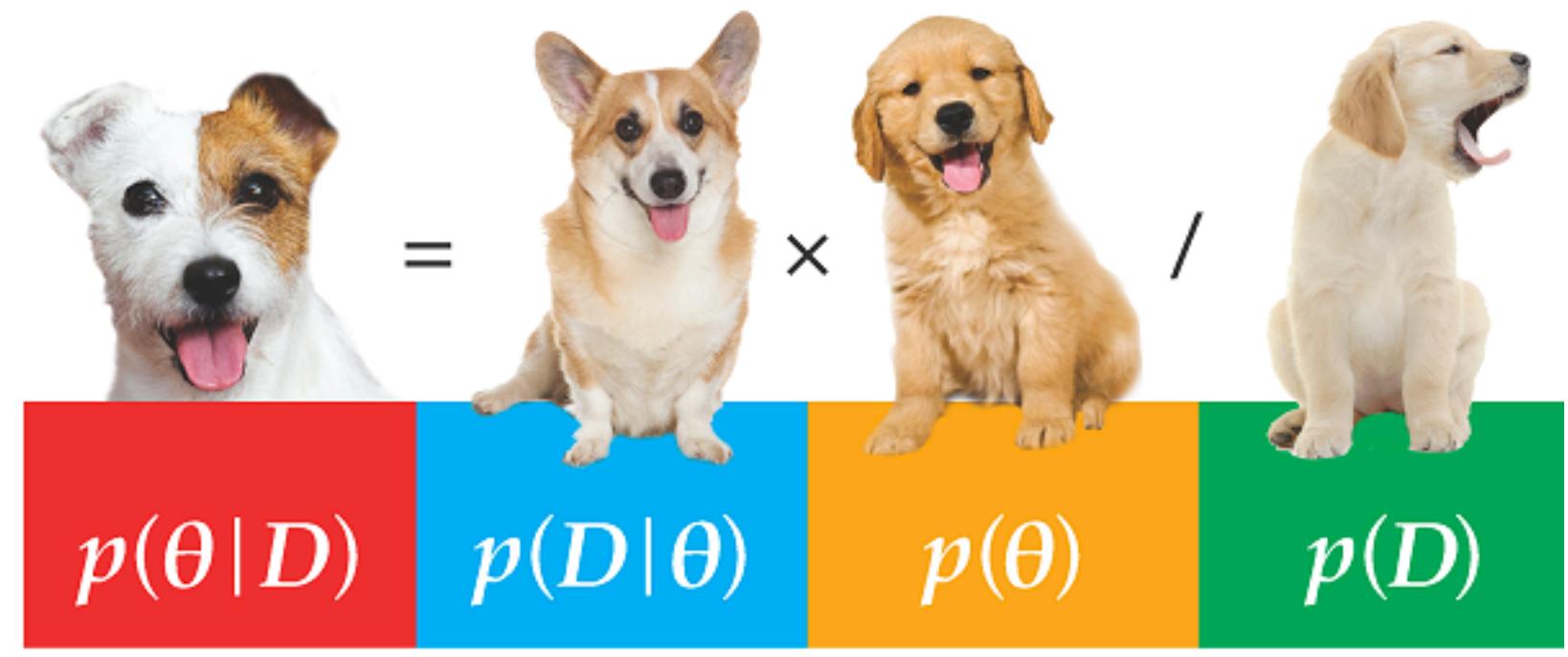
Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2009). *The handbook of research synthesis and meta-analysis*. Russell Sage Foundation.

# Bayesian Inference

Second Edition

## Doing Bayesian Data Analysis

A Tutorial with R, JAGS, and Stan



John K. Kruschke



Kruschke, J. (2014). Doing Bayesian data analysis: A tutorial with R, JAGS, and Stan. Academic Press.

Next Steps in your Experimenting Journey

# Bandit Algorithms



Dynamically choosing between exploration and exploitation:

**Exploration:** improve knowledge

**Exploitation:** maximize payoff from that knowledge

White, J. (2012). **Bandit algorithms for website optimization.** " O'Reilly Media, Inc.". Chicago