

Introductions
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Readings for Today
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Summative lecture
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Preparation for Next Class
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Class 1

Agenda

- Introductions (30 minutes)
 - Getting to know each other
 - Syllabus and materials overview
 - Typical class flow
- Readings for today (70 minutes, with 5 min break)
- Summative lecture and open discussion (20 minutes)
 - Key principles
 - Additional thoughts

Introductions
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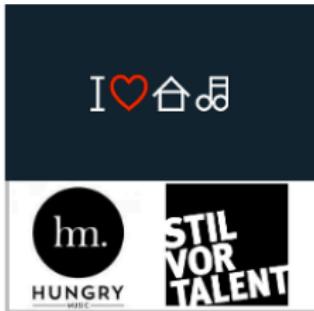
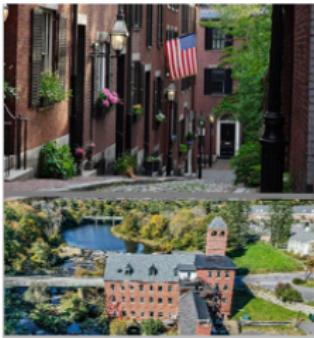
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Introductions

A little about me



A little about me



A little about me



A little about you

Let's fill out some introductory surveys: [Pollev.com/drfox](https://pollev.com/drfox)

Syllabus and materials overview

- Syllabus
- Brightspace
- Dropbox

Typical class flow

- *Part I:* Conceptual grounding and agenda setting (10 minutes)
- *Part II:* Core paper discussion (45 minutes):
 - We will discuss the 2-3 papers that all students have been assigned to read in detail
 - These papers typically will provide a mix of conceptual background and how-to guides
- *Break*

Typical class flow

- *Part III: Activity period (40 minutes):*
 - (Weeks 2 – 7) Compare / contrast: One group tasked with reviewing two additional papers to explain their points of intersection, divergence, and ties to core papers
 - (Weeks 8 – 14) Replication: One group tasked with using data from one of my current or published papers to replicate analyses and show the class the process

Typical class flow

- *Part IV:* Summative lecture on concepts (15 minutes):
 - I will make a brief presentation to tie together and highlight key concepts
 - Elements missed in the general discussion will be given greater focus
- *Part V:* Open discussion (5 minutes)

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Readings for Today

Preamble

I have provided some discussion questions for us to consider in case we need to get the ball rolling.

We may or may not discuss those questions depending on the flow of the class.

In general, I would rather talk about your ideas and questions rather than these “canned” items.

Popper (2002)

The Logic of Scientific Discovery. [Ch .1]

According to the view that will be put forward here, the method of critically testing theories, and selecting them according to the results of tests, always proceeds on the following lines. From a new idea, put up tentatively, and not yet justified in any way—an anticipation, a hypothesis, a theoretical system, or what you will—conclusions are drawn by means of logical deduction [...]

[Then,] there is the testing of the theory by way of empirical applications of the conclusions which can be derived from it. [p. 9]

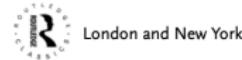
Popper (2002)

Discussion Questions

- Reactions? Insights? Disagreements?
- In your view, what is the main point?
- Do this worldview currently inform your work? How might it?

Karl
Popper

The Logic of Scientific
Discovery



Mantere and Ketokivi (2013)

Reasoning in Organization Science. Academy of Management Review, 38(1), 70-89.

Labels aside, a closer look at research practice reveals that researchers across research traditions use all three forms of reasoning. It is hardly surprising to observe that we all make inferences to a case (use deduction), inferences to generalizations (use induction), and inferences to explanations (use abduction). Thus, using reasoning types as labels to describe entire research designs is misleading. Instead, differences between research approaches, whatever they may be, are found not in the types of reasoning used but, rather, in how the three reasoning types are used in conjunction with one another. (p. 76)

Mantere and Ketokivi (2013)

Discussion Questions

- What the hell are they talking about?
 - What mode(s) of reasoning do you tend to rely on in your current work?
 - What concrete practices did you draw from this paper, if any?

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35, Fall 2010, No. 3, 75-89
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REASONING IN ORGANIZATION SCIENCE

SAKU MANTTIEN

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Prescriptive regarding organization-scientific methodology are typically founded on the researcher's ability to approach problem retinuity. In a critical examination of the use of organizational science in strategic planning, Indrahan et al. argue that organization researchers must take into account their role as "gatekeepers" who disseminate or filter research results. They propose that the capacity of the researcher to disseminate or filter research results is the key characteristic of the capacity of the researcher. To this end, we construct a typology of descriptive, prescriptive, and normative criteria for the evaluation of organization-scientific research practice. This typology addresses both cognitive limits and the diversity of research approaches in organization research. We argue that the typology can be used to evaluate the capacity of researchers to filter negative elements into the formulation and evaluation of scientific reasoning and arguments.

The objectives of scholarly reasoning is to testify new knowledge in a scientific field. The knowledge that is produced in this way, however, has been approached from many angles, ranging from epistemological considerations to the application of specific methodological procedures (Stetzer, 1993 to 2003). In this article we will focus on the epistemological debate within the social sciences (Kemmerling, 2002; McEvily, 2002; Stetzer, 1993). We will argue that the extent to which a research method may have an impact is proportional to its theoretical, methodological, or social-psychological characteristics. The theoretical premise is crucial, because the general understanding of the problem determines the direction of the explanation. A surprisingly limited literature (McEvily, 2002) and no prescriptions can be found in empirical research methodology that would indicate how to proceed when the researcher does not know exactly what he is looking for. This lack of knowledge when formulating the problem is the principal reason why the researcher cannot apply his cognitive resources in the execution of the research, which makes the resultant prescriptions unusually unsophisticated.

We thank three anonymous reviewers for their helpful, critical, and constructive evaluations of the manuscript. We are also grateful to James editor, Alan Hirsch for his thoughtful and insightful comments on the manuscript. We thank the discussor of this article, Bill McEachern, whose thoughtful and helpful comments on our work on metacognition over the years have played a crucial role in the revision of the article.

Nosek and Errington (2020)

What is replication? PLOS Biology: 1-8.

To be a replication, 2 things must be true: outcomes consistent with a prior claim would increase confidence in the claim, and outcomes inconsistent with a prior claim would decrease confidence in the claim. The symmetry promotes replication as a mechanism for confronting prior claims with new evidence. Therefore, declaring that a study is a replication is a theoretical commitment. Replication provides the opportunity to test whether existing theories, hypotheses, or models are able to predict outcomes that have not yet been observed. Successful replications increase confidence in those models; unsuccessful replications decrease confidence and spur theoretical innovation to improve or discard the model. (p. 2)

Nosek and Errington (2020)

Discussion Questions

- Do you agree with their definition of replication?
 - What are the benefits and drawbacks of applying such a definition?
 - How does this fit in with the replication crisis?

PLOS BIOLOGY

PERSPECTIVE

What is replication?

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Abstract

Credibility of scientific claims is established with evidence for their replicability using new data. According to common understanding, replication is required to study products and determine whether the same findings hold.

This definition is intuitive, easy to apply, and useful. However, the present article argues that a more refined definition is needed to address the challenges of replicability as it applies to research in social sciences.

This definition reduces emphasis on operational characteristics and focuses on the purpose of replication: to advance theory by confirming existing understanding while identifying potential sources of error or bias. This perspective clarifies what constitutes proper testing of a research claim.

Successful replication provides evidence of generalizability across the conditions of the original study. Unsuccessful replication provides evidence of the validity of the findings. The two types of replication are distinct, yet complementary. Defining replication as a combination of current theoretical expectations clarifies its importance, meaning, and generative role in scientific progress.



OPEN ACCESS

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Editor's Note

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Keywords: replication, credibility, evidence, hypothesis testing, social sciences, theory, validity

HIGHLIGHT <https://doi.org/10.1371/journal.pbio.3000001.g001>

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Introduction <https://doi.org/10.1371/journal.pbio.3000001.t001>

Rynes and Bartunek (2017)

Evidence-Based Management: Foundations, Development, Controversies and Future.

Management academics have long noted a large gap between academic research and managerial practice. [...] Some have viewed the causes of the gap as lying primarily with academic researchers, who are characterized (perhaps caricatured) as having become overspecialized, self-referential, obsessed with theory, excessively mathematical, jargonladen, unconcerned about practical problems, and dismissive of practitioners [...] Others have focused on practitioners, who are sometimes characterized or caricatured as research phobic, anti-intellectual, susceptible to unproven fads and fashions... (p. 236)

Rynes and Bartunek (2017)

Discussion Questions

- Are you familiar with evidence-based practice from your current work?
- In your PhD studies so far, have you seen a concerted effort to move towards evidence-based management?
- Where might you fit in helping to advance evidence-based management? How might you do about doing it?



Evidence-Based Management: Foundations, Development, Controversies and Future
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²Graduate School of Management, Boston College, Chestnut Hill, Massachusetts (USA) www.brown.edu

Abstract <http://dx.doi.org/10.1080/10621024.2017.1270001>
First published online in *Business in Society* on 17 January 2017.
The Annual Review of Organizational Psychology and
Behavior, Vol. 6, 2017, pp. 1–36
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Keywords evidence-based management, evidence-based practice, research-practice gap, academic-practitioner relationship, spillover effects

Abstract We review the recent development of evidence-based management (EBM) to begin to bridge gaps between research and practice, describe leading academic studies, and the emergence of evidence-based management (EBM) as a discipline. We also highlight the need for more detailed studies advancing its use. We then review categories of articles that comprise the EBM agenda: advocacy studies, theory or processes, teaching materials, and case studies. Finally, we discuss how EBM can include political, epistemological, and methodological issues directly pertinent to its development. We conclude by discussing the research base on which EBM depends. Our suggestions for future research emphasize the need for more studies of the implementation of EBM and its impact on performance, and the need for more studies of the use of EBM in real settings. Topics of particular interest include research co-created by academics and practitioners, process and outcome studies of EBM implementation, and studies of the spillover effects of EBM across domains. We also call for broader types of academic sources (like) that have previously been excluded by the organization sciences.

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Summative lecture

Preamble

What follows is my personal, idiosyncratic synthesis of the pieces that we have read to date. To be clear, many interpretations are possible due to these articles' collective:

- richness
- overlap
- distinctive features

Furthermore, there are multiple plausible criteria to judge quality research and a lack of universal consensus given the multiplicity of aims and epistemological orientations.

This is not to say anything goes; rather, I am trying to highlight the limits of my knowledge and my unique lens that necessarily abstracts away features from complex topics.

Some key principles of research design

- Falsifiability
- Defensibility
- Applicability
- Replicability

Falsifiability

- Falsifiability provides a basis for to use abductive reasoning to augment pure deductive reasoning. The latter is true a priori if the premises and statements are valid. Thus, pure deduction can transform our understanding of the system, but cannot generate truth from outside the established system - this must be uncovered by other means.

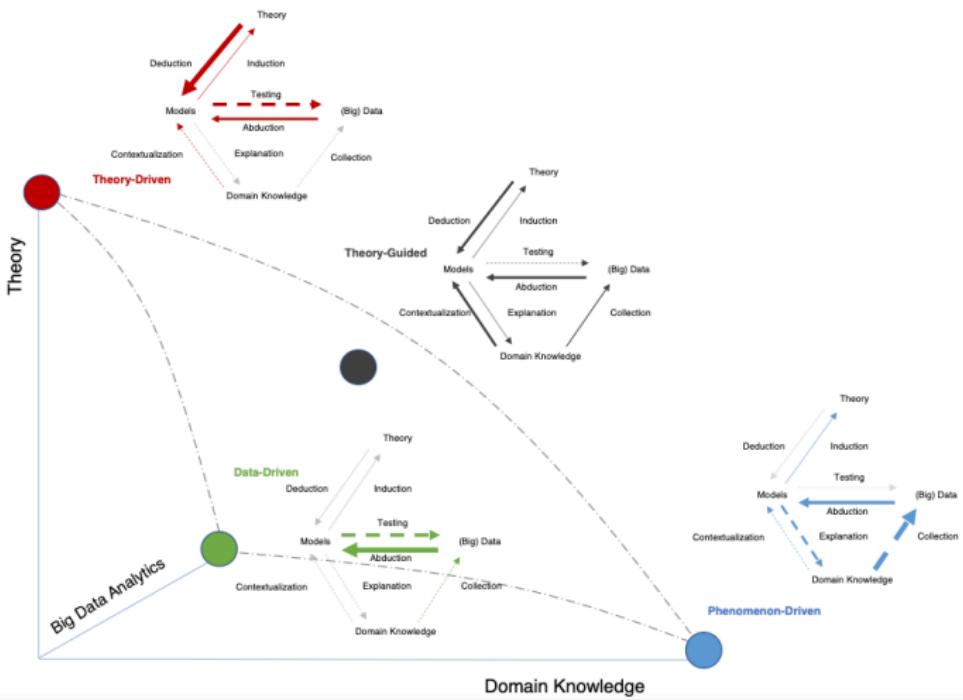
Falsifiability

My proposal is based upon an asymmetry between verifiability and falsifiability; an asymmetry which results from the logical form of universal statements. For these are never derivable from singular statements, but can be contradicted by singular statements. - Popper (2002, 19)

Defensibility

- If the logic of our arguments are defensible and the evidentiary basis is sound, we are better able to act upon the conclusions with confidence.
- We rely on multiple modes of inference to assert our claims credibility - my coauthors and I argue that the relative importance of each depends on the type of research design employed and intended contribution.

Defensibility



Defensibility

One way to map out the defensibility of an argument is with a Toulmin diagram:



Figure 3: An example Toulmin diagram

Applicability

But our arguments and conclusions, even if correct, are irrelevant if they aren't applicable to real-world problems.

There are two corollaries to this:

- We should pick problems that actually matter, not just intellectual curiosities.
- We should not be hamstrung by our ability to tackle important problems.

Applicability

I was recently at a brown-bag seminar where a pair of management colleagues were seeking advice about a preliminary research idea. It took just a few minutes for us all to agree that their research question was fascinating. It addressed an extremely interesting issue that both academics and practicing managers would like to learn more about. The only problem: the presenters had no theory. So, we spent the entire session going through our collective mental catalogues of theories that might be invoked so that the project could proceed and have some prospect of publication. People were mentioning theories I'd never heard of. We became frenzied, nearly desperate: "Good god, there must be a theory out there that we can latch onto." - Hambrick (2007)

Replicability

- Finally, the structure of our empirical base presumes that the research was performed in good order and that the findings are replicable within their domain of applicability.

Replicability

[A]n accumulation of evidence that points to empirical regularities provides us with a much broader and more generalized understanding of the world. Such empirical regularities are known as 'stylized facts'. - Helfat (2007)

The relative importance of each principle

We can consider four basic “classes” of research in management:

- basic disciplinary research (primary studies in AER, AJS)
- applied research conducted in a management context (primary studies in AMJ)
- data-driven decision making derived from primary studies (systematic reviews in IJMR, JOM)
- practitioner-focused outlets (articles in HBR, CMR, popular press)

Where might, for example, applicability be more highly valued?
Falsifiability?

Other thoughts: Useful types of thinking when conducting research

- Skeptical thinking
- Bayesian thinking
- Strategic thinking
- First principles thinking

Skeptical thinking

*"Science depends on organized skepticism, that is, on continual, methodical doubting. Few of us doubt our own conclusions, so science embraces its skeptical approach by rewarding those who doubt someone else's." Neil deGrasse Tyson, *Origins: Fourteen Billion Years of Cosmic Evolution**

Skeptical thinking

MasterClass

Neil deGrasse Tyson

—

Teaches Scientific Thinking
and Communication



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2:43

A promotional image for a MasterClass course featuring Neil deGrasse Tyson. The image is framed by a dark border. In the top left corner, the "MasterClass" logo is visible. The central focus is a portrait of Neil deGrasse Tyson, a Black man with short, dark hair and a mustache, wearing a dark suit jacket over a blue button-down shirt. To the left of his portrait, the title "Neil deGrasse Tyson" is displayed in large, white, sans-serif font, with a horizontal line separating it from the subtitle. Below the title, the subtitle "Teaches Scientific Thinking and Communication" is written in a smaller, white, sans-serif font. In the bottom right corner of the image frame, there is a small black box containing the number "2:43", likely indicating the duration of the video segment.

Bayesian thinking

Implicit in the discussions above is a question of degree of belief.

- Nosek and Errington talk about how replication increases or decreases our degree of belief.
- Popper uses the asymmetry of verification to achieve binary outcome of disconfirmed evidence.
- But couldn't we be more subtle in our treatment of beliefs?
 - Indeed, we can through the application of Bayesian logic and Bayes' Rule.
 - I will not be teaching you the statistical methods that follow from this, but you can find them.

Bayesian thinking

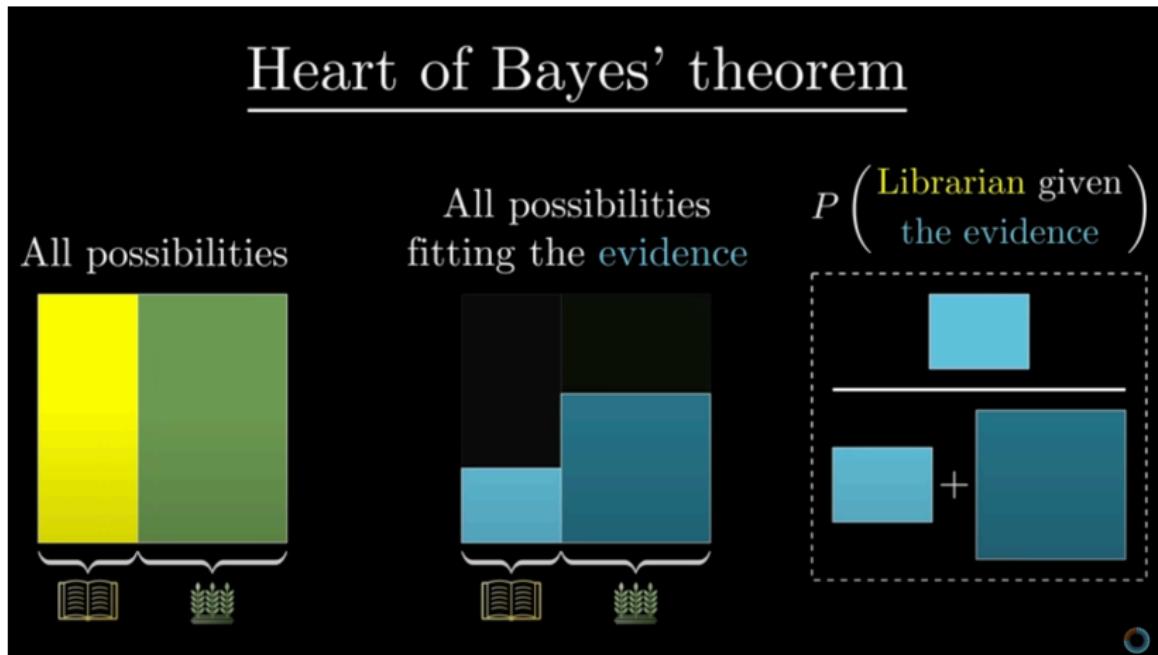


Figure 5: A Primer on Bayesian Thinking

Strategic thinking

Finally, it helps to be strategic when thinking about designing and evaluating research. By this I mean thinking that embraces three characteristics:

- Rigor
- Complexity
- Ambiguity

Strategic thinking

- Rigor
 - Comprehensive – focusing attention on both the forest (a research program) and the trees (discrete methods or studies)
 - Adaptive – balancing multiple goals and knowing what progress can be made against one or more of them simultaneously
 - Inferential – moving from what is known to what can be reasonably inferred

Strategic thinking

- Complexity
 - Dynamics – accounting for first and second order effects that are material across actors, choices, and time
 - Allocentricity – outcomes often jointly determined by internal and external factors, often other parties or agents

Strategic thinking

■ Ambiguity

- Unstable – non-linear shifts across time and situations may limit generalizability and heighten the role of context
- Unforeseeable – many research projects are a full reinforcement learning problem, learning while doing is necessary to reveal the evolving state of the world

Strategic thinking

Thinking Strategically

*The Art of Reasoning
for a Rapidly Changing World*

BIG THINK +



0.03 / 6.20 • Strategic thinking >



First principles thinking

A first principle is a basic assumption that cannot be deduced any further. Over two thousand years ago, Aristotle defined a first principle as “the first basis from which a thing is known.” First principles thinking is a fancy way of saying “think like a scientist.” Scientists don’t assume anything. They start with questions like, What are we absolutely sure is true? What has been proven? - James Clear

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Research II: Problems

- 1 Huff, A. S. (1999). Writing for Scholarly Publication. SAGE. [Ch. 1]
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Next class

Research II: Problems

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