INTRODUCTION TO DEVELOPING & APPRAISING EVIDENCE

UFOR 200
WEEK SIX SEMINAR

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OBSERVATIONAL VS. EXPERIMENTAL STUDIES

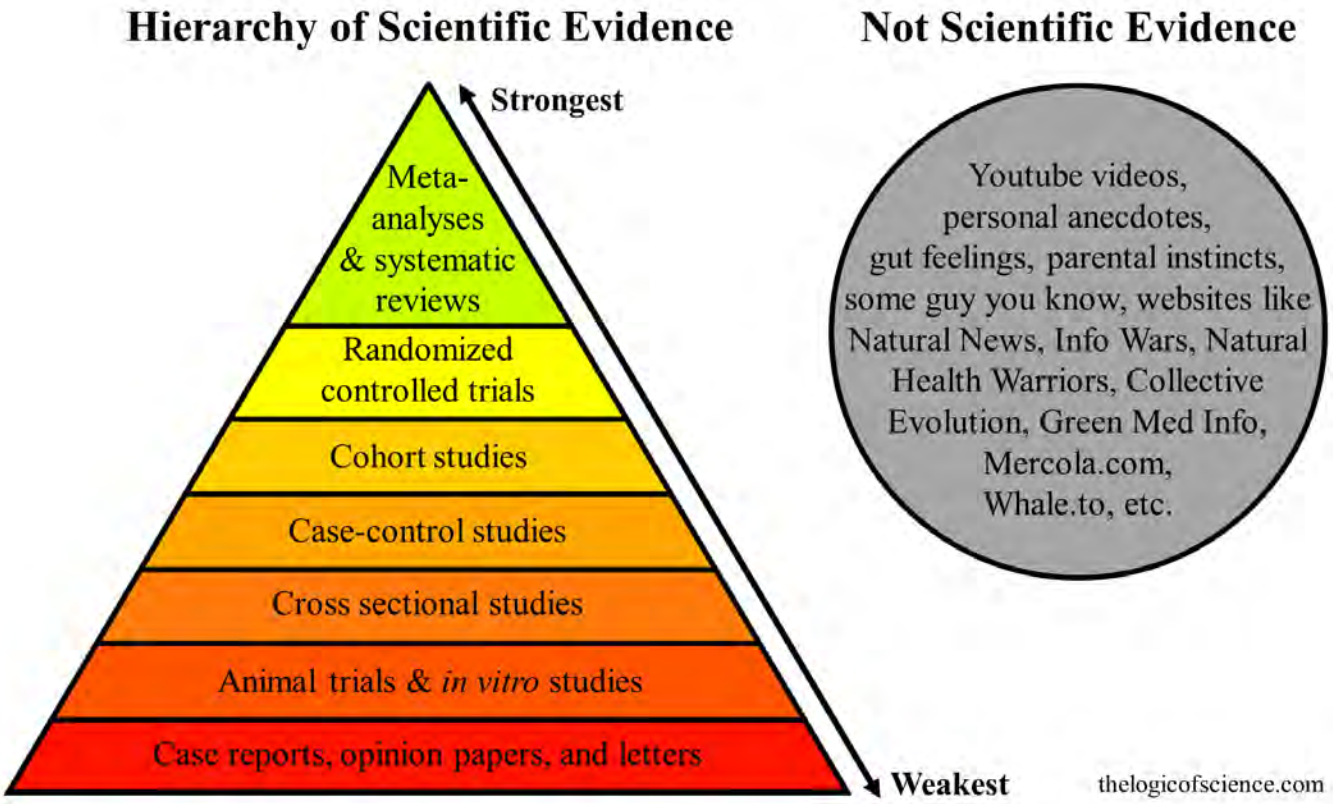
Observational

- Individuals or populations are observed and data is collected for analysis
- Most common approach in public health
- Ethical and practical concerns may guide this choice

Experimental

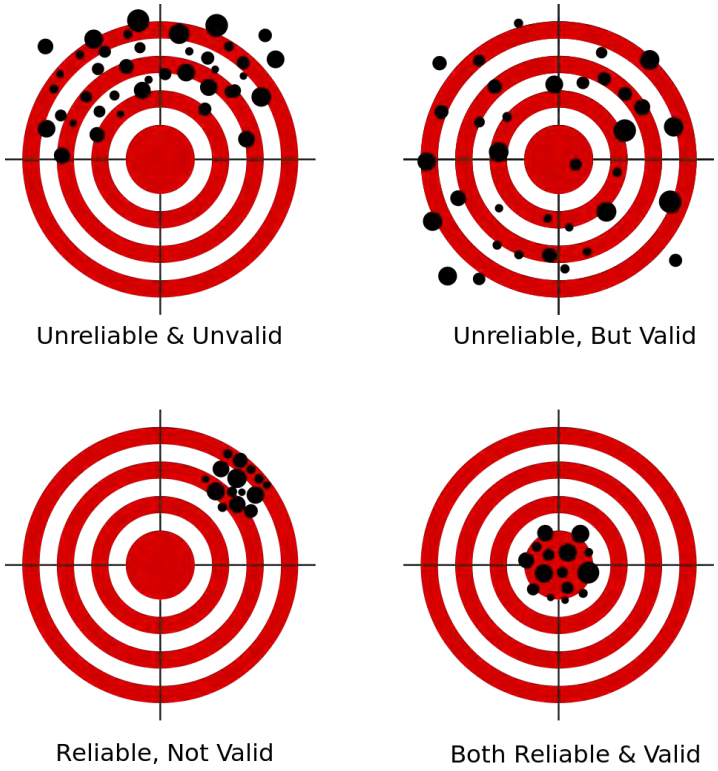
- Researchers create an artificial condition or intervene in a population
- Only way to conclusively determine causation
- “Natural experiments” take advantage of events and variation

HIERARCHY OF EVIDENCE



RELIABILITY, VALIDITY & GENERALIZABILITY

- *Reliability* is the consistency with which a result is replicated
- *Validity* is the degree to which a result approximates the truth
- *Generalizability* is the extent to which the results of an individual study are representative of a different or broader population



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METHODS & TOOLS FOR APPRAISING QUALITY

- Ask basic questions:
  1. What question is it answering?
  2. Where was it published?
  3. Who funded it?
  4. Is it up to date?
- Cochrane “Risk of Bias” tool
- EQUATOR reporting guidelines (CONSORT, STROBE, PRISMA)

Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk.	Quote: “patients were randomly allocated.” Comment: Probably done, since earlier reports from the same investigators clearly describe use of random sequences (Cartwright 1980).
Allocation concealment (selection bias)	High risk.	Quote: “...using a table of random numbers.” Comment: Probably not done.
Blinding of participants and personnel (performance bias)	Low risk.	Quote: “double blind, double dummy”; “High and low dose tablets or capsules were indistinguishable in all aspects of their outward appearance. For each drug an identically matched placebo was available (the success of blinding was evaluated by examining the drugs before distribution).” Comment: Probably done.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk.	Quote: “double blind”. Comment: Probably done.
Blinding of outcome assessment (detection bias) (Mortality)	Low risk.	Obtained from medical records; review authors do not believe this will introduce bias.
Incomplete outcome data addressed (attrition bias) (Short-term outcomes (2-6 weeks))	High risk.	4 weeks: 17/110 missing from intervention group (9 due to 'lack of efficacy'); 7/113 missing from control group (2 due to 'lack of efficacy').
Incomplete outcome data addressed (attrition bias) (Longer-term outcomes (>6 weeks))	High risk.	12 weeks: 31/110 missing from intervention group; 18/113 missing from control group. Reasons differ across groups.
Selective reporting (reporting bias)	High risk.	Three rating scales for cognition listed in Methods, but only one (with statistically significant results) is reported.

QUANTITATIVE VS. QUALITATIVE APPROACHES

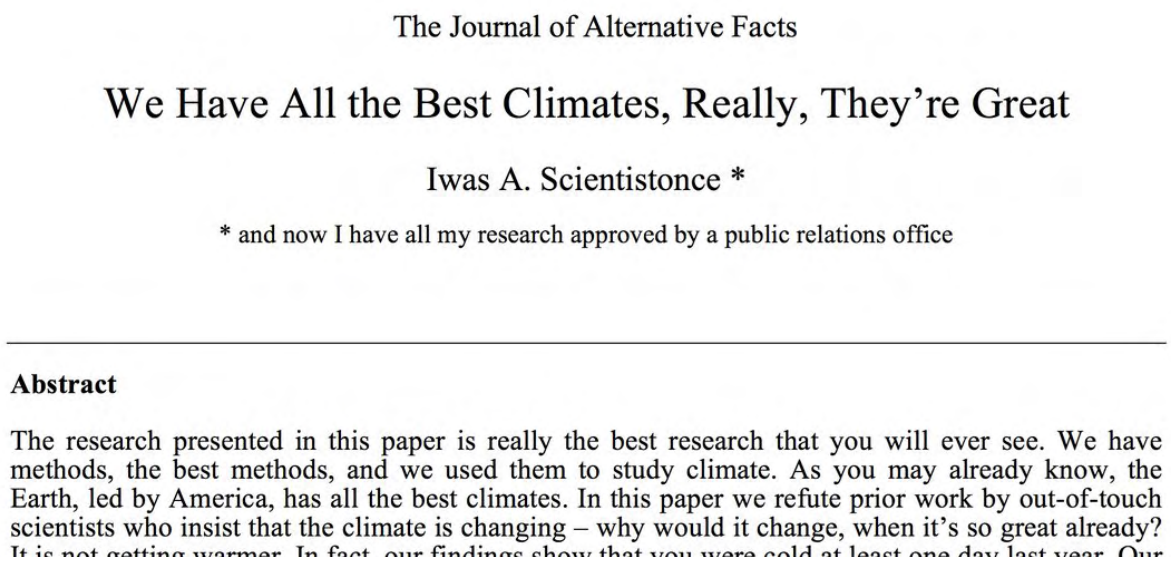
Quantitative

- Data can be measured and expressed numerically
- Analysis relies on statistical tests (assessed via p-value)
- Optimal for biological measurements, large groups, and comparisons with other studies

Qualitative

- Stories, pictures, and perspectives are data
- Analysis is emergent and narrative; often guided by theory
- Time-intensive (limiting size), but offers unique insights and texture

SUMMARY



The Journal of Alternative Facts

We Have All the Best Climates, Really, They're Great

Iwas A. Scientistonce *

* and now I have all my research approved by a public relations office

Abstract

The research presented in this paper is really the best research that you will ever see. We have methods, the best methods, and we used them to study climate. As you may already know, the Earth, led by America, has all the best climates. In this paper we refute prior work by out-of-touch scientists who insist that the climate is changing – why would it change, when it's so great already? It is not getting warmer. In fact, our findings show that you were cold at least one day last year. Our

- Consider your source(s)
- Ensure question/ approach suit your needs
- Read closely and critically
- Be open, but skeptical!