

Evaluating Published Research: What to Look For

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How do you *know* something?

- agreement reality
- experiential reality
- causal and probabilistic reasoning
- differentiating between prediction and understanding

What do you do when you want to know something?

- appeal to tradition
- appeal to authority
- rely on intuition or logic
- do your own research – **you are here**



True or False?

- } Given the mental strains between their roles as mother and employee, working mothers experience more mental illness than non-working mothers
- } Most old people have no interest in, or capacity for, sexual relations
- } Most poor people prefer to live off government welfare
- } Revolutions are more likely to occur when conditions remain very bad as opposed to when previously bad conditions are rapidly improving.

All of the above are false



Sources of Error

- inaccurate observation
- overgeneralization
- selective observation
- made-up information
- illogical reasoning
- ego involvement
- premature closure
- mystification

How can you know what to believe?

- external criteria
- internal criteria



Observation - questions to ask

- } What was left out of the observation?
- } Are the interpretations acceptable?
- } What effect of the instrument?
- } Who did the observation?
- } What was the context?
- } Did the observer control for possible distortions?



Communication - questions to ask

- Is there anything missing from the report? Is it important?
- Are you comfortable with the researchers' assumptions?
- What is the effect of the language used in the article?
- Are purposeful distortions a reality?



Interpretation - questions to ask

- How have your biases and assumptions colored your interpretation of this article?
- How much influence should the credibility of the author/journal have on your judgment of the article?
- What is your “mental set” when you read this article?




Bias - systematic error

Where does bias come from?

- researchers
- subjects
- research design

Questions to Ask

- What are the potential sources of bias?
 - How did the researcher control/compensate?
 - Which potential biases might affect observations/results?
 - Are there any undetected biases?
- 

Noise - unsystematic error

Where does noise come from?

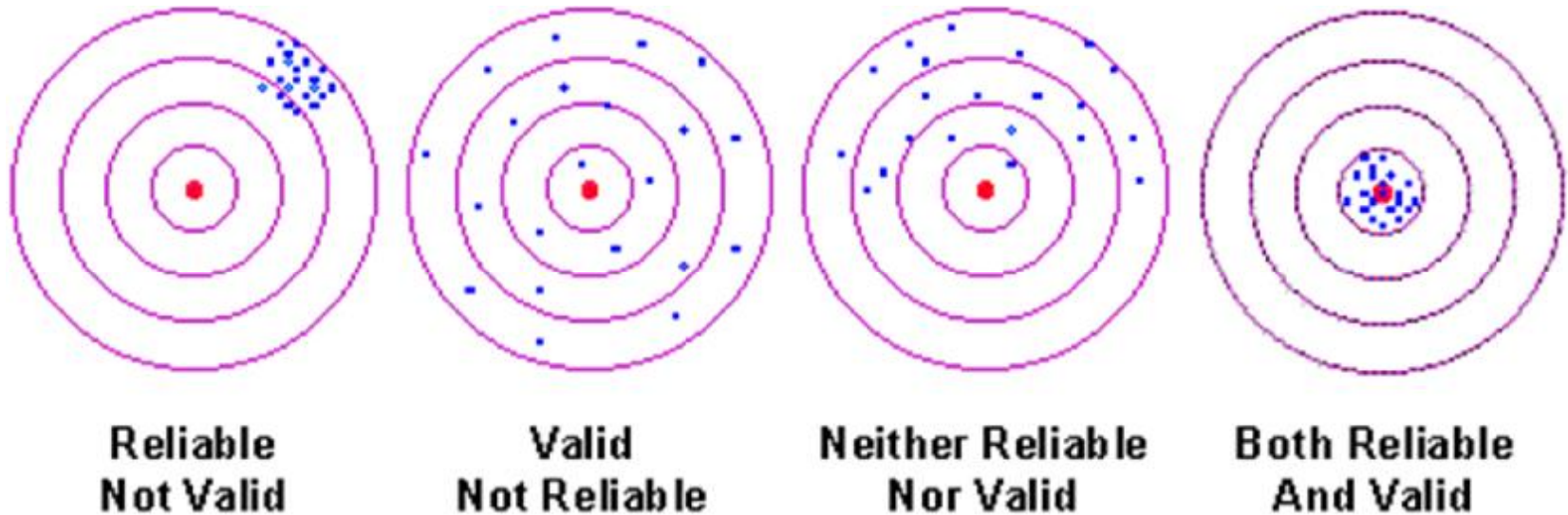
- differences among people
- fuzzy criteria
- the “mixing process”

Questions to Ask

- What are the potential sources of noise?
- How did the researcher minimize noise?
- What range of results is possible?
- Was statistical inference used?



Noise and Reliability



Source: Trochim, 1999

Subject Matter - questions to ask

- Is the problem stated in a solvable way?
- Is the research question open and non-biasing?
- How important/relevant is the problem?
- Does the research answer the question?
- Are definitions misused as explanations, circular, or inadequately specific?
- Are conceptual definitions operationalized?
- Is there a review of related research? What is included and what is missing?
- Does the review support the propositions?
- Do the findings fit the review?



Measurement - questions to ask

- Does the precision of the instrument match the goals/procedures of the researcher?
- Is some measure of reliability given?
- Is this reliability sufficient for you?
- What reliability measure was used?
- What is really being measured?
- Are the measures sufficiently valid?
- How many dimensions are being measured at once?




Description - Summarizing the Results

Elements of description

- summaries of results
- verbal descriptions
- averages
- measures of dispersion
- percentages

Questions to Ask

- Is there a summary, and is it fair?
 - What important results were left out?
 - What type of averaging or data summarizing was used?
 - How were percentages used?
- 

Relationships

Issues in Relationships

- “third” variables
- crossing levels of analysis/measurement
- freedom to vary
- causality

Questions to Ask

- Was the analysis based on a single variable?
- Are important “third” variables missing?
- Is the level of relationship measurement the same as level of hypothesis/conclusion?
- Were variables indeed free to vary?
- Were causal relationships stated or implied?
If so, are they defensible?



Control - Rival Explanations

Sources of Rival Explanations

- time - maturation/history
- effects of measurement
- effects of the subject group
- regression to the mean
- dropout bias

Questions to Ask

- Are there rival explanations for the findings?
- What steps were used to control for rivals?
- Was a control group used? Quality?
- How much of the proposed cause is needed to produce the effect?



Inference - are the results real?

- Are the data any good?
- Was statistical inference needed?
- Were the statistics correctly developed?
- Could the findings have been random?
(statistical significance)
- How important are the findings?



Generality - *to whom do the results apply?*

- Are the results factually accurate?
- What are the dimensions over which you need to generalize the findings?
- Did anything happen to the people during the study that made them less representative?
- Are the results incorrectly extrapolated to a larger or different population?
- If confidence intervals are used, are the range and levels acceptable for your use?





“Are you just pissing and moaning, or can you verify what you’re saying with data?”

Sources:

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Trochim, W. (1999). The research methods knowledge base. Ithaca, NY: Cornell University

