Measurement:
Concepts in Practice

Department of Government
London School of Economics and Political Science

1   Observation and Description

2   Measurement

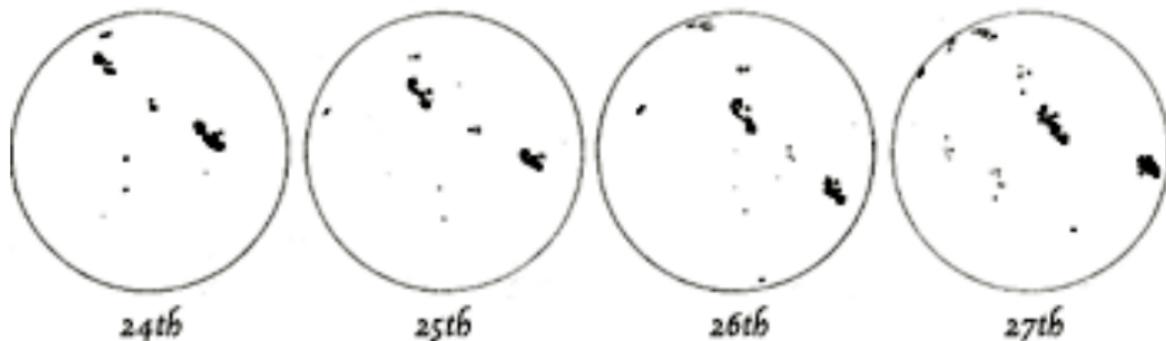3   Assessing Measurement Quality

Goals of Descriptive Research

1 To *answer* research questions

2 To *generate* research questions

Goals of Descriptive Research

1. To *answer* research questions

2. To *generate* research questions

3. To do both of these, *iteratively*

Ex.: Galileo's Drawings of Sunspots

Sunspots drawn by Galileo, June 1612

24th   25th   26th   27th

Source: Public Domain, NASA

Ex.: Broad Street Cholera

- 1854 outbreak of cholera in London
  - Around Broad Street (Soho)
  - 616 eventual deaths

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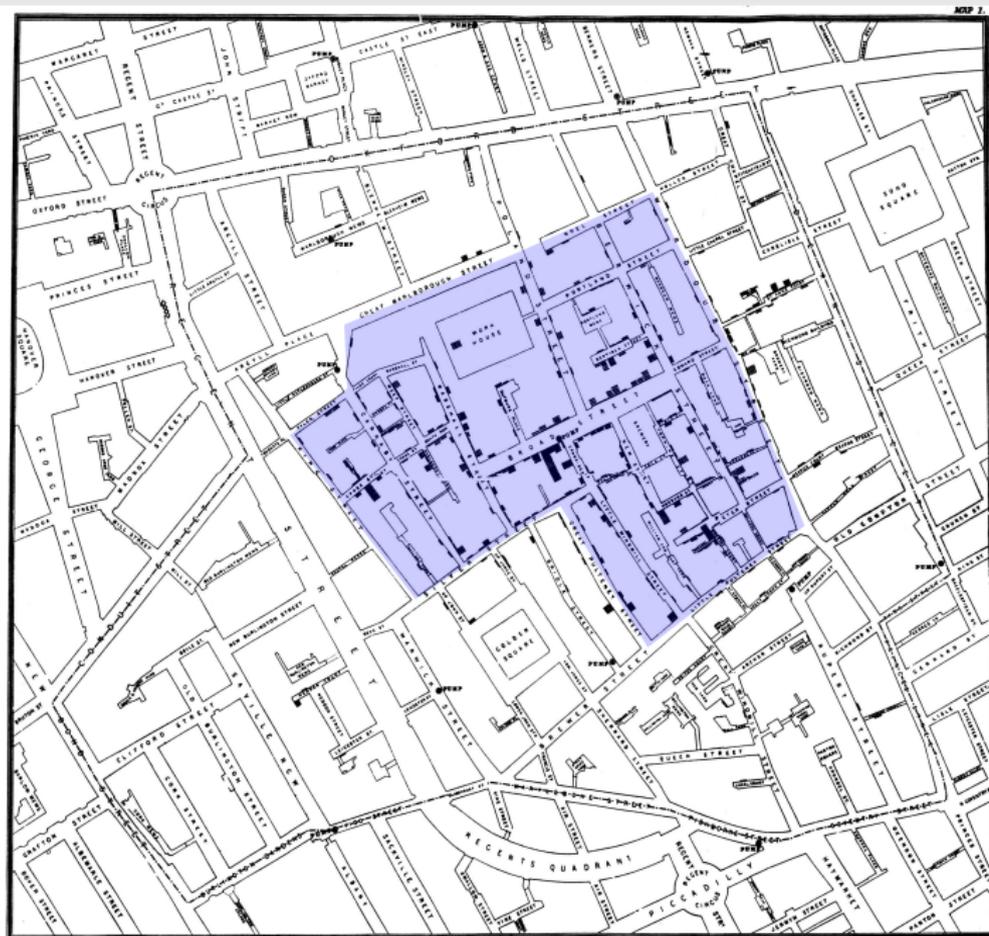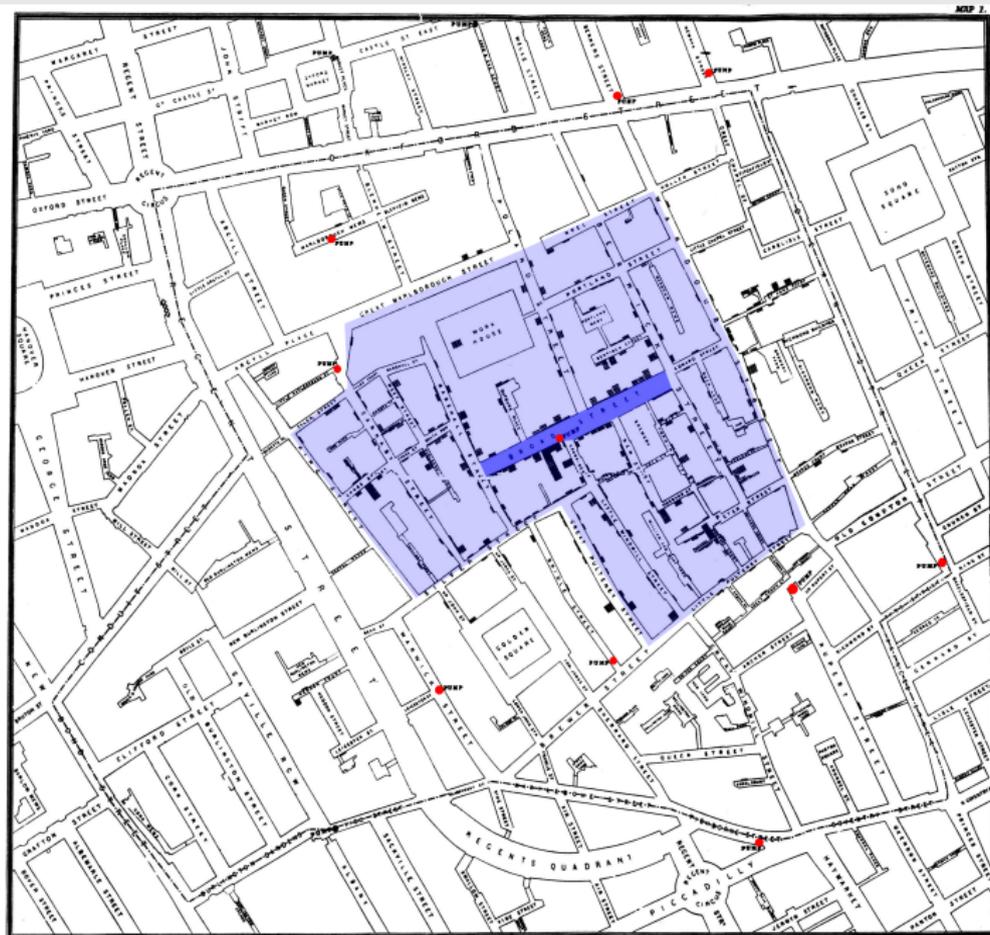
Ex.: Broad Street Cholera

- 1854 outbreak of cholera in London
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- Causal RQ: What causes transmission of cholera?

- Descriptive RQ: Who exactly is contracting cholera?

MAP 1.

SCALE 30 INCHES TO A MILE.
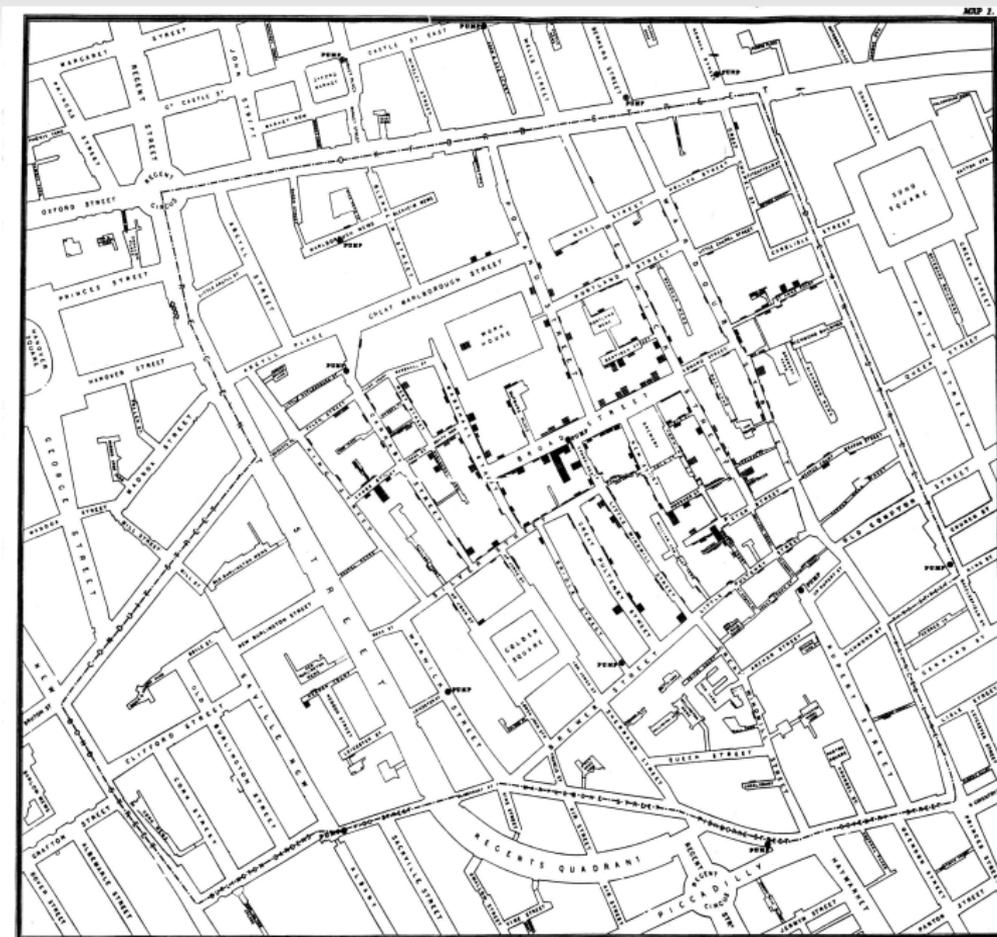
Snow Addresses by Neighborhood
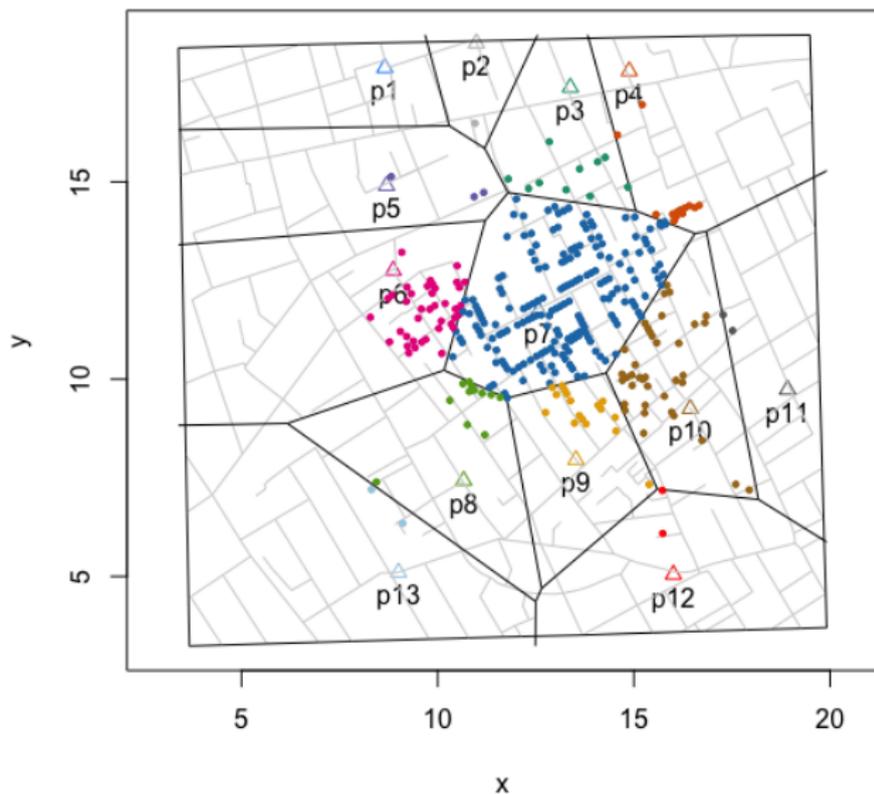
Observed Walking Paths
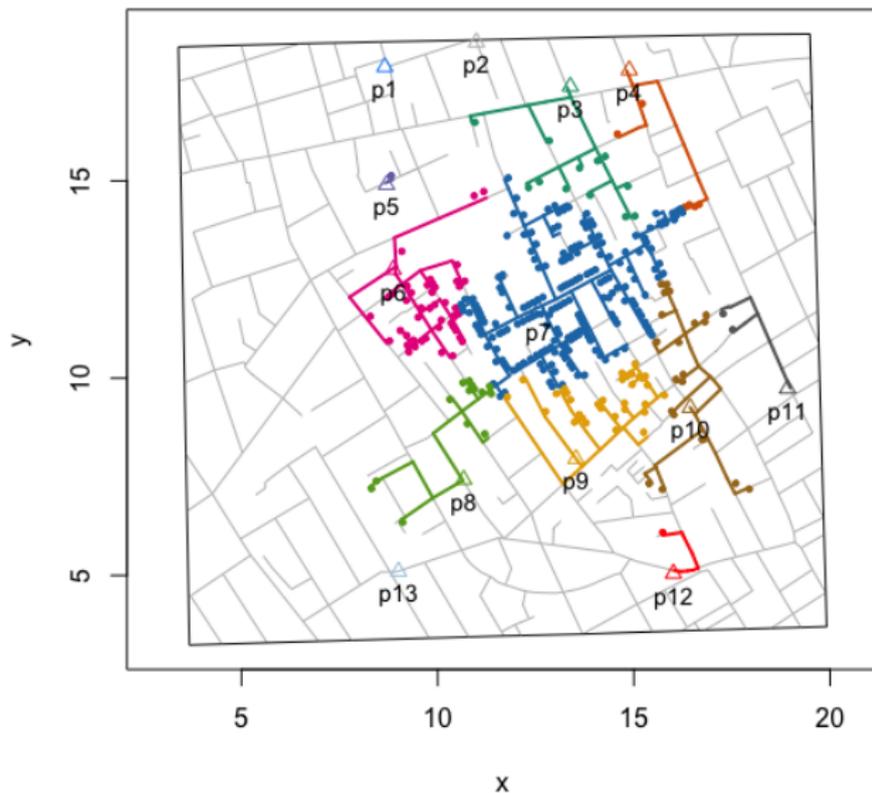
Ex.: Gapminder Data
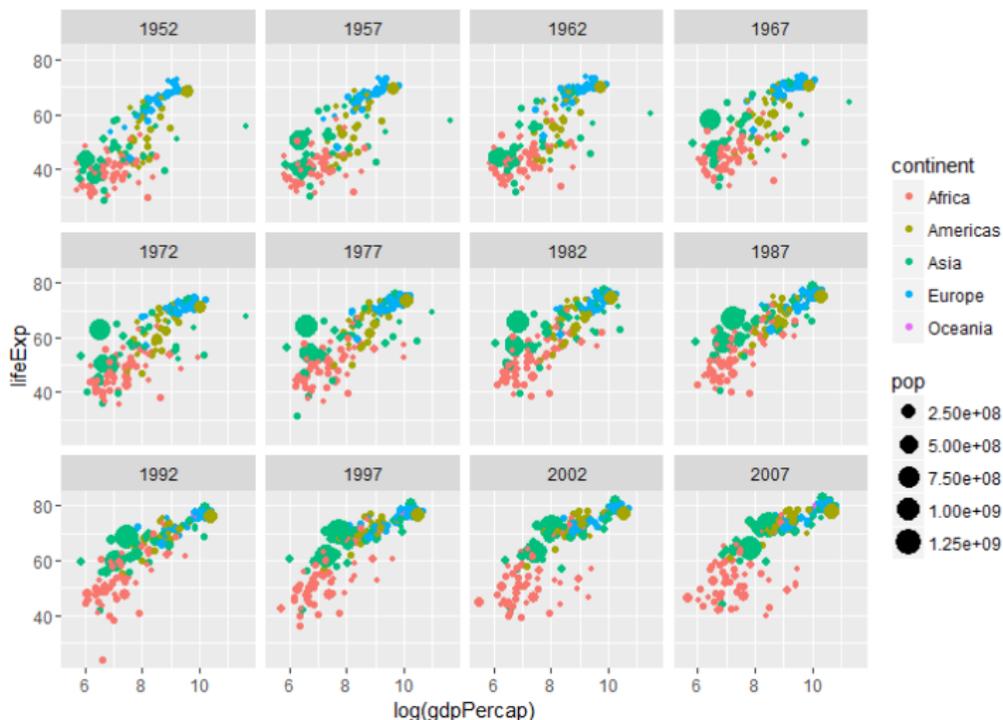
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    - "dataset observations" (DSOs)
- A clear *unit of analysis*
- Multiple cases/units
- Quantitative and qualitative *measures*
- Calculation of summary *statistics*

Dataset Observation (DSO)

"a score for a case on a variable"

State	Year	Var1	Var2
Afghanistan	2016	1	TRUE
Afghanistan	2015	1	TRUE
Algeria	2016	1	FALSE
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- Sometimes hear about "qualitative" and "quantitative" research
  - This divide is illusory because all research is qualitative and some involves quantitative data description

- Return to this in a few weeks

An Example: Opinion

- *Opinion* is a summary evaluation of a particular object

- Only one necessary feature: evaluation/favorability

- How do we measure this?

Operationalization

1. Measure features
   - Level of measurement
   - How to score each case on each feature
   - Be concrete

2. Aggregate feature measurements
   - Sum? Average? AND logical?
   - Level of measurement of final scale
   - Range of possible values
   - Justify against criticisms/alternatives

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  to observe those concepts and encode
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- The definition of *variable*:
  - A dimension that describes an
    observation
  - Or, the *operationalization* of a concept

Some definitions!

- Variable: A dimension that describes an observation

- Operationalization: the process of deciding on measures for concepts

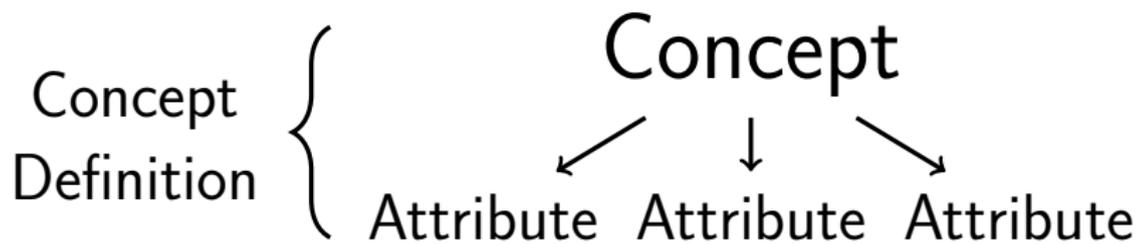- Coding: Assigning a score for a variable to an observation

Some definitions!

- Variable: A dimension that describes an observation

- Operationalization: the process of deciding on measures for concepts

- Coding: Assigning a score for a variable to an observation
    - Manual or hand coding
    - Automated coding

Operationalization II

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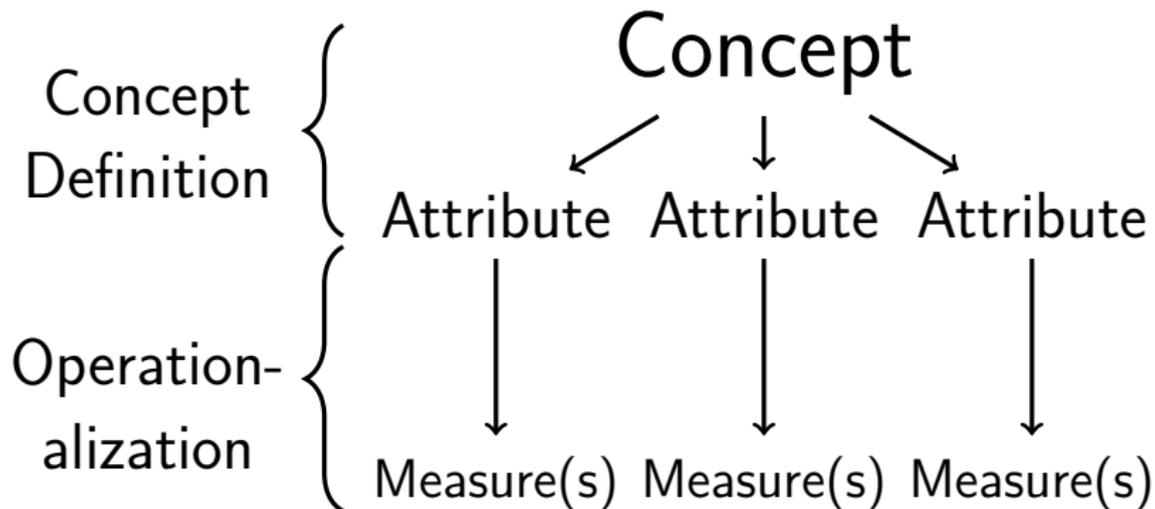
Operationalization III

Definition

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Example: Democracy

Democracy
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$\rightarrow$?

How do we operationalize this concept?

Questions?

Once we have an operationalization, *coding* turns observations of attributes into DSOs

Case	Measure1	Measure2	Measure3
UK	?	?	?
France	?	?	?
Germany	?	?	?
Spain	?	?	?
. . .			

Types of Measures

1. Categorical
   - Binary

2. Ordinal

   Quantitative

   Qualitative

3. Interval

Note: *Ratio* scale measures are interval measures with a
non-arbitrary zero value

Activity

- Concept: Democracy

- Attribute: Free and fair elections

- Measure:
  1. Categorical
  2. Ordinal
  3. Numeric

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Once we have measured *variables* for *observations*, we can conduct *analysis*!

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Once we have measured *variables* for *observations*, we can conduct *analysis*!

And once we have analysis, we can *draw inferences* and *make evidence-based claims*.

Questions?

Assessing Measurement Quality

1. Conceptual clarity

2. Construct validity
   - Convergent validity
   - Divergent validity

3. Accuracy and precision

Assessing Measures I

- *Conceptual clarity* is about knowing what we want to measure

- Sloppy concepts make for bad measures
  - Ambiguity
  - Vagueness

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- Revise concept definition as needed

Assessing Measures II

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- Construct validity is **high** if a variable is a measure of the concept we care about

- Construct validity is **low** if a variable is actually a measure of something else

Example: Polity IV[1]

Institutionalized Democracy: Democracy is conceived as three essential, interdependent elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Other aspects of plural democracy, such as the rule of law, systems of checks and balances, freedom of the press, and so on are means to, or specific manifestations of, these general principles. We do not include coded data on civil liberties.

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Authority Coding   Scale Weight

Competitiveness of Executive Recruitment (XRCOMP):
(3) Election   +2
(2) Transitional   +1

Openness of Executive Recruitment (XROPEN):
only if XRCOMP is Election (3) or Transitional (2)
(3) Dual/election   +1
(4) Election   +1

Constraint on Chief Executive (XCONST):
(7) Executive parity or subordination   +4
(6) Intermediate category   +3
(5) Substantial limitations   +2
(4) Intermediate category   +1

Competitiveness of Political Participation (PARCOMP):
(5) Competitive   +3
(4) Transitional   +2
(3) Factional   +1

Assessing Construct Validity

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- Look for:
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- For example, the multi-trait, multi-method matrix

Using Multiple Indicators

- Choose the "best" one

- Apply an AND operator
  - Must have all indicators to be coded 1
  - Treat indicators as "ordinal" in Gerring's sense

- Scale the indicators (e.g., sum or mean)

Assessing Measures III

Assessing Measures III

- Accuracy

Accurate

Synonyms: true, correct, unbiased, valid

Image Source: Wikimedia, Public Domain
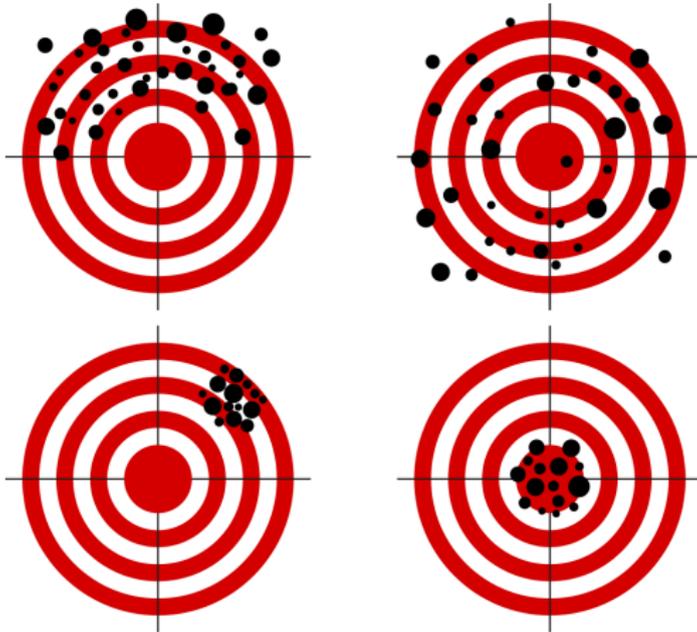
Assessing Measures III

- Accuracy

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- Accuracy

- Precision

Precise

Synonyms: certain, exact, specific, low variance

Image Source: Wikimedia, Nevit Dilmen

Assessing Measures III

- Accuracy

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Assessing Measures III

- Accuracy

- Precision

- Reliability

Reliable

Synonyms: dependable, replicable, repeatable, consistent

Typically used in the context of:

- Multiple measures used in a scale
- Multiple scores at different times
- Multiple individuals coding using one method

Questions?

Key Points

1 We want to make claims about *concepts*

2 But we only observe and can only analyse observed, measured *variables*

3 So our task as scientists is to:
   - Link the concepts we care about to observable phenomena
   - Draw out theoretical implications from measures