

Survey Research Part 1

Fundamentals of Survey Research

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Objectives

- Define the goals of a survey
- Basics of survey “error”
- Basics of survey design

Talking about surveys – philosophy of science



- Objectivism: Truth exists regardless of our perceptions

- Constructivism: Truth is our perceptions, interpretations, and social interactions

Talking about survey methods – A warning

- Multiple levels of discussion
- Words may have different meaning depending on level
 - Ex. reliability
 - Item vs Scale



What you can do with surveys?

- Honestly?
 - Anything that involves measurement that is not “independently confirmable”;
 - i.e., *self-report*
- Works for qualitative and quantitative research such as:
 - Measurement development
 - Cross-sectional/longitudinal
 - Quasi-experimental
 - Mixed methods
 - Experimental

Why NOT use a survey?

- Short answer?
 - Can you even do a survey “correctly”?
 - Part art as well as science
 - Asking people questions...
 - People lie, misremember, forget, misread, misunderstand, accidentally lie, not know and answer anyway...etc.
 - Statistical/Methodological issues
 - Various forms of bias to consider

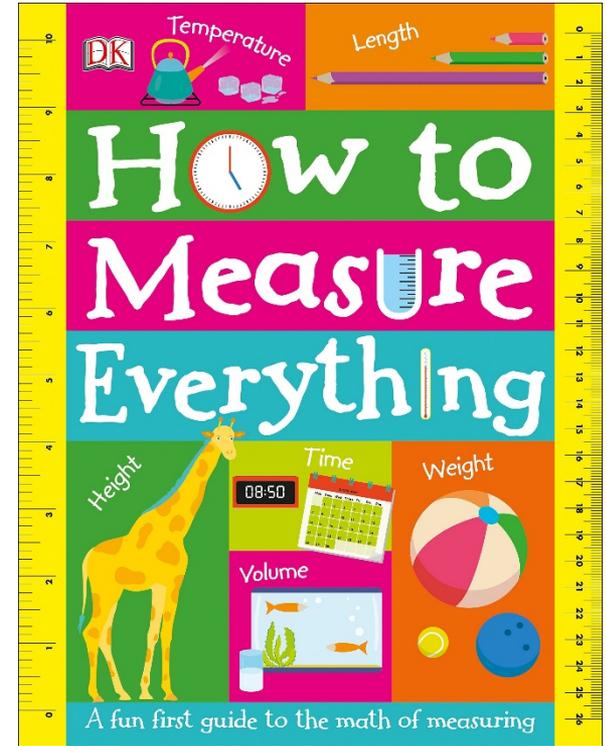
Why use a survey?

- Short answer?
 - **If done correctly** – surveys can provide
 - Accurate descriptions of a population
 - Estimates of parameters and distributions
 - Estimates without the whole population
 - Information quickly and efficiently
 - Generally cheaper



Goals of a survey

- Collect information to answer a question
- Could be a question about *anything*
 - Past/present/future
 - Events/behaviors
 - Self/others
 - People/things/processes
 - Evaluations/attitudes



Two core survey parts

- Measurement
 - What are you measuring?
 - Are you measuring what you think you're measuring?
- Representation
 - Who are you measuring?
 - Are you measuring who you think you're measuring?

A survey “done correctly”

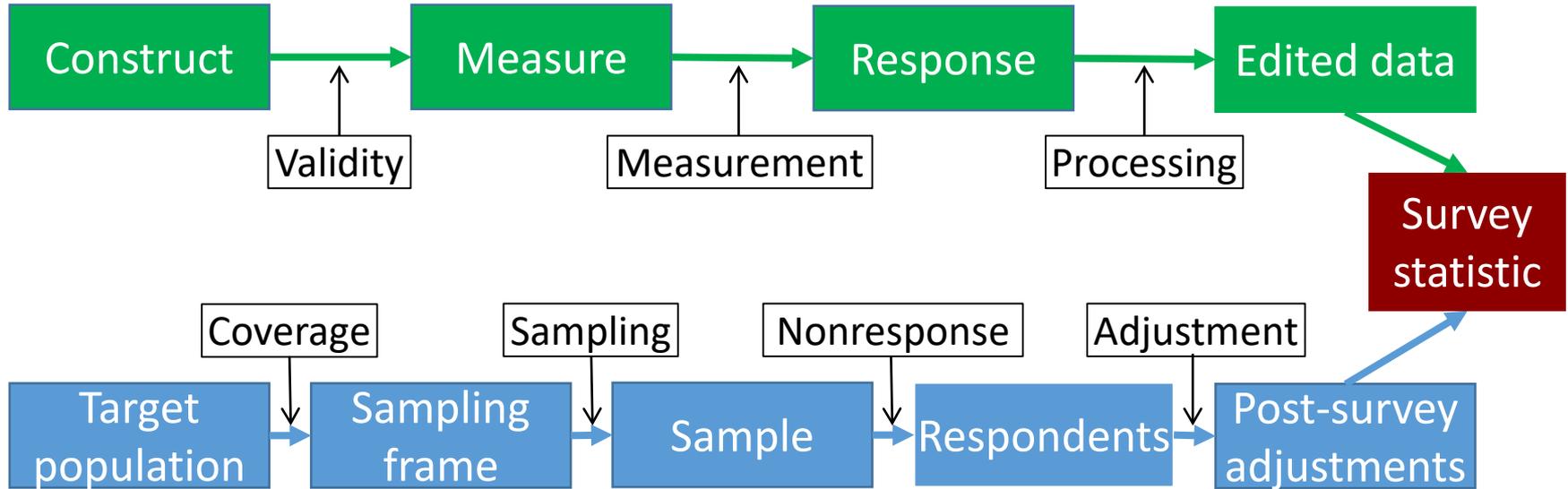
- The core parts are also where the errors happen
 - Measurement
 - Validity/reliability, processing
 - Representation
 - Convergence, sampling, nonresponse, adjustment

Basics of Survey



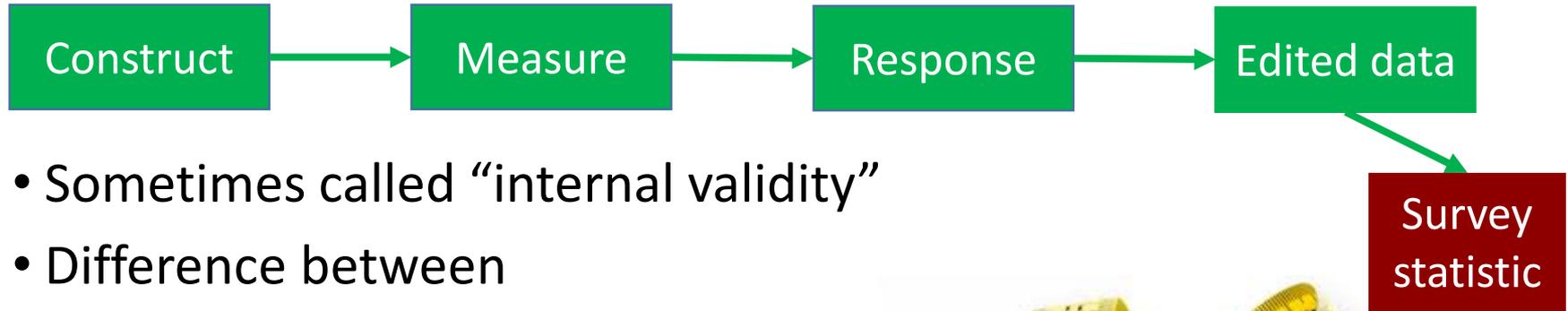
Opportunities for error

Measurement (internal) error



Representation (external) error

Measurement (internal) error

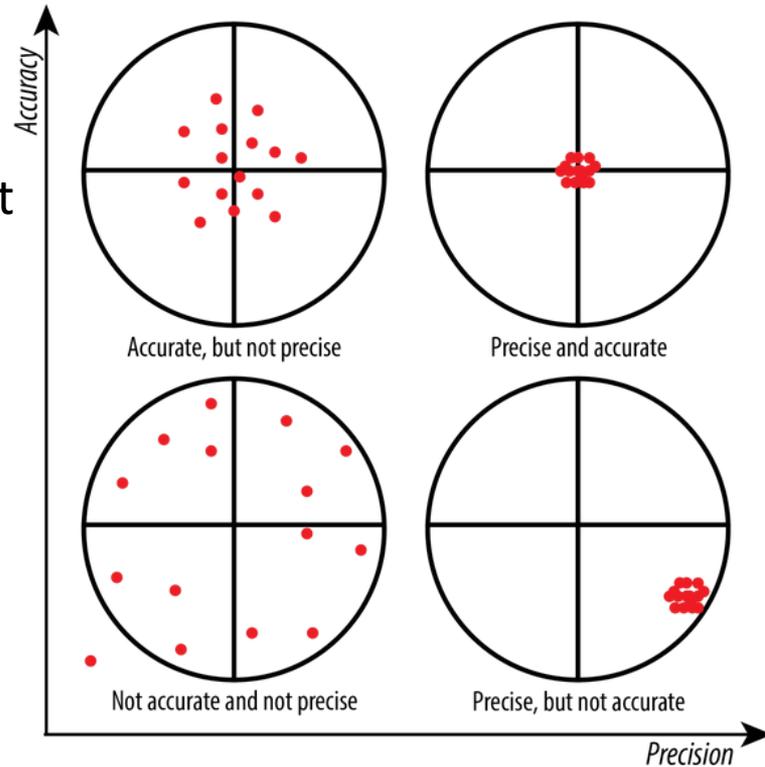


- Sometimes called “internal validity”
- Difference between
 - What the “true” value is vs the value found in the survey?
 - What was measured vs what was intended?



Measurement (internal) error

- Validity (Accuracy) –
 - Whether an assessment measures what it is supposed to measure.
- Reliability (Precision) –
 - Measurement yields consistent scores.
- Processing —
 - Response recording includes interpreting respondent intent.



Validity vs Reliability

- Validity –
 - A matter of degree
 - An item or scale are not valid, the data collected can be
- Reliability –
 - Item(s) – does the measure come out the “same”?
 - Scale – multiple items repeatedly assessing the “same” thing
 - Testing *scale* reliability = Cronbach’s α



Side thing: Cronbach's α

- Cronbach's α : internal consistency of latent variables
- What is “good”?
 - Rules of thumb are variable
 - Generally? Think the three bears
 - Not too low and not too high
 - $.70 > \alpha > .95$

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Types of validity (not all of 'em...)

- Construct
- Convergent
- Divergent
- Criterion
- Predictive
- Content
- Nomological
- Experimental
- Face
- Incremental
- Structural
- Local
- Generalization
- Postdictive

Causes of measurement (internal) error

- Instrument sensitivity
- Primacy effect
- Recency effect
- Social desirability effect
- Attrition
- Unclear directions
- Ambiguity in questions
- Inadequate time limits
- Inappropriate level of difficulty
- Identifiable pattern of answers
- Administration/scoring errors

Representation (external) error



- Sometimes called “external validity”
- Generalizability
 - Do the results extend to other groups, settings, or conditions beyond those in the study



Representation (external) error

- Coverage (target vs. frame populations) —
 - some within sampling frame ineligible
 - some in the target population will not be captured.
- Sampling —
 - randomness is crucial to sampling.
- Nonresponse —
 - What to do with missingness.
- Adjustments —
 - Methods for generalizability (weight, stratify, etc.)

Gathering respondents

- Primary considerations
 - Theory (goals)
 - Generalization ***from*** whom
 - Generalization ***to*** whom
 - Avoid generalization altogether?
 - Practical
 - Money – get the data
 - Time – to do the measuring
 - Access – get the respondents

Causes of representation (external) error

- Non-response bias
- Selection-treatment interaction
- Treatment effects
- Low response rates
- Treatment effects
 - Location
 - Setting
 - Implementation
 - History
 - Placebo
 - Diffusion
 - Hawthorne

Basics of Survey Design



Survey design – Things to think on

- Primary way avoid error
 - Both measurement and representation
- Pros vs cons
 - Really accuracy vs cost
- Three considerations
 - What to measure
 - Who to measure
 - How to measure

What to measure – Vocab

- Item = single question
 - Generally, a single column in raw data set (check all that apply ruins this...)
- Scale = some # of items used to measure a variable
 - Can be combined however you want (sum, mean, other)
- Variable = concept you want to use/measure/observe

What to measure – Items and Scales

- Examples

- Item

- Demographics (age, race, year in school etc.)
 - Direct (confirmable) questions (year Dx, year Tx, cost, etc.)

- Scale

- Concepts (ratings, evaluations, preferences, attitudes, feelings)

What to measure – Items

- Item/question considerations
 - Question type
 - Likert, semantic differential, uni- vs bipolar, open vs closed
 - Question wording
 - Length, reading level
 - Question answers
 - Response options, objective vs subjective

What to measure – Scales

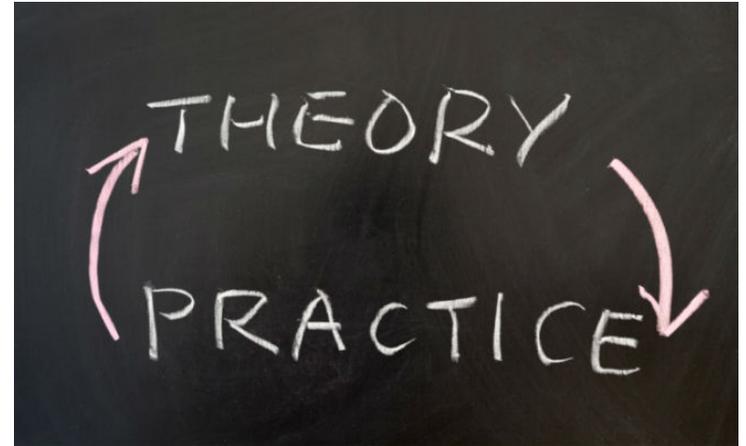
- Why ask multiple questions about one thing?
 - Think triangulation
- Two options
 - Use extant materials
 - Pro: easier
 - Con: maybe what you want to measure doesn't exist
 - Create your own
 - Pro: you will measure what you mean to
 - Con: requires lots of steps to be “robust”/“valid”

Who to measure

- Respondents
 - Ideally – the whole population of interest
 - Practically – a sample of the population of interest
 - Efficiently – a sample of the population of interest **you can get**
- How to pick?
 - Define the ideal, determine the practically available sample, determine what can efficiently be done.

Who to measure – Theory

- Who you are interested in?
- Is there a comparison of interest?
- Variety of information you want?
- Amount of information you want?



Who to measure – Reality

- Economic and logistical concerns
 - Time it takes
 - Money it takes
 - Participation it takes



How to measure

- Which method(s) you use dictate the kinds of data you may get
- Respondents have resources that you are using

How to measure – Gathering responses

- Myriad of options with different pros and cons
 - In-person
 - Most expensive, but ensure quality of data (less missing)
 - Phone
 - Moderately expensive and some may not have phones (also which #?) but ensure data quality
 - Mail
 - Relatively cheap, but there are response rate and data quality issues
 - Web
 - Cheapest and most flexible but response rate and data quality issues

How to measure – “Tailored” designs

- Mixed mode data collection
 - Some combo of multiple methods
 - Covers weakness of each other
 - Limits the variety that some of them provide
 - Ex. Thermometer questions

How to measure – respondent considerations

- All methods formats have respondent considerations
 - Comprehension and retrieval
 - Time burden
 - Cognitive burden
- Respondents have a “health bar”

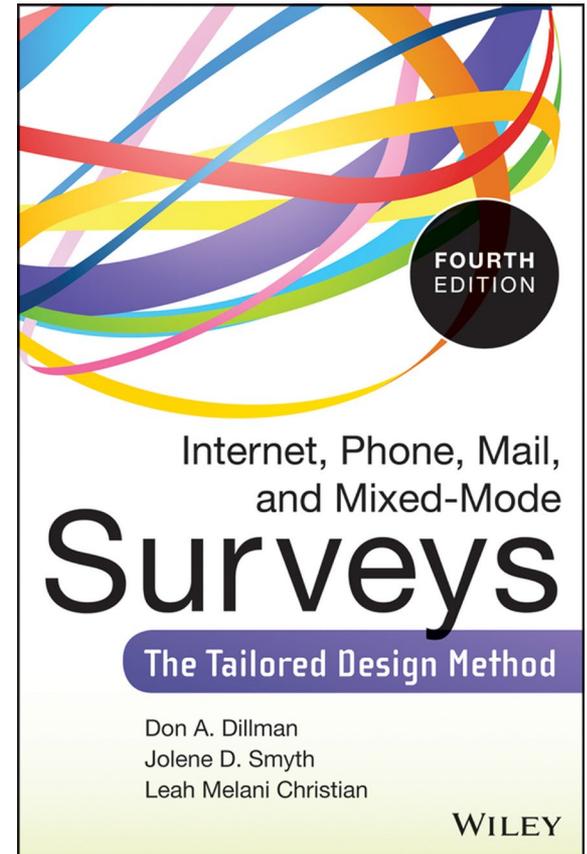


How to measure – survey set up

- Order matters!
 - Health bar (some questions are easier than others)
 - Participants pay attention to questions
- Question format
 - The font, consistency, and tidiness of the survey

Recommended reading?

- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.



Questions?