Chapter 9: Measurements

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What is Measurement

[T]he process by which we describe and ascribe meaning to the key facts, concepts, or other phenomena that we are investigating. At its core, measurement is about defining one's terms in as clear and precise a way as possible" (pp.222-223)

What are examples of times in which precision is especially important?

What are the power implications inherent in the measurement aspect of research?

What Gets Measured

Pretty much anything you want...

Break down concepts into pieces and think of how to quantify them: Good v. Bad / positive v. Negative

How can you measure things like social class, happiness, gender identity?

The power to set those goal posts is the power to define aspects of people.

Observational Terms: Things we can see with the naked eye

Indirect Observables: More subtle and complex entities that we cannot directly see with the naked eye. Must rely on inferences, causality, reporting of others, etc.

Construct: Abstractions. Cannot be directly nor indirectly observed. Socially determined. We define constructs based on what we can observe And the value we apply to those observations.

Measurement in Quant and Qual Research

QUANTITATIVE RESEARCH

More specific

Predetermined before work with participants begins

Researcher more removed from process on personal level

QUALITATIVE RESEARCH

Begin with working definition and measurement structure that changes and grows through interactions with participants

Participants are experts of their experiences and researchers are measurement instruments.

Measurement Process in Social Science Research

Determine concept of research

Define Key Terms

Decide how to measure / observe them

Determine elements of measurement to decide how data will be collected

eLements can be straight forward (ie: height, age) or multidimensional (ie: job satisfaction, wellbeing

Conceptualization

Quant Conceptualizations
Goal to have as specific and refined a definition as possible before beginning data collection
Break definition down into most clear and least abstract points (ie: specifying time in society being investigated; social norms = social roles, behaviors, meaning)

Qual Conceptualizations
Participants are experts, so their experience and understanding is more important than your definition
Consult previous research to come up with working definition as starting point for measurement process
Definitions shaped by what participants share
Researchers collect and interpret data to answer question

(First Step in Measurement Process)
Image or notion conjured up when you think of a certain term
You decide the definition and that guides your research
Definitions can vary depending on the person, time, context
Power in creating a definition and research based on that definition
Anchor your definition in those of the past, or create a new definition that challenges dominant conceptions

Operationalization

clues that point to the concept being investigated

Analogy - indicators are to a concept as symptoms are to a diagnosis

Indicator

Indicators for being tired could include yawning, rubbing eyes, not having slept in x amount of hours, etc.

already well-established empirical data and theoretical frameworks can be helpful in gathering the right indicators, but taking on a critical lens is important Because indicators can change over time (and some that haven't may need to)

It can be challenging to come up with all of the appropriate indicators to encompass a concept, but not taking this step seriously could result in distorted results with people being unnecessarily included or left out

Operationalization: Measurements

No measure is exact, but some measures are better than others

Quant Research: problem with results signifies issue with measurement, not with researchers themselves

Qual Research: Researcher is measurement instrument, deeply involved in data analysis process. Data provided by participants are interpreted by researchers to determine concept.In order to accurately reflect what participants share, researchers must acknowledge biases and build connections.

Is our measurement approach good?

Do findings mean what we think they mean?

Do they mean anything at all?

Measurement Quality in Quantitative Research

Reliability

Consistency

Memory presents reliability issue, so make recall tasks as straightforward and simple as possible.

Self reporting of participants as well as researcher observations leave room for errors in reliability

Reliable measures have similar results even if test is given multiple times

interrator reliability - degree to which researchers agree on what is being observed

Validity

Accuracy

Content validity -Ensure that measurement accurately gets at meaning of concept/measure measures what it intends to measure (ie: is going to the gym a valid measure of a healthy lifestyle?)

Predictive/Concurrent validity - Measure predicts things it is supposed to predict (ie: your measure of healthy lifestyle should predict a clean medical record)

Convergent validity - similar scores on two different measures measuring the same thing

Discriminate validity -opposite of concurrent validity. No statistical correlation between your measure and a measure for some unrelated concept

Measurement Quality in Qualitative Research

Trustworthiness

Truth value of results

Credibility - Qualitative equivalent of validity. Degree of accuracy of results as judged by participants.No such thing as subjective truth,so the goal is to get to a credible dataset.

Dependability - Qualitative equivalent of validity. Questions change over time depending on context, but each change must be documented and justified by researchers, using other researchers for review

Confirm ability - Linking data to specific responses. Different researchers should come up with similar results and each data point should link back to a specific response in an audit.

Authenticity:

Ability to capture multiple perspectives and values of all participants

Making changes to systems

Fairness

It is typical to get feedback from other qualitative researchers as well as participants to ensure accuracy of results.

Levels of Measurement

- Nominal Level
  - You can categorize your data by labelling them in mutually exclusive groups, but there is no order between the categories.
- Ordinal Level
  - You can categorize and rank your data in an order, but you cannot say anything about the intervals between the rankings.
- Interval Level
  - You can categorize, rank, and infer equal intervals between neighboring data points, but there is no true zero point.
- Ratio Level
  - You can categorize, rank, and infer equal intervals between neighboring data points, and there is a true zero point.

Why do levels of measurement matter?

The level at which you measure a variable determines how you can analyze your data.

Variable- any characteristic(s) that can take on different values, such as height, age, species, or exam score.

Independent-is the cause. Its value is independent of other variables in your study.

Dependent-is the effect. Its value depends on changes in the independent variable.

The different levels limit which descriptive statistics you can use to get an overall summary of your data, and which type of inferential statistics you can perform on your data to support or refute your hypothesis.

Gender (Mis) Measurement

Single or binary gender/sex	83
Other	2
Source of gender measure	
Article Text	0
Supplemental File	11
Response from author	81
Gender/sex measure	
Binary	65
Inclusive	15
Othering	5
Did not measure	7

Consequences of Gender Mismeasurement

1. Violates ethical principles of harm avoidance, integrity, and respect.
2. Gender inaccuracy within the data since transgender/non-binary individuals may answer incorrectly or not at all regarding gender identification.
3. Threatens the validity of psychological science.
4. Threatens the internal validity (inconsistency of a causal link) within psychological research. Additional causal variables are not accounted for.

Discussion

What suggestions or recommendations would you propose to better address the mismeasurement of marginalized groups?

Recommendations for a More Gender-inclusive Science

1. Use an inclusive Gender/sex measure.
2. Describe the gender identities of the participants (avoid othering).
3. Clearly describe both the researcher's theoretical conceptualization and their measure of gender/sex in their manuscript or supplemental files.
4. Describe how they treated the data from transgender and nonbinary participants. Specifically, they should indicate whether the data from transgender and nonbinary participants was retained or excluded from their analyses and describe how they coded gender/sex in any analyses using that variable.