




## Agenda

- o What constructs are, and what they aren't.
  - o Constructs vs. variables.
  - o Constructs vs. measures.
  - o Causes vs. effects.
- o Measuring constructs.
  - o Samples of behavior.
  - o Measurement format.
- o Why measuring constructs is hard.
- o The nomological net.
- o Constructs in your course project.

# Constructs

- Once a dirty word in psychology! 
- "That's just a *construct*" – it's not a real thing.
- MacCorquodale & Meehl (1949) made a distinction between *intervening variables* and *hypothetical constructs*.
  - Intervening variables don't imply the existence of anything beyond what is observed.
    - Your heart rate is your heart rate.
  - Hypothetical constructs "have a *cognitive* factual reference in addition to the *empirical data* which constitute their support."

# Constructs

- In other words, a construct is something we have a *theory* about.
  - Implies more than just the response itself.
  - Your heart rate could be part of a construct of anxiety.
- R & M: We infer constructs from *similar behaviors*.
  - Behaviors that have something in common.
- Constructs are *latent* variables.
  - Latent = not observable.
  - Variable = on a continuum.

# Why Constructs?

- o Constructs are inferred from *sets of similar behaviors*.
  - o Definition of “similar” varies!
- o This means that we can use constructs to organize and classify behavior.
  - o Ex: heart rate, sweaty palms, nausea, negative thoughts.
- o Helps us describe and explain more complex behavioral phenomena.
- o It is now socially acceptable (in most disciplines) to use constructs...
  - o ... but you must justify your argument that the construct exists and that you have measured it.


# Measuring Constructs

- o When we measure a construct, we are trying to determine where individuals fall on that latent continuum.
  - o Either relative to one another or to some absolute standard.
  - o This is, by definition, unknown.
  - o So there is no easy way to know whether we’ve measured correctly.
- o Measurement theory = ideas about how we can make this argument.
  - o “If our measurement really reflects a person’s true standing on the latent trait, then we expect to see...”

## Constructs vs. Measures

- We often refer to measures as if they are constructs.
  - Especially when the measures are well-established.
  - Ex: DeVellis' thermometer example; what else?
- Sometimes, the measure and the construct correspond closely enough that this is not an issue.
- Sometimes they don't.
  - We often use crude proxies for what we *really* want to measure.
  - The degree of overlap between our measure and our construct is the degree to which we can make conclusions about the construct.

## Contamination & Deficiency

- By nature, most measures are *deficient* – that is, they don't capture the entirety of the construct.
  - This is one reason we use multiple items/indicators.
- Most measures  are also *contaminated* – behavioral responses are influenced by our construct, but also by other factors.
  - Ex: fatigue, motivation, comprehension, etc.
- This means that all measures are *fallible* and likely to contain *error*.

## Causes & Effects

- o Typically, we view constructs as the **cause** of item responses (and not the other way around).
  - o Ex: I “strongly agree” that “I am sad” **because** I am depressed.
  - o DeVellis defines a scale as items that share a common cause.
  - o Most measurement theory assumes we are concerned with this type of situation.
- o This is different from a set of items that have a common **effect**.
  - o Ex: predicting attrition among college students.
  - o DeVellis calls this a set of indices – **not** a scale.
  - o Why?

## Measuring a Construct

- o R & M: A test is “a standard procedure for obtaining a sample from a specified set of overt behaviors that pertain to a construct under consideration.” (p. 4)
- o Define your construct and identify the behaviors that are relevant to that construct.
- o Develop a procedure to obtain a sample of those behaviors.
- o Administer this procedure under consistent conditions.

## Tests vs. Surveys

- We may not be able to tell by looking at a measure whether it is intended to assess a construct or a variable.
  - Ex: employee surveys
- *Medium* of assessment doesn't tell us much.
  - We can measure variables or constructs with paper & pencil... or more complex means.
- What matters is how we use it... what inferences do we intend to draw?

## 4 Challenges

- 1. Definitions vary.
  - Which behaviors are most relevant? What should & shouldn't be included?
- 2. We have to *sample* behavior – we can't have all of it.
  - What are we sampling from?
  - What's an adequate sample?
  - Save this idea... that the items we have are a sample from a (theoretically) infinite population of items "of the same kind..."

## 4 Challenges, cont.

- o 3. Error affects responses.
  - o How much? What kinds of error?
  - o Error can be random or systematic...
- o 4. Units of measurement
  - o There is no zero point for most psychological constructs.
  - o Measurement is not usually at ratio level.
  - o Why does this matter? Does it?

## The Nomological Net

- o Part of construct definition is determining how behaviors relate to the construct:
  - o R & M call this the *operational* level of definition.
  - o Example:
- o Another important part is determining how the construct relates to other constructs:
  - o This is the *nomothetic* level, or the *nomological net*.
  - o Example:
- o Why do you need to think about this at the definition stage?

## Beginnings of Test Development

- o Clearly articulate the purpose for which the test will be used.
  - o And the population for whom it should be appropriate.
- o Define your construct clearly at the operational and nomothetic levels.
  - o Based on existing research and theory in both cases.
  - o How have others measured this construct, or similar ones?
  - o Avoid pitfalls of previous measures.
- o This is often called the *testing universe*.

## Constructs and You

- o Course project: develop and (begin to) validate a measure of a construct you choose.
  - o **Keep it: (a) simple; (b) applicable to normal adults; (c) amenable to Likert-type measurement.**
  - o Limited to 24 items and no more than 3 factors/dimensions.
- o We'll obtain a convenience sample of data and perform some of the first steps in the validation process.



# First Steps

- Find a group.
  - 3-4 people is ideal.
  - Use the group sign-ups feature in Canvas to tell me who is in your group (by **January 26**, or sooner).
- **Project plan:** Choose a construct, do some background reading, and then turn in a description of your construct and your rationale for studying it.
  - What it is (clear behavioral definition).
  - Why it is important (preliminary **lit review**).
  - Why a **new measure** is needed.
  - Identify SMEs and convergent measures (close constructs in the nomological net!).
  - Due Thursday, **February 1**.

# Questions?

For next time:

A Brief Overview of Validity

Read: DeVellis Chapter 4, SIOP Principles excerpt