Theories & Data

what we're interested in

creative, inferential

unobservable

argued about

theory

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data

rule-based, deductive

observable

agreed upon

"replicable"

what we have to work with

Operational Definition

- *a statement that maps one or more empirical measures onto one or more theoretical constructs*

aka: "linking hypothesis" (in psychophysiology / vision)
or "indexing function" (in electrophysiology)

examples:

"fear of X is defined as how quickly the animal exits a given location when X is introduced"

"fear of X is defined as the number of days the animal must be food-deprived before they will move towards X"

simple, non-mathematical kinds of "Validity"

- Content (Logical) Validity

  - *whether the measure makes sense to experts …*

  - *exclusive and exhaustive measure of the construct*

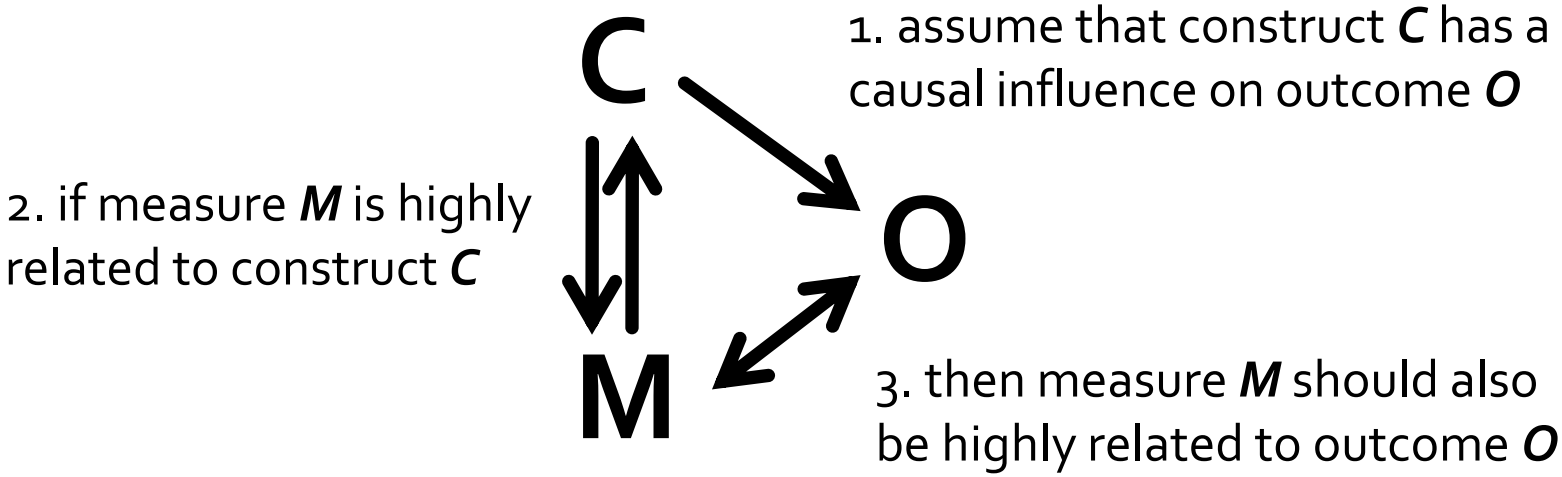
- Face Validity

  - *whether the measure appears (to anyone, even non-experts) to measure the construct*

simple, mathematical kind of "Validity"

- Criterion (Predictive) Validity

  - *whether the measure correlates with "known" <u>consequences</u> of the construct*



Construct Validity – the complicated one

- [OK definition] *the extent to which the measure provides an accurate estimate of the theoretical construct in question*

- problem: what does "accurate" mean (in this case) ?

  mathematically accurate (as in reliability) ?

  - [best definition] *the extent to which the measure provides an exhaustive and selective estimate of the target theoretical construct*

Construct Validity

Content (Logical) Validity

exhaustive

Convergent Validity

correlations

Predictive (Criterion) Validity

exclusive

Discriminant Validity

Construct Validity

- Convergent Validity - exhaustive =

  - the extent to which the measure is correlated with other measures of the same (or similar) underlying construct(s)

- Discriminant Validity - exclusive =

  *- the extent to which the measure is **not** correlated with measures of different (and dissimilar) underlying constructs*