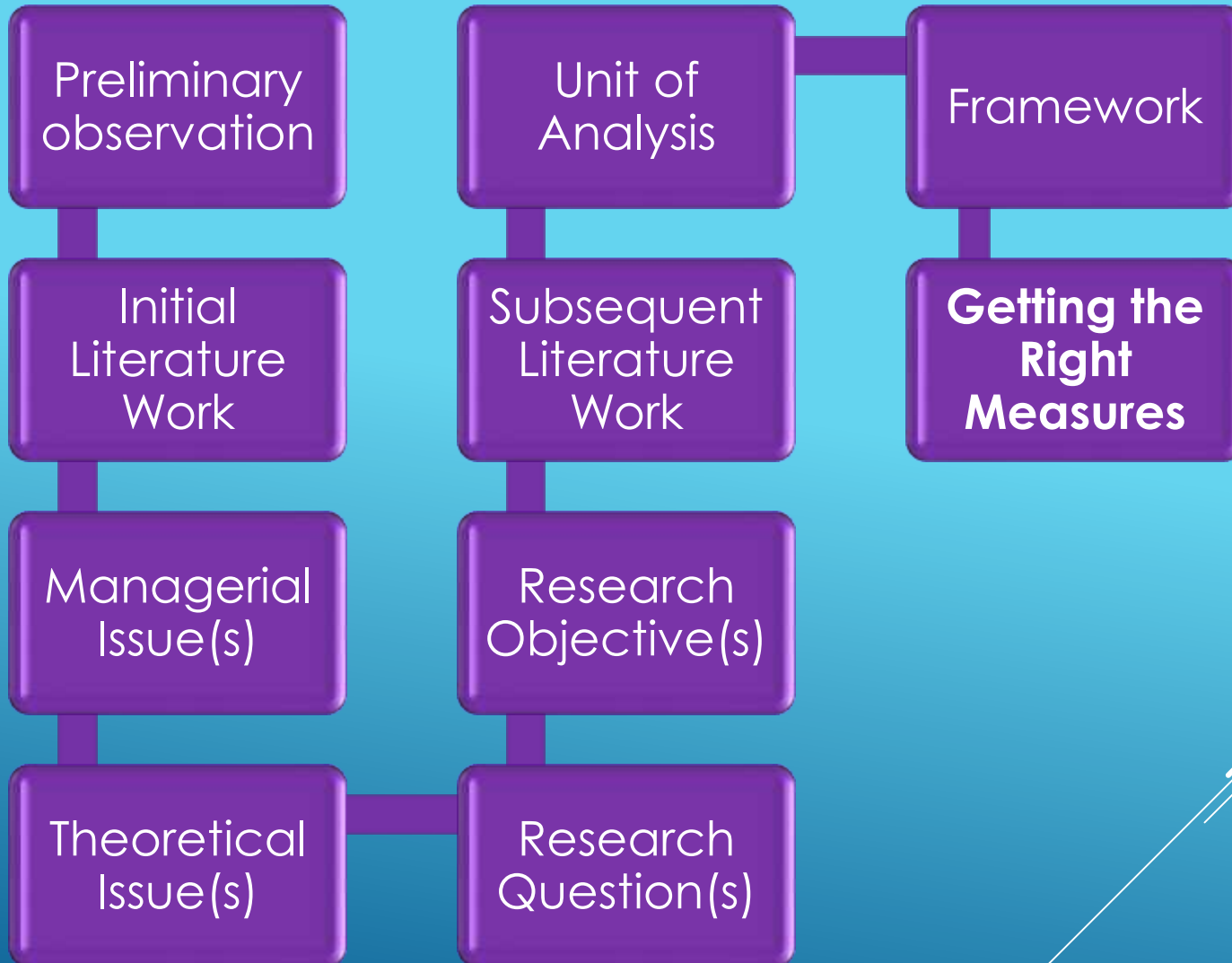


SELECTING APPROPRIATE MEASUREMENT

CHANDRAKANTAN SUBRAMANIAM

HOW WAS IT DEVELOPED



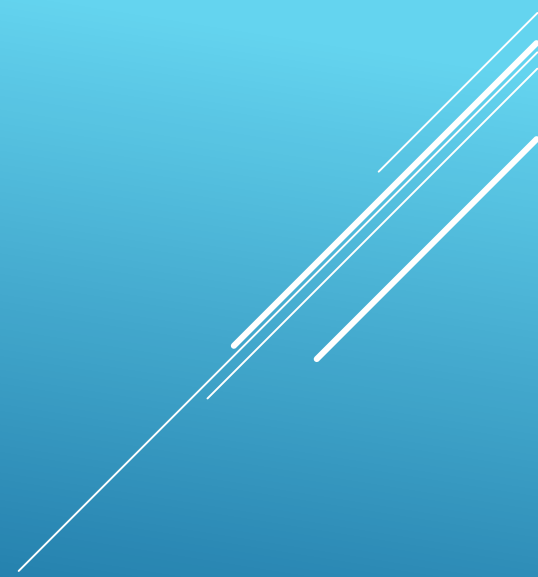
WHY IS THIS PROCESS IMPORTANT




WHAT DO I MEASURE?

- ▶ Measurement
 - ▶ The process of describing some property of a phenomenon, usually by assigning numbers in a reliable and valid way.
- ▶ Concept
 - ▶ A generalized idea about a class of objects, attributes, occurrences, or processes


MEASUREMENT SCALE

- ▶ Concepts that have been operationalized are variables that can be measured.
 - ▶ There are four type of measurement scales that can be applied to measure variables:
 - Nominal
 - Ordinal
 - Interval
 - Ratio
- 
- A decorative graphic consisting of several parallel white lines of varying lengths and orientations, located in the bottom right corner of the slide.


NOMINAL

- ▶ Subjects assigned to categories or groups that are mutually exclusive and collectively exhaustive.
 - ▶ Characteristic of scale: no order, distance or origin.
 - ▶ Basic empirical operation: determination of equality.
- 


ORDINAL

- ▶ A level of measurement describing a variable with attributes that can be ranked-ordered along some dimensions.
 - ▶ Eg. socioeconomic status composed of attributes of high, medium, low
 - ▶ Includes characteristics of the nominal scale, plus an indicator of order.
- 


ORDINAL (CONT)

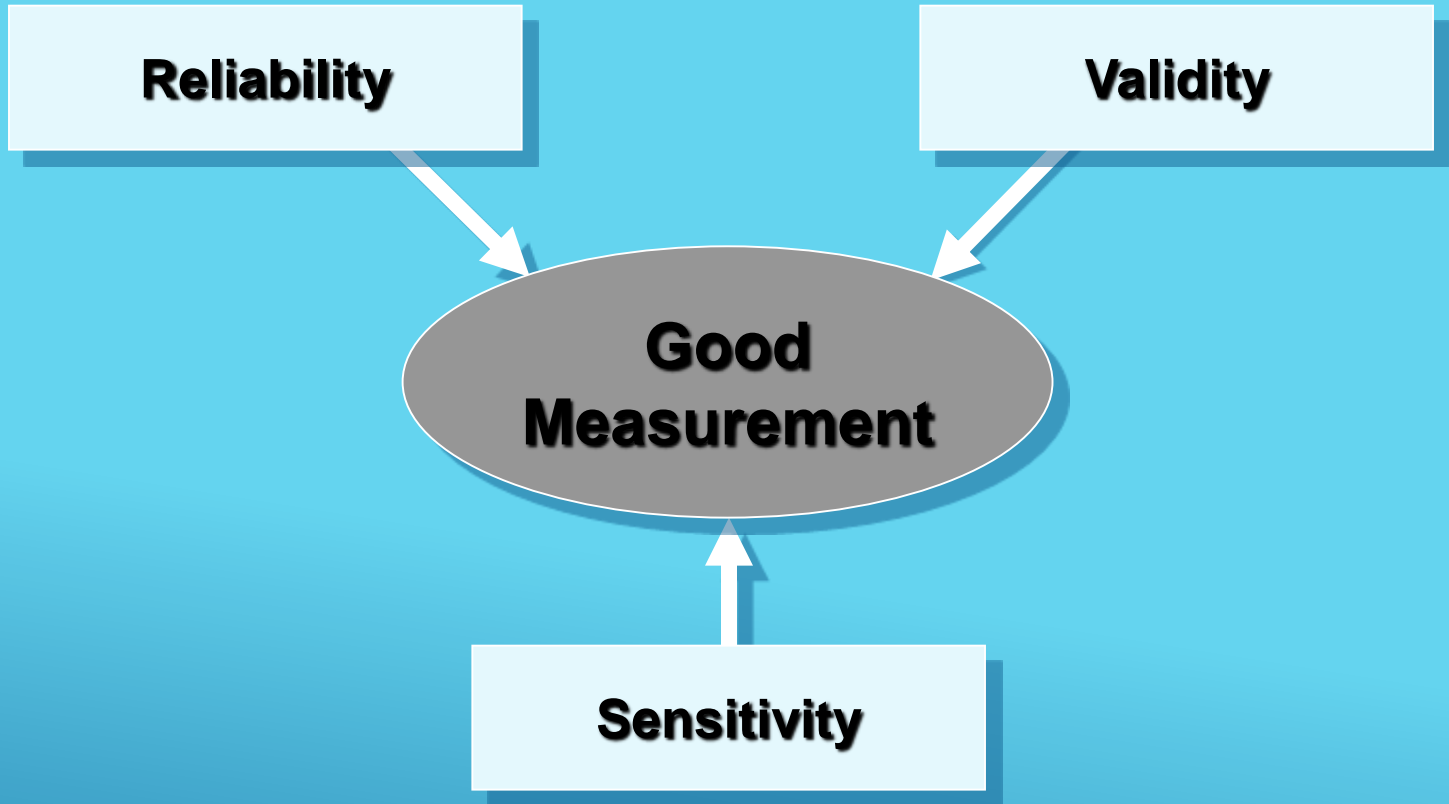
- ▶ Ordinal scales are possible if the transitivity postulate is fulfilled i.e:
 - ▶ If a is greater than b and b is greater than c , then a is greater than c .
 - ▶ The use of an ordinal scale implies a statement of “greater than” or “less than” (or “superior to”, “happier than” etc.) without stating how much greater or less.
 - ▶ Characteristic of scale: Order but no distance or unique origin.
 - ▶ Basic empirical operation: Determination of greater or lesser values.
- 

INTERVAL

- ▶ A level of measurement describing a variable whose attributes are rank-ordered and have equal distances between adjacent attributes.
 - ▶ Eg. elapsed time between 3 and 6 a.m. equals time between 4 and 7 p.m. However 6 a.m. is not twice as late as 3 a.m. because “zero” time is an arbitrary origin.
 - ▶ Interval scale has the power of nominal and ordinal scales plus an additional strength that incorporates the concept of equality of interval (the distance between 1 and 2 equals the distance between 3 and 4).
 - ▶ Characteristic of scale: Both order and distance but no unique origin.
 - ▶ Basic empirical operation: determination of equality of intervals or differences.
- 

RATIO

- ▶ A level of measurement describing a variable with attributes that have all the qualities of nominal, ordinal, and interval measures in addition are based on a “true or absolute zero” point.
 - ▶ Eg. Age
 - ▶ Ratio scale represents the absolute amount of a variable.
 - ▶ Characteristics of scale: Order, distance, and unique origin.
 - ▶ Basic empirical operations: Determination of equality of ratios.
- 
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THREE CRITERIA FOR GOOD
MEASUREMENT

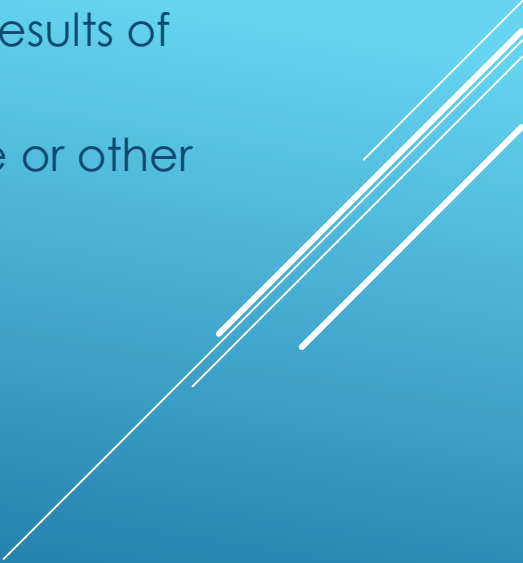
RELIABILITY

- ▶ Reliability
 - ▶ The degree to which measures are free from random error and therefore yield consistent results.
 - ▶ An indicator of a measure's internal consistency.
- ▶ Internal Consistency
 - ▶ Represents a measure's homogeneity or the extent to which each indicator of a concept converges on some common meaning.
 - ▶ Measured by correlating scores on subsets of items making up a scale.

INTERNAL CONSISTENCY

- ▶ Split-half Method
 - ▶ Assessing internal consistency by checking the results of one-half of a set of scaled items against the results from the other half.
 - ▶ Coefficient alpha (α)
 - ▶ The most commonly applied estimate of a multiple item scale's reliability.
 - ▶ Represents the average of all possible split-half reliabilities for a construct.
- 

TEST-RETEST RELIABILITY


- ▶ Test-retest Method
 - ▶ Administering the same scale or measure to the same respondents at two separate points in time to test for stability.
 - ▶ Represents a measure's repeatability.
 - ▶ Problems:
 - ▶ The pre-measure, or first measure, may sensitize the respondents and subsequently influence the results of the second measure.
 - ▶ Time effects that produce changes in attitude or other maturation of the subjects.
- 

VALIDITY

- ▶ Validity

- ▶ The accuracy of a measure or the extent to which a score truthfully represents a concept.
 - ▶ Does a scale measure what was intended to be measured?

- ▶ Establishing Validity:

- ▶ Is there a consensus that the scale measures what it is supposed to measure?
 - ▶ Does the measure correlate with other measures of the same concept?
 - ▶ Does the behavior expected from the measure predict actual observed behavior?
- 

VALIDITY (CONT'D)

▶ Face Validity

- ▶ A scale's content logically appears to reflect what was intended to be measured.

▶ Content Validity

- ▶ The degree that a measure covers the breadth of the domain of interest.

▶ Criterion Validity

- ▶ The ability of a measure to correlate with other standard measures of similar constructs or established criteria.

▶ Construct Validity

- ▶ Exists when a measure reliably measures and truthfully represents a unique concept.


▶ Convergent Validity

- ▶ Another way of expressing internal consistency; highly reliable scales contain convergent validity.

▶ Discriminant Validity

- ▶ Represents how unique or distinct is a measure; a scale should not correlate too highly with a measure of a different construct.

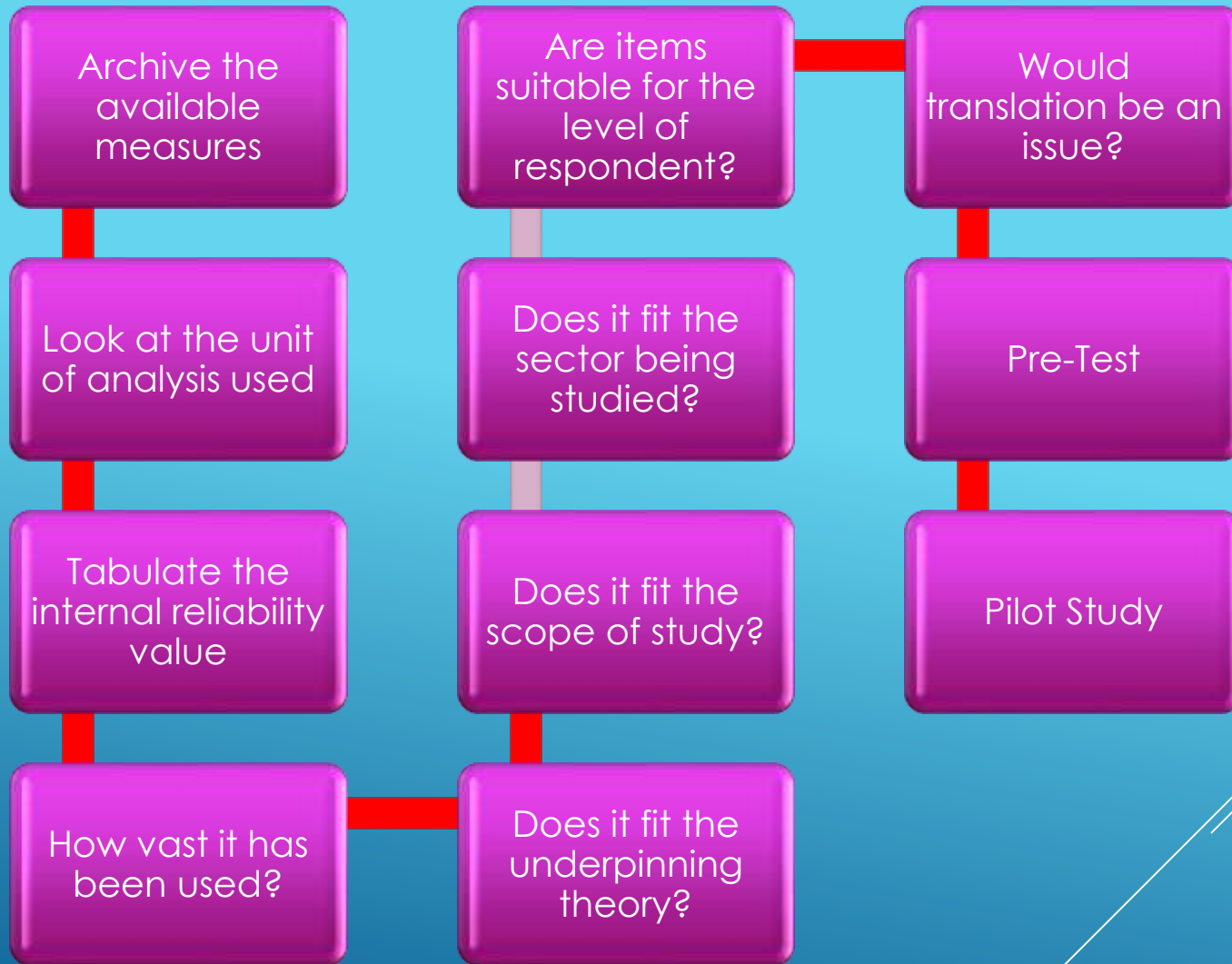
SENSITIVITY

- ▶ Sensitivity
 - ▶ A measurement instrument's ability to accurately measure variability in stimuli or responses.
 - ▶ Generally increased by adding more response points or adding scale items.
- 

SELECTING THE MEASURES



STEPS IN SELECTING MEASURES



**THANK YOU FOR
LISTENING**

