

# Measurement of Abstract Concepts



Edgar Degas: Madame Valpincon with Chrysanthemums, 1865



# Measuring What Does Not Exist

## 1. Conceptions, Concepts, and Reality

- Realism: Belief that abstract concepts are real in their consequences. Thus, although one cannot directly observe family, prejudice, anomie, self-esteem, or marital satisfaction, a science of society can achieve a great amount of explanation and prediction by assuming that such concepts have a “reality” and this reality can be measured.
- Nominalism: A reminder that realist concepts are abstractions, not an immutable reality that is separate from our constructions of them.



# Measuring What Does Not Exist

## 2. Concepts as Constructs

- Direct Observables: Sensory information.
- Indirect Observables: Abstract information.
- Constructs: Theoretical creations; abstract terms used in theory.
- Concepts: The terms concepts and constructs are used as synonyms in sociological literature. Sometimes, persons will use “concepts” to refer to single-item measures (e.g., age, education, income) and “constructs” to refer to multiple-item measures (e.g., scales or indexes of self-esteem, marital satisfaction).



# Conceptualization

## 1. Defining What We Mean

- Careful specification of terms is important to all sciences.
- Because the social sciences investigate human behavior, they often use everyday terms to mean specific forms of behavior. For example, in social psychology the terms belief, attitude, and opinion mean different things, although in common language they might be thought of as meaning the same thing.



# Conceptualization

## 2. Indicators and Dimensions

- Indicator: A concept or direct observable used to measure a construct.
  - For example, we might consider a person's extent of agreement with this statement, "I am a person of worth," as an indicator of the person's self-esteem (i.e., a construct).
- Dimension: Constructs sometimes have multiple dimensions, each with indicators.
  - For example, the construct, Locus-of-Control, has three dimensions: internal, external, and powerful others.



# Conceptualization

## 3. Interchangeability of Indicators

- Constructs typically are assumed to have multiple indicators, each with content validity.
  - For example, Rosenberg's self-esteem scale contains ten statements used to measure self-esteem. Each statement is assumed to accurately measure self-esteem as an indicator of it.



# Conceptualization

## 4. Real, Nominal, and Operational Definitions

- Real: A statement of the “essential nature” of some entity. Example: We assume that people hold a “sense of self-worth” that influences their behavior.
- Nominal: A name given to a term without any claim that the definition represents an “real” entity. Example: “Self-esteem.”
- Operational: The description of how the concept will be measured. Example: “Score on Rosenberg’s self-esteem scale.”



# Conceptualization

## 5. Creating Conceptual Order

- Conceptualization is a continuing process.
- Operational definitions, especially, can vary across studies and change over time.
- Different operationalizations of a concept can yield different results of using the concept across studies.
- Some operational definitions become firmly established within the community of scholars (e.g., Rosenberg's self-esteem scale).



# Definitions Across Studies

## 1. Exploratory Research

- Definitions are very important because this initial research will define the topic of investigation and how it should be measured.

## 2. Explanatory Research

- Definitions are important here as well.
- But if the empirical results vary little by using different definitions, then the definition used in this research might not be critical to understanding cause and effect.



# Operationalization Choices

## 1. Range of Variation

- The full range of possible variation in variables might not be of interest in a particular study.
  - One might be interested in the opinions of just males, or college students, or persons with incomes less than \$1 million/year.

## 2. Variations Between the Extremes

- Studies differ in the level of precision desired.
  - One study might want to assess opinions by each year of age. In another, it might be sufficient to know that a person is “between 18-24.”



# Operationalization Choices

## 3. A Note on Dimensions

- Researchers need to be aware of concepts with multiple dimensions and clarify which ones they are interested in measuring.

## 4. Defining Variables and Attributes

- An attribute is a characteristic or quality of something (e.g., male and female).
- A variable represents a logical set of attributes (e.g., sex can be male or female).



# Operationalization Choices

## 5. Levels of Measurement

- Nominal: Variables whose attributes have only the characteristics of exhaustiveness and exclusiveness (e.g., sex, religious affiliation, political party affiliation).
  - No ordering of the attributes is implied.
- Ordinal: Variables whose attributes have a logical rank ordering (e.g., social class).
  - The ordering is not considered to be continuous (e.g., “young, middle-aged, old” rather than “1-85”).



# Operationalization Choices

## 5. Levels of Measurement (Continued)

- Interval (Continuous): Variables whose attributes have a logical rank ordering and where the distances between the ranks have meaning (e.g., “19 is older than 18”).
  - When does “ordinal = interval”? Often, sociologists will treat ordinal-level data as interval-level data to simplify the process of data analysis (i.e., statistical analysis can be a lot easier with interval-level data).
  - Typically, as few as 5 ordered categories will be considered as interval-level data.



# Operationalization Choices

## 6. Single or Multiple Indicators

- Single: Many concepts imply a single indicator (e.g., age, income, sex).
- Multiple: Constructs imply multiple indicators (e.g., self-esteem, marital satisfaction, masculinity, affluence).
  - Multiple-indicator constructs sometimes are called “latent variables” because they are not measured directly, but instead are measured as the sum of multiple observed indicators.



# Operationalization Choices

## 7. Precision and Accuracy

- Precision: Measurement or estimation within a narrow range of numerical scores or interpretive terms.
- Accuracy: Correct measurement or estimation of a social phenomenon.
- The researcher must make choices between precision and accuracy.

**Questions?**