Instructor Manual

# Chapter 1: The Definition and Measurement of Concepts

**Learning Objectives**

1. How to clarify the meaning of concepts
2. How to identify multidimensional concepts
3. How to write a definition for a concept
4. How systematic error affects the measurement of a concept
5. How random error affects the measurement of a concept
6. How to recognize problems of reliability and validity

**Chapter Summary**

The world is a complex place filled with a great deal of variety. In order to help make sense of the world, we often develop **concepts** to explain the phenomena we witness. In the political realm, we use terms such as *liberal* or *conservative* to describe a political point of view. The meaning we add to these words determines how we perceive the world around us. To properly understand the world, it is essential that our concepts are clearly defined. Further, once a concept has been defined, we must figure out an accurate way to measure the concept. Suppose you want to know what the concept *conservative* means. How would you measure it? Once you figure out how to measure a concept, it is essential to reduce the errors associated with the measurement. It is virtually impossible to eliminate all error from a measurement so what we want to do is ensure that our measurement does not contain **systematic error**, which may lead to biased results. There may still be **random error** present in our measurement but we will be able to estimate that and account for it.

Finally, once we have defined our concept, figured out how to measure it, and minimized the probability of error, we need to ensure that our measure is both **reliable** and **valid**. A measure is said to be reliable when it consistently measures the concept we are interested in. Measures may be unreliable for a variety of reasons including faulty memory or lack of complete information, to name just two. A measure is said to be valid when it records the true value of the concept being measured. Suppose a researcher wants to know how conservative a particular news station’s broadcast is by categorizing each story on a seven-point scale from extremely liberal to extremely conservative. If the researcher categorizes enough stories, she should have a good idea of how conservative (or liberal) the station’s news broadcast actually is.

## Discussion Questions

1. Suppose a researcher wants to measure the level of freedom Americans have relative to their counterparts in Canada. Define the concept *freedom* and construct a method to measure the concept of *freedom*.
2. Thinking about the definition of freedom defined in the previous question, how would the researcher ensure that her measure is free from systematic error?
3. What challenges might the researcher face when defining and measuring the concept of freedom in a way that is both reliable and valid?

**Introduction**

* Politics is about making choices and our preferences discuss and describe the world.
* Preferences are **concepts**, ideas, or mental constructs that organize, map, and help us understand phenomena in the real world and make choices.
* Concepts may be simple or complicated.
* Political researchers aim to describe concepts and analyze the relationship between two or more concepts, in addition to transforming concepts into concrete terms.
* A **conceptual question**, a question expressed using ideas, is frequently unclear and thus is difficult to answer empirically.
* A **concrete question**, a question expressed using tangible properties, can be answered empirically.
* A **conceptual definition** clearly describes the concept’s measurable properties and specifies the units of analysis to which the concept applies.
* Having clarified and defined a concept, researchers must then describe an instrument for measuring the concept in the real world.
* An **operational definition** describes the instrument to be used in measuring the concept and putting a conceptual definition “into operation.”

**Conceptual Definitions**

* A conceptual definition provides a clear description of the measurable properties of a concept and specifies the units of analysis.
* Concepts can mean something different in one context or mean different things to different people, so it is important to make sure that concepts are clearly defined.
* If a word or concept means different things to different people, research is likely to be misunderstood.

***Clarifying a Concept***

* To clarify a concept, it is often useful to make an inventory of the concept’s concrete properties.
* After settling on a set of properties that best represent the concept, researchers write down a definition of the concept.
* The written definition communicates the subjects to which the concept applies and suggests a measurement strategy.
* The properties of a concept must have two characteristics: They must be concrete and they must vary.
* The mental exercise of making an inventory of a concept’s properties can help researchers identify characteristics that are concrete and variable.
* Brainstorming the measurable properties of a concept is an open-ended process. Researchers should also be inclusive.
* Three problems often arise during the inventory-building process:
* First, we might think of empirical attributes that are only loosely related to the concept of interest.
* Second, the inventory may include concepts rather than measurable properties.
* Third, the empirical properties may represent different dimensions of the concept.
* A **conceptual dimension** is defined by a set of concrete traits of similar type.
* Concepts are often **multidimensional**, which means that a concept may have two or more distinct groups of related characteristics.
* One example is the concept of liberalism, which may be divided into a group of characteristics that define *economic liberalism* and a group of characteristics that define *social liberalism.*
* Researchers should try, as much as possible, to define concepts in clear, unidimensional terms.

***A Template for Writing a Conceptual Definition***

* Three elements are essential when constructing a conceptual definition:
* The variation within a measurable characteristics or set of characteristics.
* The subjects or groups to which the concept applies.
* How the characteristic is to be measured.

***Why It’s Important to Identify Unit of Analysis***

* By referring to a subject or group of subjects, a conceptual definition conveys the units of analysis.
* A **unit of analysis** is the entity (person, city, country, county, university, state, bureaucratic agency, etc.) we want to describe and analyze.
* Units of analysis can be either individual level or aggregate level.
* When a concept describes a phenomenon at its lowest possible level, it is using an **individual-level unit of analysis**.
* Much political science research deals with the **aggregate-level unit of analysis**, which is a collection of individual entities such as neighborhoods, states, countries, and so on.
* Sometimes researchers want to use data collected at one level of analysis to better understand what’s happening at another level of analysis. This is referred to as **cross-level analysis**.
* It may be necessary where data on certain outcomes is not available at the individual level.
* One pitfall to avoid is the **ecological fallacy**, which occurs when the attributes of a group are applied to an individual within the group. Not all individuals within a group may share every attribute associated with the group.

**Operational Definitions**

* An operational definition describes explicitly how the concept is to be measured empirically.
* The step between conceptual definition and operational definition is often the most difficult to traverse.

***Measurement Error***

* Two types of measurement errors are possible when conducting political research:
  + **Systematic measurement error** occurs when the researcher introduces consistent, chronic distortion into a measurement.
  + **Random measurement error** results in inconsistent readings of a concept.
* *Systematic Measurement Error*
  + The **Hawthorne effect** inadvertently measures a subject’s response to the knowledge that he or she is being studied.
  + The example in the text highlighted two systematic measurement errors: verbal ability and test anxiety.
* *Random Measurement Error*
  + The example in the text highlighted various random measurement errors: fatigue, commotion, and unavoidable distractions.

***Reliability and Validity***

* **Reliability** is the extent to which a measurement produces a consistent measure of a concept. A reliable measure should produce the same reading each time it is taken.
* **Validity** is the extent to which a measure records the true value of the intended characteristic.

***Evaluating Reliability***

* A variety of methods may be used to evaluate measurement reliability. The two most frequently used methods are the **test–retest method** and the **alternative form method.**
* The test–retest method simply repeats the test using the same units of analysis. If each test produces the same or very similar results, it indicates the measure is reliable. If the results differ significantly, then it indicates that the measure is unreliable.
* The alternative form method allows the researcher to administer the test in two (or more) different forms that are roughly equivalent. The alternative form method is often used when surveying the same individuals on multiple occasions to ensure subjects are not just remembering their earlier answers.
* There are two drawbacks to these methods:
  + These approaches make it hard to distinguish random error from true change.
  + Surveys are expensive projects.
* Researchers can also utilize internal consistency approaches such as the **split-half method** and **Cronbach’s alpha**.
* An internal consistency is the split-half method, which is based on the idea that an operational measurement obtained from half of a scale’s items should be the same as the measurement obtained from the other half.
* A more sophisticated internal consistency approach is the Cronbach’s alpha. It is a natural methodological extension of the split-half extension. It compares consistency between pairs of individual items and provides an overall reading of inter-item correlation and measure’s reliability.

***Evaluating Validity***

* There are typically two types of validity that a researcher is interested in: **face validity** and **construct validity.**
* Face validity refers to whether the measure is actually measuring what it has been designed to measure. It cannot be empirically demonstrated.
* For example, trying to determine whether an individual is liberal or conservative based upon how she or he voted in the last presidential election is a poor measure because many other factors may have affected who the individual voted for in the election.
* Construct validity examines the measure in relationship to other concepts to which it should be related.
* An example might be the scores on college entrance exams and the relationship to student’s future grade point average. Students with low entrance exam scores might be expected to have lower GPA’s than students with high entrance exam scores.

## Working with Datasets, Codebooks, and Software

* The information we collect is called data and it is organized into data sets.
  + Datasets can be enormous or time, can contain names, dates, large numbers, small numbers, website links, and so on.
  + They tend to share the same general structure.
* If you’re using a data set, it’s important to know how the authors measured concepts of interest.
* You can look up variable names, descriptions, and other important information about a data set in a **codebook**.
* The property or characteristic that interests us may vary across units of analysis at a given time and it also may vary within the units of analysis over time.
  + A data set that compiles information collected at one time to study properties that vary across the units of analysis is a **cross-sectional dataset**.
  + A data set that compiles information collected at different time intervals to study properties that vary over time is a **times series dataset.**
  + Pooled data sets or time-series cross-sectional datasets incorporate cross-sectional and longitudinal variation.

## Web Resources

1. Visit the website of the Fraser Institute (<https://www.fraserinstitute.org/studies/economic-freedom>) and scroll down to the *Economic Freedom of the World: 2018 Annual Report*. Download the PowerPoint presentation. Think about how the authors define freedom in this report. How does that compare to your own definition of freedom?
2. Visit the Pew Research Center’s website at <http://www.people-press.org/2014/06/12/appendix-a-the-ideological-consistency-scale/> and examine the questions in the Ideological Consistency Scale. Are the questions likely to produce a reliable measure of political ideology? Why or why not?
3. Visit the website <http://thinkprogress.org/yglesias/2009/06/30/184432/political-journalism-just-cant-quit-the-ecological-fallacy/> and read the story. Have you found yourself committing the same type of ecological fallacy as the author of the article? How can you avoid that in your research?

## Exercises

1. Using the template in Chapter 1 of the textbook write a conceptual definition of *democracy.*
2. Based upon the conceptual definition above prepare a list of empirical characteristics you would expect to find in a democracy.