Chapter 2

Conceptualizing

Empirical research addresses *questions* or *hypotheses* about *relationships* between concepts or variables. The relationships may be between abstract constructs or between concrete variables . (Is this concept related to that one? What is the relation between these variables?) These questions or hypotheses usually have *theoretical support*—the researchers have reason to believe there is or is not a particular kind of relationship present, perhaps because of previous research they have done or because a theory they have studied seems relevant. They address the questions/ hypotheses *empirically*, by looking for evidence that would support or refute the implications of the theory.

Concepts and Constructs

A *concept*, according to Kerlinger,[1] is a word that expresses an *abstraction* formed by *generalization from particulars*. "Prejudice" is a good example. That it is abstract is evident because it is an idea—a conception—and not a physical object or event. I'm sure you can think of several examples of prejudice, but they are only particular examples—none of them *is* prejudice. We group all the things we consider to be examples of prejudice together because they have something in common, and we are interested in that something. So we can talk about it, we give the grouping a name. The name we give the grouping is thus an abstraction formed by generalization from all the particular examples.

Although they have different meanings, the word "construct" is often used as if it were interchangeable with "concept." A construct is a concept created for a specific scientific purpose. We sometimes talk about concepts in our day-to-day lives as ordinary people. In this context, we are talking about what we would probably call "ideas." Television producers sometimes talk about a concept being turned into a program, for example. But when we are talking about research, we try to be more consciously explicit and aware of what we are doing, so we use "constructs" instead.

Something to note is that neither concepts nor constructs exist in the physical world. They are both things that we create in our minds. Although they serve a number of useful purposes—they let us share ideas and they make it easier to communicate about complicated things because they "crystallize" abstract aspects of the world around us—we have to remember that we made them up: we constructed them from nothing.

[1] 1964, p. 31.

Variables

While concepts are associated with theory, variables are associated with measurement and observation. **Variables** are **empirical indicators** of constructs. Note: *The variable is not the construct*. It is something concrete that you can observe, and by its appearance you can tell whether the concept is present or absent or to what extent it is present. In a way, constructs and variables are like diseases and symptoms. When you get the flu, you have a number of experiences. You feel tired, weak, and achy. You may have nausea or other uncomfortable experiences. You may have a fever. None of these experiences are the disease. They are only *symptoms* of the disease. If you have enough of these symptoms, though, you will probably say you have the flu.

Constructs are like diseases; variables are the symptoms of constructs. You observe constructs by watching their "symptoms"— the variables that serve as their indicators. For example, the behaviors that we would say are examples of prejudice are the symptoms we would look for if we wanted to see if someone is prejudiced. Although the behaviors themselves are not prejudice, we would say that they prejudice a person who performs them.

A particularly useful way to look at variables is to see them as symbols to which values are assigned. Usually the value will be a number (GPA = 3.1) or a letter (category B). Often, it makes sense to consider a variable as representing the result of a *test* of some kind. For a given individual, the value of the variable is the individual's *score* on the test. Take, for example, the construct commonly called "intelligence." In day-to-day life, we think of intelligence as cognitive or mental ability that people have. If you want to see how much of this ability a person has, you will probably give them a test that contains questions that only someone who has the ability can answer. Because some of the questions require a higher degree of the ability than others, more intelligent people—those who have a lot of the ability—will answer more questions correctly. This test, of course, is known as the IQ test. We commonly speak of people who get high scores on this test—people with high IQs—as very intelligent. Their intelligence is the extent to which they have the cognitive or mental ability that allows them to reason and solve problems. Here, the construct is intelligence and the variable that indicates how much of this ability they have is a score on the IQ test.

Research Questions

Since the goal of empirical research is to answer a question, the first research task is to identify the question you want to answer. A good research question will be useful for a number of reasons. It will guide your efforts and help you keep your focus; it will help you decide what information you need to obtain and what methods might be appropriate to obtain that information; it will help you know how to interpret the information you do obtain, and it will help you know when you are finished.

Sometimes you may find that you have a research problem that doesn't seem to ask a question. For example, you may have a general interest in a particular line of thought. You will probably find that you can clarify your research goal and make your task more straightforward if you restate the problem in such a way that the questions implicit in the original statement become explicit. You may find that doing this is more difficult than you would expect, though, as it requires you to examine your situation and carefully analyze what it is you are trying to learn by the research. A strategy that often helps is to break off a small piece of the larger area and start with that. This will familiarize you with the particular problems you will encounter and give you an opportunity to develop ways of dealing with them.

If you are new to the area you are studying, you will probably find it most useful to do some exploratory research before you attempt to focus your questions any further. A particularly useful type of exploratory research is that which you can do in the library: see how other researches have conceptualized the problem and what research they have done, how they framed their research questions and anchored them in previous research, what theoretical perspectives they

used, what measurement and analysis methods were appropriate, what problems they encountered, etc.

The Problem Statement

Problem statements can take the form of *questions* or of *hypotheses*.

Research questions often ask for a description of something. Some examples are: "*What are the communication patterns among the people who work in this organization?*" "*What kind of interactions do foster parents have with the natural parents of their foster children?*" "*What is the non-verbal content of cigarette advertising in national magazines?*" Or they may ask for a description of a relation between two things. For example, "*Are ads that attempt to use fear of cancer and heart disease to convince people to stop smoking more or less effective than ads that take other approaches?*" "*How does the educational background of young parents influence the way they relate to their children?*"

A research question may be *open-ended*, in which case it leaves both the nature of the relationship to be investigated and its boundary conditions unspecified. It will then ask "what kind" of relationship, if any exists, and under what conditions it is seen. (*ex: What is the relation between how many close friends one has and how often one gets seriously ill?*) A research question may be *closed*, in which case it asks whether or not a specified type of relationship exists between two or more sets of phenomena under a particular set of boundary conditions. (*ex: Do people who have many close friends become seriously ill less often than people who have few?*) Closed questions are preferable to open-ended ones because they are more precise and it is easier to know when they have been answered unequivocally.

Hypotheses are declarative statements that predict a particular kind of relationship exists between two or more *variables* under specified conditions. For example, a body of research has led to the development of a complex theory relating several concepts, including social integration, mental health, alienation, and general well-being. Among other things, this theory says that social integration is positively related to general well-being and physical hardiness. One hypothesis implied by the theory might be: "Of the people who work in this university, those whose friends are friends of one another will experience fewer serious illnesses than will those whose friends do not know one another."

Hypotheses are derived from theory. The theory describes a *general* relationship between the concepts, while the hypothesis describes a *particular instance* of that relationship in specified circumstances. If the theory is valid, the hypothesis, which the theory logically implies, must also be valid. In the example above, the theory says that social integration is positively related to well-being and physical hardiness. If this is the case, then people whose friends are friends of one another should have fewer serious illnesses (if being "socially integrated" means that your friends are friends of one another, and if well-being and hardiness imply low levels of serious illness).

Although researchers are interested in theories, they test hypotheses (and not theories), because hypotheses talk about specific concrete phenomena which can be directly measured, while theories, on the other hand, talk about abstract concepts, which can be measured only indirectly. Theories can't be directly tested.

Hypotheses are preferable to research questions for two reasons:

1) Hypotheses delineate research problems more fully and precisely than questions. They specify the nature of suspected relationships between phenomena along with necessary boundary conditions.

2) Hypotheses are usually more exact than questions and thus more amenable to empirical testing that results in unequivocal answers.

Assessing Problem Statements

Research is like traveling. If you have to go somewhere, it is a lot easier to decide whether you should take a

plane or drive and in which direction you should travel if you know where you want to go. In fact, if you don't know where it is, you may never get there or you might not recognize it if you do. For similar reasons, you need to know the goal of your research. Here are some criteria you can use as you construct your problem statement:

1) Problem statements should be *clear* and *specific*. The question "What is the relation between Canadians and Americans?" doesn't give any indication about the type of relation the researcher is interested in? Are Canadians happier than Americans? Are Americans heavier than Canadians? Do Canadians like Americans more than Americans like Canadians? Each of these closed questions is more specific than the original open-ended one. The hypothesis "Canadians, on average, have more close friends than Americans" is even more specific.

2) Problem statements should be *empirically verifiable*. They should talk about what *is* the case, not what *ought to be* the case. The hypothesis "Canadian films are superior to American ones" would ask the researcher to settle a question of personal values or preferences empirically—something that cannot be done. In comparison, the hypotheses "Canadian films generally win more awards in international competitions" or "American films generally attract bigger audiences" are empirically testable.

3) Problem statements should be *phrased affirmatively*. It is better to say "characteristic X is related to event Y under these conditions" than "there is no relationship between characteristic X and event Y under any conditions." The former can be tested; the latter cannot. Problem statements that say there is no relationship should be avoided. For example, the hypothesis "there is no relationship between exposure to violent films and difficulty in establishing interpersonal relations" is similar to "there are no pianos in Japan" in that neither can be confirmed. You would have to examine all possible relationships between exposure to violent films and problems in establishing interpersonal relationships. Where would you begin? How would you know whether your failure to detect a relationship (or a piano) was because you didn't look in the right place? If your hypothesis had been "People who watch many violent films tend to have more difficulty in establishing interpersonal relationships," you would have been on much firmer ground and your research would have a better chance of success.

4) Problem statements should be *stated simply*. Compound-complex sentences and double-barreled statements can lead to serious problems. The word "and" is often a danger signal. Consider this research question: "Are people who like rap music unemployed and bothered by a sense of alienation from society because they feel they have no power?" It contains at least four completely different questions: Are rap music lovers unemployed? Are they bothered by a sense of alienation from society? Does their sense of powerlessness cause them to feel alienated from society? Is their feeling of being without power the reason they are unemployed? What is the goal of the researcher who suggested this question?

Defining the Terms in Problem Statements

Problem statements contain descriptive and operative terms.

Descriptive terms represent classes of phenomena. These include constructs and variables. Problem statements with constructs are *theoretical hypotheses*, while those with variables are *research hypotheses*. (In the course of research, all constructs must be connected to variables, since it is the research hypotheses that are tested.) The variables in hypotheses fall into three classes: independent, dependent, and intervening.

- *Independent variables* are causes; *dependent variables* are effects. The value of the independent variable determines the value of the corresponding

dependent variables. Dependent variables are the classes of phenomena requiring explanation.

- *Intervening variables* are the boundary conditions that influence the relationship between independent and dependent variables. In the statement "If X, then probably Y, under condition Z," the "Z" is an intervening variable.

Operative terms clarify the relationship between the specified classes. Examples of operative terms include words and phrases such as "increasing," "decreasing," "is related to increasing," "immediately," "diminishes," etc. Operative terms may also be used to specify the type of relationship you expect to observe. Some examples are linear, curvilinear, exponential, *positive, negative, direct, inverse, inverted-U-shaped,* and *U-shaped*. For example, in the statement "viewing violent television programs and movies leads to an increase in subsequent acts of violent aggression against women," the words "leads to an increase in" are operative terms that indicate a direct or positive relationship between "viewing violent television programs" and "subsequent acts of violent aggression against women."

Conceptual Definitions

Conceptual definitions define constructs by relating them to other constructs.[2] For example, "weight" could be defined by saying that it is the "heaviness" of objects. *Operational definitions* specify the procedures for observing and measuring constructs. To say that your operational definition of intelligence is the IQ test is to say that you measure a person's intelligence by having them take the IQ test. The person's score on the IQ test, however, is not their intelligence; it is only their score on a test. We use it, though, because we believe that people who are highly intelligent will get high scores on the IQ test. So a person's IQ score is useful as an indicator of how intelligent the person is. A conceptual definition must do more than tell how the concept will be measured. For example, to say that "intelligence is what the IQ test measures" does not define intelligence—it only tells how to measure it.

Assessing Conceptual Definitions

Here is a list of criteria you can use to judge the quality of your conceptual definitions.[3] Each criterion has an example to show how it works.

1) Conceptual definitions should denote all of the *essential qualities* of the constructs and exclude nonessential ones. They should describe the construct clearly enough so that other researchers would classify phenomena (in terms of whether or not they are occurrences of the construct) the same way as the researcher who developed the conceptual definition.

   The definition "violent movies are movies in which there are scenes of kicking, stabbing, clubbing, choking, hitting, slapping, shooting, and smashing" is not a good conceptual definition because it lists many activities that are not essential and it fails to describe the essential qualities. What are the conceptual qualities that must be present before you will call something "violent"? You may want to say something like "violent movies show scenes in which one person injures, maims, or causes pain to another." This much shorter list of more abstract qualities would probably include all of the specific activities in the list above as well as many violent acts not on that list.

   The specification of essential qualities is the most important part of a conceptual definition because it gives some very good clues about how the concept could be measured in a most straightforward way: look for the presence or absence of the essential qualities. For example, if you accepted the suggested definition of violent movies as those which "show scenes in which one person injures, maims, or causes pain to another" in the previous paragraph, you could determine whether or not a movie is violent, by looking to see whether it

[2] Kerlinger, 1964, p. 34.

[3] This section follows Smith, 1988, pp. 33-34.

contained scenes in which one person injures, maims, or causes pain to another. (But first you will have to decide what counts as injury or pain.)

2) Conceptual definitions should not be *circular*. The definition should not contain any linguistic variant of the construct being defined. This conceptual definition nicely illustrates circularity: "Negative advertising is advertising that contains statements perceived by the public to be negative." We are still left wondering what is meant by "negative."

3) Conceptual definitions should be *clear* and *precise*. Use only terms that are easily reduced to a set of primitive terms—terms with generally agreed upon meanings. Be careful here not to use terms that have more than one meaning or terms that can be interpreted in more than one way.

4) Conceptual definitions should be *complete*. They should include definitions for *all* key terms in the problem statement.

Important Terms and Concepts

abstract concepts
boundary conditions
causes
circularity
closed
concept
conceptual definitions
conceptualizing
constructs
criteria for assessing conceptual definitions
criteria for assessing problem statements
dependent variables
descriptive terms
effects
empirical
empirical research
empirically verifiable
essential qualities
explanation
exploratory research
generalization
hypotheses
independent variables
indicators
intervening variables
measurement
open-ended
operational definitions
operative terms
phrased affirmatively
positive research
problem statements
reason
relationships
research
research hypotheses
research question
scores
symptoms
theoretical hypotheses
theory
variable