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Empirical research addresses questions or hypotheses about relationships between concepts or variables.

The relationships may be between abstract constructs or between concrete variables.

- Are the new ads on cigarette packs effective?
- What is the relation between number of animals in a zoo and the crime rate in the surrounding area?

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.

Researchers address these questions or hypotheses empirically,

by looking for evidence that would support or refute the implications of the theory.

In order to do this, they need to know what questions their research is asking and what the questions mean.

A concept is ...

a word that expresses an abstraction formed by generalization from particulars.

For example, "prejudice."

We group all the things we consider to be examples of prejudice together because we are interested in what it is that they have in common.

So we can talk about it, we give the grouping a name, "prejudice."

The name we give the grouping is thus an abstraction formed by generalization from all the particular examples.

A construct is ...

a concept created explicitly for a specific scientific purpose

Something to note is that neither concepts nor constructs exist in the physical world.

They are both things that we create in our minds.

It is important to remember that we made them up: we constructed them from nothing.

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.

Variables

While concepts are associated with theory, variables are associated with measurement and observation.

Variables are empirical indicators of constructs.

A variable 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 disease and symptoms.

When you get the flu, you have a number of experiences.

You feel tired, weak, and achey.

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.

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.

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.

This is the purpose of Problem Statements.

Problem statements can be either questions or hypotheses.

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.

Research questions may ask for a description of something.

For example: "What is the non- verbal content of cigarette advertising in national magazines?"

Or they may ask for a description of a relationship 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?"

Hypotheses

A hypothesis is a prediction based on a theory.

A hypothesis states what you would expect to see happen if the theory is true.

While theories are abstract and general, hypotheses are concrete and specific.

Assessing Problem Statements

Here are the criteria that you use to assess problem statements:

Problem statements should be clear and specific.

Compare:

"What is the relation between Canadians and Americans?"

"Canadians, on average, have more close friends than Americans."

Problem statements should be empirically verifiable.

They should talk about what is the case, not what ought to be the case or what you believe.

Compare:

"Canadian films are better than American ones"

"Canadian films generally win more awards in international competitions"

Problem statements should be phrased affirmatively.

It is better to say "X is related to Y under these conditions" than ...

... "there is no relationship between X and Y under any conditions."

Compare:

"There is no relationship between exposure to violent films and difficulty in establishing interpersonal relations."

"People who watch many violent films tend to have more difficulty in establishing interpersonal relationships."

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:

"Are people who like rap music unemployed and bothered by a sense of alienation from society because they feel they have no power?"

What is the goal of the researcher who suggested this question?

The structure of Problem Statements

Problem statements contain **descriptive** and **operational** terms.

Descriptive terms

represent classes of phenomena, ...

... namely, constructs and variables.

- ~~Problem statements t~~hat use constructs are theoretical hypotheses;
- those that use 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.)

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Independent variables are **causes**

Dependent variables are **effects**

The value of the independent variable has an influence on the value of the corresponding dependent variable.

Dependent variables are the things your research is trying to explain.

for example ...

The more beer I drink, the more my driving skills will be impaired.

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.

for example ...

If I drink this bottle of beer, my driving skills will probably be seriously impaired if I have taken some anti-histamine to clear my sinuses.

A good place to start with your concepts is with a **Conceptual Definition**.

Conceptual definitions define constructs by relating them to other constructs.

For example, "credibility" could be defined by saying that it is a combination of:

- "trustworthiness" — the extent to which you are thought of as a person who tells the truth;
- "competence" — the extent to which you are thought of as a person who knows the truth; and
- "dynamism" — how strong and energetic and powerful you are seen to be.

Operational definitions specify the procedures for observing and measuring constructs.

Conceptual definitions ...

... should denote all of the essential qualities of the constructs and they should dot include any nonessential ones.

This is the most important part of the conceptual definition because it tells what the critical parts of the construct are. The essential qualities are the things that must be present; without them, you don't have the construct. In a sense, they are the ingredients of the construct.

for example ...

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.

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."

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 define violent movies as those which "show scenes in which one person injures, maims, or causes pain to another" ...

... you could determine whether or not a movie is violent by looking to see whether it contained scenes in which one person injures, maims, or causes pain to another

.

Conceptual definitions ...

... should describe the construct clearly enough so that other researchers would classify phenomena the same way as the researcher who developed the conceptual definition.

Conceptual definitions ... should not be circular.

The definition should not contain any linguistic variant of the construct being defined.

This is a circular definition:

"Negative advertising is advertising that contains statements perceived by the public to be negative."

We are still left wondering what is meant by "negative."

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.

Conceptual definitions ... should be complete.

They should include definitions for all key terms in the problem statement.

Remember that neither concepts nor constructs exist in the physical world.

They are both things that you create in your minds.

They are completely and totally made up.

You constructed them from nothing.

Good conceptual definitions are important in your research because they make it possible for other people to understand what your concepts are and what you mean by them.