

Chapter Three

Research in Action

Essential concepts

Variable

- **Variables** are empirical constructs (concepts) or quantities that take more than one value. A variable is something that can be changed, such as a characteristic or value. Variables are generally used to determine changes to one thing result in changes to another.
- E.g. From sex (female, male), marital status (single, married, divorced, widowed, deserted), age and marital status are variables.

Essential concepts

Variable

- Something that never changes is called a constant.
- Variables that only have two extremes are called attributes.
- There are two types of variables in a scientific experiment: dependent and independent.
- The dependent variable is the variable being measured, while the independent variable can be controlled by the experiment.
- The first type is independent variables (called IV's for short).
- These are predictor variables, or those that we expect to affect other variables.
- The second type is dependent variables (called DV's for short).
- These are outcome variables, or those that we expect to be affected by other variables.

Essential concepts

Data

- Data is any material or information in numerical form or nature, capable of conveying messages as in coded messages.
- Data in research is collected for the purpose of drawing valid conclusions.

Types of Data

A. Based on their process

- There are two types of data; **qualitative** and **quantitative**.
- The fundamental distinction between the two types of data is on the way the 'data' or 'information' is presented.

Essential concepts

- For example, data presented in numerical form will typically be defined as 'quantitative' data.
- But when the data is not in numerical form; it is referred to as 'qualitative' data.
- Notice that qualitative data could be much more than just words or text.
- Photographs, videos, sound recordings and so on, can be considered qualitative data.
- Quantitative types of data could be regarded as 'hard', 'rigorous', 'credible', and 'scientific'.
- While qualitative could also be regarded as 'sensitive', 'nuanced', 'detailed', and 'contextual'.

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- On the other hand, all qualitative information can be easily converted into quantitative, and there are many times when doing so would add considerable value to your research.

B. Based on their Data source:

- i. Primary data
- li. Secondary data
- **Primary data** is the raw form of statistical information which has not undergone any statistical treatment.
- These data are obtained by means of questionnaires and schedules or some other techniques.
- In some fields primary data are collected through interview and observation method.

Essential concepts

- The observation method, for collecting primary data, may be either participant or non-participant. Such data are known as primary because they are gathered by the researcher himself from the field of research directly and for first time.
- **Secondary data** is data that has undergone at least one statistical transformation. The researcher does not obtain them himself or directly rather he gathered them from published and unpublished material. Secondary data are collected by the individuals and/or institution for their own use through personal diaries, letters and survey documents, etc.

C. Based on the role of time:

- Cross-sectional data:- are data gathered at one time specified duration.
- Time-series data: - are data arranged in chronological order of time and intervals between the sequences of time is expected to be equal.

Essential concepts

- **Importance of data in research**
- Data is very important in research because:
 - It is not collected anyhow but through thought processes as questionnaires, interview, observation documents etc.
 - It provides for the use of a good instrument for the data analysis and interpretation.
 - The data gathering which must be relevant; allows for the drawing of reliable and sound conclusions.

Essential concepts

Sources of data for research

- Any research is based on various types of information.
- The more information the researcher has about the phenomenon the better will be his investigation, and explanation about it.
- Without information no investigation will be made. Just as a building needs bricks and cement for its construction, similarly, the research requires relevant information.
- In order to carry on any research activity, information should be gathered from proper sources.

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- The more valid is the sources of information, the more reliable will be the information received, which in turn, will lead to correct and reliable conclusion.
- Different authors have classified the sources of information differently.
- Some of the most important sources are classified as follows:
 - **Field sources:** The information given by individual, obtained from field experiment, survey and observation. This could be regarded as **Primary sources.**
 - It includes the actual information received from individuals directly concerning the problem of the study.

Essential concepts

- It also includes observed social phenomenon and facts that may be discovered.

Documentary sources: These include books, manuscripts, diaries and letters.

- Documents first written out (not published yet) or not printed are also included here.
- This could be regarded as **Secondary sources of data.**
- These include all types of published and unpublished, public or private documents and other such types of information.

Essential concepts

Unit of Analysis

- One of the most important ideas in a research project is the **unit of analysis**. The unit of analysis is the major entity that you are analyzing in your study.
- For instance, any of the following could be a unit of analysis in a study:
 - individuals
 - groups
 - artifacts (books, photos, newspapers)
 - geographical units (town, census tract, state)
 - social interactions (dyadic relations, divorces, arrests)

Essential concepts

Hypotheses formulation

- The building blocks of hypotheses are variables. In social science research, we deal mostly with two types of variables: independent and dependent.
- Independent variables are those things thought to be the cause or bring about change in other variables.
- Dependent variables are those things changed or affected by independent variables, sometimes through other variables.
- Independent variables always come before dependent variables in time and space.
- Hypotheses are simply if- sentences that can be categorized in certain logical forms, such as no difference (null hypothesis), associated difference, directionality of difference, and magnitude of difference.

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- If you are conducting a quantitative research study, you will typically state your specific hypotheses that you have developed from your literature review.
- A hypothesis is the researcher's prediction of the relationship that exists among the variables being investigated.
- If you wrote a research question, the hypothesis will be your tentative answer to your question.
- For the quantitative research question (i.e., What effect does using the faculty library have on students' overall grade point average during the semester examination?) the related hypothesis might go like this: Students who use the faculty library during the semester will experience a decrease in their semester examination results as compared to students not used the faculty library.

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- Unlike in quantitative research (where hypotheses are stated before collecting the data), hypotheses in qualitative research are often generated as the data are collected and as the researcher gains insight into what is being studied.

Develop a hypothesis

- A hypothesis is: "A statement of the relationships among the variables that a researcher intends to study."
- This definition brings out two important ideas.
- First, hypotheses are assertions about how two or more variables are related to or associated with each another.
- Assume that we're again interested in studying why students leave college.

Essential concepts

- One possible hypothesis is: Students drop out of college because they cannot afford to pay the high costs.
- This hypothesis posits that dropping out finance is related, and suggests that those who can't afford the costs will leave.
- It is testable, because we could see if students leave because they can't afford the cost (versus leaving for other reasons).
- Hypotheses should both say what we expect to find in our research and be testable.
- The second concept the definition illustrates is the idea that hypotheses are formulated for variables that we intend to study.
- In other words, the hypotheses are formulated before we do our research.

Essential concepts

- It's not considered proper to do the research, poke around in the data, and then write up a hypothesis that "fits" what we found.
- Hypotheses should be based on theory and what previous researchers have found; they are not just made up "off the cuff."
- Hypotheses are scientifically reasonable predictions.
- Remember, all good hypotheses are testable, and make specific predictions about what the researcher expects to find in his/her research.
- The development and testing of hypotheses is one of the important things that makes research scientific.

Essential concepts

- **Reliability**

- For a research study to be accurate, its findings must be reliable and valid. Reliability means that the findings would be consistently the same if the study were done over again. It sounds easy, but think of a typical exam in the institution; if you scored a 74% on that exam, don't you think you would score differently if you took it over again?

- **Validity**

- Validity refers to the truthfulness of findings; if you really measured what you think you measured, or more precisely, what others think you measured; it will provide you the same valid information.