

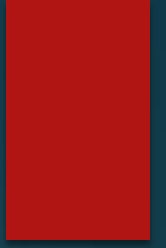
VARIABLE



Variable

- ▶ A central idea in research.
- ▶ Variable is a concept that varies.
- ▶ Anything (concept/term) that can take on differing or varying values. 2+ values. Could be numerical.
- ▶ Variation can be in quantity, intensity, amount, or type. Examples
- ▶ Production units, Absenteeism, Gender, Religion, Motivation, Grade, Age.

Types of Variable



Continuous and Discontinuous Variable

- ▶ Can the values be divided into fractions?
- ▶ Discontinuous → Discrete categories. Categorical. Classificatory.

Dependent and Independent Variable

- ▶ DV → Outcome variable → effect variable (Y). Variation in Y is influenced by some other factor (s)
- ▶ IV → (X) that influences the Y.
- ▶ The variance in Y is accounted for by X.

Explaining X and Y variables

X variable

- ▶ Presumed cause
- ▶ Stimulus
- ▶ Predicted from
- ▶ Antecedent
- ▶ Manipulated
- ▶ Predictor

Y variable

- ▶ Presumed effect
- ▶ Response
- ▶ Predicted to
- ▶ Consequence
- ▶ Measured outcome
- ▶ Criterion

Moderating Variable

- ▶ A variable that moderates the strength of $X - Y$ relationship.
- ▶ Strong relationship between the library facility (X) and performance of students (Y). Depends on the “interest and inclination” of students (MV).
Modifies the original relationship.
- ▶ Relationship is contingent on another variable.

Intervening Variable

- ▶ Surfaces between the time X starts influencing the Y. Time factor. In fact is a function of X.
- ▶ $IV \rightarrow IVV \rightarrow DV$. IVV may be DV for IV in the first place, then it is IV for DV.
- ▶ Marital status \rightarrow social integration \rightarrow Suicide.
- ▶ 4-day workweek (IV) will lead to higher productivity (DV) by increasing job satisfaction (IVV).

Extraneous Variables

- ▶ Infinite number of EV exist that may effect XY relationship.
Confounding factors.
- ▶ To be identified by the researcher.

Whether a variable is X or Y or moderating or intervening is determined by the researcher.



Relationship of Variables

- ▶ Relationship among variables. Logical.
- ▶ A statement concerned with the theoretical relationship among variables is a proposition.
- ▶ If the relationship refers to an observable reality, then the proposition may be testable → call it a hypothesis.

HYPOTHESIS



Background

- ▶ **Once variables identified**
- ▶ **Establish the relationship through logical reasoning. Proposition.**
- ▶ **Proposition is a statement about variables judged to be true.**

Definition

- ▶ Hypothesis is a testable counterpart of proposition i.e. If variables refer to empirical reality then it could be testable.
Therefore
- ▶ Hypothesis is a testable proposition.

Example –1

- ▶ Officers in my organization have higher than average *level of commitment*.
- ▶ How many variables in this hypothesis?
- ▶ Can we test this hypothesis?

Example 2

- ▶ *Level of job commitment of the Officers is associated with their level of efficiency.*

Example –3

- ▶ ***Level of job commitment of the Officers is positively associated with their level of efficiency.***

Example – 4

- ▶ **The higher the *level of job commitment* of Officers the lower their *level of absenteeism*.**

Types of Hypothesis



i. Descriptive Hypothesis

- ▶ Also called univariate hypothesis: Proposition that typically states the existence, size, form, or distribution of some variable. e.g.
- ▶ Majority of the students registered in RM class are highly motivated.

ii. Relational Hypothesis

- ▶ Statement describing the relationship between two or more variables.
- ▶ Relationship can be non-directional or directional

a. Non-directional relationship

- ▶ **The nature of relationship is not specified. Non-directional relationship.**
- ▶ **Job satisfaction and motivation are related.**

b. Directional relationship

- ▶ Hypotheses are both relational and directional
- ▶ Direction of relationship specified. Use of words like positive, negative, more than, less than.
- ▶ Hypotheses can be correlative or causal

c. Correlational Hypothesis

- ▶ Variables occur in some specified manner without implying that one causes the other. e.g.
- ▶ *Level of job commitment* of Officers is positively associated with their *level of efficiency*. Direction. Not causal

d. Explanatory Hypothesis

- ▶ Also called causal hypothesis.
- ▶ X and Y specified.
- ▶ X causes change in Y. e.g.
- ▶ High motivation causes high efficiency.


Different ways to state hypothesis

- ▶ Hi motivation causes hi efficiency.
- ▶ Hi motivation leads to hi efficiency.
- ▶ Hi motivation and hi efficiency are +ly related
- ▶ Hi motivation influences hi efficiency.
- ▶ Hi motivation is associated with hi efficiency.
- ▶ Hi motivation produces hi efficiency.
- ▶ Hi motivation results in hi efficiency.
- ▶ If hi motivation then hi efficiency.
- ▶ Higher the motivation, higher the efficiency

iii. Null Hypothesis

- ▶ No relationship between the variables /
- ▶ The relationship between the variables is “zero”
- ▶ Null hypothesis is denoted as H_0
- ▶ H_0 = No relationship between X and Y /
- ▶ H_0 = X and Y are independent of each other.
- ▶ H_0 is non directional.

Use of Null Hypothesis



- ▶ Used for testing the research hypothesis
- ▶ Researchers give more importance to negative evidence. No relationship rather than a relationship i.e. Null hypothesis.
- ▶ Reject H_0 and accept alternative

iv. Alternative Hypothesis

- ▶ It is alternative to H_0 .
- ▶ There is a perfect relationship between X and Y i.e. H_1

v. Research Hypothesis

- ▶ This is the hypothesis formulated by the researcher.
- ▶ Tells not only the relationship but also the nature of relationship between X and Y.

The Role of Hypothesis

- ▶ It guides the direction of study
- ▶ It identifies facts that are relevant and those that are not.
- ▶ It suggests which form of research design is likely to be the most appropriate.
- ▶ It provides framework for organizing the conclusions of findings the conclusions of findings.

The Characteristics of a Testable Hypothesis

- ▶ Hypothesis must be conceptually clear.
- ▶ Hypothesis should have empirical referents.
- ▶ Hypothesis must be specific.
- ▶ Hypothesis should be related to available techniques of research.
- ▶ Hypothesis should be related to a body of theory

REVIEW OF LITERATURE



Assumption

- ▶ ***Assumption is that:***
 - **Knowledge accumulates.**
 - **We learn from and build on what others have done.**

In review

- ▶ Researchers read other people's research.
- ▶ They learn, compare, replicate, or critically appreciate the work by others.



Goals of Review of Literature

1. To demonstrate a familiarity with a body of knowledge and establish credibility.

- ▶ **Tells the reader that the researcher knows the research in an area and knows the major issues. i.e.**
- ▶ **Demonstrates the researcher's professional competence, ability, and background.**

2. *To know the path of prior research and how the current research project is linked to it*

- ▶ **Review outlines the direction, ability, and background of research on a question and shows the development of knowledge.**
- ▶ **Places the research project in context
→ makes a connection to a body of knowledge.**

3. *TO INTEGRATE AND SUMMARIZE WHAT IS KNOWN IN AREA*

- ▶ Tells where prior studies agree, disagree, where questions remain unanswered.
- ▶ No reinvention of the wheel. No wastage of effort.
- ▶ Indicates direction for future research

4. *To learn from others and stimulate new ideas*

- ▶ **Researcher benefits from others efforts.**
- ▶ **Ready made techniques. Also difficulties, blind alleys. Replications to overcome previous limitations.**

5. *Identification of variables*

- ▶ **None of the important variable relevant to the study project is left out.**

6. *Help in developing theoretical framework*

- ▶ **Ready made theoretical models for research may be available.**
- ▶ **Previous studies provide evidence for developing theoretical argumentation for positing the relationship among variables.**

7. *Problem statement can be made with precision*

- ▶ **Review provides clarity of thought about the issue under study.**

Types of Reviews

- ▶ **Reviews vary in scope and depth.**
- ▶ **Each may have different goals**
- ▶ **Six types of reviews**

1. *Self study reviews*

- ▶ ***Increase the readers confidence***
- ▶ **Demonstrates researchers familiarity with an idea.**
- ▶ **Not only others have credibility of the researcher but also the researcher develops self-confidence.**

2. *Context reviews*

- ▶ Place a specific project in the big picture
- ▶ Focusing on a specific issue
→ providing background
- ▶ Linking the project with specific body of knowledge and advancing further.

3. Historical reviews

- ▶ Trace the development of an issue over time.
- ▶ How a particular issue or theory has evolved.

4. *Theoretical reviews*

- ▶ Compare how different theories address an issue.
- ▶ Evaluate different theories for the soundness of their assumptions, logical consistency, and scope of explanation.
- ▶ Researcher may integrate two theories – form a hybrid

5. *Integrative reviews*

- ▶ Summarizes what is known at a point in time.
- ▶ Pulls together disparate research reports.

6. *Methodological reviews*

- ▶ Point out how methodology varies by study.
- ▶ Researcher evaluates the methodological strengths of past studies.
- ▶ Conflicting results may be the outcome of different research designs

Where to find research literature

- ▶ **Computer: on line systems.**
- ▶ **Scholarly journals.**
- ▶ **Books – containing reports of original research, or collection of research articles. READERS or Book of Readings.**
- ▶ **Dissertations.**
- ▶ **Government documents.**
- ▶ **Policy reports and presented papers.**
- ▶ **Bibliographic indexes.**

Referencing electronic sources:

- ▶ **Ahmad, B. (2006). *Technology and immediacy of information.* [on line] Available <http://www.bnet.act.com>**

1. CONDUCTING
REVIEW OF
LITERATURE

2. ETHICAL ISSUES



Define and refine a topic

- ▶ Have a good idea of your topic of interest
- ▶ Some clear research question to guide pursuit of relevant material.
- ▶ “Crime” is too broad. Narrow it to: “type of crime” or “economic inequality and crime”
- ▶ Review may help refocusing.

Design a search

- ▶ **Set parameters of your search:**
- ▶ **Type of review; how extensive.**
- ▶ **How to record the bibliographic citations.**
- ▶ **Begin a file folder or computer file.**

Locate research reports

- ▶ **Articles in scholarly journals.**
- ▶ **Locating the relevant articles is difficult.**
- ▶ **Many academic field have “abstracts” or “indexes” for scholarly literature.**
- ▶ **Look in reference section of library**
- ▶ **Also available on computer.**

Computerized literature search

- ▶ Researchers organize computerized researches by author, by article title, by subject, or by keyword.
- ▶ *Keyword* important term for topic that is likely to be found in the title.
- ▶ Use 6-8 keywords in most computer based searches and use several synonyms

Other material

- ▶ **Scholarly books: have to use catalog**
- ▶ **Dissertations: A publication called *Dissertation Abstract International*.**
- ▶ **Government Documents: Section in library.**
- ▶ **Policy reports and presented papers. Difficult to locate. May be part of some bibliographies of published studies, or abstracts, or indexes.**

What to record

- ▶ Write down all details of the reference (full name of the authors, titles, journal name, year, volume, issue, pages)
- ▶ Same about books and other publications.
- ▶ Follow some standard format Like APA/ASA style.
- ▶ Referencing electronic source: Ahmad, B. (2006). *Technology and immediacy of information*. [on line] Available <http://www.bnet.act.com>

Write the review

- ▶ Read critically. Skepticism is the norm of science. Don't accept simply because it is published. Evaluate.
- ▶ See whether introduction and the title fit with the rest of the article.
- ▶ Methods and results sections are the most critical.

How review will look like?

- ▶ Listing series of reports with a summary of each is not a review.
- ▶ It reads a set of notes strung together.
- ▶ Organize common findings or arguments together.
- ▶ Address the most important ideas first, to logically link findings, and to note discrepancies.

Plagiarism

- ▶ In publications, presentations, writings the researchers explicitly identify, credit, and reference the author when they take data or material verbatim from another person's written work, whether it is published, unpublished, or electronically available.
- ▶ Do not present others' work as your own. Even the ideas have to be acknowledged.

Ethical Issues in Research

- ▶ **Management listening to Union members' conversation in cafeteria through hidden devices. Is there a moral question involved?**
- ▶ **A researcher discards damaging information about an organization. Is this proper?**
- ▶ **These questions are philosophical questions.**

Ethical Issues

- ▶ Philosophical questions (No agreement)
- ▶ Societal norms determine what is right and what is wrong.
- ▶ Codes of behavior determine what ought to be done.

Ethical behavior pervades
each step of the research
process – data collection,
data analysis, reporting,
and dissemination of
information



Rights of the respondents

- ▶ **The right to be informed (informed consent: the expressed or implied acknowledgment waiving an individual's right to privacy when he/she agrees to participate in study)**
- ▶ **The obligation to be truthful**
- ▶ **Privacy**
- ▶ **Deception**

Obligations of the researcher

- ▶ **The purpose of research is research. Do not misrepresent.**
- ▶ **Objectivity – also no misrepresentation of research findings**
- ▶ **Protecting the right to confidentiality of the subject and clients.**

THEORETICAL FRAMEWORK



Theoretical framework

- ▶ **Theorizing the relationships among several factors relevant to the study.**
- ▶ **Can be called a conceptual model.**

Conceptual Model


- ▶ **Researcher elaborates the relationship among the variables.**
- ▶ **Explains the logic underlying these relationships.**
- ▶ **Describes the nature and direction of the relationships**

Theoretical foundation

- ▶ **Build up the theory**
- ▶ **Deduce hypothesis**
- ▶ **Test the theory or part thereof.**

Provides the roadmap

- ▶ To the formulation of appropriate research question.
- ▶ To the formulation of research hypothesis.
- ▶ To the advancement of knowledge by testing theory.



Six basic
components of
Theoretical
Framework

1. Make an inventory of variables

- ▶ Identify the variables relevant to the study.
- ▶ Search the literature, talk with informants, and observe

2. Specify the direction of relationship

- ▶ **Theorize the direction of relationship among the variable → negative or positive**

3. Logic for the proposed relationship

- ▶ **Theorize the logical relationship between different variables.**
- ▶ **Argument could be built up on the basis of previous studies, observations, inferences.**

4. Make an inventory of propositions

- ▶ Stipulation of logical relationship between two variables ends up in a proposition.
- ▶ Number of interrelationships resulting in a number of propositions.
- ▶ Each proposition supported by rigorous logic.
- ▶ Take stock of the propositions.

5. Arrange propositions sequentially

- ▶ **Interlink the propositions and arrange them sequentially.**
- ▶ **Axiomatic derivation.**
- ▶ **This will be theoretical framework**

6. Present schematic diagram

- ▶ **Helps in understanding the theorized relationships among the variables.**

Example → Research Question

- ▶ **Why middle class families become small in size?**
- ▶ **Let us follow the guideline for theoretical framework.**

1. Inventory of relevant variables

- ▶ Education level of the couples, age at marriage, working women, rationalism, exposure to mass media of communication, accessibility to health services, use of family planning practices, parental aspirations about the education of their children, shift to nuclear families, mobility orientation, etc.

2. Specify the direction of relationship

- ▶ If you just make statements by using variables, it can indicate the direction of relationship. Look:
- ▶ Higher the education higher the age at marriage. Higher the education of women greater the chances of their being career oriented. Higher the education more the rationalism.

- ▶ Higher the education more the exposure to mass media of communication. Higher the education more the accessibility to health services. Higher the education more the exposure to mass media of communication. Higher the education more the accessibility to health services. Higher the education greater the use of family planning practices. Higher the education of parent higher their aspiration about the education of their children

3. Explanation for the proposed relationship

Higher the education higher the age at marriage: *Argumentation:* For getting high levels of education the youth spend about 16 years of their life in educational institutions.

Usually complete their schooling at age 22 years. Spend about 2-3 years for establishing themselves in their careers. During the whole of this period marriage is deferred. So with hi education the age at marriage goes up.

Compare

- ▶ By the time highly educated youth decide to marry they are 25yrs.
- ▶ Compare marriage at age 25 yrs with marriage at age 16 yrs.
- ▶ With this higher age at marriage there is a reduction in reproductive period of women.
- ▶ Many of these women may be career women. Should they spend time to raise the children or to pursue the career. Rational decisions about the use of contraceptives. Family limitation is the option.

4. Inventory of propositions


- ▶ **The relationships specified under item 2 can be examples of propositions. Formulate additional propositions by using other combinations of variables.**

5. Arrange propositions sequentially

- ▶ Higher the education, more the rationalism. Higher the rationalism, more the investment in career achievement. Greater the investment in career achievement, higher the age at marriage. Higher the age at marriage, shorter the reproductive period.
- ▶ Shorter the reproductive period, smaller the size of family.
- ▶ Use of contraceptive may be an intervening variable

6. Schematic diagram

- ▶ By preparing a schematic diagram researcher had an idea from where he is going to start (introduction) and what will be the step by step procedure to complete the research literature means what will come in the introduction section, rationale methods (instruments) and how he /she is going to use this literature while defending the results.



PROBLEM DEFINITION AND RESEARCH PROPOSAL

First step in research process

- ▶ No formula for the selection of topic.
- ▶ Start with a broad area of interest.
- ▶ Interest from a variety of sources:
 - ▶ Personal experiences.
 - ▶ Mass media.
 - ▶ Developments in knowledge.
 - ▶ Solving problems (Org., family).
 - ▶ Hot issues of daily life.

Broad area of interest

- ▶ Family → Trends in Pakistani family
- ▶ Population → Aging population
- ▶ Labor Unions → Protecting the rights of members.
- ▶ Marketing → TV commercials

Narrowing the topic

- ▶ Try to get background information from different sources.
- ▶ For example

Examine the literature

- ▶ Published articles are excellent sources of ideas for R. questions.
- ▶ Already specific and suggest research questions. Focus on the following:
 - ▶ a. Explore unexpected findings discovered in previous research.
 - ▶ b. Follow future research suggestions.
 - ▶ c. Apply existing theory to new topic.
 - ▶ d. Challenge the previous findings.
 - ▶ E. Specify the intervening process

Talk over ideas with others

- ▶ Share ideas with knowledgeable people
- ▶ Seek out those who differ. Discuss possible research questions with them.

Apply to a specific context

- ▶ Focus onto a specific historical period.
- ▶ Narrow the topic to a specific society.
- ▶ Consider which subgroups are involved – expected differences

From research question to hypotheses

- ▶ Tentative answers to questions – identification of variable (Family, population, labor unions)
- ▶ Argumentation – propositions
- ▶ Testable propositions – hypotheses
- ▶ Interrelationship of propositions – framework

Problem Definition

- ▶ From broad to specific concern
- ▶ Present problem statement in clear and precise manner. Problem could be
- ▶ An existing business problem identified by the Manager
- ▶ Scope for future improvement
- ▶ Areas needing conceptual clarity
- ▶ Curiosity of the researcher

Sponsored Researches

- ▶ Symptoms of issues identified – tip of the iceberg – underlying factors to be identified.
- ▶ Management dilemmas to be translated into research questions
- ▶ Terms of reference
- ▶ Some steps may not get emphasis.
- ▶ Management's research decisions based on the urgency of the study, time available, existing information, and cost-benefit equation.

Research Proposal

- ▶ Document that presents a plan for a project to reviewers for evaluation.
- ▶ Can be a supervised project or a project proposed to funding agency.
- ▶ Convince the reviewers about the capability of the researcher.
- ▶ For funded projects the researchers need to show the track record of past success.

Research proposal sections

- ▶ Introduction (background, objectives, significance)
- ▶ Research design (data collection technique, population, sample, tools, fieldwork, data processing and analysis)
- ▶ Report writing
- ▶ Time schedule
- ▶ Research Team
- ▶ Budget