Research Design

TMSL

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Research Design

- Overall framework that researchers rely on to carry out their research studies
- Contains details about the specific objectives of the study and the methods that shall be used to meet the objectives
- Show the kind of data that the researcher intends to use and how the researcher will collect, collate, process, and analyze the data
- Provides a comprehensive structure of the methods and techniques that are supposed to be used for a specific research study to be completed

Deciding on Research Design to be Undertaken

1. The objective of research may be fact finding, exploring, or evaluatory
2. The area of thinking would indicate the broad disciplinary area of the research, like sociology, economics, management, and so on
3. The locus of location is whether the research is primarily located in a library, in archives and records, in a field of activity, or in a laboratory
4. The relationship sought would include associative relationship, comparison, or causal relationship
5. The method of gathering evidence itself gives certain special features of research. For example, a questionnaire may be used, as in the surveys, interviews may be held, or participant observation may be used
6. The kind of data collected profoundly influences the kind of research. The data may be either qualitative, which may either allow generalization on arguments and description or it could be quantitative, which may lead to rigorous quantitative analysis and definitive conclusions
7. The procedure may be comparison of data, descriptive measures of data, or in-depth analysis of an incident, or it may be an evaluation of a policy
8. The time dimension of study is important from the point of view of whether the study is cross-sectional or longitudinal. In the first, the status of systems or phenomenon is analyzed, whereas in the second, the developmental aspects of several variables of the phenomenon will be investigated over time

	Types of Research			
	Ex post facto		Experiments	
Attributes	Survey	Field studies or case in depth	Laboratory experiments	Field experiments or quasi experiments
Qualitative	Y	Y	-	-
Quantitative	Y	-	Y	Y
Descriptive	Y	Y	-	-
Causal	Y	Y	Y	Y
Exploratory	Y	Y	-	Y
Formal	Y	Y	Y	Y
Case	-	Y	-	-
Statistical	Y	-	Y	Y
Understanding Theoretical	-	Y	Y	Y
Applied Problem	Y	Y	-	Y
Analytical	-	-	-	-
Empirical	Y	Y	Y	Y
Longitudinal	Y	Y	-	Y
Cross-Sectional	Y	Y	Y	Y
Participatory	-	Y	-	Y
Non- Participatory	Y	Y	Y	Y

Issues of Research Design

- *The richness of the research* in the discipline is evaluated depending on whether the discipline is in the initial stages of exploration and classification or a mature subject leading to considerable amounts of application in practice.

- *The degree of clarity* of the problem should be judged. The higher the degree of clarity, the more rigorous the research design, tending towards experimental research.

- *The degree of control* that can be obtained over a variable should be evaluated. If this is negligible, then field studies are preferred and the relationships or hypotheses tend to become somewhat weak.

- *The time scale* with respect to phenomenon to be studied should be determined. If a phenomenon can be studied effectively, considered only over a period of time, then longitudinal studies will be required.

- *The objectives set forth* should be related to the units of study, that is, the individuals, groups, organizations, or an economy/society. The research design will considerably vary as the domain of research gets enlarged.

- The kind of *relationship that is implied* by the objective or hypothesis is important. This will considerably influence the type of techniques that will be used for analysis.

Research Design Process

1. Selection of type of research

a) Field Survey Research

- General study of a large number of respondents (large sample), eliciting direct responses to specific questions.
- The responses may be collected orally, in face-to-face meetings, or remotely, through mail in written form or telephone in oral form.
- The data obtained can be generalized and is representative of a large population.
- These surveys are generally carried out at a particular point of time and are cross sectional.
- They produce ‘thin’ data (not deep).
- They are generally used for descriptive analysis, correlational type hypothesis testing, and often for exploration.

Research Design Process

1. Selection of type of research

b) Field Study

- This is an in-depth study of a single respondent or a very small number of respondents to obtain rich (deep) data of specific instances by using methods of probing.
- It uses combinations of several data collection procedures.
- It provides greater understanding of specific instances but its results cannot be easily generalized like research survey results.

Research Design Process

1. Selection of type of research

c) Experiments

- In an experiment there is controlled manipulation of one or more independent variables so that its effects on one or more dependent variables can be measured.

- There are three kinds of experiments.

(i) **Laboratory experiments (Equivalent Physical system):** Experiments in which manipulation of independent variables is carried out in an artificial environment away from the location of phenomena.

(ii) **Simulation experiments (Equivalent Symbolic System):** Here, selective manipulation of independent variables of a model of the (phenomena) system is carried out.

(iii) **Experiments in field setting:** The manipulation of independent variables is carried out in the natural setting but control is not as rigorous as in laboratory experiments.

Research Design Process

2) Selection of the measures and the measurement techniques

- Measurement is defined as the assignment of numbers to characteristics of objects, persons, states, or events according to rules

- There are four techniques –

a) **Questionnaires -**This is a set of questions, used as an instrument for seeking relevant information directly from respondents.

b) **Attitude scales-** These scales elicit self-reports of beliefs and feelings towards an object

c) **Observation sheets-** This is the direct examination of behaviour or results of behaviour.

d) **In-depth interview schedules-** These are interviews in which individuals are made to express their feelings freely and without fear of dispute or disapproval.

Research Design Process

3) Sample Selection

Sampling designs are aimed at **two major objectives:**

(i) The sample is representative of the population

(ii) The size of the sample is adequate to get the desired accuracy.

The sampling process consists of:

- A definition of the target population in terms of elements, sampling units, domain, and period
- Specification of a frame of sampling if probability sampling is used (for example, telephone directory, map, or listings)
- Specifying sampling units (for example, a firm, department, group, or an individual that is addressed in the sample)
- The sampling method (for example, probability versus non-probability, single versus cluster, stratified versus non-stratified, single stage versus multistage)
- Determination of sample size, which is the number of elements in the sample, using statistical methods but often moderated by judgment based on other considerations like availability, cost, and accessibility
- Implementation of the sampling plan by ensuring the various controls required in the field to attain the sampling objectives and by contacting the sample members.

Probability Sampling Methods

1. Simple random sampling

- In a simple random sample, every member of the population has an equal chance of being selected. Your sampling frame should include the whole population.
- To conduct this type of sampling, you can use tools like random number generators or other techniques that are based entirely on chance.

2. Systematic sampling

- Systematic sampling is similar to simple random sampling, but it is usually slightly easier to conduct.
- Every member of the population is listed with a number, but instead of randomly generating numbers, individuals are chosen at regular intervals

3. Stratified sampling

- Stratified sampling involves dividing the population into subpopulations that may differ in important ways. It allows you draw more precise conclusions by ensuring that every subgroup is properly represented in the sample.
- To use this sampling method, you divide the population into subgroups (called strata) based on the relevant characteristic (e.g., gender identity, age range, income bracket, job role).

4. Cluster sampling

- Cluster sampling also involves dividing the population into subgroups, but each subgroup should have similar characteristics to the whole sample. Instead of sampling individuals from each subgroup, you randomly select entire subgroups.
- This method is good for dealing with large and dispersed populations, but there is more risk of error in the sample, as there could be substantial differences between clusters. It’s difficult to guarantee that the sampled clusters are really representative of the whole population.

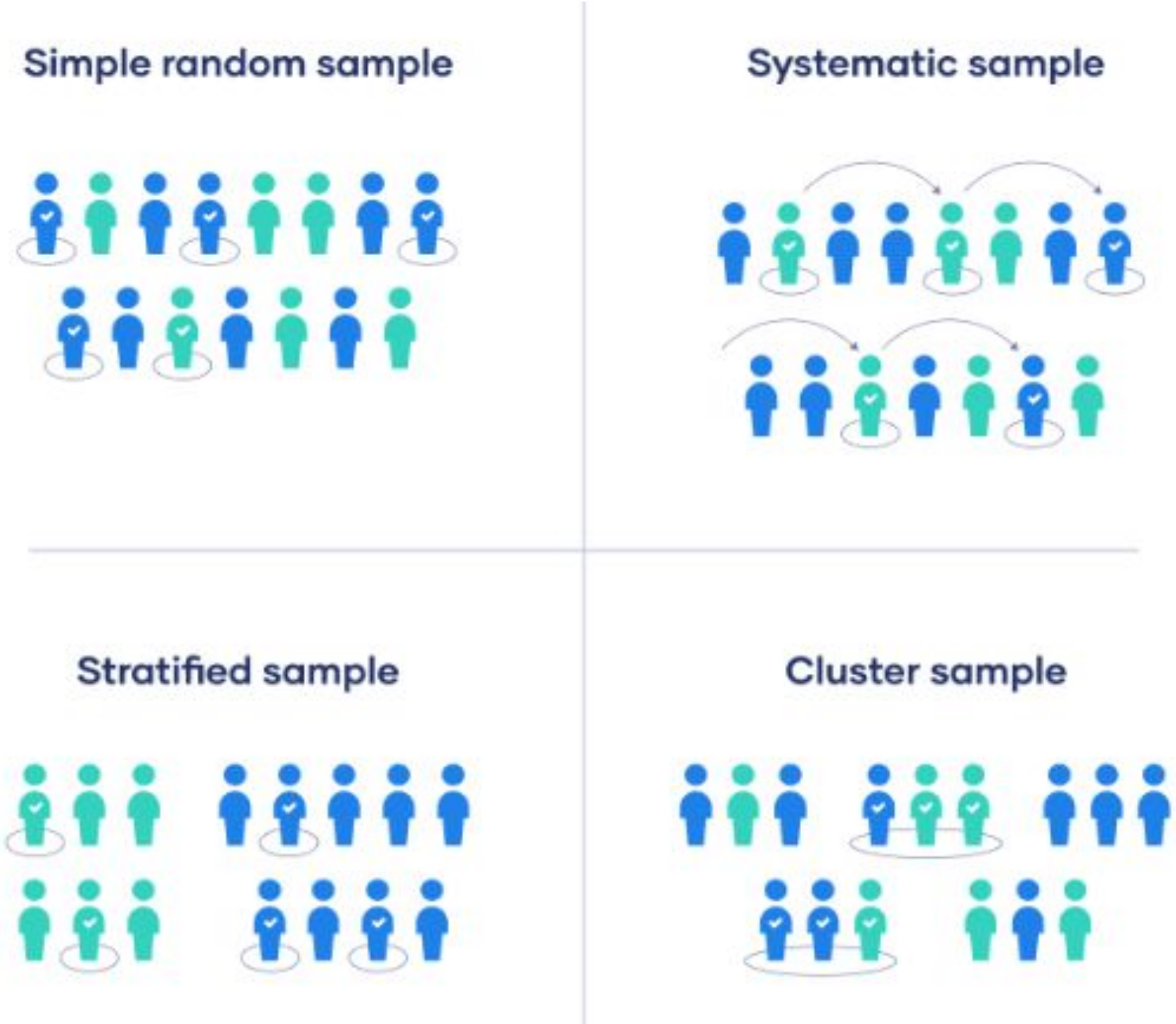

Figure: Probability Sampling Methods

Non-Probability Sampling Methods

1. Convenience sampling

- A convenience sample simply includes the individuals who happen to be most accessible to the researcher.
- This is an easy and inexpensive way to gather initial data, but there is no way to tell if the sample is representative of the population, so it can't produce generalizable results. Convenience samples are at risk for both sampling bias and selection bias.

- **2. Voluntary response sampling**
- Similar to a convenience sample, a voluntary response sample is mainly based on ease of access. Instead of the researcher choosing participants and directly contacting them, people volunteer themselves (e.g. by responding to a public online survey).
- Voluntary response samples are always at least somewhat biased, as some people will inherently be more likely to volunteer than others, leading to self-selection bias.

3. Purposive sampling

- This type of sampling, also known as judgement sampling, involves the researcher using their expertise to select a sample that is most useful to the purposes of the research.
- It is often used in qualitative research, where the researcher wants to gain detailed knowledge about a specific phenomenon

4. Snowball sampling

- If the population is hard to access, snowball sampling can be used to recruit participants via other participants.
- The number of people you have access to “snowballs” as you get in contact with more people.
- The downside here is also representativeness, as you have no way of knowing how representative your sample is due to the reliance on participants recruiting others. This can lead to sampling bias.

5. Quota sampling

- Quota sampling relies on the non-random selection of a predetermined number or proportion of units. This is called a quota.
- You first divide the population into mutually exclusive subgroups (called strata) and then recruit sample units until you reach your quota.
- These units share specific characteristics, determined by you prior to forming your strata. The aim of quota sampling is to control what or who makes up your sample.

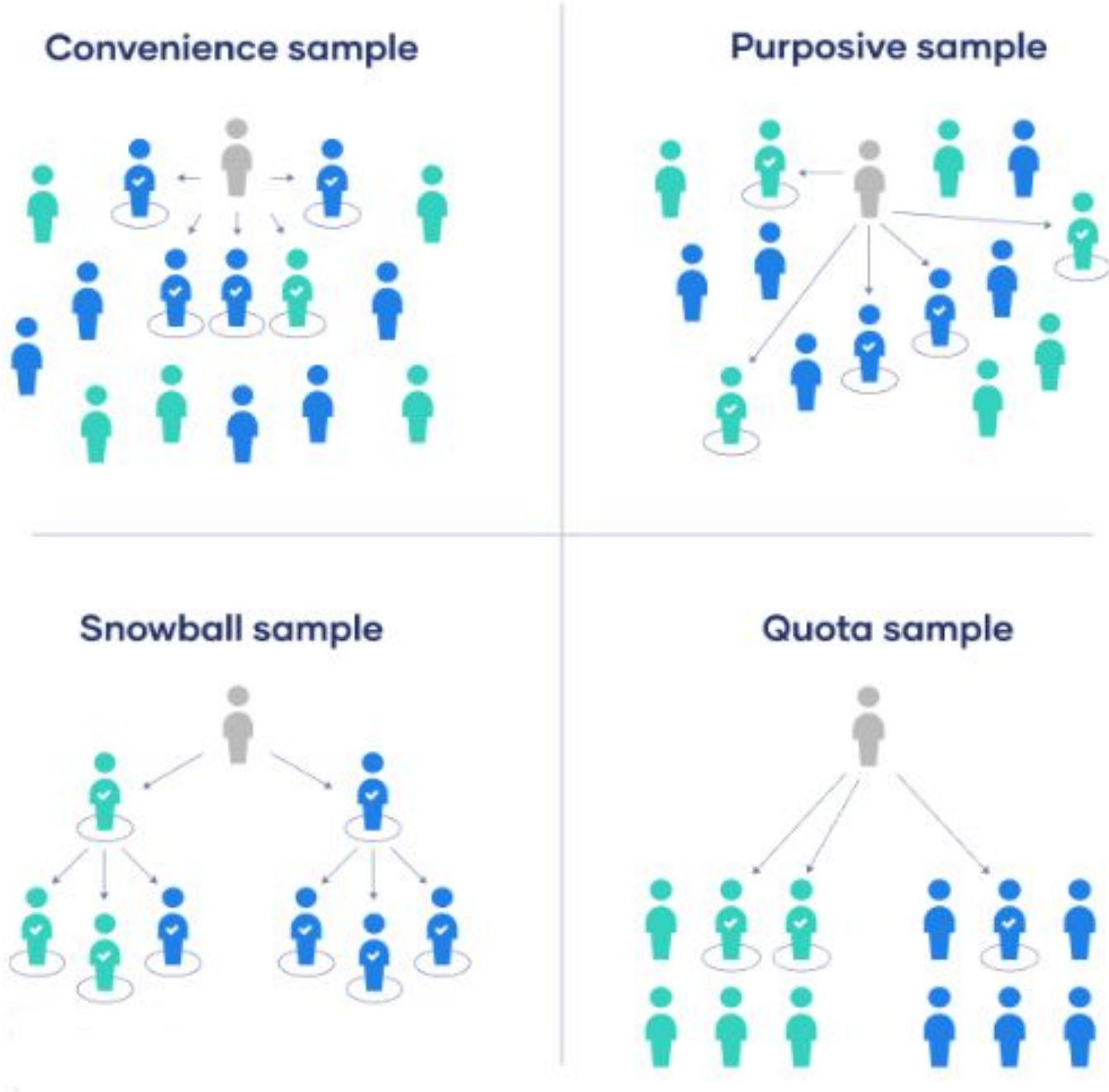

Figure: Non-Probability Sampling Methods

Research Design Process

4) Selection of Data Collection Procedures

- Data collection will involve the development of the instruments for data collection, identification of sources of data, and the context in which the sampling has to be done.
- The sources of data are usually people and existing records.
- To get information from people, it is either necessary to use interviews, where the information may be given readily, or questionnaires, where the information may have to be given after careful reflection on the part of the respondent.

Research Design Process

4) Selection of Data Collection Procedures

There are two sources of data—secondary data and primary data.

i) Secondary Data-

- This kind of data is generated for purposes other than for solving the problem under study.
- There are three methods of obtaining secondary data:
  1. The data is available in published research journals, reports, and books open to the public in libraries.
  2. Search of data generated within the organisation through reports, log books, records of unions, minutes of meetings, proceedings, accounting documents, home journals, and so on.
  3. Computer search of databases and the World Wide Web.

Research Design Process

4) Selection of Data Collection Procedures

ii) Primary Data-

- The procedures used for collecting primary data in a research study are those of the research types already discussed.

(a) Questionnaire mail surveys

(b) Interviews of several kinds

(c) Observation of phenomena/subjects

(d) Special techniques like video/audio recording/projective methods.

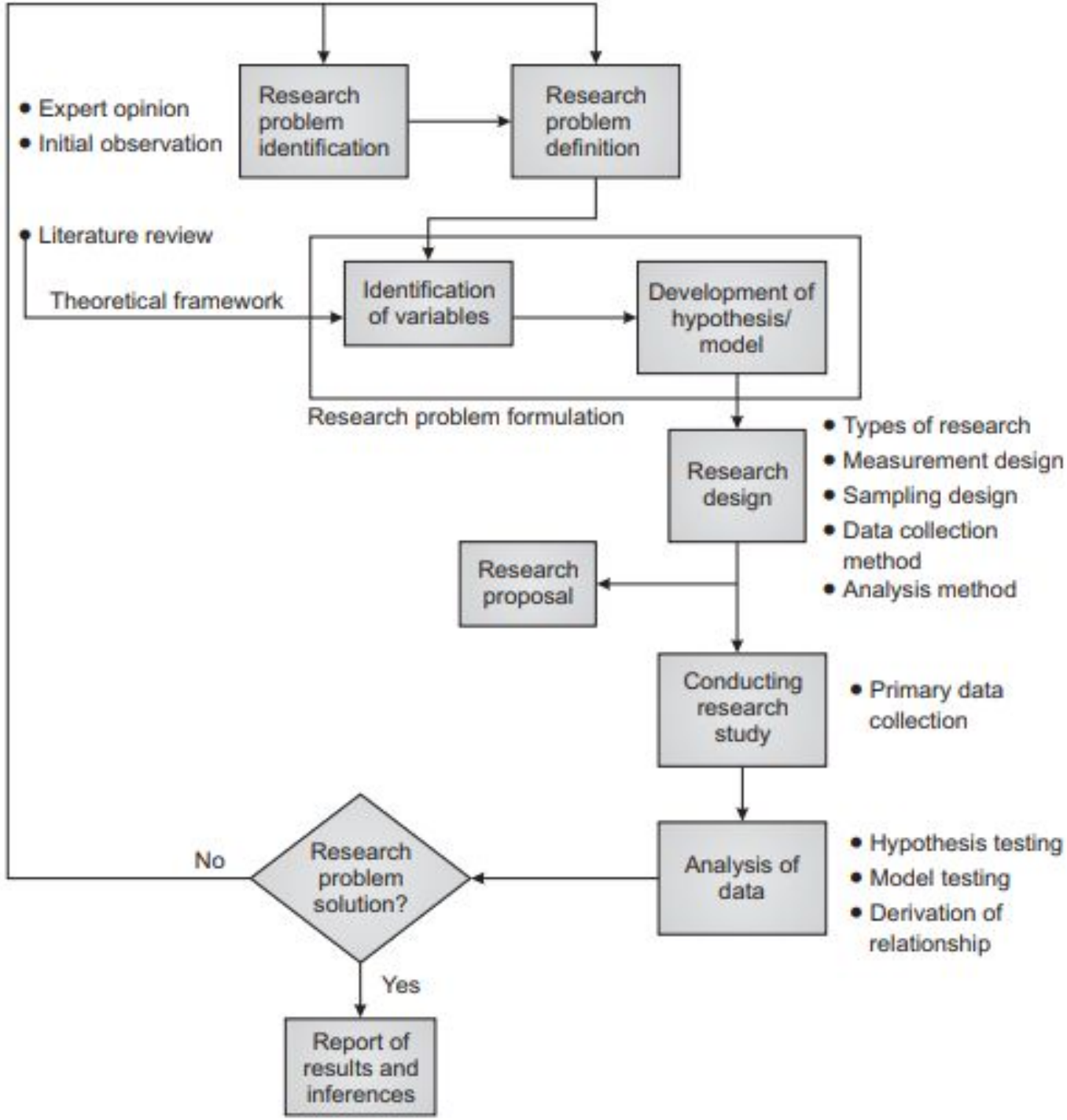

Figure: Research Process

Models

- Models are a representation of phenomena.
- While the theory tries to explain phenomena, a model tries to represent its structure, function, and process.
- Description, explication, and simulation are the three features of a model

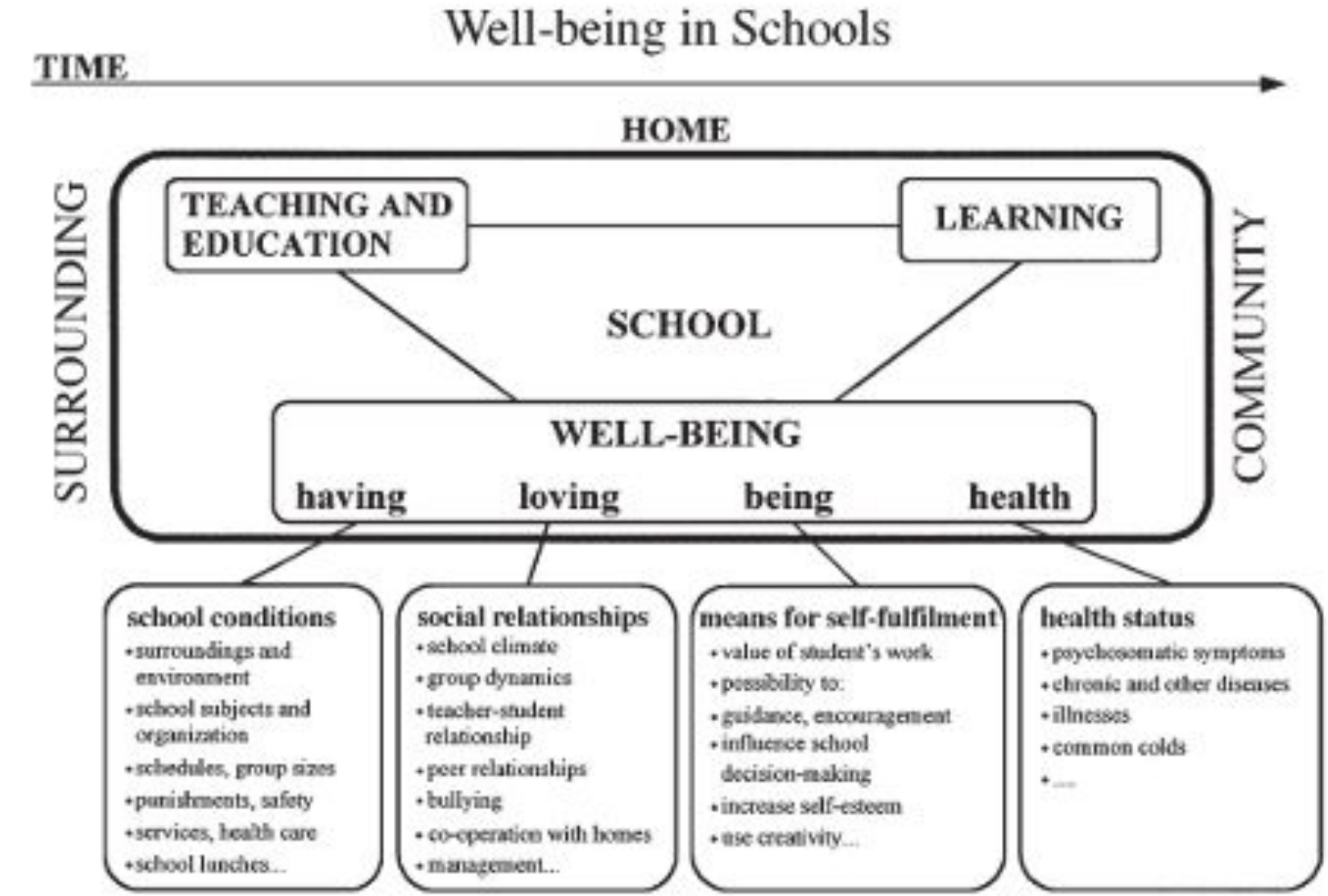

Fig. 1: The School Well-being Model.

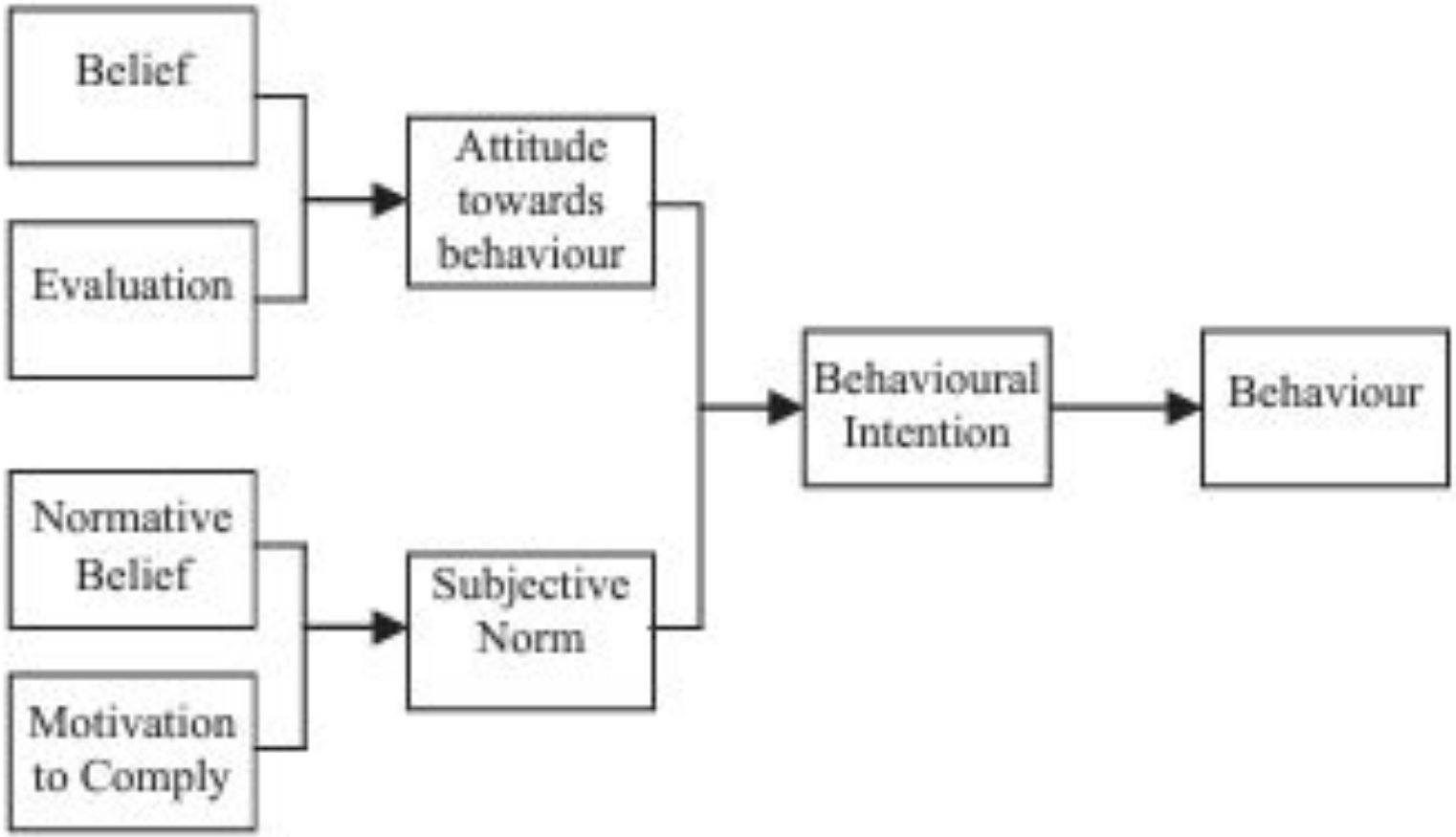

Figure: Model of reasoned Action

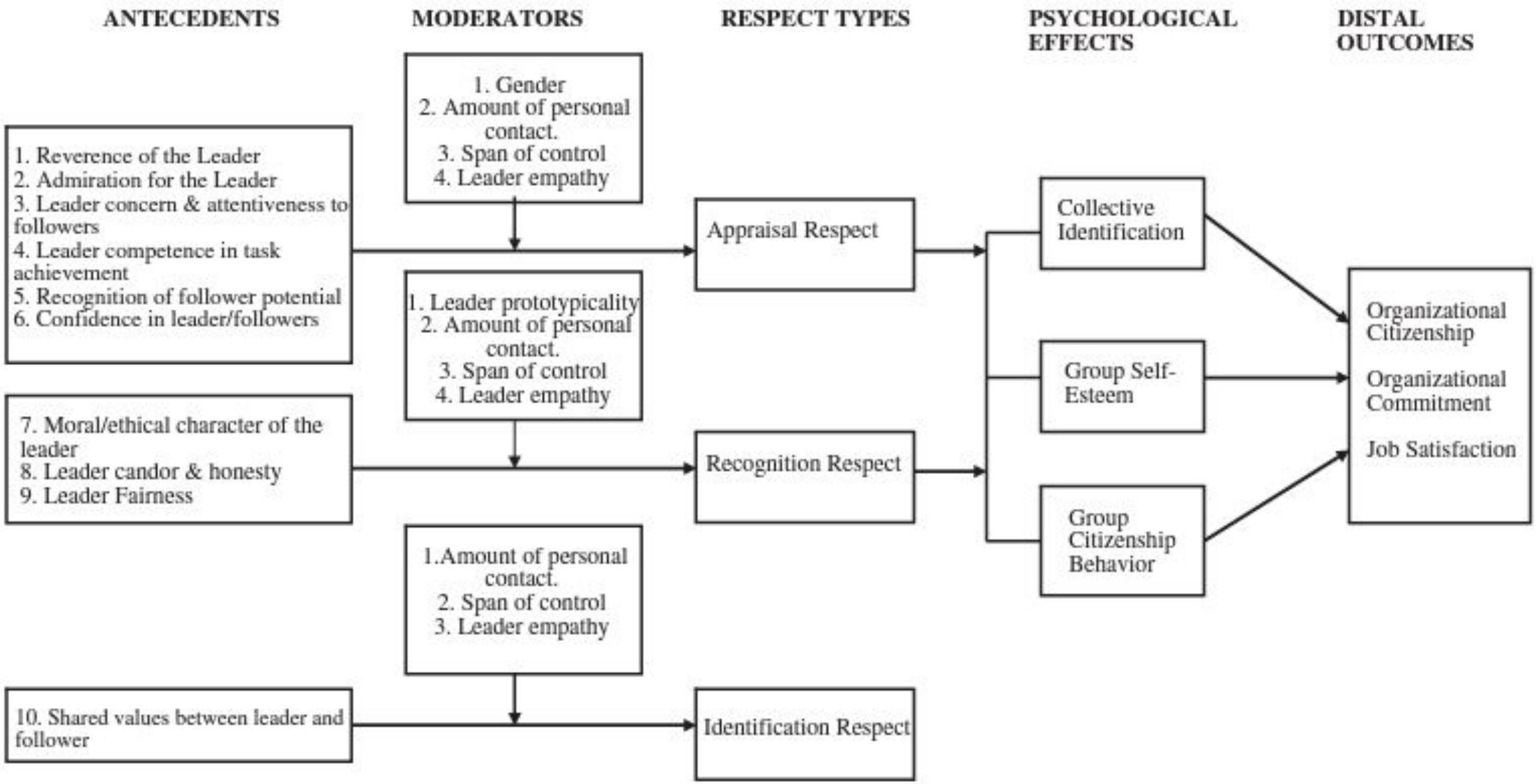

Figure: Model of Leadership