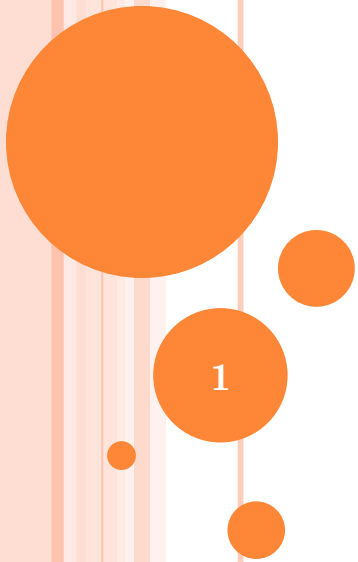


RESEARCH METHODOLOGY

9/15/2011



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RESEARCH DESIGN

- A research design is a plan or strategy of investigation so conceived as to obtain the answers to research questions.
- A research design is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically.

RESEARCH DESIGNS

- Research study designs – Different perspectives:
 - The number of contacts with the study population
 - The reference period of study
 - The nature of investigation

RESEARCH DESIGNS

- The number of contacts with the study population
 - Cross Sectional Studies
 - Before-and-After Studies
 - Lognitudinal Studies
- The reference period of study
 - Retrospective-Dealing with past events, looking back
 - Prospective-Expected or expecting to be the specified thing
 - A prospective study focuses on the outcome, whereas retrospective study looks back and examine the factors in relation to the outcome.
- The nature of investigation
 - Experimental
 - Non-Experimental

STUDY DESIGNS BASED ON NUMBER OF CONTACTS

- Based on the number of contacts with the study population, designs can be classified into three groups:
 - Cross-sectional studies
 - Before-and-After studies
 - Longitudinal studies

CROSS-SECTIONAL STUDIES

- Also know as *one-shot* studies
- Finding out the prevalence of a phenomenon, situation, problem, attitude or issue by taking a cross-section of the population
- Over all picture as it stands at the time of study
- Cross sectional with respect to study population
- Simple design
 - Identify what you want to find out
 - Select the study population
 - Select a sample
 - Contact the respondents

THE BEFORE-AND-AFTER STUDY DESIGN

- Also known as Pre-test/Post-test design
- Measures change in a situation, process, issue, problem
- Most appropriate for measuring the impact or effectiveness of a program
- two sets of cross-sectional data collection on the same population .

THE BEFORE-AND-AFTER STUDY DESIGN

○ Advantages

- Impact of an assistance

○ Disadvantages

- Two contacts with population .
- more expensive & difficult .
- Time lapse – respondents not available for ‘after’ study
- Measures total change – contributions of independent and extraneous variables cannot be quantified separately
- time lapse between the *before* and *after* observations, changes in the study population .

THE BEFORE-AND-AFTER STUDY DESIGN

- Disadvantages (Contd...)
 - **Reactive Effect**
 - The instrument itself educates the respondents
 - Example: Ascertain the impact of a program designed to create awareness of drugs
 - Questionnaire – listing drugs and asking people whether they have heard about them
 - Respondents are being made aware of them at the pre-test level and this might be reflected in the post-test level

THE BEFORE-AND-AFTER STUDY DESIGN

○ Disadvantages (Contd...)

• Regression Effect

- Possible shift in attitude between two points of data collection
- Extreme positions at pre-test stage – may shift towards the mean at post-test stage

THE LONGITUDINAL STUDY DESIGN

- pattern of change in relation to time
- Study population visited a number of times at regular intervals, usually over a long period
- Interval length may vary from study to study
- Same information collected at each visit
- Data collected from same study population .
- Equivalent to a series of repetitive cross-sectional studies

THE LONGITUDINAL STUDY DESIGN

○ Disadvantages

- Similar as before-and-after studies
- Conditioning Effect
 - If the same respondents are frequently contacted they begin to know what is expected of them
 - Responses may not be natural

RESEARCH DESIGNS

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STUDY DESIGN BASED ON REFERENCE PERIOD

- Reference Period
 - Time frame in which the study is exploring process, situation, and problem
- Categorization
 - Retrospective
 - Prospective
 - Retrospective-Prospective

RETROSPECTIVE DESIGN

- Investigate a process, situation problem that has happened in past
- Conducted either on the basis of data available for that period or on the basis of respondents' recall of situation
- Example – Living conditions in early ages

PROSPECTIVE DESIGN

- The prevalence of a process, situation, problem, and outcome in future
- Establish outcome of an event or what is likely to happen
- Experiments – prospective
- Examples
 - breath testing on prevention of accidents
 - Find effect of parental involvement on the level of academic achievement of children

RETROSPECTIVE - PROSPECTIVE DESIGN

- Focus on past direction in a process and study it into future
- A part of data is collected retrospectively from existing records
- Intervention is introduced and then the study population is followed to ascertain the impact of the intervention
- Examples – Direction studies for projection

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STUDY DESIGNS BASED ON THE NATURE OF INVESTIGATION

- Experimental Study
 - Start from the cause to establish its effects
 - Researcher introduces an intervention that is assumed to be the cause of change and waits until it has produced or has been given sufficient time to produce the change
- Non-Experimental Study
 - Start from the effects to trace the cause
 - Researcher starts from the outcomes or effects and attempts to determine the causation

EXPERIMENTAL STUDY DESIGNS

- The after-only design
- The before-and-after design
- The control group design
- The comparative design
-

THE AFTER ONLY DESIGN

- Population has been exposed to an intervention
- Study of its impact on population
- Baseline information (Pre-test)
 - Constructed on the basis of respondents' recall of the situation before the intervention
 - Existing records
- Faulty design
 - No proper baseline data available
 - Real life – mostly followed

THE BEFORE-AND-AFTER DESIGN

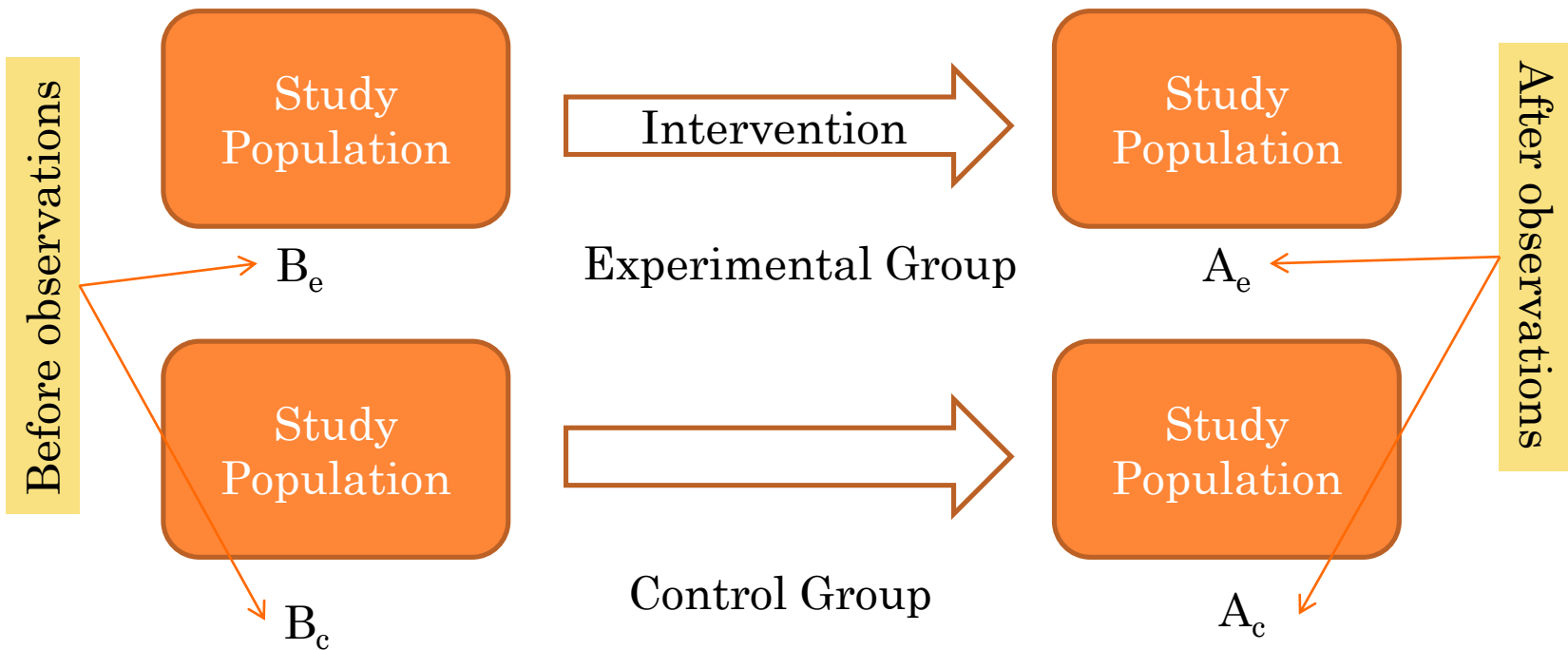
○ Observations

- Before the intervention is introduced
- After the program has been implemented or taken its effect
- Study the impact attributable to the intervention

THE CONTROL GROUP DESIGN

- Two population groups instead of one
 - Control group
 - Experimental group
- Two groups – comparable in every respect except the intervention
 - Experimental group receives intervention – the control group does not
- ‘Before’ observations made on each group at the same time
- Experimental group exposed to assistance
- ‘After’ observations are made on each group
- Difference in the before and after observations between the groups is attributed to the intervention

THE CONTROL GROUP DESIGN



In experimental group

$$A_e - B_e = \text{Impact of intervention} + \text{Impact of extraneous variables}$$

In control group

$$A_c - B_c = \text{Impact of extraneous variables}$$

THE CONTROL GROUP DESIGN

In experimental group

$$A_e - B_e = \text{Impact of intervention} + \text{Impact of extraneous variables}$$

In control group

$$A_c - B_c = \text{Impact of extraneous variables}$$

In other words

$$(A_e - B_e) - (A_c - B_c) = \text{Impact of Intervention}$$

The impact of any intervention is equal to the difference in the before and after observations in the dependent variable between the experimental and control groups

THE COMPARATIVE DESIGN

- Need to compare the effectiveness of different treatment modalities
- Study population divided into same number of groups as treatments to be tested
- For each group the baseline w.r.t. dependent variable is established
- Different treatment models introduced to the different groups
- Observe the changes in the dependent variable
- Degree of change in different groups – relative effectiveness of the interventions

THE COMPARATIVE DESIGN

- Example – Effectiveness of three teaching models on level of comprehension
- Divide the class into three groups through randomization
- Establish baseline of the level of comprehension
- Expose each group to a different teaching model
- Again measure the levels of comprehension of each group
- Compare the comprehension levels to establish the most effective group
- Extraneous variables – Equally affect each group (randomization)

SUMMARY – RESEARCH DESIGNS

- The number of contacts with the study population
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REFERENCES

- Research Methodology, Ranjit Kumar, Chapter 8