OVERVIEW OF RESEARCH DESIGNS

ADVANTAGES AND DISADVANTAGES

PROCESS OF DESIGNING AND CONDUCTING A RESEARCH PROJECT

❑ What--What was studied? What about--What aspects of the subject were studied? What for--What is/was the significance of the study?	➢ Introduction, Research Question(s), Objectives and Justification
❑ What did prior lit./research say?	➢ Literature Review
❑ What was done--How was the study conducted?	➢ Methodology
❑ What was found?	➢ Results and Discussion
❑ So what?	➢ Implications
❑ What now?	➢ Conclusions and Future Res

ETHICS IN RESEARCH

- ❑ **Responsibility as a research**
  - Protection of the subject – do no harm
  - Anonymity and Confidentiality
- ❑ **Certification of Ethical Behavior in Research**
- ❑ **Must complete an IRB Protocol**
  - Expedited Protocol
  - Exempt Protocol
  - Full Protocol
- ❑ **Plan for at least 4-6 weeks for approval**
- ❑ **Cannot do any research until you have that approval**

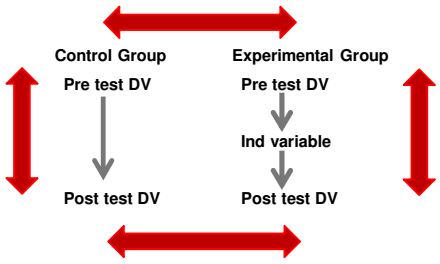
EXPERIMENTAL RESEARCH

- Experimental research is an attempt by the researcher to design a structure that maintains control over all factors that may affect the result of an experiment.
- In doing this, the researcher attempts to determine or predict what may occur.
- Experimental design is a blueprint of the procedure that enables the researcher to test a hypothesis by reaching valid conclusions about relationships between independent and dependent variables.
- Thus experimental designs are very useful for cause and effect questions.

KEY CHARACTERISTICS OF EXPERIMENTAL DESIGNS

- Participants selected and assigned to groups
  - control
  - experimental
- An intervention is applied to one or more groups
- Time is a factor
- Outcomes are measured at the end of the experiment

EXPERIMENTAL DESIGN STRUCTURE



KEY CHARACTERISTICS OF EXPERIMENTAL DESIGNS

- Procedures are designed that address potential threats to validity
  - Internal
  - External
  - Construct
  - Statistical Conclusion

- Statistical comparisons of different groups are conducted

EXPERIMENTAL DESIGNS

- Characterized by complete *random assignment* of groups or subjects
- Groups are independent
- Usually employs strong control
- Parametric analysis has very rigid assumptions
- When assumptions cannot be met, one would use nonparametric analysis

EXPERIMENTAL DESIGN ADVANTAGES & DISADVANTAGES

Advantages

High level of control

Applicability across fields

Clear cut results

Variety of structures

Easily replicated

EXPERIMENTAL DESIGN ADVANTAGES & DISADVANTAGES

Disadvantages

Cannot always bring things to the laboratory

Ethics of experimentation and denial

High possibilities of human error

Experimental influence – Hawthorne effect

Manipulation of variables is not completely objective

SURVEY DESIGN

a.k.a. "paper-pencil" measures or "self-report" measures

represents the dominant paradigm for social science research in the last 30 years

CHARACTERISTICS OF TYPES OF SURVEYS

Type of survey	Obtaining sample	Cooperation rate	Cost per respondent	advantages	disadvantages
in person	difficult	medium	high	interviewer rapport, nonverbal cues	respondent apprehension, expensive
telephone	easy	high	medium	Fast	Limited time, nonrandom sample
mall intercept	easy	medium	medium	fast, in-person	Nonrandom sample
mail	easy	low	low	expensive	Nonrandom sample, respondent errors
computer-assisted	easy	high	low	automatic data entry	Requires computer literacy

SURVEY DESIGN ADVANTAGES & DISADVANTAGES

Advantages

- Efficient for collecting large amount of information
- Statistical techniques to determine validity, reliability, and statistical significance
- Flexible to collect wide range of information
  - attitudes, values, beliefs, and past behaviors.
- Standardized - relatively free from several types of errors
- Relatively easy to administer
- Economy in data collection

SURVEY DESIGN ADVANTAGES & DISADVANTAGES

Disadvantages

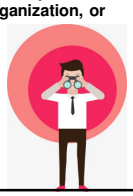
- Subjects' motivation, memory, and ability to respond
- Not appropriate for studying complex social phenomena
- Structured surveys, particularly those with closed ended questions, may have low validity when researching affective variables.
- *Respondents* usually self-selected
- Participants may not answer honestly

OBSERVATION DESIGN

Field Research

Nonparticipant observation. Researcher is not part of the activity taking place, but simply observes. May be identified as observer/research.

Participant observer. Researcher takes part in community, organization, or activity. Researcher attempts to learn what it is like to be part of the community, organization, or participate in the activity.



OBSERVATIONAL DESIGN

Case Studies

Field Studies

Ethnographic

Ethnomethodological

Classificatory

STYLES OF OBSERVATION

Unstructured observation – describing what occurs. Researcher usually does not have a preconceived idea about what would occur.

Semi-Structured observation [using a checklist to record what you have found]. Requires that you have an idea about what will be found.

Structured observation. Starting with an operational definition of what you want to measure – and counting only the behavior or situation that "fits" the definition.

OBSERVATION DESIGN ADVANTAGES & DISADVANTAGES

Observational Research

Advantages	Disadvantages
• Access to situations and people where questionnaires and interviews are impossible or are inappropriate to use.	• Can be viewed as too subjective.
• Access to people in real life situations.	• Time consuming.
• Good for explaining meaning and context.	• Depends on the role of researcher
• Can be strong on validity and in-depth understanding.	• Overt: may affect the situation and thus validity of findings.
• Can be strong on validity and in-depth understanding.	• Covert: ethical principles contra vened.
	• High potential for role conflict for practitioner researchers.

OTHER DESIGNS

Causal Comparative (retrospective)

Documentary Analysis

- Historical
- Content Analysis

Secondary Analysis

- Data Banks
- Meta Analysis

Unobtrusive Analysis

Modelling & Simulation

CAUSAL-COMPARATIVE RESEARCH?

Also known as "ex post facto" research. (Latin for "after the fact").

In this type of research investigators attempt to determine the cause or consequences of differences that already exist between or among groups of individuals.

Retrospective research.

IN OTHER WORDS…

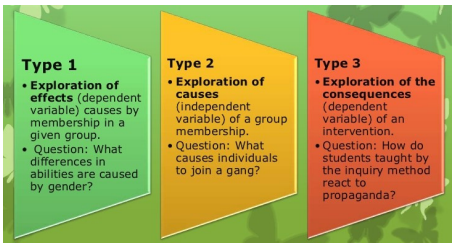
Causal-comparative research is an attempt to identify a causative relationship between an independent variable and a dependent variable.

- The relationship between the independent variable and dependent variable is usually a suggested relationship (not proven) because you (the researcher) do not have complete control over the independent variable.

THE THREE TYPES

There are 3 types of causal-comparative research:

- Exploration of Effects
- Exploration of Causes
- Exploration of Consequences



SIMILARITIES TO CORRELATIONAL RESEARCH

Both types of research are examples of associational research:

- Researchers seek to explore relationships among variables.

Both attempt to explain phenomena of interest.

Both seek to identify variables that are worthy of later exploration

- Often provide guidance for later experimental studies.

THE STEPS…

Problem Formulation

Select the sample of individuals to be studied.

Instrumentation- achievement tests, questionnaires, interviews, observational devices, attitudinal measures…there are no limits…

THE DESIGN

The basic design is to select a group that has the independent variable and select another group of subjects that does not have the independent variable.

The 2 groups are then compared on the dependent variable.

INTERNAL VALIDITY

Usually 2 weaknesses in the research:

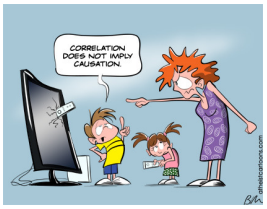
- Lack of randomization
- Inability to manipulate an independent variable

Threats

- Oftentimes subject bias occurs
- Location
- Instrumentation
- Loss of subjects

PROCEED WITH CAUTION!!!

The researcher must remember that demonstrating a relationship between 2 variables (even a very strong relationship) does not "prove" that one variable actually causes the other to change in a causal-comparative study.



HISTORICAL RESEARCH?

It is the procedure in which a researcher collects and evaluates data to understand reports or observation made by others.

It test hypotheses concerning causes, effects or trends that may help to explain present events and anticipate future events.

SOURCES OF INFORMATION

Primary

- Eye or ear witnesses
- Original documents such as

Secondary

- Copies of objects
- Second hand information
  - Textbooks
  - Periodicals
  - Newspapers
  - Encyclopedias
  - Review of research and other references

EVALUATING SOURCES

External Criticism

- Authentic?
- Genuine?

Internal Criticism

- Accurate?
- Meaning?

EXTERNAL CRITICISM

Who wrote the document?

For what purpose was the document written?

When was the document written?

Where was the document written?

Under what conditions was the document written?

Do different forms or versions of the document exist?

INTERNAL CRITICISM

What was meant by the author?
How much credibility can be given to the author?
What was the author trying to say?
How could the authors word be interpreted?
Does the document contain bias of any sort?

DATA ANALYSIS IN HISTORICAL RESEARCH

Methodology to synthesize a very large amount of data into a meaningful narrative

- Organize information into categories
- Locate patterns or themes
- Develop a coding system

ADVANTAGES OF HISTORICAL RESEARCH

Allows investigation of topics and questions that can be studied in no other way.
Study evidence from the past.
Make use of different kinds of evidence.
Provide a rich source of information.

DISADVANTAGES OF HISTORICAL RESEARCH

Threats to internal validity

Limitations of the sample and instrumentation

Can not ensure representativeness of the sample

Unable to check the reliability and validity

Bias of the researcher

…examples…

Content analysis

What is content analysis?

Content analysis is a method of coding qualitative and/or quantitative narrative data to identify the prevalence of key themes and issues in relation to a particular context.

Steps in content analysis

- Initial preparation of data
- Constructing a coding scheme
- Preparing the data units
- Coding the data
- Analysis of the data

CONTENT ANALYSIS ADVANTAGES AND DISADVANTAGES

Advantages:

1. It can be virtually unobtrusive.
2. It is cost effective.
3. It provides a means of study a process.

Weaknesses:

1. Limited to examining already recorded messages.
2. Ineffective for testing causal relationships between variables.
3. Not appropriate in every research situation.

SECONDARY DATA ANALYSIS

Secondary Data Analysis

A type of research in which *data collected by others* are reanalyzed.

Primary Data Analysis

Original analysis of the data collected in a study.

Meta-Analysis

"Analysis of analysis"

Quantitative procedure for summarizing or integrating the findings obtained from a literature.

Uses the results of individual research projects on the same topic as data points for a statistical study of the topic.

SECONDARY DATA ANALYSIS

Advantage

Saves cost for data collection.

Saves time required for data collection.

May obtain data otherwise impossible.

Disadvantage

Data collected may not be suitable for the researcher's purposes. (Validity)

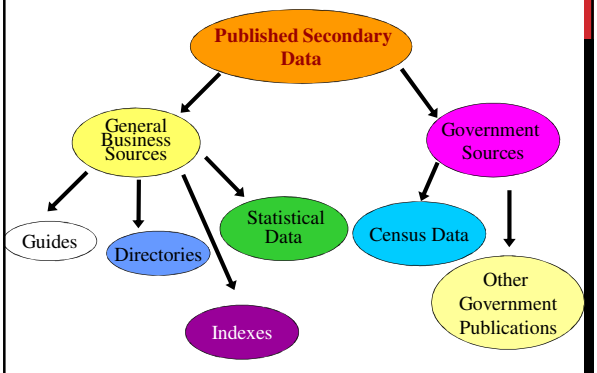
All necessary data may not be available in existing data.

Requires time to search for the data set.

Original data set may not be accurate.

Existing data sets may contain more variables than what the researchers need. Need time to sort out the data.

A Classification of Published Secondary Sources



TIPS FOR AVOIDING PLAGIARISM

NEVER use someone else's research and fail to cite the individual(s).

Do not copy information from a source text without proper acknowledgement

Always use quotation marks when reproducing material from a source text, and use proper documentation

Do not paraphrase material from a source text without appropriate documentation

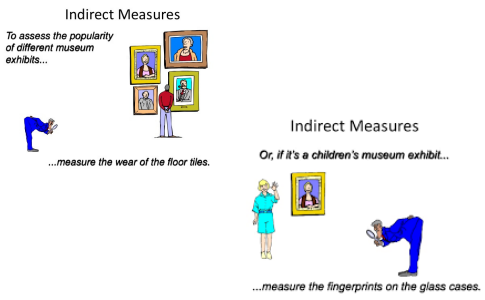
Always cite the research service when purchasing completed research from the service

Adapted from Strong, William S. (1993), *The Copyright Book: A Practical Guide*, (London: MIT Press), 1.

ETHICAL ISSUES IN SECONDARY DATA ANALYSIS AND CONTENT ANALYSIS

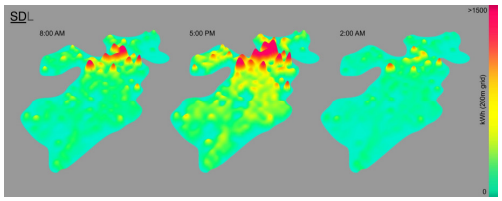
- Analysis of data collected by others, as well as content analysis of text, does not create the same potential for harm as does the collection of primary data, but neither ethical nor related political considerations can be ignored.
- Because in most cases the secondary researchers did not collect the data, a key ethical obligation is to cite the original, principal investigators, as well as the data source, such as the ICPSR.
- If medical records are included in the data then the IRB must approve the use of the data.

UNOBTRUSIVE RESEACH



MODELLING & SIMULATION

Boston "heat" modelling



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