

Unit - 3.

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Research Design

Plan

- Overall scheme & program
- Outline from writing hypothesis to final analysis of data.

Structure

- diagram of outline, schemes etc.

Strategy

- more specific than plan.
- It implies the how part (each objective, tackle problem during the research)

Purpose - to provide answers to research questions

- to control variance

◦ Experimental (produced by dependent variable)

◦ Extraneous (extraneous or irrelevant)

◦ Error (those variations which occurs as a function of the factors as the not controlled by the experimenter)

Types of Parts - Overall R.D is divided into following parts :-

- Sampling Design - deals with the method of selecting items to be observed for the given study
- Observational Design - relates with the conditions under which observation is to be made
- Statistical Design - concerns the question how many items to be observed and how the info and data gathered to be analysed
- Operational Design - deals with techniques by which procedures specified in sampling, observational & statistical

design is carried out

- Feature -
- ① Specifies the sources & types of info relevant to the research problem
 - ② It is a strategy specifies which approach will be used to gathering and analysing the data
 - ③ Includes time and ^{cost} budget

Feature of good design is that it must be flexible, economical, not time consuming, efficient, appropriate, valid, objectively.

A research design must contain

- ① a clear statement of research problem
- ② techniques and procedures to be used for gathering info.
- ③ the population to be studied.
- ④ methods to used for analysing the gathered data.

Imp terms to be used in Research

- ~~IV~~ IV & DV
- Extraneous V - Control
- Confounded relationship - Research hypothesis
- Experimental and Control group.
- Treatments
- Experiment

Experimental design:

— defines as a sequence of steps which permits the objective analysis of objective data to ~~to~~ Φ in a way that a definite cause-effect relationship can be inferred between IV and DV \rightarrow response variable manipulated by experiments (affected by manipulation of IV)

A sound experimental design is based upon some basic principles.

① Replication (fusion of words)
Duplication + ~~Re~~ Repetition

"deliberate repetition of an experiment, using a nearly identical procedure with a different set of subjects, in a different settings at a different time."

\rightarrow validating a previous study.
— experimental error used as a measurement

- occurred to faulty - experim. design
- measurement
 - biased observer
 - uncontrolled variables
 - uncontrolled extraneous

Randomization - independent observations
 it is done by - population randomly assigned to treatment or
 treatment randomly assigned to subject the
 it lead to controls the extraneous

Local Control - balancing, blocking and grouping the subjects or experimental units of employed/used in the experimental design.

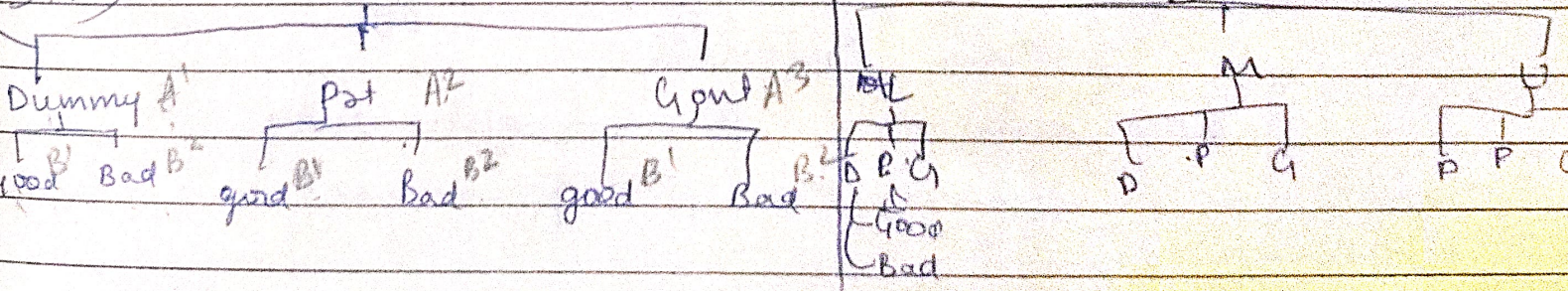
- Types -
- 1) Randomised Block Design (eg. corn field plant design)
 - 2) Matched Design (Deaf.)
 - 3) Factorial Design
 - 4) Within & Between Group Design
 (repeated) (independent)
 eg. proactive inhibition

~~Randomized Block Design~~

Factorial Design -

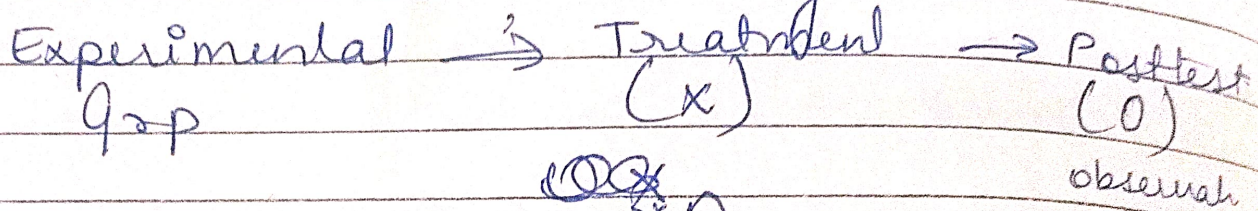
1) Simple factorial Design (2 factorial design)
 (2x2), (3x4), (5x3)

2) Complex factorial Design (multiple factorial design)
 (3x3x2) student



Within Group Design.

① One shot case study -



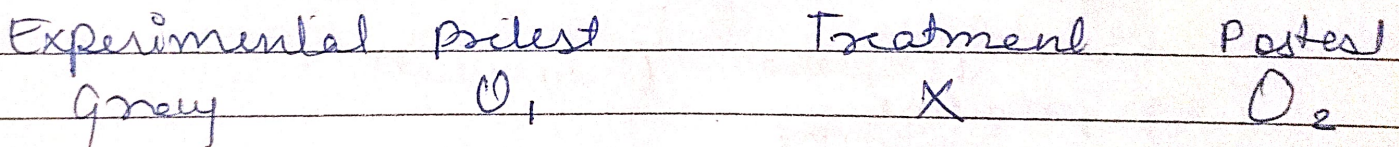
~~no-control group~~

It is studied like ex post facto.

DV is seen \downarrow accident
IV already occurred \downarrow causal factors.

Principal reward for all time

② One group of before after design



$O_1 \times O_2$

$O_1 \neq O_2$ diff ps calculated b t test and diff is compared (correlated t)

③ Time series design - different time intervals

day duty & night duty effect on performance

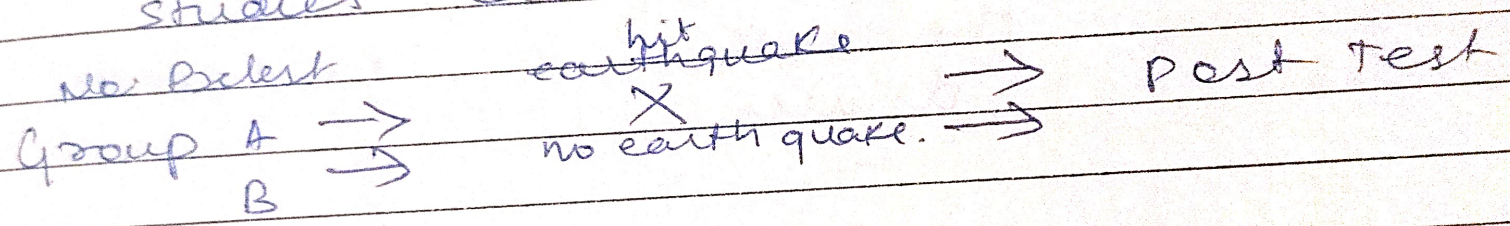
① Counterbalancing
Experimental ptest
Group

sequence change of
2 Tasks to control the confounding
Treatment Posttest
effect of sequence

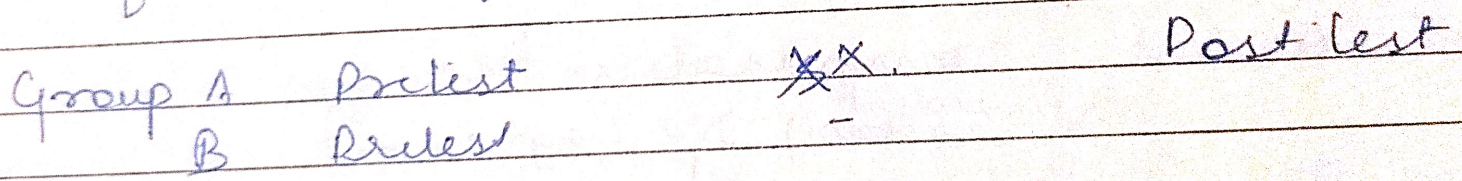
AB BA X BA

~~Match~~
Between Group Design

① 2 static comparison group designs
2 groups stable or residing in any
naturalistic environment. then
studies can be done



② Before and after 2 group comparison



*
③ Randomized 2 group designs A X Post test
B

④ Before - after randomized group designs
A Pretest X Post test
B + +

⑤ Randomized block design

⑥ Before after matched group design

Non experimental

① Expost facto Design

2 types

① Causal Correlational Research Design

trying to find relation b/w and association b/w 2 events / conditions occurring at the same time

	(IV)	(DV)
Month of the year	The drunk drivers	Road accident
Jan	~	.
Feb	~	.
Mar	.	.

② Causal Comparative Design

	IV (violent cartoon)	DV (aggression)
E	X	y^1
C	-	y^2
		y

Latin Square design

	I	II	III	IV	V
X ₁	A	B	C	D	E
X ₂	B	C	D	E	A
X ₃	C	D	E	A	B
X ₄	D	E	A	B	C
X ₅	E	A	B	C	D

Quasi experimental.

- ① Non-equivalent group design
- ② Time series.

① Non equivalent group design

(Ea group) A	A - Experim group	(Non equivalent)
B	B - Control group	

① Posttest only non equivalent group design

X Student (School A)	-	X	O ₁
X Student (School B)	-	-	O ₂

② Pretest - Posttest non equivalent group design

A	O ₁	X	O ₂
B	O ₃	-	O ₄

③ Non equivalent before-after design

A	O ₁	O ₂	X	O ₃	O ₄
B	O ₅	O ₆	X	O ₇	O ₈

② Time series.

Pretest - Posttest at time intervals

① Time series design

$O_1 O_2 O_3 \times O_4 O_5 O_6$

② Interrupted Time Series design

before 1yr 2y 6m 1m After 4m 10m 1yr 2y

$O_1 O_2 O_3 O_4 \times O_5 O_6 O_7 O_8$

 binx
 reducing
 measu

③ Interrupted time series design with comparison or control group.

A $O_1 O_2 O_3 \times O_4 O_5 O_6$
 B $O_1 O_2 O_3 - O_4 O_5 O_6$

④ Equinobent time sample design

$O_1 O_2 \times O_3 O_4 O_5 N O_6 O_7 O_8 \times O_9 O_{10} O_{11}$
 $O_{12} N O_{13} O_{14} \times O_{15} O_{16} O_{17} N O_{18} O_{19} O_{20}$
 $\times O_{21}$