

## PSY 250

### Quasi and Non-experimental designs Chapter 10

### Nonexperimental vs. Quasi- Experimental Strategies

- Resemble experiments but contain some threat such as a confounding variable that can not be completely eliminated so can not infer causation
- QE – make some attempt to minimize threats to Int. V.
- NE – do not
- Sometimes the only real option

### Designs

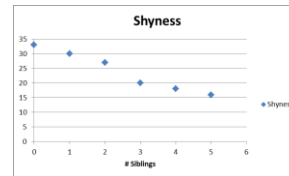
- IV not manipulated but groups or conditions created in terms of an existing variable (usually participant or time variable)
  - E.g. gender, age, location
- Between Designs = Nonequivalent group designs
- Within Designs = pre-post designs

### Nonequivalent Between Group Designs

- Researcher has no control over group assignment
- Thus, no assurance that groups are equal on other variables
- Assignment Bias

## 1. Differential Research Design (NE)

- Also called ex post facto research
- Compares pre-existing groups defined by participant variable
- E.g. shyness scores from single child vs. child with siblings
- Existence and description of relationships
- Similar to correlational design in terms of question, but different design and analysis



Correlational

Differential

Siblings		
0	1-2	>3
33	28.5	18

## 2. Posttest-Only Non-equivalent Control Group Design (NE)

- Also called static group comparison
- Applied settings
- Measure effectiveness of treatment with pre-existing participants
- Similar but nonequivalent participants used as control condition

X            O            Exp. Grp  
                   O            Control

## 3. Pretest – Posttest Non-equivalent Control Group Design (QE)

- Stronger version of posttest only design
- Both control (C) and experimental (E) groups measured prior to treatment and again after E group receives treatment
- Shows if groups are similar on the DV before manipulation of IV
- Also controls for time related changes in DV indep. of IV
- Reduces threat of both assignment bias and time related threats

O            X            O            Exp. Grp.  
                   O            O            Control

## But...

- Doesn't eliminate all threats to Int. V.
- E.g. differential history effects
  - History differs between groups
- Differential instrumentation, differential testing, differential maturation or differential regression

## Within-Subjects NE and QE Pre-Post Designs

- One group of participants measured before and after an event or treatment
- Impossible to counterbalance order of treatments
- Time Related Threats to Int. V.
  - History, instrumentation, testing effects, maturation, & statistical regression

## Preexperimental Designs

- One-shot case study
  - X-O (X=exposure to event, O=observation)
  - No comparison to those not exposed to event
  - No way to know person's response before intervention

## 1. One-Group Pretest – Posttest Design (NE)

- One pre and one post-test measurement
- E.g. voter's confidence in electoral candidate before and after televised debate
- O      X      O



## 2. Time Series Design (QE)

- Treatment is manipulated by researcher
- Series of observations for each participant before and after treatment or event
- E.g. Measures of stress weekly for 2 months preceding and following introduction of aromatherapy in workplace

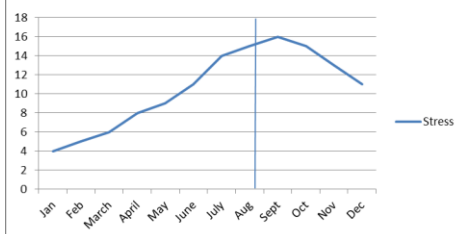
■ O O O X O O O



## 3. Interrupted Time Series Design (QE)

- Treatment is *NOT* manipulated by researcher
- E.g. Depression measured monthly for 3 months before and after Christmas
- Works with predictable event like decriminalizing marijuana
- For unpredictable events like Katrina, rely on archival data
- Can see trends in data before treatment
- Can observe long-term changes following treatment
- But other changes can coincide with treatment
  - E.g. cold weather/snowfall and Christmas

**Stress**



## Single Subject Time-Series Designs

- Applied to Single Individuals
  - Compulsive behavior in one client before and after therapy

## Single Case Time-Series Designs

- Applied to Single Organizations
  - Number of fights before and after anti-bullying campaign in a single school

## 4. Equivalent Time – Samples Design (QE)

- Treatment is repeatedly administered and removed during series of observations
- E.g. introducing music in the workplace – turning it on and off and measuring worker concentration at regular intervals weekly
- O O O X O N O X O
- Best used when treatment effect is expected to be temporary
- Hard to determine causality if treatment effect is permanent

TABLE 9.1 A Comparison of the Classical Experimental Design

DESIGN	RANDOM ASSIGNMENT	PRETEST	POSTTEST	CONTROL GROUP	EXPERIMENTAL GROUP
Classical	Yes	Yes	Yes	Yes	Yes
One-shot case study	No	No	Yes	No	Yes
One-group pretest/posttest	No	Yes	Yes	No	Yes
Static group comparison	No	No	Yes	Yes	Yes
Two-group posttest only	Yes	No	Yes	Yes	Yes
Time-series designs	No	Yes	Yes	No	Yes

## Developmental Research Designs

- Describe relationship between age and other variables
- E.g. development of language, self concept, theory of mind



## Cross-Sectional Research Design

- Differential Research
- Ex. of between subjects NE, nonequivalent groups design
- Separate group of participants for each age being compared
- Measure DV for each group

## Cross-Sectional Research Design cont.

- Pros
  - Time efficiency
  - Less investment by researcher
- Cons
  - Can't see how individual develops
  - Indivs. of diff. ages grew up in diff. environments (cohort or generation effects)
    - E.g. computer literacy
  - Cohorts = individuals who are same age and have lived in similar environments

## Longitudinal Design

- Measuring variable in same individuals over a period of time
- E.g. IQ and age
- Within subjects NE, one group pretest-posttest design
- Atypical longitudinal designs
  - Measure development of different individuals over time – social evolution
  - E.g. changes in attitudes towards homosexuality at same college at 10 year intervals

## Longitudinal Design cont.

- Pros
  - Absence of cohort effects
- Cons
  - Time consuming
  - Huge commitment
  - Attrition
  - Testing effects

## Cross-sequential Design

- Time-lag design = a researcher aims to determine the effects of time of testing while holding age constant
- Cross-sequential design = tests two or more age groups at two or more time periods
  - Avoids problems of both cross-sectional and longitudinal designs

## Cross-sequential Design (cont.)

**Exhibit 8.11** Cross-sequential Design Combining Longitudinal, Cross-sequential, and Time-lag Methods

		Year of Test				
		2004	2005	2006	2007	
Year of Birth	1984	20	21	22	23	← Longitudinal
	1985	19	20	21	22	
	1986	18	19	20	21	
	1987	17	18	19	20	← Time Lag

Source: Adapted from Elmes et al., 2006.