Quasi-Experimental & Small N Designs

- Quasi-Experimental Designs
  - Research in settings where true experiments can’t be conducted
  - Lack control of true experiment
  - Nonetheless -- want to measure impact of “variable”
  - Approximate experiment -- “Quasi”
  - Lower internal validity than a true experiment
    - Have to be wary reaching causal conclusions
Quasi-Experiments

- Typically use because of practical or ethical reasons
- Can’t manipulate or control variables
- Research in the Real World situations

- Unless you become research psychologist -- design most likely to use / encounter
  - Less control over variables -- worries about internal validity
  - Often best that you can do under circumstances
  - do the best you can to draw valid conclusions
Nonequivalent Groups Design

- Evaluate effect of one variable (quasi IV) on another (DV)
- Select groups that differ in terms of variable (quasi IV)
- Compare on measure of DV
- Example:
  - Effect of organizational structure within a company on worker happiness
  - Flat structure vs. Tall structure
  - DV: Questionnaire on work related happiness
- Won’t be able to perfectly control situation (confounds)
- Can often dismiss with an additional study or by other means
Pretest-Posttest Designs

- Sometimes evaluating some type of program or change
- Often use pretest-posttest design
  - Measure before change, measure after change
- Earlier in course – confounds associated with pretest-posttest designs
  - Ex: history, maturation, regression to the mean, etc.
  - Care must be taken to avoid/evaluate these confounds
Interrupted Time Series Designs

- Extend pretest-posttest design – Time Series Design
  - Multiple measures before treatment initiated
  - Multiple measures after treatment initiated
  - Compare trends before and after
Interrupted Time Series Example

- Ex: Traffic fatalities and speeding in Connecticut
- 1955 – record # of traffic fatalities in Connecticut
- Governor ordered crack-down on speeding
  – Change in policy effective?
Interrupted Time Series Example

- Alternative explanations?
Control Series Design

- Add control group to time series
- Evaluate possible confounds
Small N Designs

- Single subject designs
- Small-N Designs
  - N refers to the sample size in the experiment
- Clinical Research/Intervention Research
Large-N Designs?

- Between subjects design -- different groups in different conditions
  - Compare mean of groups
  - assume: average == typical person
  - experiment shows how the typical person would respond
- Average may or may not reveal what is “typical”
  - ex: final exam:
  - 15 people score 100
  - 15 people score 50
  - 0 people scores 75
  - average = 75 -- is the person who score 75 the most typical person in class?
Small N designs

■ rather than test many people in a superficial fashion
■ test a few people in great detail
  – e.g., experiment with 40 people for 1 hour each
  – vs. experiment with 2 people for 20 hours each
■ repeated testing -- much more detail, precision
■ problem -- will the results apply to other people?
Clinical Research

- Evaluate effectiveness of treatment
- May not have access to large “group”

- Read Chapter 21 for next class

–Therapy for Anger
Baseline Designs

- Simple AB design
  - $A =$ baseline period before treatment
  - $B =$ post treatment period
- baseline period -- get many measures
  - feel for variation
  - ensure that performance is stable
- once performance is stable -- apply treatment and again make observations
- shift in performance coincides with onset of treatment?
- want to attribute to treatment
Baseline Design

Target Behavior

Time

baseline
treatment
why do you need stable baseline?

- Problems with noisy baselines or drifting baselines
Reversal Design

- problems with AB designs
  - history (another event, covaries in time with treatment)
  - spontaneous remission

- Reversal Designs: AKA ABA Designs
  - A - baseline period (measure behavior without treatment)
  - B - treatment period (observe effect of treatment on behavior)
  - AB -- can’t be sure that it was the treatment
  - take it away (reverse treatment) -- return to A (ABA)
  - If treatment effective -- behavior back to baseline level
  - In therapy situation -- B beneficial
  - Reinstitute -- return to B (ABAB design)
ABAB Example

- Horton (1987) -- behavior therapy
- severely developmentally disabled 8-year-old girl
- behavioral problem -- spoon banging
  - fling food
  - possibility of hurting herself
- behavioral technique -- “facial screening”
  - mildly aversive technique
  - cover face with a soft cloth when she bangs spoon
- used ABAB design
  - get a baseline for behavior
  - apply treatment -- decreases behavior
  - remove treatment -- behavior returns
  - reapply treatment -- behavior disappears
ABAB Example (Horton, 1987)
Control

- Can combine other types of controls to ABAB
- e.g., Double Blind study
Multiple Baseline Designs

- Sometimes can’t use ABAB design (withdrawal design)
  - can’t “remove” treatment
  - carryover effects
  - want to rule out some confounds (time)
- use multiple baseline periods
  - rather than looking at a single behavior of single subject
    - multiple subjects
    - multiple behaviors in same subject
    - multiple situations
- Key: introduce treatment at different times
  - (unconfounded with time)
Ex: Allison & Ayllon (1980)

- behavioral coaching techniques in pee-wee football
  - compare standard coaching techniques
  - with a behavioral approach (positive and negative reinforcement)

- subjects: four second-string players who:
  - “completely lacked fundamental football skills”
  - concentrate study on blocking techniques

- DV -- percent of drills performed correctly

- establish a baseline for each -- observe poor performance

- start applying treatment one at a time
Allison & Ayllon

- increase in blocking performance following treatment
- difficult to attribute to time or practice
- improvement didn’t occur until treatment applied
Multiple Baseline Design

- Multiple behaviors