An Introduction to Research Design
for Research in Health, Education and Human Development

David E. Barrett
Alumni  Distinguished Professor
Department of Teacher Education
Eugene T. Moore School of Education
Clemson University
Categories of Research Designs

1. Experimental Design
2. Comparison of Intact Groups
   a. Retrospective Comparison
   b. Prospective Comparison
3. Correlation/ Regression
   a. Naturalistic Observation
   b. Secondary Data Analysis
Experimental Design

- E = Experimental Group; C = Control Group
- Participants are assigned at random to E and C groups
- Controls for possible pre-existing differences
Example of Experimental Design

Goal: Examine effects of early preventative intervention for mothers and infants

Method: New mothers assigned to Infant-Centered (E) or Mother-Centered (C) intervention during the neonatal period
Example of Experimental Design (continued)

Findings: For high demographic-risk mothers and infants, Infant-Centered (E) intervention resulted in lower maternal stress and better parent-child interaction at 4 months of age*

Intact Group Comparison: Retrospective

- I= Index Group; C= Comparison Group
- Subjects already differ on independent variable
- Researcher must control for other “confounding” variables
- Study begins well after group membership is established
- Groups are compared for differences in later functioning
Example of Intact Group Comparison: Retrospective

Goal: Examine effects of early (prenatal and infant) nutritional supplementation on children’s behavior.

Method: Children from malnourished population in Guatemala divided into two groups based on early nutritional experiences: Well-Supplemented (I) and Not Well-Supplemented (C). Groups are studied at 6-7 years of age.
Example of Intact Group Comparison: Retrospective (continued)

Findings:

• At school age, Well-Supplemented children showed more positive affect and more social involvement than controls.
• At school age, Well-Supplemented children showed better impulse control and frustration tolerance than controls*.


Intact Group Comparison: Prospective

- **I** = Index Group; **C** = Comparison Group
- Subjects selected based on standing on independent variable
- Study begins at time of grouping on independent variable
- Groups are followed and compared for differences in later functioning
- Researcher must control for other “confounding” variables
Example of Intact Group Comparison: Prospective

Goal: Examine effects of unplanned cesarean section on maternal post-partum depression and mother-infant interaction

Method: Mothers who planned for normal delivery were divided into two groups: Unplanned cesarean section (I) and Normal delivery (C). Mothers and infants were studied at 2 and 30 days post-delivery.
Example of Intact Group Comparison: Prospective (continued)

Findings: Mothers who experienced unplanned cesarean section showed higher levels of depression at 30 days post-delivery, as well as more obstetric complications. There were no group differences in mother-infant interaction*.

Correlation/Regression: Naturalistic Observation

- Researcher collects behavioral data in natural setting
- Y = Dependent variable (variable we wish to predict)
- X₁, X₂, ..., Xₖ = Independent variables (variables used as predictors)
- Researcher follows theoretical rationale for selection of variables
Example of Correlation/Regression Study: Naturalistic

Goal: To better understand the social characteristics and cognitive abilities which are related to children’s pro-social behaviors (helping, sharing, comforting).

Method: 5 to 8-year-old children are studied at a summer camp in Rockville, Maryland for an entire summer. Observers record instances of pro-social and antisocial behavior and test children for “social cognition” (the ability to understand others’ thoughts and feelings).
Example of Correlation/Regression Study: Naturalistic (Continued)

Findings:

• Socially assertive children were more pro-social than non-assertive children.
• More understanding children were more pro-social but only if they were assertive; otherwise they were less likely to intervene on another’s behalf.
• There were no sex differences in pro-social behaviors.
• Boys were more aggressive but only with regard to unprovoked aggression*.

Correlation/Regression: Secondary Data Analysis

- Data have already been collected by another agency or research team
- Y = Dependent variable (variable we wish to predict)
- X₁, X₂, ... Xₖ = Independent variables (variables used as predictors)
- Current researcher follows theoretical rationale for inclusion of variables
Example of Correlation/Regression Study: Secondary Analysis

Goal: To better understand personal and background characteristics related to juvenile delinquency and recidivism (repeat offending) as well as effects of prosecution for first time offenses.

Method: Analysis of data collected on 100,000 juvenile offenders whose cases have been processed by the South Carolina Department of Juvenile Justice (DJJ). All youth were born between 1981 and 1988 and have now “aged out” of the system.
Example of Correlation/Regression Study: Secondary Analysis (Continued)

Findings:

• Early age at first referral is strongest predictor of repeat offending.
• Father absence predicts repeat offending.
• Prosecution for first offense predicts repeat offending.
• Gender and race differences in likelihood of prosecution.
• Race differences in incarceration rates*.


References Cited


