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**Cozby & Bates:  
Methods in Behavioral Research**

**Chapter 11: Single Subject, Quasi-  
Experimental, & Developmental Research**

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## DESCRIPTIVE

- GOAL: TO DESCRIBE SNAPSHOT OF THOUGHTS, FEELINGS, AND BEHAVIORS OF INDIVIDUALS. TO CAPTURE A SNAPSHOT OF THEIR STATE AT A GIVEN PLACE AND TIME.
- Survey
- Interview
- Naturalistic observation
- Non-causal, state of the world, often ideographic
- Can (easily) include complexities of situation
- Can (easily) capture what is currently happening. [e.g., political surveys]
- limited by adequacy of comparisons

## CORRELATIONAL (Quasi-Experimental)

- **Variable** – *any attribute that can assume different values among different people or across different times or places.* E.g., age, shoe size, weight, egotism, burnout, stress, cognitive development...
- GOAL: TO UNCOVER SYSTEMATIC RELATIONS
- Statistical analysis: correlation coefficient (pearsons r)
- $r = +1 > r = 0 > r = -1$
- Make predictions
- Test predictions (theory)
- Causal relations cannot be inferred on basis of correlation (requires temporal order, causal path, association)

## EXPERIMENTAL

- Manipulate variables of interest (manipulate a given situation or experience for two or more groups of individuals, followed by a measurement of the effect of those experiences on thoughts, feelings, or behavior).
- Establishes an adequate control/comparison group so that causal relations can be established.
- Not all topics allow experimental manipulations (e.g., ethics of the milgram study; broad social issues; homelessness, etc.)

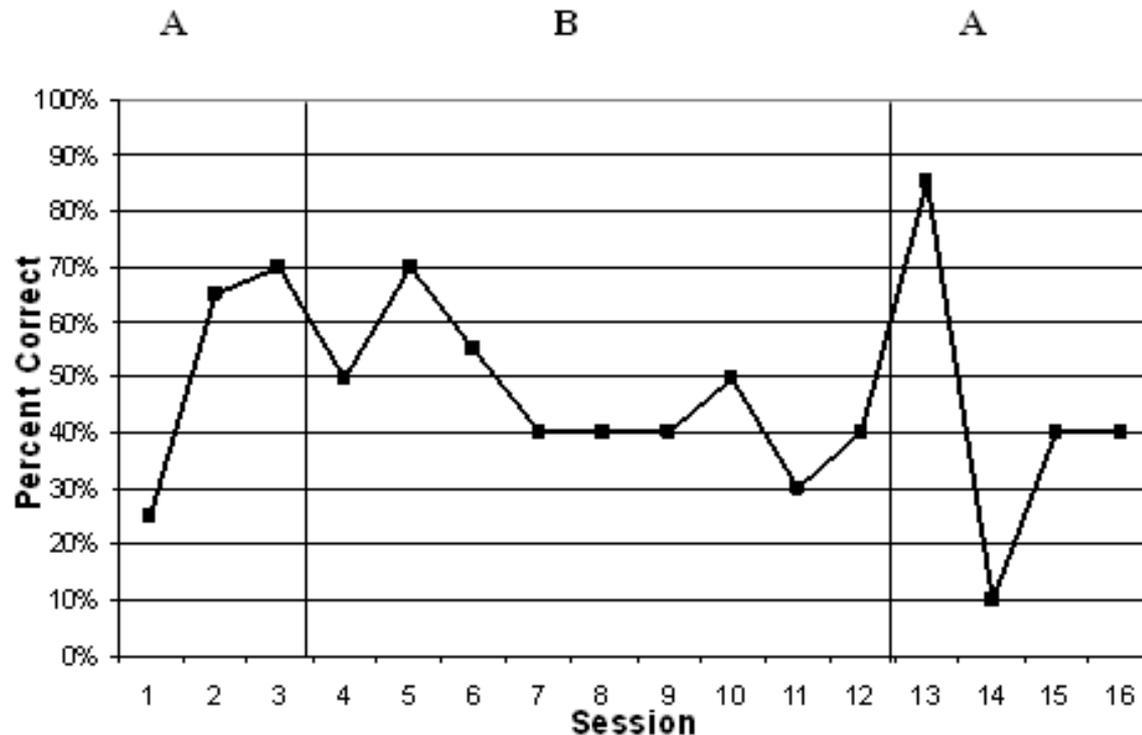
## Approaches to Research

Descriptive	Correlational (Quasi-Experimental)	Experimental
<ul style="list-style-type: none"> <li>•Current state snapshot</li> <li>•Not about relations</li> <li>•Often “Real World” (e.g., focus group)</li> <li>•Allows complexity</li> </ul>	<ul style="list-style-type: none"> <li>•2+ variables</li> <li>•Is there a relationship</li> <li>•Not causal               <ul style="list-style-type: none"> <li>-&gt; prediction (e.g., gpa/SAT/GRE)</li> </ul> </li> <li>•Can test theory</li> </ul>	<ul style="list-style-type: none"> <li>•2+ variables</li> <li>•Causal relations</li> <li>•Manipulate variables</li> <li>•Often “lab”-based</li> <li>•Predict, understand, explain, control</li> <li>•Can lose complexity</li> </ul>

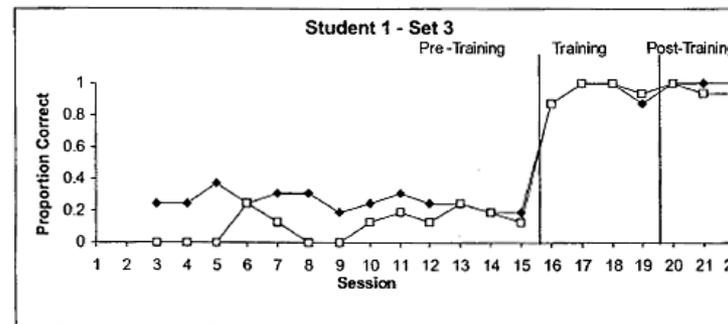
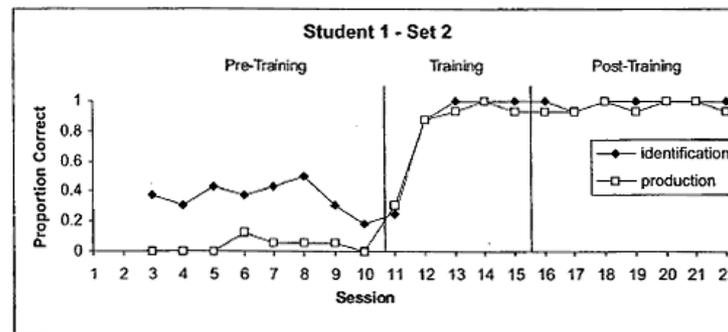
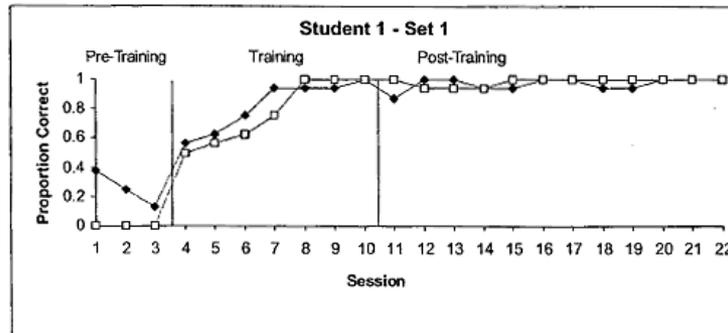
# Single Subject (Single Case) Designs

- Early history of work on Reinforcement Contingencies (Learning)
- Basic idea:
  - Baseline → TMT → Post-Treatment
- **Reversal Designs**
  - ABA Withdrawal (or Reversal) Design
- **Multiple-Baseline Designs**
  - **Across subjects**
  - **Across behaviors**
- **Alternating treatments Design**

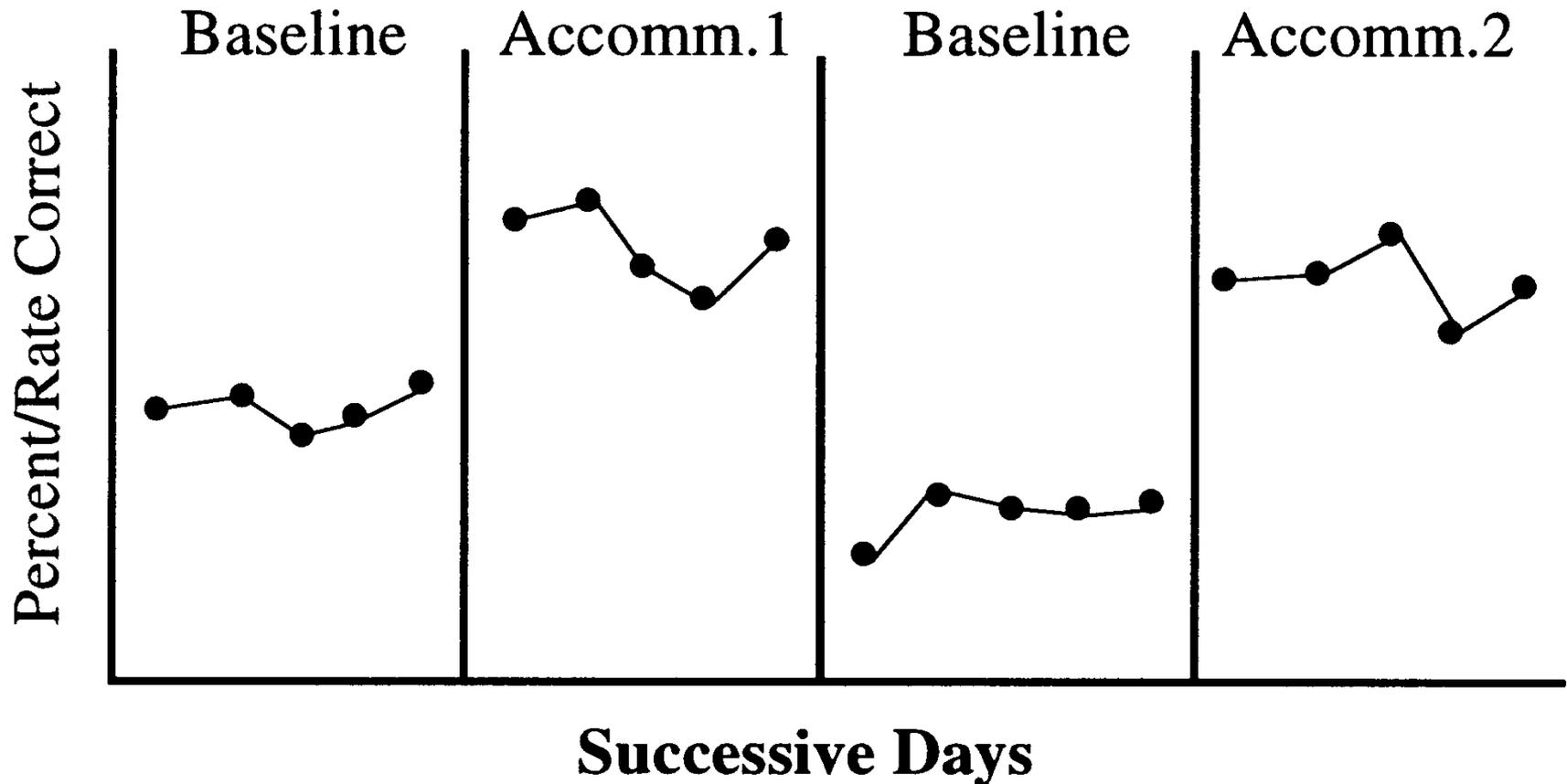
# ABA Reversal Design (within subject)



# Multiple Baseline Design (across subjects)



# Alternating Treatments Design



# Single Case (Subject) Designs

- The idea of change from baseline is the critical element
- TYPES:
  - A-B-A (Reversal) designs
  - Multiple Baseline designs
    - Across subjects
    - Across behaviors
  - + alternating treatments

**Research on programs that are proposed and/or implemented to achieve some effect on a group of individuals (e.g., school, work, community).**

**1. Needs assessment**

- are there problems to be solved?

**2. Program theory assessment**

- Will problem be addressed?

**3. Process evaluation**

- monitoring

**4. Outcome evaluation**

- Did program achieve desired outcomes?

**5. Efficiency assessment**

## Quasi-Experimental Designs

*Quasi-Experiments address the need to study the effects of IVs in settings in which the control features of “true” experimental designs cannot be implemented*

- Causality is harder to establish – e.g., often there is a failure of random assignments to conditions (e.g., to handle participant variables)
  - POST-TEST ONLY (lacks comparison group)
  - PRETEST-POSTTEST (what other confounds?)

## **ONE-GROUP POSTTEST ONLY DESIGN**

- Lacks comparison Group

## **ONE-GROUP PRETEST-POSTTEST DESIGN**

- May allow confounds
  - History
  - Maturation
  - Testing
  - Instrument Decay
  - Regression to the Mean

## **NONEQUIVALENT CONTROL GROUP DESIGN**

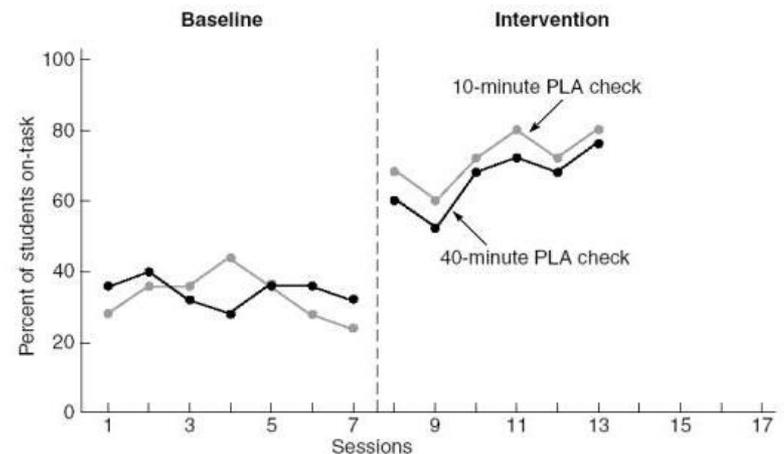
- Can allow SELECTION DIFFERENCES (*Selection Bias*) as an alternative explanation for the experimental findings
- Use of a pre-test can minimize the likelihood that pre-existing group differences could account for the experimental findings

## **NONEQUIVALENT CONTROL GROUP PRE-TEST POST-TEST DESIGN**

- as above, but provides additional evidence of comparability of groups despite the lack of random assignment

# Interrupted Time-Series Design

- Comparison of Post Treatment averages against pre-treatment baseline
- This can be done with additional (non-equivalent) control groups (e.g., different classes, different states [seatbelt, DUI], etc.)



**FIGURE 10.5** Percentage of students who are on-task at 10 minutes and 40 minutes into the class period. The figure presented here depicts the results of one of five classrooms investigated by Mayer et al. Only one classroom is presented here to illustrate a time-series design, whereas Mayer et al. used five classrooms and a multiple-baseline design. PLA refers to planned activity. Adapted from G. R. Mayer, L. K. Mitchell, T. Clementi, E. Clement-Robertson, & R. Myatt (1993). "A dropout prevention program for at-risk high school students: Emphasizing consulting to promote positive classroom climates," *Education and Treatment of Children*, 16, 135-146. Reprinted by permission.

## Cross-Sectional vs. Longitudinal Designs

Cross-sectional: different groups representing different ages

Longitudinal: same group(s) at different ages

- These approaches can be combined to allow what Cozby refers to as a “sequential” method of data collection.

**Cohort**: a group of people born at the same time, exposed to the same events, etc.

## Chapter 11 Terminology

- Baseline
- Cohort
- Control series design
- Cross-sectional vs. longitudinal method
- History Effects (confound)
- Instrument Decay (confound)
- Regression to the Mean (confound)
- Testing effects (confound)
- Maturation (confound)
- Selection effects
- Interrupted time-series design
- Multiple baseline design
- Nonequivalent control groups design
  - Posttest only
  - Pretest-posttest design
- One group posttest only
- Program Evaluation
  - Needs assessment
  - program theory assessment
  - process evaluation
  - outcome evaluation
  - efficiency assessment Quasi-Experiment
- Reversal design
- Sequential method

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