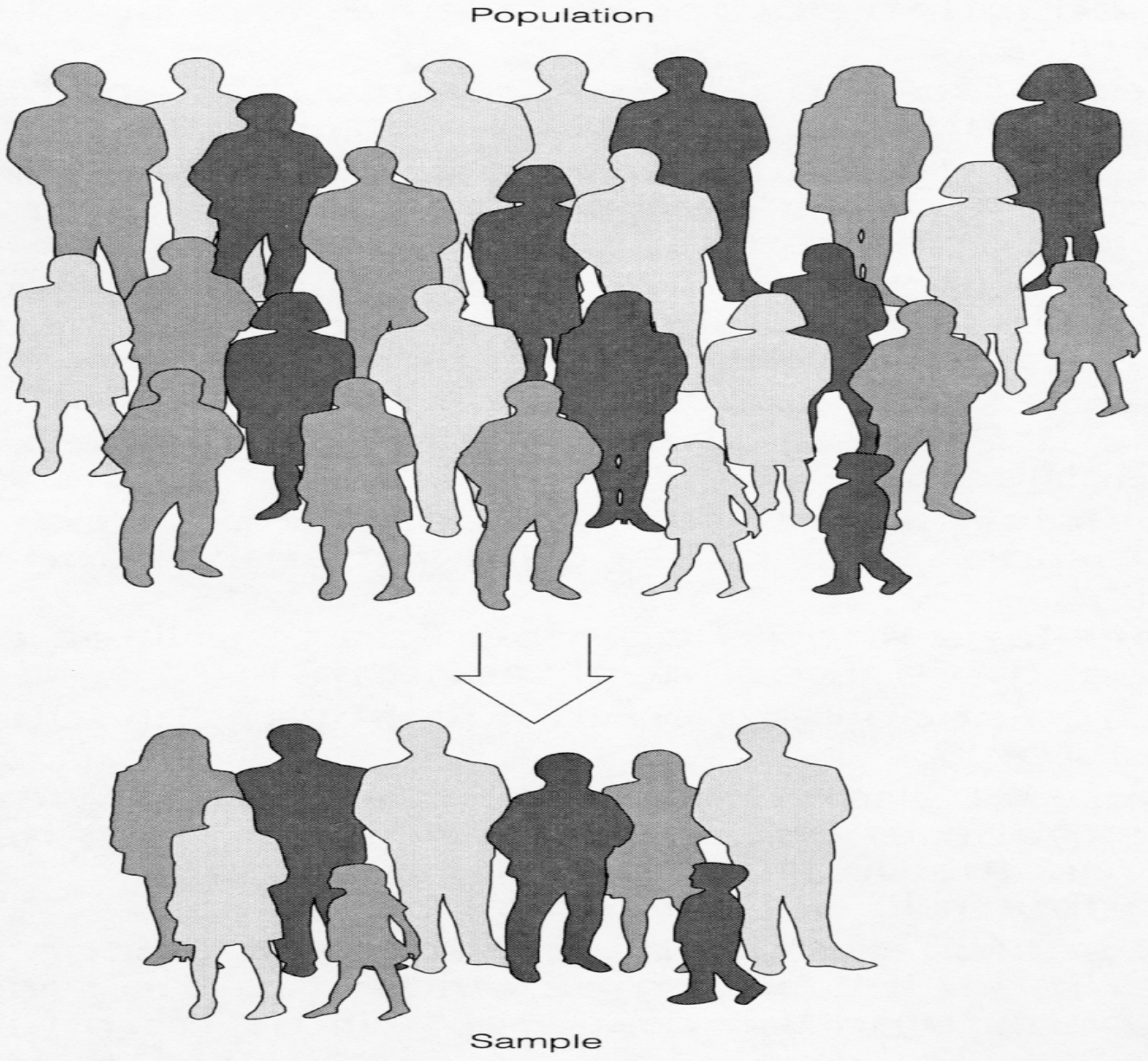
Experimental Research – Group Designs

Population and Sample



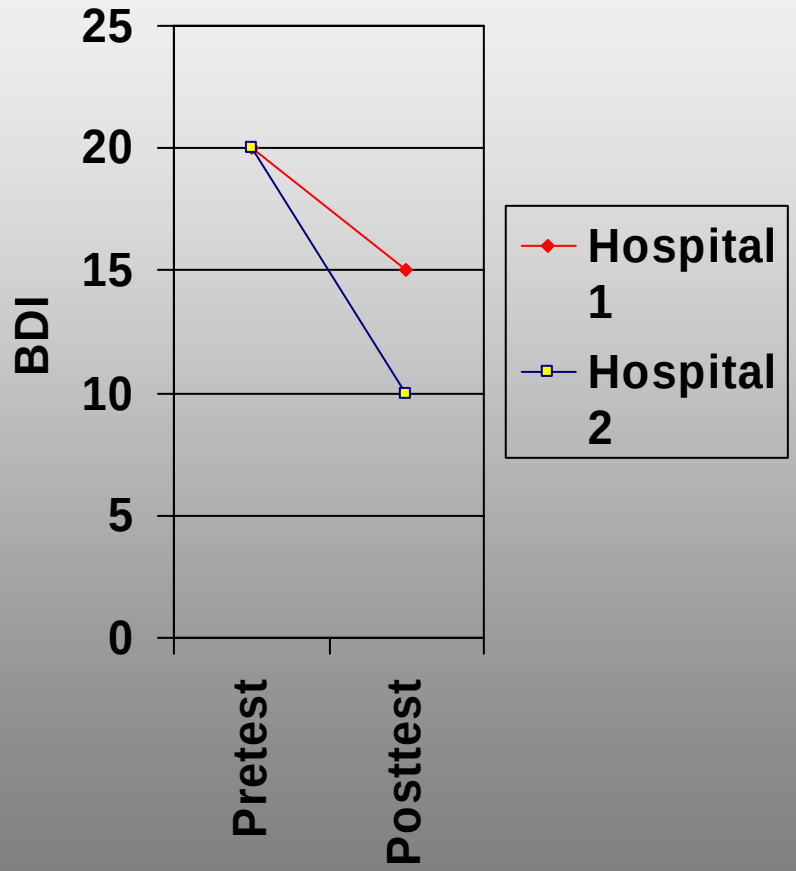
Sampling

- Sample should be representative of population
  - How representative must a sample be?
  - How does one recruit a representative sample?
- What is the rationale for the selection of a sample?
- In psychological research, random sampling is not usually invoked (Kazdin, 2003)
  - Parsimony – Why should there be individual or group differences?

Random Assignment

- Decreases likelihood of differences between experimental and control groups

Differential Regression Toward the Mean

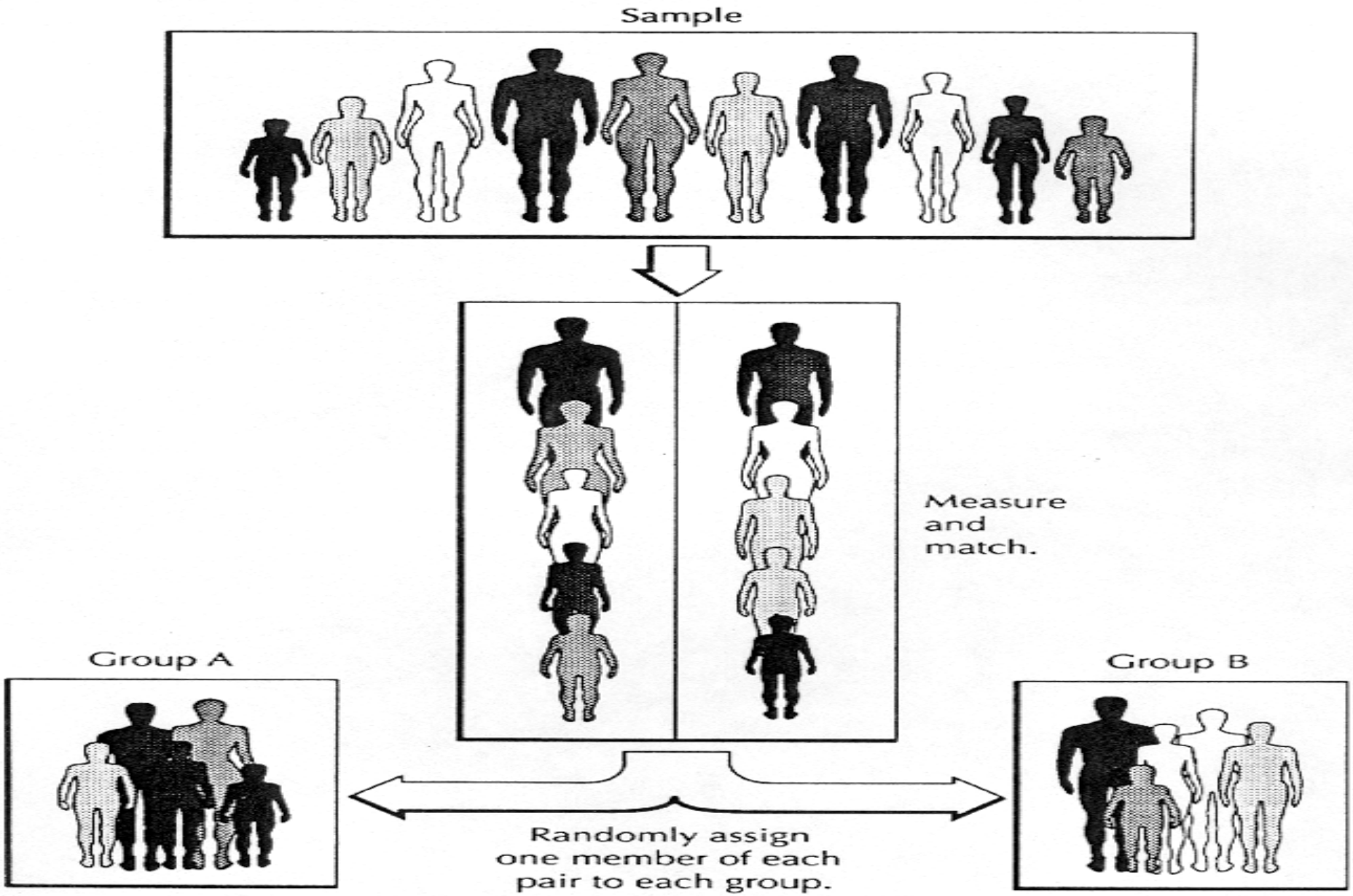


- Random assignment decreases differential risk of regression toward the mean

Random Assignment

- What if random assignment inadvertently results in two groups that are different along some dimension?
  - Increase sample size to >40 per group
  - Statistical control (e.g., ANCOVA)

Randomized Matched Groups Design



Group Designs

Posttest Only Design

Group 1	**Treatment**	**Posttest**
Group 2		**Posttest**

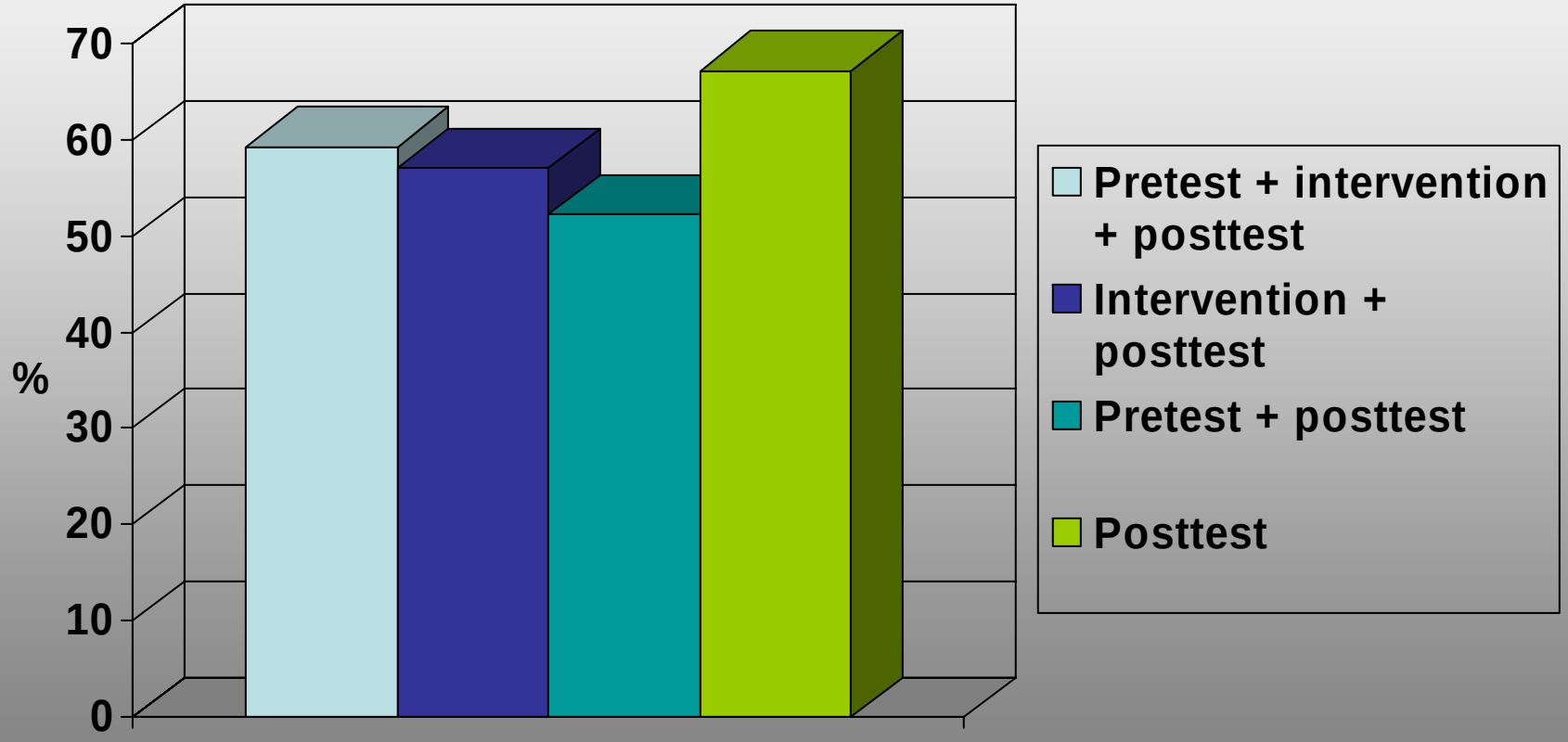
Pretest-Posttest Control Group Design

Group 1	**Pretest**	**Treatment**	**Posttest**
Group 2	**Pretest**		**Posttest**

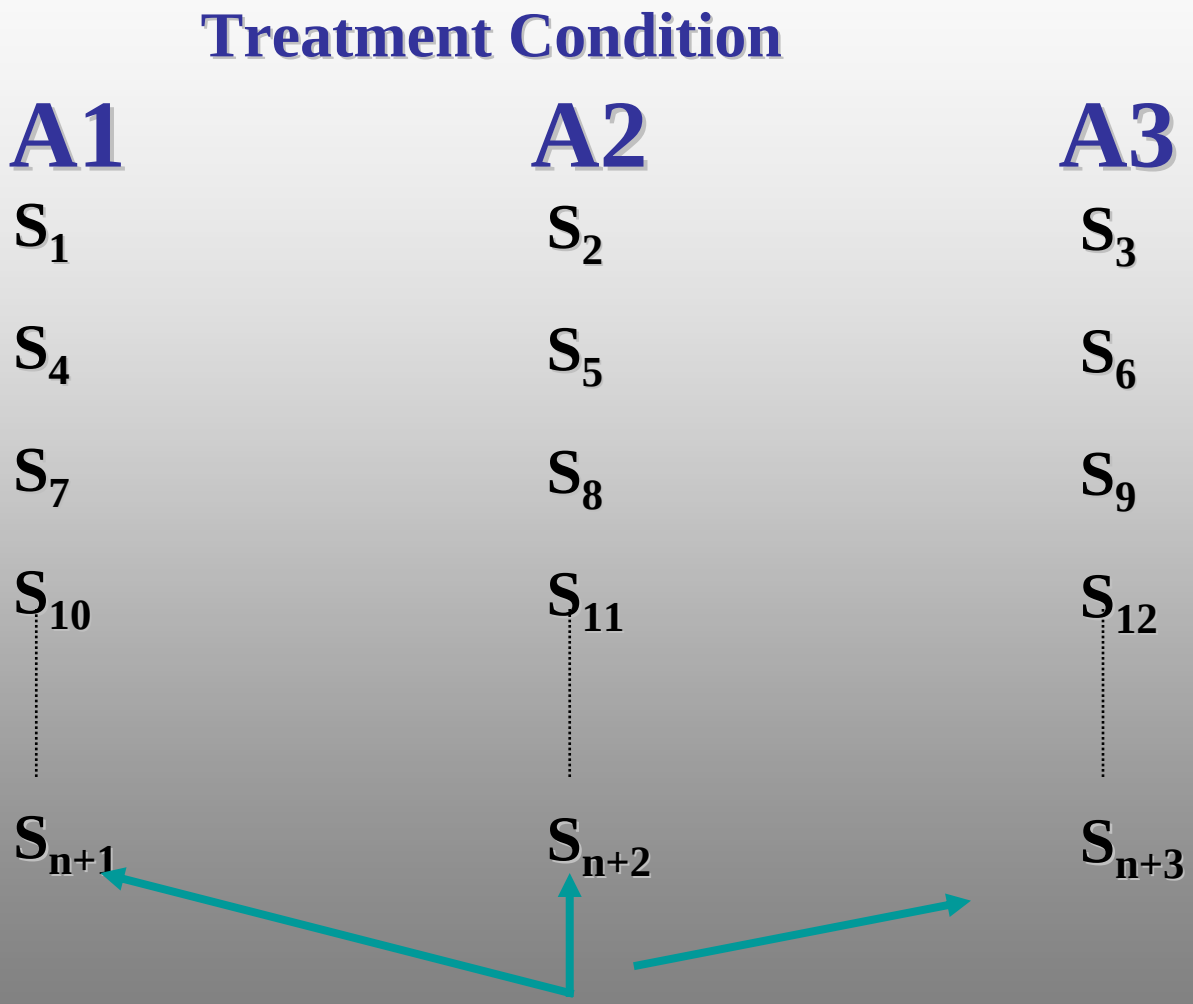
Solomon Four-Group Design

Group 1	**Pretest**	**Treatment**	**Posttest**
Group 2	**Pretest**		**Posttest**
Group 3		**Treatment**	**Posttest**
Group 4			**Posttest**

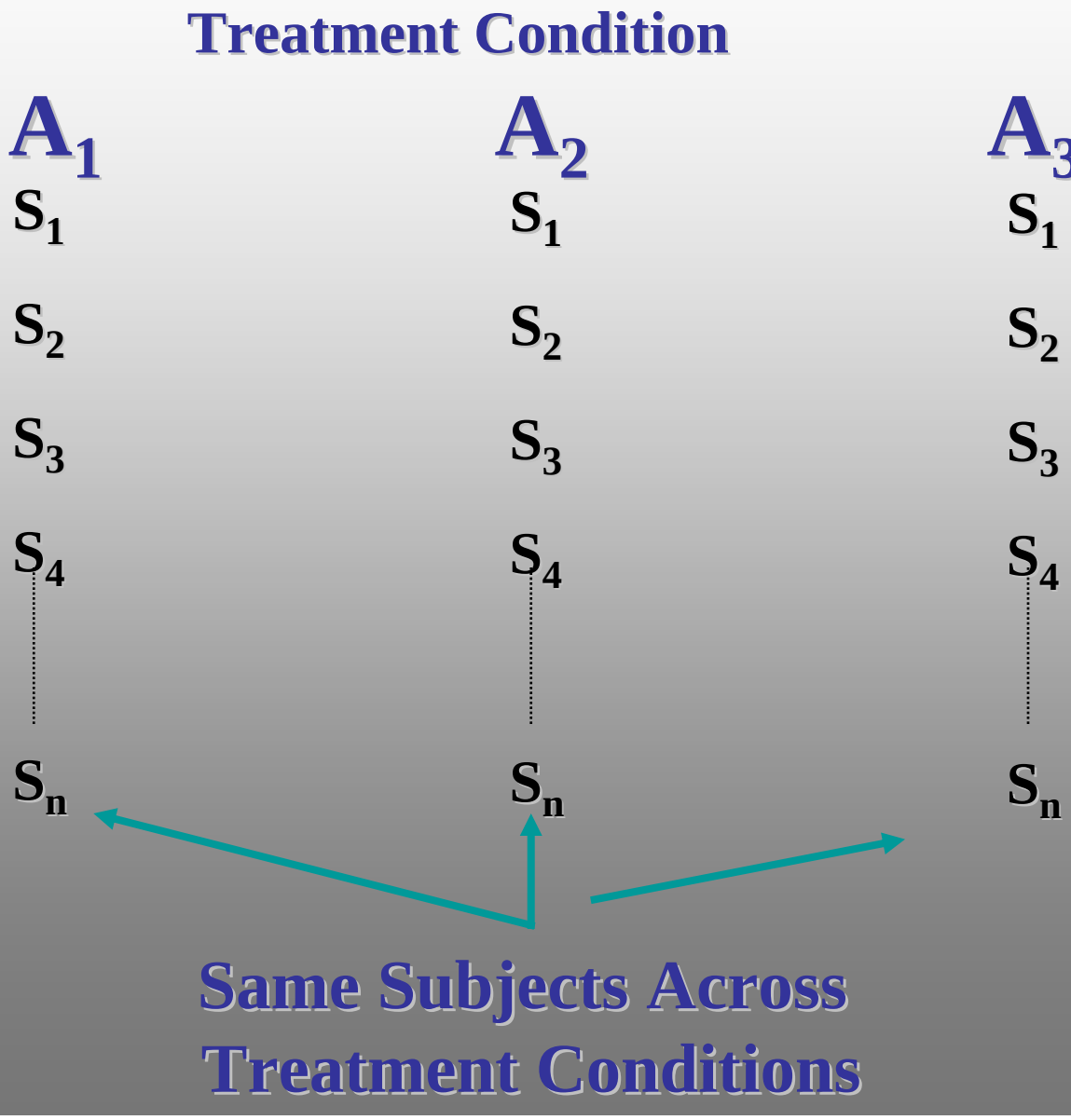
Sex Education Intervention to Prevent Teenage Pregnancy: Use of Contraception in 54 High Schools (Traeen, 2003)



Between Subjects Designs



Within Subjects Designs



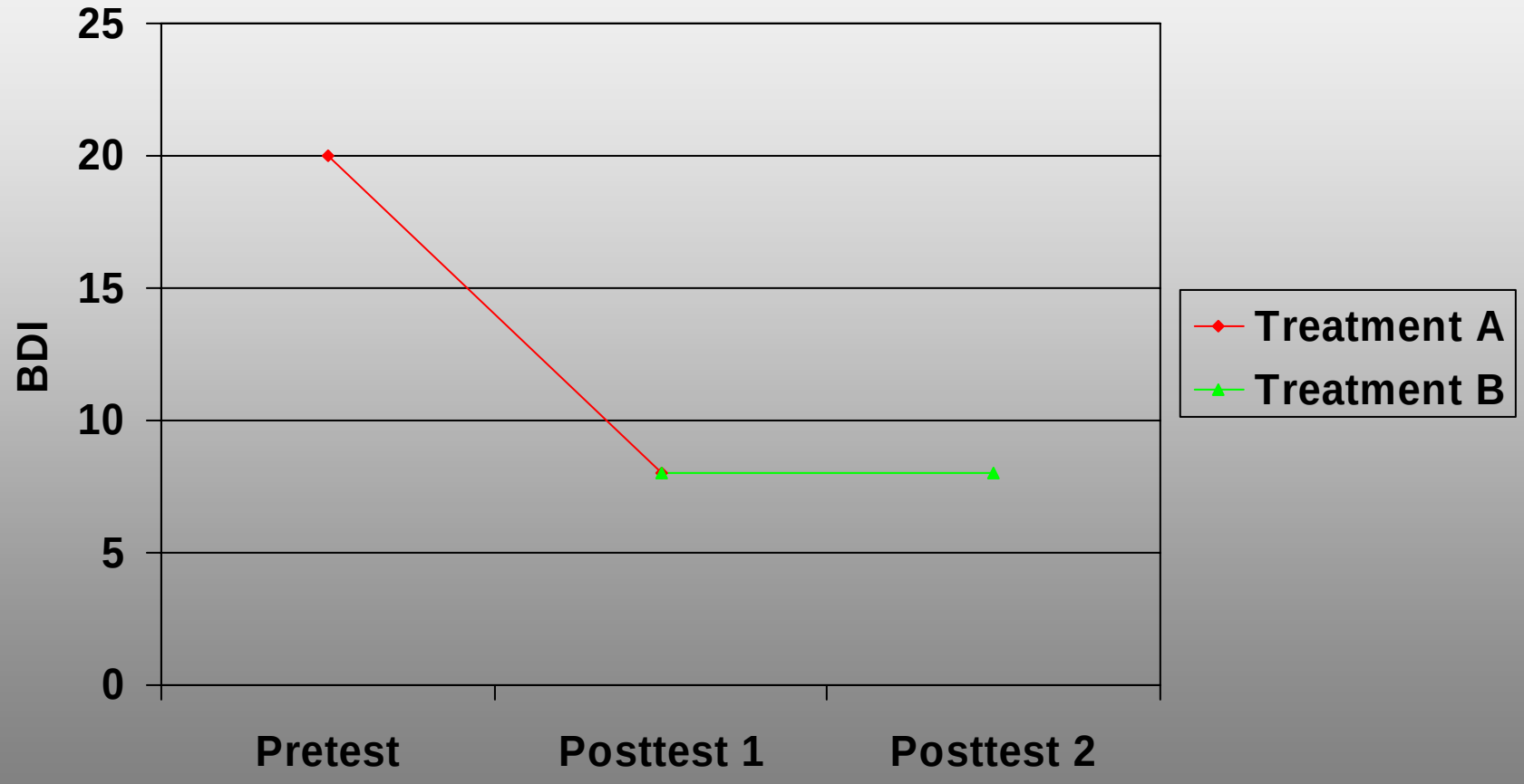
When to Use a Within-Subjects Design

- Participant variables make it difficult to create a comparable control group
- It is important to economize on number of participants
- When you want to assess the effects of increasing exposure on behavior

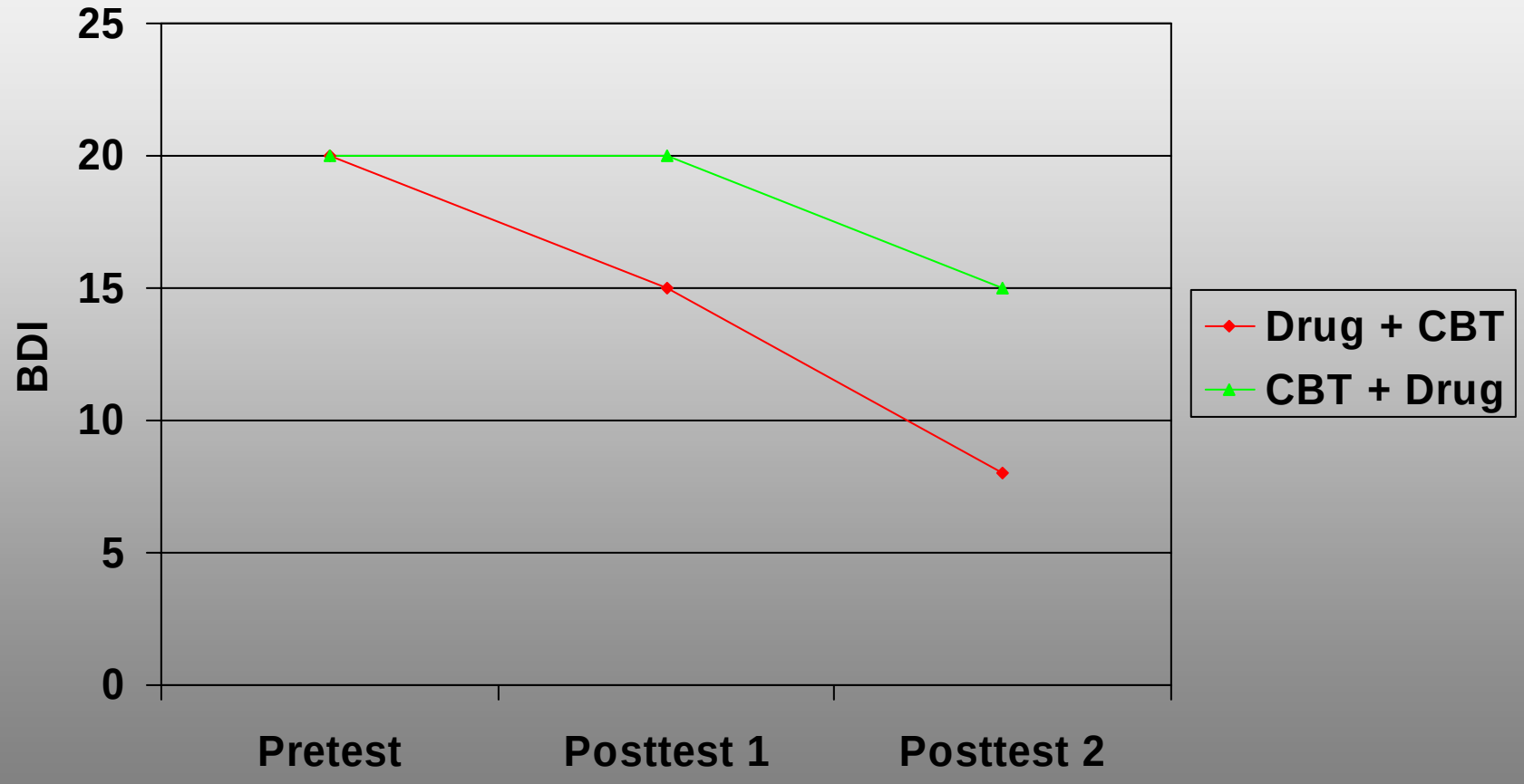
Disadvantages of Within-Subject Designs

- You cannot assume the person is exactly the same after exposure to the first treatment
  - Carryover effects occur when a previous treatment alters the observed behavior in a subsequent treatment

Order Effects



Sequence Effects



Sources of Carryover

- *Learning*
  - Learning a task in the first treatment may affect performance in the second
- *Fatigue*
  - Fatigue from earlier treatments may affect performance in later treatments
- *Habituation*
  - Repeated exposure to a stimulus may lead to unresponsiveness to that stimulus

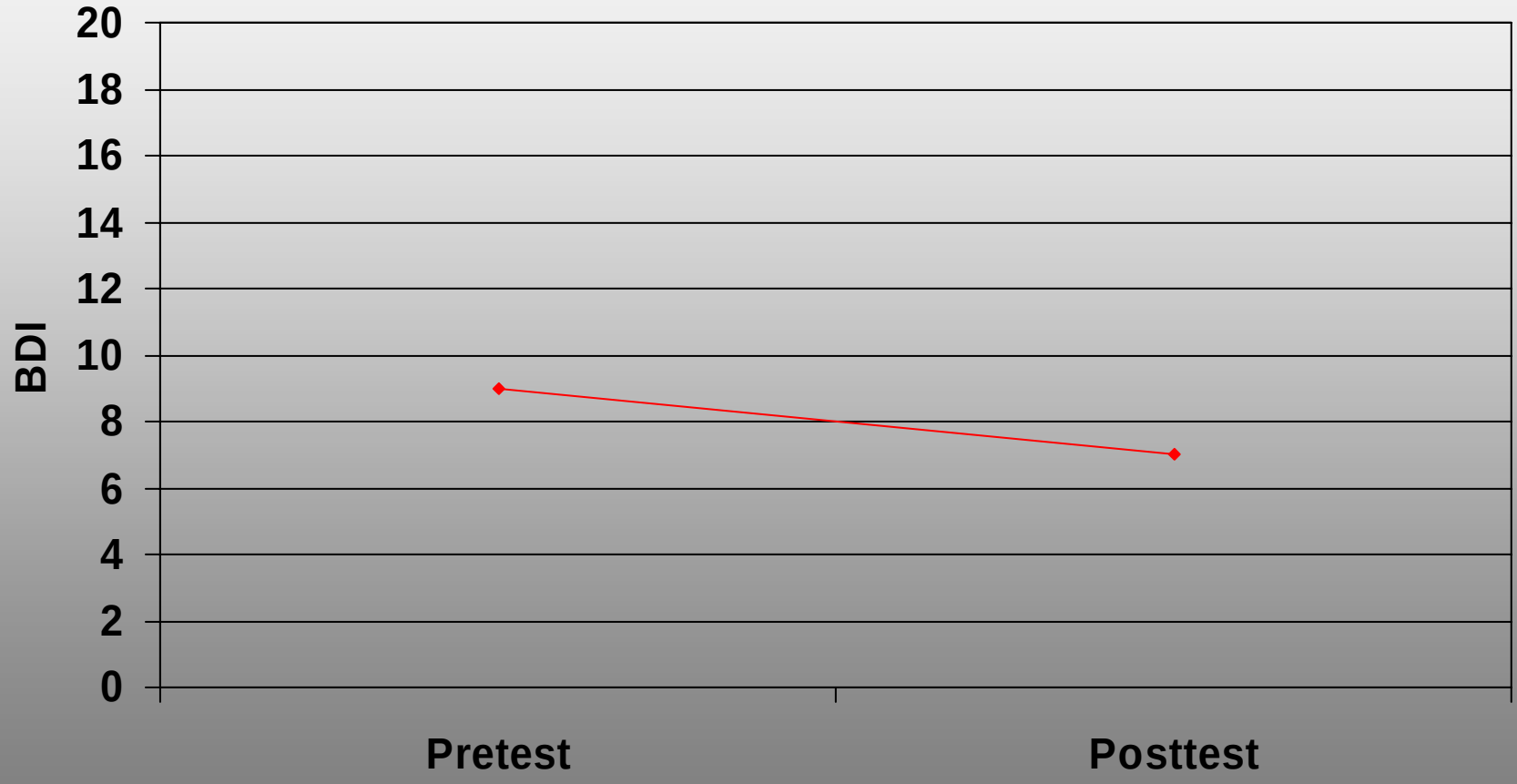
Sources of Carryover

- *Sensitization*
  - Exposure to a stimulus may make a subject respond more strongly to another
- *Contrast*
  - Subjects may compare treatments, which may affect behavior
- *Adaptation*
  - If a subject undergoes adaptation (e.g., becomes accustomed to depression), then earlier results may differ from later ones

Dealing with Carryover Effects

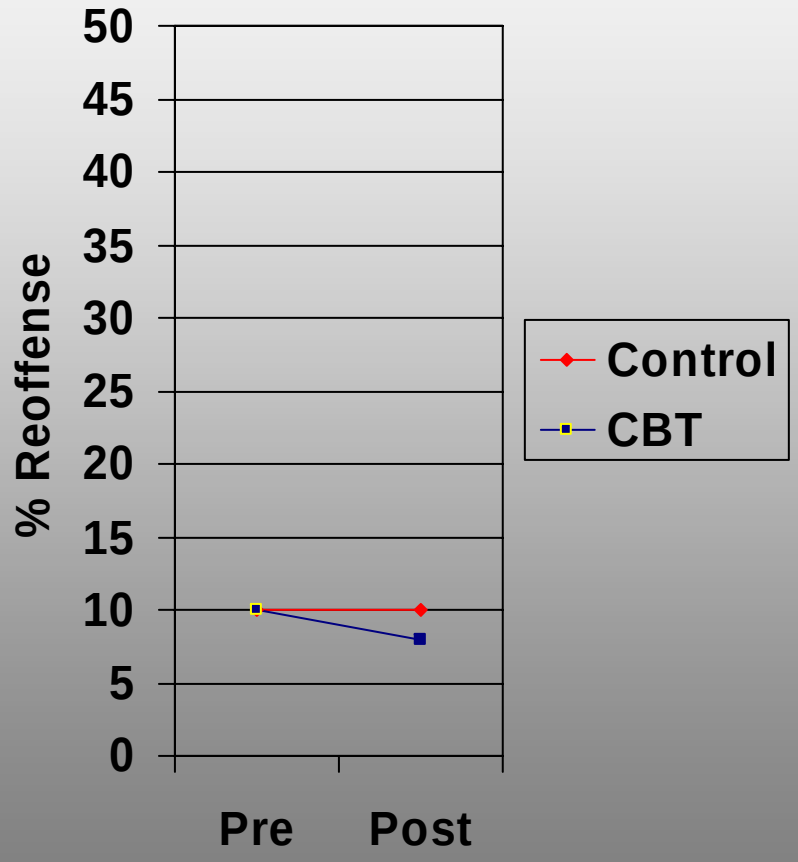
- *Counterbalancing*
  - The various treatments are presented in a different order for different subjects (complete or partial)

Floor Effects

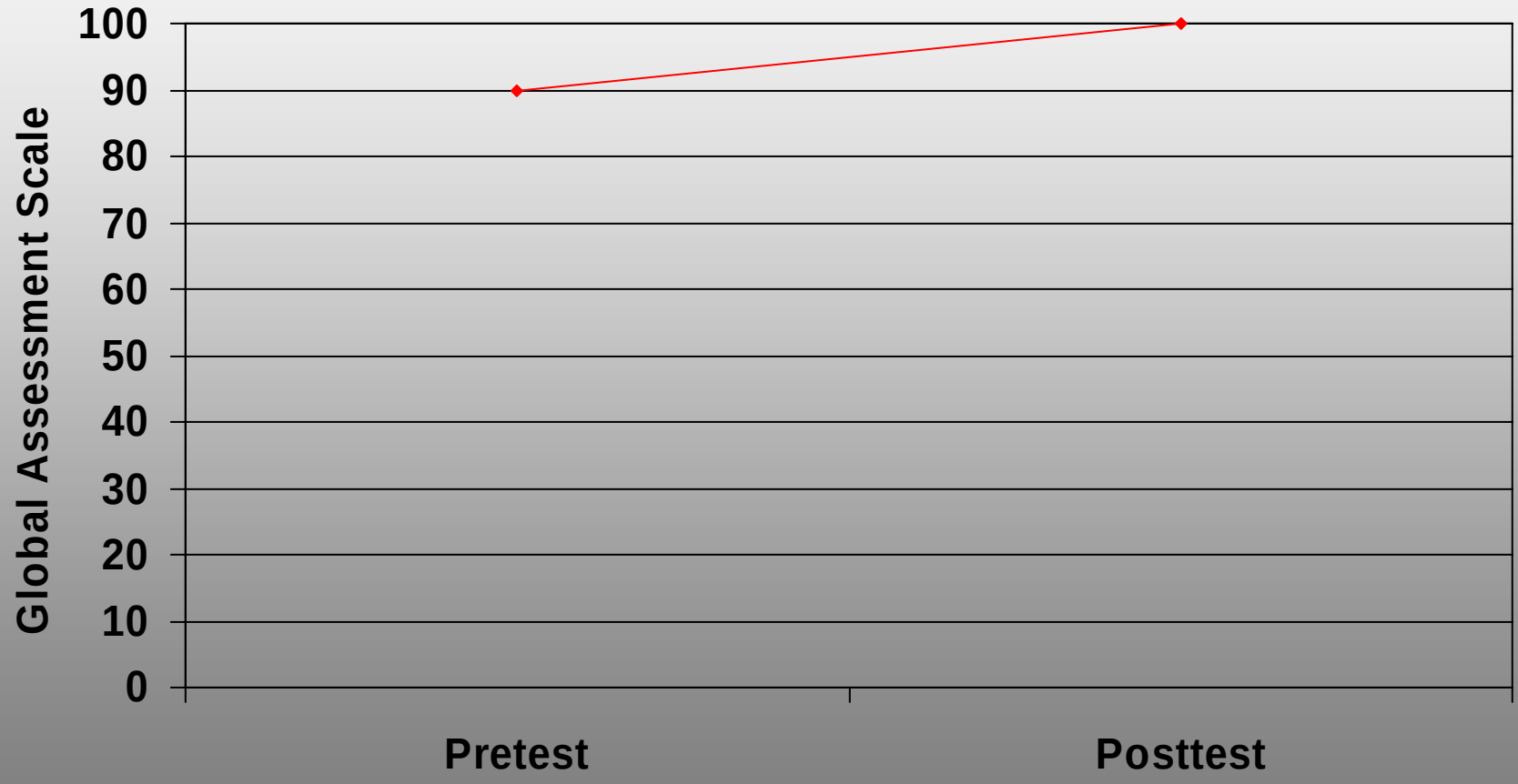


Floor Effects: Low Base Rates

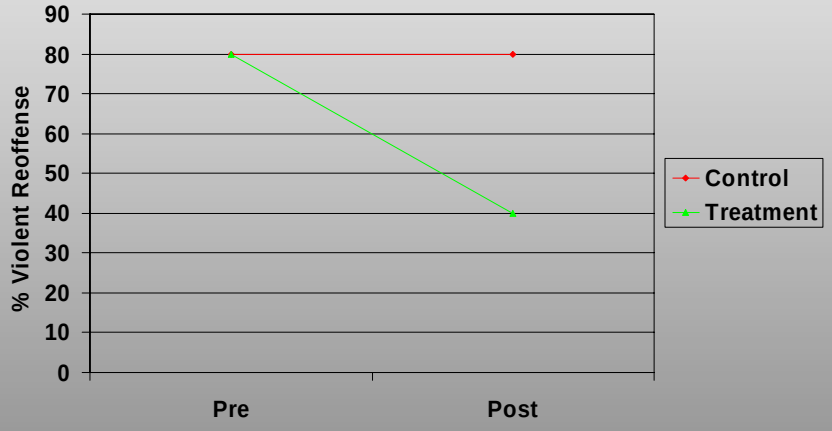
- A California Study of cognitive-behavioral interventions for sexual offenders selected men with one arrest only
- Risk for reoffense is likely to be low



Ceiling Effects



Ceiling Effects: High Base Rates



- Is a treatment that yields a 40% rate of violent recividism significant?
- It this reduction likely to be viewed as important by the public?

Factorial Designs

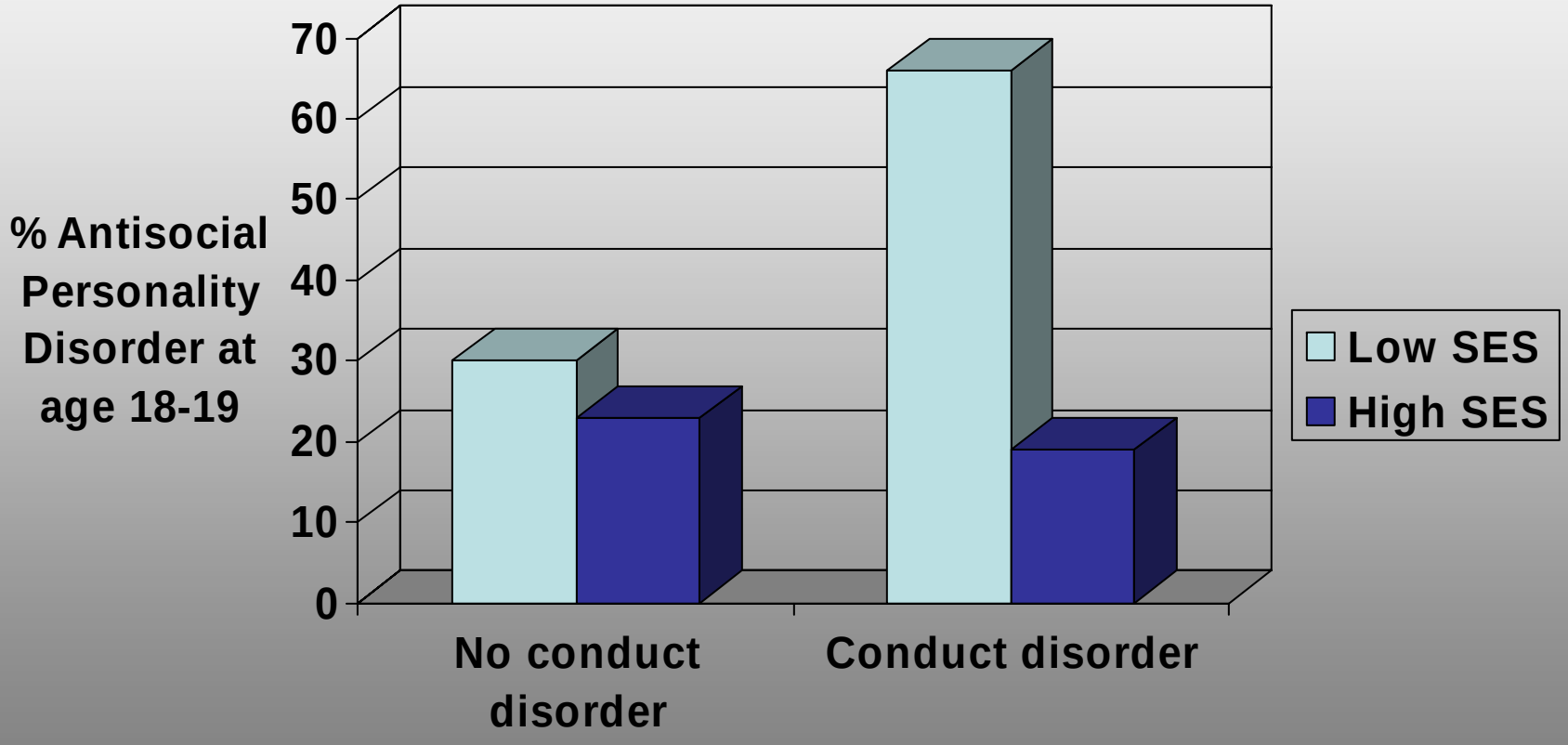
- 2 or more variables
- Why examine 2 or more variables at once?
  - Interactions between variables and potential moderators or mediators can be examined
  - e.g., gender x suicide attempts
- Selection of variables should be guided by theory

Factorial Designs

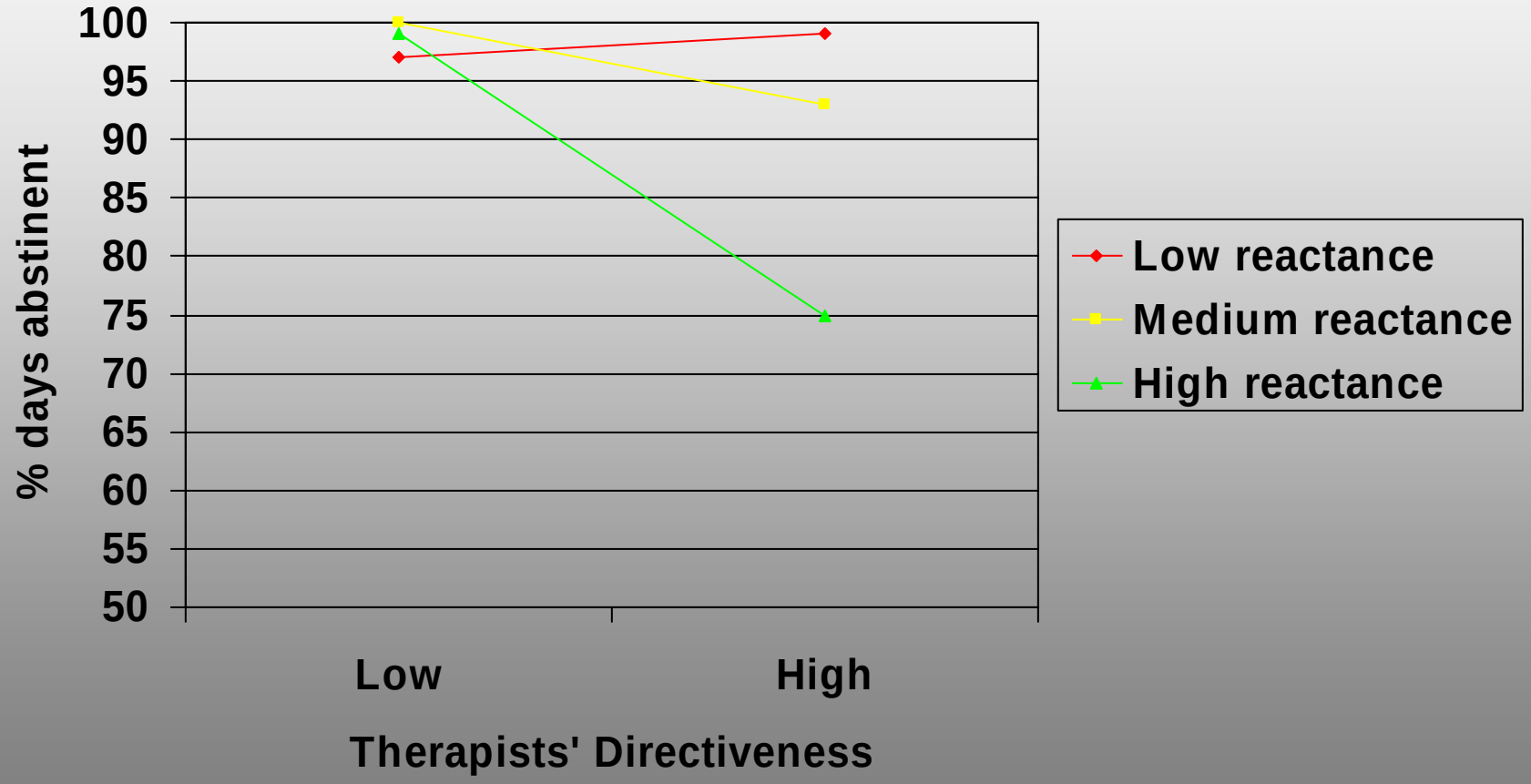
- Complex interactions are difficult to interpret
- Effects of gender, anxiety, and stress on depression

Gender	Anxiety	Stress
M	Hi	Hi
M	Hi	Lo
M	Lo	Hi
M	Lo	Lo
F	Hi	Hi
F	Hi	Lo
F	Lo	Hi
F	Lo	Lo

2 x 2 Interaction: SES, Conduct Disorder at 7-12 years of age, and APD (Lahey et al., 2005)



2 x 3 Interaction: Therapist Directiveness, Patient Reactance, and Drinking (Karno & Longabaugh, 2005)



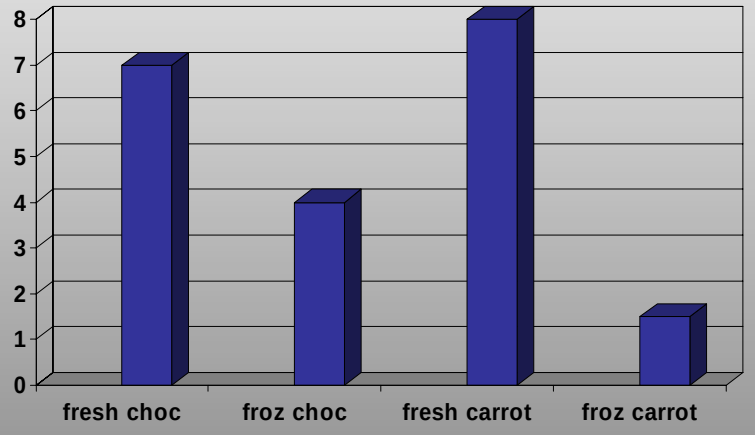
Factorial Design: Between and Within Model

Within-Subjects Independent Variable

Between Subjects Independent Variable

	A_1	A_2	A_3
B_1	S_1	S_1	S_1
	S_2	S_2	S_2
	S_3	S_3	S_3
	S_4	S_4	S_4
B_2	S_5	S_5	S_5
	S_6	S_6	S_6
	S_7	S_7	S_7
	S_8	S_8	S_8

How Many Variables Can Humans Process? (Halford et al., 2005)



- 2-way interaction
- People prefer **fresh** cakes to **frozen** cakes. The difference depends on the flavor (**chocolate** vs **carrot**). The difference between **fresh** and **frozen** is (greater/smaller) for **chocolate** cakes than for **carrot** cakes.

3-Way Interaction

- People prefer **fresh** cakes to **frozen** cakes. The difference depends on the flavor (**chocolate** vs **carrot**) and the type (**iced** vs **plain**). The difference between **fresh** and **frozen** increases from **chocolate** cakes to **carrot** cakes. This increase is (greater/smaller) for **iced** cakes than for **plain** cakes.

Group 1: Propose Hypotheses About a 3-Way Interaction

- Effects of gender, anxiety, and stress on depression
- Rank order the group from most to least likely to be depressed and provide a rationale

Gender	Anxiety	Stress
M	Hi	Hi
M	Hi	Lo
M	Lo	Hi
M	Lo	Lo
F	Hi	Hi
F	Hi	Lo
F	Lo	Hi
F	Lo	Lo

Group 2: Propose Hypotheses About a 3-Way Interaction

- Effects of insomnia, weight loss, and suicidality on depression
- Rank order the group from most to least likely to be depressed and provide a rationale

Insomnia	Weight loss	Suicidality
Yes	Yes	Hi
Yes	Yes	Lo
Yes	No	Hi
Yes	No	Lo
No	Yes	Hi
No	Yes	Lo
No	No	Hi
No	No	Lo

Group 3: Propose Hypotheses About a 3-Way Interaction

- Effects of therapist gender, patient gender, and therapist directiveness on CBT for depression
- Rank order the group from most to least likely to benefit from CBT provide a rationale

Therapist	Patient	Directiveness
M	M	Hi
M	M	Lo
M	F	Hi
M	F	Lo
F	M	Hi
F	M	Lo
F	F	Hi
F	F	Lo

4-Way Interaction

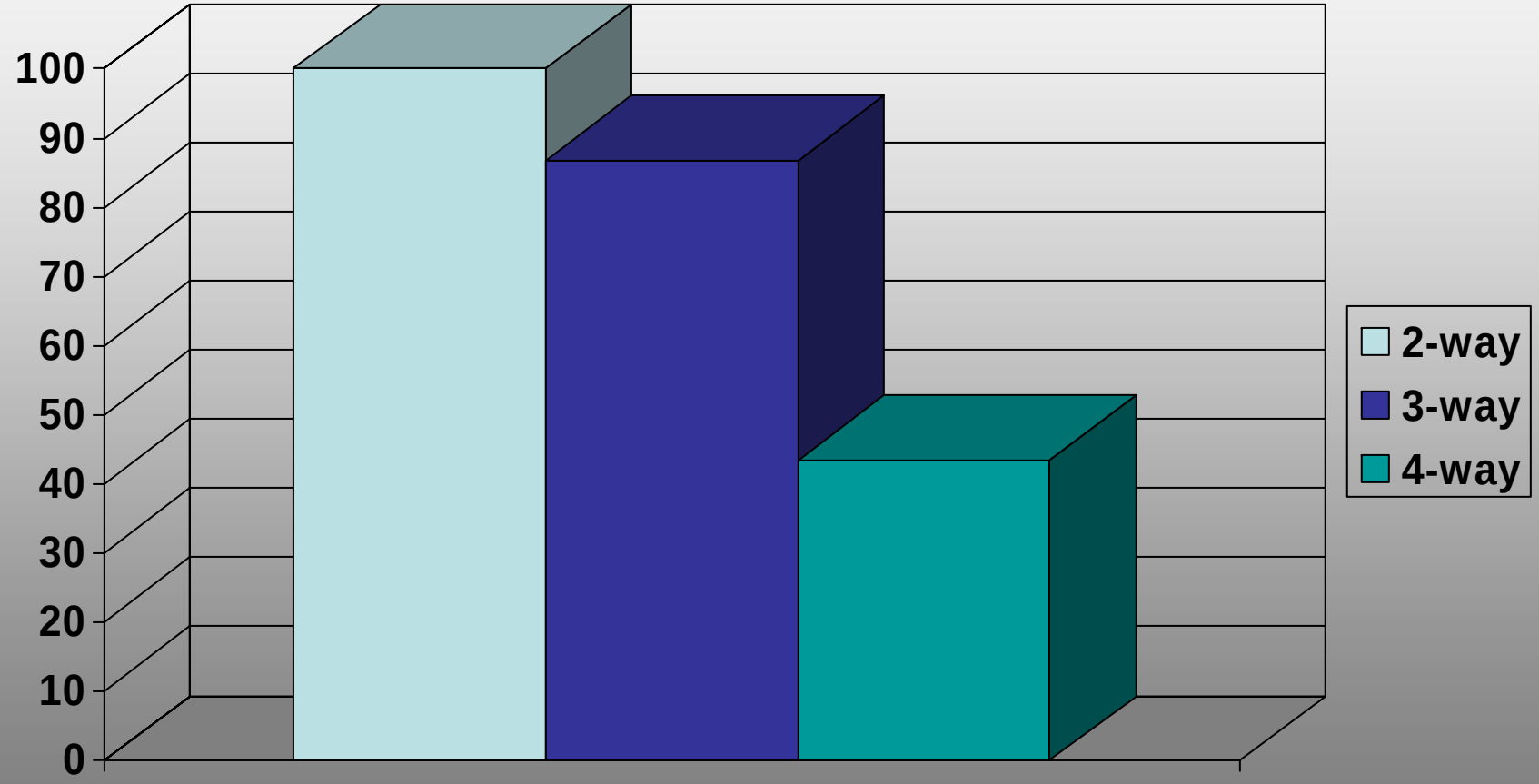
- People prefer **fresh** cakes to **frozen** cakes. The difference depends on the flavor (**chocolate** vs **carrot**), the type (**iced** vs **plain**) and the richness (**rich** vs **low fat**). The difference between **fresh** and **frozen** increases from **chocolate** cakes to **carrot** cakes. This increase is greater for **iced** cakes than for **plain** cakes. There is a (greater/smaller) change in the size of the increase for **rich** cakes than for **low fat** cakes."

4-Way Interaction

- Effects of gender, anxiety, stress, and suicidality on depression

Gender	Anxiety	Stress	Suicidality
M	Hi	Hi	Hi
M	Hi	Hi	Lo
M	Hi	Lo	Hi
M	Hi	Lo	Lo
M	Lo	Hi	Hi
M	Lo	Hi	Lo
M	Lo	Lo	Hi
M	Lo	Lo	Lo
F	Hi	Hi	Hi
F	Hi	Hi	Lo
F	Hi	Lo	Hi
F	Hi	Lo	Lo
F	Lo	Hi	Hi
F	Lo	Hi	Lo
F	Lo	Lo	Hi
F	Lo	Lo	Lo

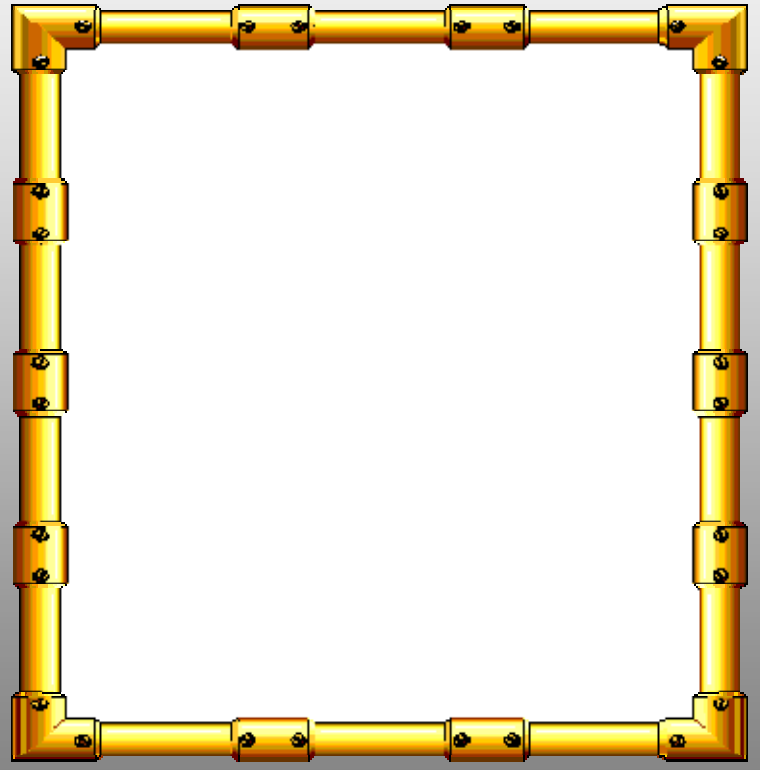
% Correct By Interaction Problem Type Among 30 Graduate Students (Halford et al., 2005)



Control Groups:
What other interpretations can account for this pattern of results?

No Treatment Control Groups

- To what extent would persons change or improve without treatment?
- Controls for:
  - History during intervention
  - Maturation
  - Statistical regression
  - Effects of repeated assessments



No Treatment Control Groups

- Should dropouts who had been randomly assigned to treatment be included in the no treatment control condition?

Examples of Psychotherapy Studies Involving No Treatment Control Groups

- Behavioral marital therapy > no treatment control in reducing marital distress in 30 studies (Shadish & Baldwin, 2005)
- Individual, group, classroom, teacher, parent training > no treatment control in reducing internalizing and externalizing in 4th graders (Weiss et al., 2003)
- Educational prevention program for dating violence > no treatment control for reducing violence among abused teenagers (Wolfe et al., 2003)

No Treatment Control Groups

- Issues
  - Disappointment
  - Resentment
  - Seeking other treatment
  - Attrition
  - Ethical issues

Waiting List Control Groups

- Treatment is delayed rather than withheld
- Waiting period corresponds to the length of treatment

Examples of Psychotherapy Studies Involving Waiting List Control Groups

- Group therapy > waiting list control for anxiety, depression, hope among breast cancer survivors (Lane & Viney, 2005)
- CBT > delayed treatment for cannabis dependence (Babor, 2004)
- CBT > waiting list control for social phobia (Hofmann, 2004)

Waiting List Control Groups

- Issues
  - Participant expectancies
  - How long a wait is feasible?
  - Long-term control not possible after the group receives treatment

No Contact Control Groups

- Participants are not aware that they are in a study on psychotherapy
- No expectations concerning treatment
- Not typically used in clinical settings

Attention Placebo Control Groups

- Meetings with therapist Same number and duration of sessions as treatment group
- Controls for nonspecific factors in psychotherapy
  - Contact with a therapist
  - Belief that change will occur

Examples of Psychotherapy Studies Involving Attention Placebo Groups

- Family substance abuse intervention > minimal contact control in reducing adolescent substance abuse (Spoth et al., 2004)
- CBT > minimal contact control (telephone questions) in treating generalized anxiety disorder in older adults (Stanley et al., 2003)

Attention Placebo Control Groups

- Issues
  - Attention placebo control conditions are more effective than no treatment (Lambert & Bergin, 1994)
  - Credibility
  - Comparability to treatment
  - Ethical issues
    - Ineffective treatment may distort the participant's perspective of therapy
    - Deleterious effects

Standard Treatment Control Groups

- Treatment as usual as a control group
- All participants receive a treatment that is assumed to be effective

Examples of Psychotherapy Studies Involving Treatment as Usual Control Groups

- Mindfulness-based CBT > TAU (family doctor) in reducing depression (Ma & Teasdale, 2004)
- CBT > TAU (masters level therapists in HMO) in reducing panic disorder (Addis et al., 2004)

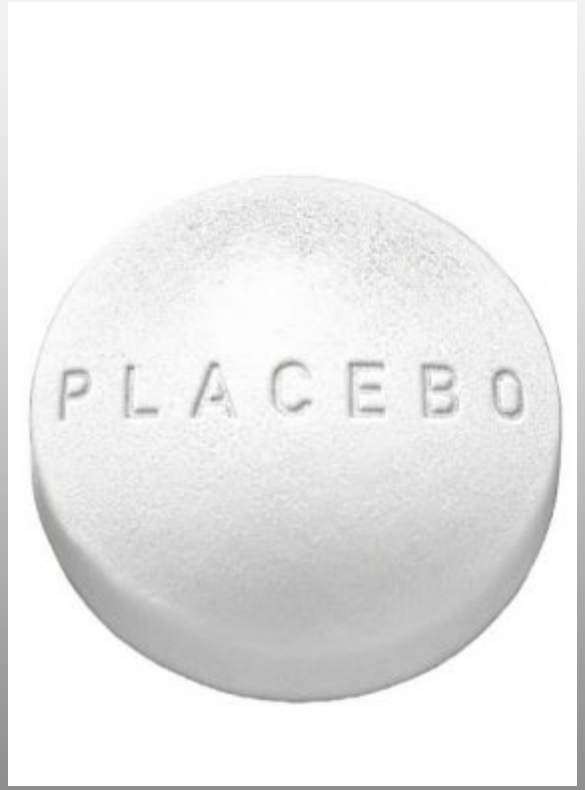
Standard Treatment Control Groups

- Issues
  - Expectations, enthusiasm of investigator and therapists
  - What is the content of standard treatment?
  - Ethical issues
    - What if standard treatment is shown to be ineffective or deleterious?

Yoked Control Groups

- Control participants and treatment participants are matched on variables that might systematically vary across conditions (e.g., # of sessions)
- Helps rule out potential confounds

Methodology Case Study #1



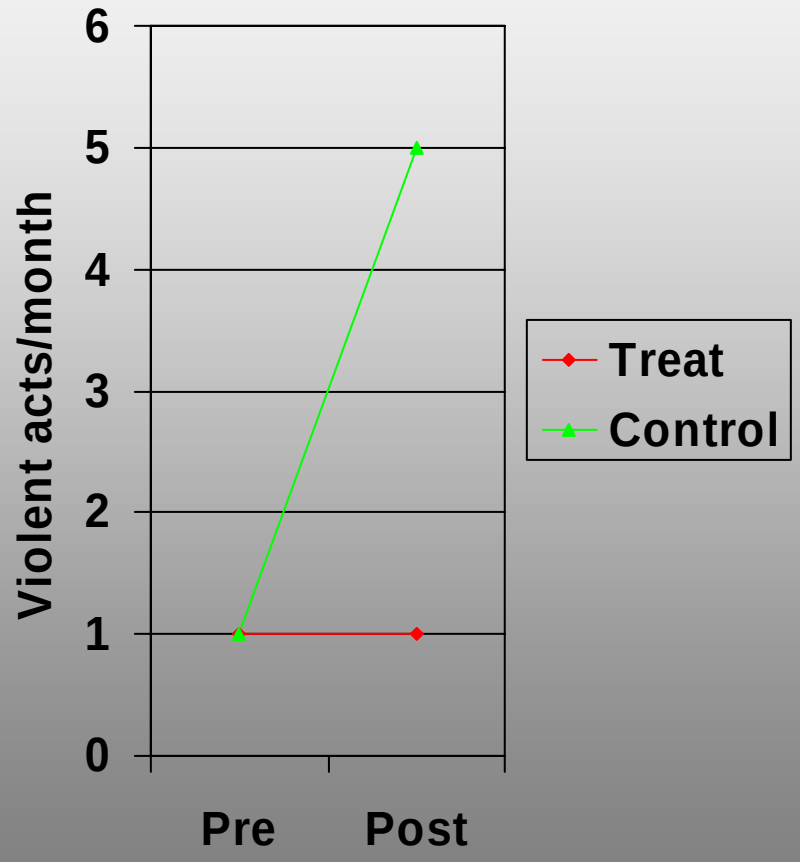
- You are asked to develop an attention-placebo control condition for cognitive therapy
  - What would you need to know about CT?
  - What will you try to control for?

Methodology Case Study #2

- Dr. X. Pert has demonstrated in a study of 80 clients that social skills training reduces depression relative to a no treatment condition
- She now wants to compare social skills training to CBT
- What control group(s) will she need?

Methodology Case Study #3

- A researcher who has developed an intervention for children's violence finds no change after one year
- Can an intervention that produces no change be considered efficacious?



Methodology Case Study #4

- Based on a theory of narcissism, you develop a treatment for shy people that emphasizes how self-absorbed they are
- Your control condition does not include an active treatment
- Are you ethically obligated to provide shy people an active treatment?

What treatment, by whom, is most effective for this individual with that specific problem, under which set of circumstances?

Gordon Paul, 1967

Treatment Evaluation Strategies

Treatment Package Strategy

- a vs. 0
- Does treatment that contains multiple components produce therapeutic change?
- No treatment, waiting list, or attention placebo control

Dismantling Strategy

- $a_1 + a_2$ vs. $a_1 - a_2$
- What are the necessary and sufficient components of treatment?

Constructive Treatment Strategy

- a vs. a + b
- What can be added to a treatment to make it more effective?
- Is the combined treatment more effective than an individual treatment?
  - Fluoxetine + CBT > Fluoxetine or CBT

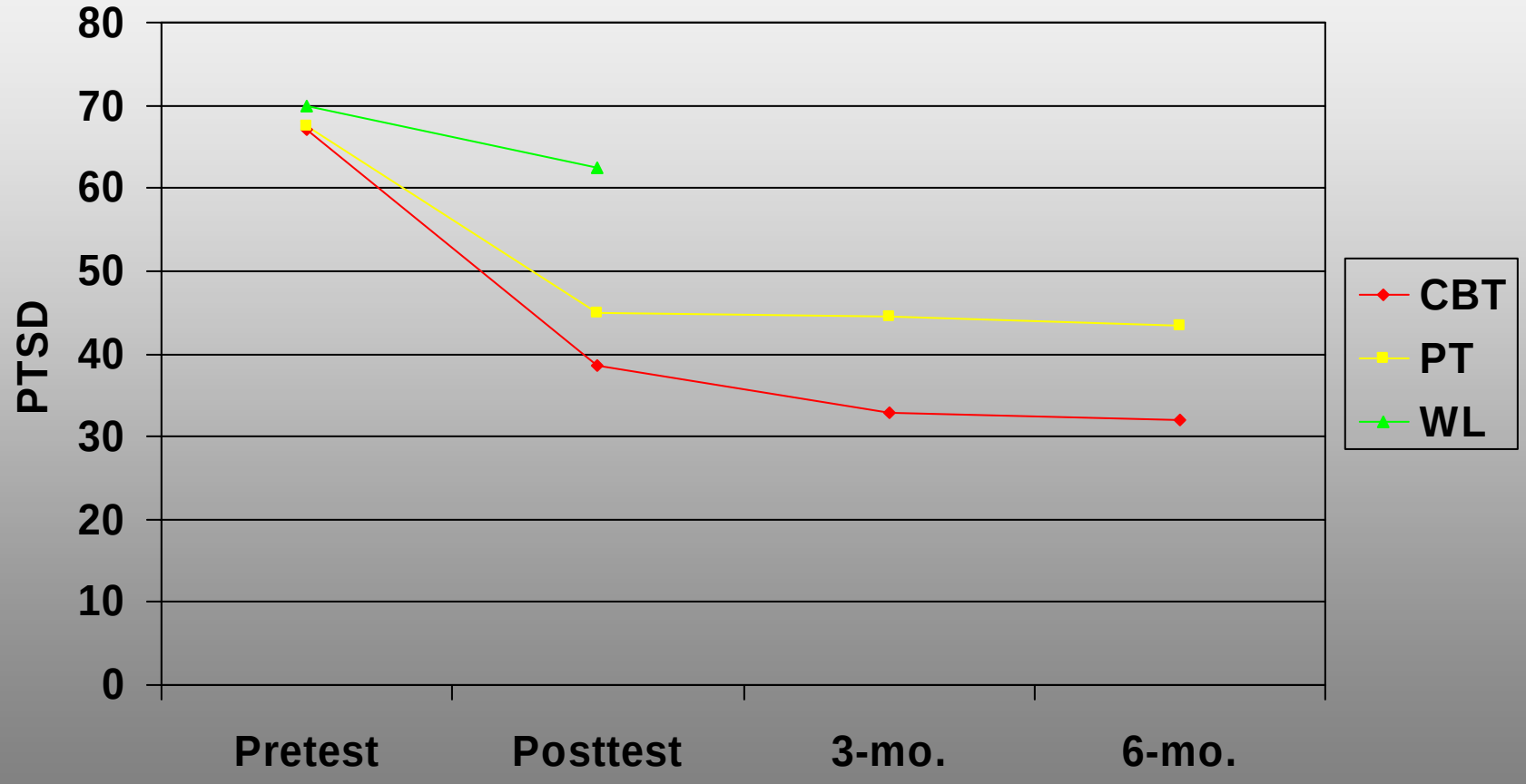
Parametric Treatment Strategy

- a vs. a ⟶
- Dimensions or parameters of treatment are altered to find the optimal way of administering treatment
- Basic parameter is duration

Comparative Treatment Strategy

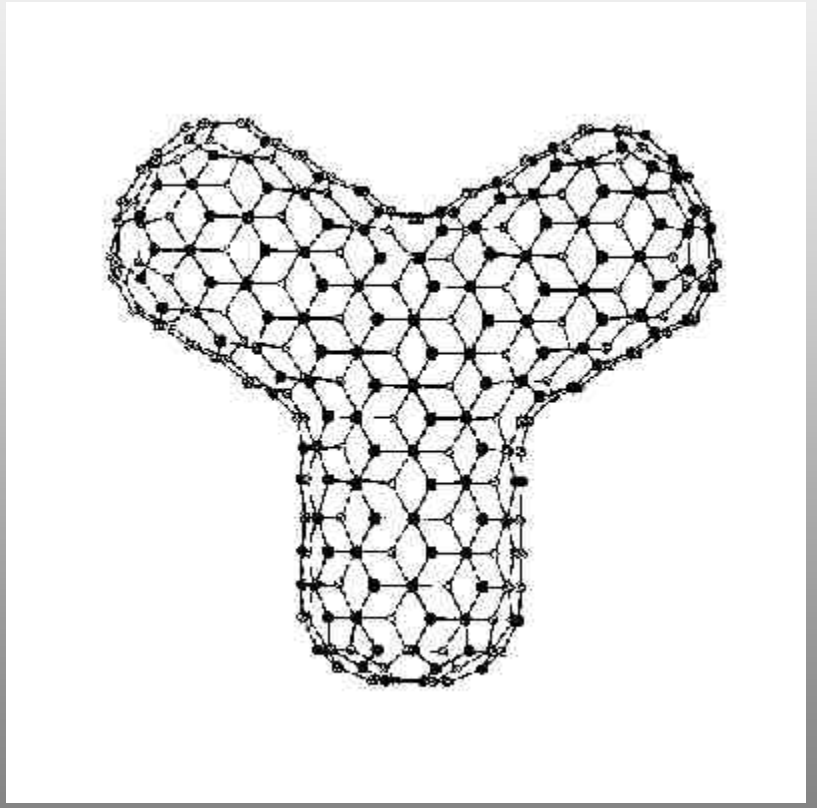
- a vs. b
- Which treatment is better for a clinical problem?

CBT for PTSD in Women Survivors of Childhood Sexual Abuse (McDonagh et al., 2005)

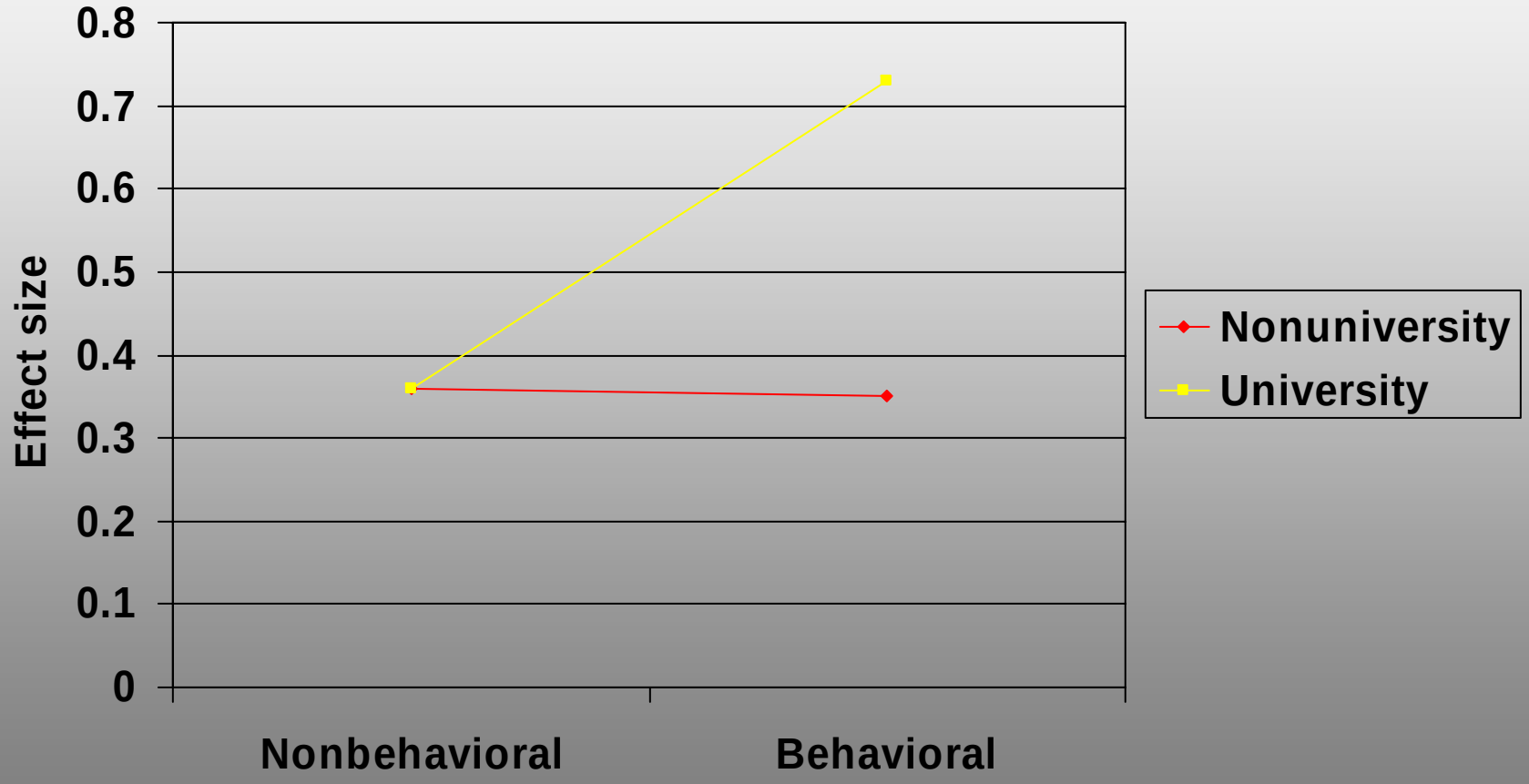


Treatment Moderator Strategy

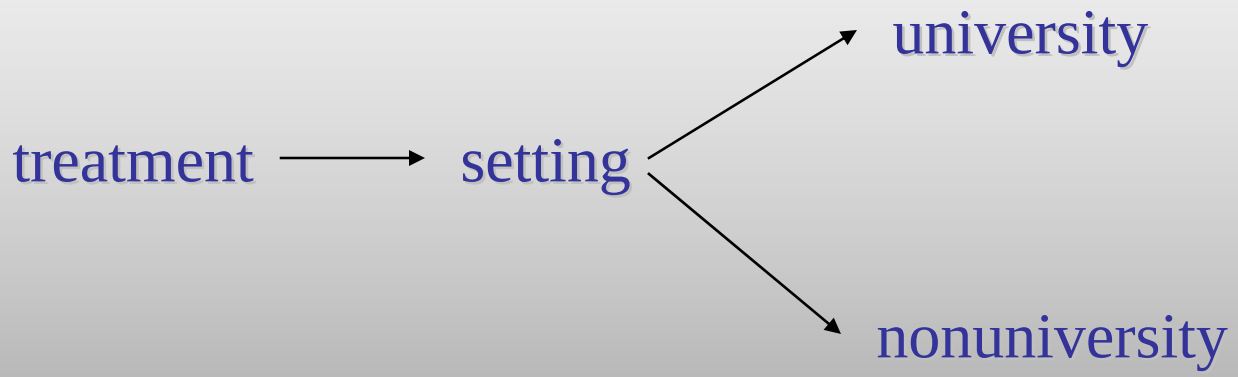
- a → ↗ ↘
- Which variables influence treatment effects? (e.g., matching)
- Identification of moderators should be guided by theory



Treatment Setting as a Moderator of Treatment Outcome: Meta-analysis (Shadish & Sweeney, 1991)



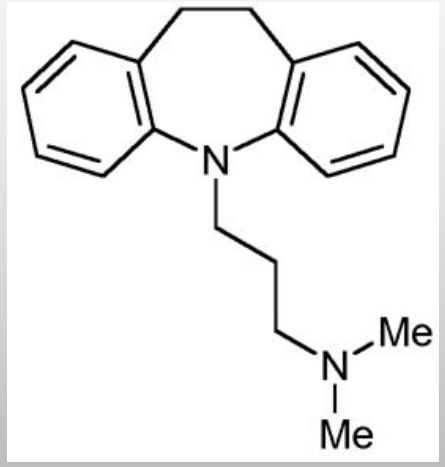
Treatment Setting as a Moderator of Treatment Outcome

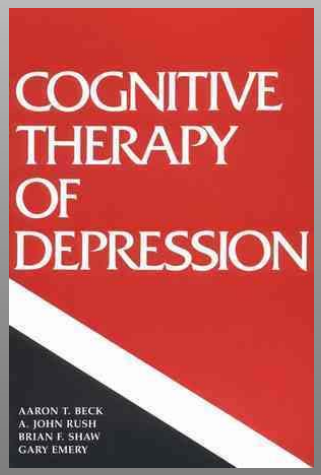


Treatment Mediator Strategy

- a → b → c
- Mechanisms of change
- What processes cause change?
- Castonguay et al. (1996)
  - Therapeutic alliance and client cognitive and emotional involvement cause change
  - Therapeutic techniques do not

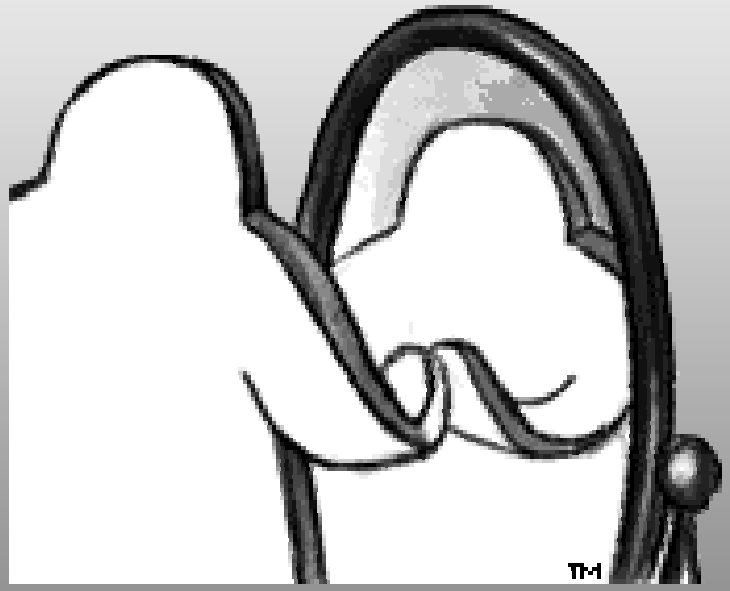
Methodology Case Study #1





- You want to determine if Imipramine, CBT, or both are necessary to treat Major Depressive Disorder
- What treatment evaluation strategy(ies) would you use?

Methodology Case Study #2



- Based on social identity theory, you hypothesize that clients who perceive themselves as similar to their therapist will improve more than clients who perceive themselves as dissimilar
- Which treatment evaluation strategy(ies) might you use to test this hypothesis?

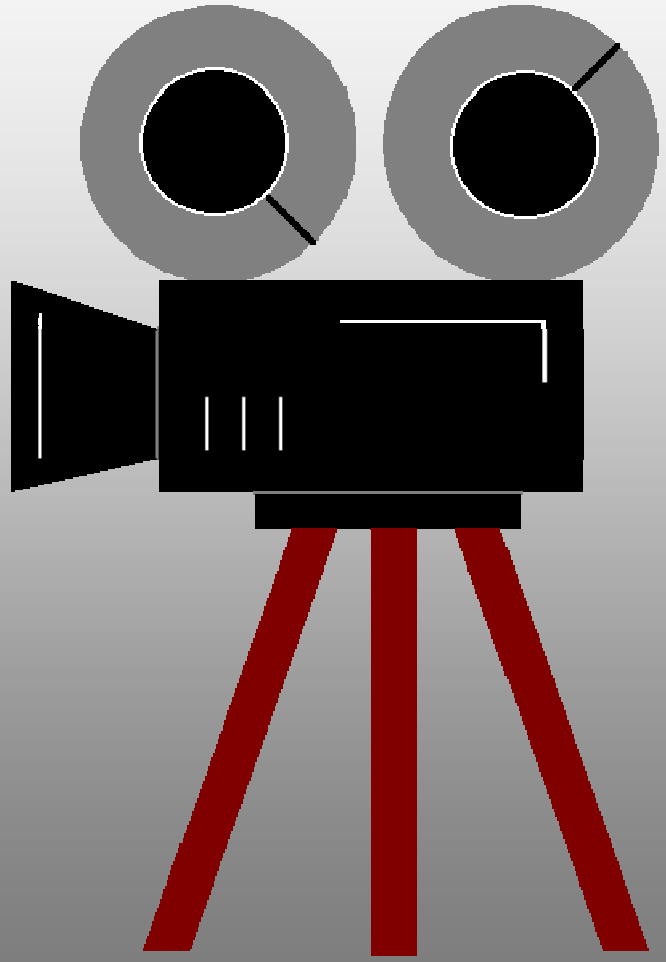
Assessing the Impact of the Experimental Manipulation

Experimental Analogue of Sexual Harassment

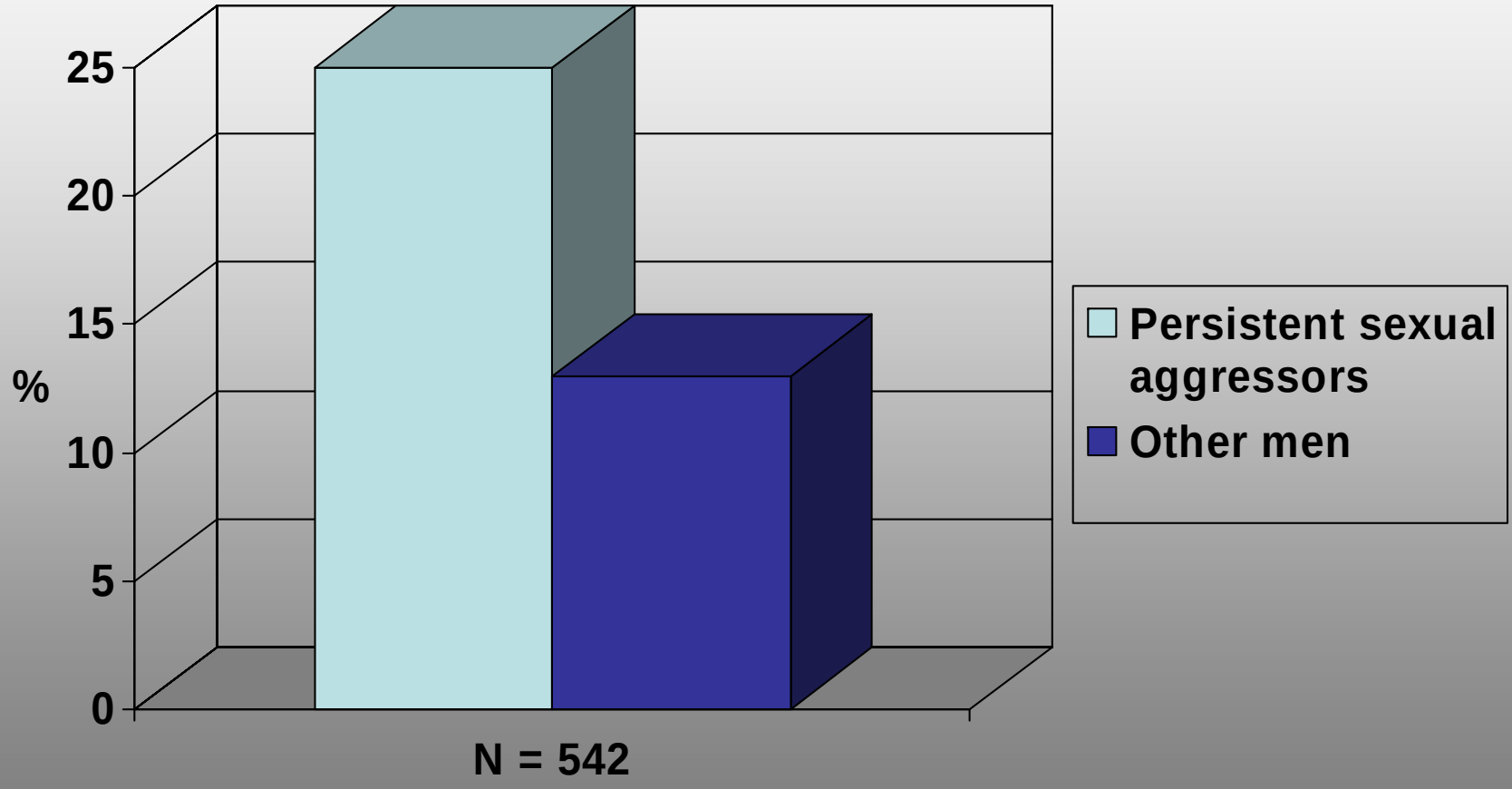
- Sexual harassment = an unwanted sexual experience
- Participants must have an opportunity to create an unwanted sexual experience for another person

Experimental Analogue of Sexual Harassment

- A female student (confederate) is depicted as strongly disliking sexual material
- Male participants view sexual or nonsexual film
- Participants choose one of the films to show to the student



Showing of Sexual Film Among Persistent Sexual Aggressors vs. Other Men



Types of Manipulations

- Variations of information
  - How did the sexual film differ from the nonsexual film?
- Variations in participant behavior and experience
  - Some participants showed sexual film, most did not
  - Persistent sexual aggressors vs. others

Manipulation Check

- Questionnaire following instructions or rationale
- When should the manipulation check occur?
- What if the manipulation check fails, but there is still an effect on the DV?
  - Participants aren't aware of the manipulation, but the between-groups outcome is different

Pilot Studies

- Focus groups
  - What experimental variables are likely to have an impact?
- Pilot experiment
  - Does the experimental manipulation work on a small scale?

Treatment integrity (fidelity)

- Treatment should be defined
  - Criteria, procedures, tasks, therapist/client characteristics
  - Manualized treatments
    - Can treatment integrity be evaluated when no manuals are employed?
- Therapists should be trained
  - Experience is not a substitute for training
- Ongoing supervision

Empirically-Supported Therapies for Children and Adolescents (Kazdin & Weisz, 1998)

- Internalizing problems
  - CBT for anxiety
  - Coping skills training for depression
- Externalizing problems
  - Cognitive problem-solving skills training for oppositional and aggressive children
  - Parent management training for oppositional and aggressive children
  - Multisystemic therapy for antisocial behavior

Empirically-Supported Therapies for Adults (DeRubeis & Crits-Cristoph, 1998)

- Major depressive disorder
  - Cognitive therapy
  - Behavior therapy
  - Interpersonal therapy
- Generalized anxiety disorder
  - Cognitive therapy
  - Applied relaxation
- Social phobia
  - Exposure therapy
  - Exposure therapy + CBT

Empirically-Supported Therapies for Adults (DeRubeis & Crits-Cristoph, 1998)

- Obsessive-compulsive disorder
  - Exposure and response prevention
- Agoraphobia
  - Exposure therapy
- Panic disorder
  - Cognitive therapy
  - Exposure therapy
  - Applied relaxation

Empirically-Supported Therapies for Adults (DeRubeis & Crits-Cristoph, 1998)

- Post-traumatic stress disorder
  - Exposure therapy

Treatment Fidelity of Multisytemic Therapy (MST): Treatment Principles

- 1. The primary purpose of assessment is to understand the fit between the identified problems and their broader systemic context.
- 2. Therapeutic contacts should emphasize the positive and should use systemic strengths as levers for change.
- 3. Interventions should be designed to promote responsible behavior and decrease irresponsible behavior among family members.
- 4. Interventions should be present-focused and action-oriented, targeting specific and well-defined problems.
- 5. Interventions should target sequences of behavior within or between multiple systems that maintain identified problems.

Treatment Fidelity of Multisytemic Therapy (MST): Treatment Principles

- 6. Interventions should be developmentally appropriate and fit the developmental needs of the youth.
- 7. Interventions should be designed to require daily or weekly effort by family members.
- 8. Intervention effectiveness is evaluated continuously from multiple perspectives, with providers assuming accountability for overcoming barriers to successful outcomes.
- 9. Interventions should be designed to promote treatment generalization and long-term maintenance of therapeutic change by empowering care givers to address family members' needs across multiple systemic contexts.

Treatment Integrity: MST Adherence Measure

(Henggeler et al.,1997)

- 1. The session was lively and energetic.
- 2. The therapist tried to understand how the family's problems all fit together.
- 3. The family and therapist worked together effectively.
- 4. The family knew exactly which problems were being worked on.
- 5. The therapist recommended that family members do specific things to solve their problems.
- 6. The therapist's recommendations required family members to work on their problems almost every day.
- 7. The family and therapist had similar ideas about ways to solve problems.

Treatment Integrity: MST Adherence Measure (Henggeler et al.,1997)

- 8. The therapist tried to change some ways that family members interact with each other.
- 9. The therapist tried to change some ways that family members interact with people outside the family.
- 10. The family and therapist seemed honest and straightforward with each other.
- 11. The therapist's recommendations should help the children to mature.
- 12. Family members and the therapist agreed upon the goals of the session.
- 13. The family and therapist talked about how well the family followed her/his recommendations from the previous session.

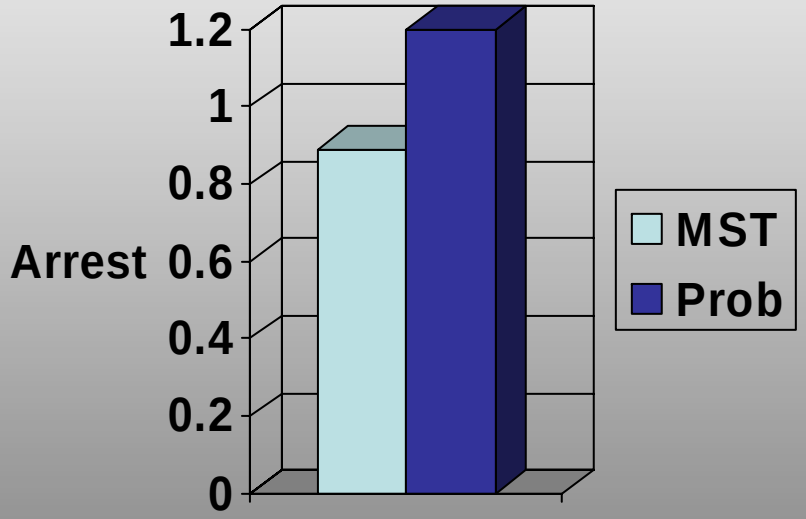
Treatment Integrity:
MST Adherence Measure

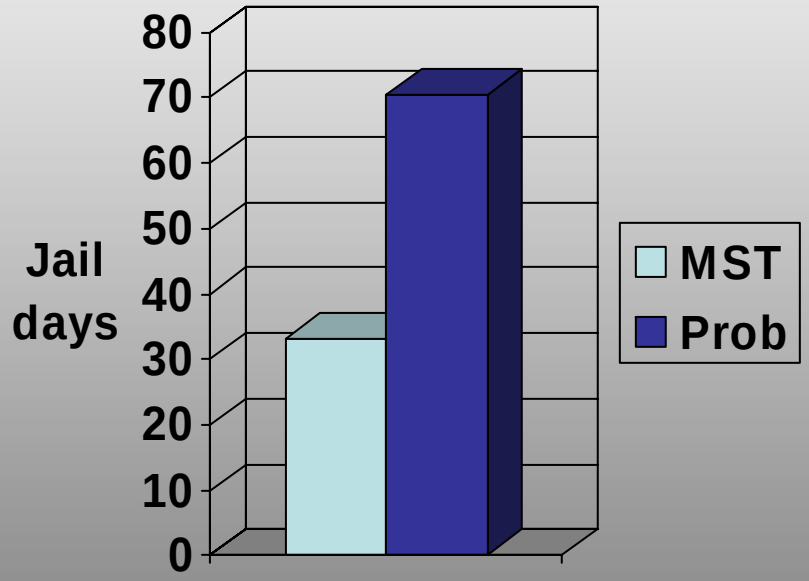
- 14. The family and therapist talked about the success (or lack of success) of her/his recommendations from the previous session.
- 15. The therapy session included a lot of irrelevant small talk (chit-chat).
- 16. Not much was accomplished during the therapy session.
- 17. Family members were engaged in power struggles with the therapist.
- 18. The therapist's recommendations required the family to do almost all the work.
- 19. The therapy session was boring.
- 20. The family was not sure about the direction of treatment.

Treatment Integrity:
MST Adherence Measure

- 21. The therapist understood what is good about the family.
- 22. The therapist's recommendations made good use of the family's strengths.
- 23. The family accepted that part of the therapist's job is to help change certain things about the family.
- 24. During the session, the family and therapist talked about some experiences that occurred in previous sessions.
- 25. The therapist's recommendations should help family members to become more responsible.
- 26. There were awkward silences and pauses during the session.

MST Monitored for Fidelity vs. Probation: 1.7-year Follow-up

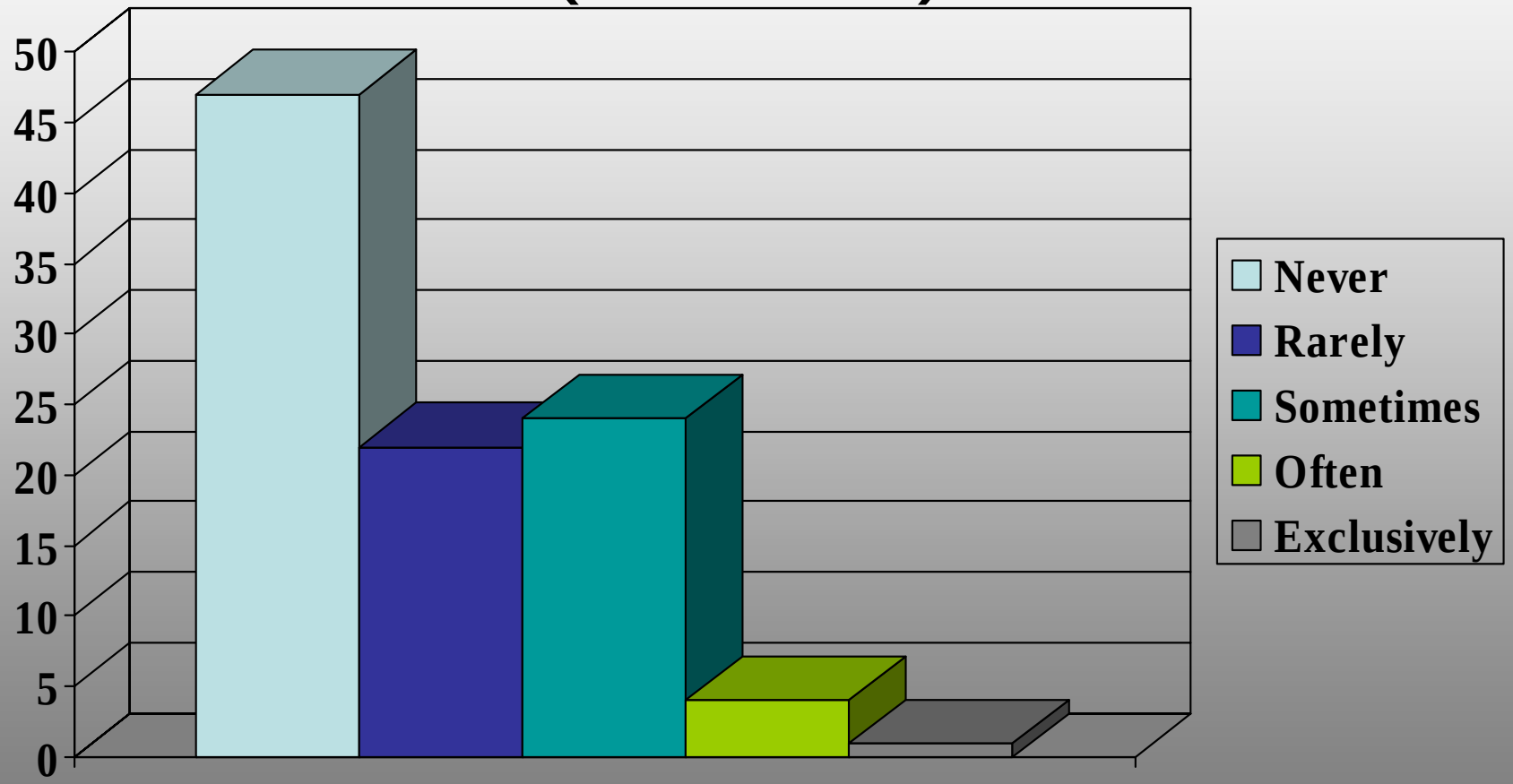




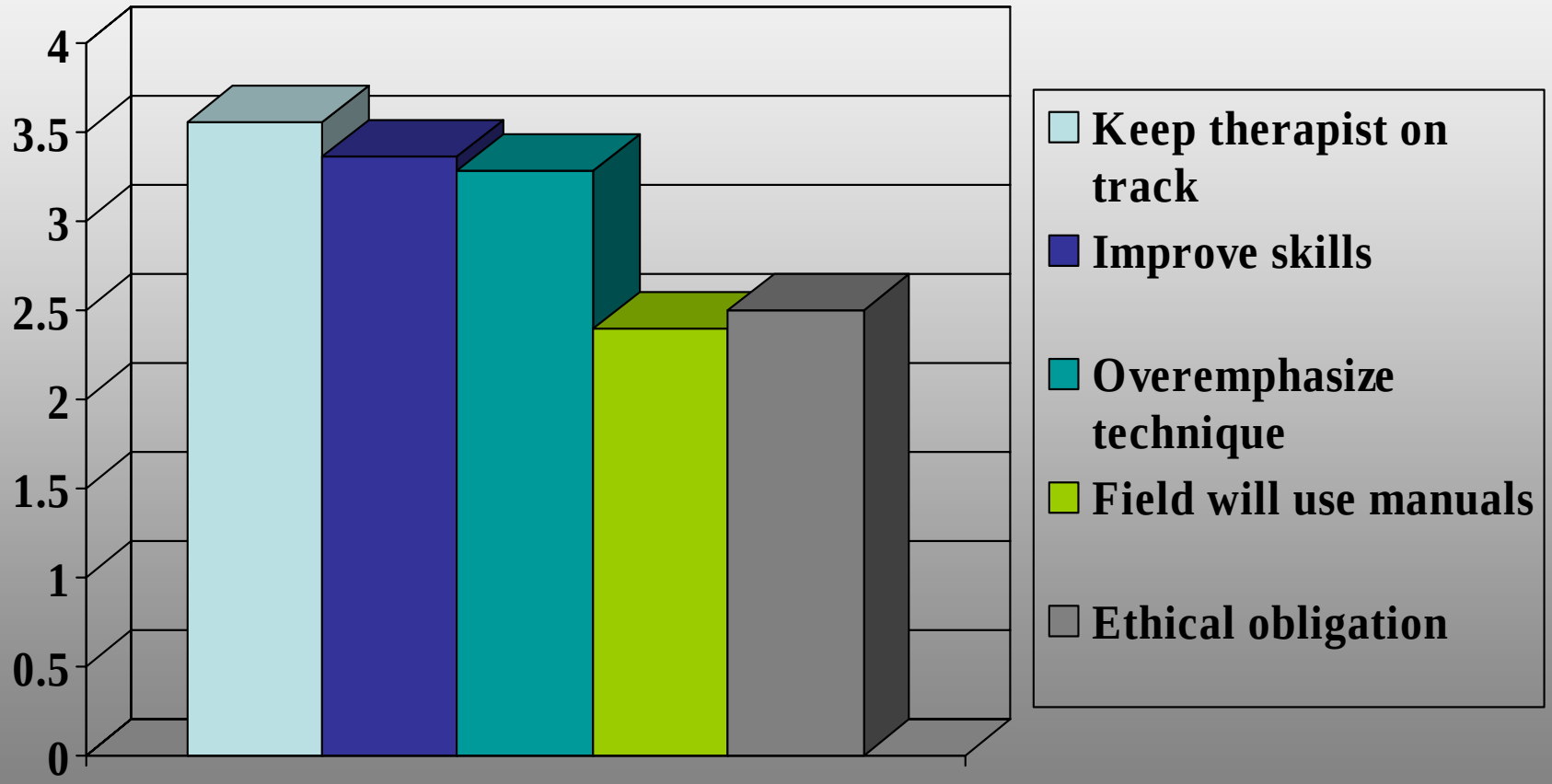
A National Survey of Practicing Psychologists' Attitudes Toward Psychotherapy Treatment Manuals

Addis & Krasnow (2000)

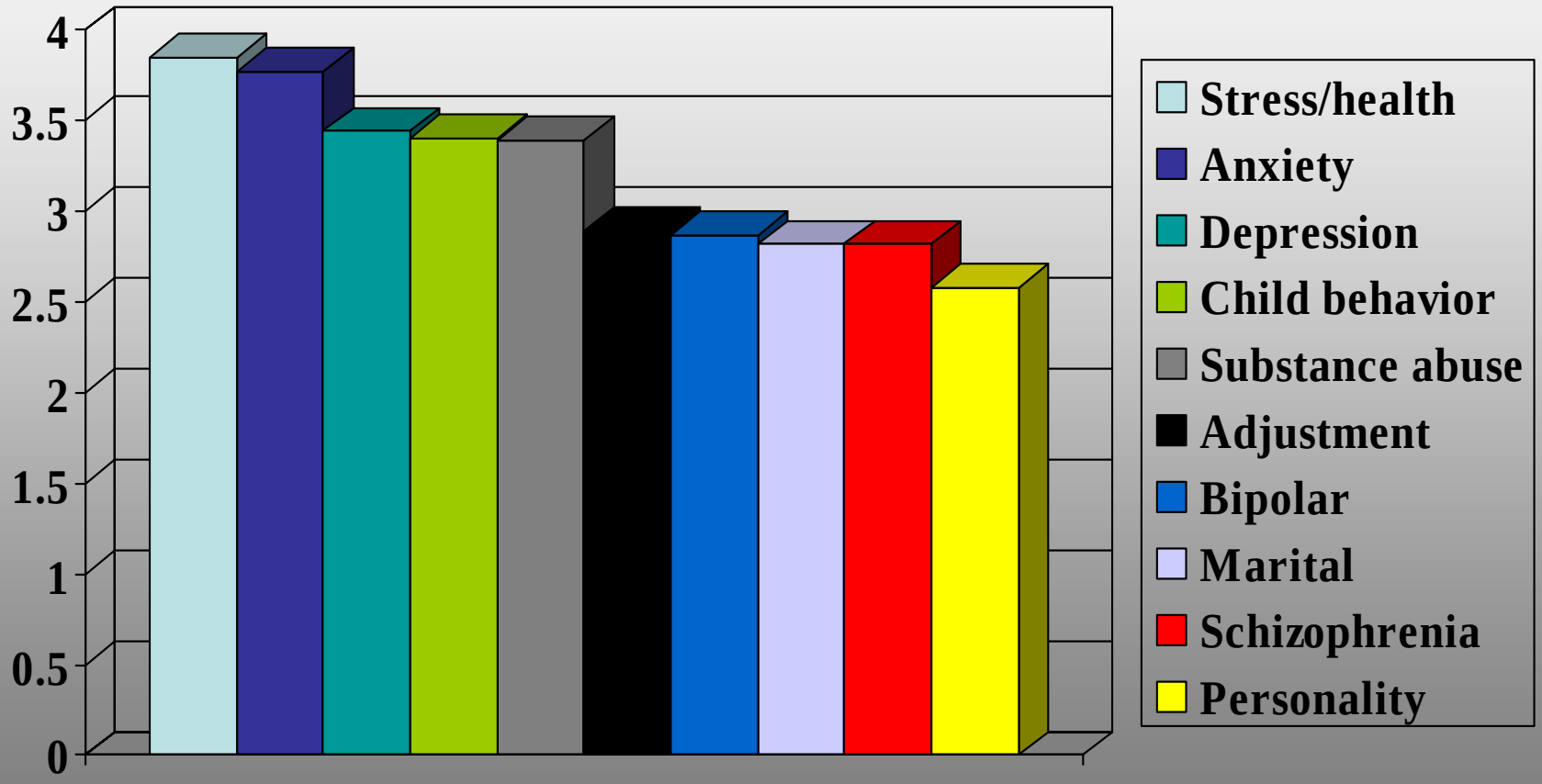
How Often Do You Use Treatment Manuals in Your Clinical Work? (N = 669)



Practitioners' Attitudes Toward Manuals



Appropriateness of Manuals For Various Disorders



Treatment Differentiation

- Are two or more treatments distinct from each other?
  - Potential problem of overlap when the same therapists provide more than one form of treatment
  - Common factors (Castonguay et al., 1996)

Variables That Should Be Equivalent When Comparing Treatments

- Number of treatment sessions
- Length of treatment sessions
- Individual or group format
- Training of therapists
- Therapeutic alliance

Treatment Content

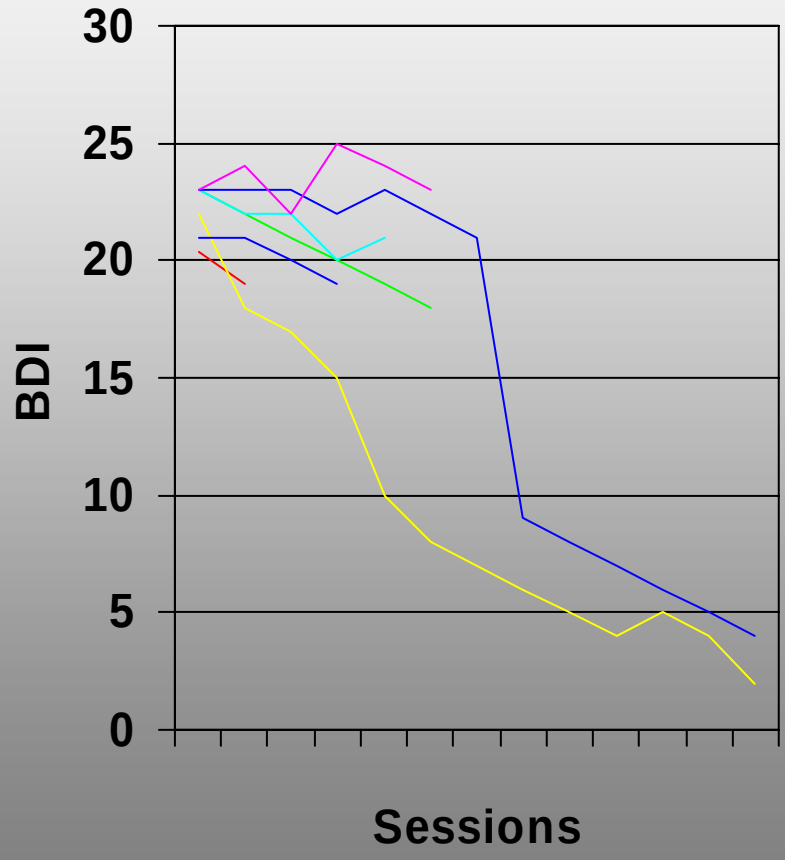
- Psychodynamic-interpersonal
  - focuses on the therapist–client relationship as a vehicle for revealing and resolving interpersonal difficulties
- CBT
  - emphasizes the provision by the therapist of cognitive and behavioral strategies for application by the client
- Behavior therapy – Exposure
  - repeated in-session in vivo exposures to social performance situations, video feedback, didactic training, and weekly homework assignments

Exclusion of Participants in Data Analyses

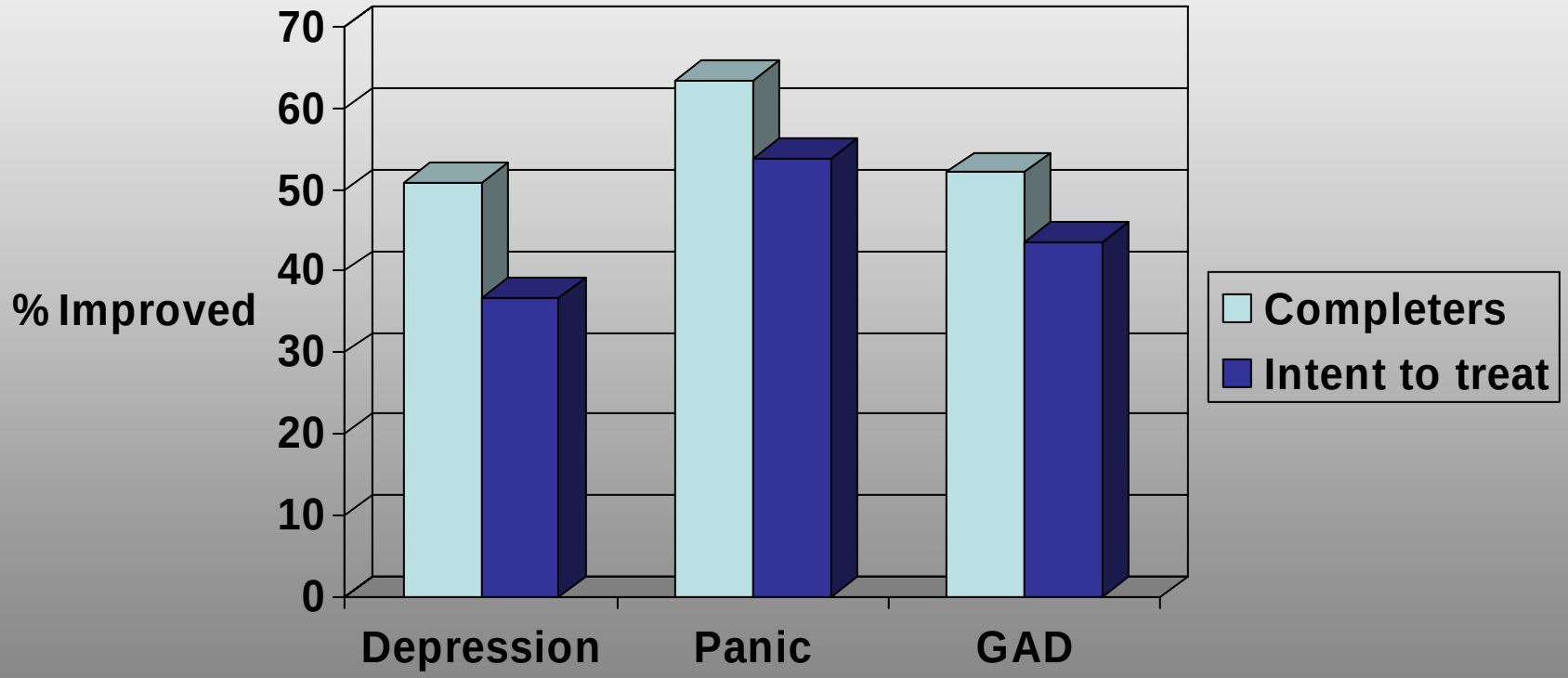
- What should be done with participants who do not receive adequate exposure to the experimental manipulation?
  - e.g., treatment dropouts
- Shouldn't those who receive full exposure to an experimental manipulation be considered the most relevant group to analyze?
- Completer analysis most commonly used
  - May be biased in favor of treatment
  - Selecting a subgroup of completers violates random assignment

Exclusion of Participants in Data Analyses

- Intent to treat analysis
  - Include all participants
  - Preserves random assignment
  - Last data provided are used for posttest
  - Conservative estimate of outcome

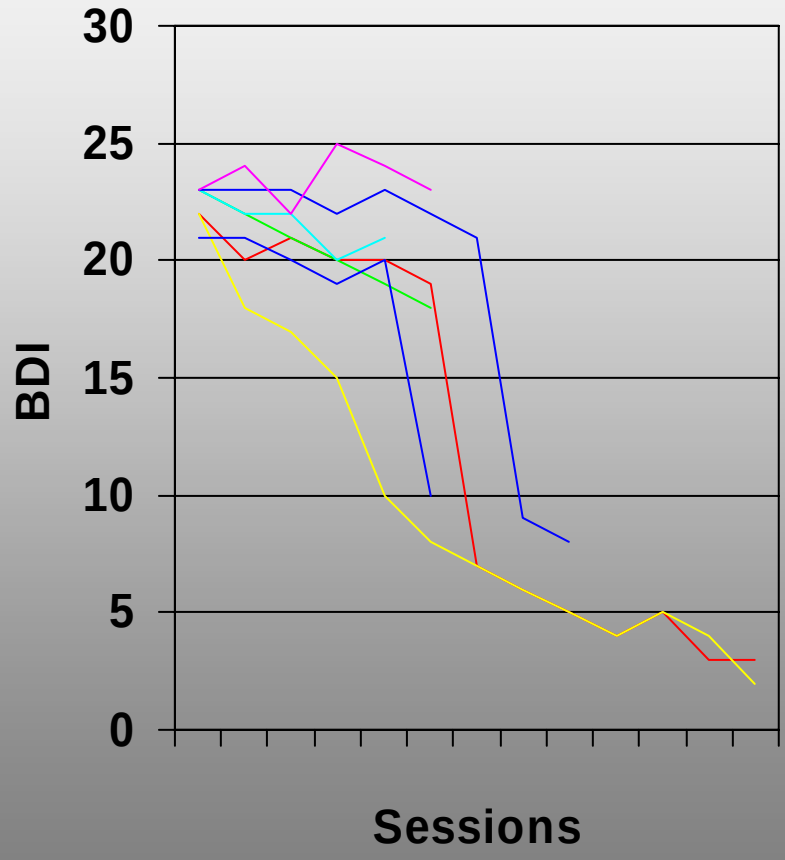


Meta-Analysis of Treatments for Depression, Panic, GAD (Western & Morrison, 2001)

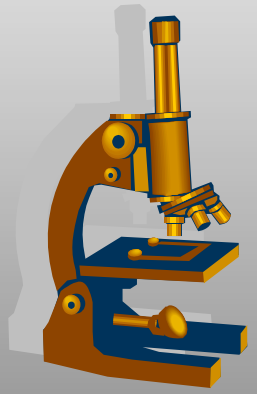


Exclusion of Participants in Data Analyses

- Post hoc analyses of subgroups
  - Analyze completers only; or
  - Examine correlation between dose and effect



Observational Research

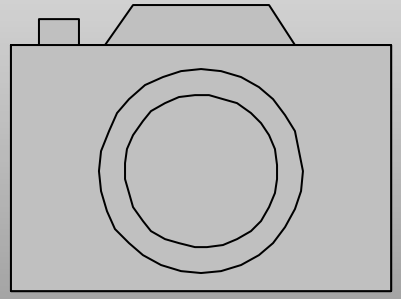


- Observe characteristics rather than intervene
- Some variables cannot be manipulated experimentally
  - e.g., severe psychopathology
- Multiple variables usually cannot be manipulated in experimental research
  - Observational methods and data-analytic techniques allow the consideration of the influences of multiple variables
- Goal is to understand causality

Case Control Designs

- Form groups that differ on a characteristic (IV) and study group differences (DV)
- “Case” = someone who has a condition (e.g., depression)
- Sampling bias is possible
  - How are cases identified?

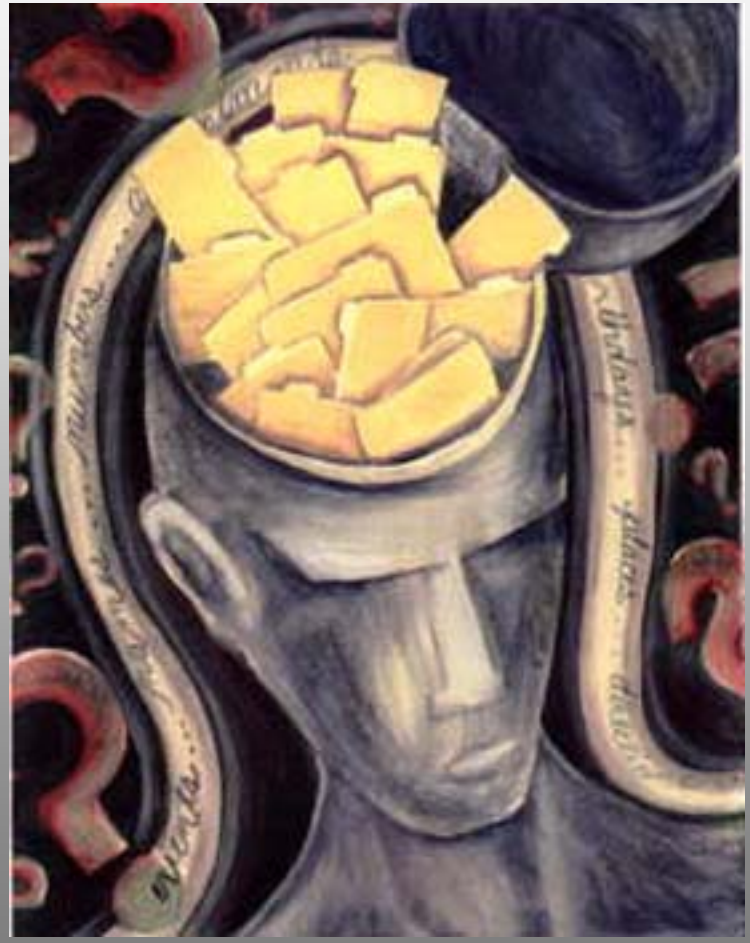
Cross-Sectional Designs



- Snapshot of current characteristics
- Hypotheses concerning group differences
- Results are correlational

Retrospective Design

- Goal is to draw inferences about some antecedent condition that leads to an outcome
- Groups formed on the basis of the outcome
- Reports of past events are assessed (e.g., abuse)
  - Self report
  - Archival records
- When is a retrospective design more appropriate than other designs?



Cohort Designs

- A group(s) is studied over time
  - Also known as longitudinal or prospective study
- The group is studied before an outcome (e.g., depression) occurs

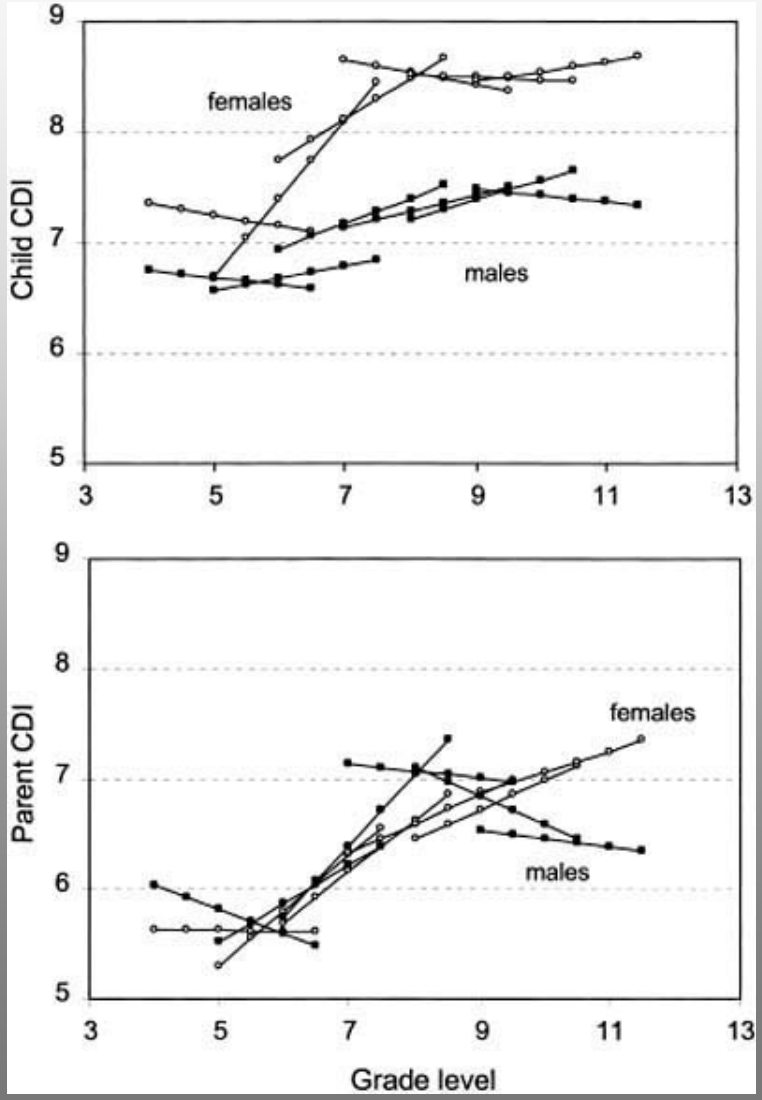
Cohort Designs

- Single Group Cohort Design
  - All persons who meet a particular criterion are included (e.g., all clinic cases, all persons a school)
  - At least 2 assessments are required
- Multigroup cohort design
  - 2 or more groups who initially differ on a risk factor (e.g., abuse) are followed over time to determine an outcome (e.g., depression)
- A temporal sequence can be established
  - The outcome variable cannot affect predictor variable (assuming that the outcome did not exist at Time 1)
  - If A precedes B, can it be assumed that A *causes* B?

Accelerated, Multicohort Longitudinal Design

- 2 or more cohorts differ in age when they enter the study
- Accelerated = each group covers a portion of the total time frame of interest (e.g., 5-8 yrs., 8-11 yrs., 11-14 yrs.)
  - More economical than other cohort designs
- Controls for historical influences that occur at developmental periods (e.g., changing community norms regarding drugs or effects of war at 6 yrs. vs. 9 yrs. vs. 12 yrs.)

Accelerated, Multicohort Longitudinal Design (Cole et al., 2002)



Limitations of Cohort Designs

- Time
- Cost
- Attrition can bias the sample
- Outcome may have a low base rate and require an extremely large sample
- Results may be specific to a unique sample

Case Studies and Single-Case Research Designs

Case Studies

Case Study

Intensive description and analysis of a single individual

Sources: natural observation, interviews, psychological tests, archival records

Case study to illustrate a theory-based clinical subtype

Quadripartite Model of Sexual Aggression (Hall & Hirschman, 1991)

- 4 motivational precursors that correspond to subtypes of sexual aggressors
  - Physiological
  - Cognitive
  - Affective
  - Developmentally-related personality problems

DSM-IV Criteria for Pedophilia

- A. Over a period of at least 6 months, recurrent, intense sexually arousing fantasies, sexual urges, or behaviors involving sexual activity with a prepubescent child or children (generally age 13 years or younger)
- B. The person has acted on these sexual urges, or the sexual urges or fantasies cause marked distress or interpersonal difficulty
- C. The person is at least age 16 years and at least 5 years older than the child or children in Criterion A

Application of Data to the Case: Risk Factors for Sexual Offending

- The single best predictor of future offending is past offending
- Child molesters over age 50 are at lower risk for recidivism
- Sexual interest in children a strong risk factor for sexual offending
  - 25-30% of men who are not child molesters exhibit sexual arousal in response to stimuli involving children
  - Sexual arousal is inversely correlated with age

Advantages of Case Studies

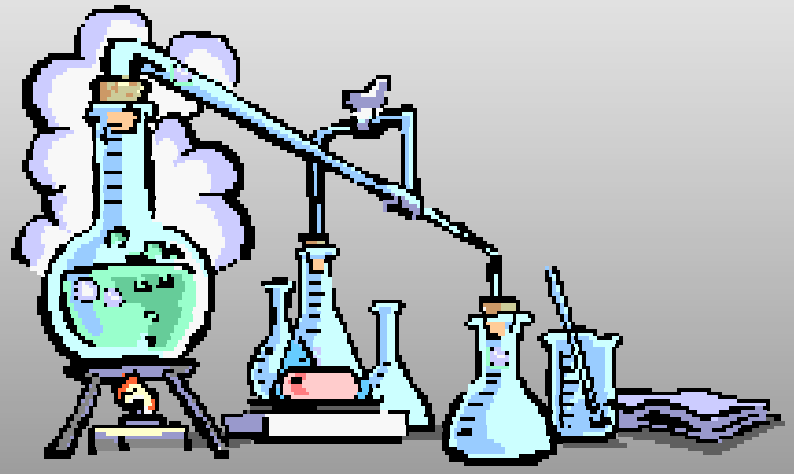
- Focus on complexity
- Allow the study of rare phenomena (e.g., multiple personality disorder)
- May provide a counterinstance of notions assumed to be universally applicable
- Provide sources of hypotheses
- Persuasive

Disadvantages of Case Studies

- Inability to draw causal conclusions
- Alternative explanations cannot be easily refuted because of lack of control over variables
- Limited generalizability

Single-Subject Designs

- Characterized by scientific rigor
- Can demonstrate causal relations
- Experimental design
  - Effects of different interventions (IVs) on the same subject
- Problems that are relatively rare can be studied



Single-Subject Designs

- A large number of observations collected from the subject
  - To control within-subject variability
- Focused on variables with considerable influence or effects
  - To enhance visibility of the association

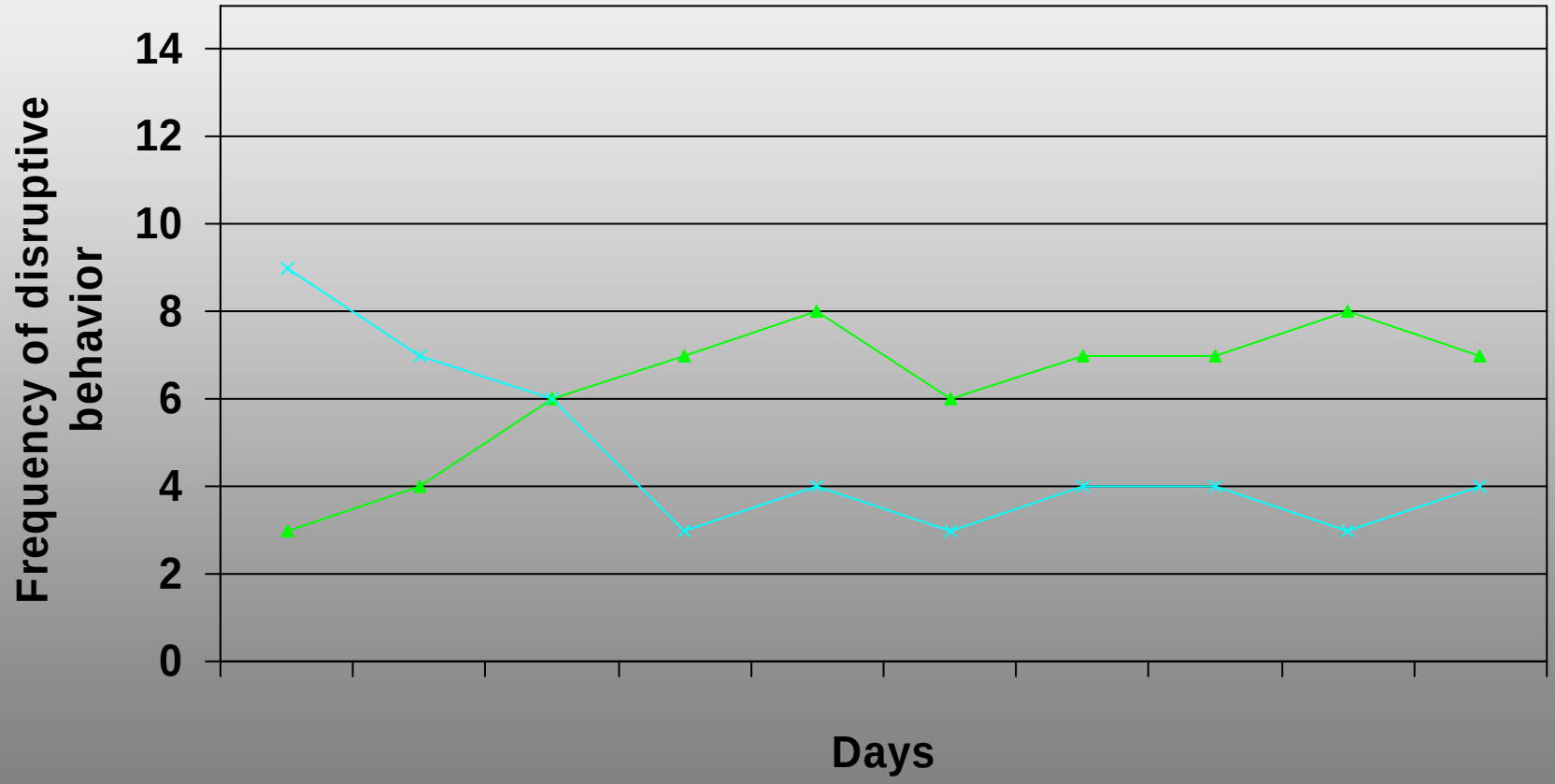
Single Subject Designs

- Similar to within-subjects design
  - Subjects exposed to multiple levels of the independent variable
- Data not averaged across subjects

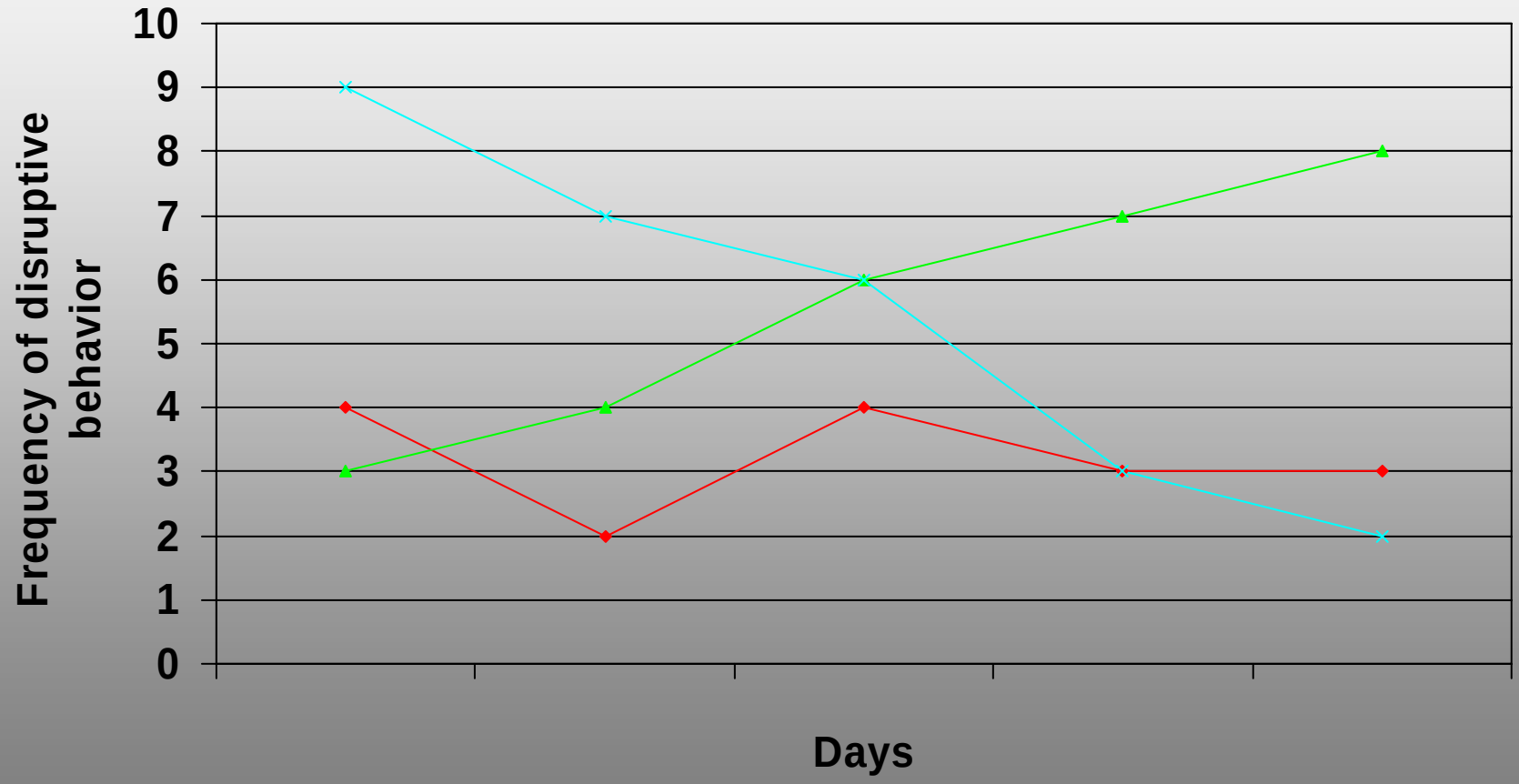
Baseline Design

- The Behavioral Baseline
  - Establishes the level of the dependent variable within each phase (baseline/intervention)
  - Assesses the amount of uncontrolled variability
  - A stable baseline allows one to make inferences about the effects of treatment

Establishing a Stable Baseline



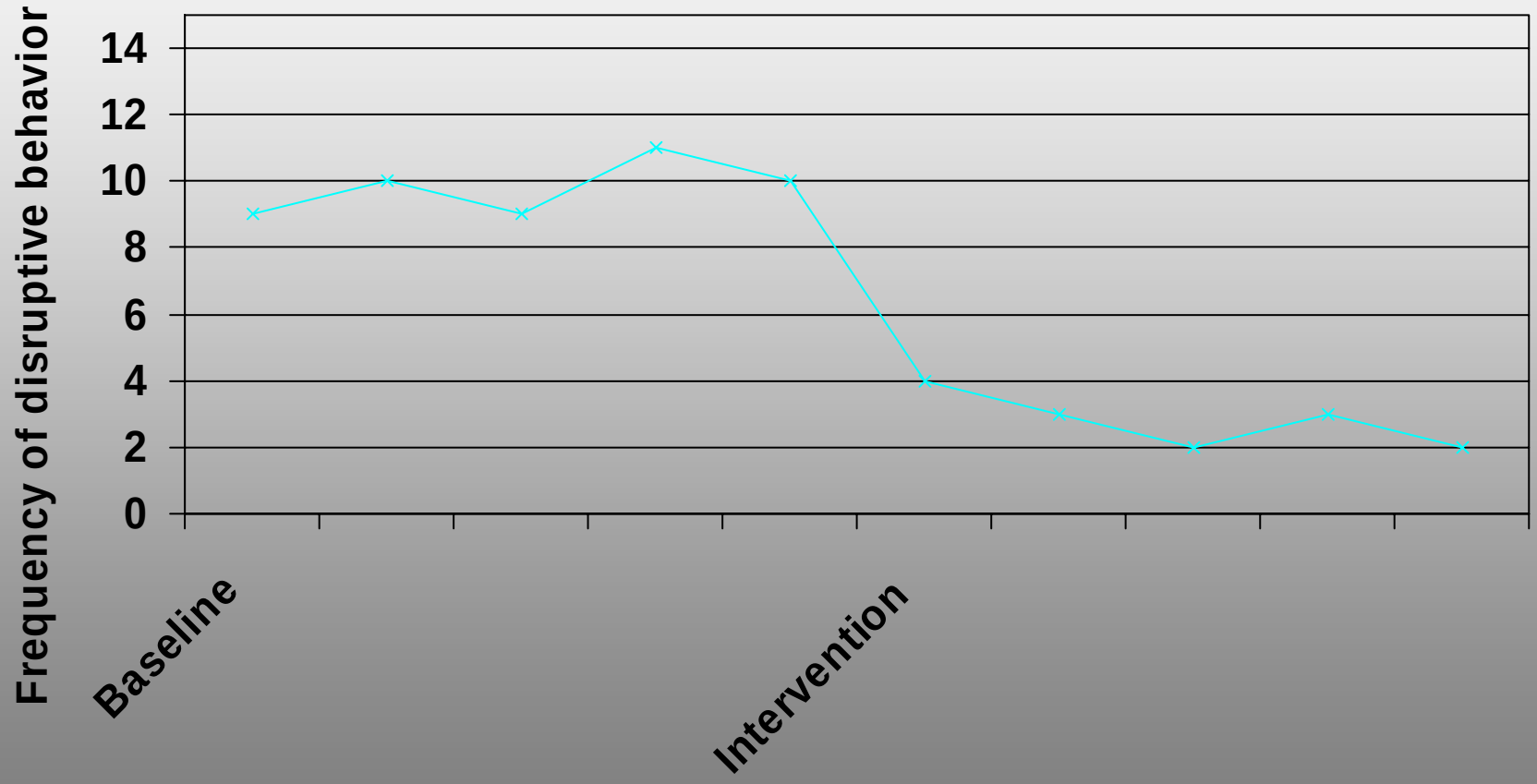
Baseline Slope



Baseline Design

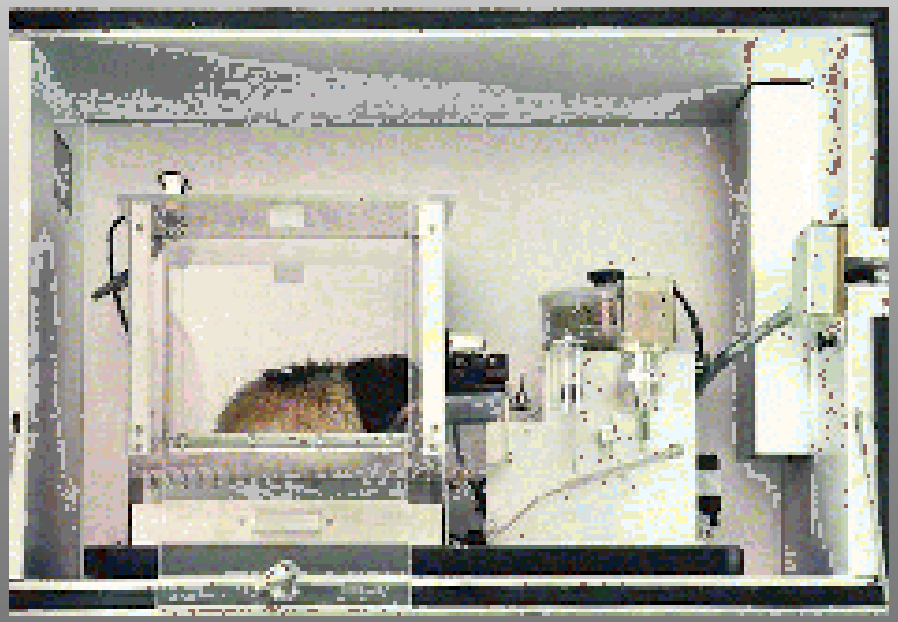
- Baseline Phase
- Intervention Phase
  - Continuous assessment during intervention

Baseline and Intervention



B.F.Skinner

- Skinner and single subject “baseline” designs
  - Motor behavior of rats, pigeons, “Skinner Box”
  - Journal of Experimental Analysis of Behavior



Baseline Designs: Reversal Designs

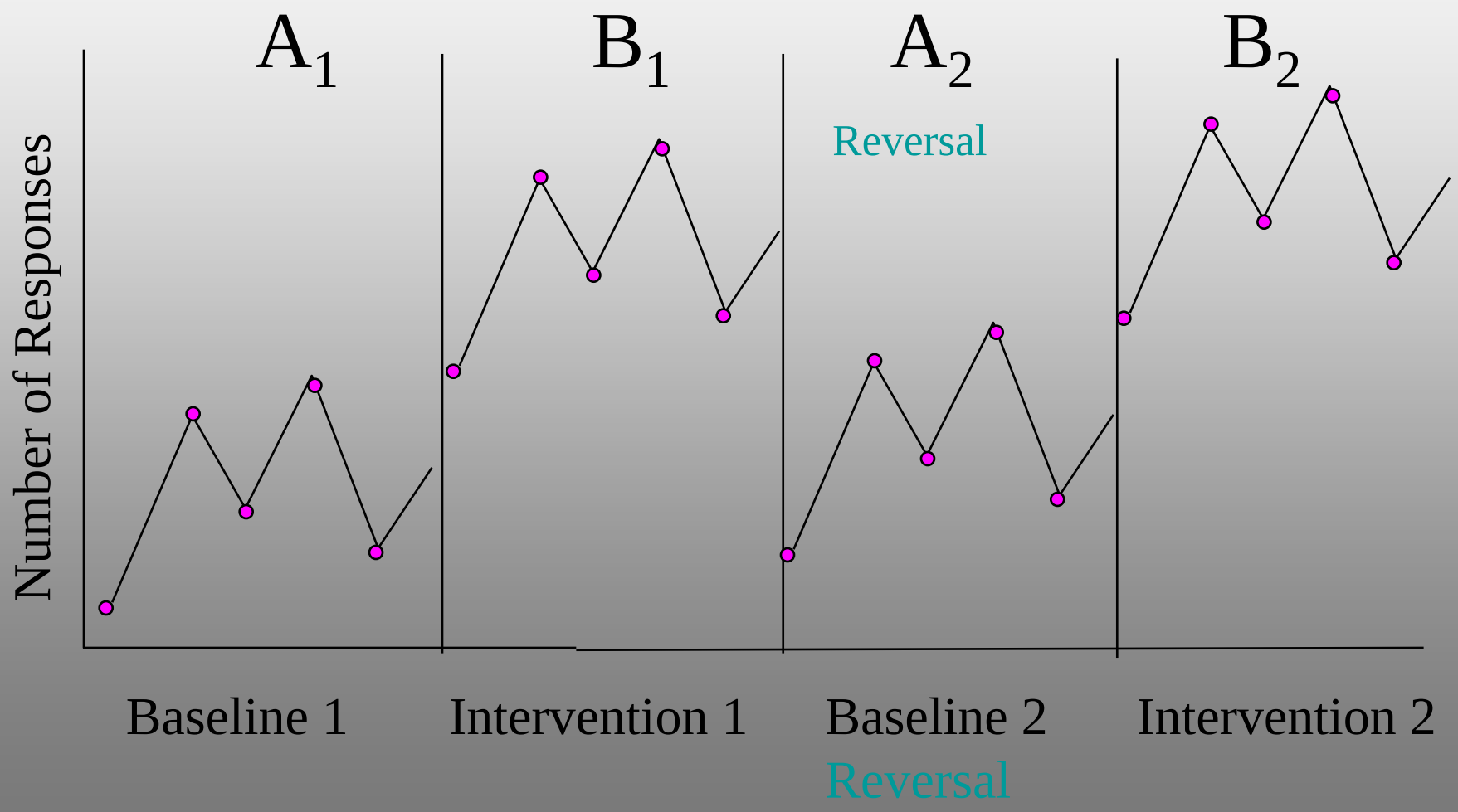
AB

ABA

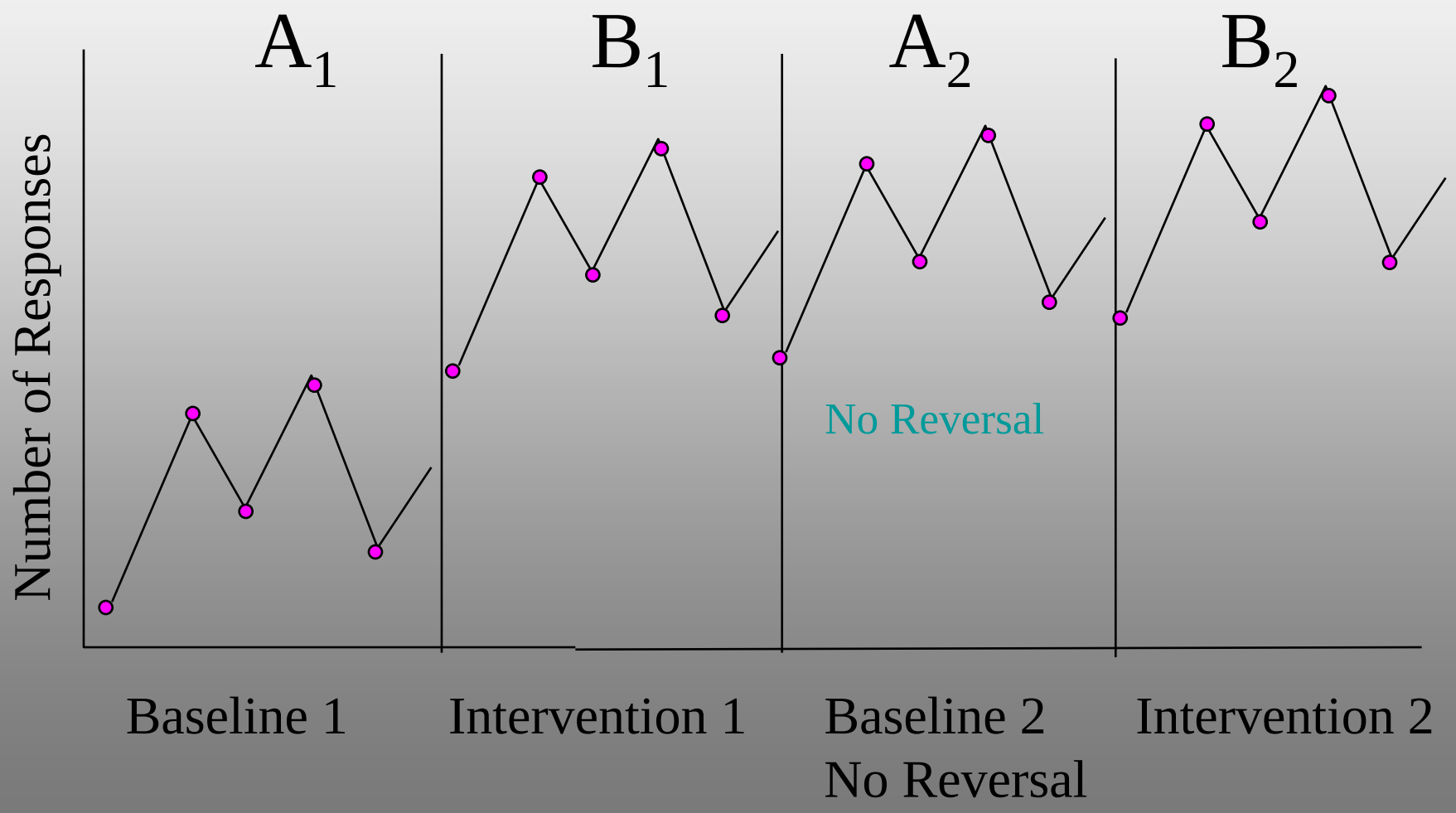
ABAB

ABACABA,etc.

Treatment Effect Illustration



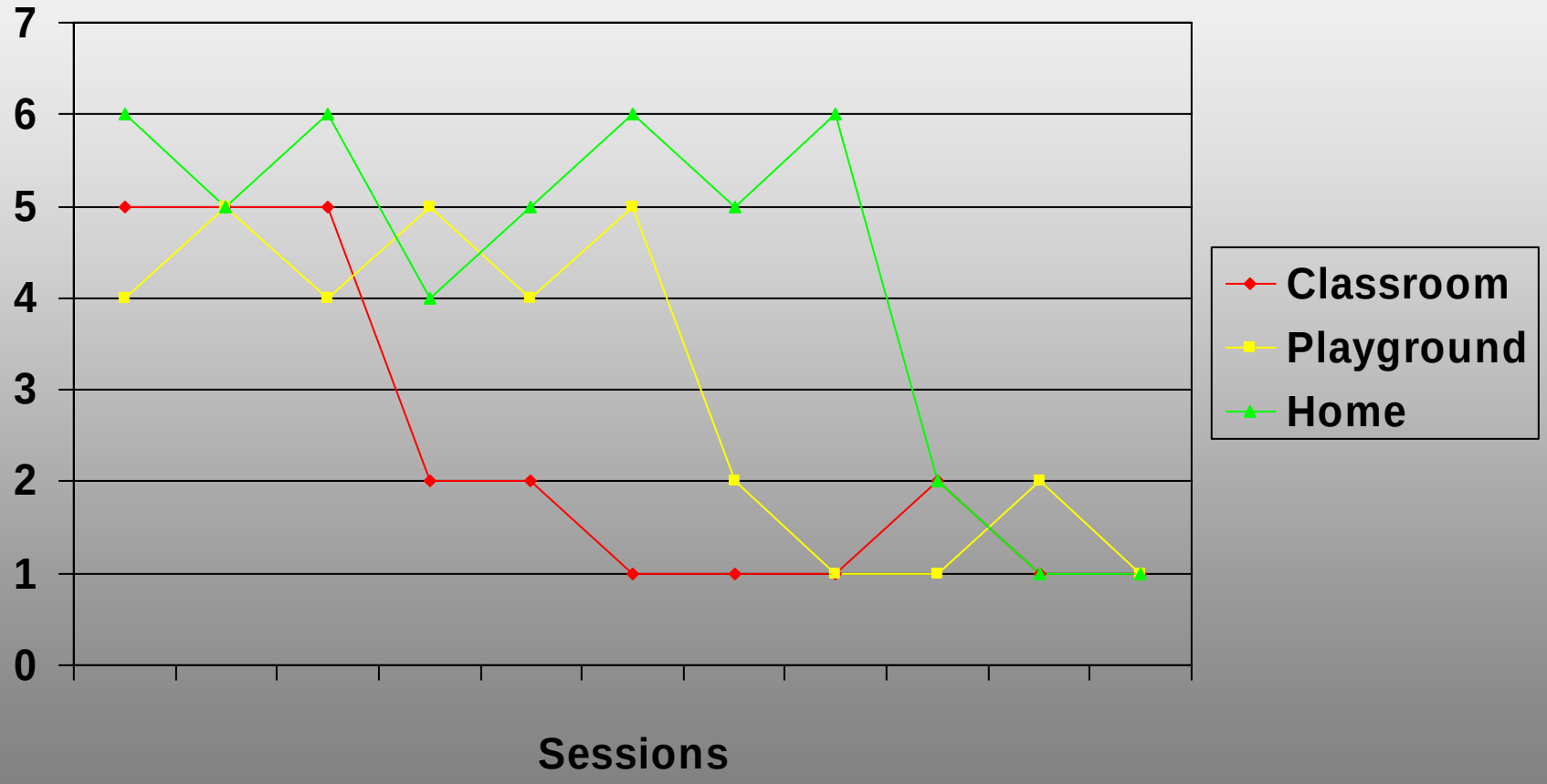
Confounding or Carryover



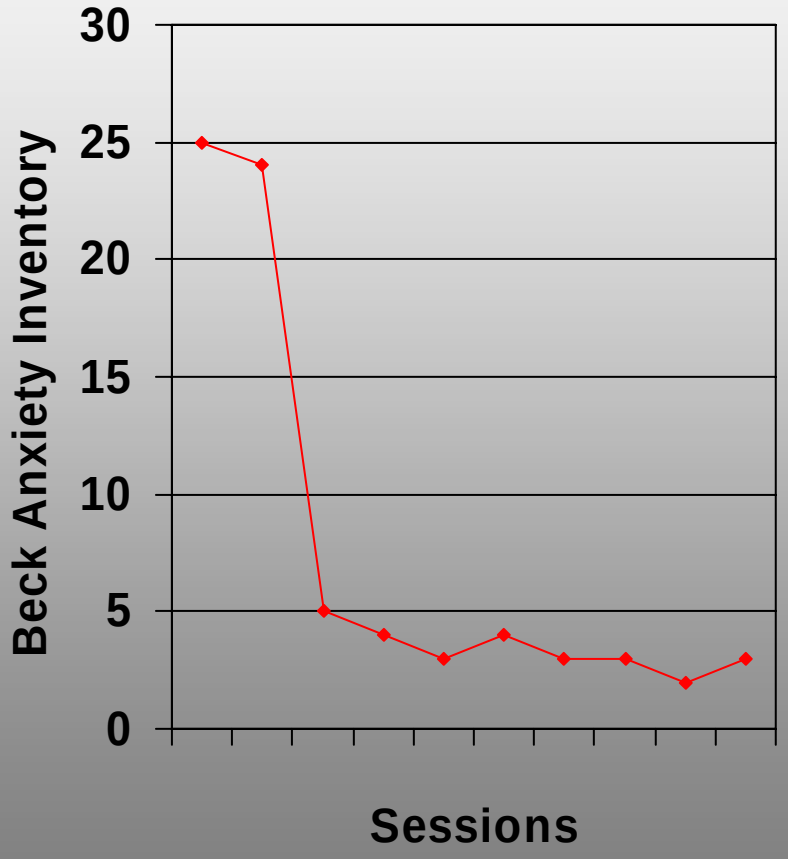
Multiple Baseline Design

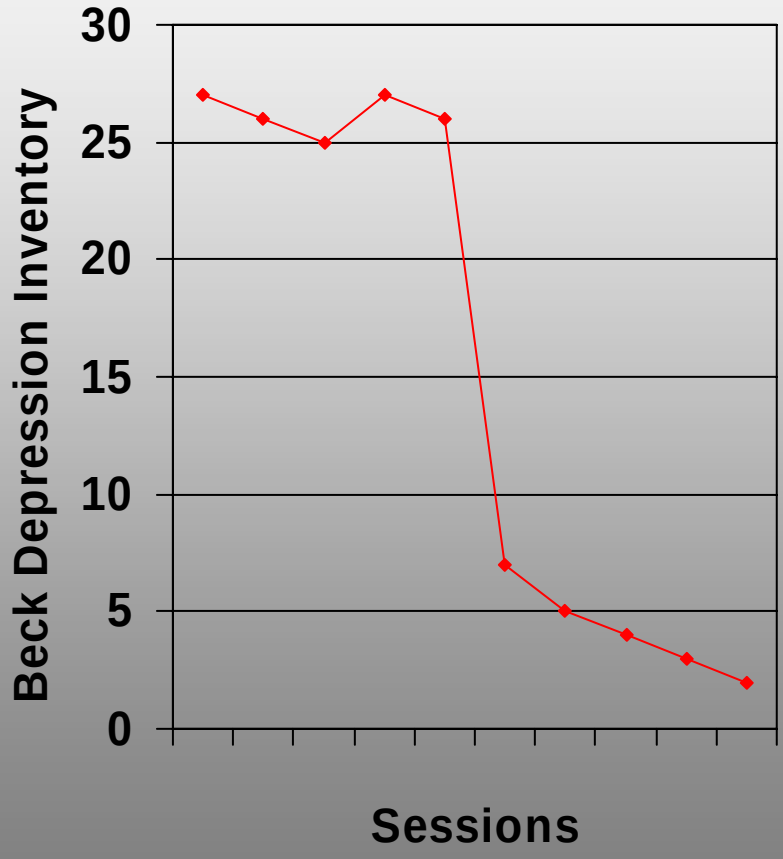
- Ethical issues in reversal designs
- Multiple baseline design does not involve withdrawal of intervention
- Effects of an intervention across multiple behaviors, individuals, or situations is evaluated

Multiple Baseline Design for Aggressive Behavior

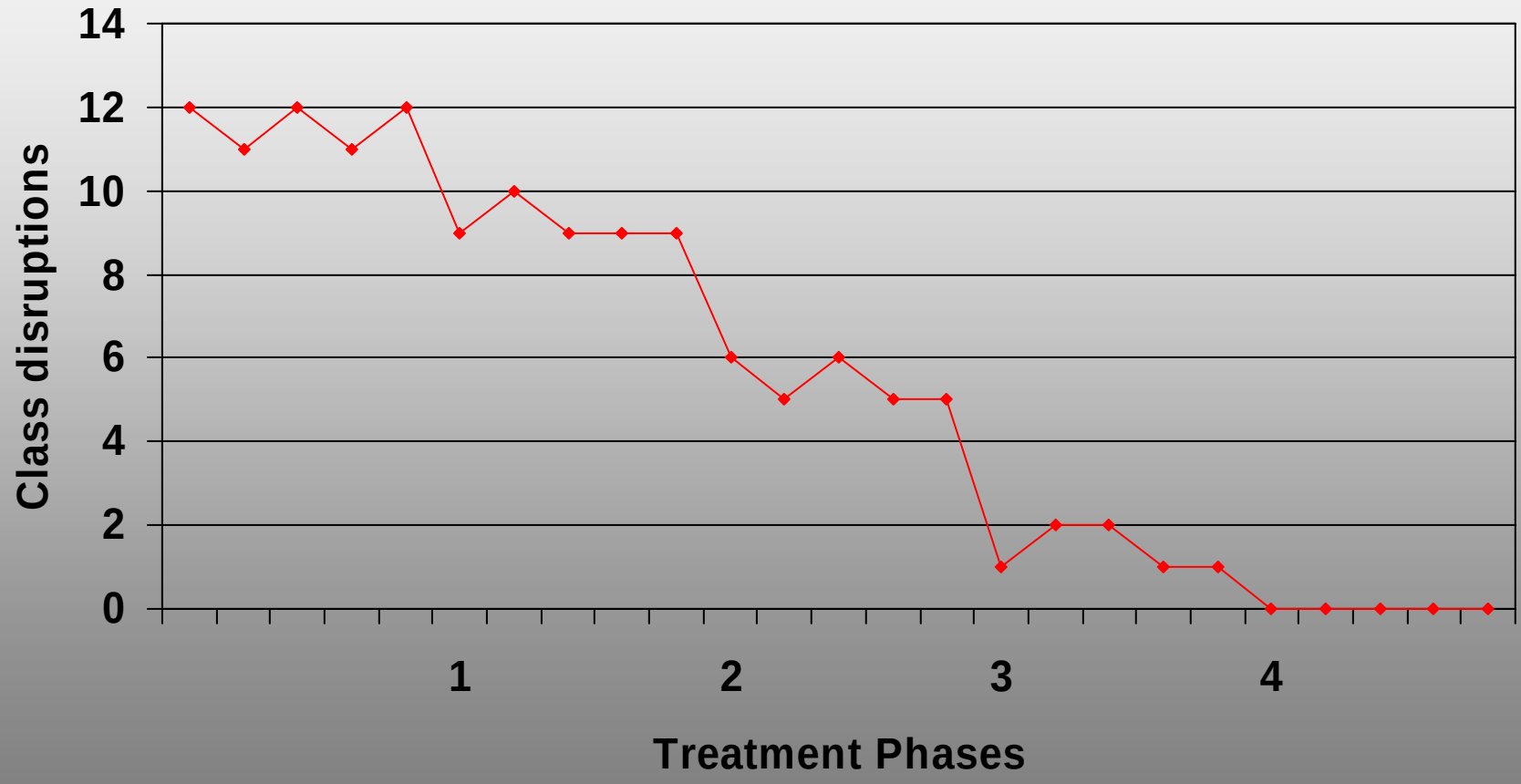


Multiple Baseline Design for Anxiety and Depression





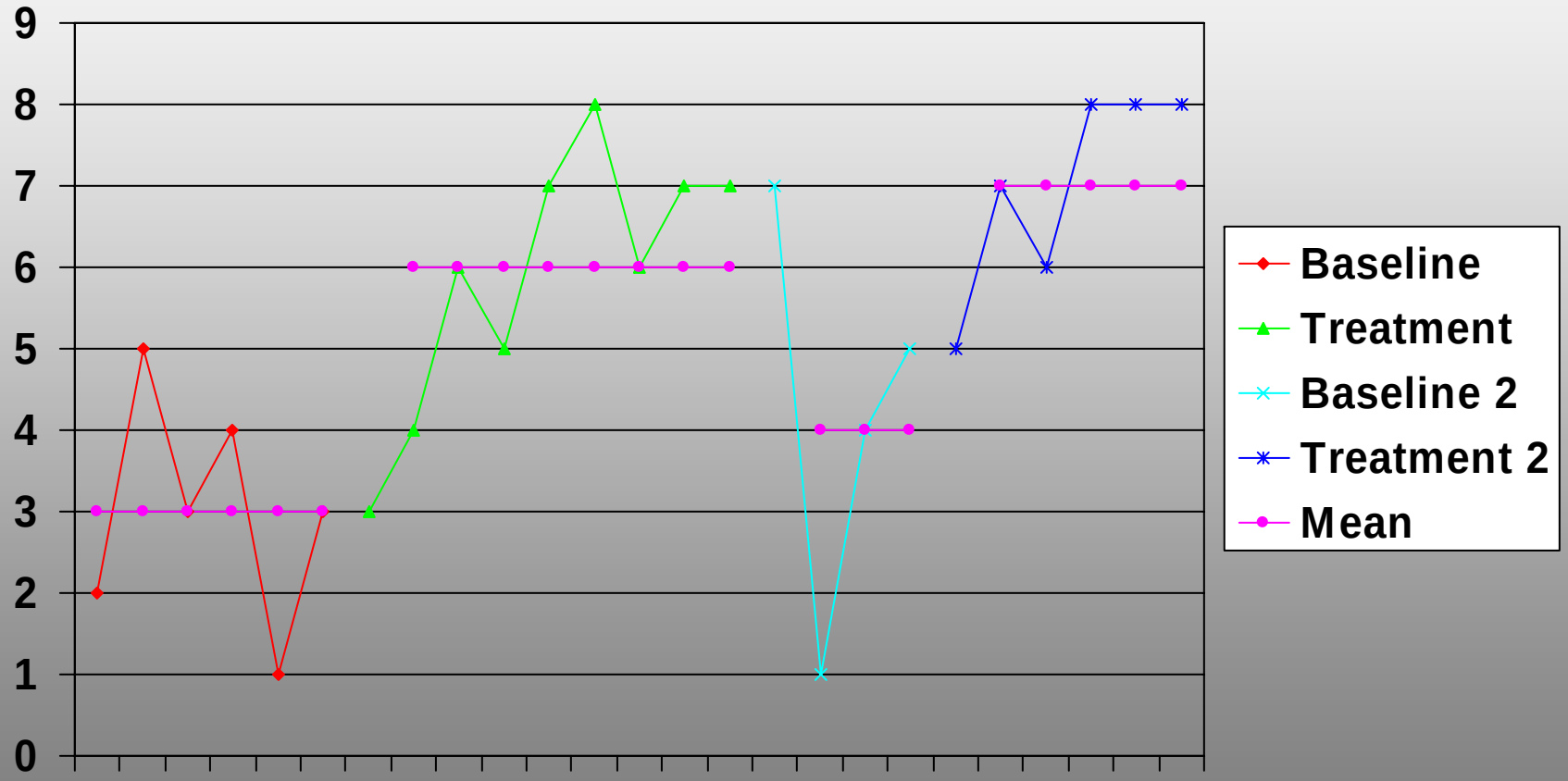
Changing Criterion Design



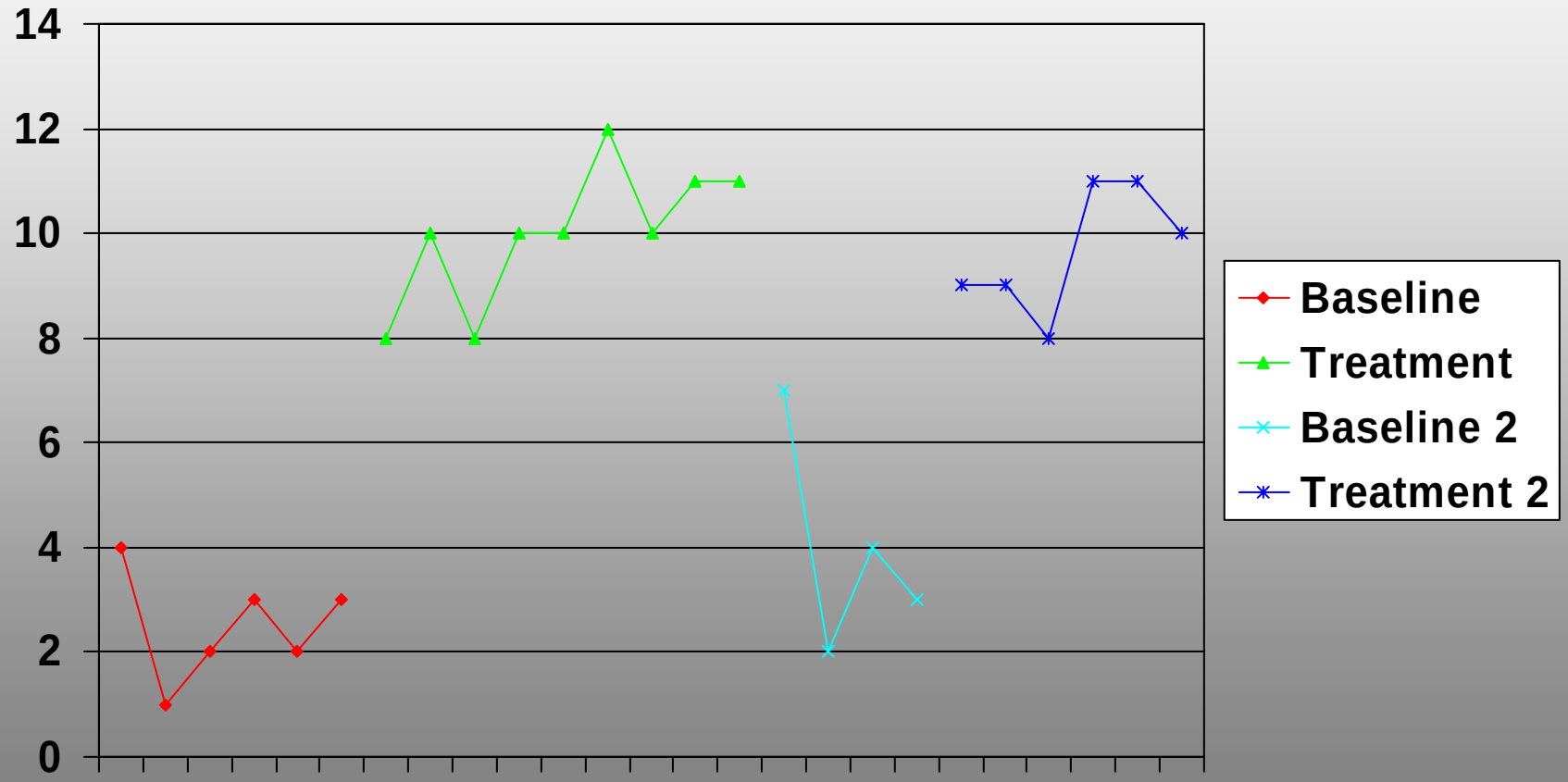
Data Evaluation in Single Case Research

- Visual inspection

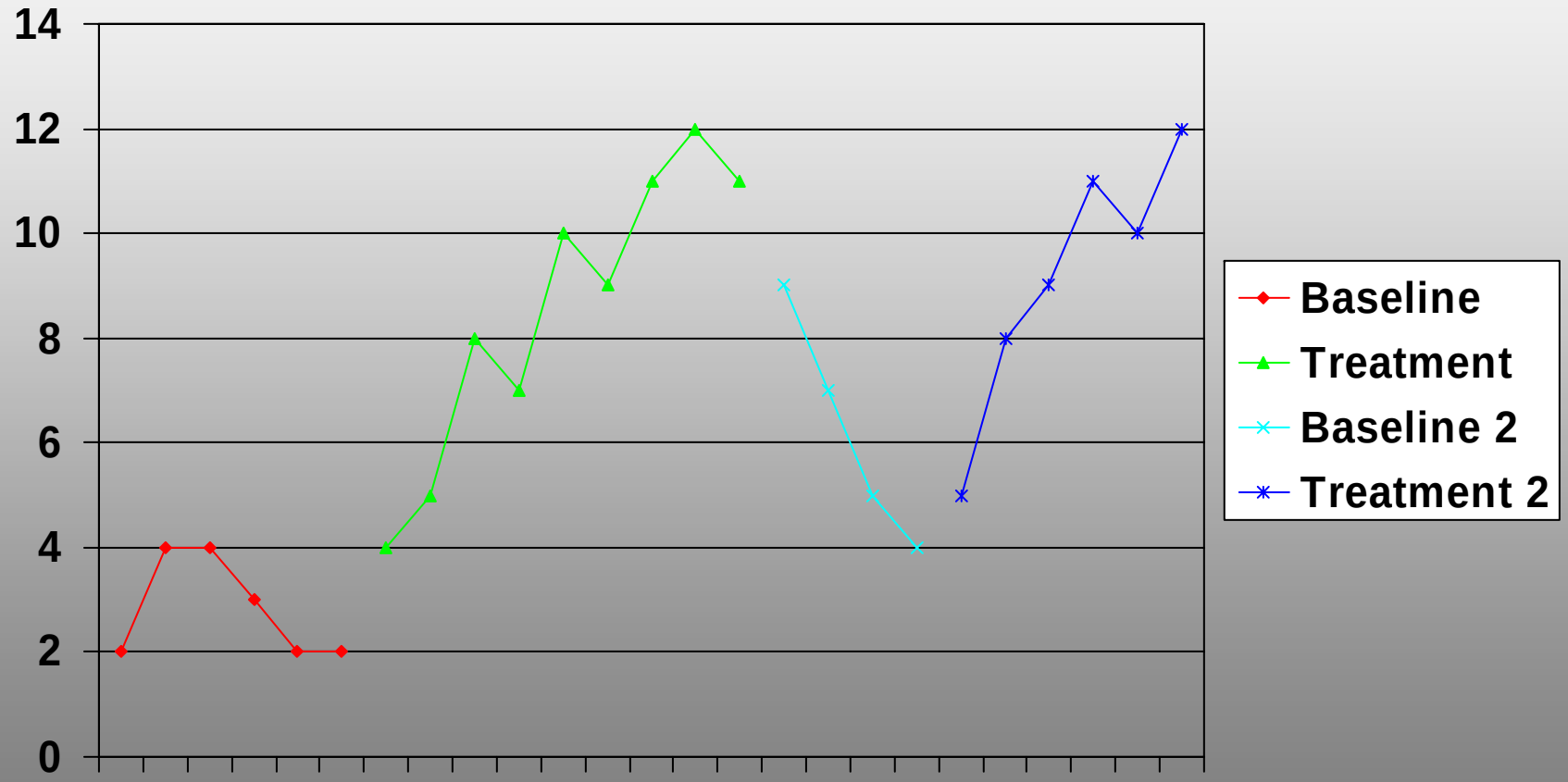
Changes in Mean



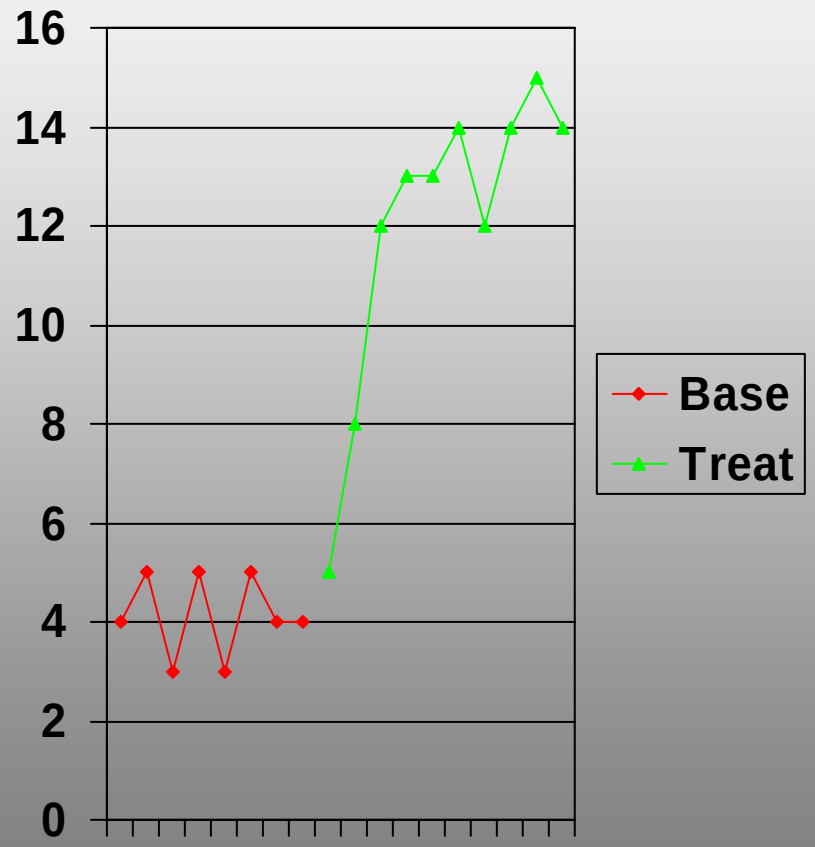
Changes in Level:
Shift from one phase to the next

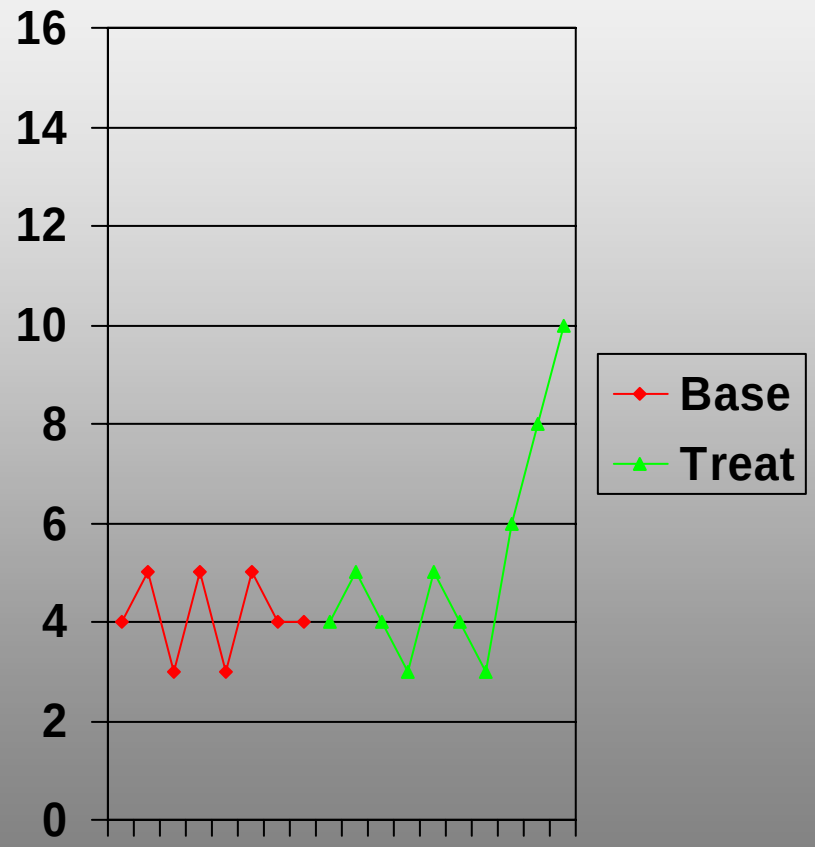


Changes in Slope



Latency of the Change





Single Subject Designs and Empirically-Supported Treatments

- Well-established
  - 10 single-case design expts by at least 2 independent investigators, demonstrating superiority to pill, placebo, or other tx
- Probably efficacious
  - 4 single-case design experiments

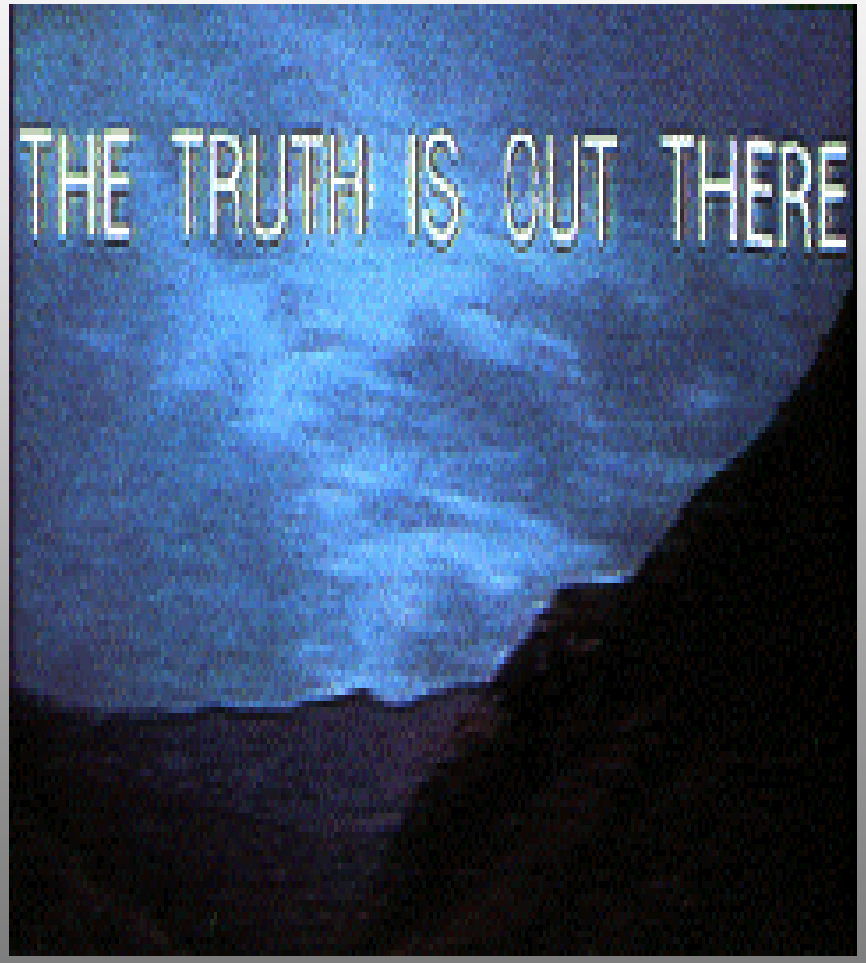
Data Evaluation in Single Case Research

- Limitations – lack of concrete decision rules
- Only very marked effects may be noticed
- Particular patterns of data (e.g., mean, slope) required

General Limitations of Single-Subject Designs

- Potential moderators unknown (e.g., age, gender)
- External validity unknown

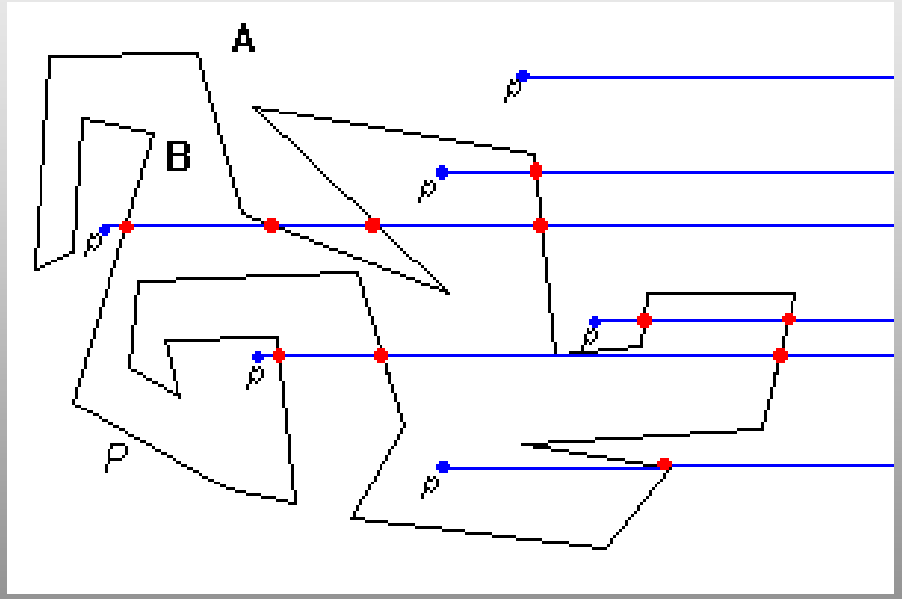
Qualitative Research



- Social constructionism
  - Reality can never be fully apprehended, only approximated (Denzin & Lincoln, 2000)
  - Participants' perspective important
  - Subjective

Theory in qualitative research

- A priori framework not necessary
- Hypotheses not tested
- Grounded theory
  - Theory is developed based on data from the field



Sampling in qualitative research

- Case study
- In depth study of small numbers of people (5 to 25)
- Samples not necessarily representative
  - Selection of individuals who can provide the richest information possible
- Snowball sampling

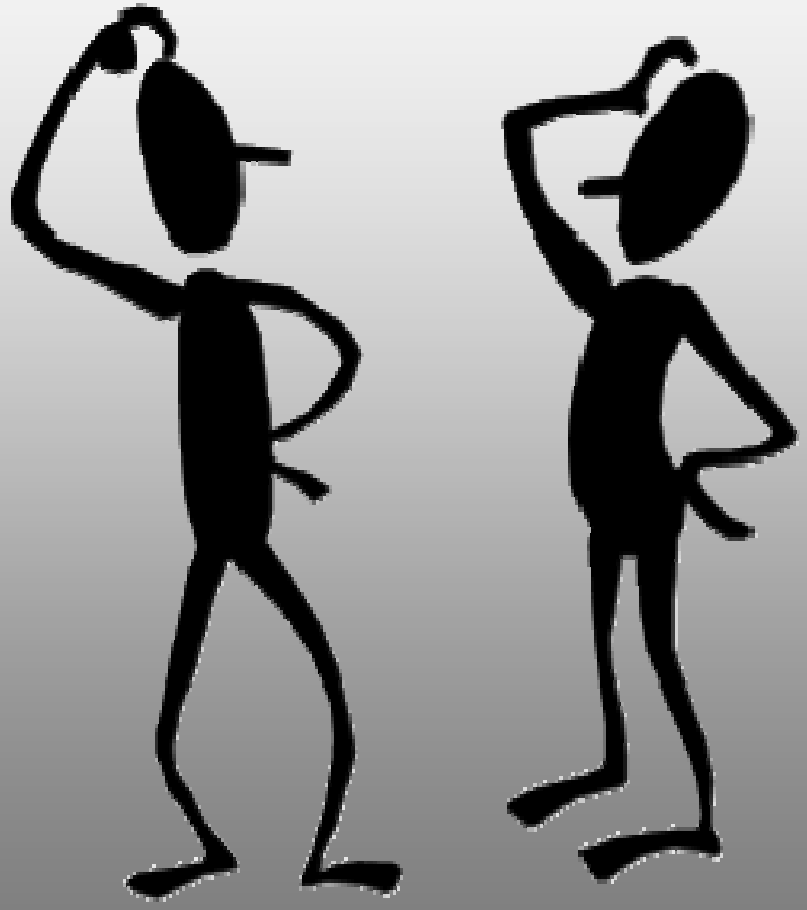
Qualitative research methods

- Minimum of 6 months of fieldwork necessary (Paisley & Reeves, 2001)
- Interviews, observations, documents

Qualitative Interviews (Paisley & Reeves, 2001)

- **Hypothetical (What would you do in this situation?)**
- **Devil's advocate (Some people think that)**
- **Ideal position (If you had unlimited time and resources)**
- **Interpretive (checking if interpretation is correct)**

Qualitative data



- Rather than numbers, direct quotations are used as data
- Constant comparative analysis
  - Compare incidents within the same data set or across data sets

Limitations of Qualitative Research

- External validity
  - How generalizable are the results?