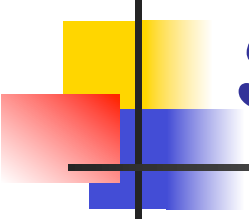




# Single Subject Designs

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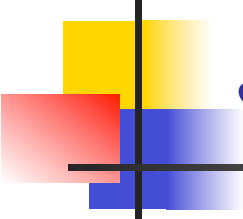
## Lecture 6



# Potential Uses of Single-System Designs

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- **Assess and monitor change**
- **Evaluate whether change has occurred**
- **Determine whether change in intervention is needed**
- **Determine whether intervention caused observed change**
- **Compare relative effectiveness of interventions**



# Key Characteristics of Single-System Designs

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- Different phases
  - Baseline
  - Intervention
  - Follow-up
- Comparison of baseline and intervention phases
- Change intervention, as needed
- Change design, as needed



# Phases

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- Period of time during which distinctive evaluation activity occurs
- “A” represents baseline phases
- “B” through “Z” represent intervention phases
  - “B” or “BC” etc. represent multiple interventions
  - “B<sup>1</sup>,” “B<sup>2</sup>,” “B<sup>3</sup>,” etc. represent changes in intervention intensity



## Phases (cont' d)

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- Length of phases
  - Long enough to obtain a clear, representative, and stable picture of target
  - Adjacent phases should be equal length, ideally
- Comparison of nonadjacent phases should be done with care, if at all



# Baseline Phase

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- Period of time during which no formal intervention is implemented
- Usually first implemented prior to intervention



# Baseline

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- Period of time during which no formal intervention is implemented
- Usually first implemented prior to intervention
- Analogous to a control group



# Purposes of Baseline

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- Provides a basis of comparison to determine change (i.e., evaluation)
- Assessment
  - Determine extent of the problem
  - Determine cause(s) of problem





# Types of Baselines

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- **Concurrent/prospective**
- **Reconstructed/retrospective**
  - **Best for specific events**
  - **Should be recent if based on memories**
- **Combined retrospective and prospective**

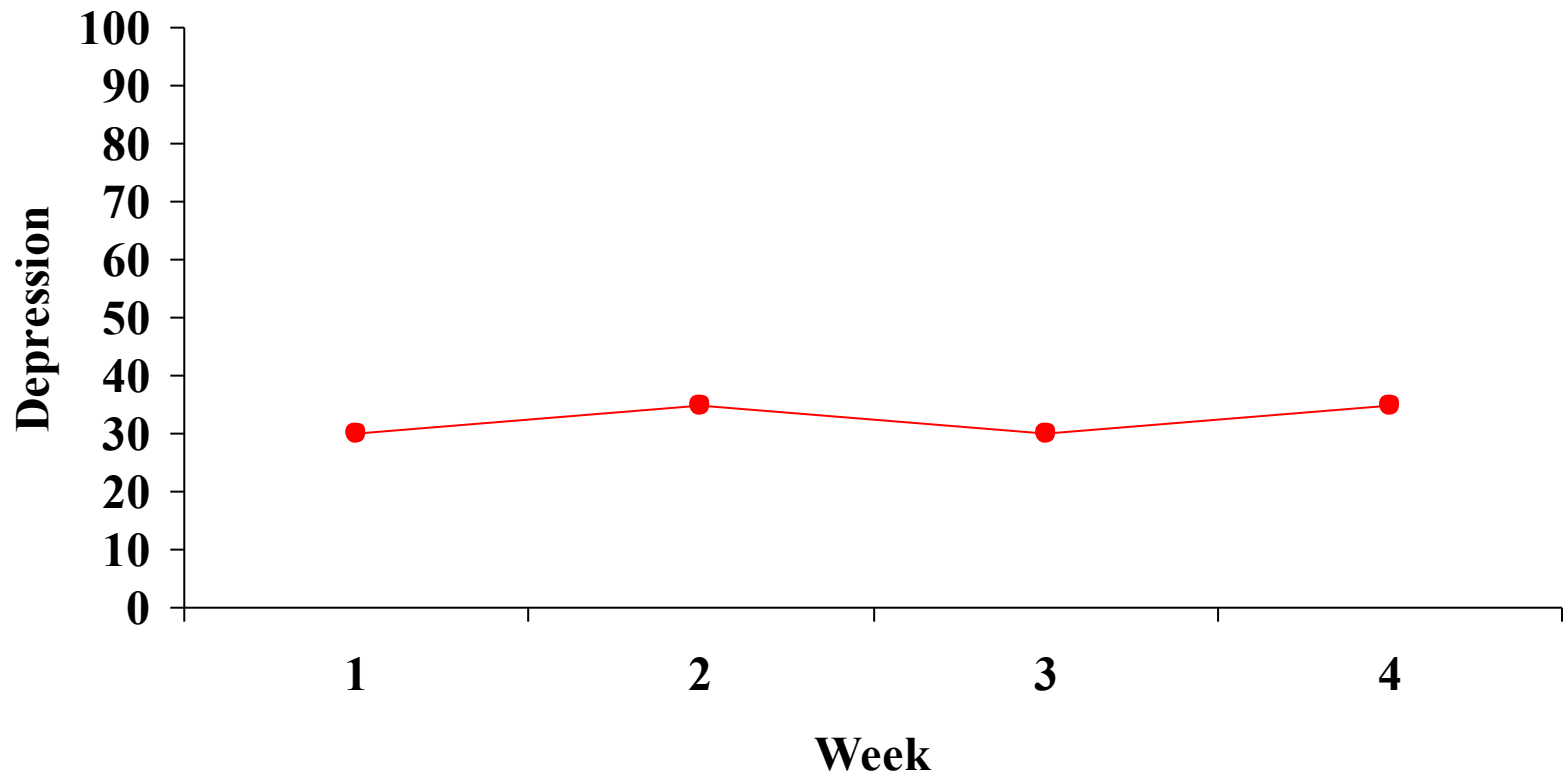


# Length of Baselines

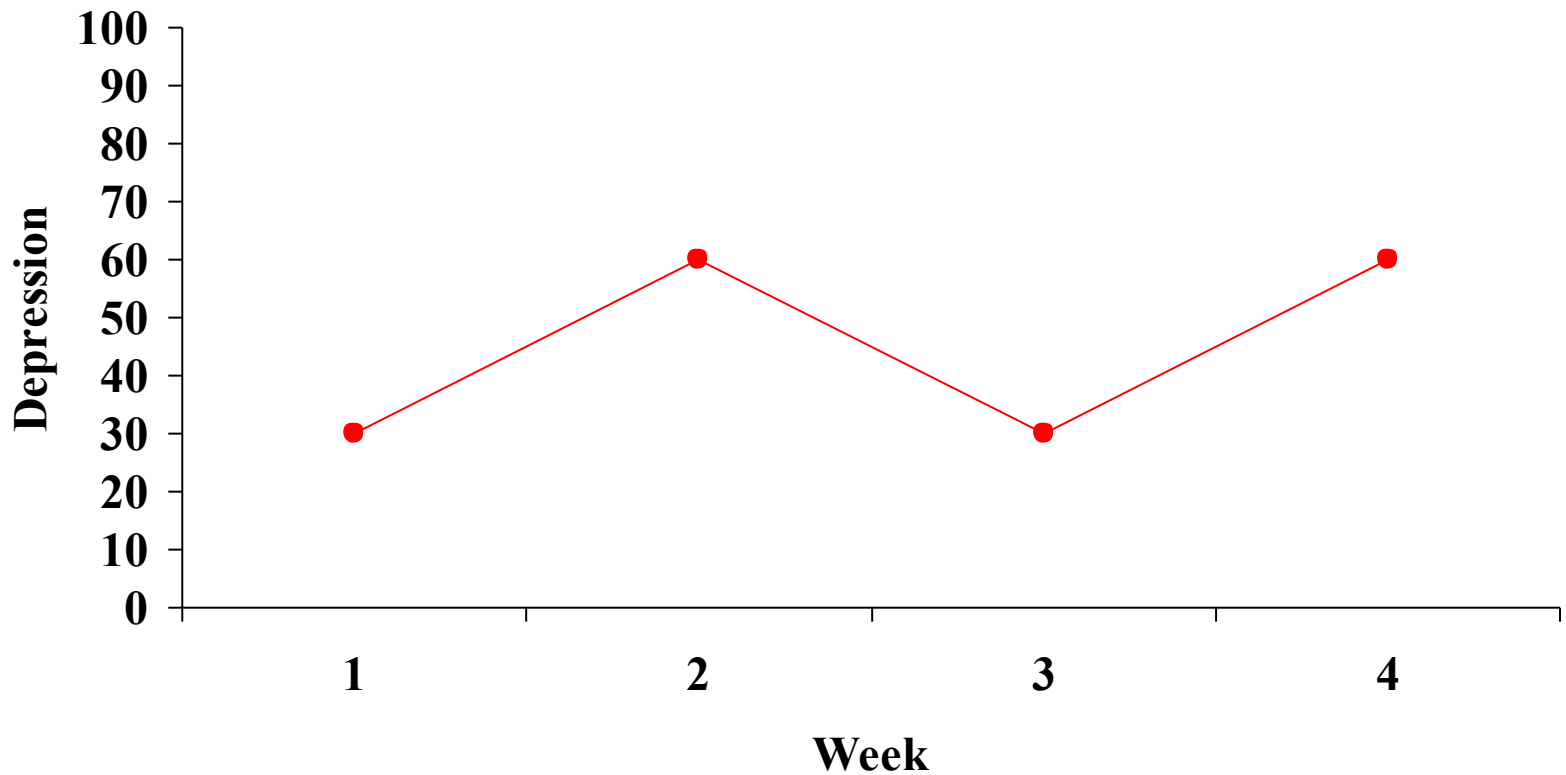
---

- Long enough for assessment and evaluation
  - Clear, representative, and predictable picture of target
  - Baseline/intervention comparison assumes that if the intervention had not occurred, the baseline pattern would have continued unchanged
- Minimum of 3 observations, ideal of 7 to 10 or more observations

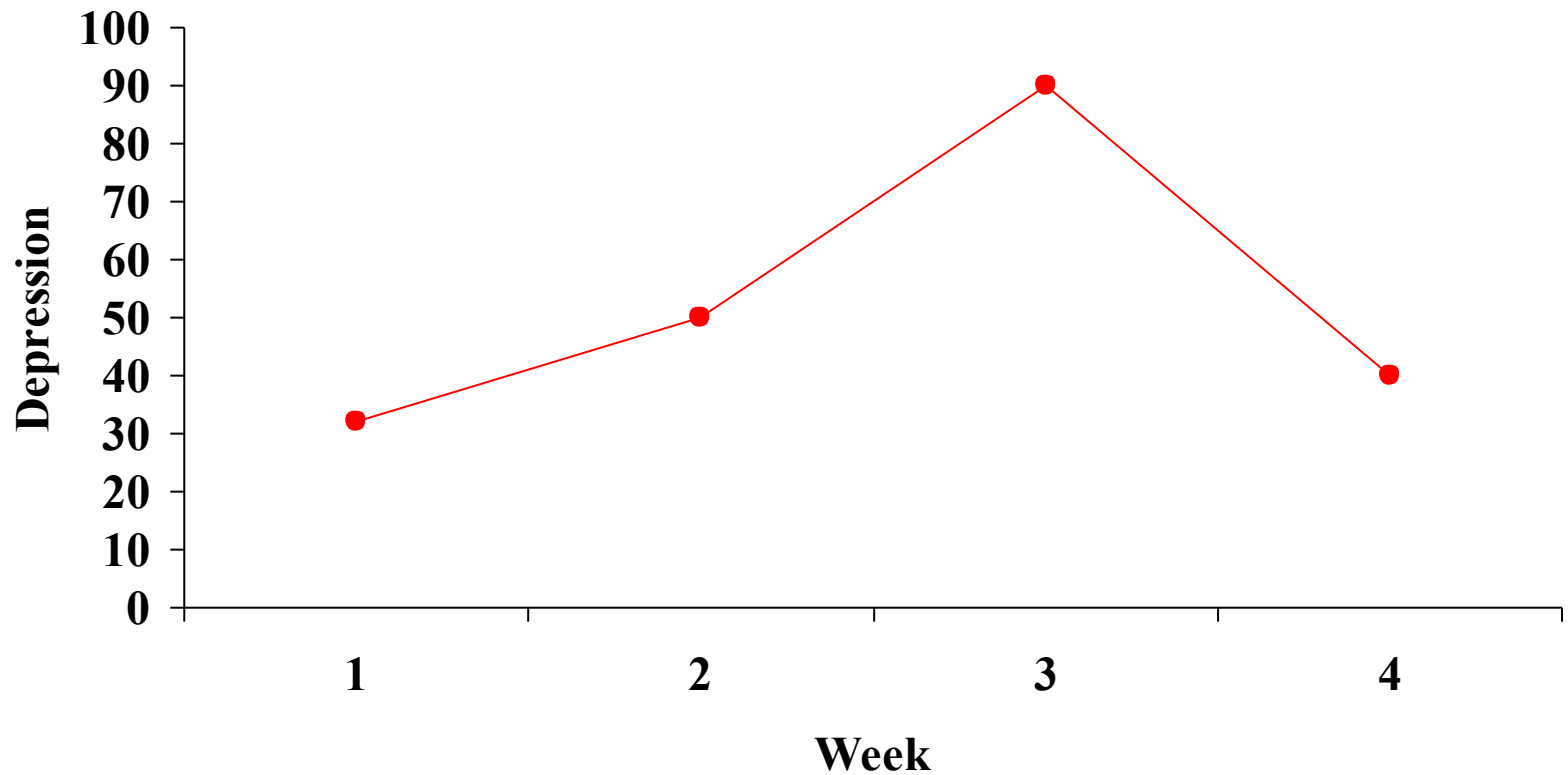
# Baseline: Predictable and Not Variable



# Baseline: Predictable and Variable



# Baseline: Not Predictable and Variable





# When are Baselines Unnecessary?

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- Prospective baseline unwarranted in some crises situations
- Prospective baseline unnecessary when no history of desired behavior having occurred



# Intervention Phase

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- Period of time during which formal, planned, systematic practitioner actions designed to change a target take place
- One or a combination of interventions implemented
- Should be related clearly to goals
- Should be specified clearly



# Follow-up Phase

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- Period of time after completion of an intervention during which maintenance of change is monitored and, perhaps, reinforced





# Comparison of Baseline and Intervention Phases

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- Used to determine change
- Assumption is that if the intervention had not occurred, the baseline pattern would have continued unchanged

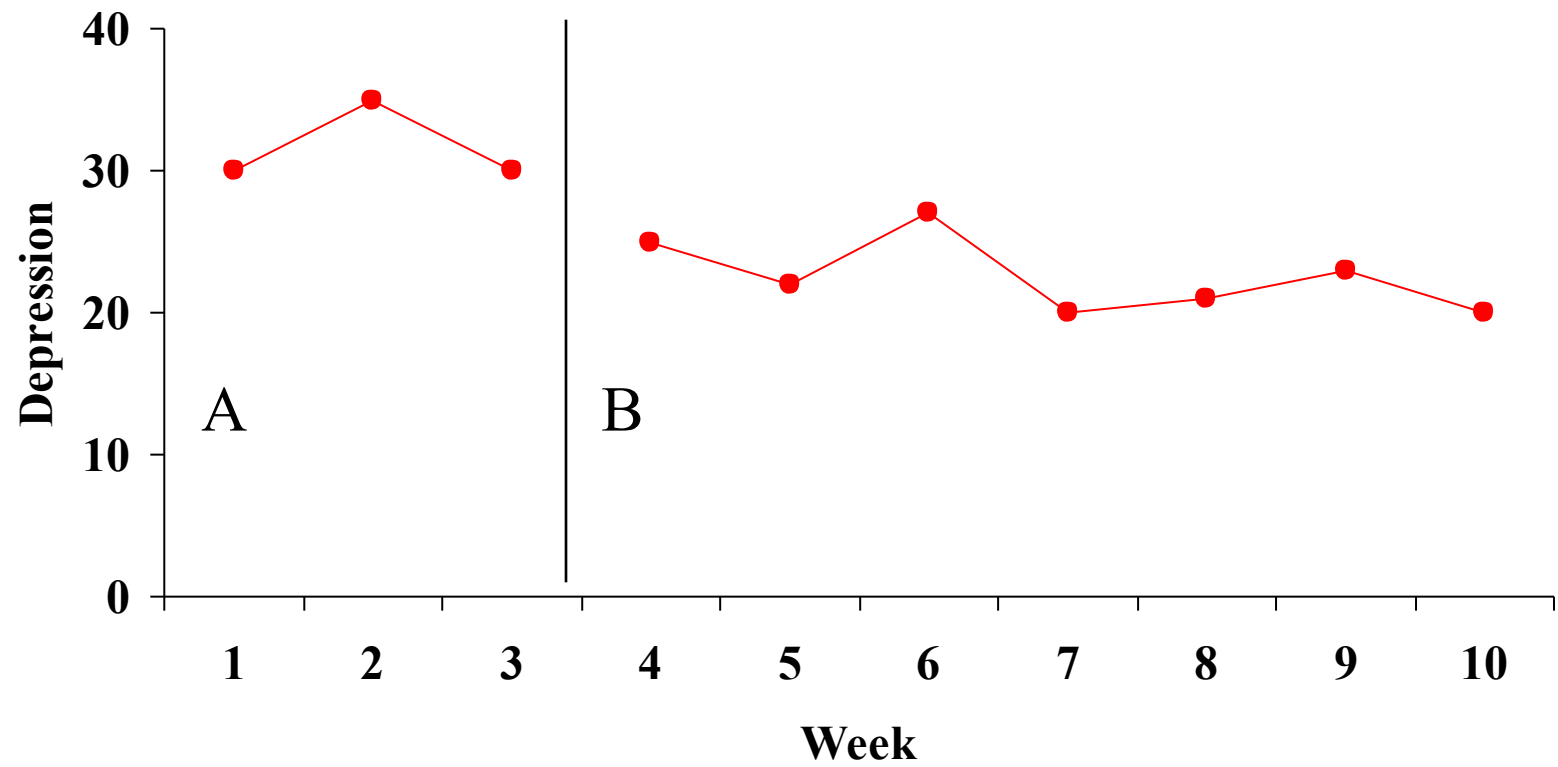


# Change Intervention, As Needed

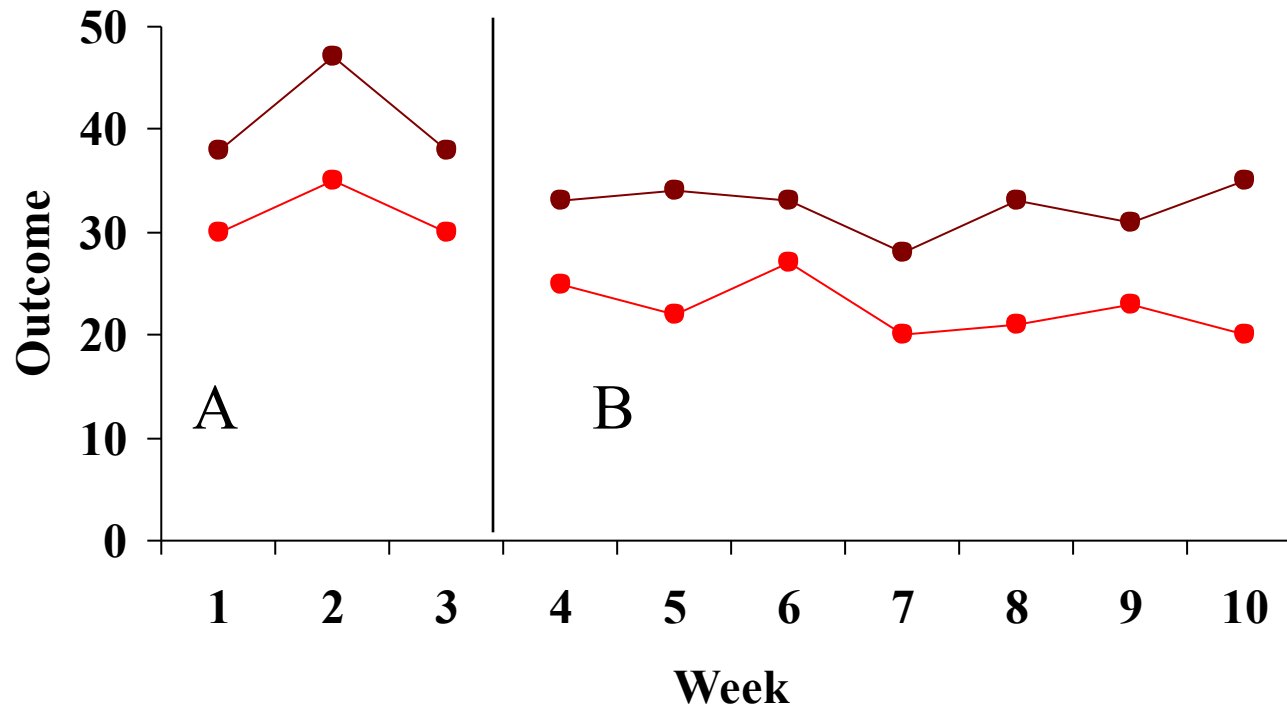
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- Interventions may be continued, added, removed, replaced, or changed in intensity
- Change in response to deterioration of target
- Change in response to insufficient improvement in target
- Change in response to attainment of goal

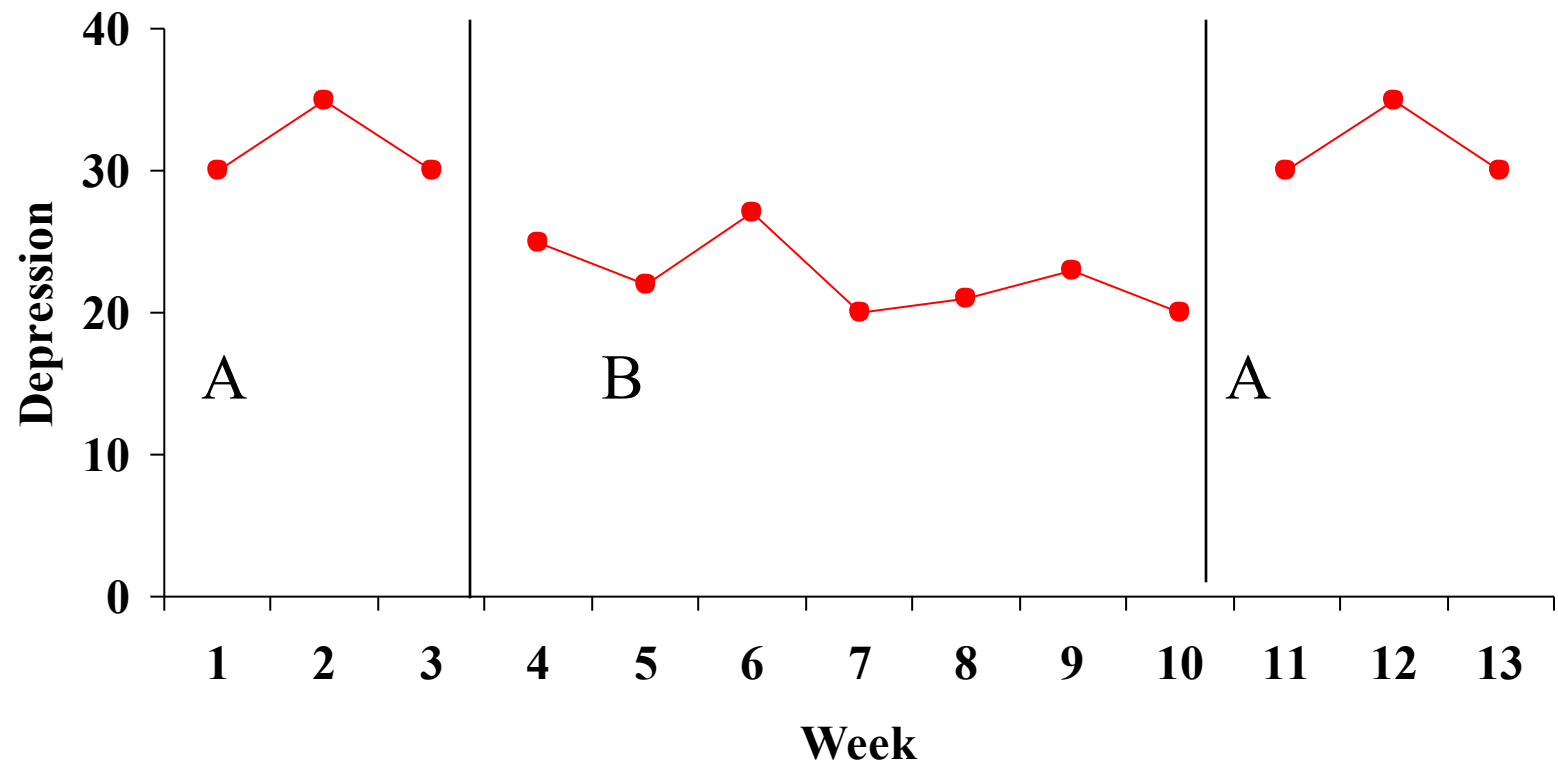
# A-B Design



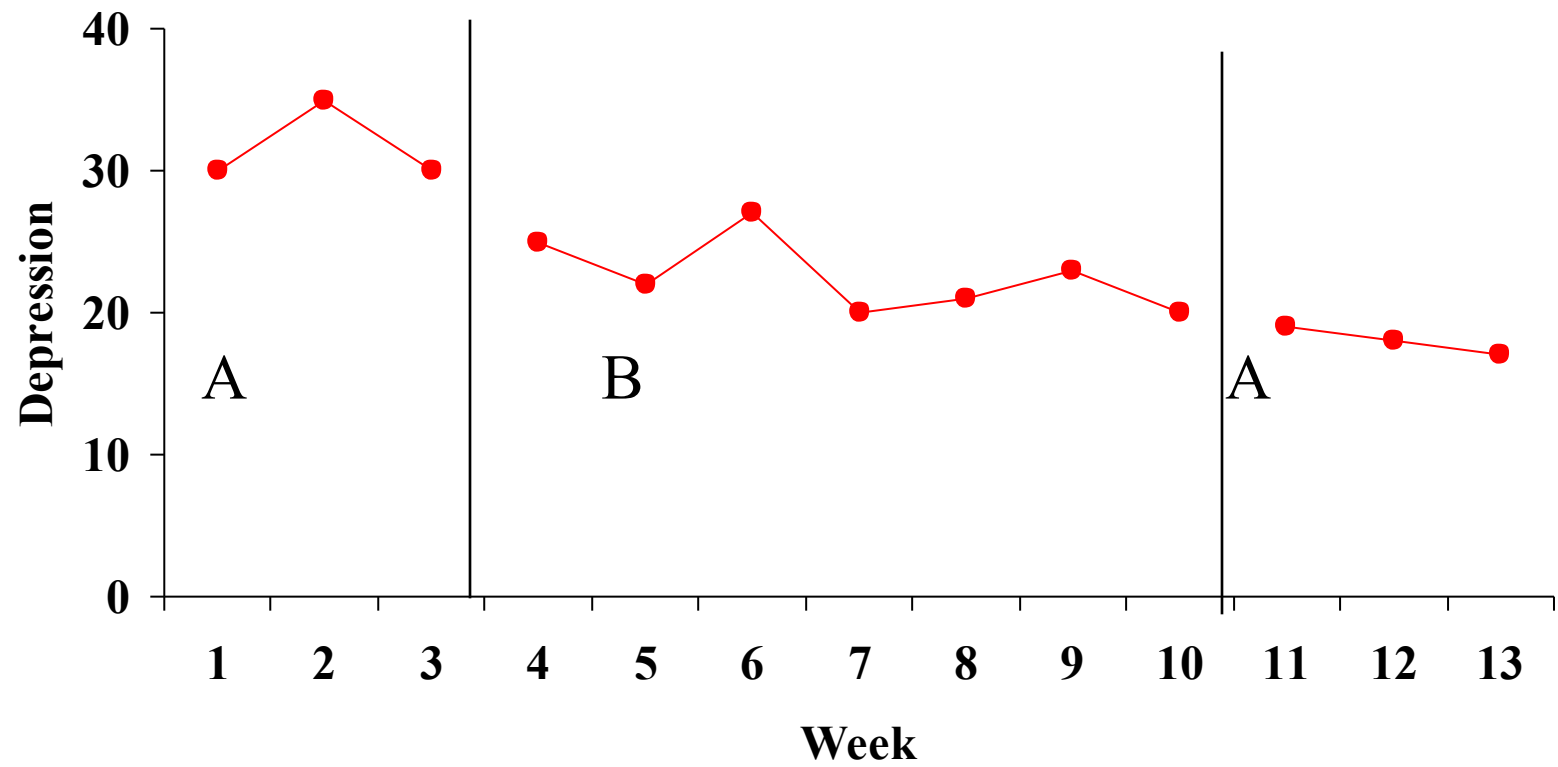
# A-B Design (2 Outcomes)



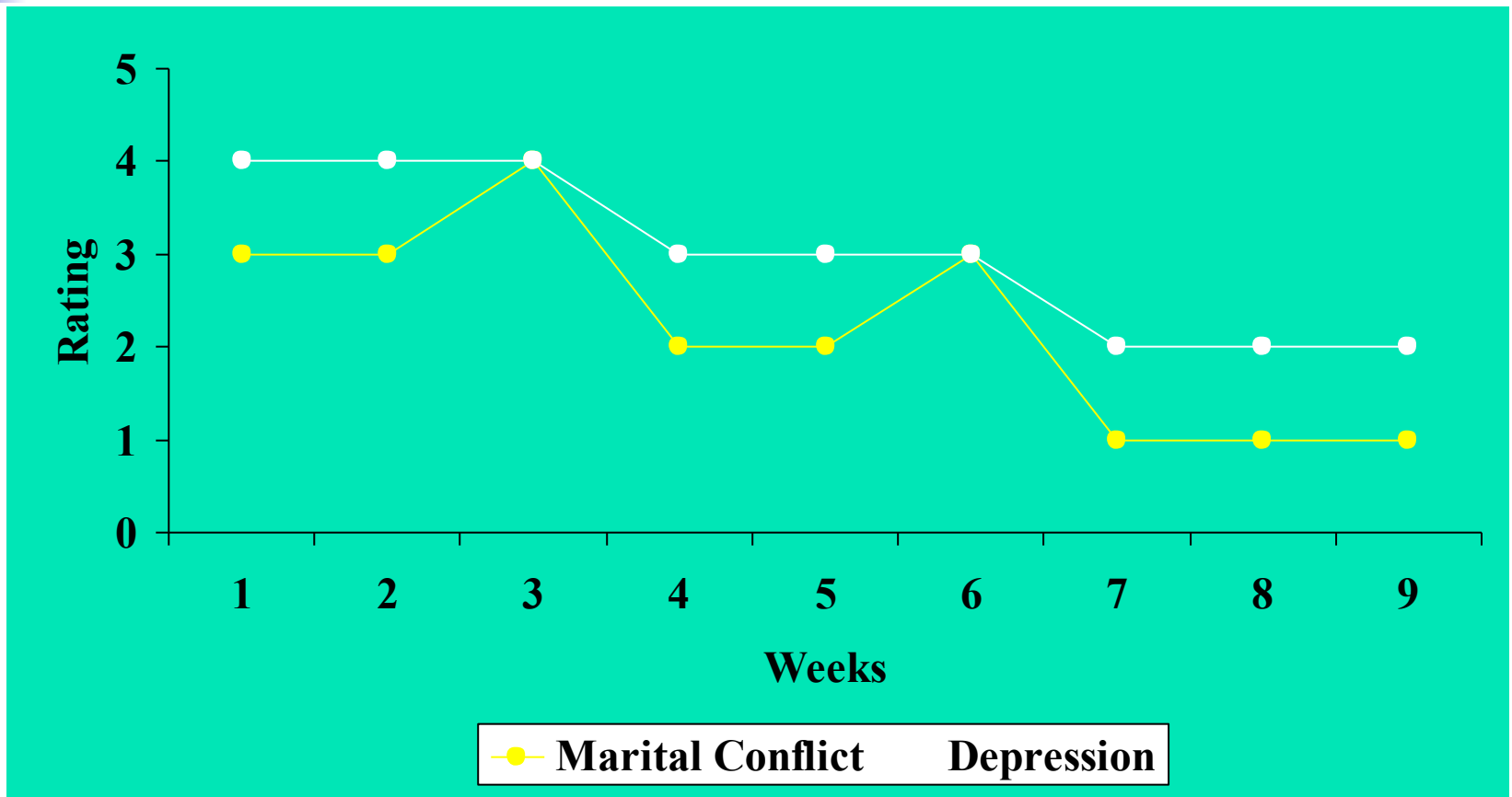
# A-B-A Design



# A-B-A Design



# Marital Conflict and Depression (B-only Design)



# Components of a Good Recording Plan

- **Select a measurement method**
- **Decide who should collect data**
- **Decide when and where to collect data**
- **Decide how often to collect data**
- **Decide how many targets to record**
- **Standardize recording procedures**



# Decide Who Should Collect Data

- Advantages and disadvantages with different sources
  - Client
  - Practitioner
  - Independent evaluator (e.g., supervisor, colleagues)
  - Relevant others (e.g., spouse, parent)



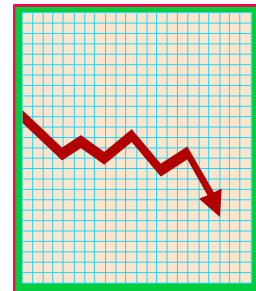
# Methods for Observing Behavior

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- **Self-monitoring**
  - Self observation
  - Overt or covert behavior
- **Direct observation**
  - Outside observer
  - Limited to overt behavior

# Charting Conventions

- Outcome on vertical axis
- Time on horizontal axis
- Phases separated by vertical line
- Don't connect lines across phases
- Use care in plotting missing data
- "A" designates baseline phase, B...Z designate intervention phase
- 2 or 3 outcomes can be plotted on the same chart to examine covariation



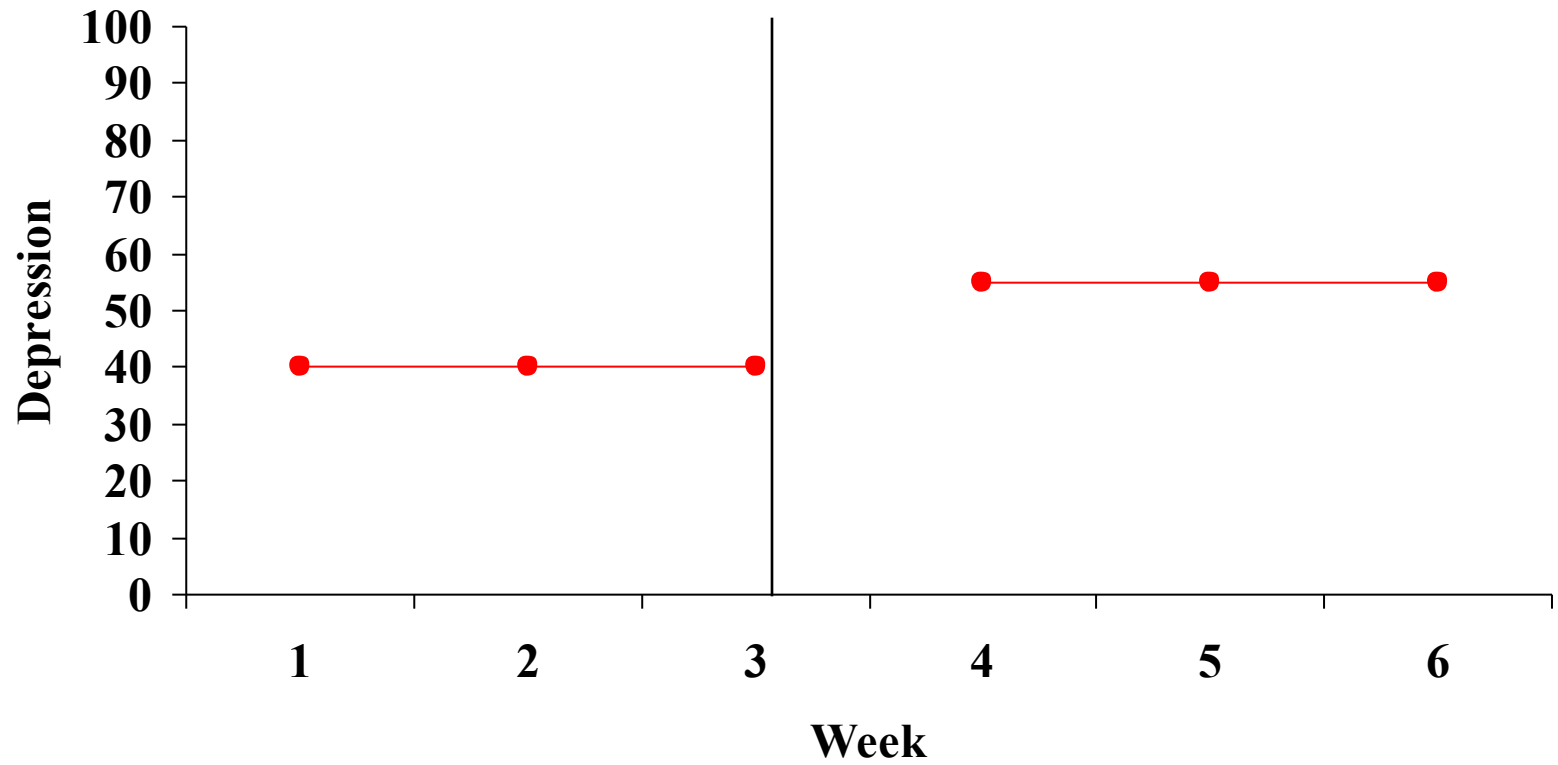


# Visual Analysis

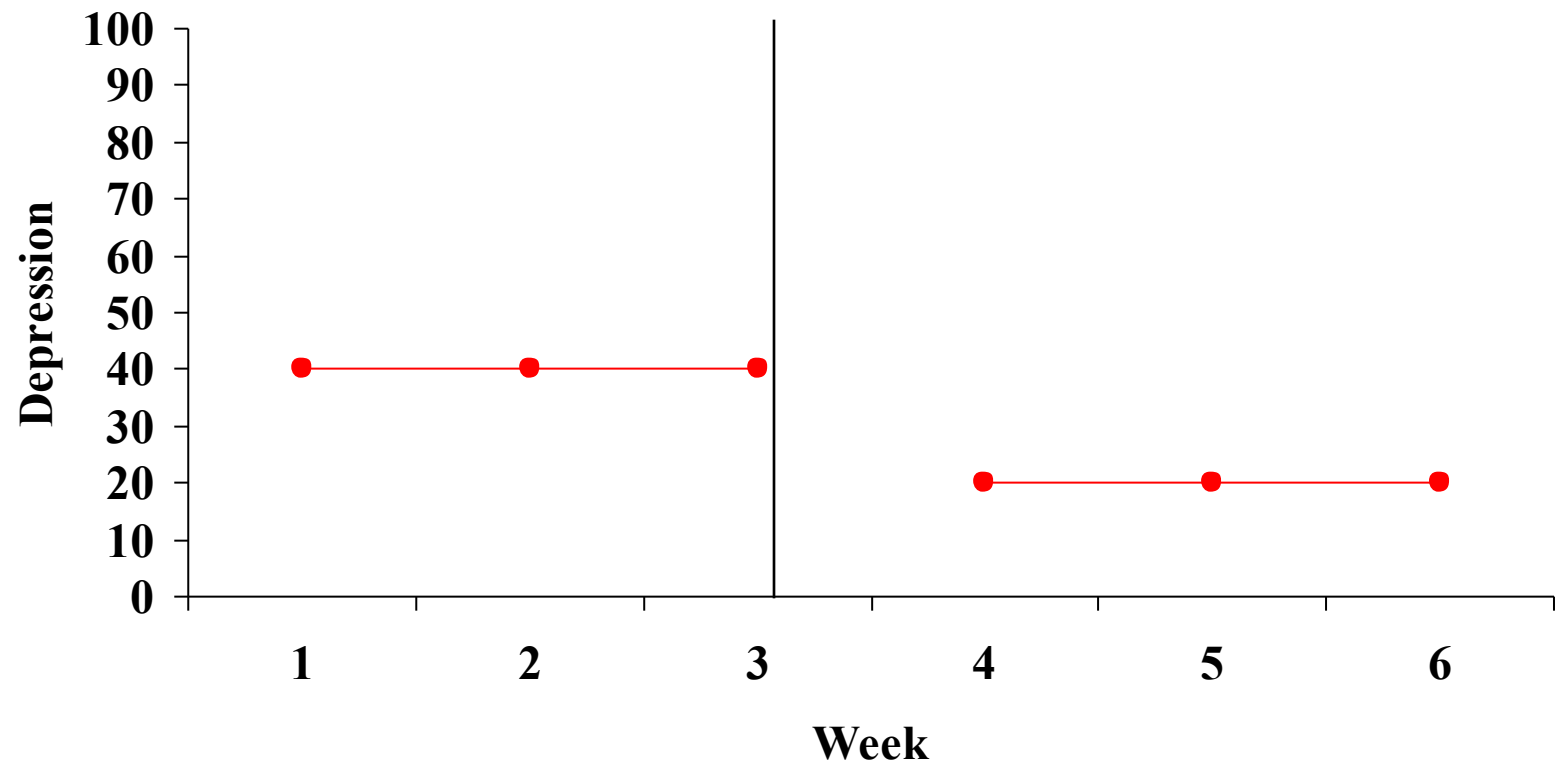
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- Change in level
- Change in trend
- Nature of change
  - Improvement
  - Deterioration
  - No change

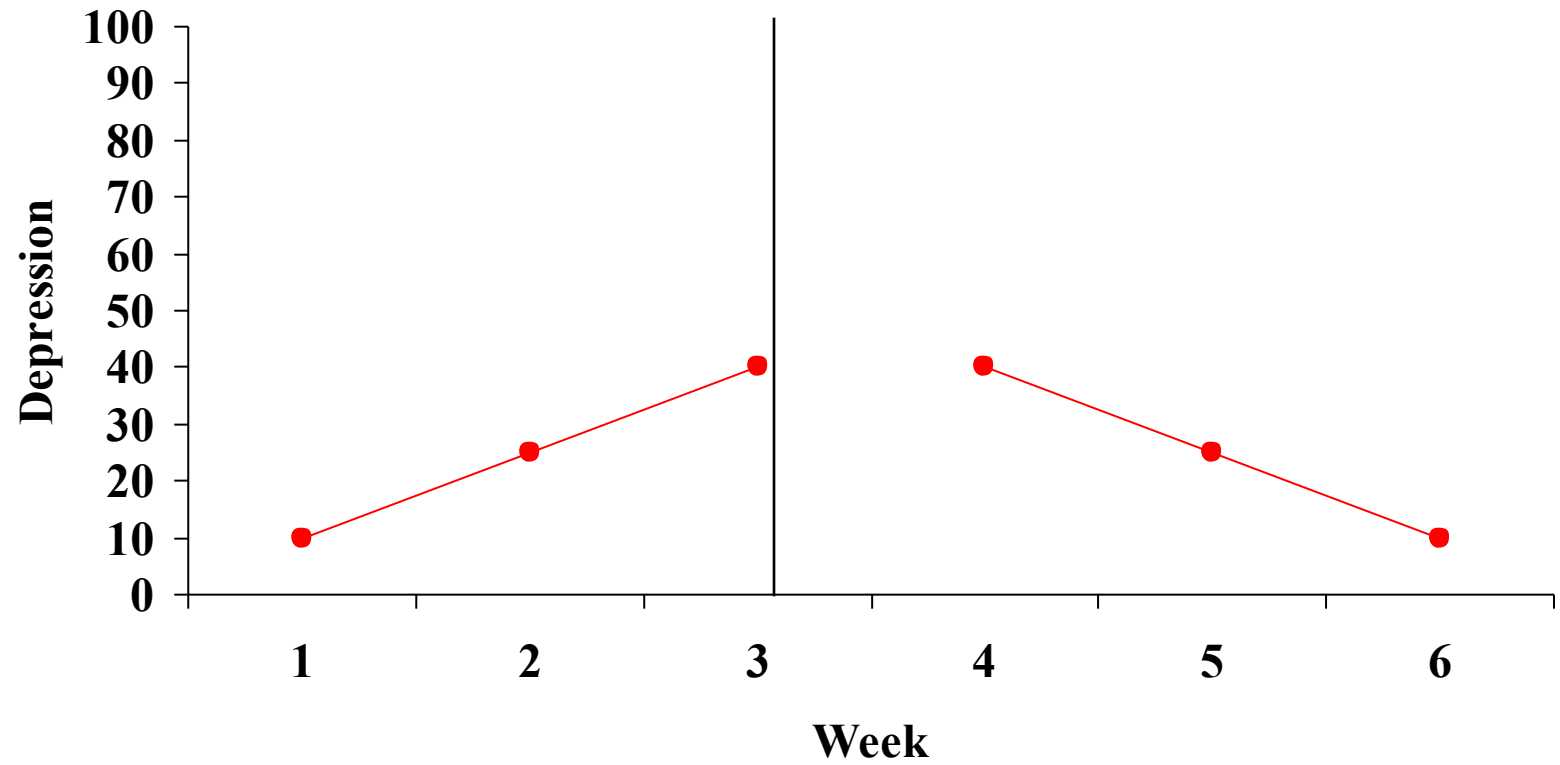
# Difference in Level: Deterioration



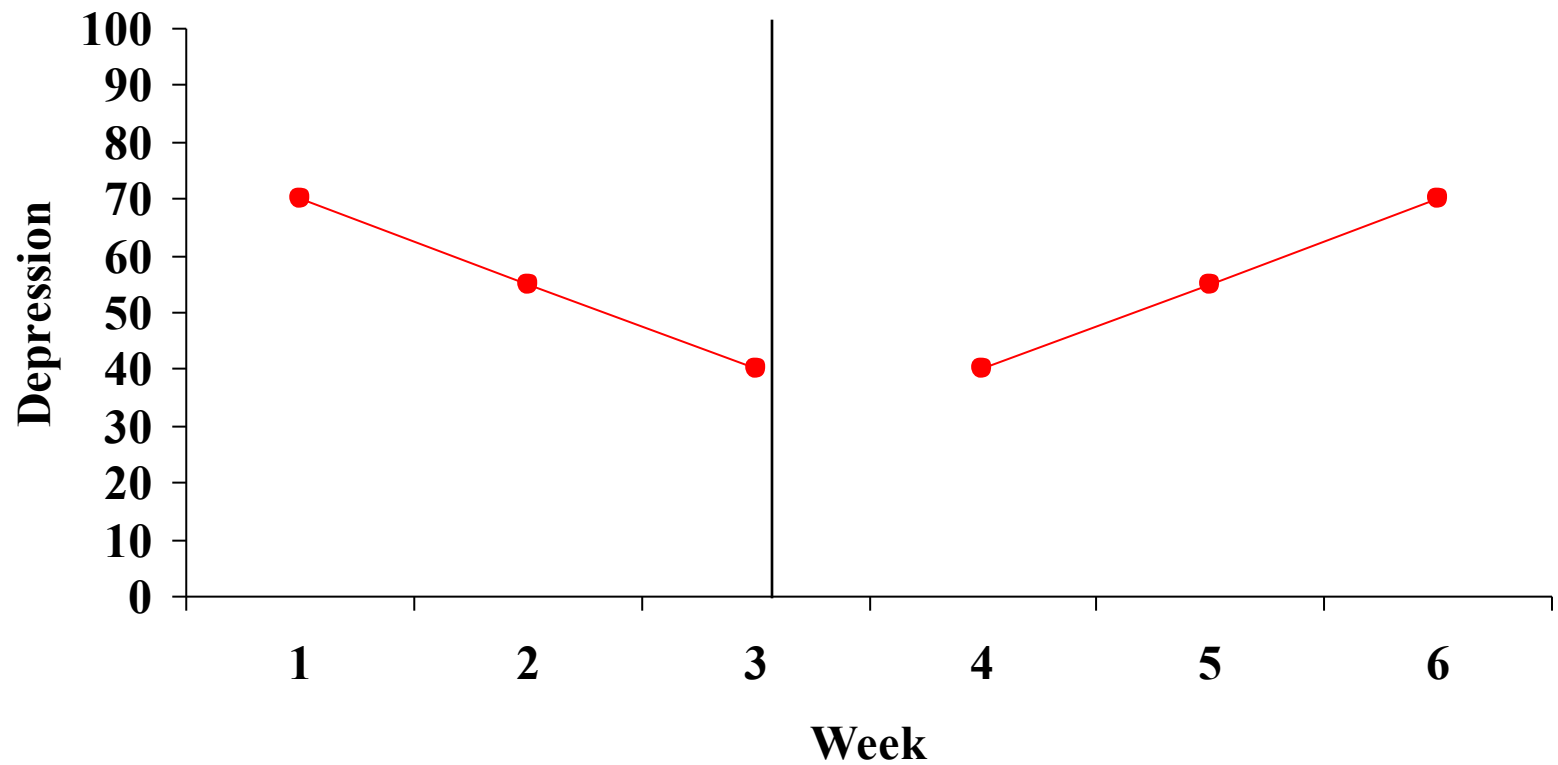
# Difference in Level: Improvement



# Difference in Trend: Improvement

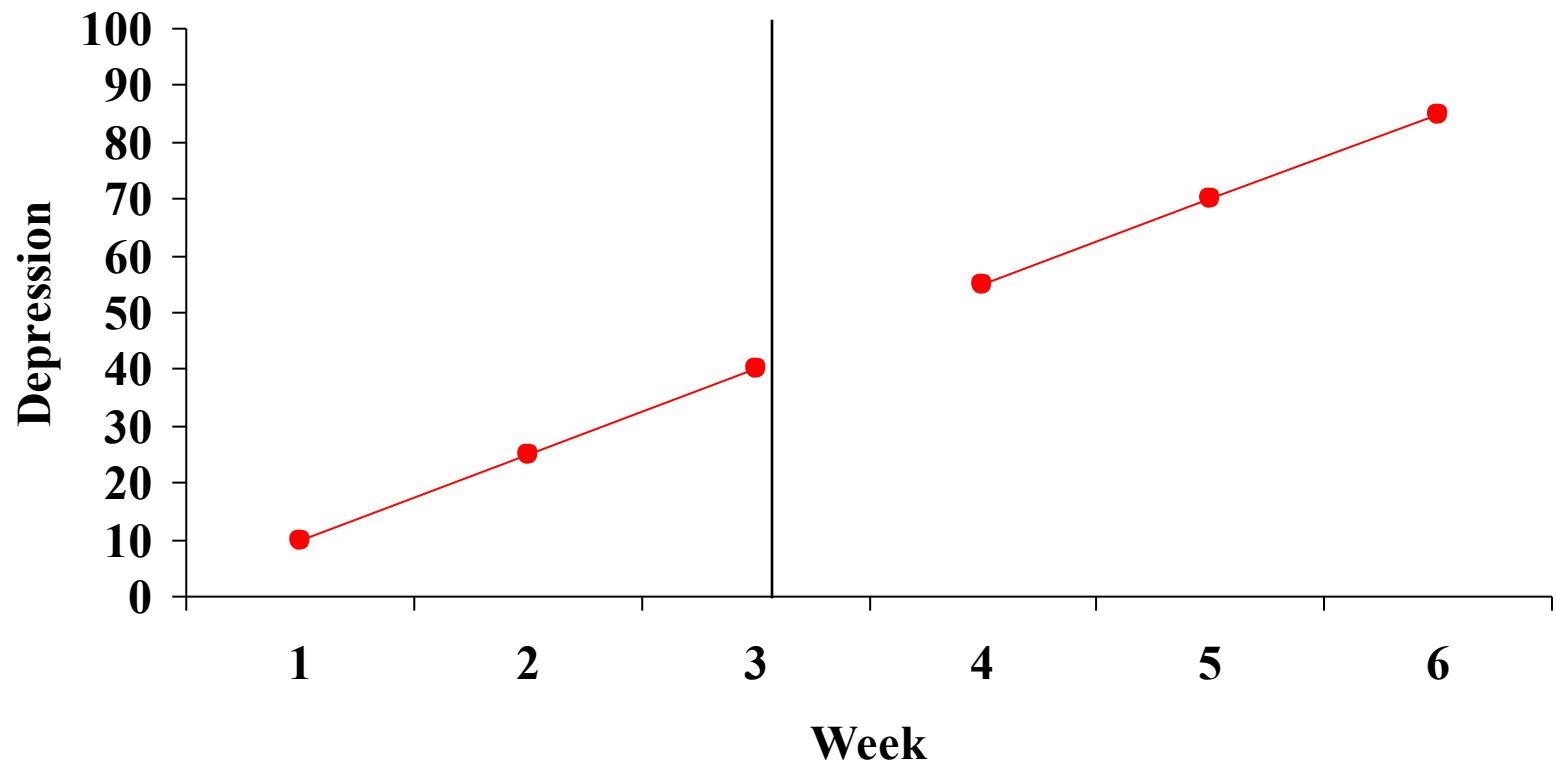


# Difference in Trend: Deterioration

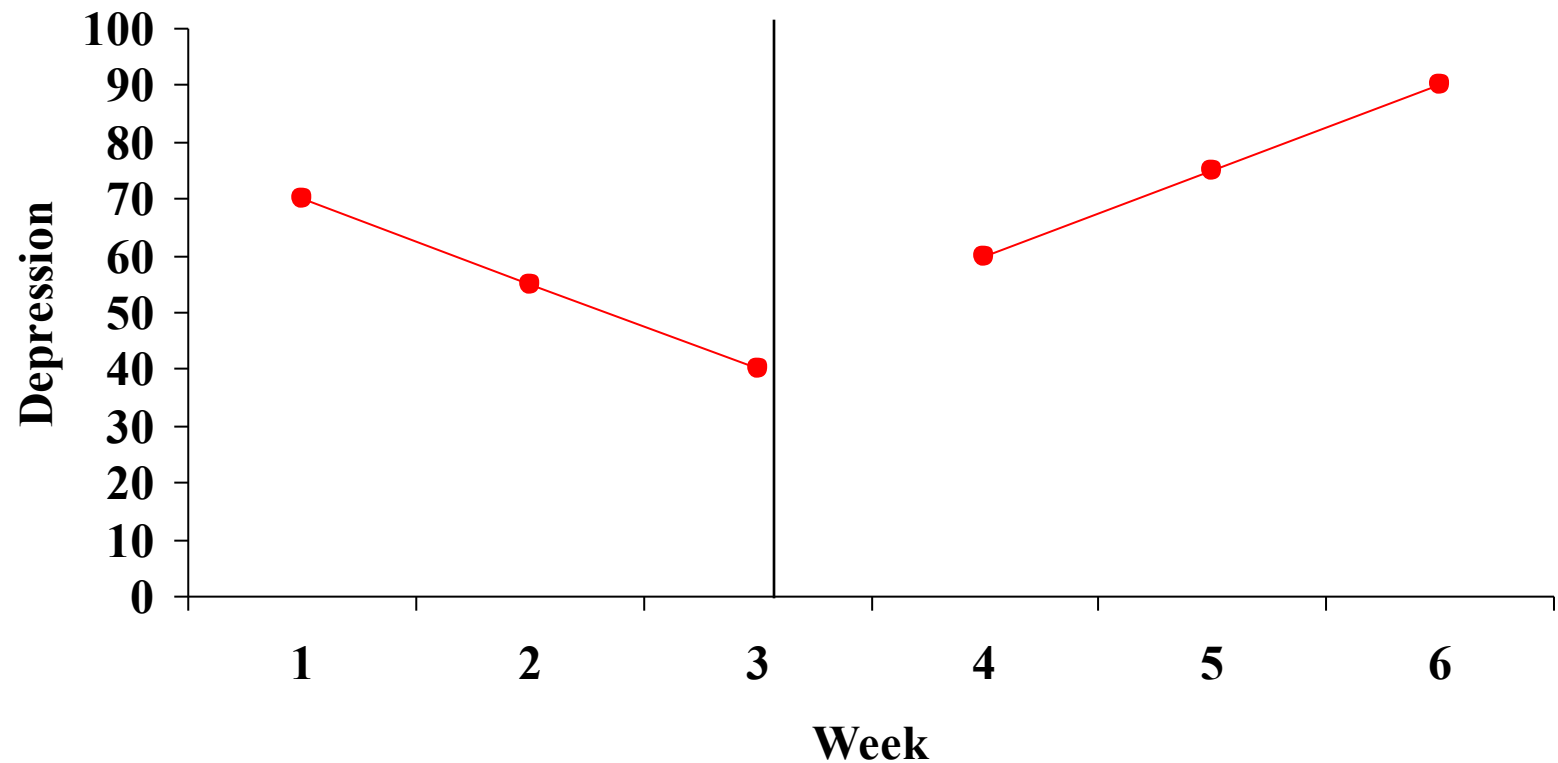


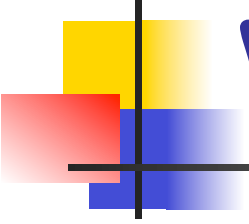


# No Difference in Trend



# Difference in Level & Trend: Deterioration



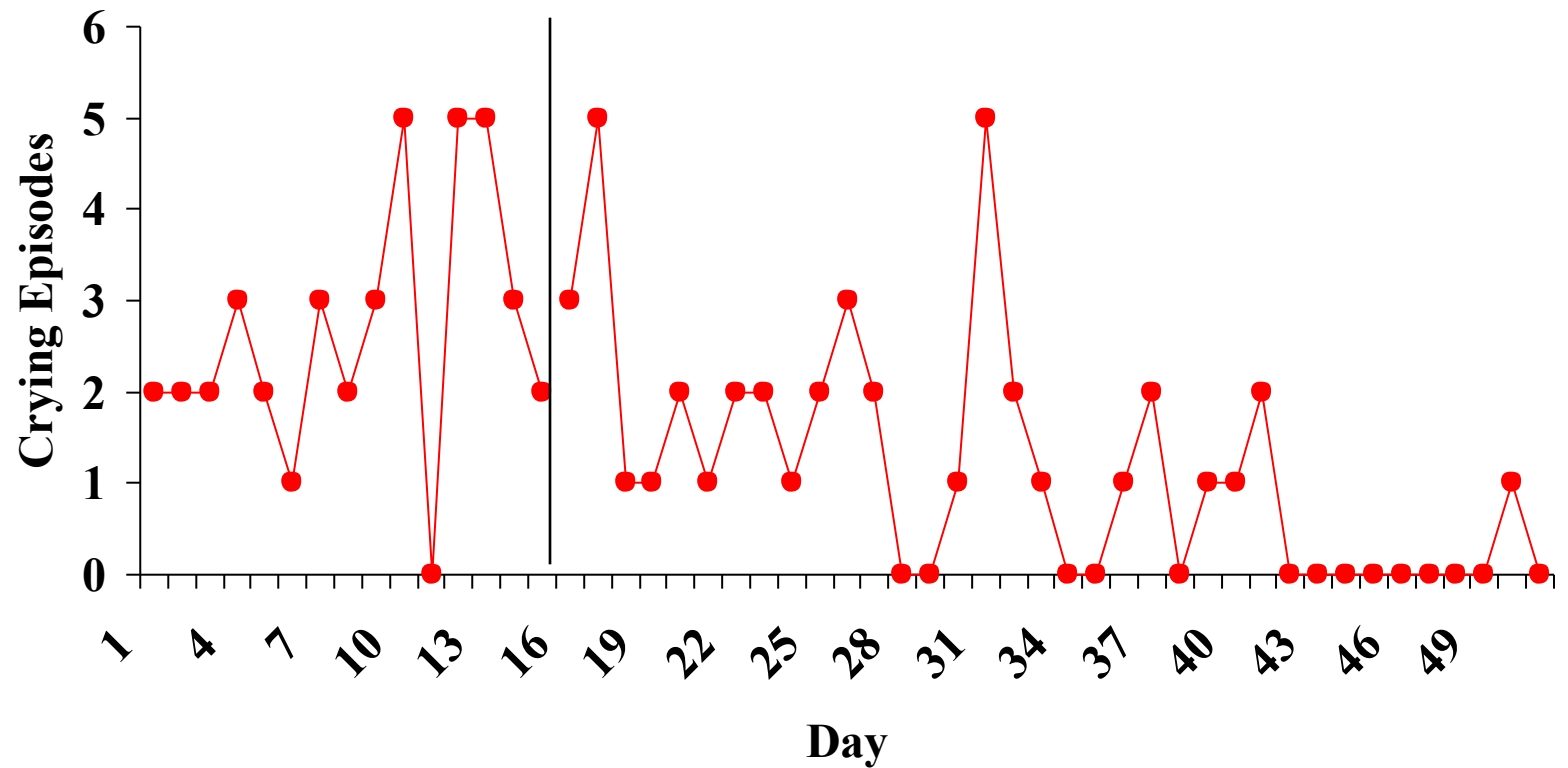


# Potential Problems with Visual Analysis

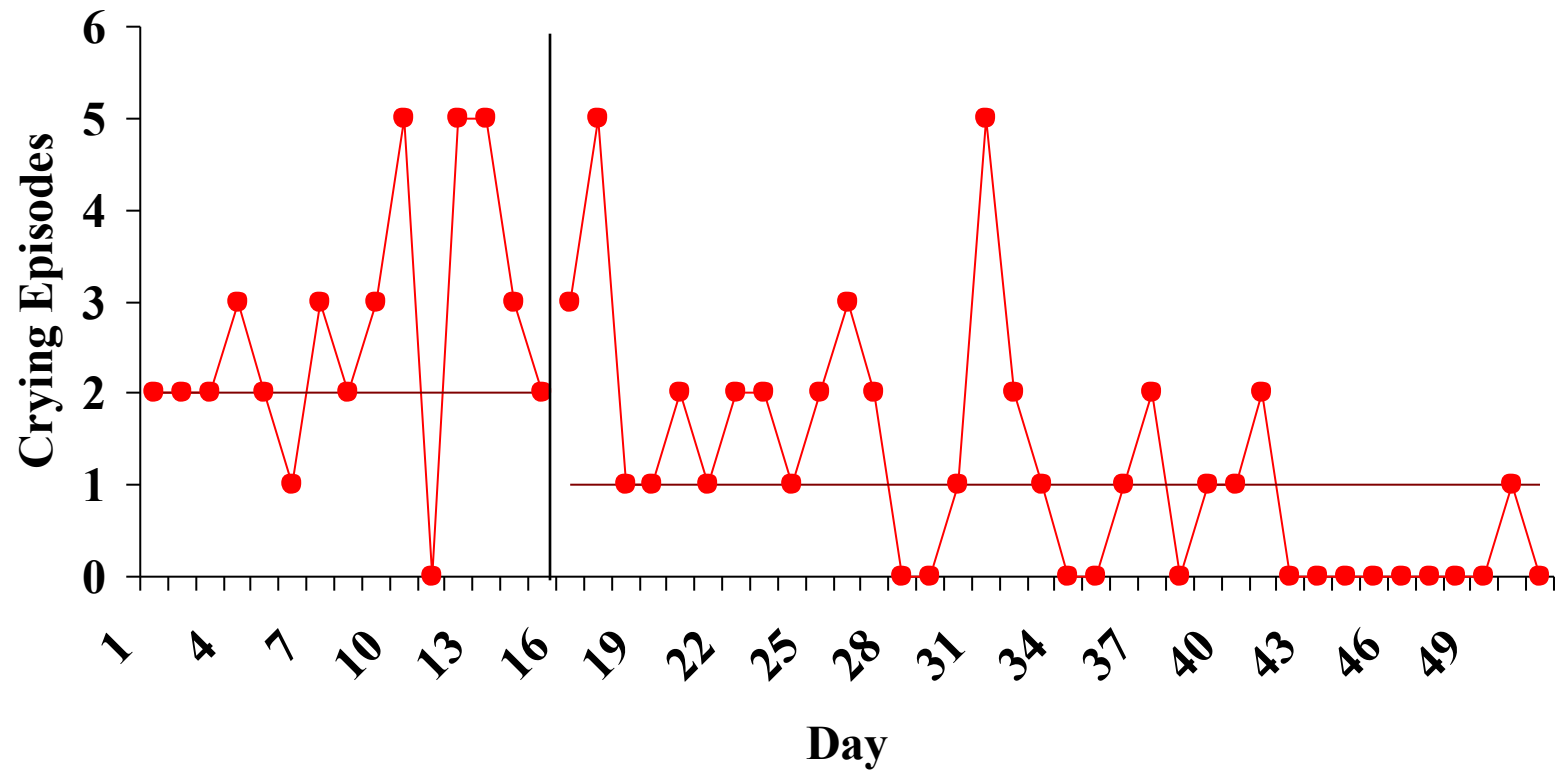
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- Sometimes change is ambiguous

# Daily Frequency of Crying



# Daily Frequency of Crying With Median Lines



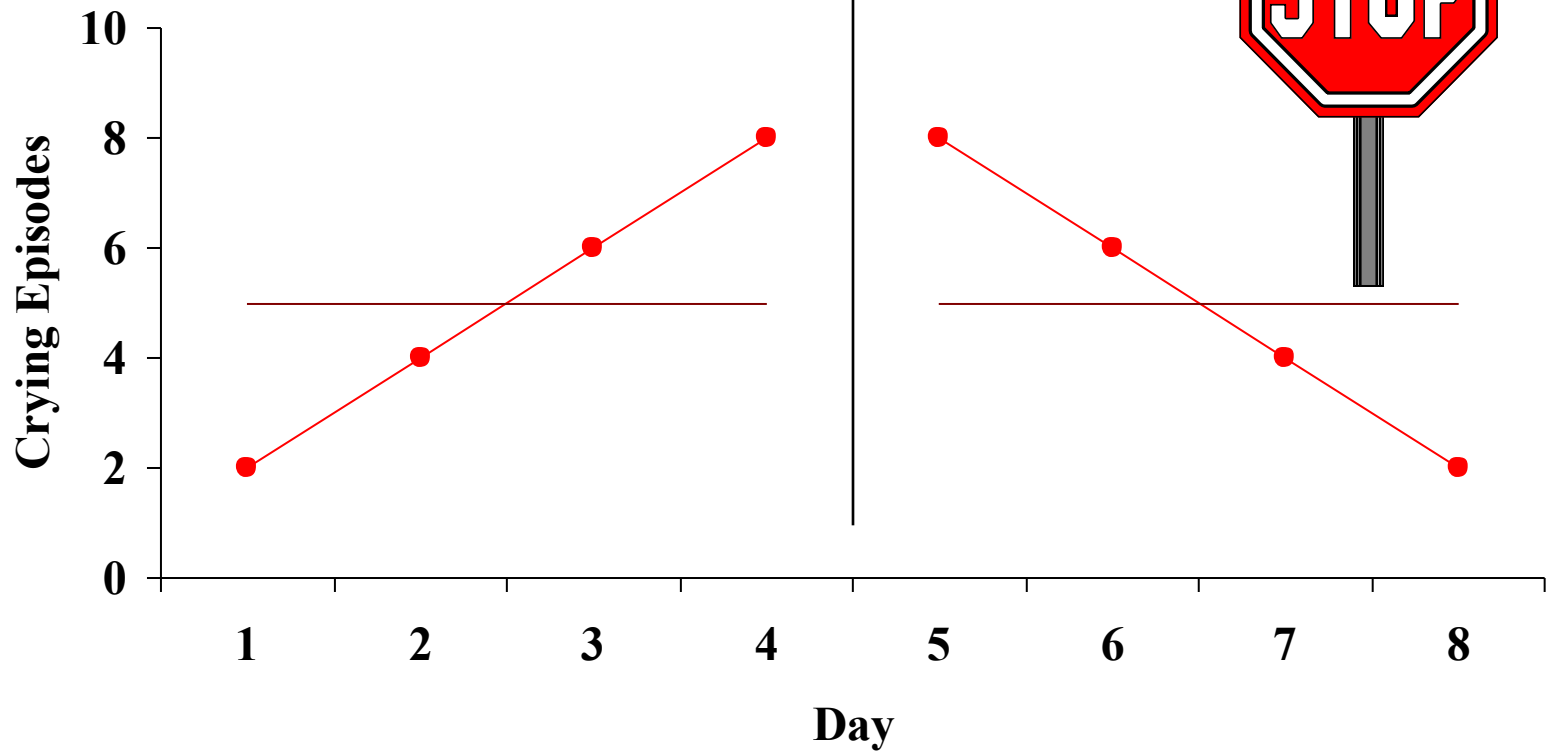


# Trend

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- Average rate of increase or decrease over time
- Measures of central tendency are inappropriate for data exhibiting a trend

# Trend with Mean Lines





# Repeated Measurement Using Individualized Rating Scale (IRS)

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- Also known as a “target complaint scale,” a “self-anchored scale,” and an “individual problem rating scale”
- Tailor-made for each client





# IRS Example

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**Intensity of anxiety today**

**(1) Little or no anxiety**

**(2) Some anxiety**

**(3) Moderate anxiety**

**(4) Strong anxiety**

**(5) Intense anxiety**



# Advantages of IRS' s

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- Can be completed by clients, practitioners, relevant others, or independent evaluators
- Tailored to individual clients
- Easy to administer and score, and so can be used frequently



# Advantages of IRS' s (cont' d)

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- Can be used with most clients
- Can be used to measure intensity of targets
- Can be used to measure thoughts and feelings
- Evidence of good reliability, validity, and sensitivity to change

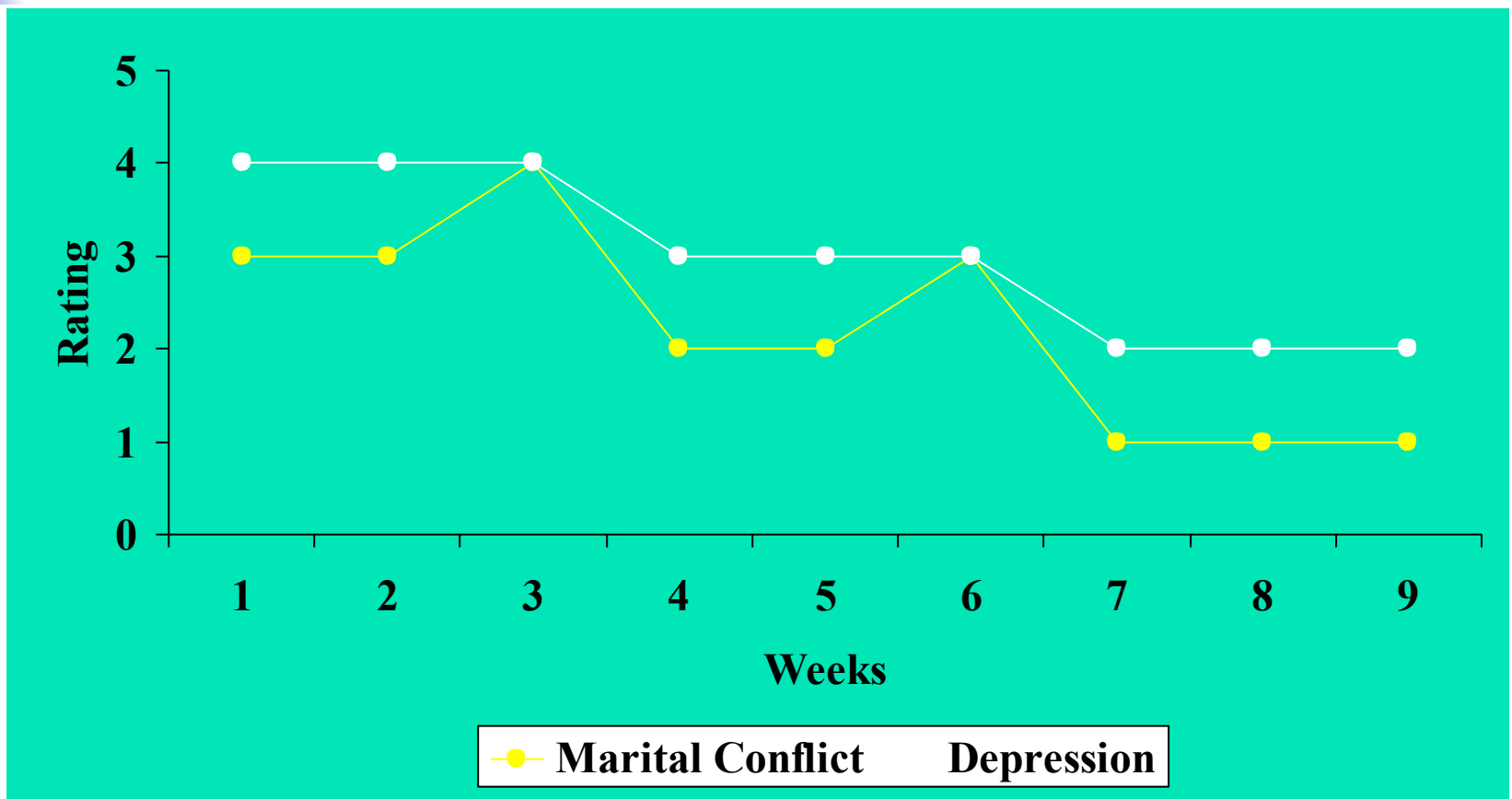


# Repeated Measurement Using Logs

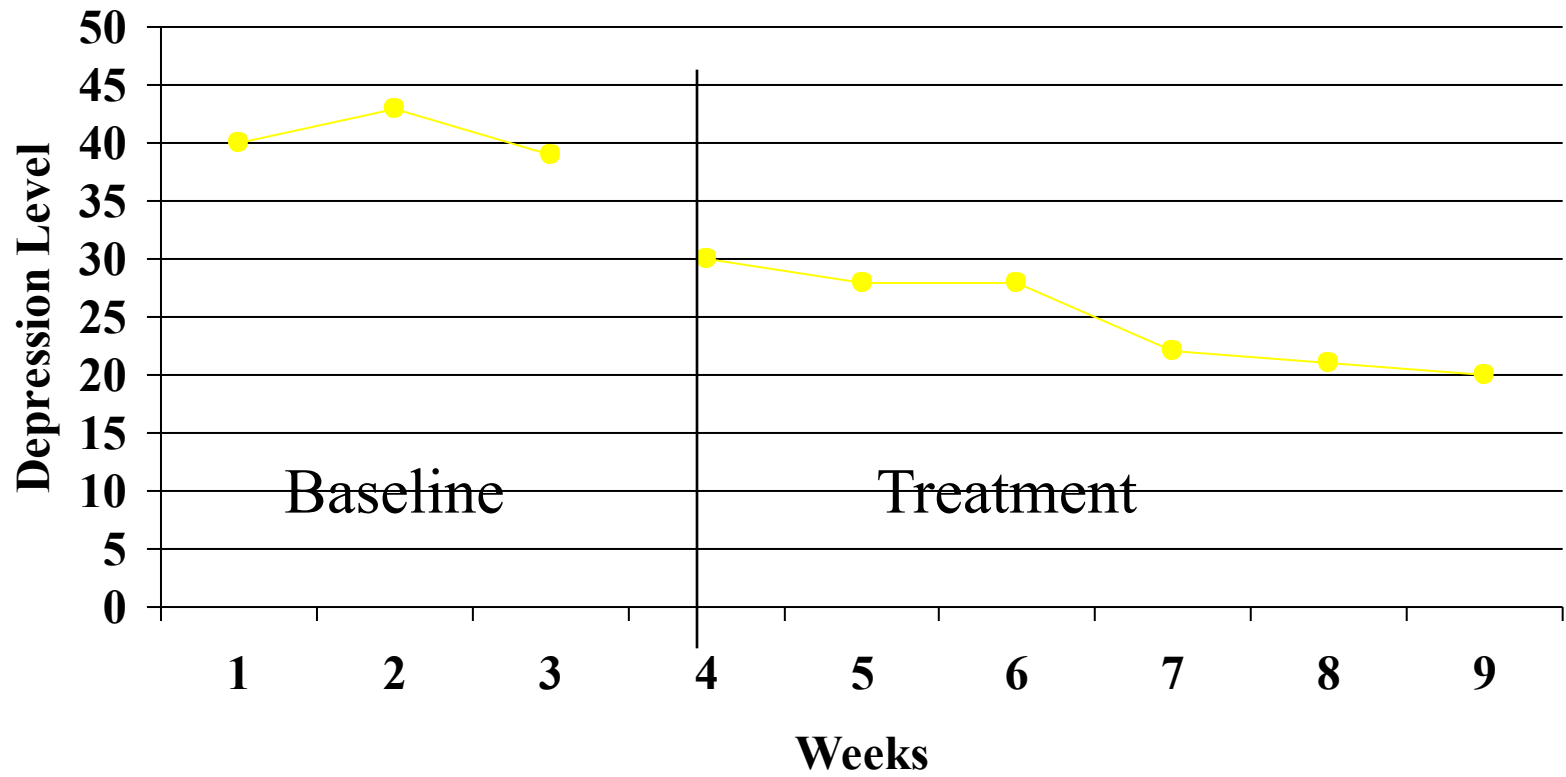
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- Also known as “client annotated records” and “critical incident recording”
- Organized journal of events relevant to targets, and the client’s perceptions of the circumstances under which these occur
- Used mostly by clients, but can be used by practitioners and significant others

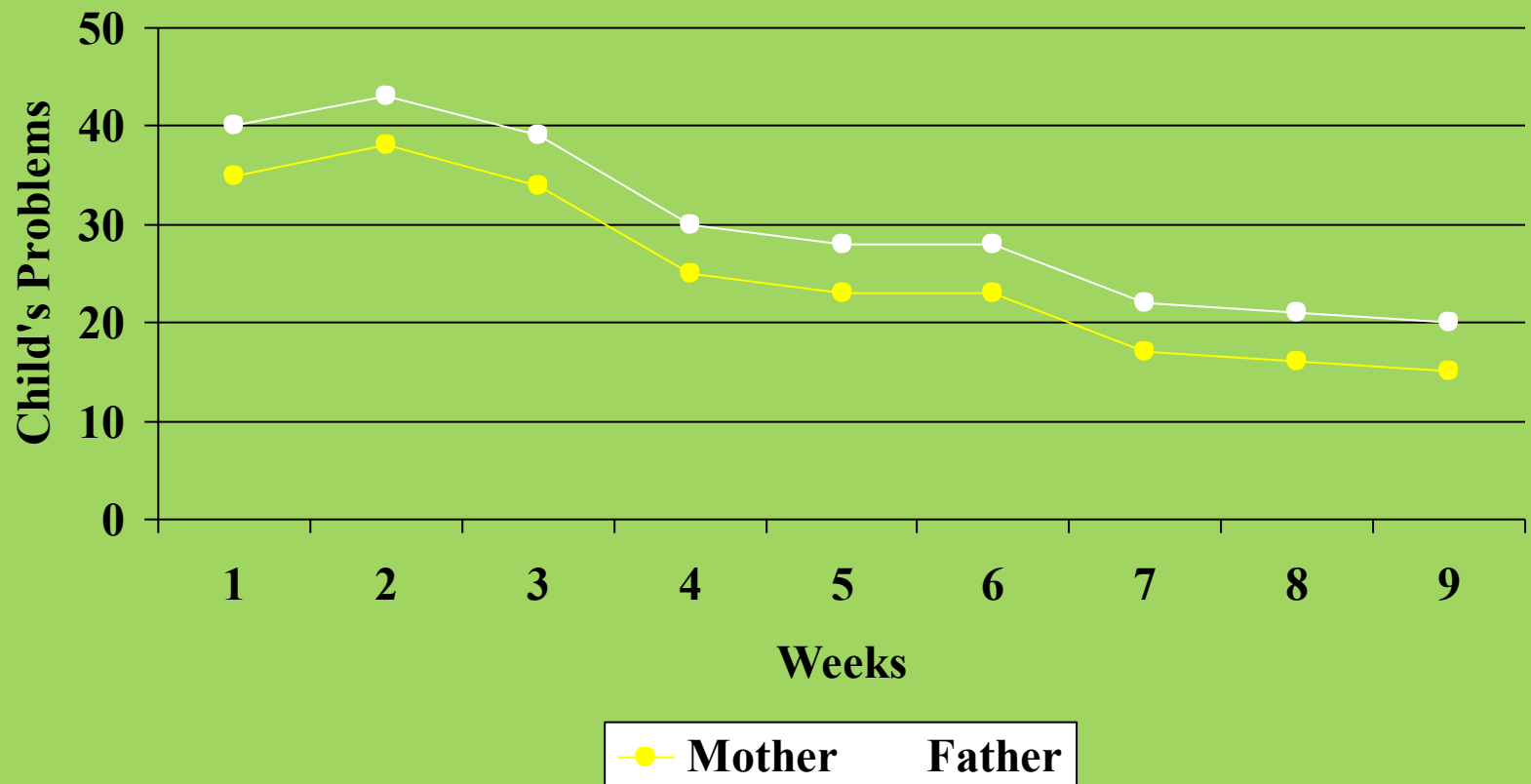
# Marital Conflict and Depression (2 outcomes)



# Depression Level



# Child's Problems Rated by Mother and Father





# Internal Validity

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A claim to good external validity is how representative is the study's participants.

Few human services projects and program evaluation use random sampling of the population and use convenience of some kind.





# Replication

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- The process of duplicating an experiment-in which the same hypotheses, variables, sampling procedures, testing instruments, and techniques are used with a different sample of the same population. (Barker, 1999, p. 409) (Case confidence)