

Action Research: Increasing Accountability and Improving Data-Based Decision Making

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Presentation Overview

- *Practitioner Research: Why so little?*
- *Movement toward high quality field-based research*
- *School-based action research: Why do it? Types? Steps?*
- *Evaluating action research; Procedures, tools and data analysis*
- *Intervention integrity: How to get it*
- *Developing and disseminating action research*
- *Single Case Research: [A-B-A-B Designs; Multiple Baseline Designs: Alternating Treatments Design]*
- *Intro to Qualitative Research*
- *Research Planning Checklist - Steps for successful field research*
- *Questions and discussion of your projects (including potential projects)*

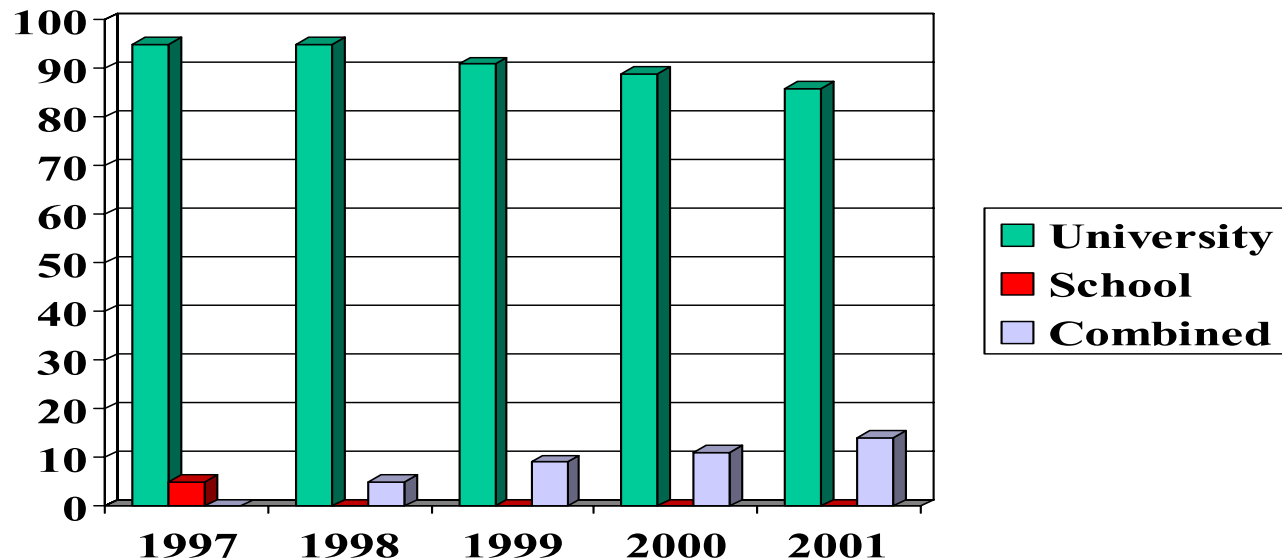


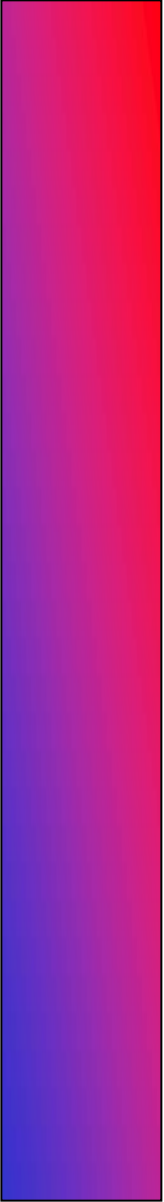
Goals for the workshop

- Increase knowledge about *action research*.
- Learn how to design *action research* projects.
- Show how research and practice come together in data-based decision making.
- Show that “confirmation/disconfirmation” and “discovery” can be part of an action research program.

School Psychology Research

- Who does it?
 - 1987-92 - 33% of NASP Presentations were done by practicing school psychologists - large percentage were not empirical. (Little & Mink, 1993).
 - *School Psychology Review* percent of publications by category since 1997



- 
- Most psychologists are trained in large group, experimental research.
 - Problems with large group research.
 - Difficult to do in schools.
 - Provides little info on individual cases.
 - Few observations.
 - Error due to individual differences.
 - Difficult to find large numbers of students with similar problems.

Experimenting Society Model (Campbell, 1988) argues that all of our efforts (assessment, consultation & intervention) should be grounded in “flexible experimentation”. Local research with attention to outcomes on salient local variables should be increased (Stoner & Green, 1992).

New conceptions of research as a process rather than an outcome has led to increased “scientific thinking” in practice (i.e., FBA).



Why do few practicing school psychologists do research?

- Training
 - Especially on research designs that are more compatible with practice
 - Little basic research design in training programs.
 - Less interest in research by MS or Ed.S. level practitioners.
- Time
 - Large caseload
 - Other initiatives
- Reward
- Local Relevance?
- Collaboration
- Difficulty getting published



• *ETS Survey of Certified School Psychologists* (Rosenfeld, Leung & Oltman, 2000)

Surveyed 543 practitioners nationwide on the importance of tasks (n=73 items) and the importance of knowledge to perform them (n=102 items).

Bottom Five items for practitioners were as follows:

Bottom Five Task Items

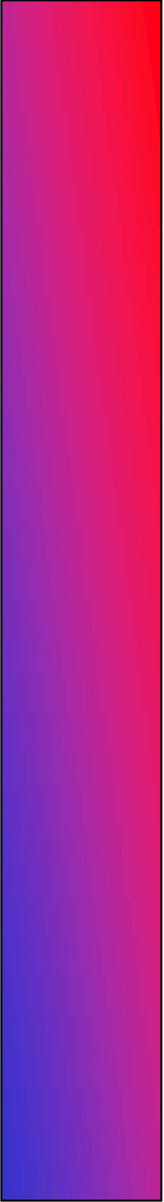
69. Collect and analyze data on relevant variables.

70. Provide vocational counseling to individuals or groups.

71. Prepare written reports of research describing purpose, methodology, conclusions and recommendations.

72. Determine the methodology or research design to be used in a particular study.

73. Develop proposals for research studies and obtain support from funding sources.



The bottom five knowledge items for practitioners were:

Bottom Five Knowledge Items

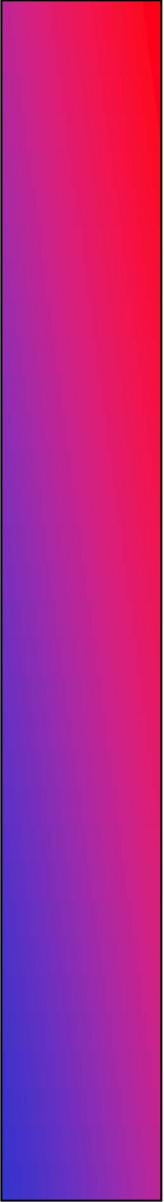
98. Supervisory techniques.

99. **Technical and statistical issues in program evaluation.**

100. **Research and experimental design.**

101. Vocational guidance.

102. Methods for assessing special aptitudes and interests (e.g., art, music, mechanical, vocational).



“Practitioners can no longer assume that offering something is useful; there is an expectation of professional accountability in determining students’ needs and linking them to optimal preventative or intervention strategies....practitioners must be committed to evaluation of practice and providing feedback on the application of empirically supported interventions in schools”
(Stoiber & Kratochwill, 2000, pp.100).

Evidence-Based Interventions (EBI)

Criteria for Coding Studies and Classifying Treatment as Beneficial (from Stoiber & Kratochwill, 2000)

1. At least 2 between group studies of same treatment with same target population.
 - Random assignment of participants to conditions.
 - Findings must show treatment better than control or comparison condition.
 - Or equivalent to existing EBI



Evidence Based Interventions (EBI) (continued)

OR

2. At least 2 **within-group design** studies of same target problem to be better than the comparison conditions on problem assessments following the establishment of a **reliable baseline**.

AND

3. Majority of applicable studies must support treatment.
4. Experiments must be conducted with treatment manuals.
5. The treatment procedures must be shown to have adhered to the treatment manual or protocol.

Research Knowledge, Skills & Activities of University Researchers vs. School Practitioners

<u>Research Skills & Activities</u>	<u>University</u>	<u>Practitioners</u>
Theory	Yes	Yes
Literature Review	Yes	Yes
Research Plan	Yes	Yes
Hypotheses	Yes	Yes
Measures	Probably	Yes
Subjects	No	Yes
Design Skills	Yes	No
Analysis Procedures	Yes	Probably Not
General Research Procedures	Yes	No
Ethical Principles	Yes	Yes
Legal	Yes	Yes
Human Relations	External	Internal
Knowledge of Sources of Research Invalidity	Yes	No
Statistical Software	Yes	Generally No
Preparation of Report	Yes	No Help
Social Validity	Depends on research location	Yes





School-Based Intervention Research

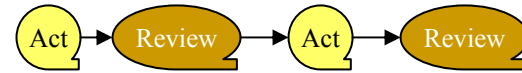
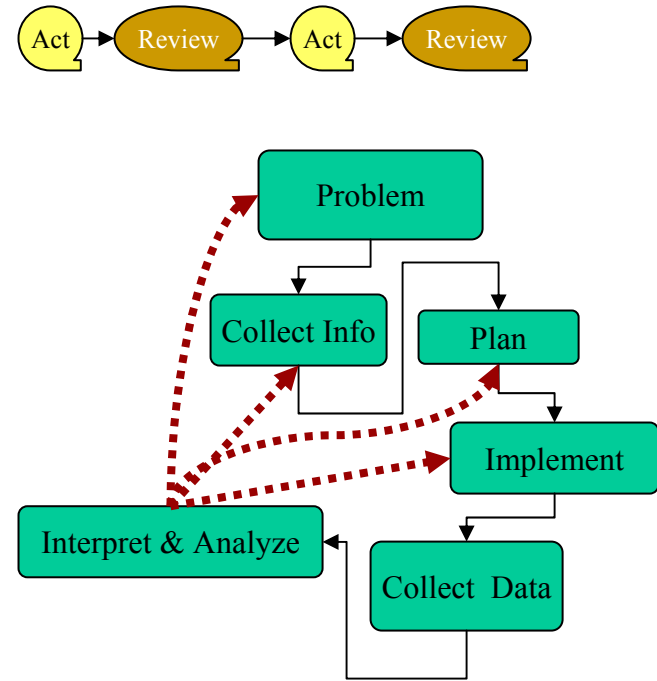
Types of Research

- √ **Basic Research** - knowledge for knowledge's sake, no planned application. Testing theories of behavior. Contribution to literature.
- √ **Applied Research** - uses methods of basic research - goal is testing theoretical concepts in problem settings. Immediately useful information. Contribution to research literature
- √ **Action Research** - uses research (scientific) methods - varying in rigor. Focus is not on theory development but in solving local problems. Goal is local applicability not universal validity.

Focus on Action Research

What is it? – Defining statements

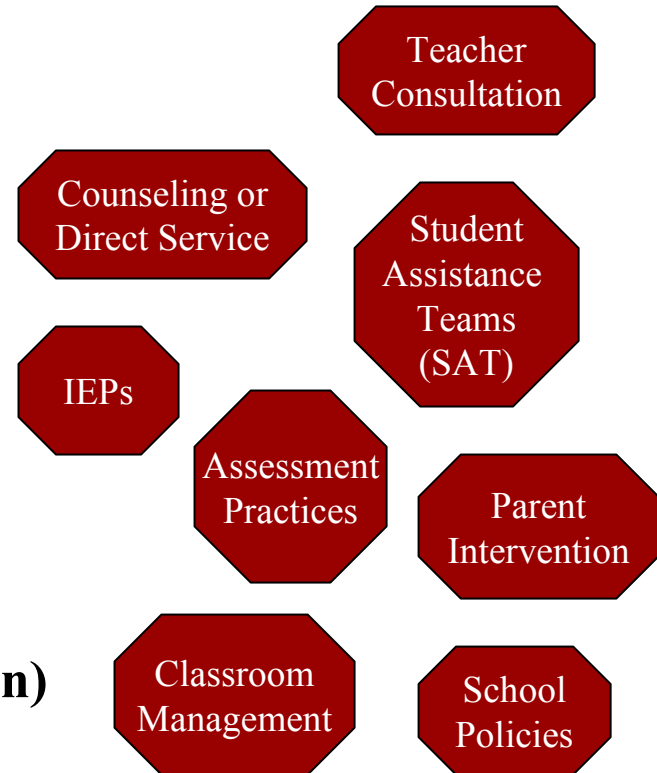
- **Based on natural actions**
- **Context dependent - practical**
- **Designed to improve practice**
- **Done in teams or individually**
- **Less theory-based**
- **Flexible iterative process**
- **Gain understanding and create change at the same time**
- **May focus on teaching or learning**
- **Systematic inquiry**



Why do Action Research?

[Value of Action Research]

- Investigate a problem of interest
- Professional development
- Classroom/school change
- Improved practice
- New learnings
- It's practical
- Collaborative
- Benefits
- Mini-experiment
- Self-change agent(s)
- Intervention effectiveness
- Accountability
- Ecological (systems orientation)
- Create own knowledge



Types of Action Research

- **Quantitative** [confirmation/disconfirmation]
- **Qualitative** [discovery]

**Child
Teachers
Principal
Parents
Classroom
School
Community**



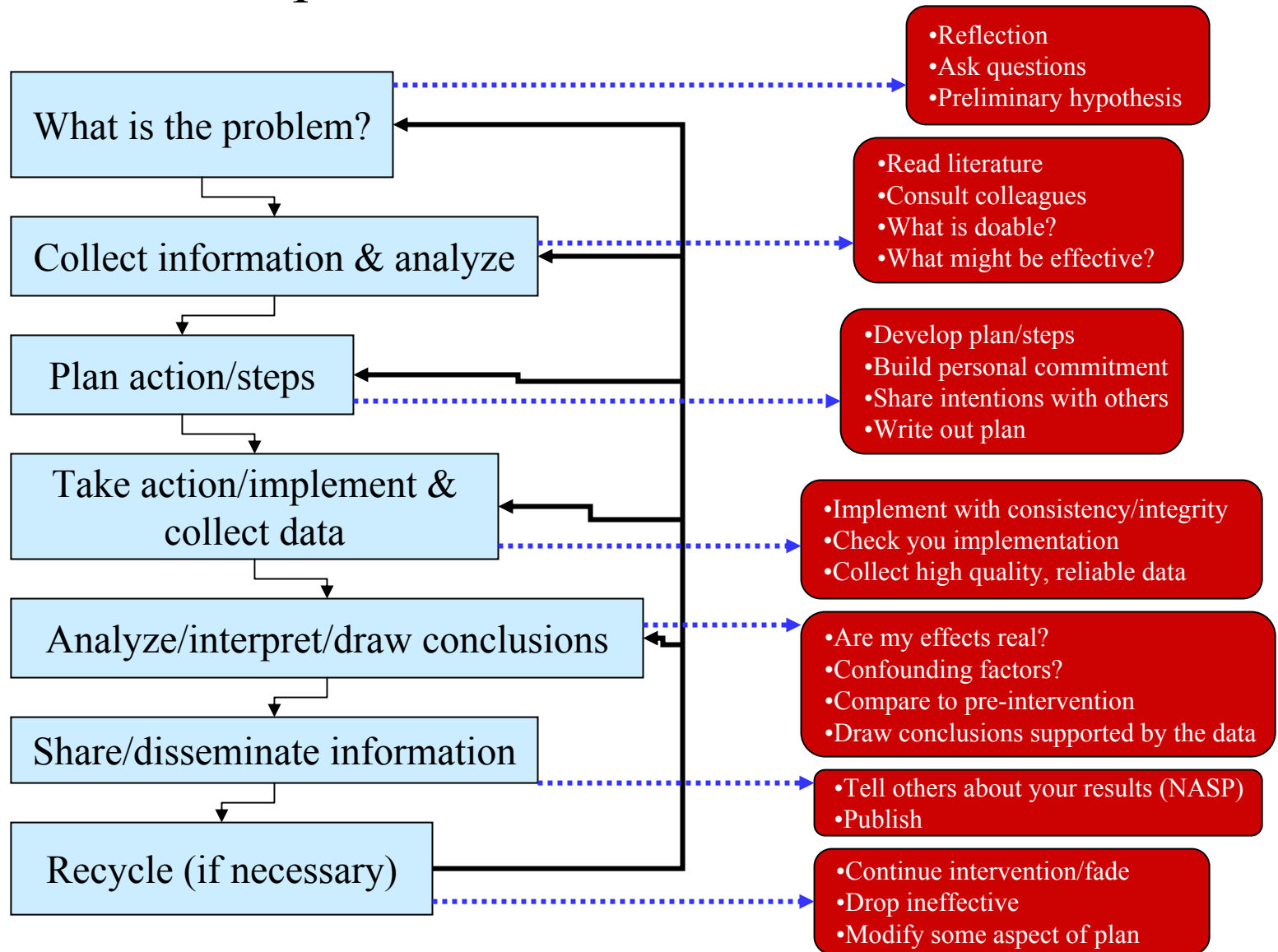
Research & Intervention Efficacy

TWO SIDES OF THE SAME COIN

Knowledge/Skills/Tools for Action Research

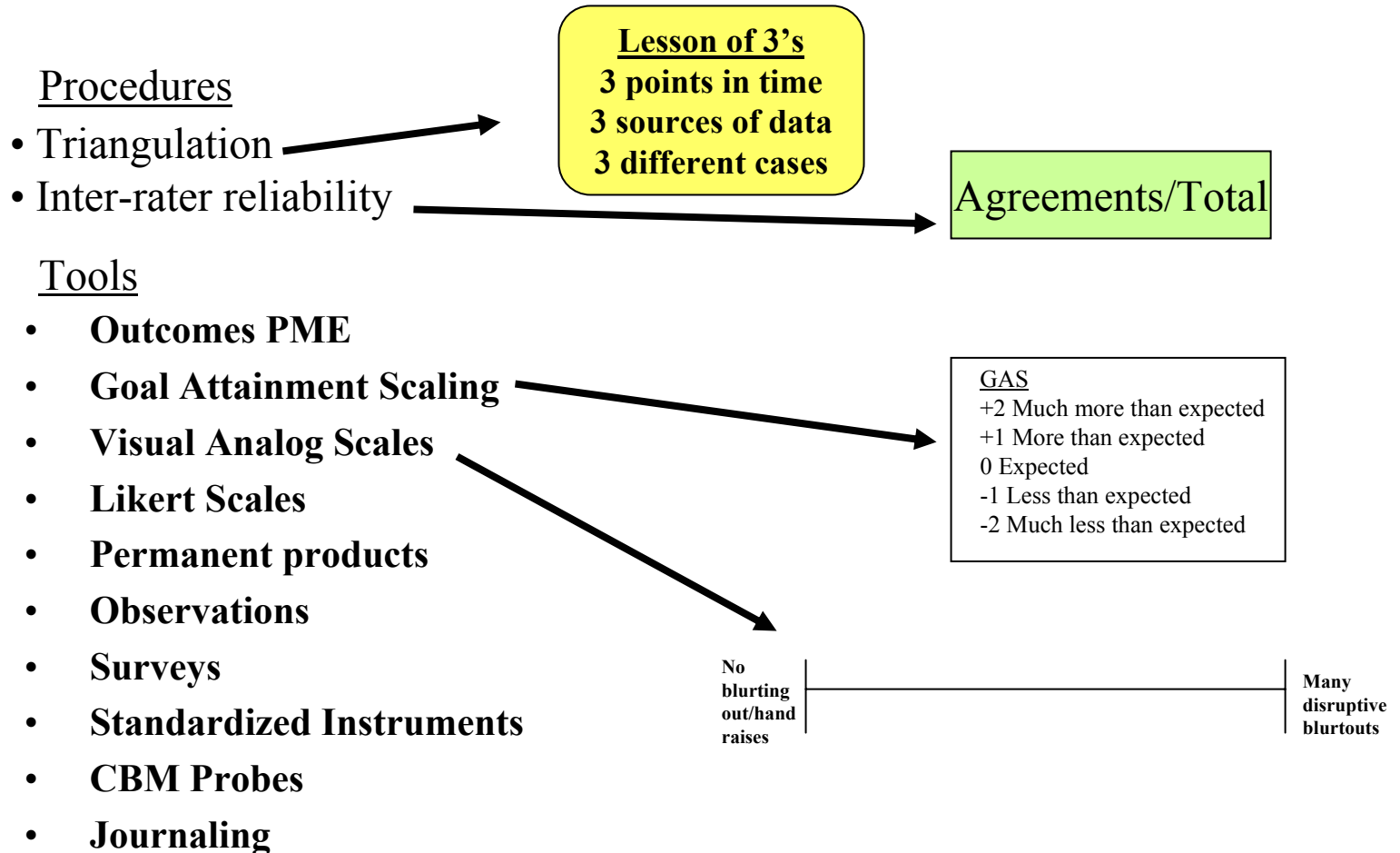
1. Designs [research/evaluation]
2. Intervention planning/implementation aids
3. Evaluation tools
4. Data analysis skills
5. Data maintenance & dissemination

Steps in Action Research



Evaluation in Action Research: Procedures & Tools

- Goal: *Increase confidence in the effects of research*





Intervention Integrity

Techniques designed to insure consistency of implementation.

- Acceptability of the intervention – [IRP-15 or TARS]

Methods

1. Describe the steps of the intervention
2. Model the steps (where appropriate)
3. Role play and reverse
4. Practice
5. Performance Feedback

Tools

1. Treatment steps checklist
2. Self-monitoring forms
3. Classroom cues
4. Interviews
5. Permanent products

Data Analysis

How do you document results?? Effectiveness??

- Pre-post mean differences (effect size) $\rightarrow \frac{\text{Mean 1} - \text{Mean 2}}{\text{SD of Mean 1}}$
- Visual analysis in single case (small-n) studies
- Correlational analysis
- Working theory (data saturation)

Building an Action Research Program and a Local Intervention Research Base (LIRB)

- Buy-in for “Action Research” – collaborative inquiry (team building)
- Skills needed
- Identify resources
- Literature resources and sharing
- Develop support for the research process
- Time for action research
- Summaries of research (local website)
- Training in action research (in-service)



Action Research: *Confirmation/Disconfirmation vs. Discovery*

Concepts & Examples

Confirmation/Disconfirmation

Small-N Designs

1. Advantages/disadvantages
2. Withdrawal designs
3. Multiple Baseline designs
4. Alternating Treatments designs

Discovery

Grounded Theory

1. Procedures
2. Sampling
3. Data collection
4. Data reduction
5. Activity/example



Designs

- *Single-Case (Small-N) Research Designs*
- *Qualitative Research Design*

Rationale for These Designs

- *Easier than large group studies.*
- *Consistent with practice needs.*
- *Relevant to school staff.*
- *Combines practice with research.*
- *High social validity*



Single-Case Experimental Studies; An Analysis

Classic experimental designs feature:

- Treatment and control group.
- Random assignment of subjects to groups.
- Control group receives no treatment by monitored on DV.
- Pretest posttest control group design.
- ROXO (experimental) and RO O (control)

Classic experimental designs control for threats to the validity of the study.

Disadvantages:

- 1. Withholds treatment from control group.**
- 2. Small sample size.**
- 3. Intact groups.**



Alternatives to Classic Random Assignment Control Group Design

Repeated Measures Designs - They feature:

- One sample of subjects.
- Repeated measurement of the DV.
- $OX^1OX^2OX^3O$

Advantages of Repeated Measures Designs

- More economical.
- Types of problems.
- Multiple observations.
- Reduces error due to individual differences.

Disadvantages of Repeated Measures Designs

- Experiments extend over time.
- Learning gained from pretesting.

Special Type Repeated Measures Design

→ *Single Case Experimental Designs*



Many Types of Single Case Experimental Designs

- Small-n Designs
- Uses 1 or few subjects to validate treatments
- Similar to repeated measures designs.
- Basic Types:
 - *Withdrawal designs*
 - A-B
 - A-B-A
 - **A-B-A-B**
 - B-A-B
 - A-B-C-B
 - *Multiple Baseline Designs*
 - Across behaviors
 - Across subjects
 - Across settings



Types of Single Case Experimental Designs (cont.)

- *Alternating Treatments Design*

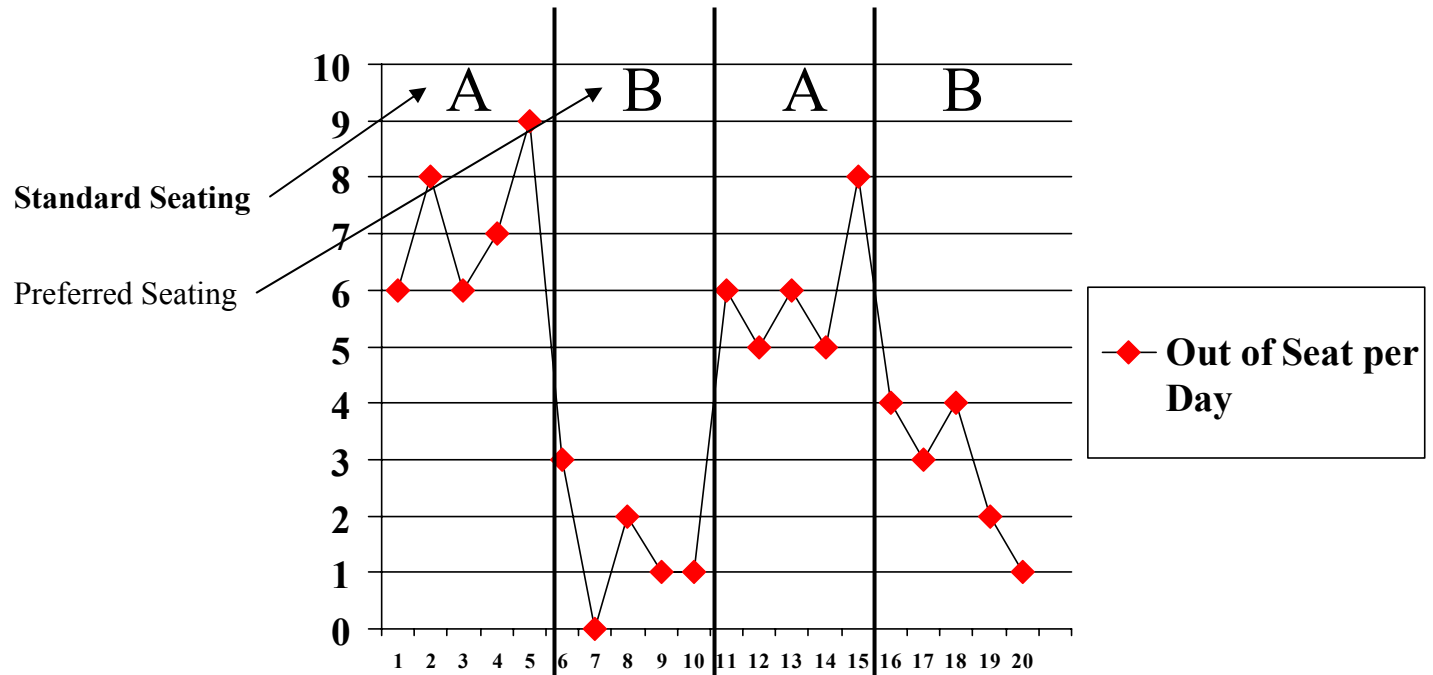
Focus on Three Types of Single Case Designs

- 1. A-B-A-B Withdrawal Design.*
- 2. Multiple Baseline Design*
- 3. Alternating Treatments Design*

A-B-A-B Design

Features/Advantages:

- Reversal design.
- Direct replication of effects.
- Shows causal effects with changes in level & trend.
- High certainty for treatment effect.
- Ends on treatment phase.
- Can be done in as little time as a month.





A-B-A-B Design (cont.)

Elements of an effective A-B-A-B design

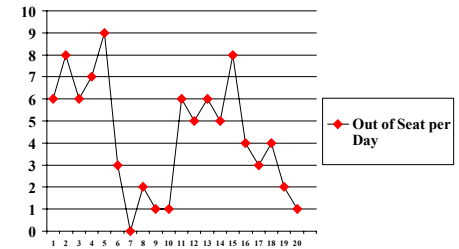
- **Make sure all parties understand/consent to be involved in study.**
- **Clearly define target behavior(s).**
- **Define settings in which behavior(s) occur.**
- **Practice/confirm inter-rater reliability for observations and check at least once per phase of study.**
- **Develop manual/protocol for intervention (steps).**
- **Collect data with another observer in each phase.**
- **Confirm baseline stability (5 days minimum).**
- **Collect continuous data over all study days.**
- **Train staff and introduce intervention (5 days minimum).**
- **Check for treatment integrity.**
- **Withdraw intervention (5 days minimum).**
- **Re-introduce intervention**
- **Follow-up in 2 weeks or month.**

A-B-A-B Design (cont.)

Data Analysis

1. Plot data (use Excel spreadsheet or SPSS)

Days	1	2	3	4
Yells	7	8	5	9

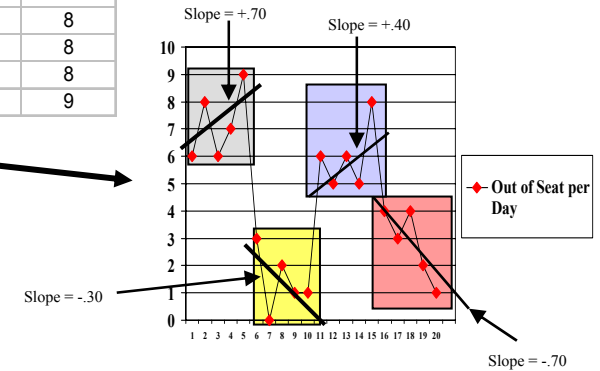


2. Check for auto-correlation in data.

Days	Yells	Lag 1
1	7	7
2	7	5
3	5	6
4	6	6
5	6	7
6	7	8
7	8	8
8	8	8
9	8	9

Durbin-Watson = 1.233

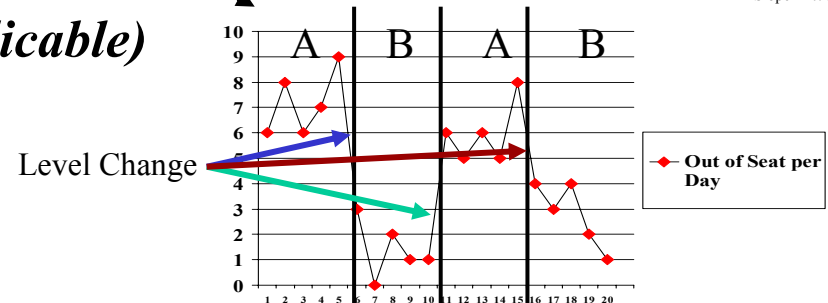
3. Compute slope by phase.



4. Check for data overlap by phase.

5. Check for level change by phase.

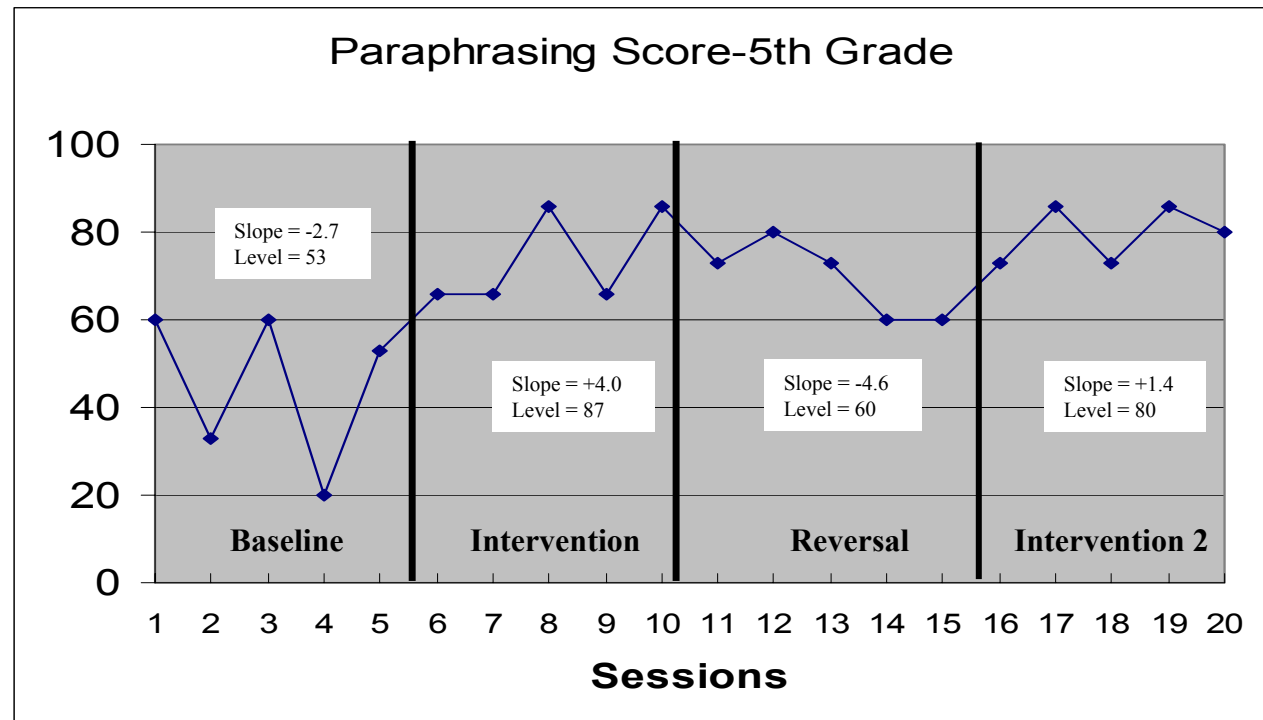
6. Use *t*-test or ANOVA (if applicable)



A-B-A-B Design (cont.)

Disadvantages:

- Not appropriate for behaviors/learning that cannot be reversed. However.....

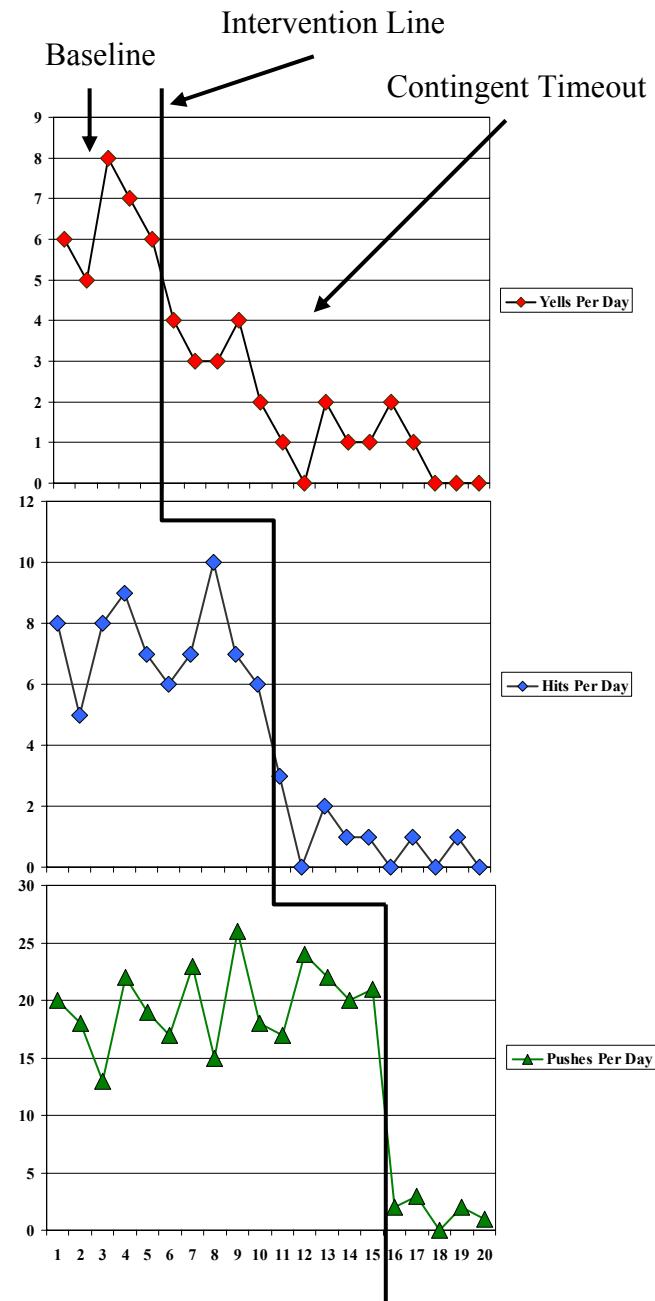


Multiple-Baseline Designs

- *Multiple but separate A-B designs.*
- *Assumption targeted behaviors are independent of one another.*
- *Evidence of causation for the intervention (independent variable) on the behavior (dependent variable) occurs in 2 ways.*

1. Level and/or trend changes across each A-B design (weak)

2. Rate change over untreated behaviors in other A-B segments (stronger).



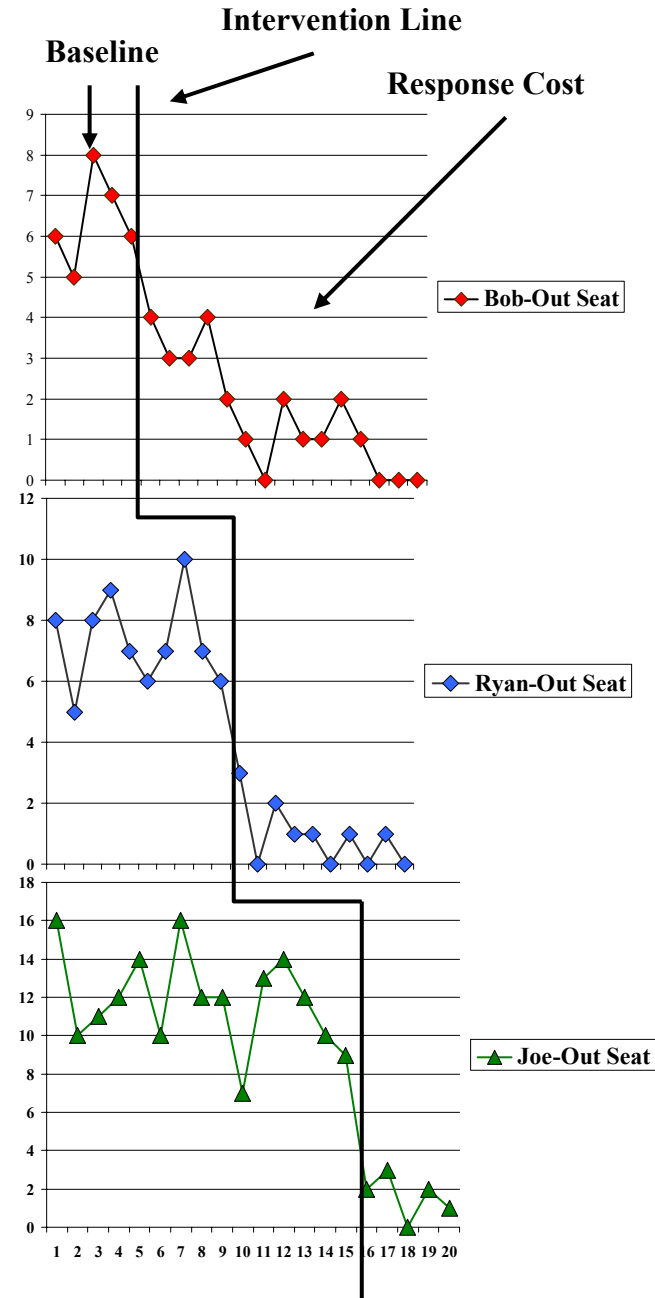
Multiple-Baseline Designs (cont.)

- *Weaker than a reversal design.*
- *3 or more replications is best.*
- *Multiple -baseline designs can be used:*

- 1. Across subjects.*
- 2. Across behaviors.*
- 3. Across settings.*

Advantages:

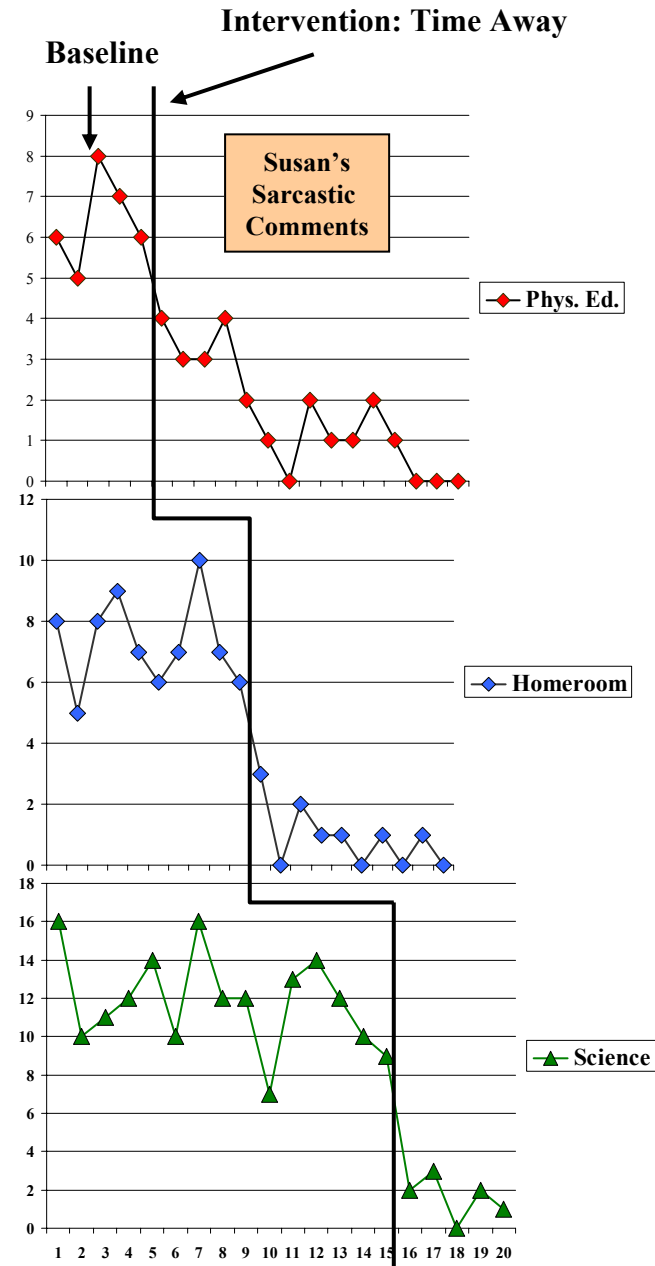
- *Ends on treatment phase.*
- *No withdrawal of effective intervention.*
- *Replications within the study.*
- *More naturalistic.*
- *Generalization across settings/students.*



Multiple-Baseline Designs (cont.)

Disadvantages:

- *Concurrent measurement of several baselines.*
- *Long baseline conditions.*
- *Ethical to continue long baselines?*



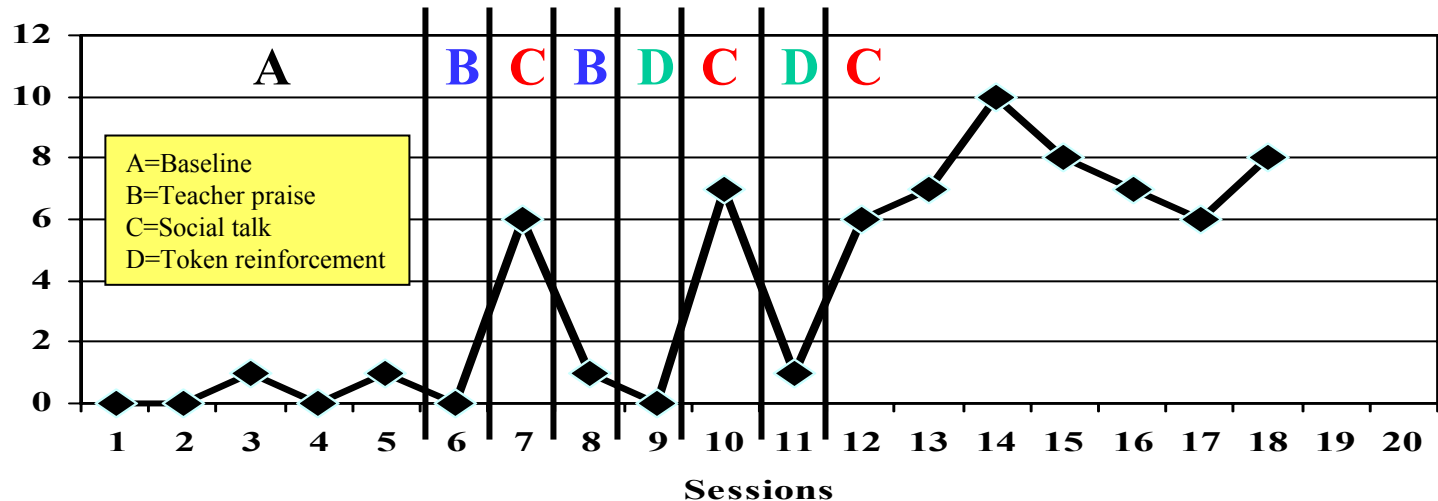
Alternating Treatments Design

Overview Below

Features and Advantages

- Good choice for FBA.
- Tests relative effectiveness of interventions.
- Clear discrimination should be part of treatment.
- Level rather than trend data is critical.
- Can produces results quickly.

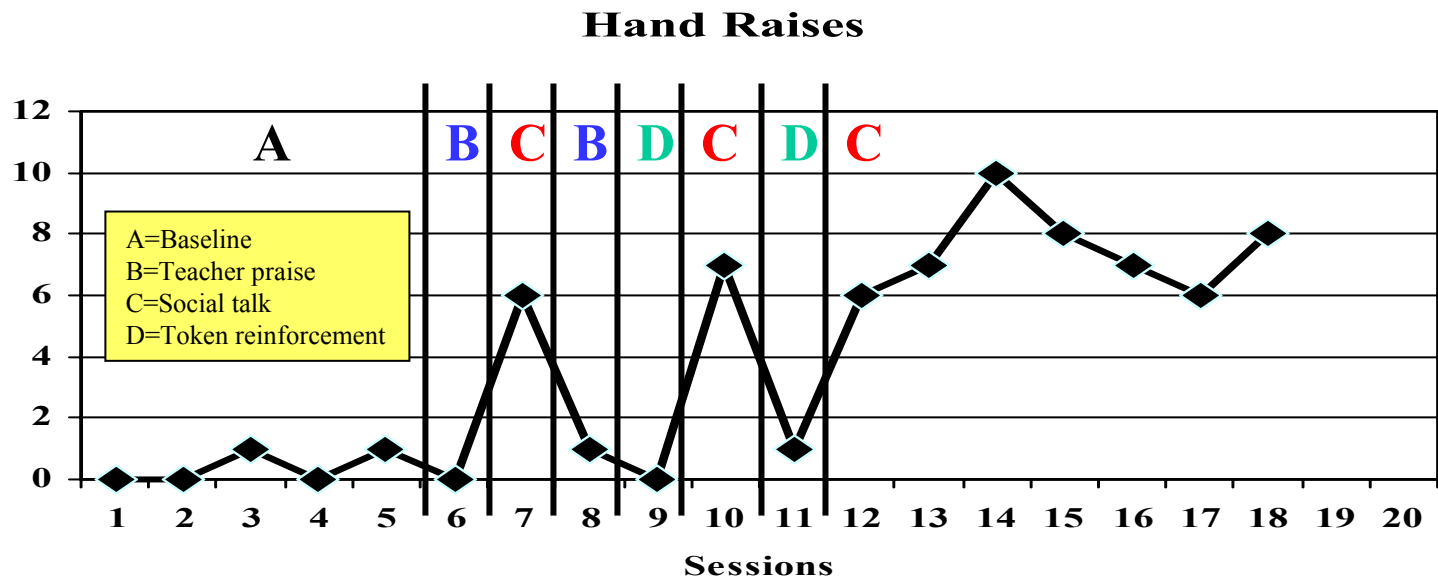
Hand Raises



Alternating Treatments Design (cont.)

Running an ATD Study and Data Analysis

- Determine order for alternating treatments (randomization?). Consider carry-over effect.
- Formal baseline not needed.
- Develop clear treatment procedures that allow the child to EASILY discriminate between conditions.
- Visual analysis of level changes.
- Continue on most effective intervention in last phase.





Qualitative and Quantitative Research

Qualitative Research

- Human behavior is always bound to the context in which it occurs.
- Employ an "insider's" perspective; this makes qualitative research an personal and subjective style of research.

Quantitative Research

- Strives for testable and confirmable theories that explain phenomena by showing how they are derived from theoretical assumptions.
- View social reality in the same manner as physical reality.
- Attempt to tightly control the variable in question to see how other variables are influenced.



Qualitative Research: Grounded Theory

- Special type of qualitative method.
- Definition -
 - **Theory** - A set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena. (Strauss & Corbin, p. 15).
 - **Grounded** - Set in, or derived from data.
 - **“Grounded Theory”** - A set of inter-related concepts (theory) derived from data that can be used to explain phenomena.
- Grounded Theory is about **“Discovery”**
- Theory is derived from systematically gathered data.
 - Interviews.
 - Observations.
 - Records
 - Documents



Qualitative Research: Grounded Theory (continued)

- Procedures include:
 - Data collection.
 - Data reduction.
 - Coding.
 - Elaborating.
 - Theoretical sampling.
 - Writing memos.
 - Conceptualizing.
 - Elaborating/relating.

Qualitative research (like all other research) begins with questions

1. How do SAT team members define effectiveness?
2. What factors make intervention ideas more or less acceptable for teachers in my buildings.
3. What factors contribute to decisions about retention?



Qualitative Research: Grounded Theory (continued)

Background/Literature Review

- Use literature to enhance sensitivity of concepts to be studied.
- Use literature as a initial source for developing questions or planning observations.
- Use literature as a secondary data source (code/note observations).
- Literature may suggest areas for sampling.
- Use literature to confirm findings or identify where the literature is incorrect.

Sampling

- Whom shall we ask? (collect data)
 - Teachers (which ones), administrators; parents; students.
- Theoretical sampling - “data gathering driven by concepts derived from the evolving theory...” (Strauss & Corbin, p. 201)



Qualitative Research: Grounded Theory (continued)

Modeling Data

- Memos - ideas about what may be happening in the data.
 - Can be used at any stage of the study.
 - Seek to compare data or codes.
 - Reflections or analytic thought.
 - Summary of data analytic sessions.
- Diagrams - visual the show how concepts relate to one another.

Qualitative Software

- Not necessary but helpful.
- InVivo (www.scolari.com)
- Atlas Ti (www.atlasti.de)



Qualitative Research: Grounded Theory (continued)

Data Collection

- Interviews (asking questions) the most frequently used approach.
 - Sensitizing questions.
 - Theoretical questions.
 - Practical and structural questions.
 - Guiding questions.
- Transcriptions (from tapes or from field notes)

Data Analysis

- Microanalysis - line-by-line analysis of data.
- Open coding - concepts and properties are identified in the data. Generates categories, properties and dimensions in the data.
- Axial coding - secondary analysis that seeks to relate to one another.
- Selective coding - integrating and refining theory.
- Additional data collection.
- Theoretical saturation - no new categories or properties emerge.

Coded Transcript

Q: Why do you attend the NASP Convention?

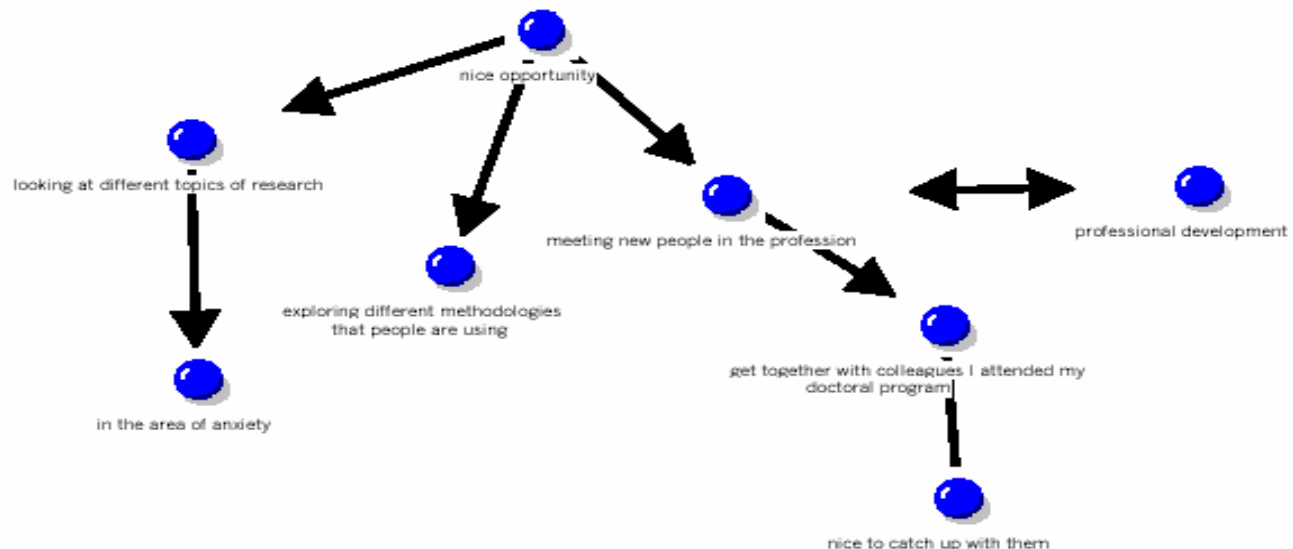
Fac: I attend the NASP conference for professional development. I am interested in exploring different methodologies that people are using, also in terms of looking at different topics of research interests typically in the area of anxiety. Also, it is a nice opportunity to get together with colleagues I attended my doctoral program with. So that is kind of nice to catch up with them as well as meeting new people in the profession.

] professional development
] exploring different methodologies th
] looking at different topics of resea
] in the area of anxiety
] nice opportunity
] get together with colleagues I atten
] nice to catch up with them
] meeting new people in the profession

Q: Any other reasons you can think of for attending the NASP conference?

Fac: That's pretty much it.

NASP Presentation Model





Grounded Theory Exercise

[Discovery]

- Ask the person if they are a:
 - Practitioner
 - Trainer
 - Student
 - Other

- Ask: Why do you attend the NASP convention?
 1. Write out answer.
 2. Ask if he she has anything to add.
 3. Do a line by line analysis.
 4. Underline initial categories
 5. Categories that suggest relationships.
 6. Draw a model.



School-Based Intervention Research - Field Research Checklist

Check

- Hypothesis related to practice.***
 - Operational definition of variables
 - Student/Classroom/Teachers and target behaviors to be studied (sampling rationale - FBA).
- Theory based research – identify studies***
- Gain interest/consent in study***
 - Develop a “Research Brief” – overview of study.
 - Interest teacher in study. Examine acceptability for classroom research.
 - Find a research partner (colleague).
 - Gain approval of principal.
 - Gain approval of district research committee.
 - Gain consent from parent/child assent.
- Plan detailed research methods.***
 - Create timeline.
 - Develop/identify data collection measures.
 - Develop treatment protocol (manual).
 - Prepare treatment integrity methods (i.e., checklists, procedures).

School-Based Intervention Research - Field Research Checklist (continued)

Implementation

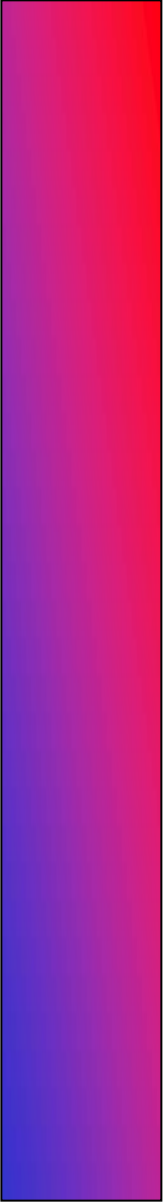
- Practice observing (with partner) using measures.
- Assess inter-rater reliability (for observational studies)
- Collect data (for single-case studies run inter-rater reliability regularly).
- Train teacher in intervention (use manual/protocol).
- Check for “treatment integrity” during intervention phases.
Check for NO treatment during “no treatment” phases.
- Check for follow-up maintenance of intervention 2, 4, 6 weeks later.

Data Preparation

- Single-case studies
 - Plot data on line chart(s).
 - Mark phases of study.
- Qualitative study
 - Transcribe interviews

Data Analysis

- Single-case studies
 - Check for overlap.
 - Check for level changes (critical for “alternating treatments” design)



School-Based Intervention Research - Field Research Checklist (continued)

- Check for slope by phase.
- Check for auto-correlation.
- Apply statistical analysis if possible.
- Qualitative (Grounded Theory) designs
 - Code data.
 - Compare data codes.
 - Link related findings.
 - Create model that describes evolving theory.
- Report Preparation***
 - Use APA Style Manual.
 - Prepare Title Page & Introduction (relevant literature).
 - Prepare Method and procedures section.
 - Prepare Results (Tables and Figures).
 - Write Discussion and related to literature review in Introduction.
 - References.
 - Write abstract last.
- Submit for presentation or publication.***
 - Does study match theme(s) of convention?
 - Does the study match other published articles in publication?