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What Works with Single Case Research in AAC

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Background

Single case designs (SCDs)

- Are also known as single-subject experimental designs
- Involve "repeated, systematic measurement of a dependent variable before, during, and after the active manipulation of an independent variable" (Kratochwill et al., 2010)
- Can provide strong experimental controls (Kratochwill et al.)

SCDs are used frequently in the AAC literature

- Allow for the study of heterogeneous populations (e.g., Richards et al., 1999)
- Are well-suited for intervention studies designed to provide early indications of efficacy (i.e., "Phase II research"; Robey, 2004)
- Can examine the process of skill acquisition, which can yield crucial information when developing new interventions (Robey)
- Provide flexibility; refinements can be made if necessary

SCD Design Standards

- Used for systematic reviews and meta-analyses; influence policy decisions
- Useful for improving the "reputation" of SCDs
- Various groups create SCD standards to evaluate empirical evidence:
 - Autism: Reichow et al. (2008)
 - Pediatric medicine: Logan et al. (2008)
- Design standards are different from "publishing standards"
- Publishing standards are devised for individual peer-reviewed journals

New SCD Design Standards: What Works Clearinghouse

- The Institute of Educational Sciences (IES), part of the U.S. Department of Education, recently published technical documentation on SCDs
- Will be used to evaluate IES research proposals

What Works Clearinghouse for SCDs

Design	Meets Standards	Meets Standard with Reservations
ABAB	Minimum of 4 phases per case with at least 5 data points per phase	Minimum of 4 phases per case with at least 3 data points per phase
Multiple Baseline	Minimum of 6 phases with at least 5 data points per phase	Minimum of 6 phases with at least 3 data points per phase
Alternating Treatment	5 repetitions of the alternating sequence	4 repetitions of the alternating sequence

General Criteria

- The independent variable must be systematically manipulated
- Each outcome variable must be measured systematically over time by more than one assessor
- Inter-assessor agreement must be collected for at least 20% of the data within each phase
- At least three attempts to demonstrate an intervention effect at three different points in time must be attempted

- Each phase must have a minimum of 3 data points (to meet standards with reservations) and 5 data points (to fully meet standards)

VISUAL ANALYSIS OF SCDs

Four Steps

Step 1: Documentation of a predictable baseline pattern

Step 2: Assessment of within-phase patterns

Step 3: Comparison of data from each phase with the data in the adjacent (or similar) phase to determine if:

- Manipulation of the IV has an associated effect

Step 4: Integration of all information from all phases of the study to determine if:

- There are at least 3 demonstrations of an effect at different points in time

Six Variables

Six features are used to assess effects:

1. Level
2. Trend
3. Variability
4. Immediacy of Effect
5. Overlap
6. Consistency of Data Patterns across Similar Phases

Applying the *What Works Clearinghouse* Standards to AAC Research

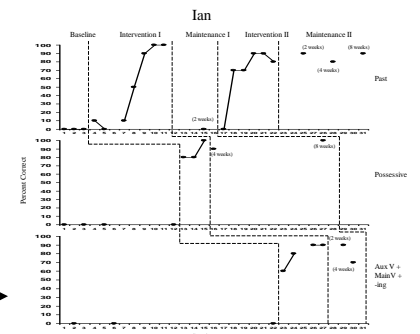
Overall, the standards can be effectively applied to AAC research, but there are a few areas of concern warranting additional consideration:

Concern #1: Minimum of 5 data points per phase

Baseline phase: This requirement often is impractical or even unethical

- Fatigue, boredom, participant mortality
- IRB: Max of 3 consecutive sessions with uncooperative behavior

This design¹ would not fully meet standards

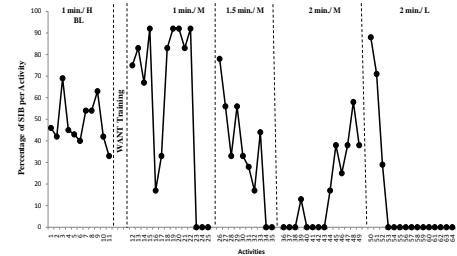


Concern #2: Little guidance for other designs such as changing criterion designs

Visual analysis guidelines cannot be uniformly applied; for example:

- Overlap is expected
- Some variability may be tolerated

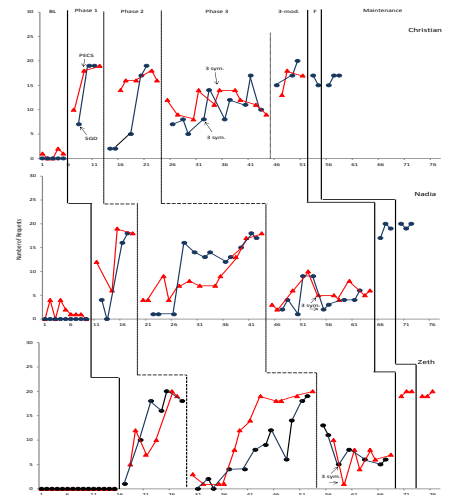
This design² would not fully meet standards



Concern #3: Little to no guidance for combined designs

E.g., ATD infused into MBD³

- Evaluate as ATD, MBD, or both?
- Number of data points in each phase is dictated by phase mastery criteria and may not meet standards



Concern #4:

Important AAC standards are not included

- Social validation (e.g., Schlosser, 1999)

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