ASHA Convention 2012, Atlanta, GA

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**

<table>
<thead>
<tr>
<th>Design</th>
<th>Meets Standards</th>
<th>Meets Standard with Reservations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABAB</td>
<td>Minimum of 4 phases per case with at least 5 data points per phase</td>
<td>Minimum of 4 phases per case with at least 3 data points per phase</td>
</tr>
<tr>
<td>Multiple Baseline</td>
<td>Minimum of 6 phases with at least 5 data points per phase</td>
<td>Minimum of 6 phases with at least 3 data points per phase</td>
</tr>
<tr>
<td>Alternating Treatment</td>
<td>5 repetitions of the alternating sequence</td>
<td>4 repetitions of the alternating sequence</td>
</tr>
</tbody>
</table>

**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 design\(^1\) 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 design\(^2\) would not fully meet standards

**Concern #3: Little to no guidance for combined designs**

E.g., ATD infused into MBD\(^3\)

- 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)
Acknowledgements

Many thanks to the National Center for Special Education Research, Institute for Education Sciences, for sponsoring the authors’ attendance and participation in the 2011 Summer Research Training Institute: Single-Case Intervention Design and Analysis

References


