

DESIGNING AND EVALUATING GROUPED AND CLUSTERED INTERVENTIONS WITHIN A SINGLE-CASE EXPERIMENTAL DESIGN FRAMEWORK

Background and rationale

Many psychological and educational interventions are delivered in group settings, where participants receive the intervention together (e.g., parent training groups aimed at improving parenting skills), or in clustered settings, where participants receive individual interventions within groups (e.g., reading interventions for students clustered in classrooms).

Applying Single-Case Experimental Design (SCED) methodology in these contexts raises important methodological challenges:

- In group-based interventions, all participants start the intervention simultaneously, complicating randomization and threatening internal validity.
- Interactions among group members violate the assumption of independent observations and reduce degrees of freedom.
- Group characteristics and events (e.g., size, intervention length) create systematic differences in power.
- Selection effects may cluster participants with specific attributes (e.g., proficiency level, emotional status), leading to systematic moderation of intervention effects.
- Groups may differ in instructor or therapist, resulting in differences in delivery and treatment fidelity.

At the same time, these characteristics may themselves be of substantive interest:

- How large are group-based differences in intervention effects?
- To what extent do instructor characteristics influence intervention effects?
- How do intervention dosage and group composition influence intervention effects?

Aim of the workshop

Provide information and tools on how to design and analyze grouped and clustered SCEDs that account for these challenges while preserving the strengths of the methodology.

The workshop consists of four interconnected parts:

1. **Introduction:** theoretical foundations, rationale, and research examples.
2. **Design:** methodological considerations, practical challenges, and potential solutions.
3. **Visual Analysis:** graphing and interpreting data.
4. **Quantitative Analysis:** from descriptive statistics to multilevel and Bayesian approaches.

We will not address possibilities and problems of combining different SCEDs in a meta-analytic context.

Expected outcome

Participants will recognize challenges associated with grouped and clustered SCEDs and can solve most of these issues independently.

Format: this interactive workshop will include hands-on exercises using real or simulated data.

Target audience and level: Researchers, clinicians and students who want to learn how to design and analyze grouped and clustered SCEDs. The workshop is intended for beginners in grouped and clustered SCEDs, but participants should have basic knowledge of SCED. Familiarity with R and RStudio is preferred, and both programs should be installed beforehand. Preparatory materials will be provided for participants with limited R experience.

Preference: full day workshop

Maximum number of participants: approximately 30. Two PhD students are willing to assist.

Conflict of Interest: The authors declare no conflict of interest.