BCBA® CHEAT SHEET · EXPERIMENTAL DESIGN · D.4, D.7, D.2

Single-case experimental designs at a glance

Every design answers one question: did the independent variable, and not something else, change the behavior?

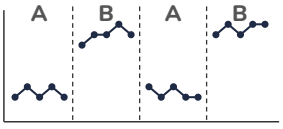
Baseline logic: the job each phase does D.4

Prediction. Steady baseline data show where the data path would go if nothing changed.

Verification. Showing the baseline level would have continued: a return to baseline in a reversal, or untreated tiers staying flat in a multiple baseline.

Replication. The effect appears again: reinstating treatment, or the next tier changing once treatment reaches it.

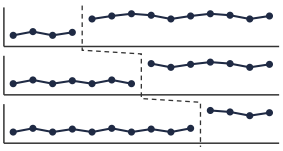
The four designs D.7



Reversal (A-B-A-B)

Baseline, intervention, withdraw it, then reinstate it. Many authors call this version a withdrawal design.

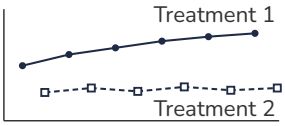
Control The return to A verifies; the second B replicates.
Choose it for Behavior likely to reverse, and safe to let return.
Watch for Withdrawing treatment can be unethical for harmful behavior, and learned skills may not reverse.



Multiple baseline (across behaviors, settings or participants)

Baselines run at the same time on two or more tiers; the intervention starts on one tier at a time, staggered.

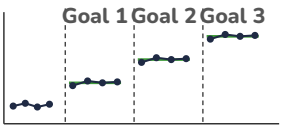
Control Untreated tiers staying flat verifies; each tier changing only when treated replicates.
Choose it for Skills that will not unlearn, and behavior you would not want to bring back. Nothing is withdrawn.
Watch for Tiers must be similar but independent. One tier on its own is only an A-B comparison.



Multielement (alternating treatments)

Two or more conditions alternate rapidly, often session by session in a counterbalanced or random order, each paired with a distinct stimulus.

Control Differentiation: the data paths separate and stay separated.
Choose it for Comparing treatments quickly. No baseline phase or withdrawal needed; functional analyses use this logic.
Watch for Multiple-treatment interference: an effect under alternation may not match the effect alone.



Changing criterion

After baseline, a performance criterion changes in steps, such as 2, then 3, then 4 cups of water a day.

Control Behavior shifts to match each new criterion and stays there.
Choose it for Behavior the learner can already do, to increase or decrease gradually.
Watch for Strengthen it by varying phase length and step size, or briefly returning to an earlier criterion.

Exam traps

Verification or replication? Verification checks the baseline prediction; replication repeats the intervention's effect.

A failed reversal is not replication. If the level holds after withdrawal, the prediction is unverified: it could be irreversibility or another variable, so experimental control is not shown.

"Single-case" is not one participant. What defines it is the within-person comparison.

An A-B design is not proof. Without verification and replication, history and maturation remain possible.

IOA is not replication. IOA checks the measurement; replication concerns the effect.

Name it in four questions

- Is anything **withdrawn**? Reversal.
- Is anything **staggered** across tiers? Multiple baseline.
- Are conditions **alternating quickly**? Multielement.
- Is a **goal changing in steps**? Changing criterion.

Validity D.2

- **Internal:** could something else explain the results?
- **External:** do the results apply to new people, settings or implementers?
- **Direct replication** repeats the same procedures; **systematic replication** changes them on purpose to test generality.

Read the free lesson

D.7 Reversal, multiple-baseline, multielement, and changing-criterion designs

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