

O Effect, Effect! Wherefore art thou Effect?



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Problem

There is an ongoing discussion about the position of statistics in the analysis of single-case data, going back to the foundational work of Skinner and Sidman.

Proposal

Meta-statistical considerations in the discussion of single-case data analysis are needed more than the development and statistical evaluation of new statistical techniques.

Points for Discussion

- Statement 1: There is a fundamental distinction between descriptive and inferential statistics.
- Statement 2: This distinction is important for all applied data-analysis, and therefore also for the analysis of single-case data.
- Statement 3: Visual analysis and quantitative summary measures (e.g., “effect” size indicators) are part of the field of descriptive statistics.

Points for Discussion (cont.)

- Statement 4: Descriptive statistics are not meant for going beyond the observed data.
- Statement 5: You cannot see the effect; you can only *infer* the effect. You can see a *difference* or a *relation* (not the effect itself) and you can infer the effect from what you see, what you know, and what you assume.
- Statement 6: Inferential statistics can assist in inferring the effect (e.g., causal inference based on a randomization argument) but are not always needed or appropriate.
- Statement 7: A three-step procedure for the analysis of single-case data is recommended with (1) visual analysis, (2) quantification of the differences and relations, and (3) using these quantifications as estimators or test statistics in a well-defined random sampling or random assignment model. Not all three steps are needed for all single-case data analysis problems, but no step should be skipped. This implies three scenarios: scenario 1, scenario 1+2, and scenario 1+2+3.