Different ways to analyse RCTs

i.e., 2X2 within-between experiments

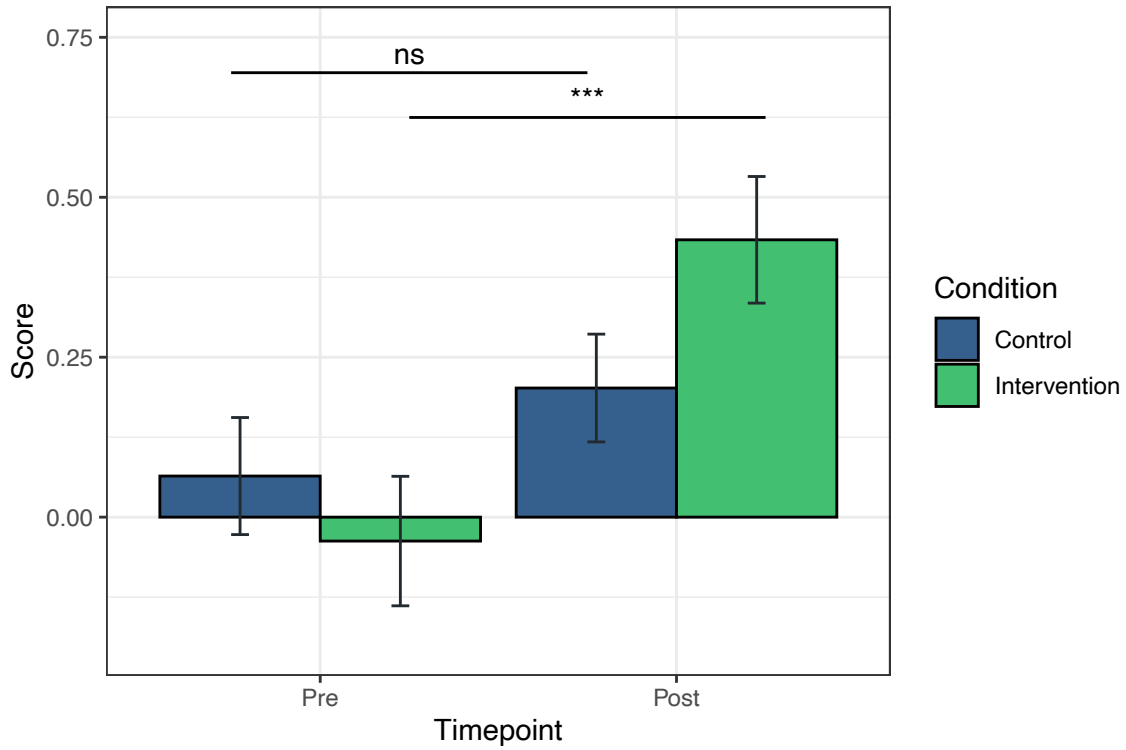
Scenario

In each of the below scenarios, a Randomized Controlled Trial studied the effect of a psychotherapeutic intervention (vs. control) on a self-report measure of well-being.

Participants were randomized to either the control or intervention group. They completed the measure of well-being before completing the intervention (timepoint 'pre') and after it (timepoint 'post').

Analytic strategy 1

- A dependent *t*-test was used to compare scores between pre and post in the intervention group. Significant results were found ($p < .001$).
- A dependent *t*-test was used to compare scores between pre and post in the control group. Non-significant results were found ($p >= .05$).

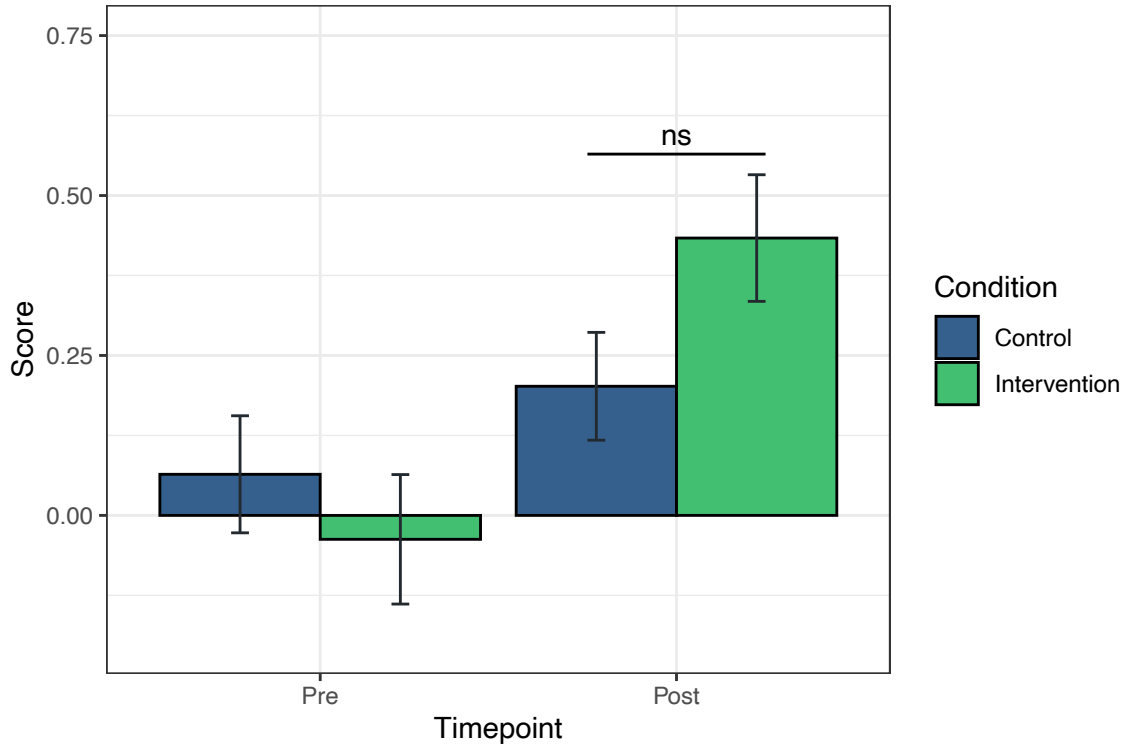


Question

- Given these results, what should we conclude about the efficacy of the intervention for well-being?

Analytic strategy 2

- An independent *t*-test was used to compare scores between the control and intervention groups at the post intervention timepoint. Non-significant results were found (p >= .05).

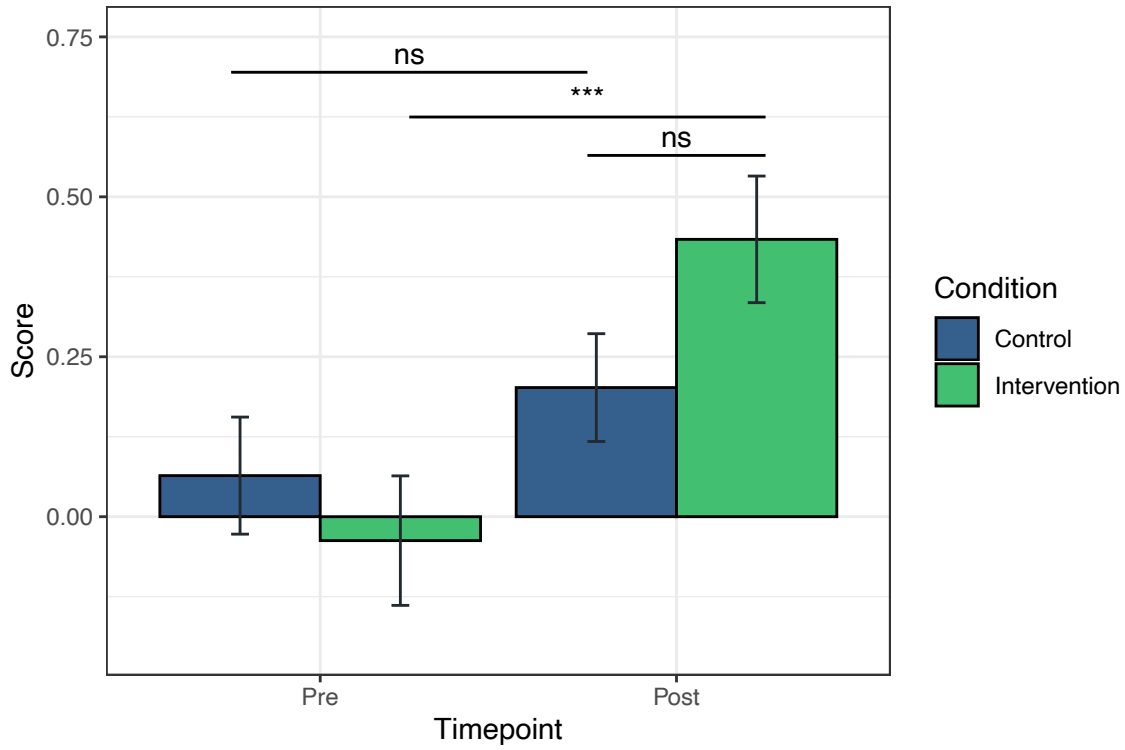


Question

- Given these results, what should we conclude about the efficacy of the intervention for well-being?

Analytic strategy 3

- A dependent *t*-test was used to compare scores between pre and post in the intervention group. Significant results were found ($p < .001$).
- A dependent *t*-test was used to compare scores between pre and post in the control group. Non-significant results were found ($p >= .05$).
- An independent *t*-test was used to compare scores between the control and intervention groups in the post intervention timepoint. Non-significant results were found ($p >= .05$).

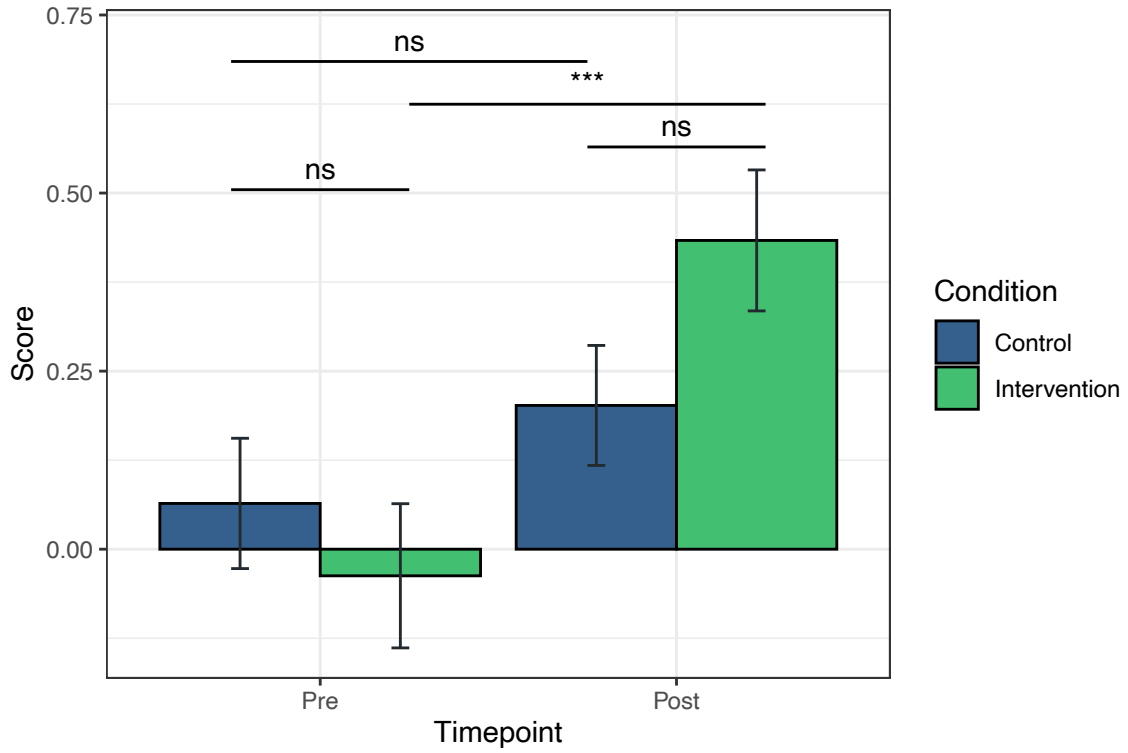


Question

- Given these results, what should we conclude about the efficacy of the intervention for well-being?

Analytic strategy 4

- A dependent *t*-test was used to compare scores between pre and post in the intervention group. Significant results were found ($p < .001$).
- A dependent *t*-test was used to compare scores between pre and post in the control group. Non-significant results were found ($p >= .05$).
- An independent *t*-test was used to compare scores between the control and intervention groups in the post intervention timepoint. Non-significant results were found ($p >= .05$).
- An independent *t*-test was used to compare scores between the control and intervention groups in the pre intervention timepoint. Non-significant results were found ($p >= .05$).



Question

- Given these results, what should we conclude about the efficacy of the intervention for well-being?

General questions

- In analytic strategy 4 where all four tests are run, are any of the tests redundant to answering the primary research question of 'is the intervention effective?'
- What other ways are there of analyzing these data? What are the pros and cons of each of them?
- What are the inappropriate ways of analyzing these scores, and why?
- Which is the most appropriate way of analyzing these scores, and why?