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?