



Comparative inferences

From two samples to two populations

- Today: decide whether two groups really differ, using random samples from each.

Two year groups, reading minutes

- Year A sample mean: 25. Year B sample mean: 32.
- Gap: 7 minutes.

Turn & talk: does Year B read more? How sure are you?

Samples always differ. Even from the same group.

- SP-02 showed five samples of one group giving five different answers.
- So a gap between two sample means is expected, not surprising.

Is the gap bigger than the wobble?

- $\text{MAD } 1.6 \rightarrow 7 \div 1.6 = 4.4 \text{ MADs}$. Far beyond ordinary variation.
- $\text{MAD } 8 \rightarrow 7 \div 8 = 0.9 \text{ MADs}$. Well inside it.

Same gap of 7. Opposite conclusions.

A rough guide

- Under 1 MAD $\rightarrow$ the data supports no claim.
- Above 2 MADs $\rightarrow$ supports a real population difference.

Your turn

- Means 14 and 18, MAD 1.2. How many MADs? What can you conclude?
- Thumbs up when you have both.

Say it precisely

- “The data does not show a difference” $\neq$ “There is no difference.”
- Failing to detect something is not proving it absent.

And a conclusion about 10 students is not a conclusion about 2 year groups.

Now you

- → In-class practice sheet