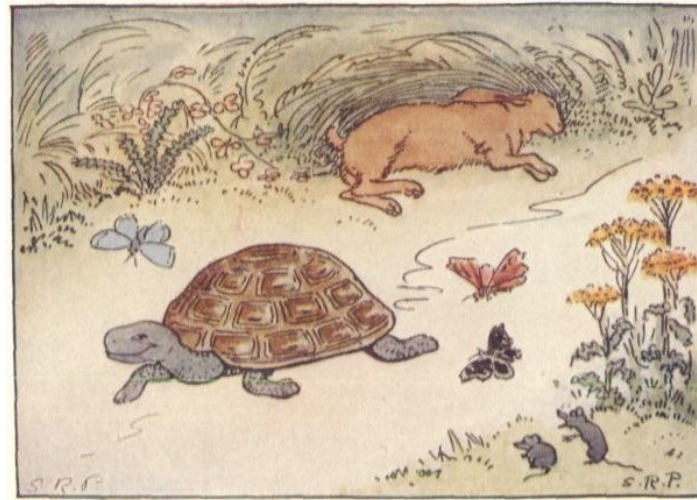


Data games

Andy Wills

Animal racing!



THE TORTOISE AND THE HARE

Question

Is any number on one dice more likely than any other?



Distribution on a single dice

1 : |||||

2 : |||||

3 : |||||

4 : |||||

5 : |||||

6 : |||||

Does the animal racing distribution look like this?

Why / why not?

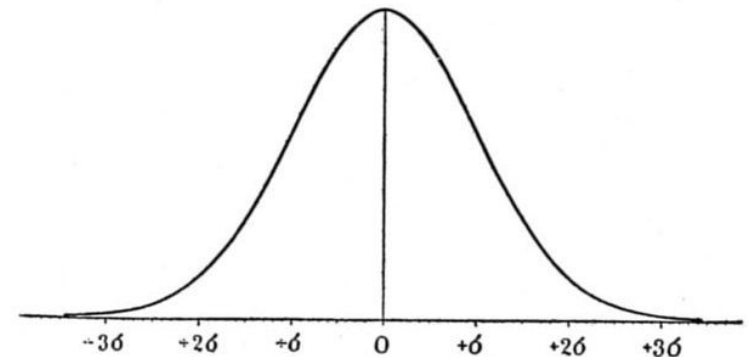
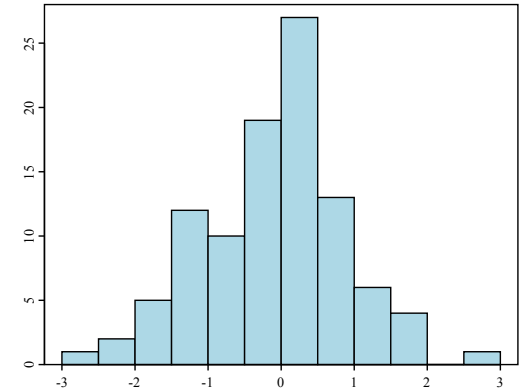


Central Limit Theorem

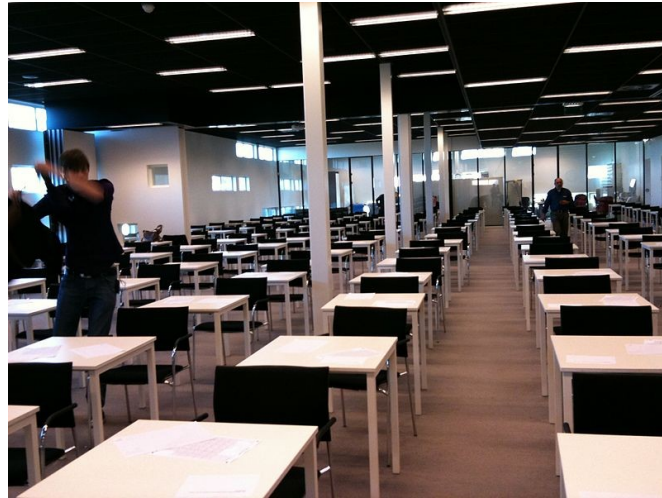
If a total score is the sum of a bunch of different scores, it will have approximately the same distribution **whatever the distribution of the individual scores.**

A theorem, not a theory.

Known as a *normal* or *Gaussian* distribution.



Exam hall bingo!



The Results

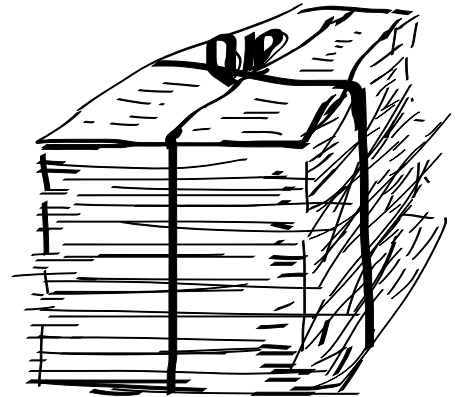
To be revealed in class...

- What each group decided, and how long they took.
- Which team (red or blue) is actually smarter.
- How big the difference between the two teams really is.



Sample sizes

- This game is much like a psychology experiment:
 - You collect some data about two groups.
 - You collect enough of it to be confident that you know whether the groups differ.
- Looking back, how soon do you think you should have stopped?
- To be revealed in class...
 - What the minimum sample size a psychologist should accept for these two groups is.
- To be revealed next **year**:
 - How I worked out the minimum sample size.

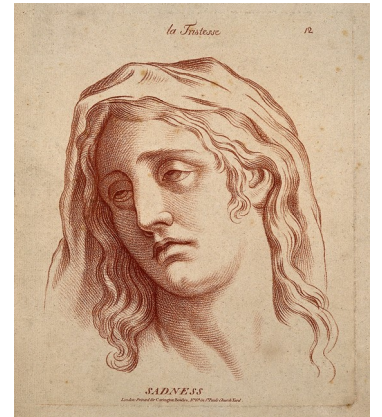


Praise and punishment

10 min activity



- What improves performance more:
 - Praising people when they do well?
 - Criticising them when they do badly?



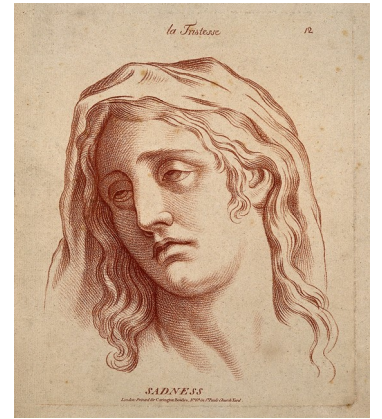
https://upload.wikimedia.org/wikipedia/commons/9/94/A_woman_whose_face_expresses_sadness._Etching_in_the_crayon_Wellcome_V0009337.jpg

https://commons.wikimedia.org/wiki/File:Happy_face_ball_crop.jpg

Praise and criticism



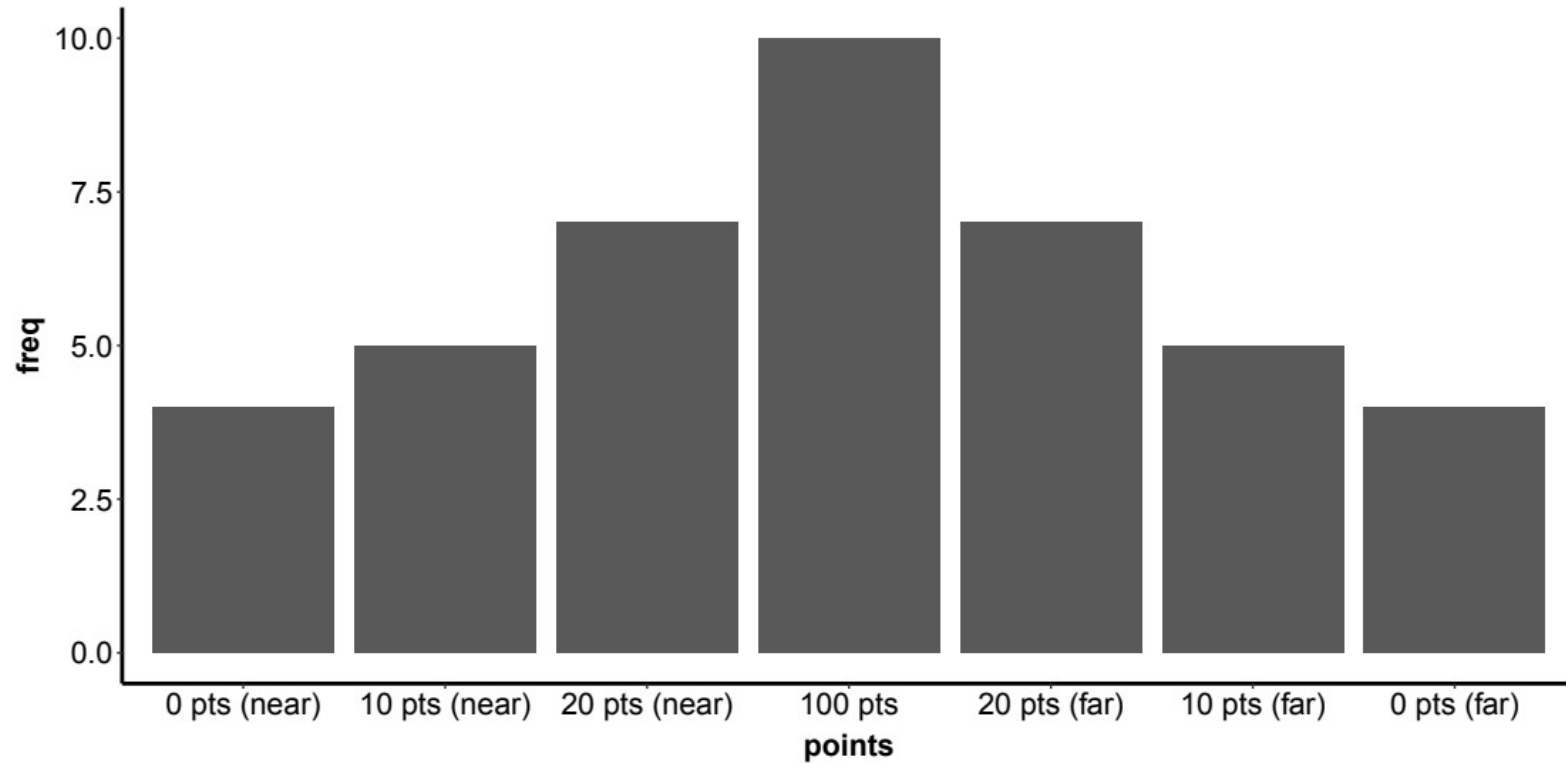
- When you praised the player, what tended to happen?
- When you criticised the player, what tended to happen?
- What does this tell us about praise versus criticism?



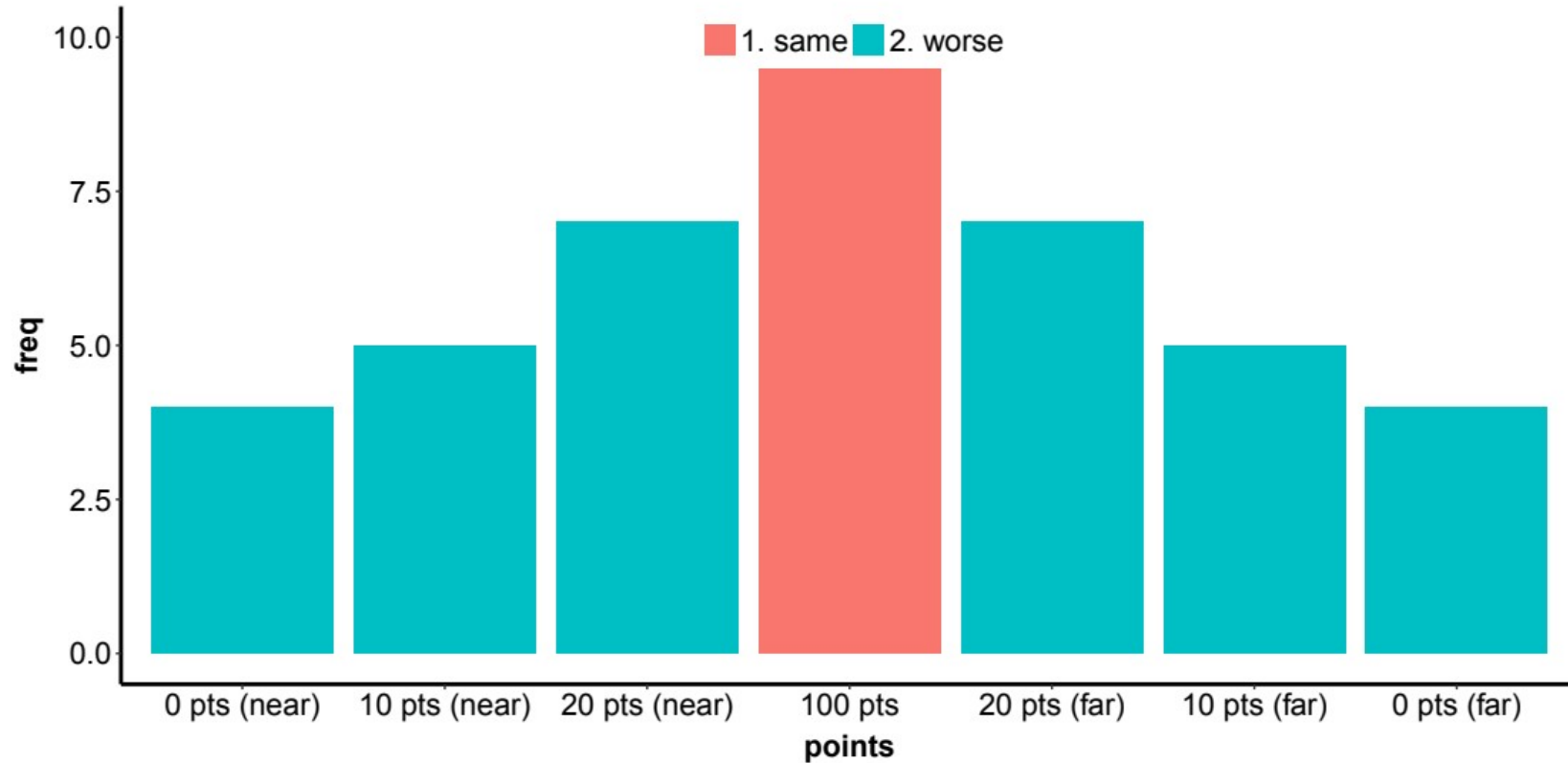
A secret is revealed...

...come to class to find out what it is!

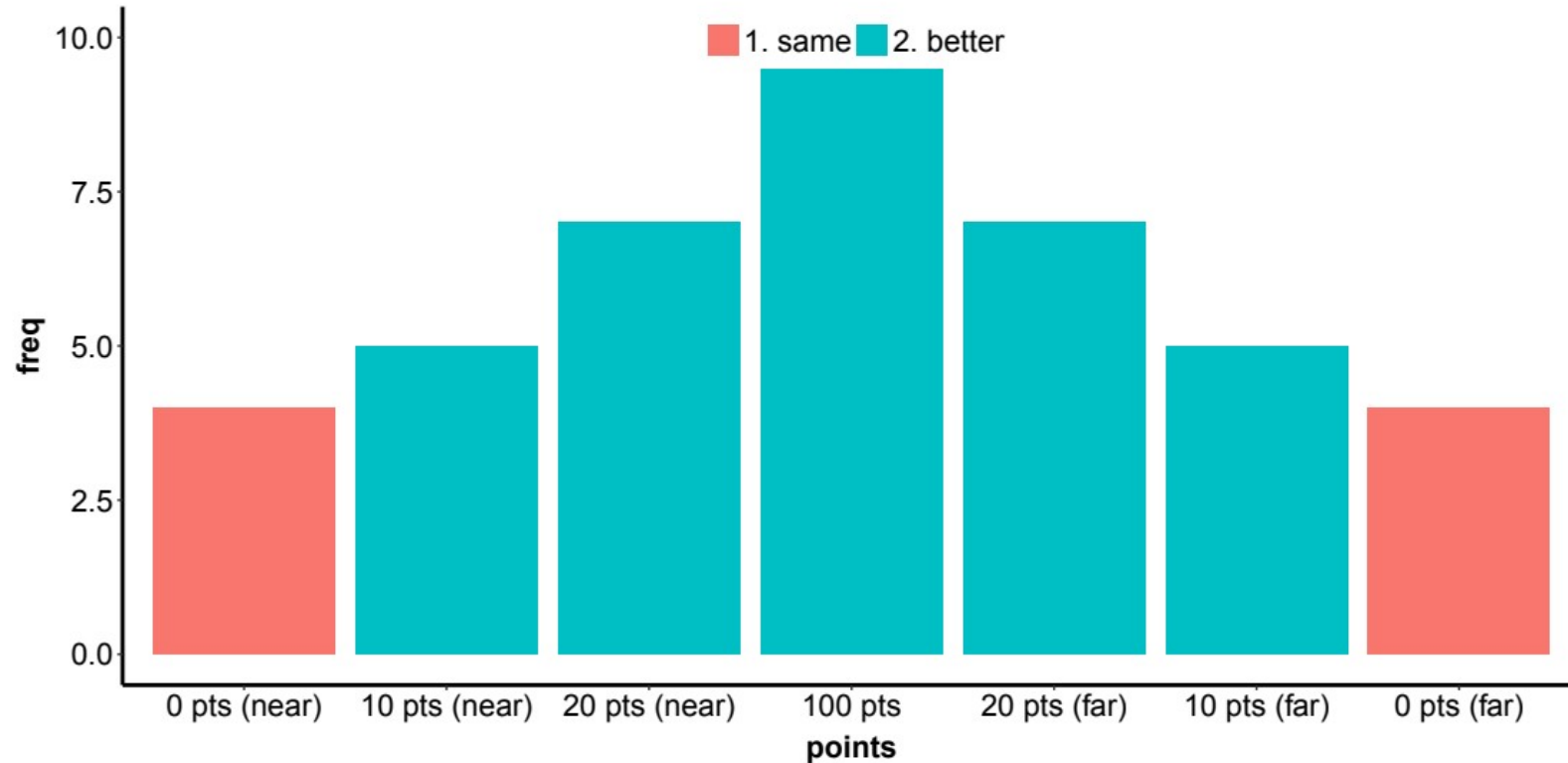
Distribution of scores



When you praise...



When you criticise...



Regression to the mean

Other areas it (may) apply to:

- OFSTED school inspections
- Remedial classes
- Evidence for unconscious learning
- “Difficult” second film / second novel.

Groups and behaviours



Spoiler alert!

**DON'T LOOK AT THE LAST
SLIDE UNTIL AFTER YOU
HAVE ANSWERED THE
QUESTIONNAIRE !!!**

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The same information in a table...

	Group A	Group B
Desirable	18	9
Undesirable	8	4

$$18 : 8 = 9 : 4$$