Tute Week 7
PSYC3122

Results Practical

Data analysis & write-up

Today's plans

- Feedback on participation mark
- Reminders / Intro to correlations & beta coefficients
- Data analysis
- Write-up of Results section

Warning: Don't panic about the stats if you've not done them before – it's quite easy when you take it one step @ a time.

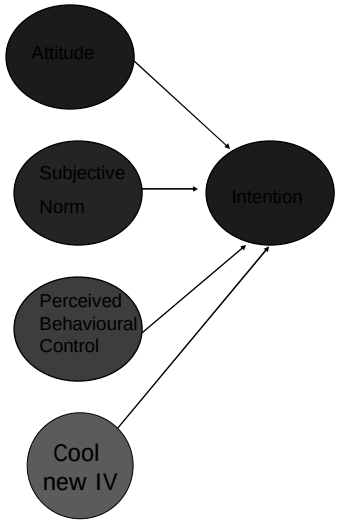
Participation – The marking criteria

- 4.5-5: Consistently creative and insightful contribution to discussion in terms of questions asked and willingness to chime in to help others and to discuss ideas. Demonstrated understanding of the material.
- 4.0: Significant contribution to discussion. Occasional creativity or insight, and consistent willingness to ask questions and address discussion points. Demonstrated understanding of the material.
- 3.5: Satisfactory contribution to discussion. May not show creativity or insight, but usually willing to ask questions and address discussion points. Understanding of the material most of the time.
- 2.5-3: Inconsistent contribution to discussion. Occasional willingness to ask questions, or address discussion points. Occasional evidence of understanding of the material.
- Less than 2.5: Little contribution to discussion. Very little willingness to ask questions, address discussion points, or evidence of understanding of the material.

Structure of Analyses

- Preliminary data screening
- Preliminary analyses of M, SD, inter-correlations using correlation command
- Then test relationship of core TPB vars + new IV to intentions using multiple regression (hypotheses 1-4)

Reminder: Your study's design:



Your hypotheses

- Hypothesis 1: The more positive someone's attitude to the behaviour, the more likely to intend to act
- Hypothesis 2: The more positive the subjective norm for the behaviour, the more likely to intend to act
- Hypothesis 3: The more positive the perceived control for the behaviour, the more likely to intend to act
- Hypothesis 4: The [higher or lower] the level of [your IV], the more likely to intend to act

- How can you tell if that's true, given a big set of #s?

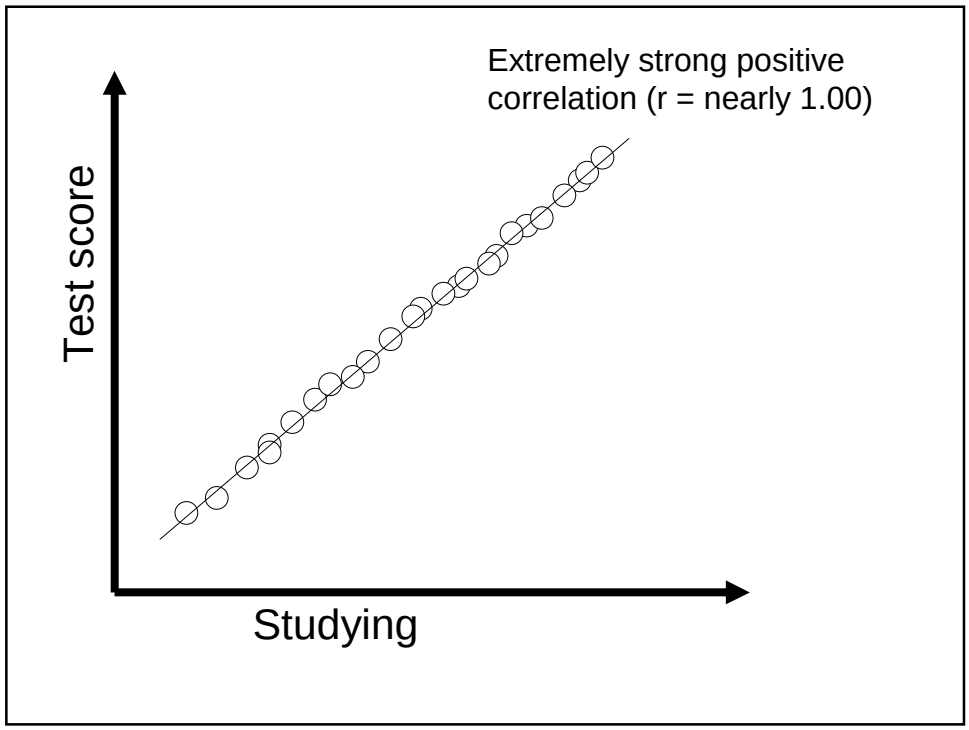
Looking at #s visually?

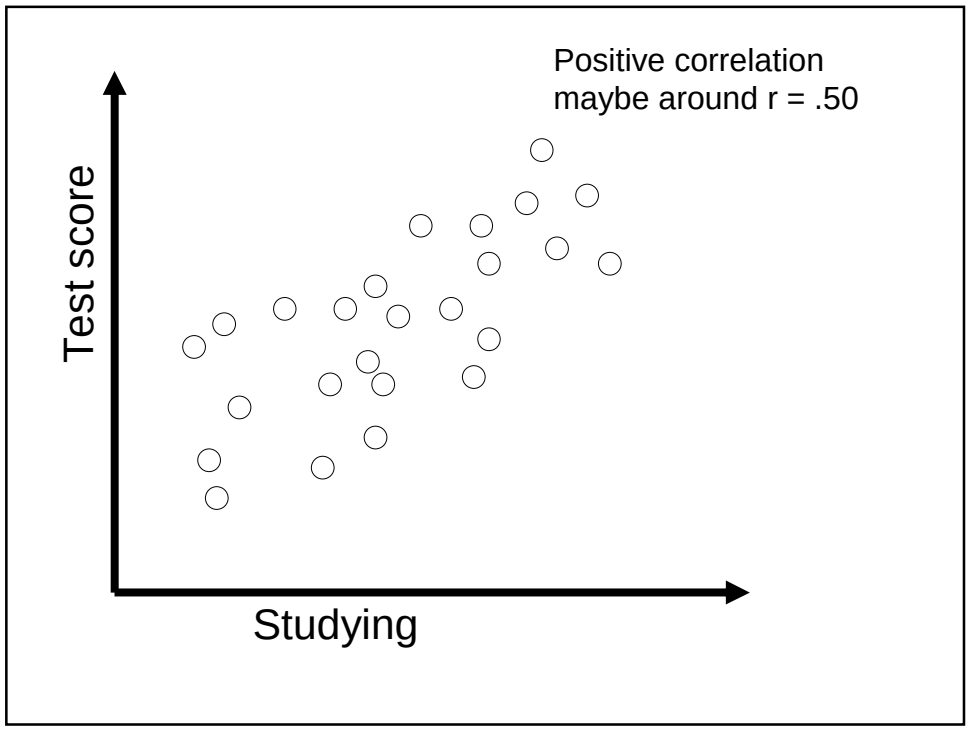
- Too hard.
- Too unreliable.

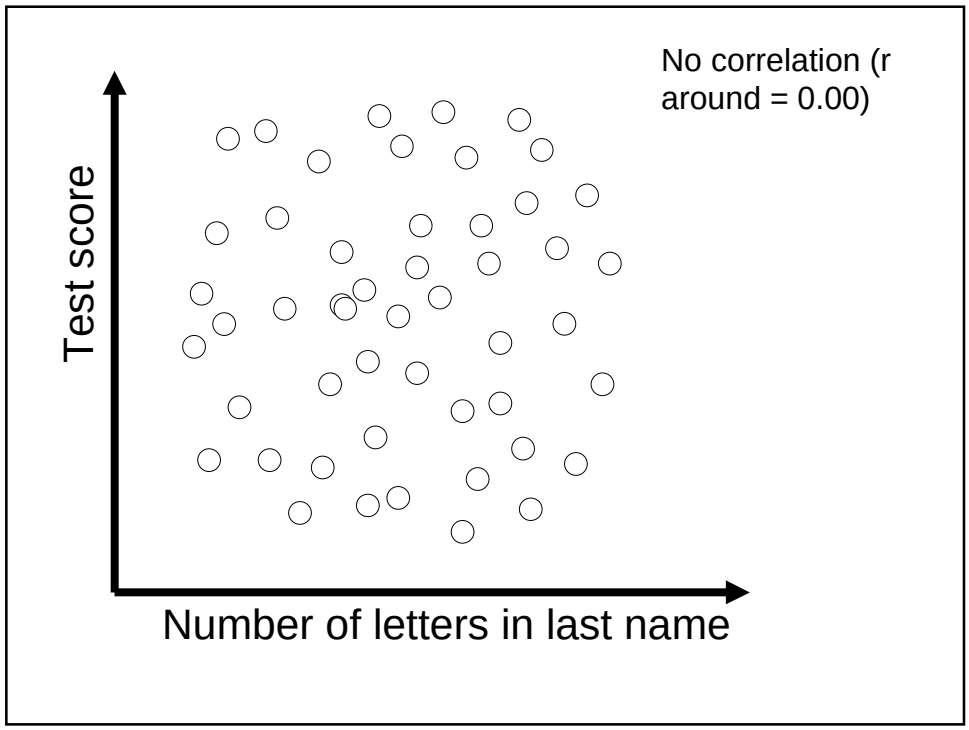
IV1	IV2	DV
3	6	7
5	1	2
5	5	4
3	2	4
...		

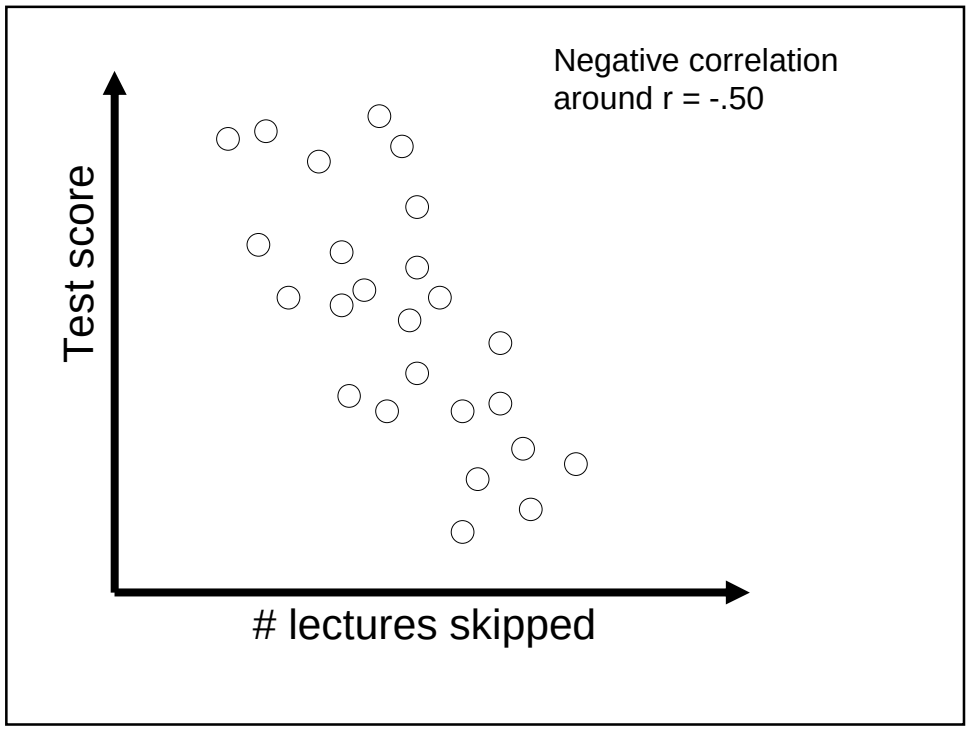
Reminder / Intro: Correlations (r)

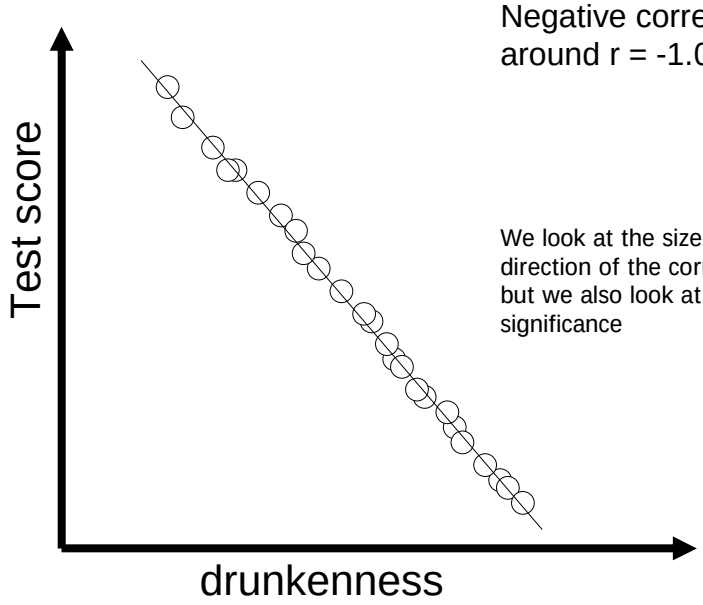
- Use statistics to describe relationship
- Correlations range from -1 to +1 and measure the relationship between two variables
- By convention labelled *r*
- Positive correlations (r>0) mean that Ps that score high on one variable also usually score high on the other variable
- Negative correlations (r<0) mean that Ps that score high on one variable also usually score low on the other variable
- Correlations are extremely useful ways to describe the relationship between 2 variables


Extremely strong positive
correlation (r = nearly 1.00)
Test score
Studying


Positive correlation
maybe around r = .50
Test score
Studying


No correlation (r around = 0.00)
Test score
Number of letters in last name


Negative correlation around r = -.50
Test score
lectures skipped



Negative correlation around r = -1.00

We look at the size and direction of the correlation, but we also look at its significance

What is significance, anyways?

- Never mind the deep philosophical stuff and complex math for this assignment
- The point is, sometimes we see patterns appearing in data just based on random chance
- Researchers use hypothesis testing to decide whether the pattern is “significant” as opposed to chance.
- If $p < .05$, there is less than 1 chance in 20 that you would get this pattern based on chance
  - By tradition, if there’s $p < .05$, we interpret the pattern as being reliable and real
- If $p > .05$, we say the effect is unreliable
- If $p > .05$ and $< .10$ (e.g., $p=.075$), you can report a “marginal effect” of the IV or “unreliable trend” associating the IV and the DV
  - A marginal effect MAY BE real but also could be chance
  - Creates difficulties of interpretation. Some would just say “not significant effect”

Reminder / Intro: Betas (β)

- Betas are another statistic ("standardized regression coefficients"), by convention labelled β
- like correlations, betas measure the relationship between two variables
  - Positive betas show that if the P scores higher on the IV, they also usually score higher on the DV.
  - Negative betas show if the P scores higher on the IV, they also usually score lower on the DV.
  - Betas can be larger than 1 or less than -1, though that is rare; I wouldn't worry about it here.
- The good thing about Betas is they test the unique relationship of the IV and the DV after controlling for all other variables in the model.
  - So they're more informative than correlations.
  - Correlations ignore all other variables.

Reminder / Intro: Betas (β)

- Controlling for other variables does heaps of good things statistically
  - makes interpretation clearer & gives you more power to test.
- What you need to understand is not the basis of the math but how to report and interpret the statistics
  - If the beta for a variable is significant and in the predicted direction then the hypothesis is confirmed
  - If it's not significant or significant in the wrong direction, the hypothesis is not supported
- If a beta coefficient for an IV is significant, it means that that IV explains part of the variability in the DV uniquely, in a way that isn't because of any other variable in the regression model
  - So if the beta for perceived control is significant controlling for attitudes, the SN and your novel IV, it means ???
- If the beta for an IV is not significant, and the correlation was significant between the IV and the DV, that means that the relationship between the IV and the DV is not "unique"
  - The relationship is probably caused by a third factor
  - There are other cool tests you could do to find out what the 3rd factor is ("mediation analyses") but they are too hard for this course.

And just in case you're really not into #s lately ...

- P and decimal places:
  - .000 – zero – by convention, we never write p = .000, we always write p < .001 (meaning, there's less than a 1 in a 1000 chance we'd get this pattern of data based on chance)
  - .05 – 5% (if p=.05, there's 5 chances in 100 we'd get this data based on chance)
  - .10 – 10%
  - .15 – 15%
  - .037 (3.7% - NOT 37%) – If p = .037, p < .05 so the statistic is significant

Results part 1: Preliminary analyses of M, SD, inter-correlations

- What is the overall baseline response for the variable? (In particular, are means above or below the midpoint of the scale?)
- Are all IVs correlated with DV in predicted direction? Say so or say not.
- In this section in a paper you would also comment on the inter-correlations among the IVs, but don't bother for this assignment
  - TPB assumes attitudes, subjective norms, and control are relatively independent
  - Sig correlations frequently found though – in real world psych, everything's inter-related!

Results part 2: multiple regression

- 2 steps: testing overall fit THEN test of hypotheses
- What is the overall usefulness of the model?
  - Look at whether overall variability in DV is associated with IVs as a set
  - If most hypotheses are true, there will be large variance accounted for in DV, more than expected by chance ($F>1$, $p < .05$)
  - Amount of variance accounte for is labelled "R^2"
  - TPB meta-analyses usually find about 60% of variance in intentions accounted for by TPB, i.e., $R^2 = .60$
- THEN: Is each hypothesis confirmed or not ?
  - Predicted positive relationship for each IV should lead to positive observed beta (β), $p < .05$; negative relationship should lead to negative beta, $p < .05$.
  - If $p > .05$, or significance is in wrong direction, hypothesis is disconfirmed

Conducting your data analyses

- To do the analyses, download the **instructions on data analysis** from the web, along with the **data file**.
- Don't panic if you're confused. It will be easier if as you do the analyses you start writing your results section right away
  - Download the **template results** from the course web site
  - Carefully go through it changing the details so that it reflects your questionnaire and data

Conclusions

- Swift progress during this tute would be:
  - Conducting analyses
  - Drafting up your results using template
- Feeling anxious / not finished?
  - Don't worry, there's heaps of time.
  - After going over the revision slides, work through the instructions step by step.
  - 2 optional tutes in next 2 weeks on results
  - 1 required tute in 3 weeks with helpful advice on discussion
  - Assignment is due on the 22nd of October!