

Project Planning

M&Ms: An ounce of prevention is worth a pound of cure

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The 4 stages of #sleepyteens



You're always wondering 'what's everyone else doing? Are they speaking to each other? Am I missing out? Should I be on this? Should I be up?' And then yeah it affects my sleep. (Daniel, 15)



→ Enhance available evidence to support informed decision-making

What I learned...

- Why are you asking that question in that way?
 - Does the previous literature address all perspectives?
 - Evaluate methodology and analysis
- Power of communication
 - Think about how your research represents you
 - Think about other's agenda such as the media
 - Think about the value of discussing ideas with other people

Project Planning

- Think Ahead
- Think Parallel
- Think Question not Outcome
- Think Report not Review
- Reasons to plan ahead

Think Ahead

- know when the deadline is and work back from there.
 - the deadline tells you when everything must be done by, so set your milestones by that date.
 - put them in your calendar and share them with supervisor.
 - avoid thinking about the project in terms once I get A done I will move on to B as time fills up with work and before you know it there is not enough time for X, Y and Z.

Think Ahead

- know when will your participants be available.
 - this tells you when you must be running your study.
 - if using undergraduate students, probably looking at running January to March.
 - if using postgraduate students, probably looking January to June.

Think Ahead

- know what your study and data will look like before running the study.
 - Does the design of your study answer your research question?
 - Are you collecting data that can answer your research question?
 - Can you analyse your study?
 - If your study relies on an analysis that you or your supervisor have never done, is that appropriate?

Think Ahead

- Sketch everything
 - The best research tool you have prior to running any study is a pencil and a sheet of paper.
 - sketch your design, sketch your data, sketch your analysis, sketch your write-up.
 - get it out of your head and make it real
 - incredibly helpful for spotting issues and for referring back to when unsure.
 - it does not have to be a good sketch!

Think Parallel

- what can be done whilst you are waiting for something else to happen
 - waiting for feedback from supervisor on idea, do more reading around the area.
 - waiting for ethics to be confirmed, get study prepped or write introduction and methods as you now know your plan
 - waiting for quantitative data to come in, prep analysis code
 - there is always something that can be done whilst you are waiting.

Think Question Not Outcome

- No dissertation is about finding a significant finding.
 - Of course no research should be about that but the field is slow to change.
 - Your main goal is to run and present the appropriate design and analysis to answer your research question regardless of outcome.
- Have your research question and any hypotheses written down from the start.
 - refer back to them any time you start to lose big picture.
 - don't worry about what the study will show, that is not your concern.

Think Question Not Outcome

- The greatest studies are not great because they are complex or show some fancy result. They are great because they are well planned and well thought out.

Think report and not review

- Introductions in a journal article contain a review of relevant literature and not a review of all literature.
 - avoid writing about every study in an area and stick to what builds your research question and justification.
- Read journal articles for style as well as content.
 - two different approaches to reading and both are equally as important
 - when you read an article that you liked, make notes about what it is you liked and try to emulate that.

Think report and not review

- adopt approaches to help organise papers you are reading and look into reference managers
 - QALMRI blog by Dr James Bartlett:
<https://bartlettje.github.io/2021-10-06-learning-to-read-scientific-journal-articles/>
 - Endnote:
<https://www.gla.ac.uk/myglasgow/library/help/endnote/>
 - Others:
<https://www.gla.ac.uk/myglasgow/library/help/endnote/similarsoftware/>

Reasons to Plan Ahead

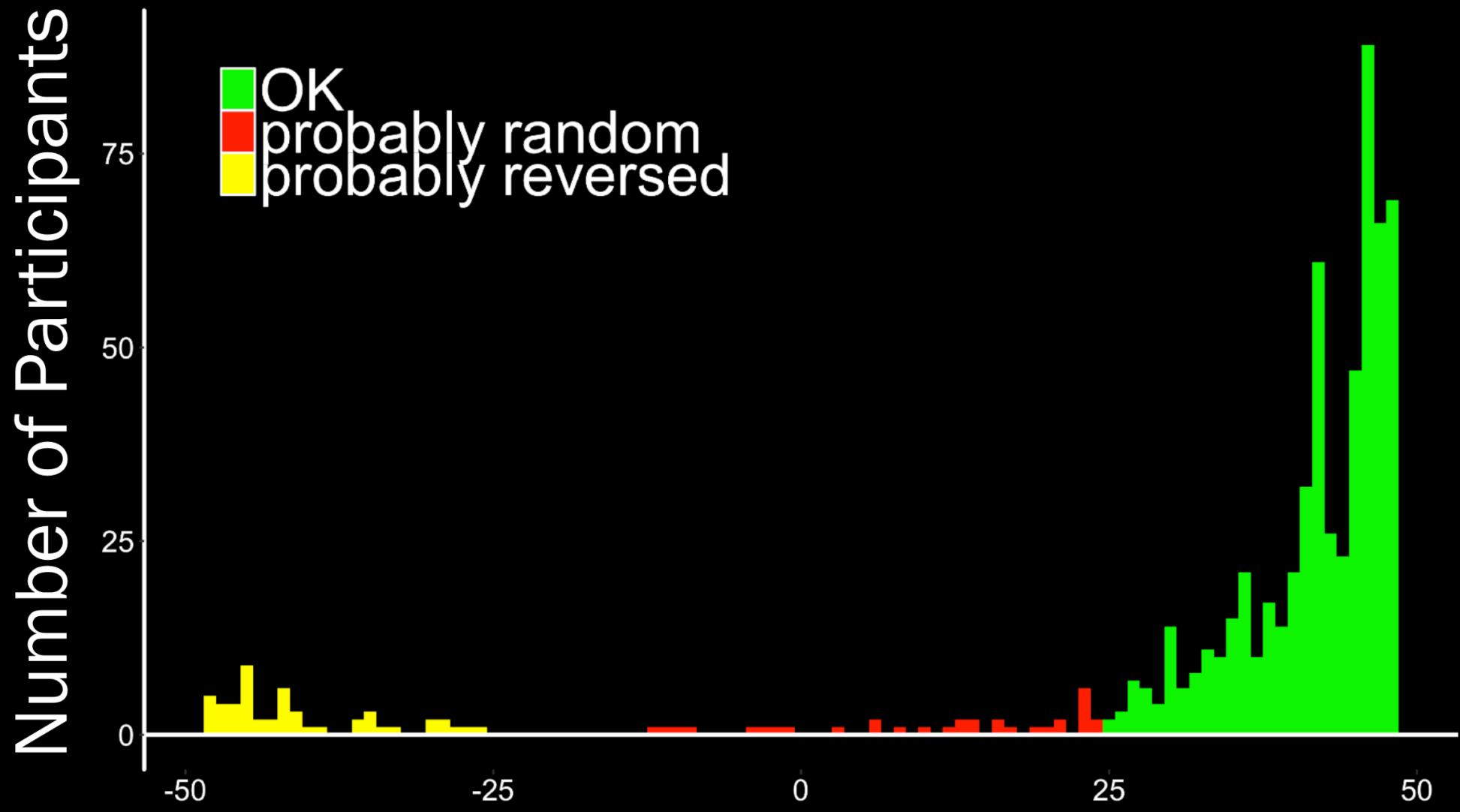
- make running your study easier and less stressful
 - reduce the unexpected.
- there are million reasons work does not get published but methodological design and analysis shoud not be one of them
 - this is something we as researchers have full control over when we **plan ahead**.



POSITIVE CONTROLS

How do you know your manipulation worked?

- Positive control: An outcome-neutral effect that is guaranteed to be present if everything worked as planned
- Negative control: Establish a baseline to determine if there were pre-existing differences between groups
- Sense Checks: check for impossible values, such as negative age or RT, and floor or ceiling effects
- Predict reasonable variable distributions and relationships, then plot everything to check





NAMING THINGS

A rose is not a ROSE by any other name.

- Structure your project (<https://slides.djnavarro.net/project-structure>)
- Name your files systematically, so both you and the computer can find what you need.
- Name your variables systematically, thinking about how you will need to wrangle the data for your analysis.
- Consider using version control, like GitHub, dropbox, or OSF (osf.io)
- Think about whether and how you will share your materials, data, and results with participants and the wider scientific community.

This is a Mess

- Data (Subjects) 11-15.xls
- ExperimentData Nov 15.xls
- final report2.doc
- project notes.txt
- report.doc
- report final.doc
- Subject Data Nov 12.xls

Better Organisation

- _project-notes.txt
- data/subjects_2021-11-12.xls
- data/subjects_2021-11-15.xls
- data/experiment_2021-11-15.xls
- report_v1.doc
- report_v2.doc
- report_v3.doc

Difficult to Wrangle

Subject ID	ASD Question 1	ASD Q2 special interests	ASD q3 (eye contact)
1	2	5	3
2	4	4	1

* reverse code questions 1, 4, 6, and 10

Easier to Wrangle

subject_id	ASD_numbers_1_rev	ASD_interest_2_fwd	ASD_eye_3_fwd
S1	2-Seldom	5-Always	3-Sometimes
S2	4-Often	4-Often	1-Never



SIMULATING DATA

Sometimes it's OK to fake your data.

- Run through your study a few times to create pilot data to download so you know how your data files will be structured
- Code you can write ahead of data collection:
 - Participant exclusion
 - Data processing from raw data to scores
 - Analysis
 - Plots
 - Descriptive tables and stats
 - Power analyses by simulation
- You can use faux to simulate data for single-level and multilevel factorial designs (<https://debruine.github.io/faux/>)



```

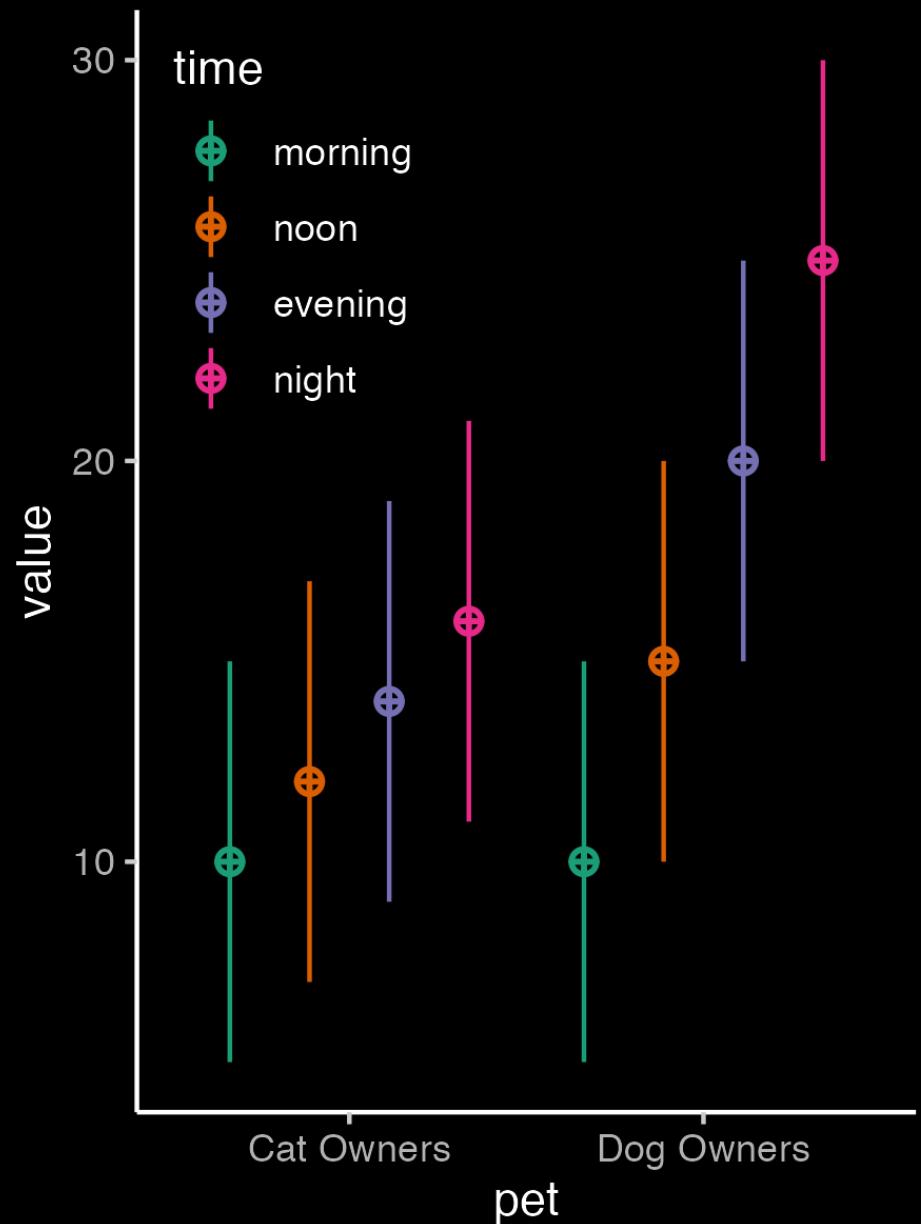
between <- list(
  pet = c(cat = "Cat Owners",
          dog = "Dog Owners"))

within <- list(
  time = c("morning",
          "noon",
          "evening",
          "night"))

mu <- data.frame(
  cat = c(10, 12, 14, 16),
  dog = c(10, 15, 20, 25))
)

data <- sim_design(within, between,
                    n = 100, mu = mu,
                    sd = 5, r = .5)

```





JUSTIFY EVERYTHING

Why did you make the choices you did?

- Things you might need to consider / justify (depending on design):
 - Choice of measures / population
 - Participant / outlier exclusions
 - Parametric / nonparametric, or ordinal / linear stats
 - Alpha level ($p < .05$ is not the only choice)
 - Target power (80%)
- A power analysis is not the only way to justify sample size

Type of justification	When is this justification applicable?
Measure entire population	A researcher can specify the entire population, it is finite, and it is possible to measure (almost) every entity in the population.
Resource constraints	Limited resources are the primary reason for the choice of the sample size a researcher can collect.
Accuracy	The research question focusses on the size of a parameter, and a researcher collects sufficient data to have an estimate with a desired level of accuracy.
A-priori power analysis	The research question has the aim to test whether certain effect sizes can be statistically rejected with a desired statistical power.
Heuristics	The researcher decides upon the sample size based on a heuristic, general rule or norm that is described in the literature, or communicated orally.
No justification	The researcher has no reason to choose a specific sample size, or does not have a clearly specified inferential goal and wants to communicate this honestly.

Sample Size Justification, Lakens, <https://psyarxiv.com/9d3yf/>

What knowledge is valuable?

Epistemology: Branch of philosophy concerned with knowledge: “how can we know what can we know?”

“I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind;” (1883)

Lord Kelvin (Chair of Natural Philosophy at the University of Glasgow)





University
of Glasgow

Sneaking a ‘keek’ behind the curtain (rationale for keeking)



Research Question help to inform method





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Transparency rather than replicability in qualitative research



scienceonapostcard

@etsy