THE UNIVERSITY of EDINBURGH

Data Analysis for Psychology in R (DAPR)

Stats Team

Emma Waterston **Josiah King** **Elizabeth Pankratz** **Umberto Noè**

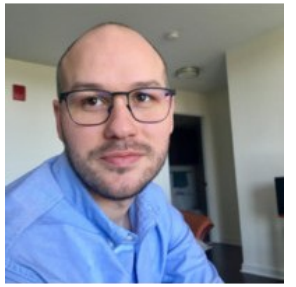
If in doubt:
ppls.psych.stats@ed.ac.uk

Put the name of your course in the subject title, for example:
"DAPR1 – data question"

Lots of lovely tutors!!

Patrick Sturt

Alex Doumas



Zach Horne

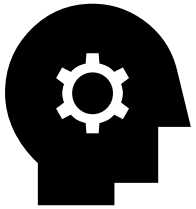
Martin Corley

Aja Murray

Dan Mirman

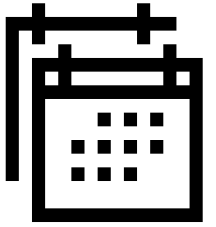
Data Analysis for Psychology in R 1/2/3

summarise, visualise, and make inferences based on data



special focus on methods from psychology research, measuring psychological constructs

tool



course year

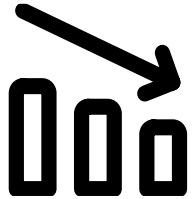
icons from Iconify

“I'm studying psychology, why do I need to learn stats?”

Psychology without stats:

“Mindfulness helped me reduce *my* anxiety, so surely it will work for my patients too.”

Psychology with stats:



“How effective is mindfulness for reducing anxiety, on average? Is it likely that these results are just a coincidence?”

Studying stats will

- help you understand the scientific process
- develop your problem-solving and critical-thinking skills
- open doors for you, both at uni and beyond

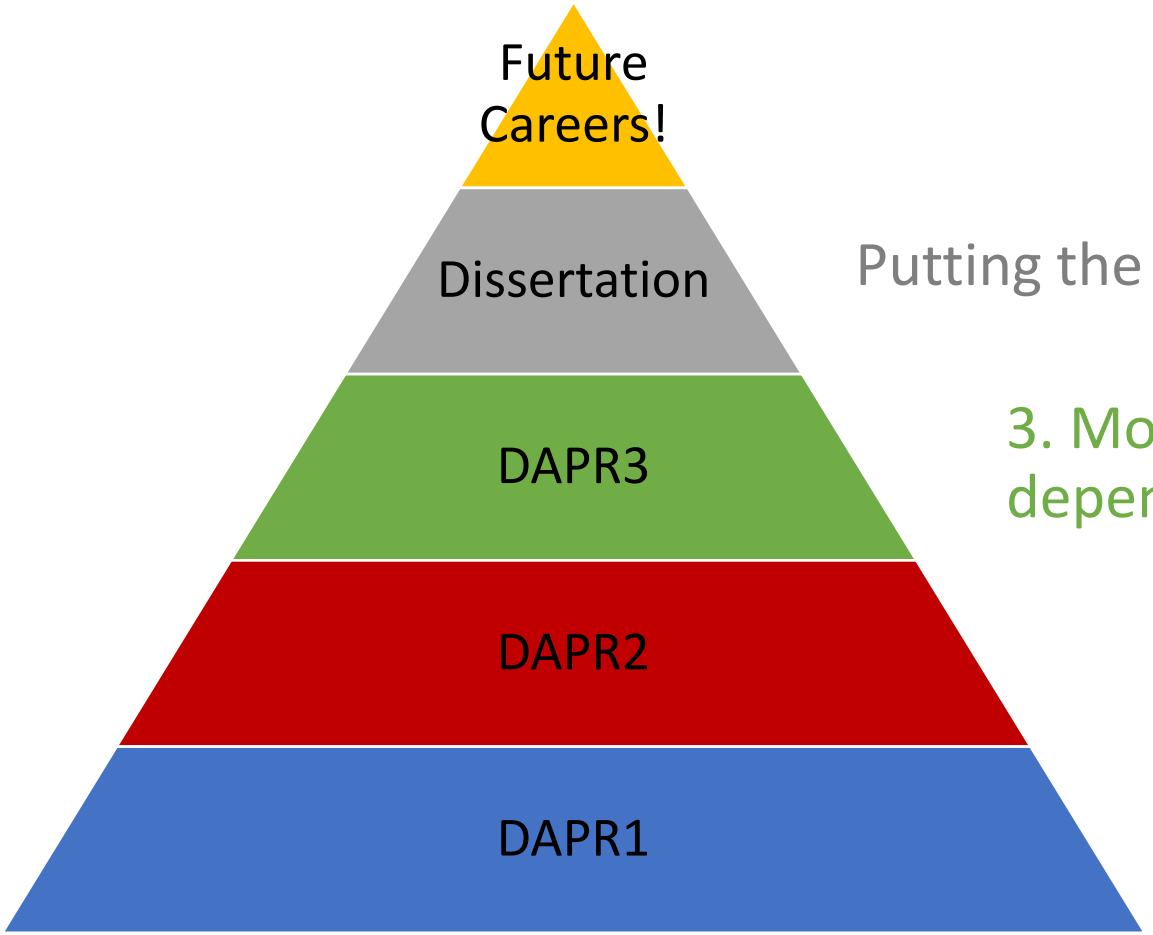
icons from Iconify

Why R ?

- Free and open-source
- Tons of tools for data analysis
- The state of the art for reproducible research and scientific transparency

graphics from tidyverse

The DAPR Curriculum and Your Degree



Putting the tools into practice

3. More advanced models for dependent or survey data

2. Building predictive models for independent data

1. Principles of data visualisation and inference

How Does DAPR Work?

Lectures

- 2 per week (see timetable)
- Content and concepts, plus some live coding demonstrations

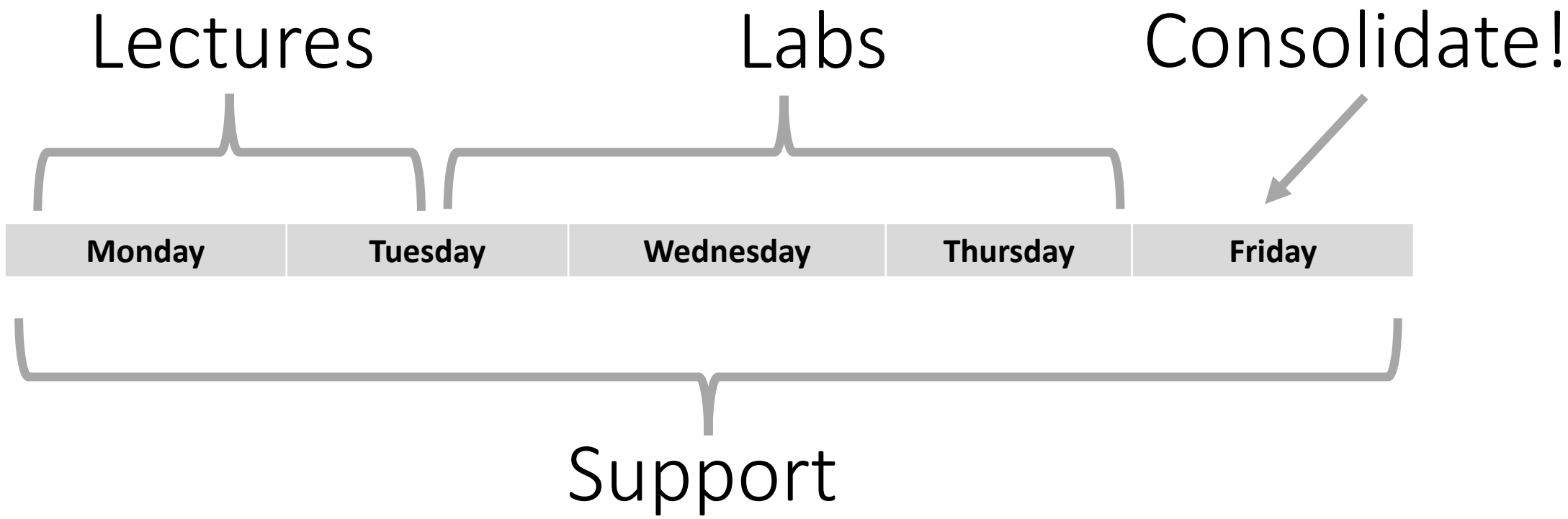
Labs

- a time and place to work on the exercises
- 1 hr per week: be organised, put away distractions
- working in groups
- a team of tutors will be there to help

Support

- lectures: feel free to ask questions
- labs: ask the tutors (they want to help!)
- discussion forums: any time peer-to-peer support
- office hours: see Learn page for details

How Does DAPR Work?



How Does DAPR Work?

Weekly Quizzes 10%

- Released on a Monday at 9am and due on the Sunday at 5pm.
- The feedback and solutions will only be available after the deadline (after Sunday at 5pm)
- No extensions, as these count as continuous summative assessments.
- Late submissions are not possible as solutions are available after the deadline.

Coursework 30%

- Group work
- Analyse a dataset to address specific tasks
- Write up and present your analysis and results

Exam 60%

- Closed book, paper-based
- You will be given an equation sheet so don't worry about having to remember all formulas

Help and Support

- **Labs** (see your personal timetable for the time)
  - Ask tutors for help on R, lab materials, concepts from the lectures
- **Discussion forums** (see LEARN for links)
  - Piazza: A peer-to-peer discussion forum to write questions and get answers from other students.
  - Group Discussion Space: A space to coordinate with each other and contribute to group reports.
- **Office hours**
  - Dedicated hours during which instructors are available to support you and help explain anything unclear about the course content or assessments.
  - Course LEARN page > Course information > Course contacts and office hours
- **Student adviser**
  - Your student adviser (name on Euclid) can support you on anything that is not directly related to the course materials or can refer you to more specialist support.
- **Cohort lead**
  - Your cohort lead (name on Euclid) can support you with academic-related questions, reference letters, and general advice on how to make the most of your time at university.

Course Materials

- Each week's material will be within a weekly folder on LEARN containing:
  - Weekly quiz
  - Lecture slides
  - Lecture activities or readings
  - Lab exercises
- The weekly folders will become available incrementally on LEARN.

LLMs

- LLMs are “bull- 💩 machines”
  - They don’t *know* or *understand* or *think* anything.
  - They are just like your phone's predictive text/auto-complete, but on steroids

- Good when you can verify the output – e.g., “I want my plot to be blue”

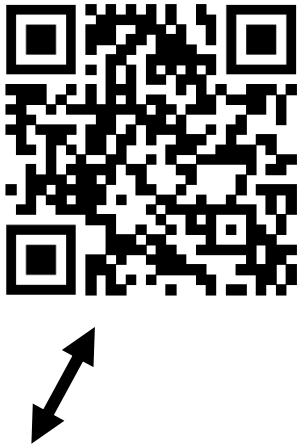
- Not so good if you can’t

https://thebullshitmachines.com/

Our View on AI

- In DAPR, we want you to do the thinking, interpreting, and reporting yourself.
- Learning is hard work, but that hard work now will pay off later in your dissertation (and beyond).
- Work with the humans around you: your peers and the stats team!
  - Your peers are a better resource than any LLM (and explaining concepts to others helps them learn too!).
  - Our job is to help you learn stats. We want you to ask for help.

AI Policy



- Using AI in non-assessed work = ☑
  - e.g., LLMs are sometimes helpful for understanding R documentation.
  - But be aware of the environmental cost (https://www.bbc.co.uk/sounds/play/w3ct6vz4)
- Using AI in assessed work = ✗
  - Do not use LLMs at all in your assessments, including:
    - planning, conducting, or interpreting analyses
    - structuring or formatting a report
    - generating text or code
  - Just like plagiarising from human-written texts, presenting AI work as your own is academic misconduct.
- Engaging with every step of the process yourself is what will help you learn. And learning is why we are all here.

Own-Work Policy

The university's own-work policy applies to the assessments of the DAPR courses.

For group-based reports:

- Avoid plagiarism on reports
- Don't copy/share work between groups
- Don't copy verbatim from the lab materials

Own-work policy also applies to the following:

- Weekly quizzes
- Final exam

The mindset for success in DAPR

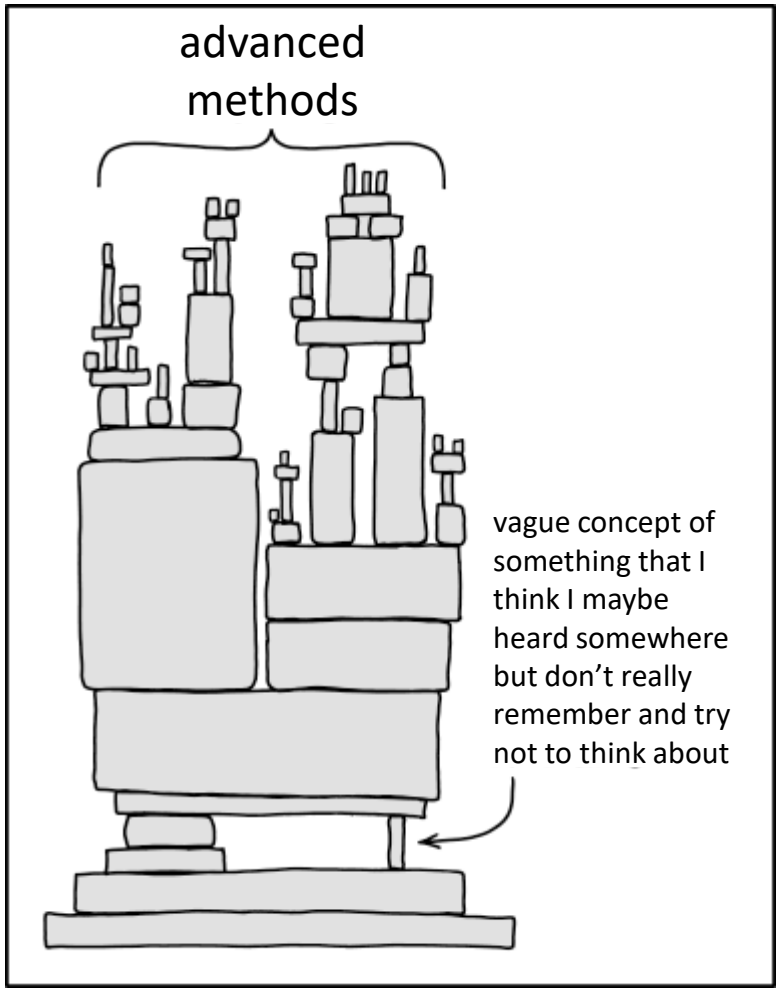
1. Bring a can-do spirit.

2. Mistakes are your friend and teacher.

3. Treat learning stats like learning a new language. Your skills will grow as you use them!

4. By learning a little bit now, you develop your ability to re-learn in the future.

5. It's OK if your foundations are shaky. This is normal. They will get stronger as you learn and re-learn.



Expectations

What the course expects of you

- To work steadily and consistently across the year
- Regular studying and keeping up to date
- Continuous engagement and attendance
- Being proactive and asking for help/support when you need it

What you can expect from us

- We will work hard to help you succeed
- We will be open and communicate with you
- We will be polite, respectful and treat you like adults
- We will never try to trick you or hinder your development

What we expect of you

- You work regularly throughout the year and keep up to date with the materials
- You interact and communicate with the teaching team
- You are polite and respect the teaching team and your classmates
- If you email, include the course name in the subject as some instructors also teach across multiple courses.

Course Introduction

Data Analysis for Psychology in R2 (DAPR2)

Course Overview

Block 1: Introduction to Linear Models (Sem 1, Weeks 1-5)

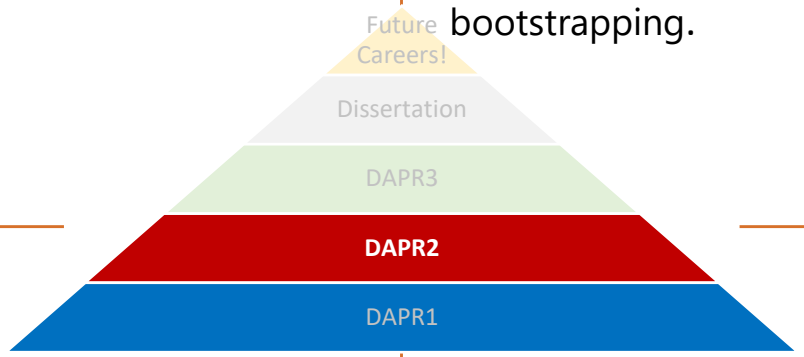
- Lecturer: Dr Emma Waterston

- Learn to build and interpret linear models for continuous outcomes with single and multiple continuous predictors, as well as conduct model comparisons.

Block 2: Analysing Experimental Studies (Sem 1, Weeks 7-11)

- Lecturer: Dr Elizabeth Pankratz

- Introduces to multiple regression with categorical predictors, as well as introducing assumptions and diagnostics checks, and bootstrapping.



Block 3: Interactions (Sem 2 Weeks 1-5)

- Lecturer: Dr Elizabeth Pankratz

- Extends from multiple linear regression to include interactions, where we will also cover how to conduct multiple comparisons, and apply different types of corrections.

Block 4: Advanced Topics (Sem 2 Weeks 6-10)

- Lecturer: Dr Zach Horne

- Focuses on more niche and advanced topics within the realm of linear regression. Will learn to build and interpret generalized linear models for binary outcomes before focusing on wider issues within the psychological literature, such as replication, power, and open science.

Assessment Dates/Information

Weekly Quizzes (10%)

Released:
Mondays at 9am

Due:
Sundays at 5pm
(feedback immediately after)

Time limit: 60 mins

Best 14/18 quizzes count
(first two quizzes for practice)

No extensions (these are continuous summative assessments)

Group-Based Report (30%)

Released:
Thurs 12th Feb at 12 noon

Due:
Thurs 5th March at 12 noon

Preparation:
4 example reports during lectures/labs
(Sem 1 weeks 5 & 11; Sem 2 weeks 5 & 9)

Exam (60%)

May Diet

Centrally Timetabled:
https://exams.is.ed.ac.uk/

Preparation:
Exam prep lecture and Q&A in final week + mock exam in final lab (Sem 2 week 10)

Lab Structure

- Group-based work in preparation of the assessed report in Semester 2
- One group per table (maximum 6 students)
  - Take note of the table number (e.g., Group 1, 2, 3...), and stay with this group for the duration of the semester
  - The table you work with during labs will not necessarily be composed of the same individuals you work with on the assessed report
- In majority of labs, work through a set of 10 questions/exercises each week
- As a group, you will have the opportunity to complete four example reports (three before the assessed report is released) and receive in-person verbal guidance/feedback from your lab tutor during class if you request this

Installing R and RStudio

Please install a version of R and RStudio on your own computer before the first lab in Week 1 – you will need this to be able to complete the lab exercises

- Full DAPR2 cohort **does not** have access to the PPLS RStudio Server
- Instructions for installation and updating available at https://edin.ac/3B0oi5A
  - Please follow these instructions carefully

- For those of you who have Chromebooks:
  - Local installation is not possible so you should (continue to) use the PPLS RStudio Server at https://rstudio.ppls.ed.ac.uk/
  - If you need to request access, fill out the form here: https://edin.ac/3Le1mEW

Tasks for Welcome Week

- Go to the **DAPR2 LEARN page**
  - Take a look around so you get to know the course and the LEARN page structure

- Watch the **Course Overview** video (this one) ☑
  - **Course Materials: Semester 1** > **Week 0: Welcome Week**

- Read through the following documents
  - **Course Information** folder
  - **Assessments** > **Assessment Overview** & **Assessment and Feedback Information**

- Install **R and RStudio** (non-Chromebook users)
  - Instructions: https://uoepsy.github.io/files/install-update-r.html

- Review previous **DAPR1** materials / **support materials** if required:
  - **DAPR1 24/25 Materials**: https://uoepsy.github.io/dapr1/2425/
  - **R Bootcamp**: https://uoepsy.github.io/scs/r-bootcamp/
  - **RMD Bootcamp**: https://uoepsy.github.io/scs/rmd-bootcamp/

Welcome to the course!