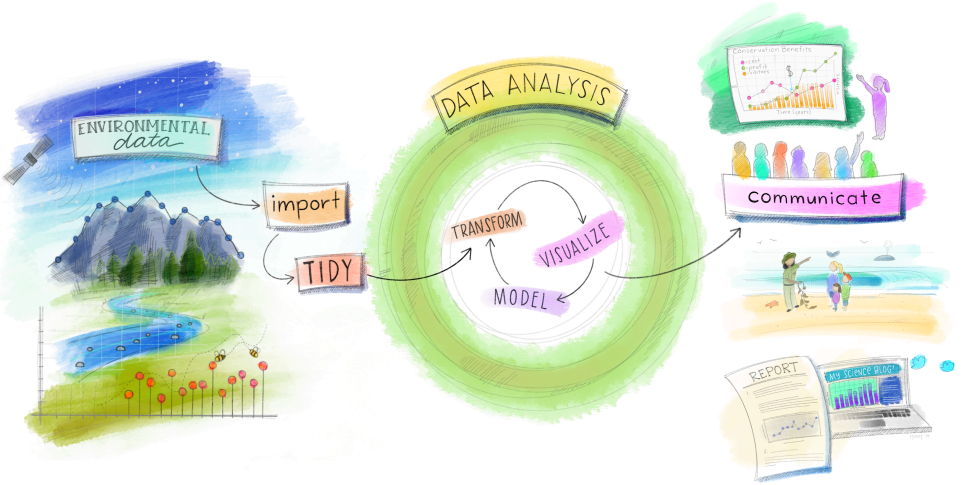
Welcome to STA 112

Ciaran Evans

Welcome!



- Dr. Ciaran Evans
- Manchester 329
- Course website: https://sta112-f25.github.io/

Illustration: Updated from Grolemund & Wickham's classis R4DS schematic, envisioned by Dr. Julia Lowndes for her 2019 useR! keynote talk and illustrated by Allison Horst.

Agenda

- Activity: getting to know each other, and how do fans impact NBA games?
- Plan for week 1
- Syllabus highlights

Class activity

- Work in small groups to answer the activity questions (handout)
- We'll reconvene to discuss in 15--20 minutes
- I will collect your work at the end of class (part of class participation grade)

Image: NBA.com

Research question

What specific question were the researchers trying to answer?

- Do home teams perform better when they have more fans present?

Data

To answer their research question, the authors gathered data on NBA games. Where did the data come from? Were there any issues with the data?

- Results and attendances downloaded from Basketball-Reference.com
- Attendance data also collected from NBA and local news

> Issue: reported attendance sometimes inaccurate!

Methods

What statistics and data science tools did the researchers use to come to their conclusions?

- Linear regression model
  - Includes other potential factors that could influence outcome of game
- Hypothesis tests for strength of the relationship

Conclusions

What did the researchers conclude about their research question?

- An increase of 1,000 home fans is associated with an increase of 1.4 points in the home team's margin of victory, after controlling for other factors
- So, home teams tend to perform better when they have more fans
- Is there anything you would do differently?

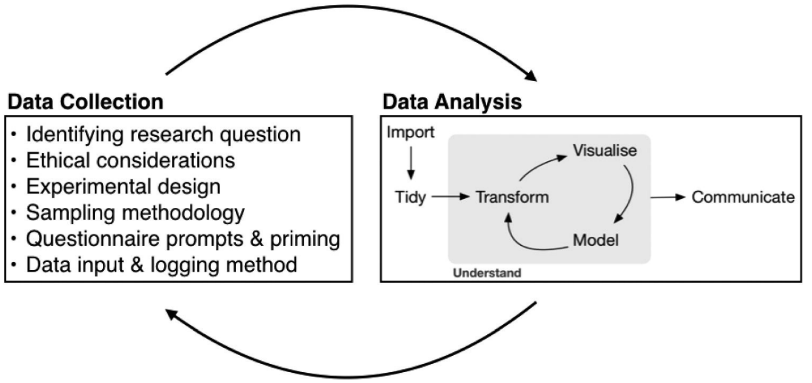
Reproducibility

> Could you reproduce their results?

Possibly, but it would be hard.

- Data doesn't seem to be available (we would have to collect it ourselves)
- Code for analysis not available

Components of (good) data analysis



- Defining a clear research question
- Collecting data that can answer your question
- Data preparation: exploring, cleaning, transforming
- Investigating question with figures, tables, models
- Communicating results
- Sharing data and code to make work reproducible

Source: Albert Y. Kim & Johanna Hardin (2021) "Playing the Whole Game": A Data Collection and Analysis Exercise With Google Calendar, Journal of Statistics and Data Science Education, 29:sup1, S51-S60, DOI: 10.1080/10691898.2020.1799728

Plan for Week 1

- Download R and RStudio today or tomorrow
  - Instructions on course website
  - Please contact me if you have problems!
- Bring laptop to class from now on
- Friday: HW 1 released

Expectations

- Complete any assigned reading ahead of class
- Bring laptop each day
- Submit class activities (graded for effort, not completeness or correctness)

Course components

- Class participation (graded for effort)
- HW assignments (roughly one per week)
- Exams (2 midterms, 1 final)
- Project

AI policy

- I will *never* use AI to grade your work; all feedback you receive will be directly from me and the TA
- Collaboration with other students, and AI assistance, is permitted on homework
  - Assistance does *not* mean uploading the assignment to ChatGPT and copying the answers
  - You must cite collaborators and external resources
- See syllabus for further details

For next time

- Make sure R and RStudio are installed
- Instructions are provided on the course website