Intro to R

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R u ready?

- PollEv.com/elizabethsimmons903

If statistics programs/languages were cars...

Why R?

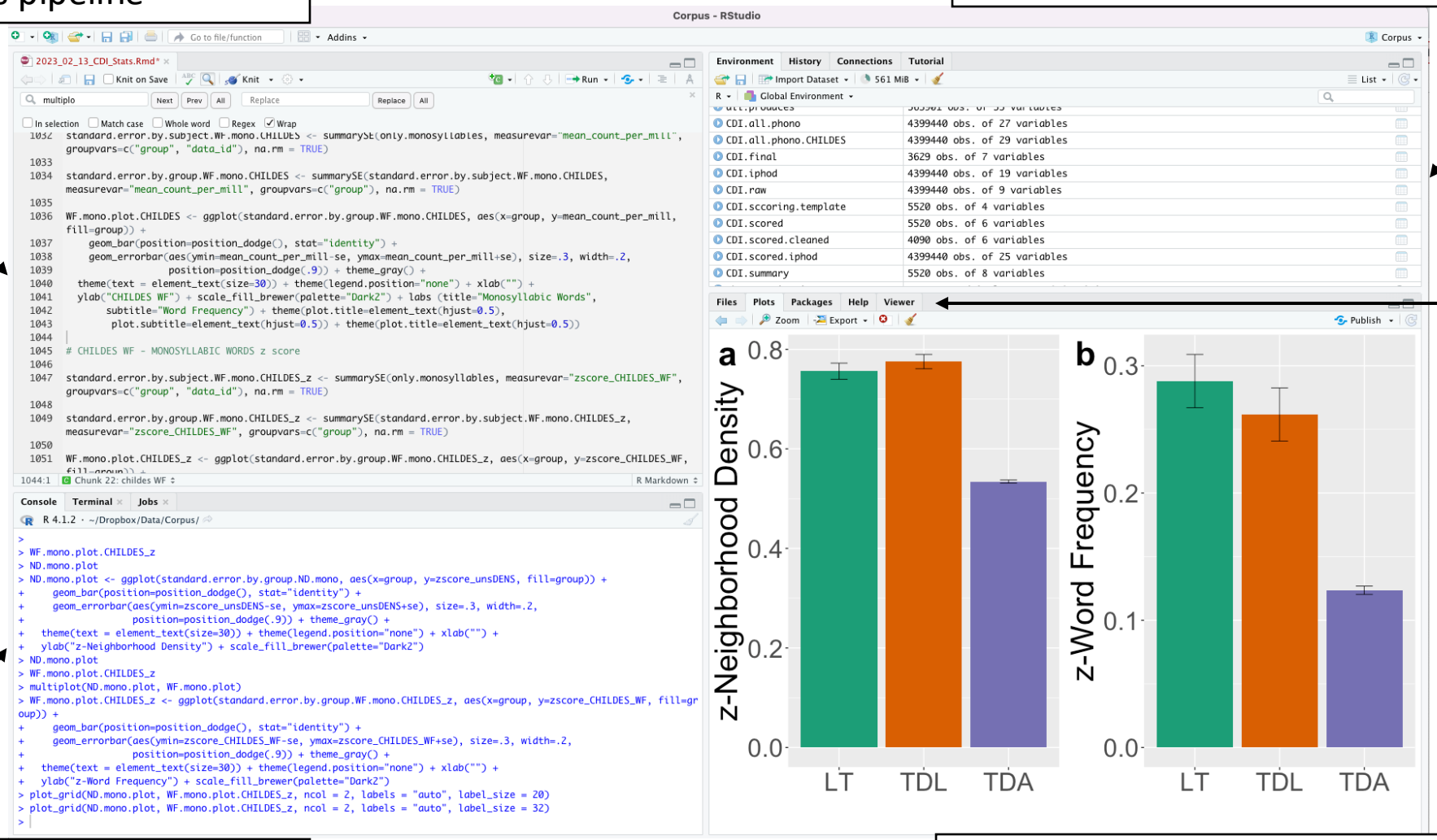
- Reproducibility!
- Transparency!
- Efficiency!

The basics

- **R** is a coding language
- You can use **RStudio**, a coding environment, to run R code
  - Write and execute code without using the R terminal
  - Helps with transparency
  - Easy to run long scripts and short chunks of code
- **R packages** are free, mini-programs that allow you to complete a range of functions

Script: This could be a range of file types, but generally a text file; your "analysis pipeline

Environment: Displays active data sets and models



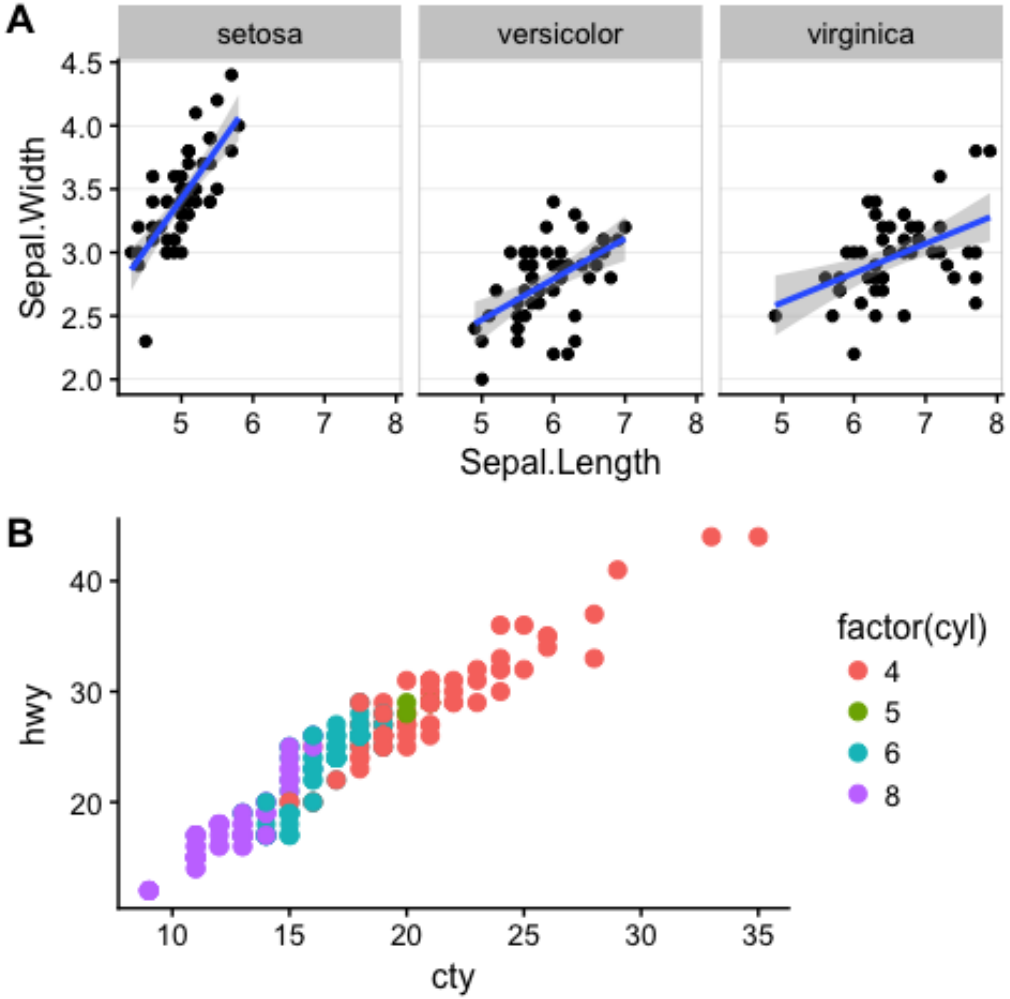
Terminal: Execute your script here; view error messages; can type directly in this pane

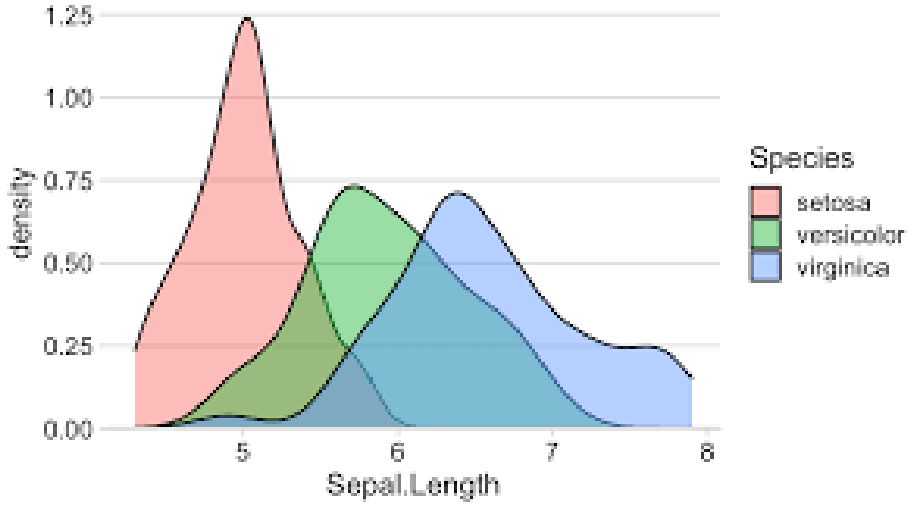
Plots: Toggle between packages, files, plots and viewer; Multifunctional pane

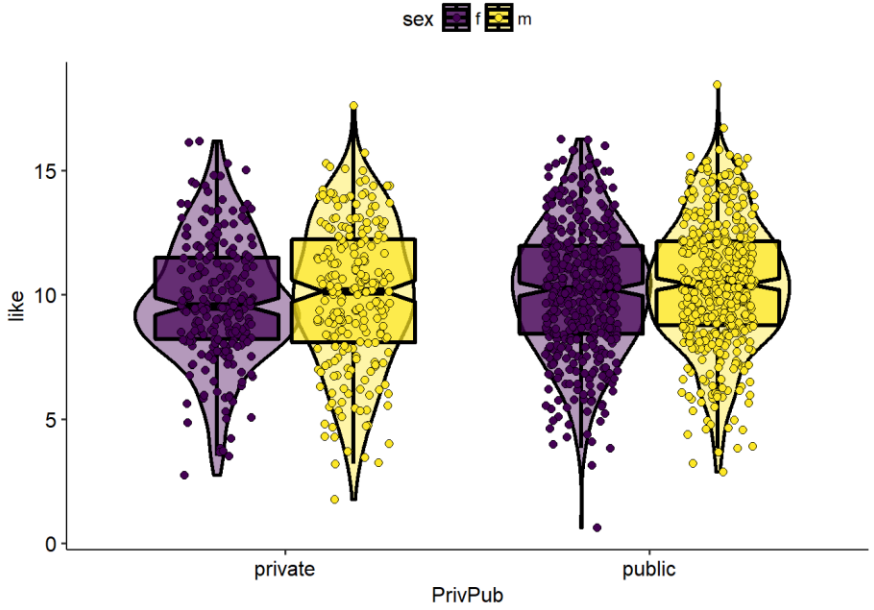
Packages

- Anything you can dream up – there's a package for that!
- Data manipulation (dplyr)
- Figures (ggplot, cowplot)
- Mixed effects models (lmer4)
- ANOVA (ez)
- Effect sizes (effsize)
- Open-source databases (childesdb)
- Image processing (magick)

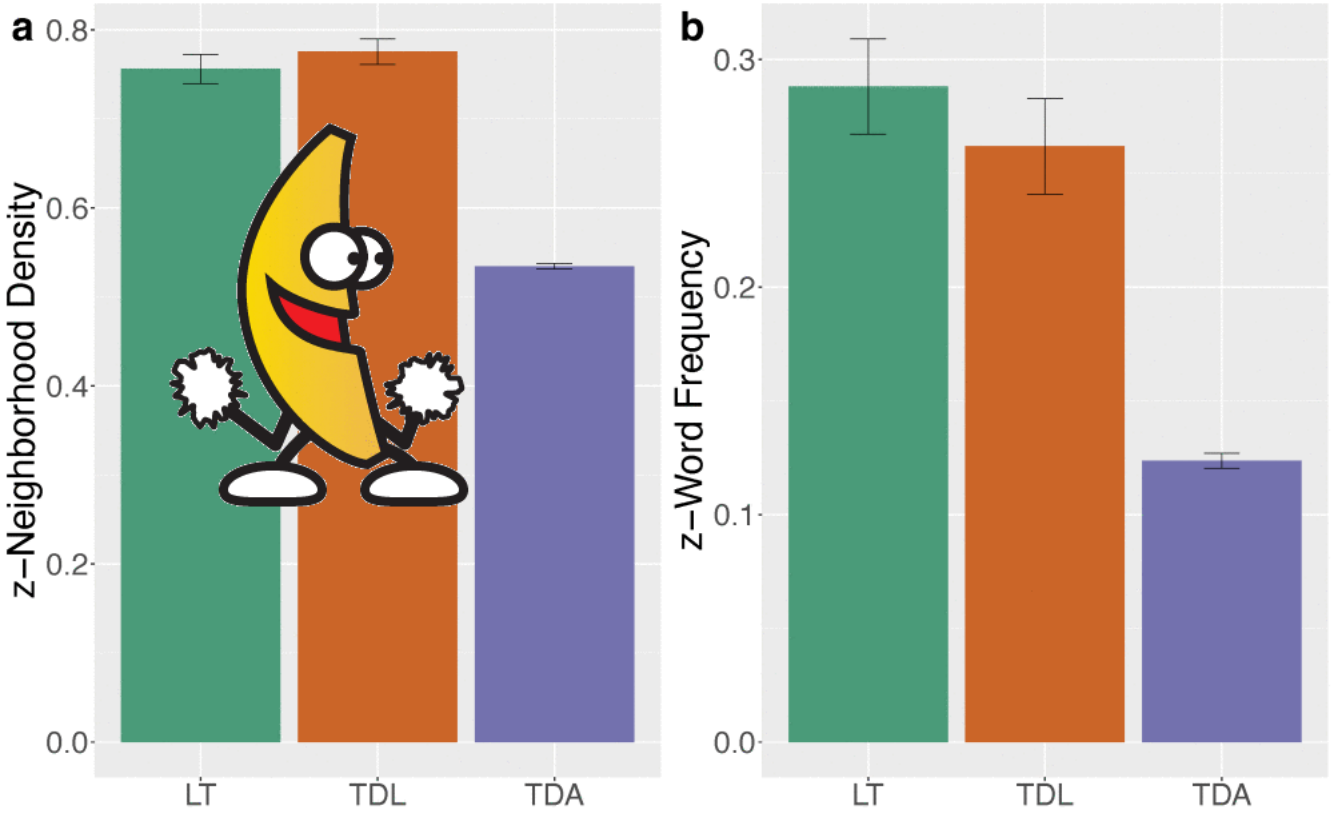
ggplot2 (with cowplot)







magick

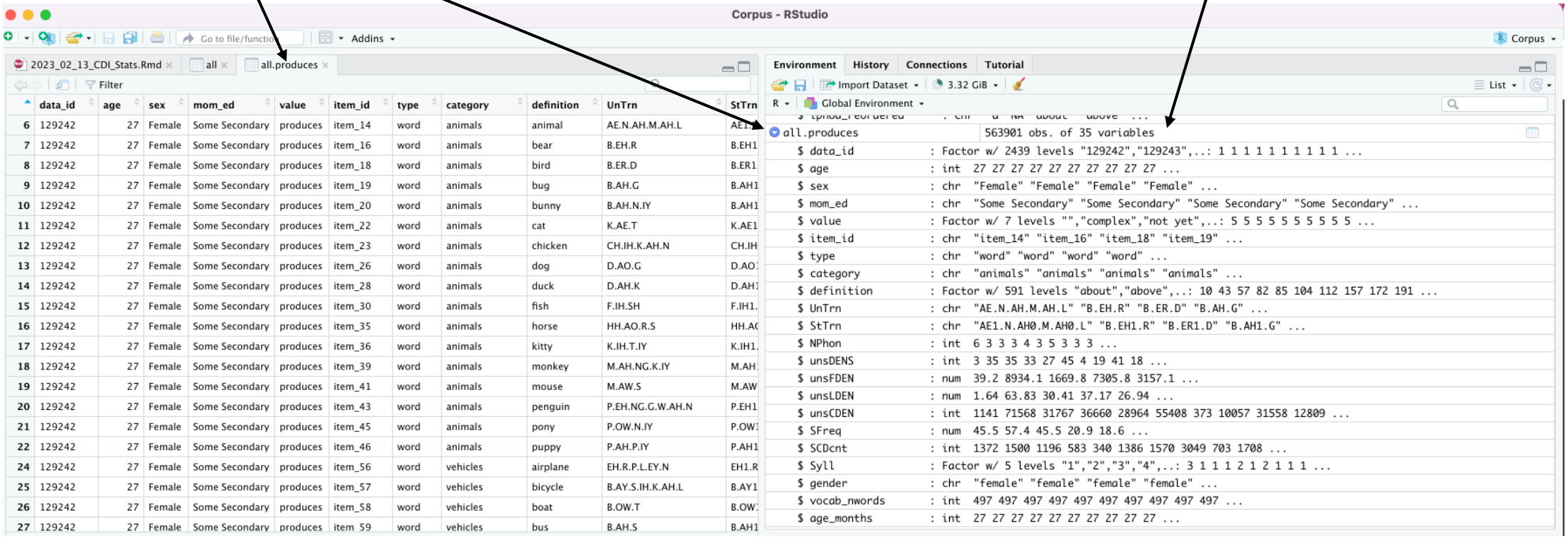

a
z–Neighborhood Density
0.8
0.6
0.4
0.2
0.0
LT
TDL
TDA
b
z–Word Frequency
0.3
0.2
0.1
0.0
LT
TDL
TDA

Advanced basics

- R is **case-sensitive** language
- Be consistent in your code – this allows you to recycle chunks of code and save time
  - Standardize coding conventions (i.e., subject number is always subject_id)
- Operations in R are performed on **data frames**
  - Think of them as a spreadsheet
  - Rows = observations
  - Columns/vectors = variables

data frame (df) called all.produces - R doesn't like spaces!

all.produces data frame contains 563,901 observations and 35 variables



Learn from my mistakes

- Practice writing code! Practice makes (almost) perfect!
- Don’t reinvent the wheel – look for pre-existing code then adapt
- Re-analyze old data sets in R
- Good places to start:
  - Intro to data manipulation, visualization and basic analyses: http://www.cookbook-r.com/
  - If you want a step-by-step intro: https://www.rstudio.com/resources/webinars/a-gentle-introduction-to-tidy-statistics-in-r/
  - Got an error? https://stackoverflow.com/ (watch out – responses can be snarky)

Next steps: Download R and R Studio

Step 1) Download R here: r-project.org & install

Step 2) Download RStudio here: posit.co & install