
The fundamentals of data visualization in R

Our topics and goals

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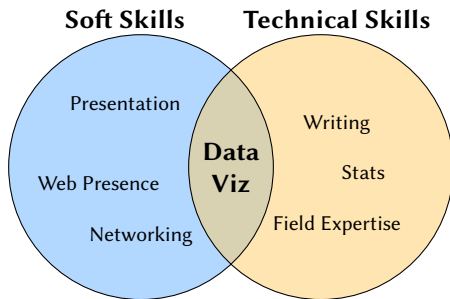
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Welcome!

Why visualize data?

- **Communicating** results is a key element in research (and in the job market)
- Good visuals are a crucial but often underrated skill in academia

☞ In some sense, where soft and technical skills meet:



What's a “good figure”?

What geoms are being used? What issues do you notice?

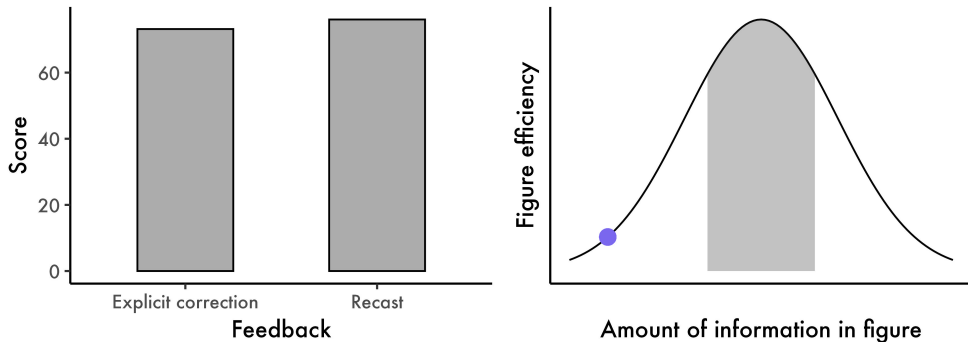


Figure 1: Figure vs. amount of information

What's a “good figure”?

What geoms are being used? What issues do you notice?

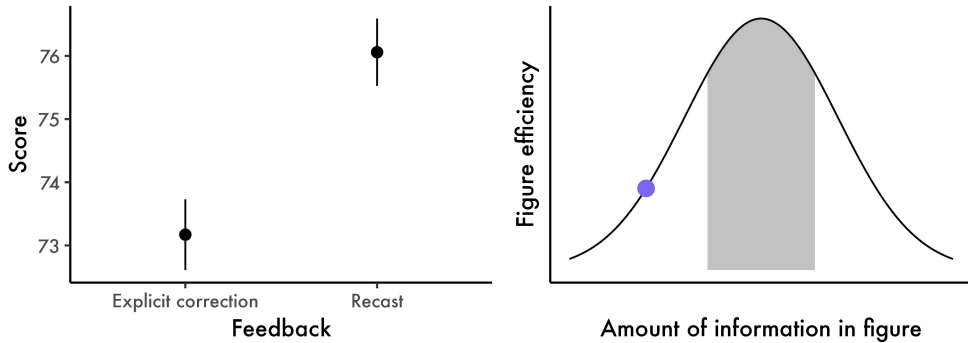


Figure 2: Figure vs. amount of information

What's a “good figure”?

What geoms are being used? What issues do you notice?

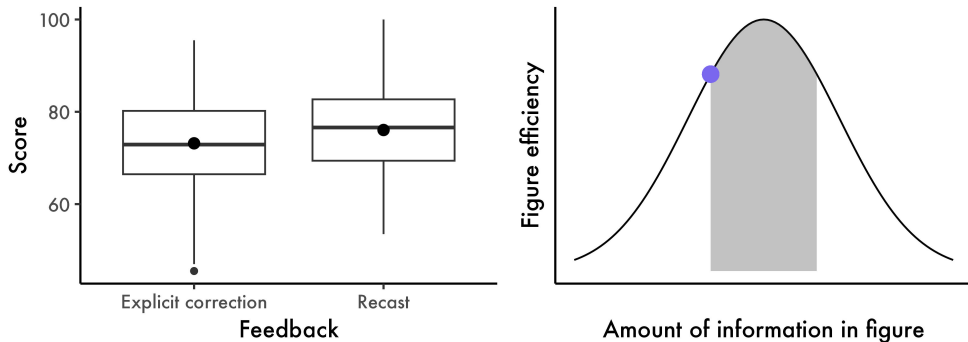


Figure 3: Figure vs. amount of information

What's a “good figure”?

What geoms are being used? What issues do you notice?

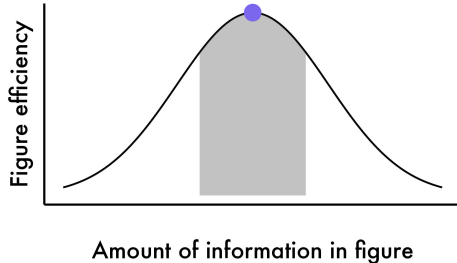
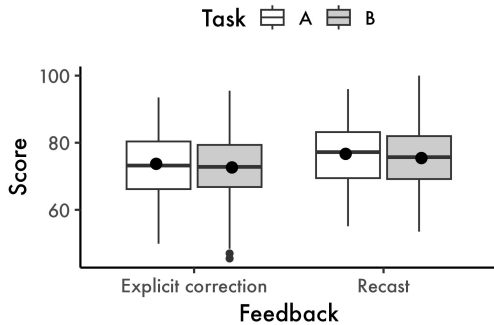


Figure 4: Figure vs. amount of information

What's a “good figure”?

What geoms are being used? What issues do you notice?

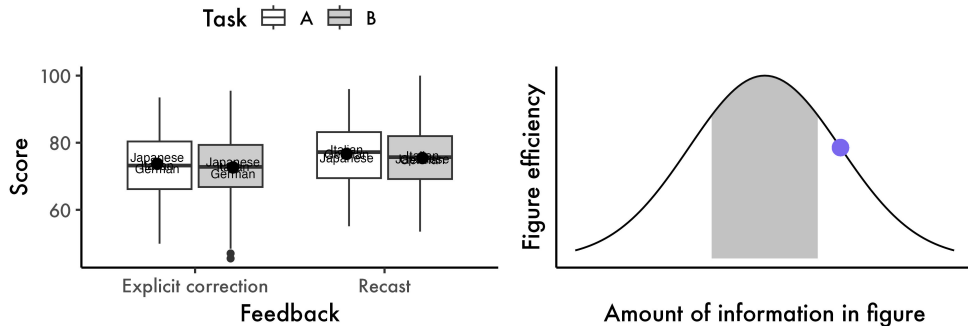
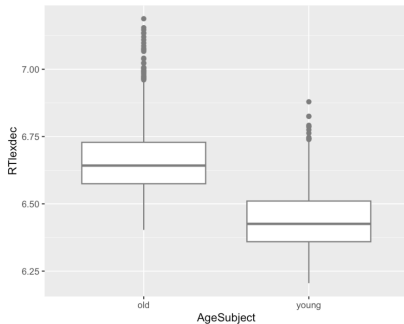


Figure 5: Figure vs. amount of information

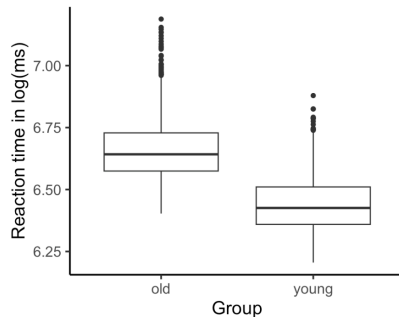
What's a “good figure”?

Form also matters

Examples



(a) Font is **too small**; contrast is **too low**



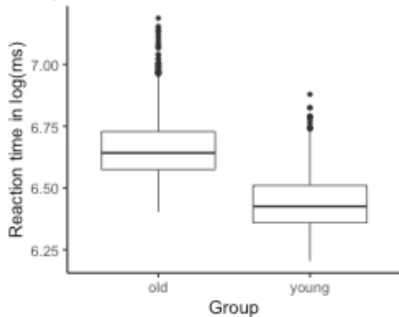
(b) Good font size; good contrast; better labels

Figure 6: From the guidelines at SLR (1)

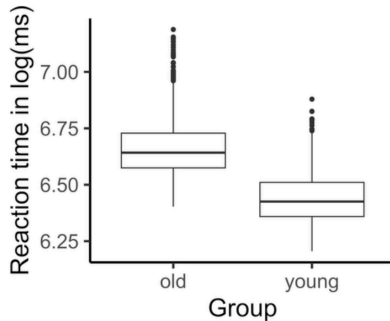
What's a “good figure”?

Form also matters

Examples



(c) Font size and contrast are appropriate, but resolution is **too low** (25 dpi)



(d) Resolution is good (400 dpi), but font is too large

Figure 7: From the guidelines at SLR (2)

Our itinerary

Topics we will cover in three days

1. Basic principles behind data visualization

Data cleaning/preparation; `ggplot2` and its core structure; essential `geoms`

Practice

2. Data transformation for visualization

Scales, facets, and grids; aesthetics; `dplyr` and conditionals

Practice

3. Plotting individual variation

Visualizing model estimates; a brief intro to Quarto

Interactive plots and extra packages

Practice

Materials and logistics

- ☞ **IDE:** many options (**Positron**, RStudio, Sublime, VSCode, nvim, etc.)
 - If you prefer, you can also use posit.cloud
 - We will focus on **scripts**, *not* slides
 - Our main package will be **tidyverse**, but we will certainly use others

(Wickham et al. 2019)

What you need: an IDE + **tidyverse** installed

Positron vs. RStudio

- Positron is the new IDE from Posit, and will likely replace RStudio
 - So you might as well switch to Positron these days
- ☞ It's a personal choice: for our course, it won't matter which IDE you use

Survey

forms.cloud.microsoft/r/m6mCwa4d5m



References I

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Pedersen, T. L., Miller, E., Bache, S. M., Müller, K., Ooms, J., Robinson, D., Seidel, D. P., Spinu, V., Takahashi, K., Vaughan, D., Wilke, C., Woo, K., and Yutani, H. (2019). Welcome to the tidyverse. *Journal of Open Source Software*, 4(43):1686.