



Figures and Displays

Tips for Effectiveness

December 28, 2020

Berkeley

Department of
Integrative Biology

IB 305: Thriving in Academia

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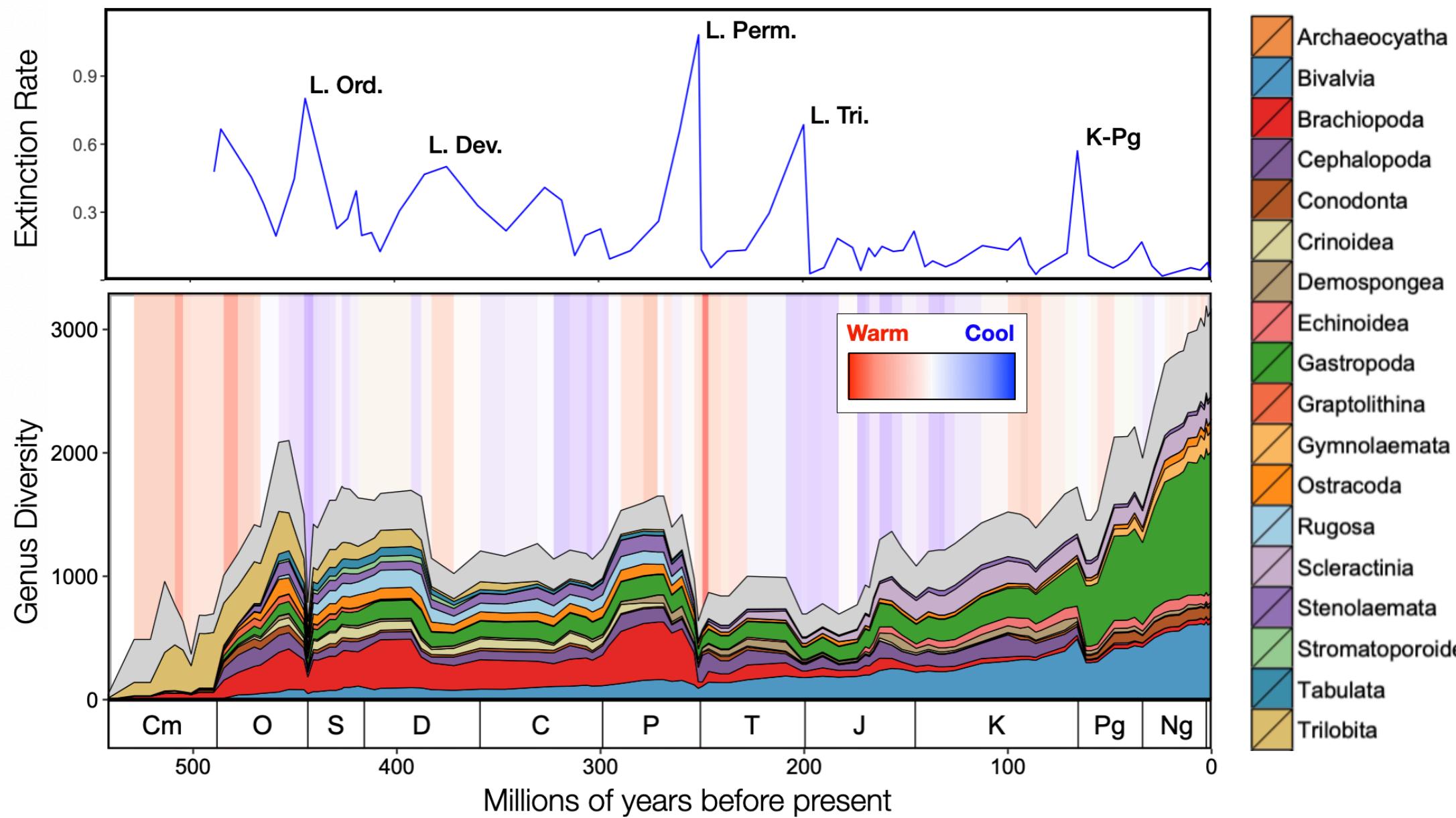
General background & tips on figures and displays

- Types of displays
 - Conceptual: illustrate concept or hypothesis, pose predictions graphically
 - Experimental design: explain experimental design/methods
 - Summary: present information in concise format
 - Data: present results of your analysis

General background & tips on figures and displays

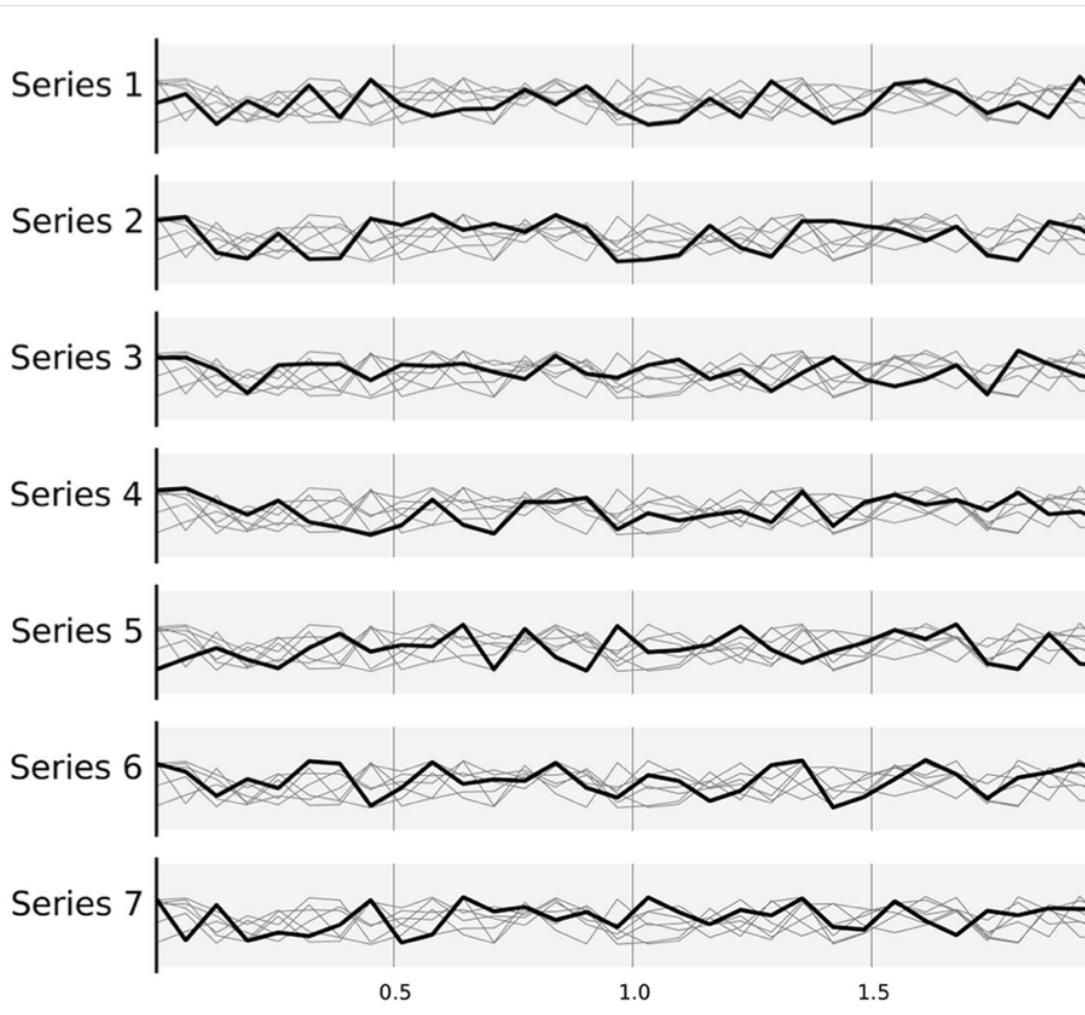
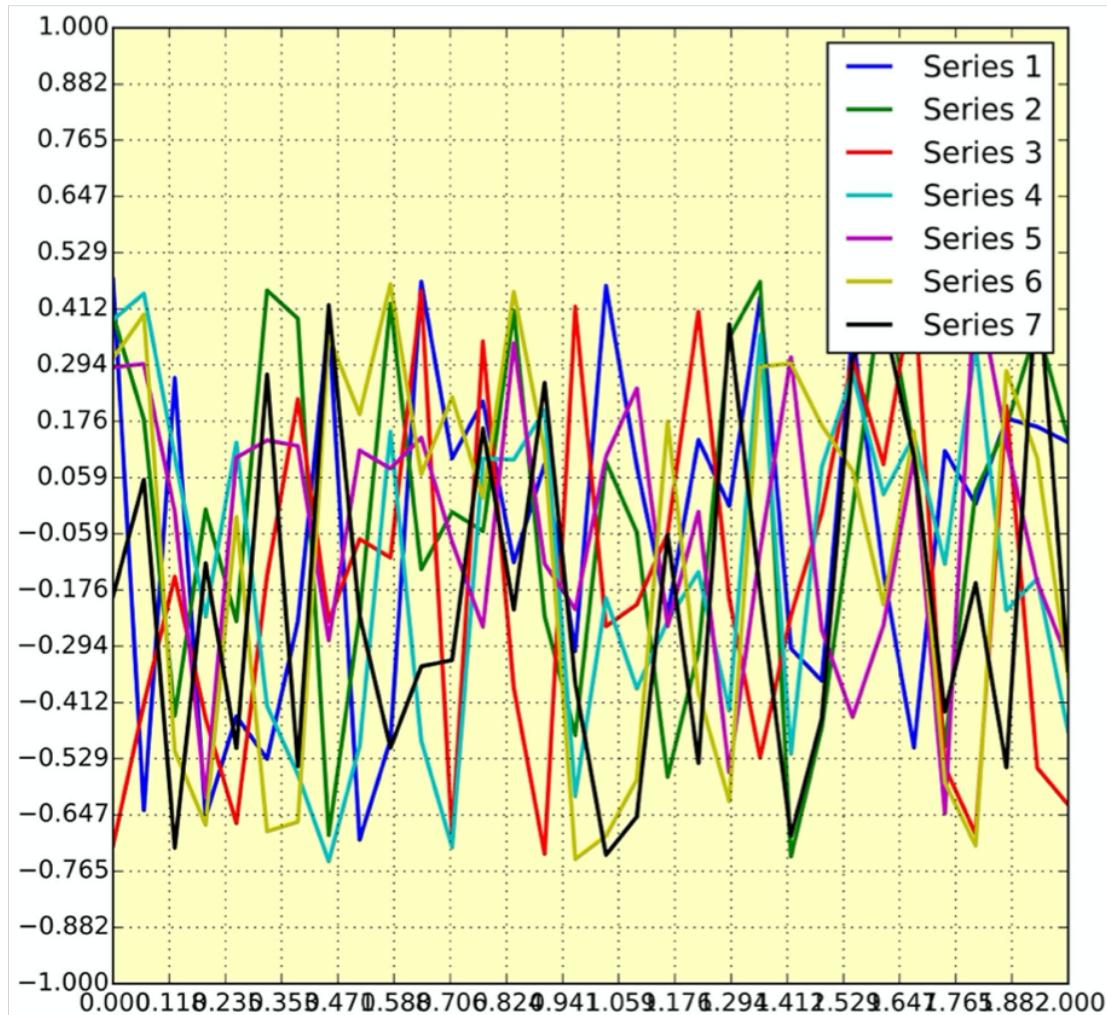
- Integrating displays into text
 - When do you want the reader to look at the display? Position as close as possible
 - Explicitly refer to figure/display when appropriate. E.g. “there is no significant effect of temperature on cell size (Fig. 3).”
 - Conclusions/big picture stuff in text, tell reader what you want them to conclude. Don’t include figures that have no specific point or message.
 - If preliminary data - state why these data are important for specific aim

Identify your message & know your



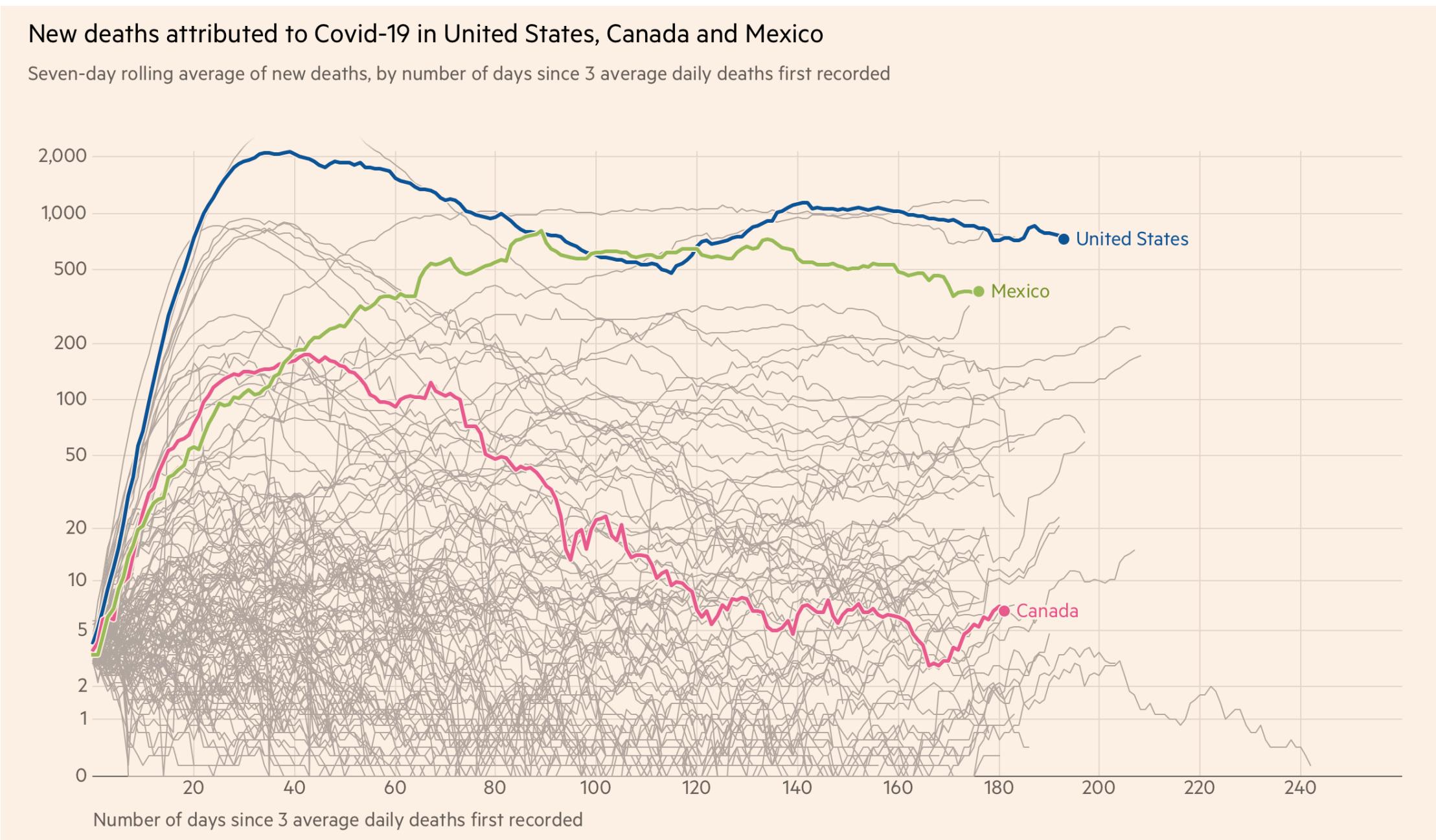
Tailor the type and amount of information you present to the expertise of the audience and the amount of time they will have to digest it

Avoid “chartjunk”



Present your data in a way
that allows the reader to
quickly get the message
with as little effort as
possible

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Present your data in a way that allows the reader to quickly get the message with as little effort as possible

Write clear and succinct captions

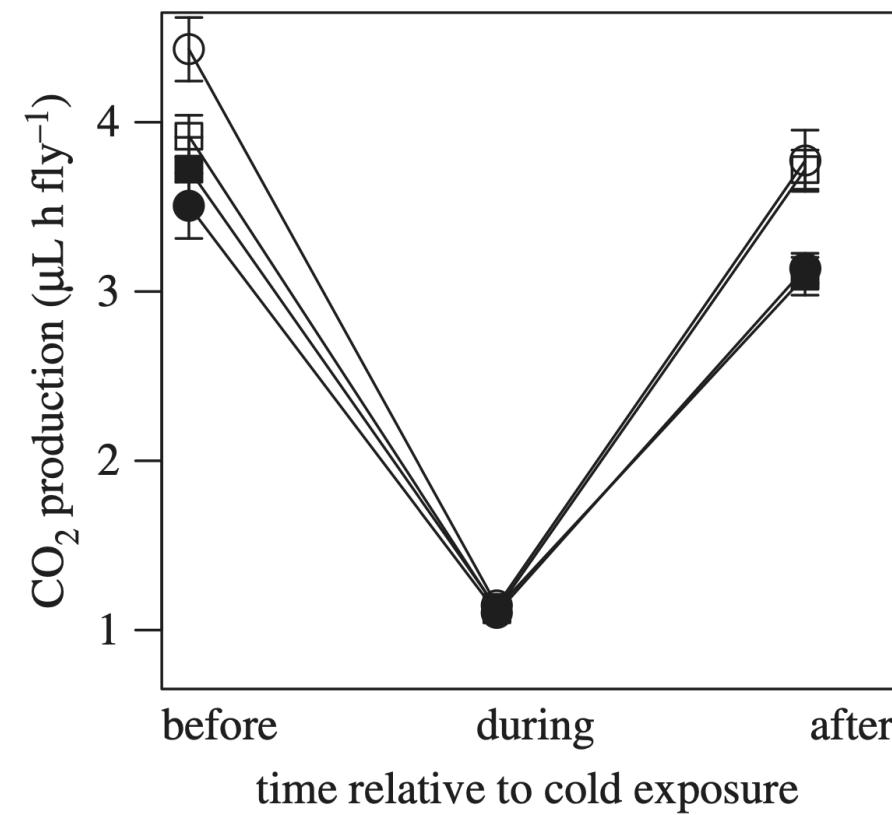
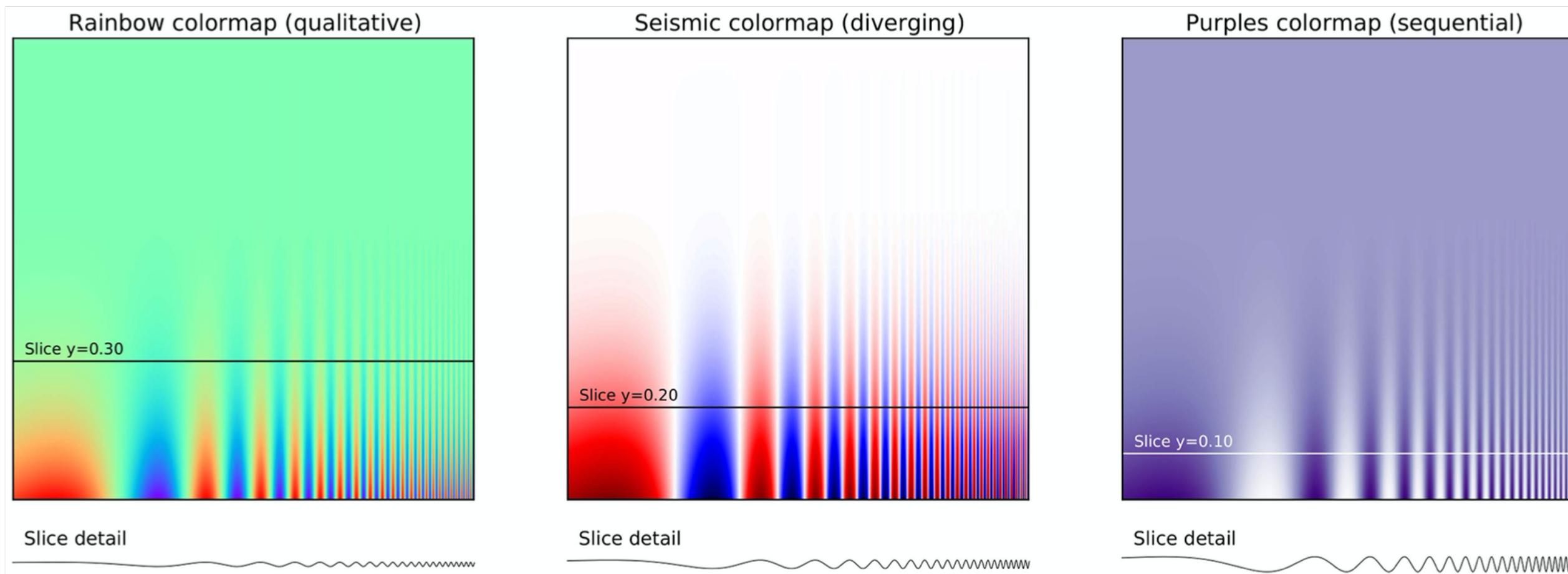


Figure 2. Metabolic rates (estimated by CO_2 production) of cold-hardy (white) and -susceptible (black) flies. Hardy flies have higher metabolic rates before and after cold exposure, and greater metabolic plasticity. $n = 12$ pools of 40 (before and after) or 80 (during) females flies per line per time point, values are means \pm s.e.m. Symbols denote replicate lines from experimental evolution experiment.

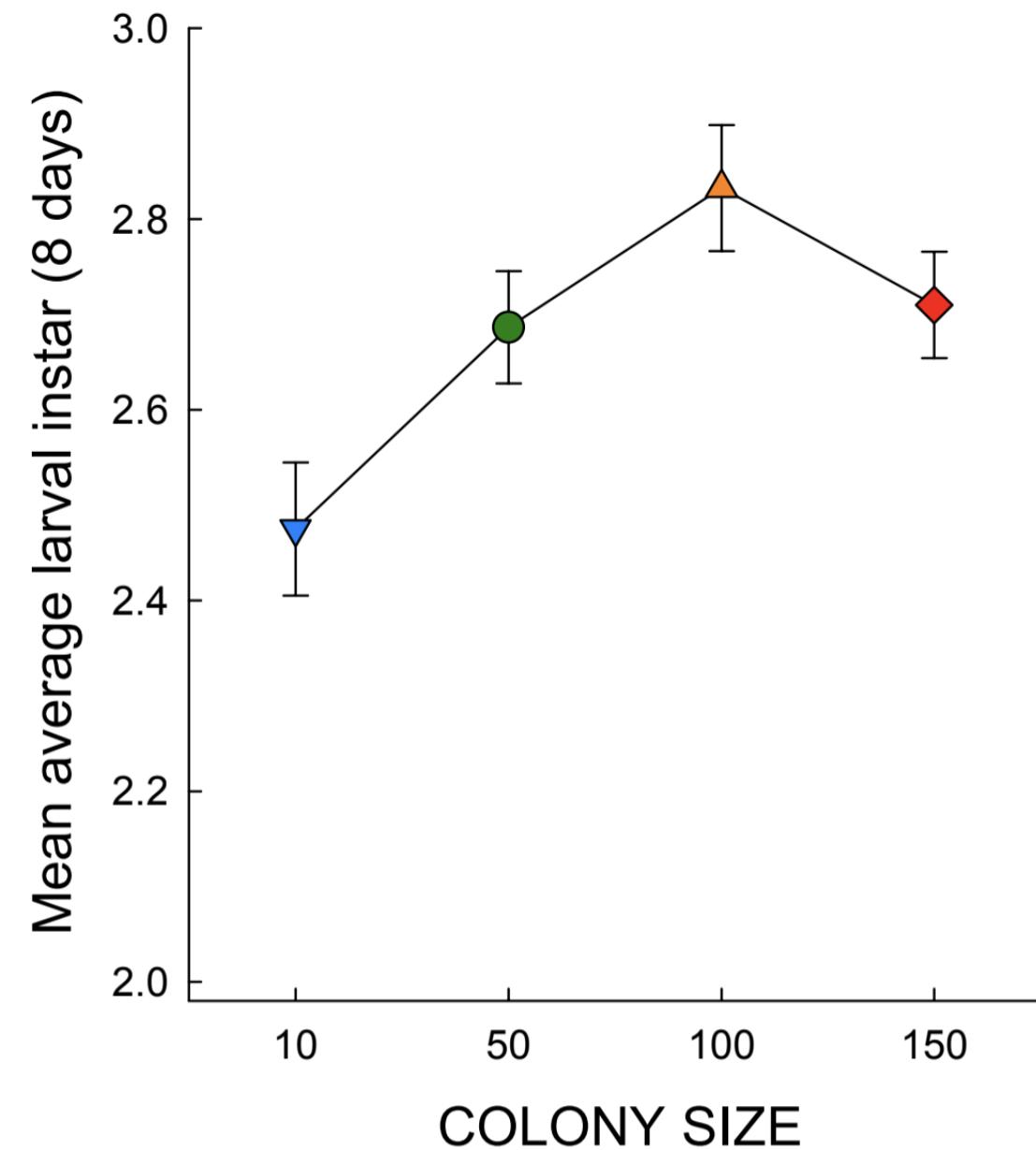
- The caption should be stand-alone text that includes:
- All of the information needed to read and interpret the figure, including error/confidence intervals
- A succinct statement of the message of the figure –what should readers take away from it?

Use color effectively and sparingly



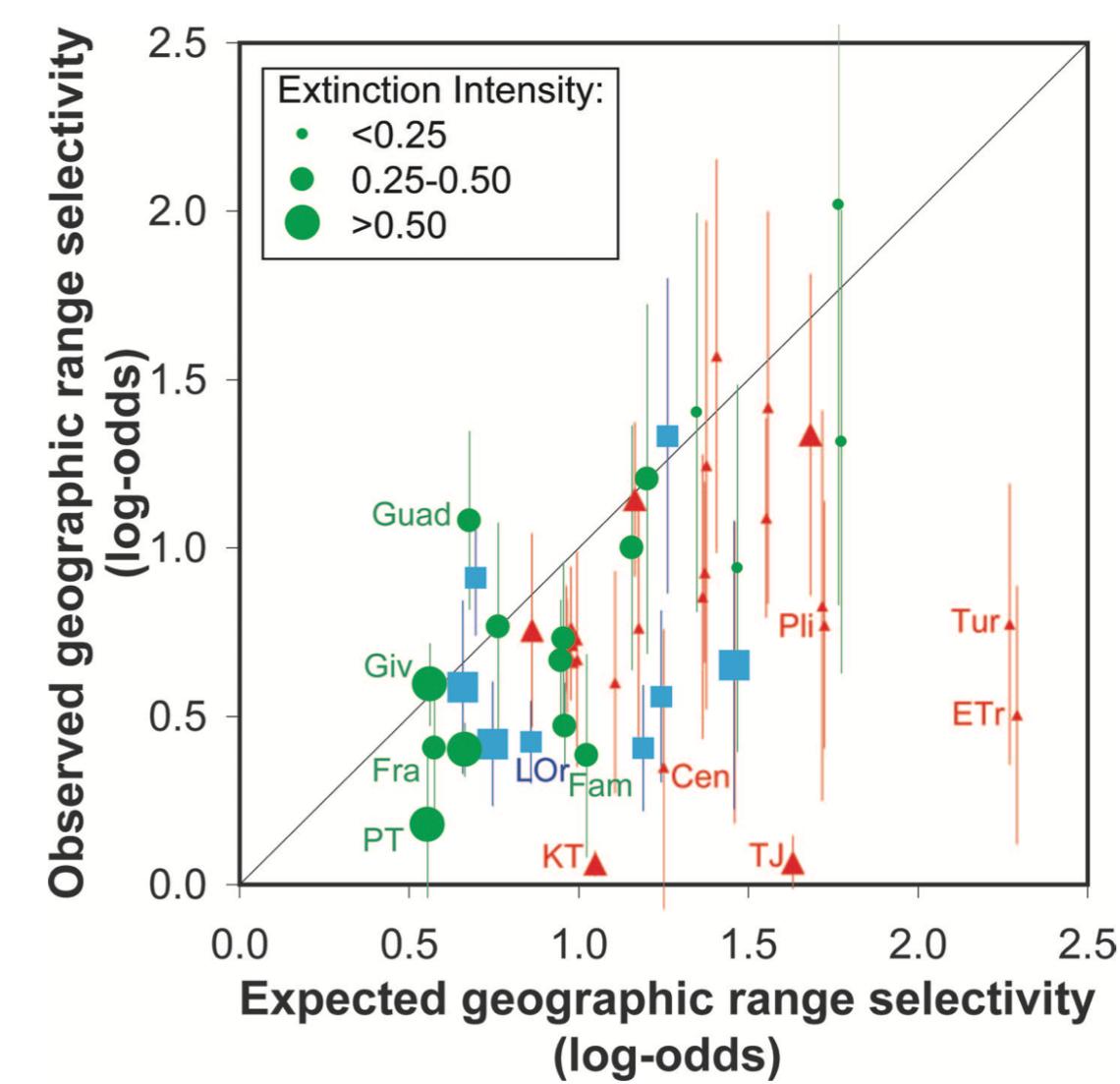
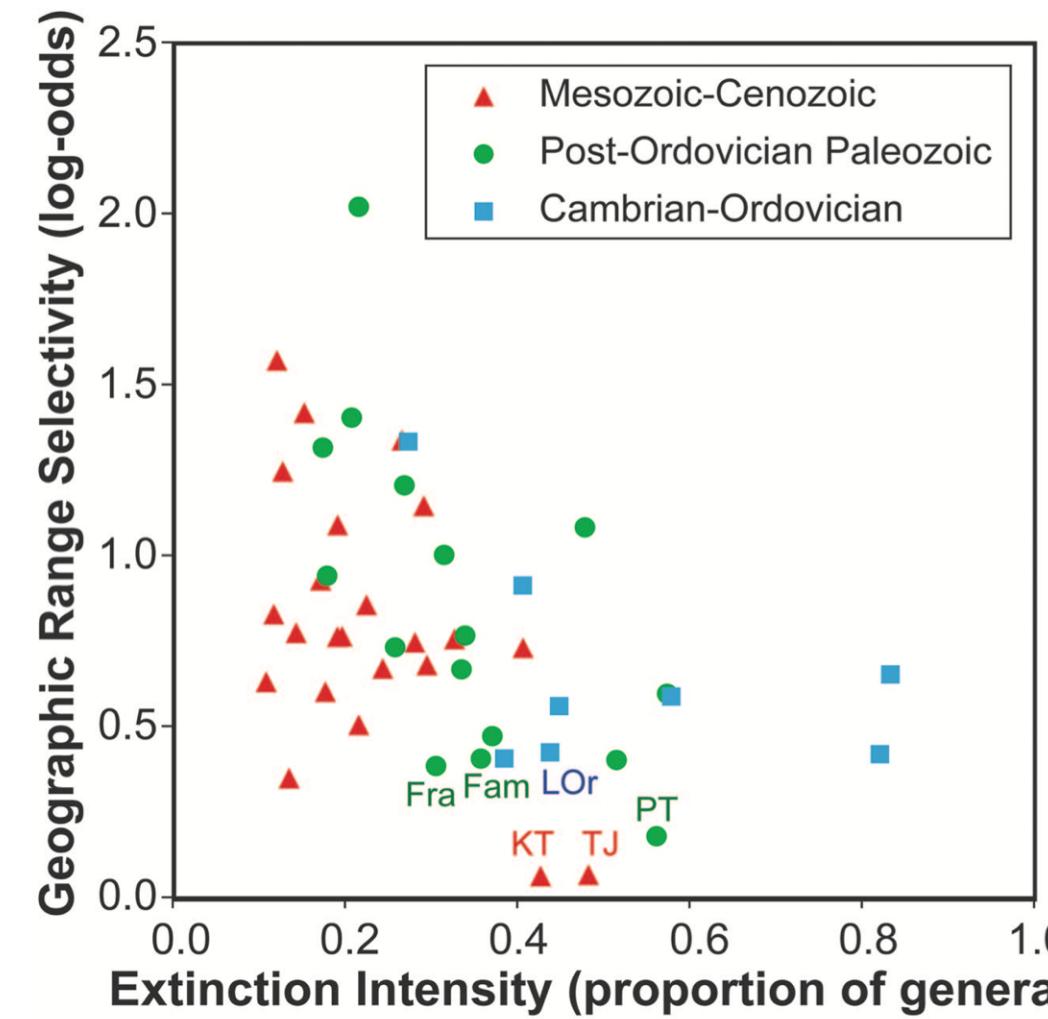
- Color scheme should be chosen to clarify the patterns you want to highlight -don't use extraneous colors
- Color differences should be perceptible to color-blind readers

Use color effectively and sparingly



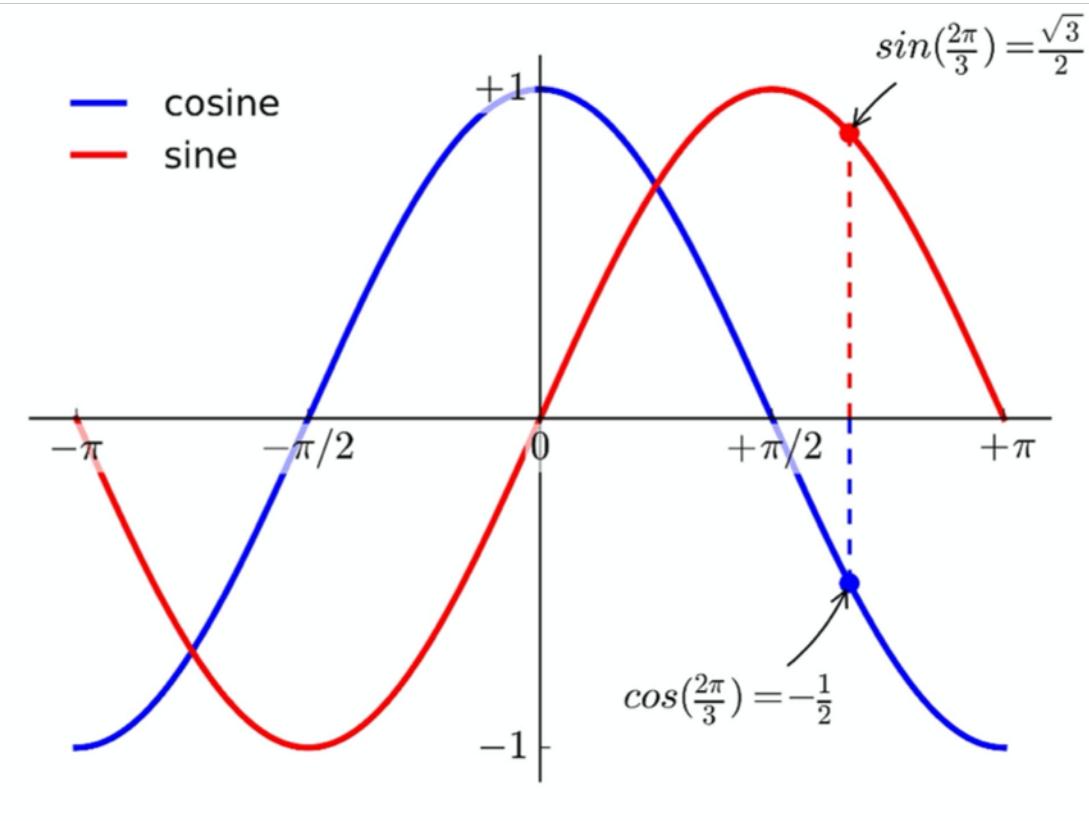
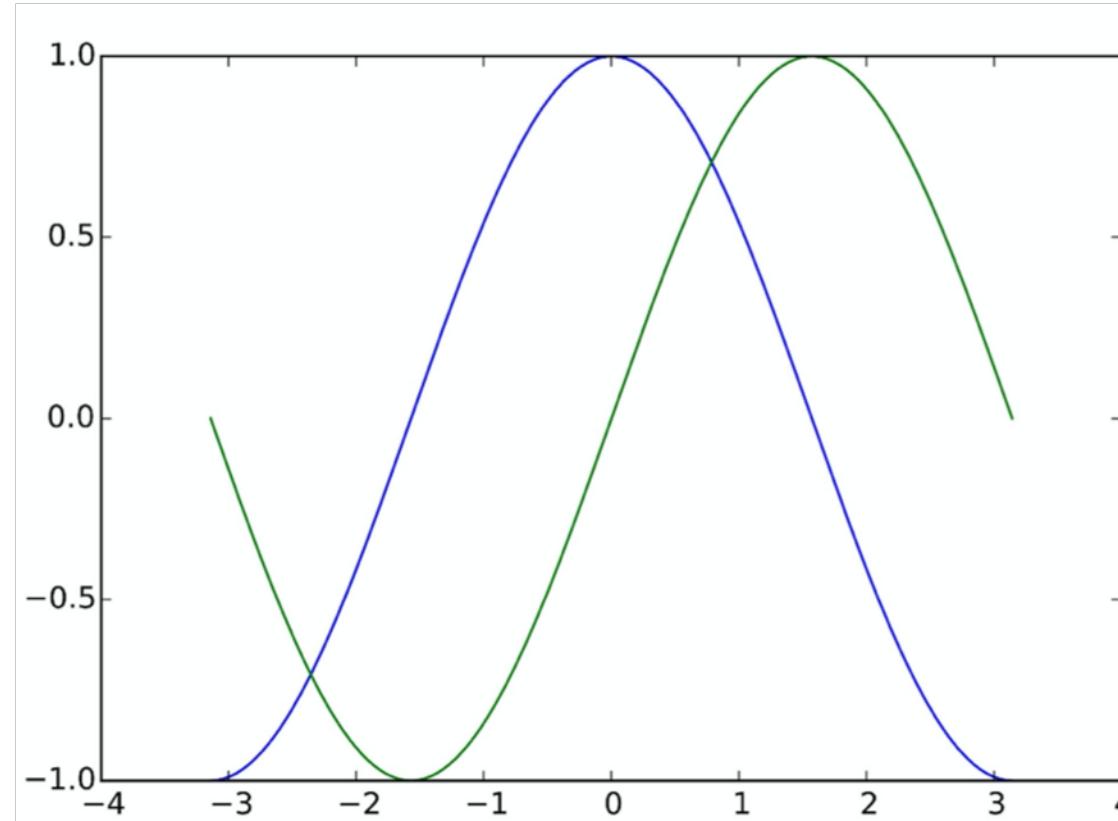
- In this example color is redundant with x-axis and so more confusing than clarifying

Use colors, symbols, and labels consistently



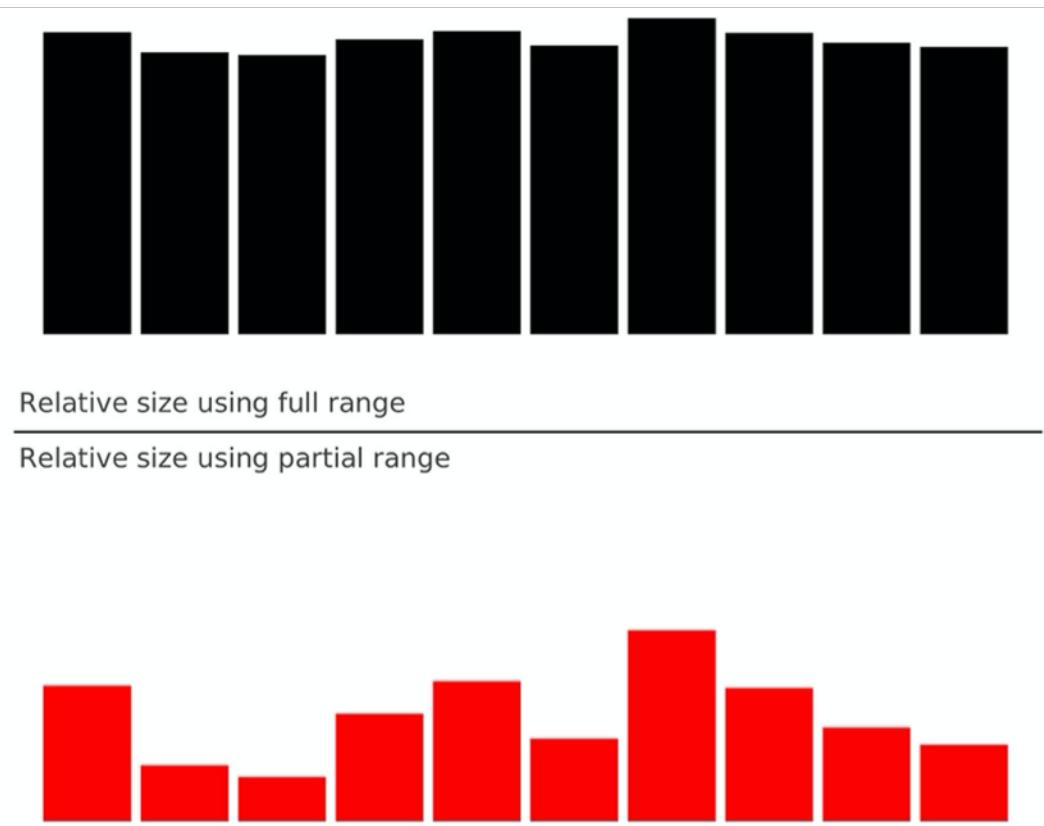
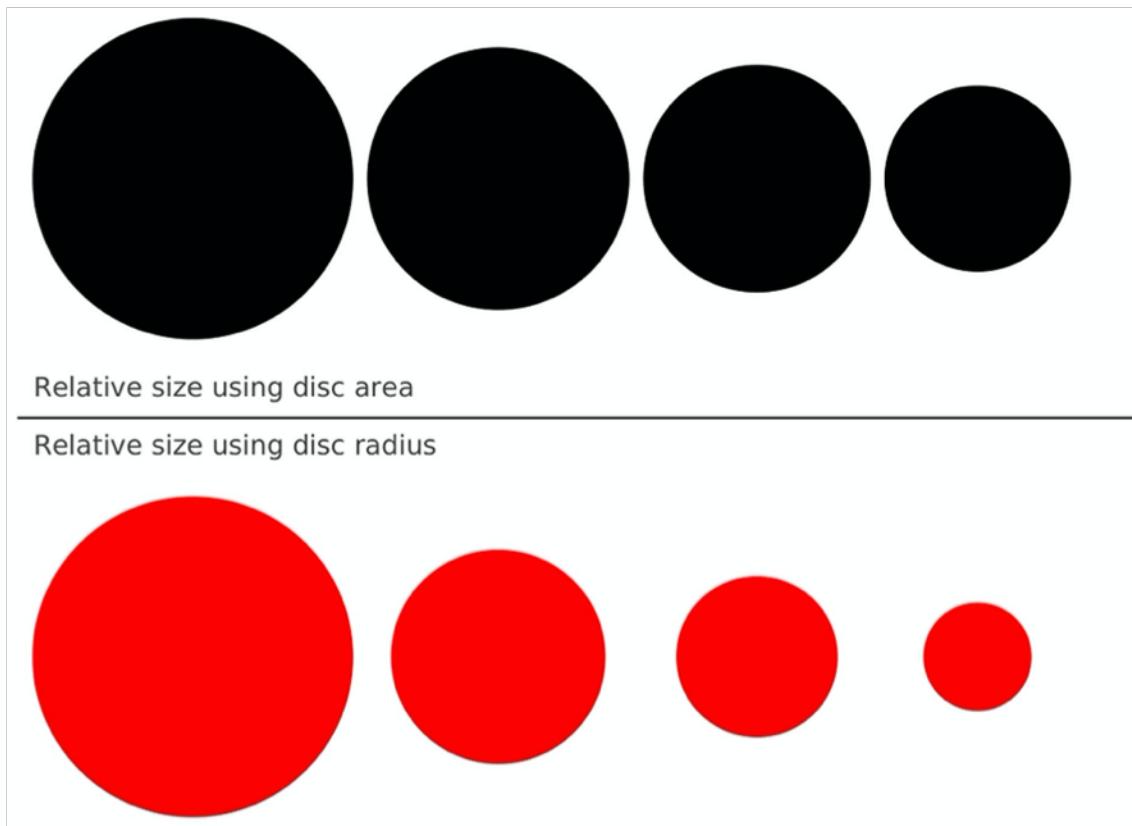
- Consistent choices make it easier for readers to compare figures; inconsistent choices promote confusion

Don't trust the defaults



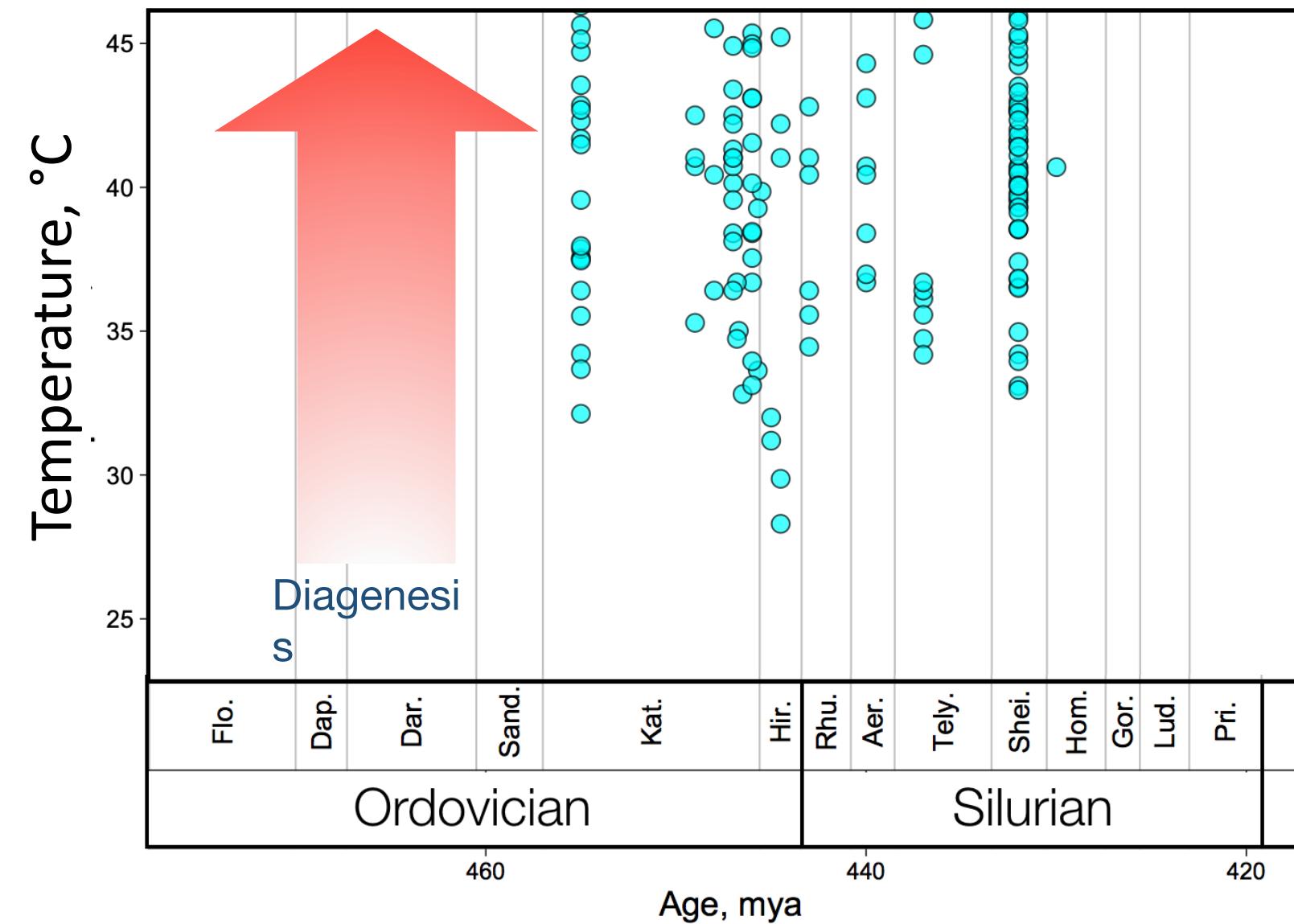
- Remember that the software doesn't know what the *message* of your figure is

Don't mislead readers

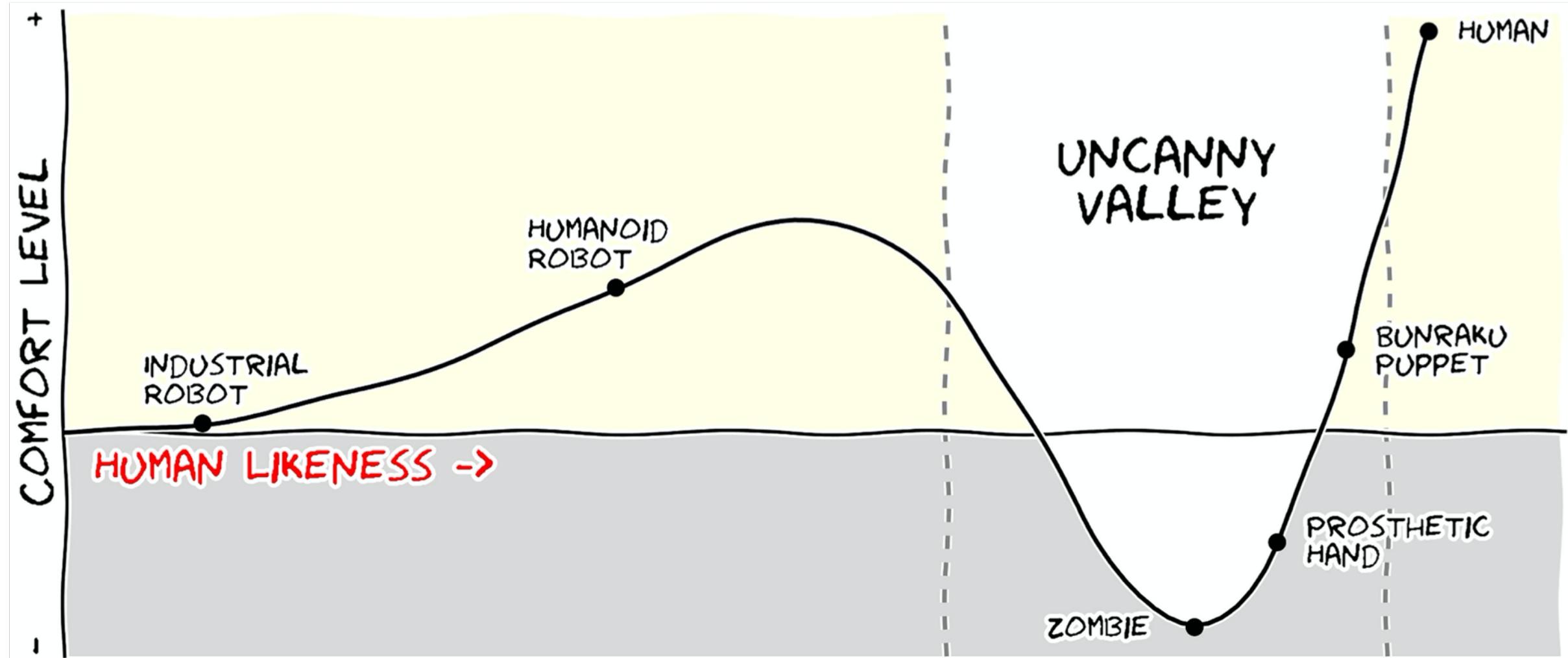


- Make sure that your figures effectively convey your message but that they also do justice to the data
- When making decisions about scaling etc. pay attention to how readers will interpret the scales

Provide guidance to head off predictable confusion or misunderstandings



Prioritize message over beauty and information density



- Provide only as much information as is necessary to communicate your message; don't confuse readers with extraneous information or aesthetic flourishes (but make sure that the reader knows where to go to get additional information if they want it)

Learn to use a single flexible platform (e.g. R or Python) for making your figures

- Invest the energy to figure out how to make and modify your figures with code, avoid modifying in Illustrator or similar packages as much as possible
- As much as possible, integrate your figure-making into your analytical workflow so that your figures are easily updated with new data or aesthetic changes

Assignment

- From your current reading find one example of a figure that you think is very effective and one example of a figure that you think could be improved. Submit the figures along with a short paragraph explaining why you think each figure is good or bad
- If you are currently working on figures for a proposal or paper, you can instead submit the figure for peer critique