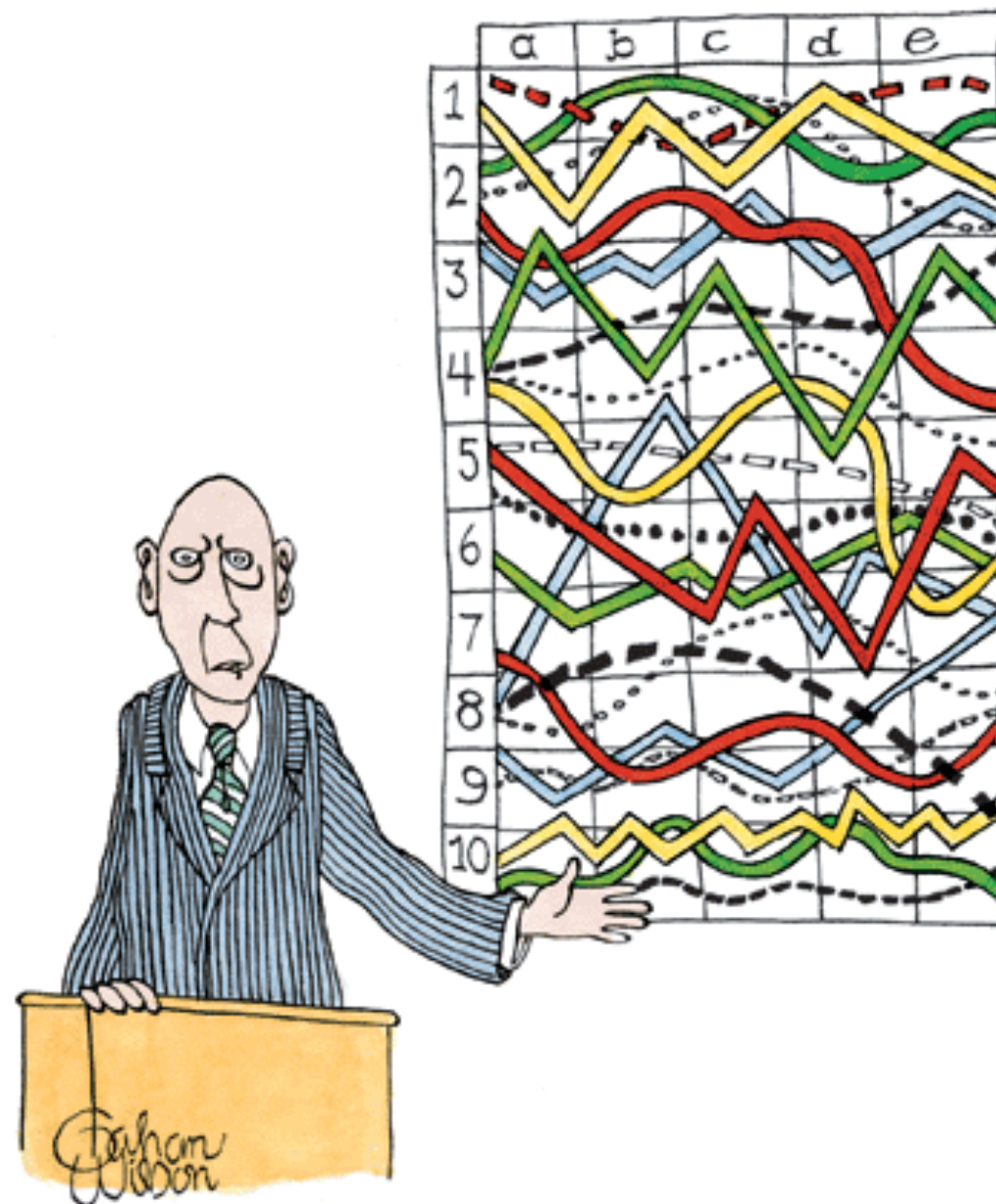


Data Visualization

Ellianna Abrahams & Thomas Robitaille

Why is
Data Visualization
useful?



"I'll pause for a moment so you can let this information sink in."

“Good data visualization
leads you to see what might
otherwise go unnoticed”

- *Daniela Huppenkothen* -

✦ **To Discover**

- ✦ Exploratory plots and charts allow us to find relationships

✦ **To Explain**

- ✦ Published figures allow us to disseminate results with the community
- ✦ Outreach visualizations allow us to share our findings with the public

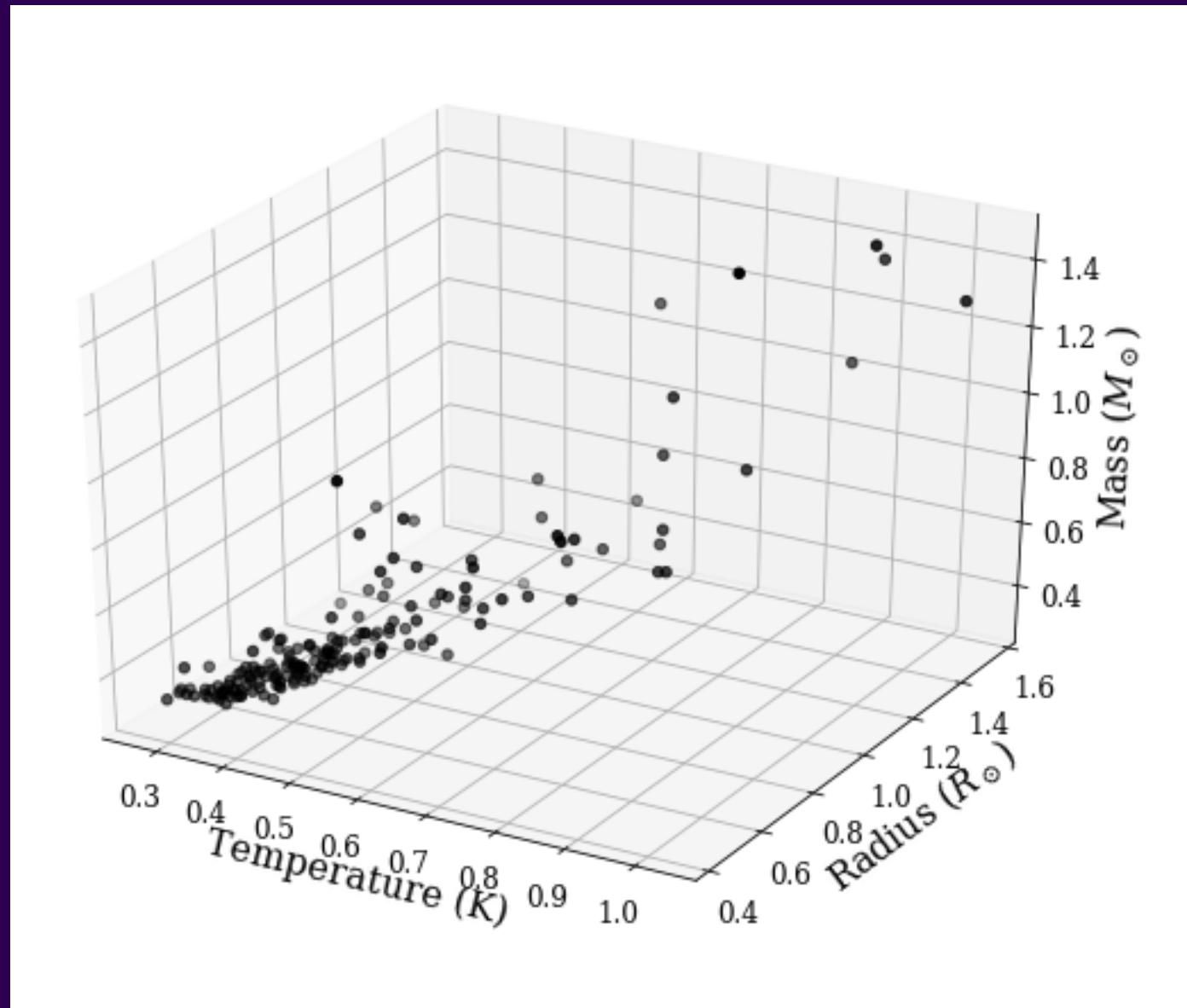
✦ **To Discover**

- ✦ Exploratory plots and charts allow us to find relationships

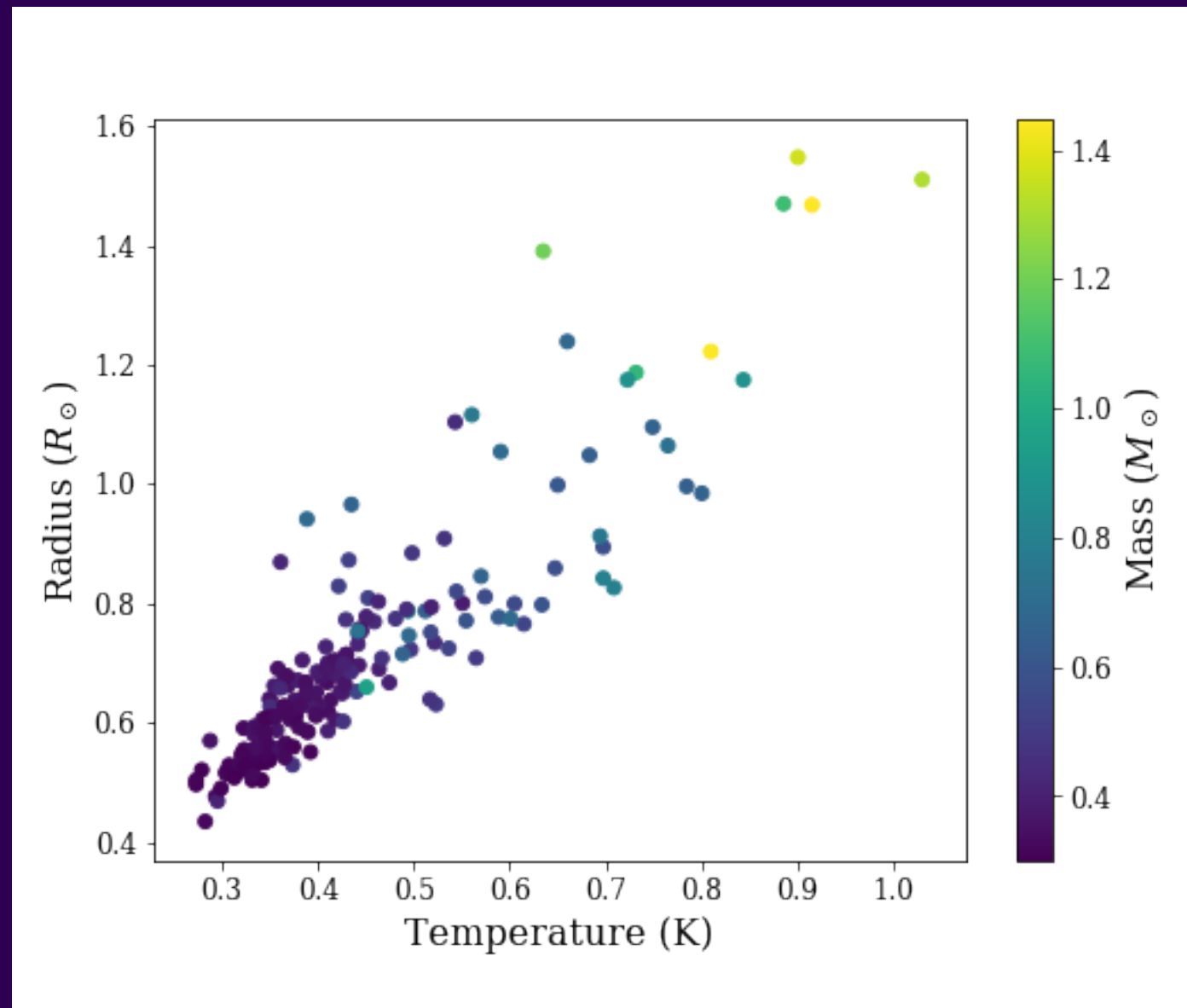
✦ **To Explain**

- ✦ Published figures allow us to disseminate results with the community
- ✦ Outreach visualizations allow us to share our findings with the public

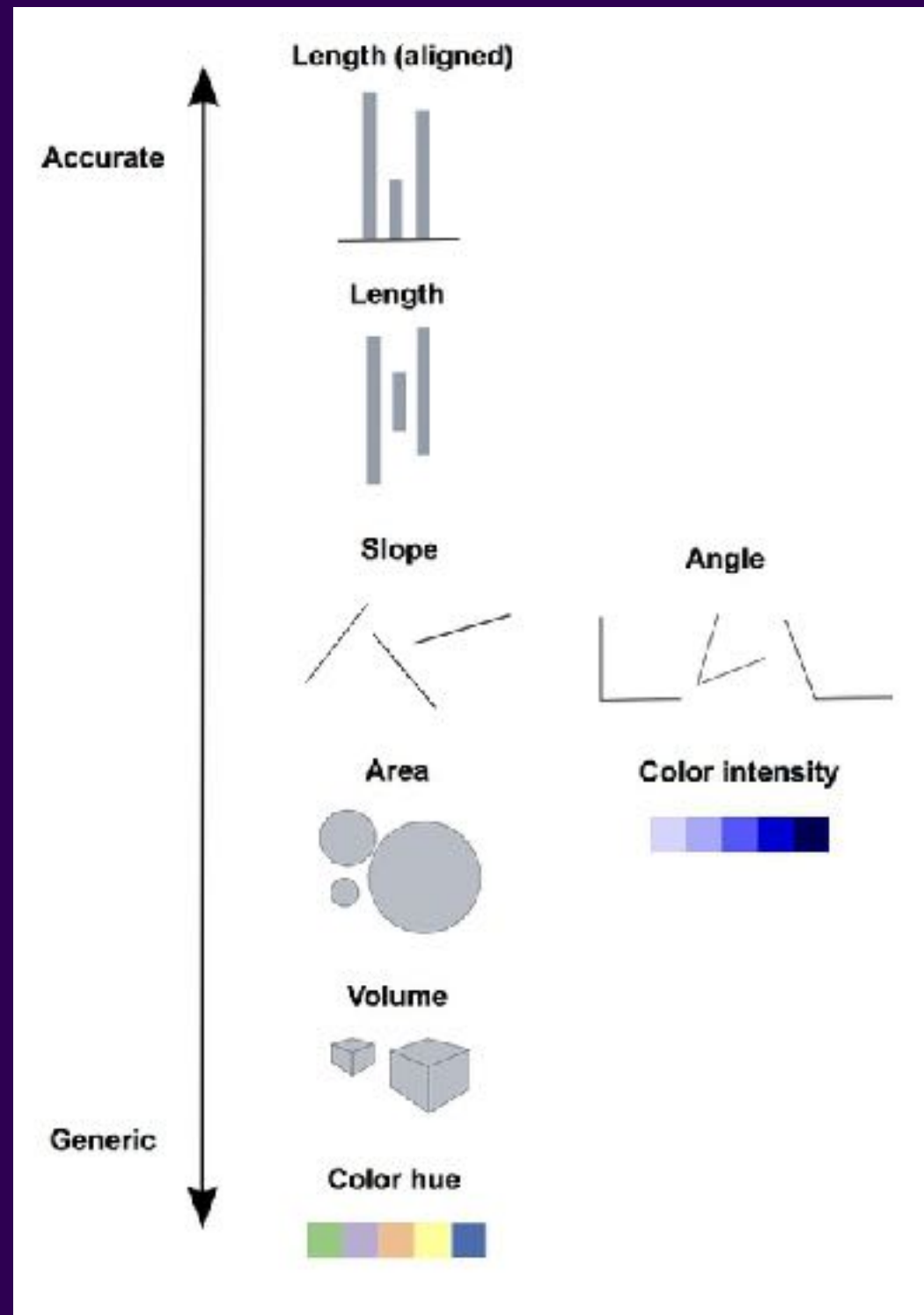
1. Simpler is Better



1. Simpler is Better

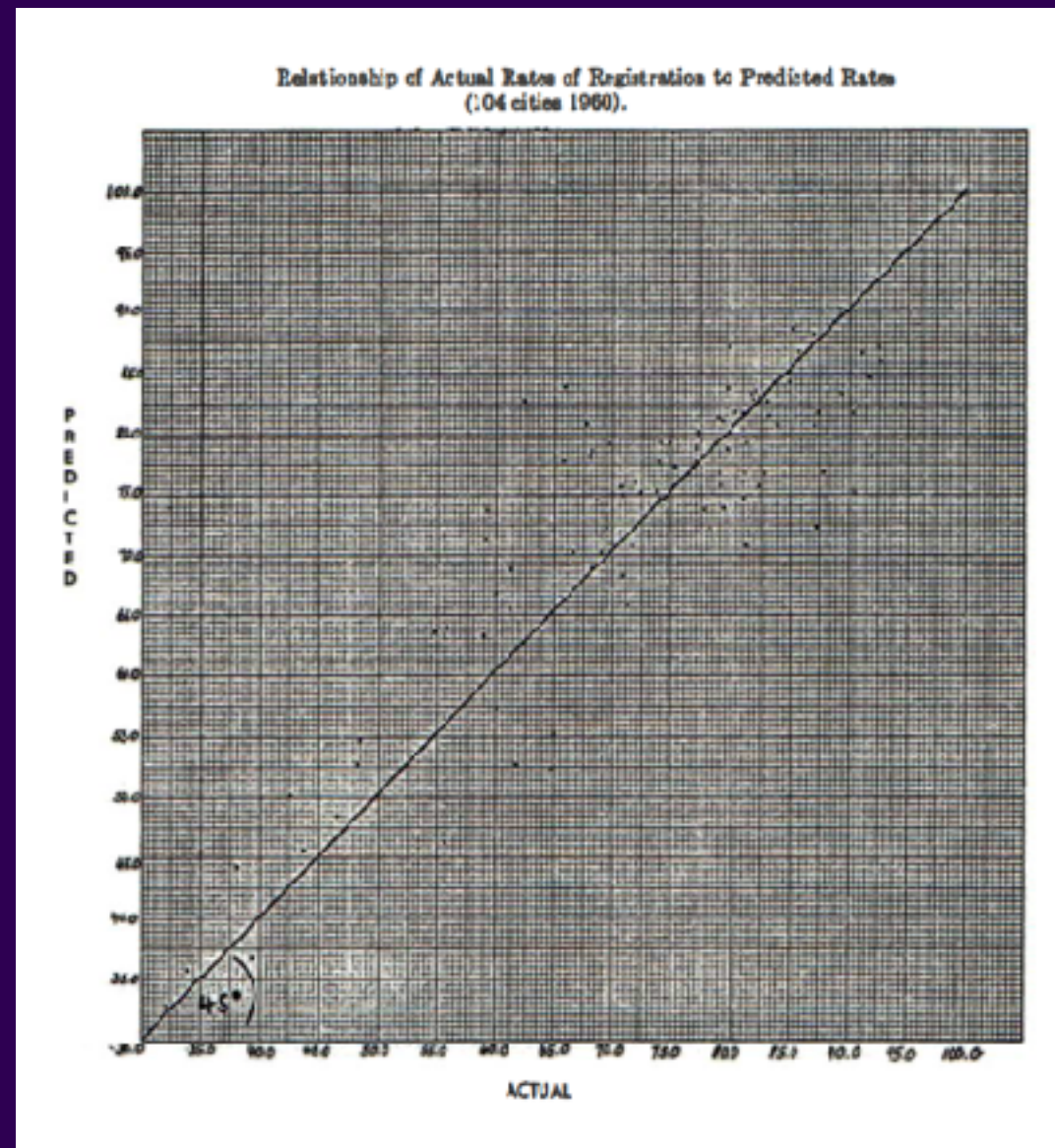


Perceptual Hierarchy

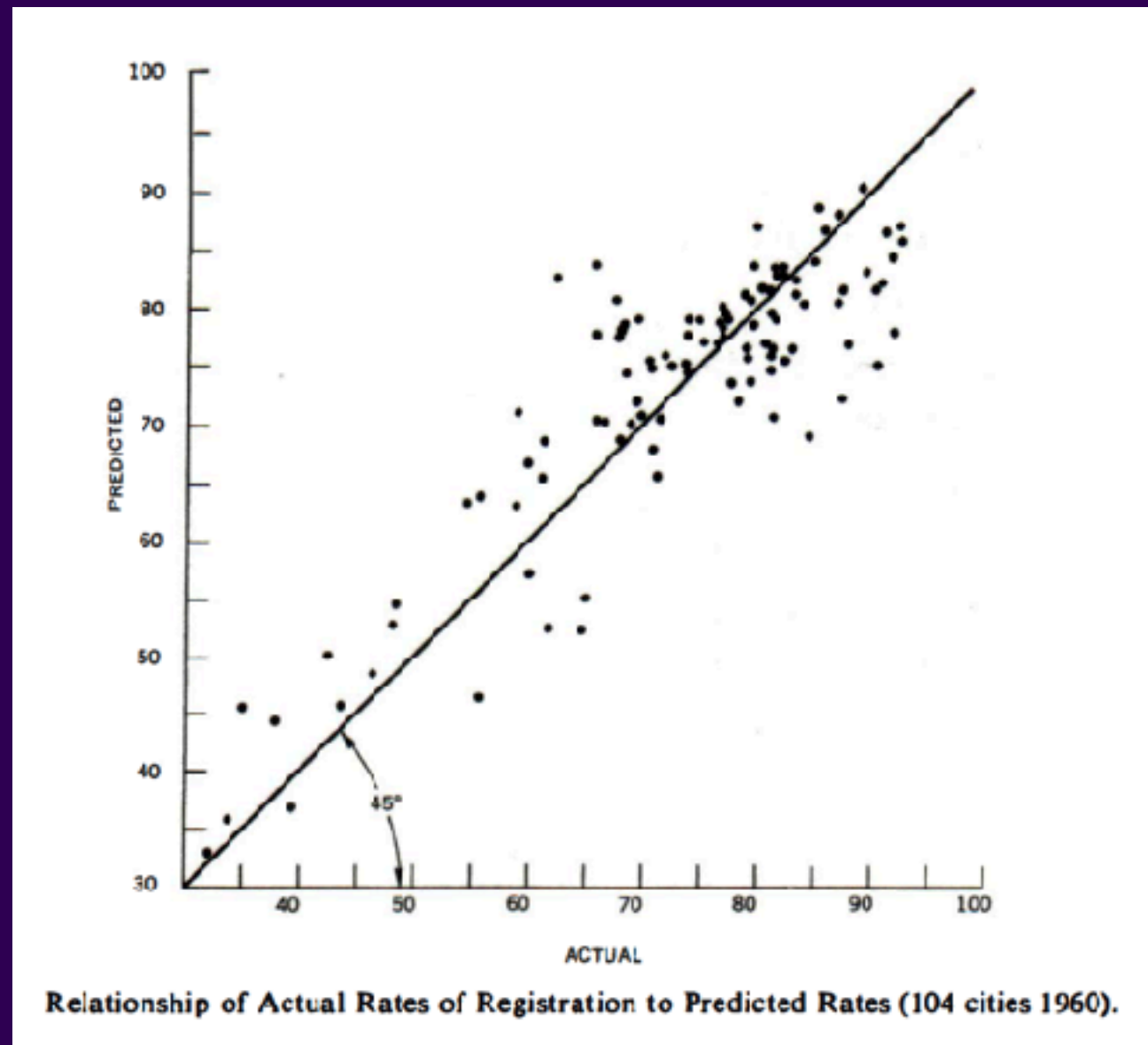


Cleveland & McGill 1984
Graphic by P. Aldhous

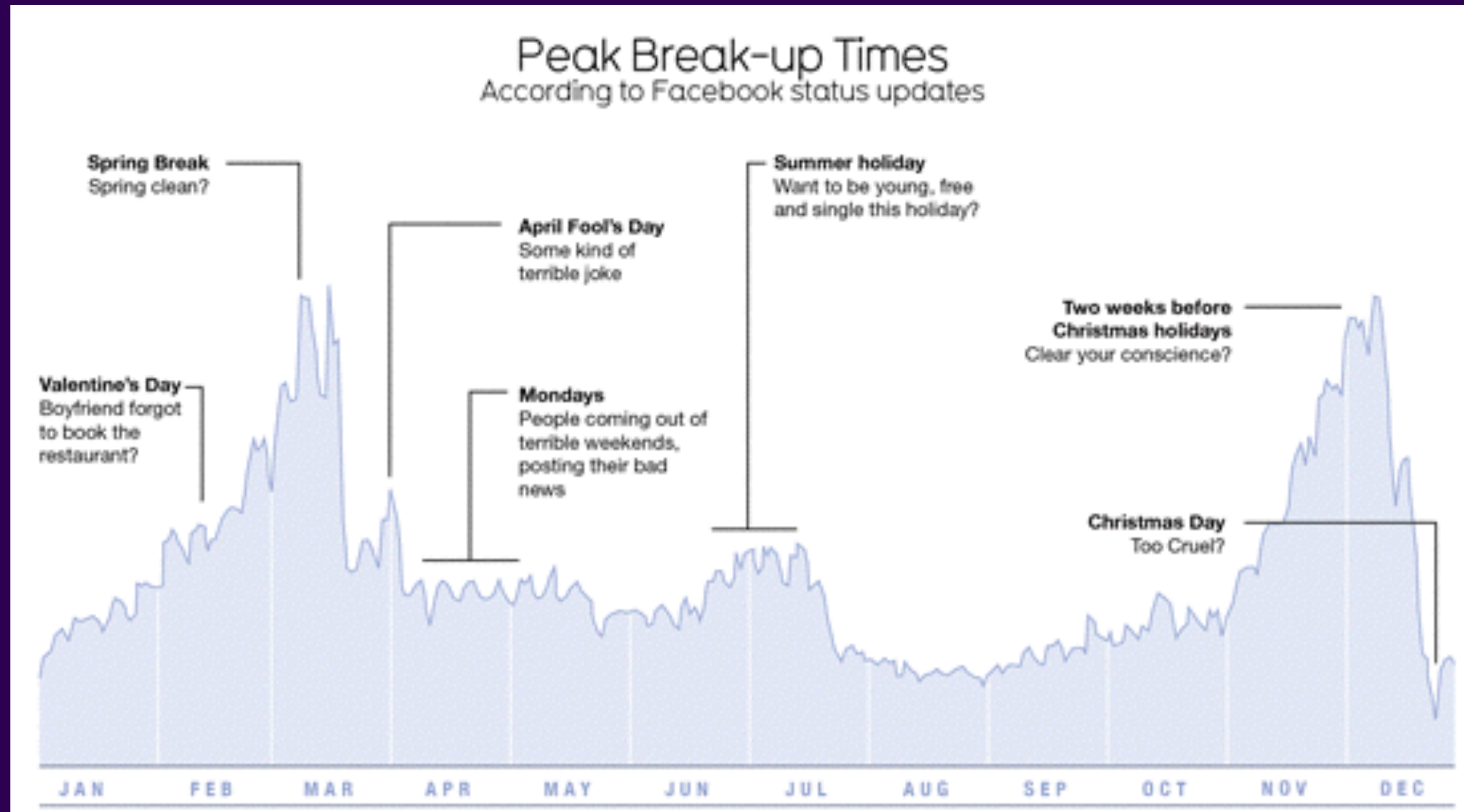
2. “Spend Ink” on Data



2. “Spend Ink” on Data



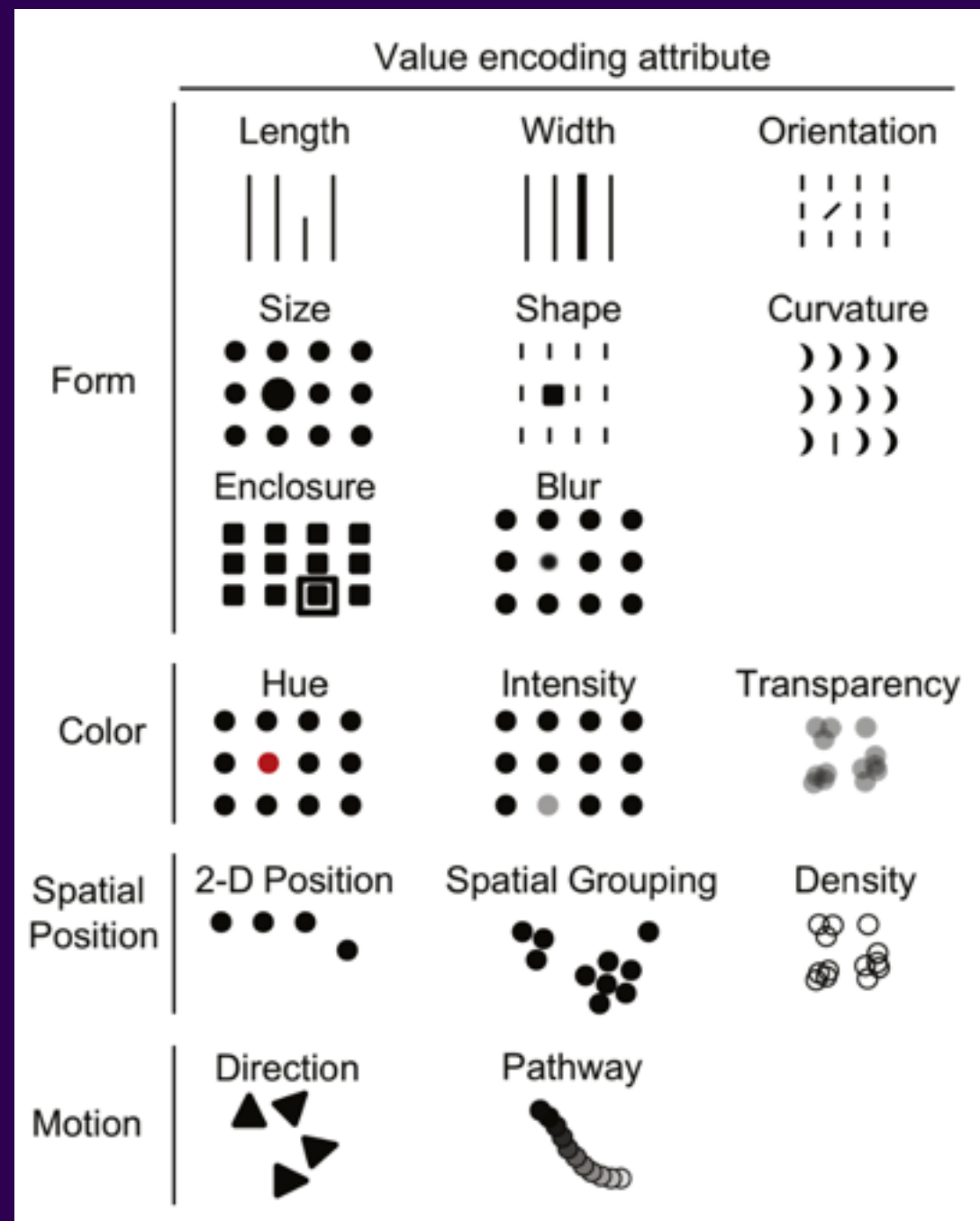
3. Make Data Coherent



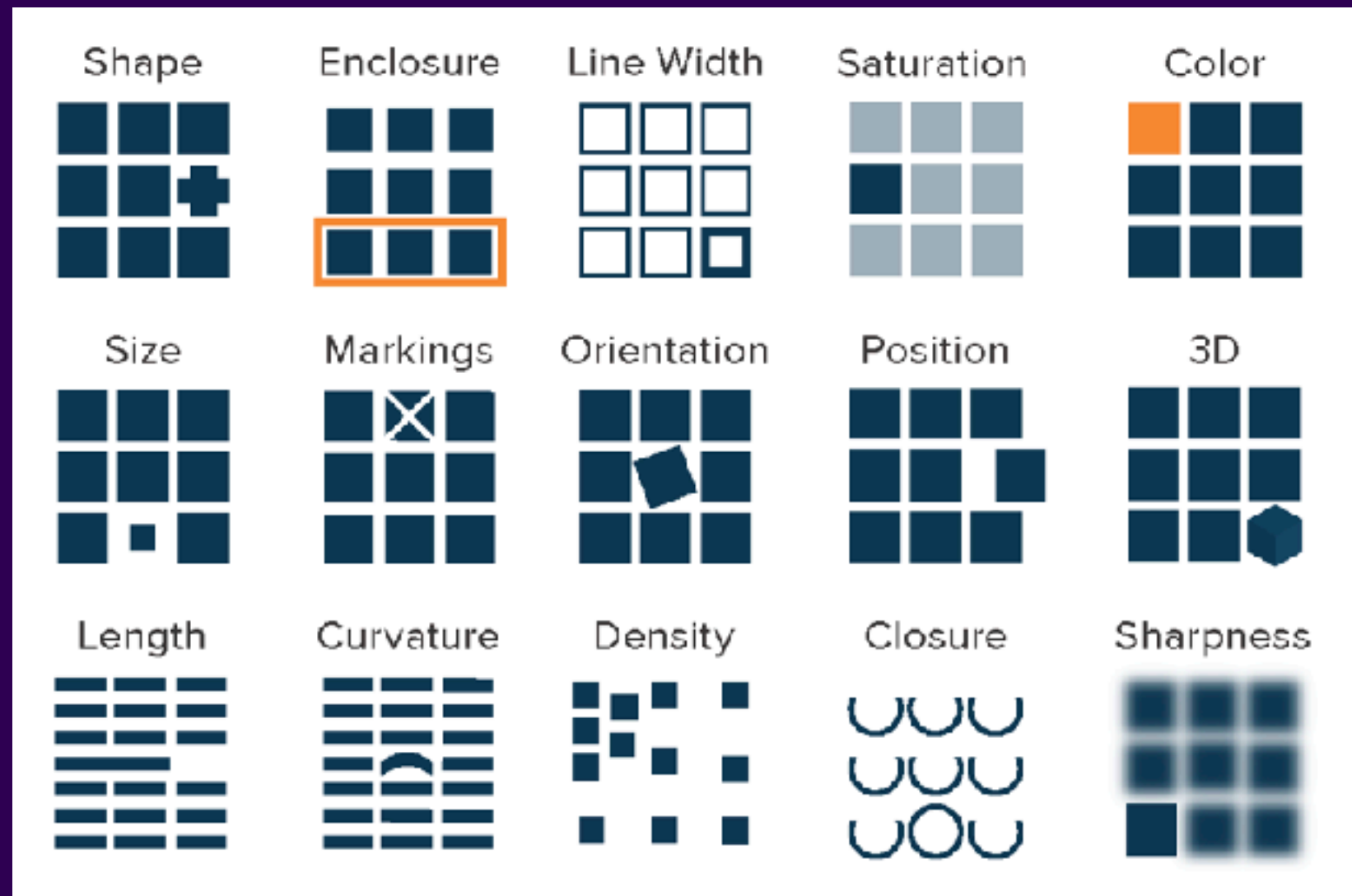
Tufte 1983

Graphic by D. McCandless and L. Byron

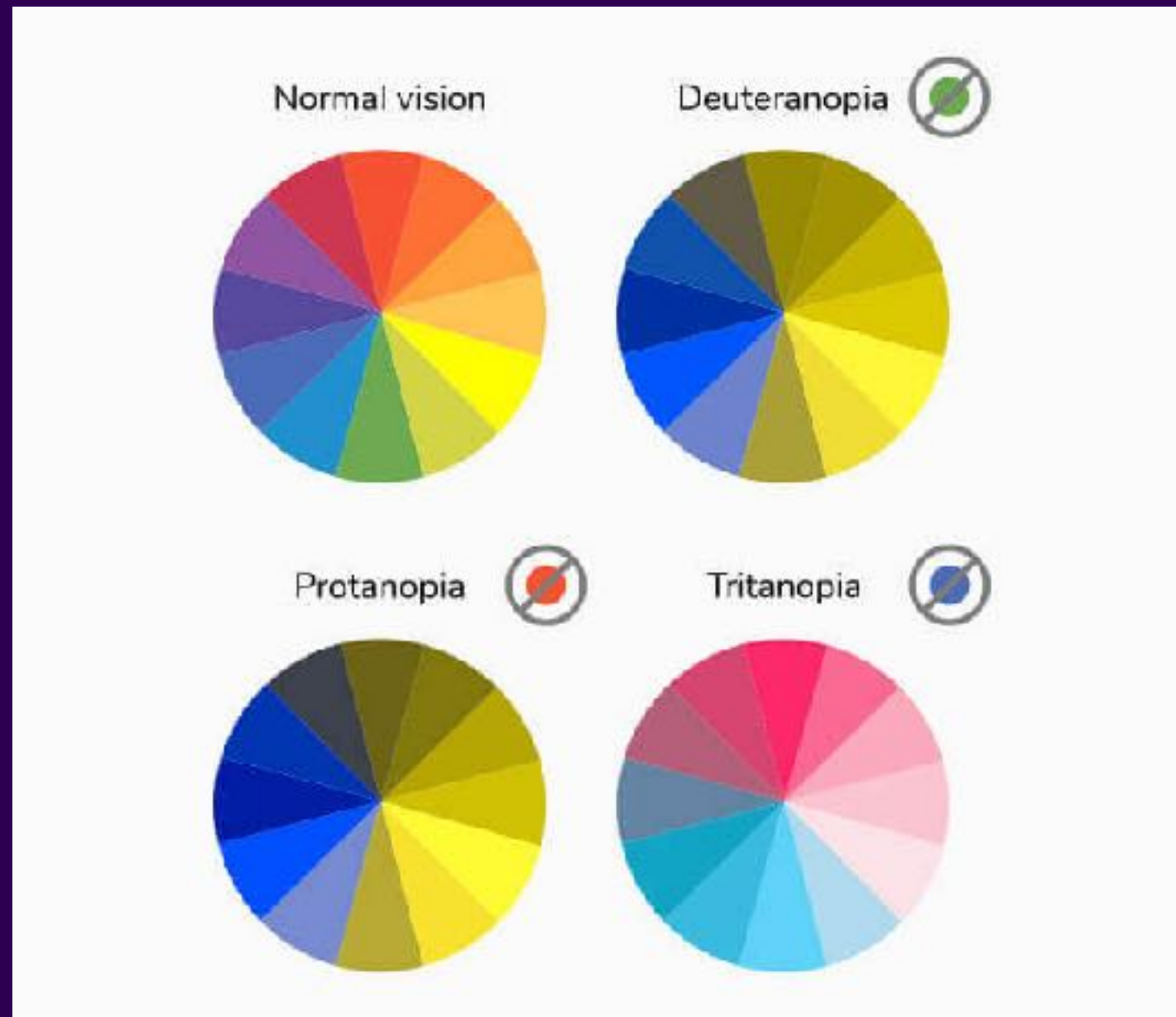
Pre-Attentive Processing



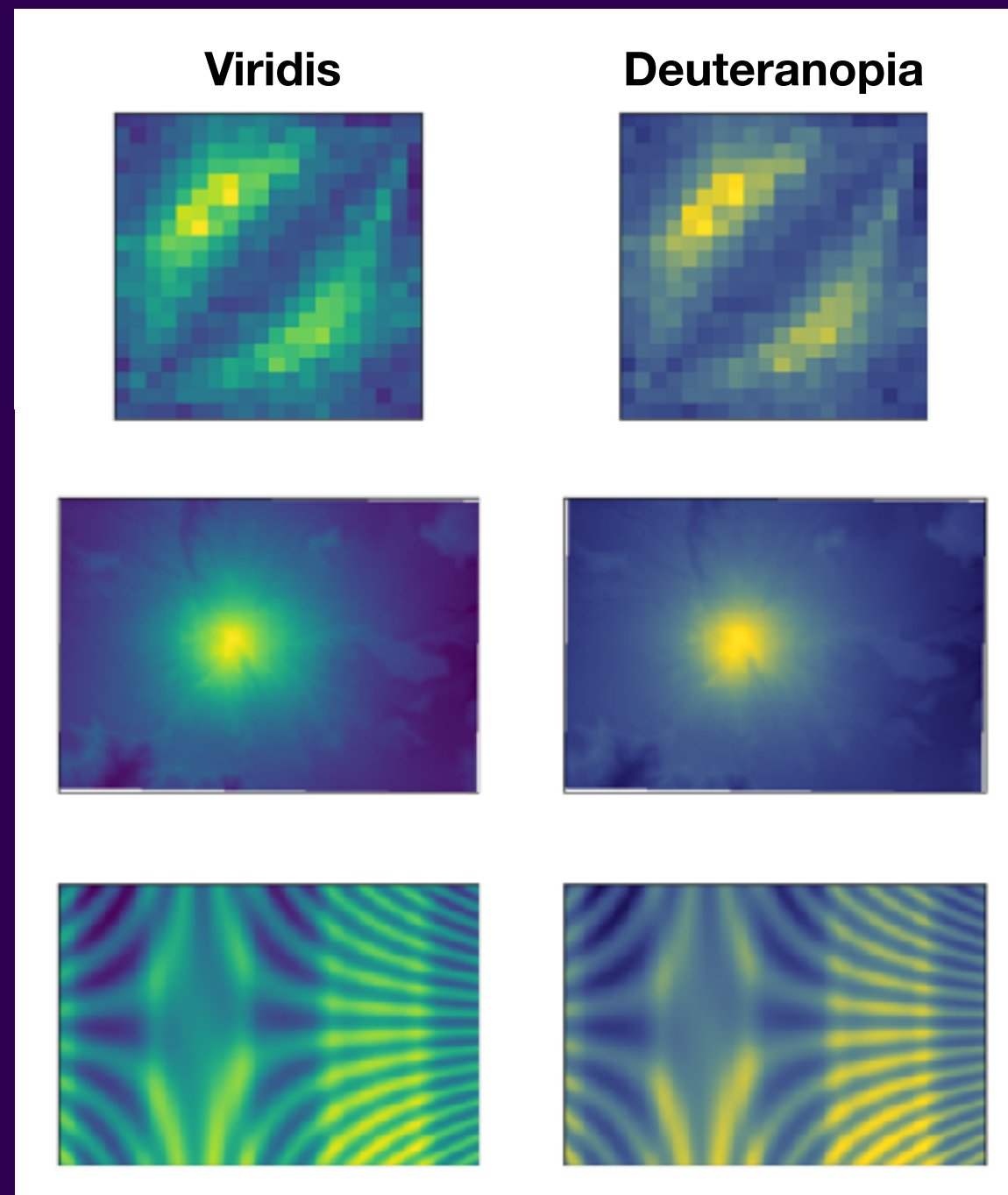
Pre-Attentive Processing



4. Accessibility



Perceptual Uniformity



Further Reading

✦ **Simpler is Better**

- ✦ Ten Guidelines for Effective Data Visualization in Scientific Publications, Kelleher & Wagener
- ✦ Show Me the Numbers, Designing Tables & Graphs to Enlighten, Few 2004
- ✦ Introduction to Data Visualization, P. Aldhous Fall 2016 ([Course Notes](#))
- ✦ Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods, Cleveland & McGill 1987

✦ **"Spend Ink" on Data**

- ✦ The Visual Display of Quantitative Information, Tufte 1983
- ✦ Form and Function, Small 1947

Further Reading

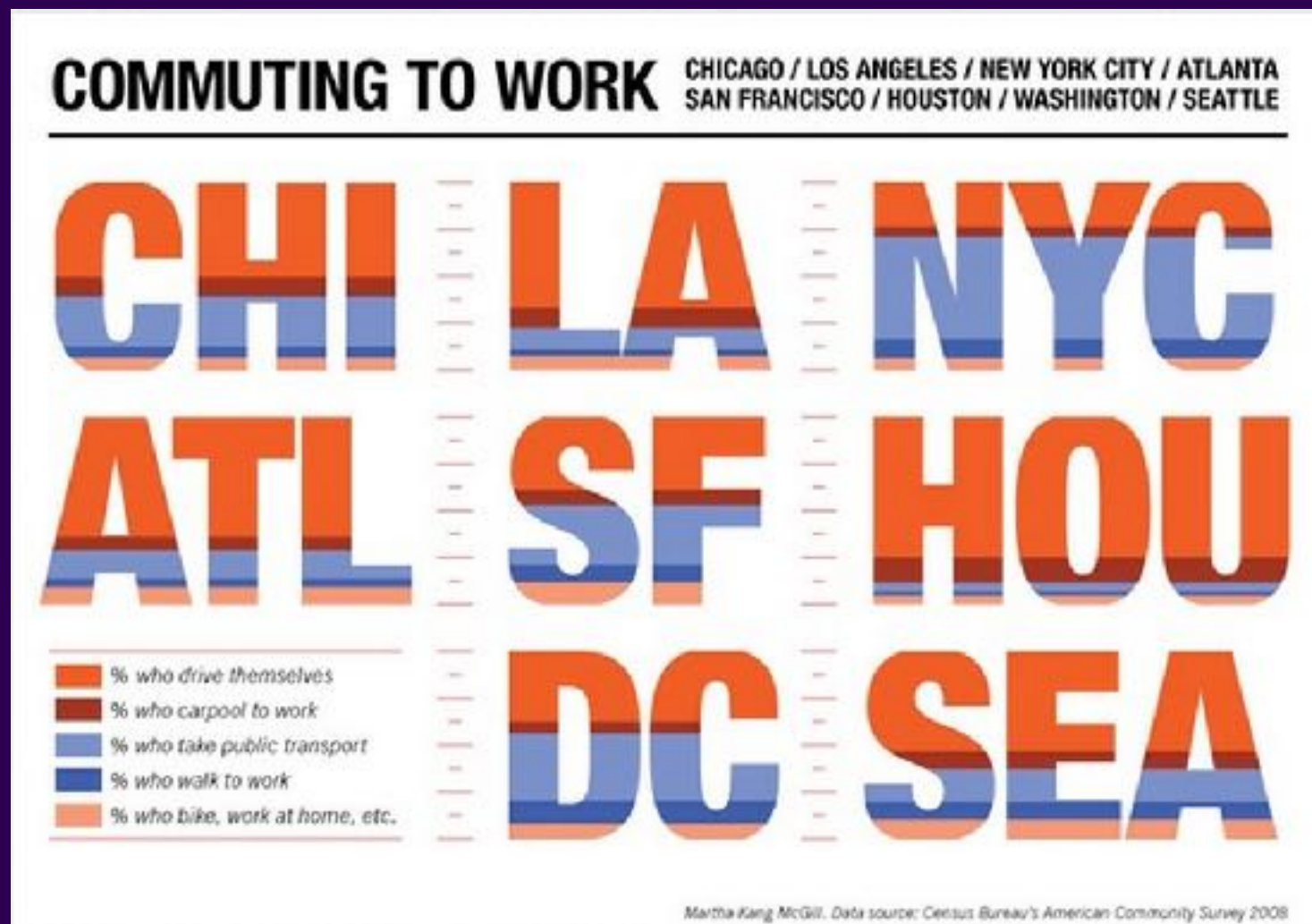
✦ Make Data Coherent

- ✦ Beautiful Evidence, Tufte 2006
- ✦ Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods, Cleveland & McGill 1987
- ✦ Information Visualization: Perception for Design, Kauffman 2004

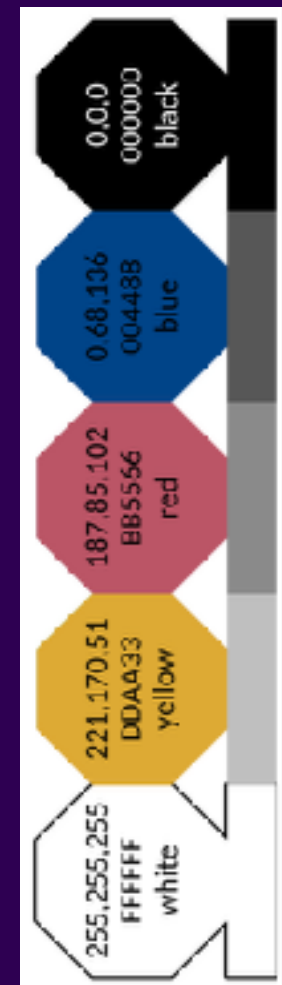
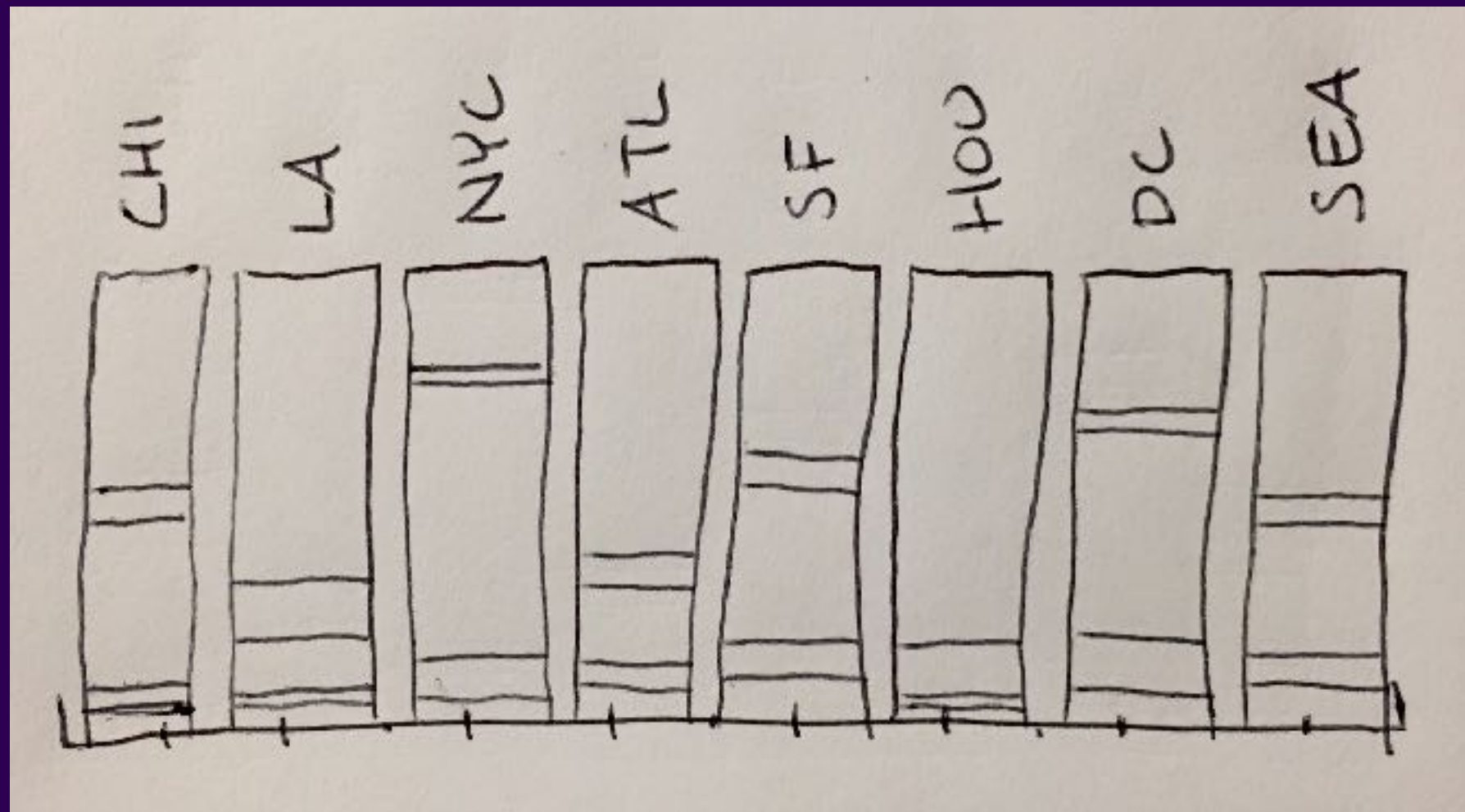
✦ Accessibility

- ✦ How to Make Your Charts More Accessible with Color Blind Friendly Palettes, R. Cravit ([Venngage Article](#))
- ✦ A Better Default Color Map for Matplotlib, Smith & van der Walt ([Scipy Con Talk](#))
- ✦ An Improved Rainbow Colormap for Visualization ([Google AI Blog](#))

Walkthrough: Improve a Visualization



Walkthrough: Improve a Visualization



Invitation:

Improve a Visualization

1. Form groups (3-4 people)
2. Pick a data visualization as a group
(Your own or from Github)
3. Brainstorm improvements yourself
4. Share your brainstorm with your team
(Hear from every person)
5. Vote on the 3-5 improvements your team wants to do
6. Prototype on paper