Data Visualization Workshop

Presented by Simone Betito

June 2021

👋 Hello!

Who Am I?

- Product Designer in Data Visualization here in NYC
- MSDV Parsons Grad
- I like to analyze & visualize data related to the environment, social justice issues etc. in my spare time.

Theme: Using Data Viz to Make Compelling Stories

Goals:

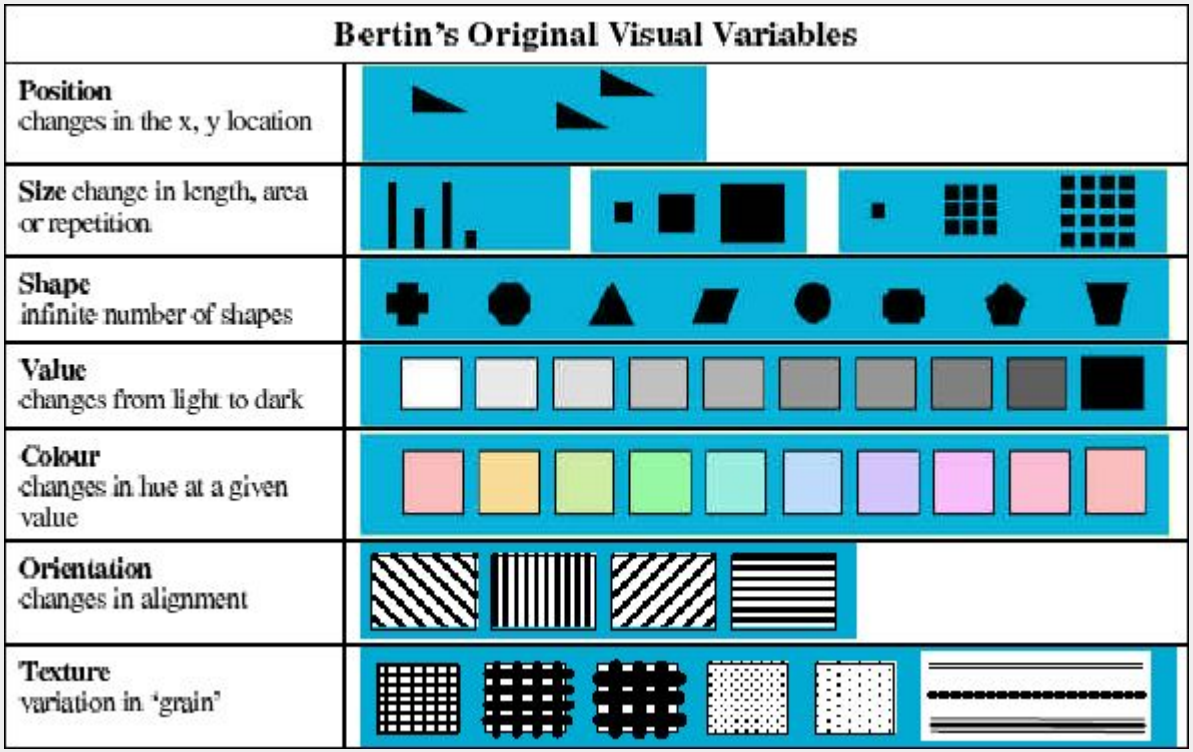
- Get a basic familiarity with Tableau
- Be critical of data provenance
- Learn how to create compelling visualizations through theory

Agenda

- Objectives of Workshop
- Data Visualization Basics (Chart types, Visual Variables, Accessibility)
- Messy Processes
- Data Storytelling
- Break🙏
- Data Misinformation & Ethics
- Basics of BI Tools (Measures & Dimensions, Navigating Tableau)
- Data Visualization example using Tableau
- Assignment

Visual Variables

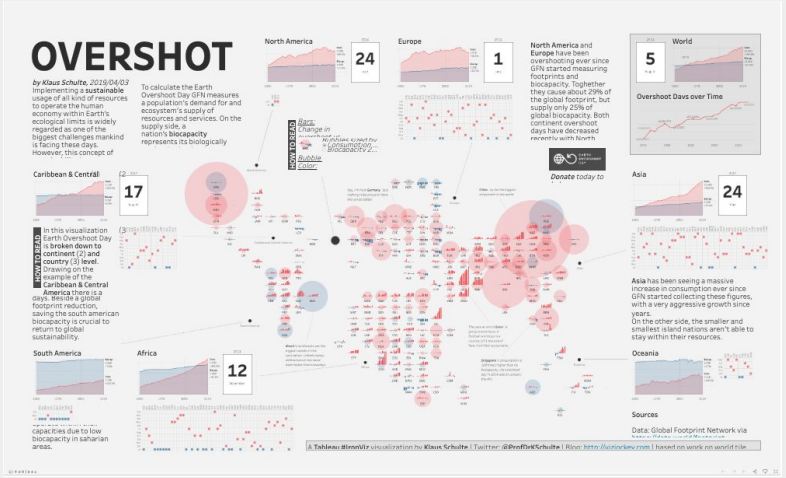
(Bertin Variables)


Bertin's Original Visual Variables
Position
changes in the x, y location
Size change in length, area or repetition
Shape
infinite number of shapes
Value
changes from light to dark
Colour
changes in hue at a given value
Orientation
changes in alignment
Texture
variation in 'grain'

Source

Size

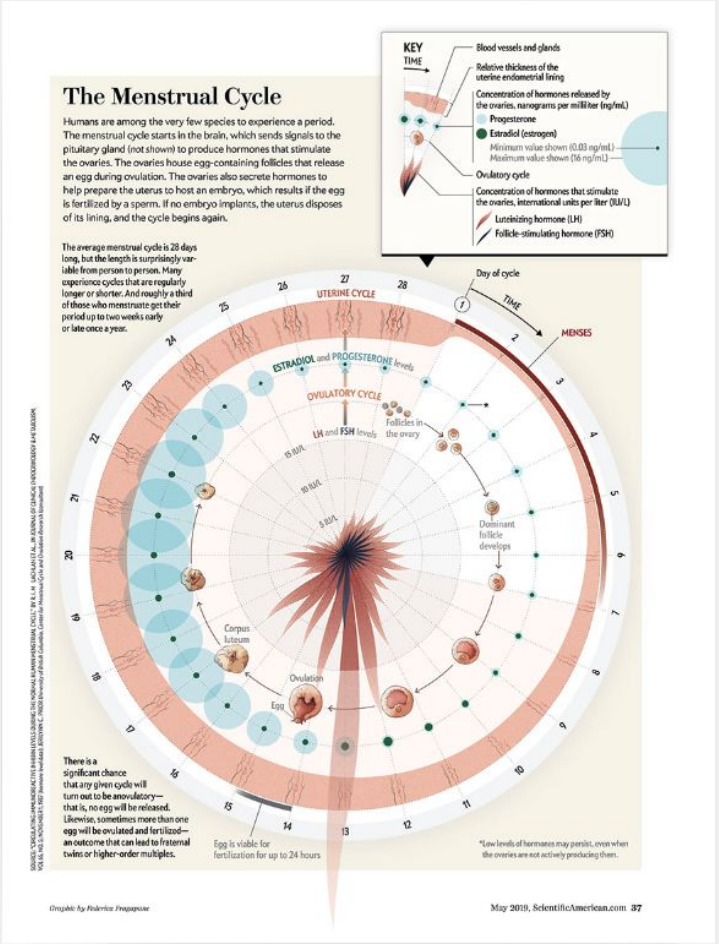
- Human perception of size differences
- Changes in length, area or repetition



Source

Position

- Changes in x, y, (z) location
- Good when precision matters
- Order, length, associative



Source

Colour

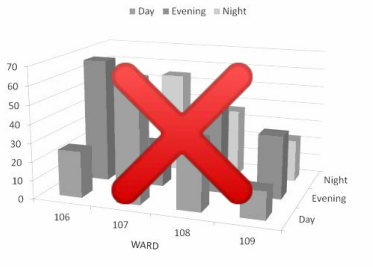
- Changes in hue at a given value
- Difficult for humans to perceive vs position or size
- Colours and categories must be mentally linked, remembered and referred to without confusion.
- Consider Accessibility - colour blindness
- Intuitive Colour palettes (i.e: using blue for bodies of water)

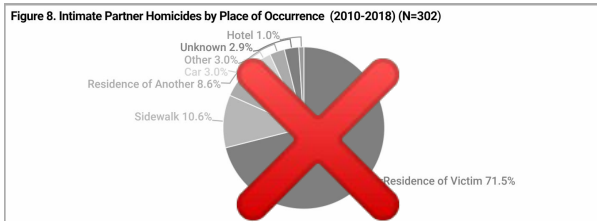
Source: Fullstack D3, Amelia Wattenberger

Types of Charts

How to choose the right chart?

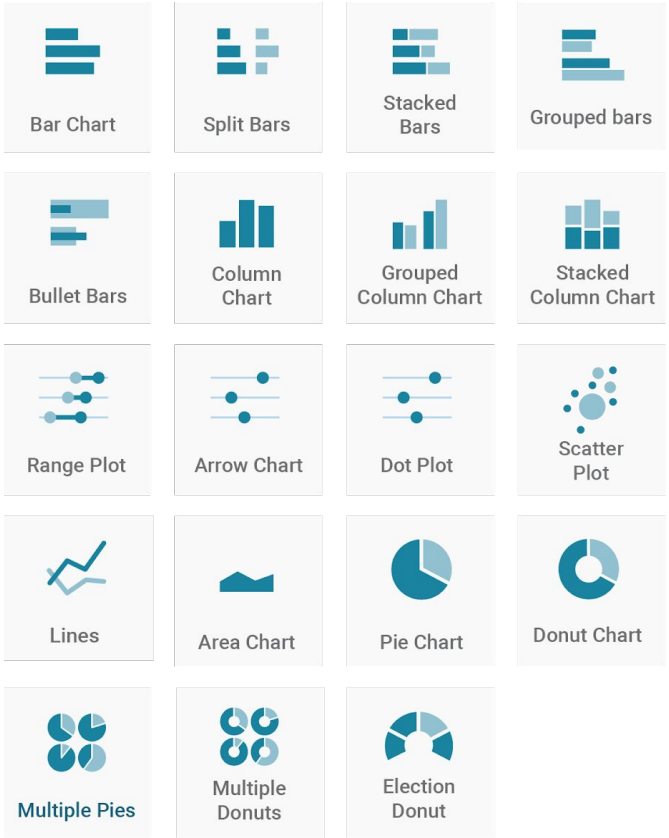
- No single right way to visualize data
- Iteration
- Rough Guide:
  - **Think about the data you're visualizing**
    - Line charts -> use **continuous** data
    - 🆘 Pie charts 🆘 -> less than 4-5 “slices”
    - No 3D Charts!





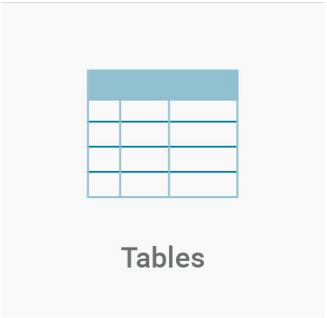
Source: Images from Google

Charts



Maps

Tables

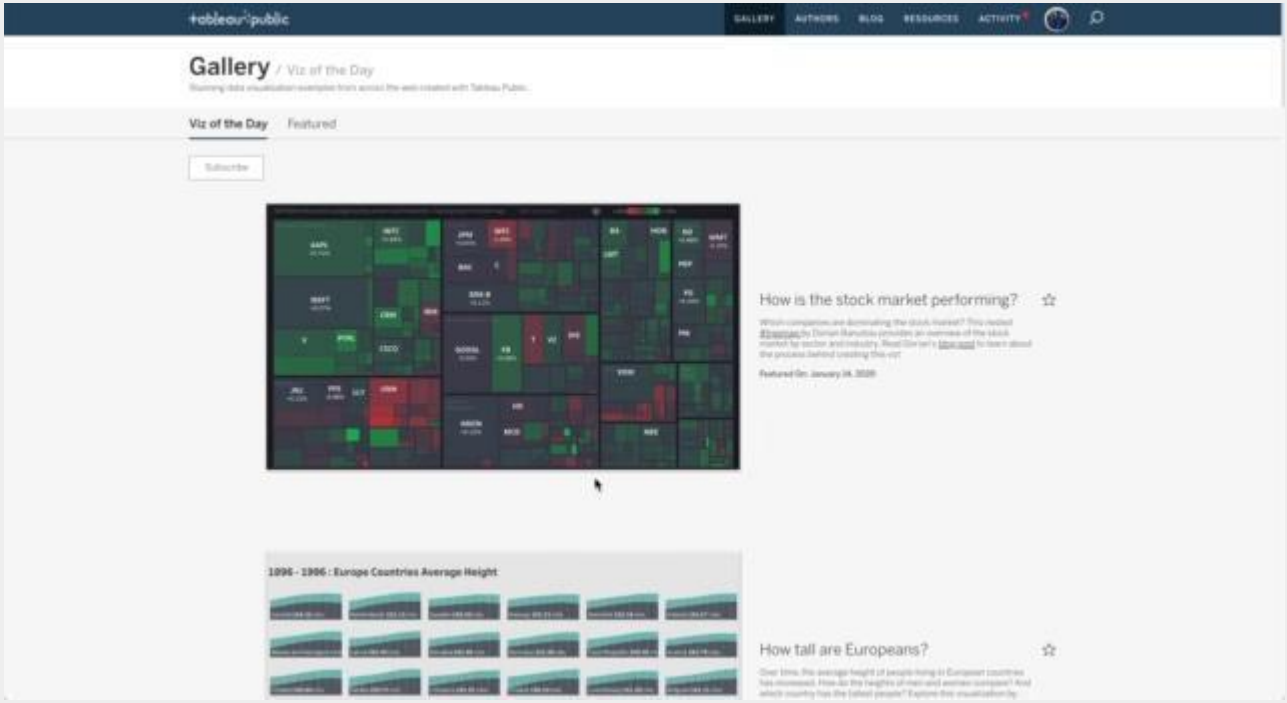


Other Resources for inspo:

Tableau Public Gallery
Information is Beautiful Awards
Reddit: Data is Beautiful
Interactive Chart Chooser

Source: DataWrapper

Tableau Public



Data Viz Accessibility

- Beyond colour blindness
- Employing Takeaway title
- Label data directly
- Type and colour contrast
- Add alt-text

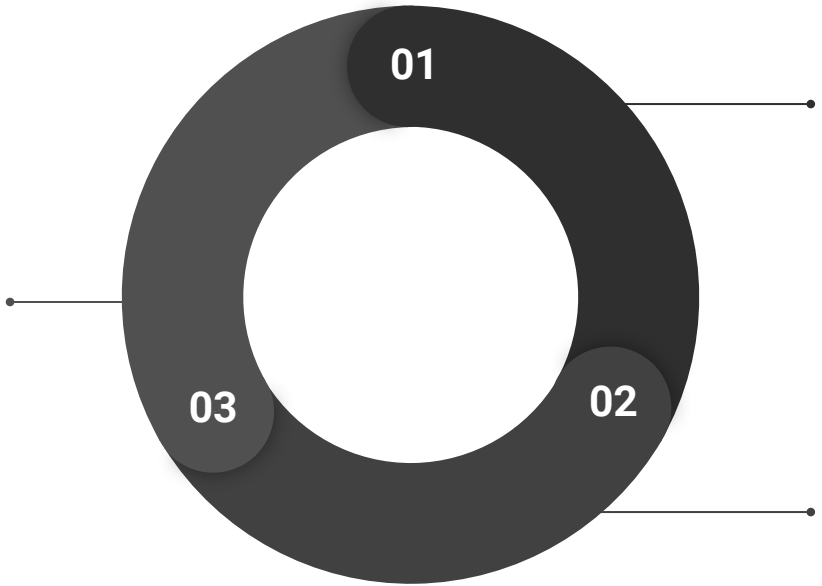
Resources:

Contrast Checker
Viz Palette
Your Interactive Makes Me Sick

Building a Viz

Aka Messy Processes

Building a Visualization is Not a Linear Process



Storyboard or Sketch

Define flow, concept, audience, information hierarchy, data cleanup, build wireframe or prototype

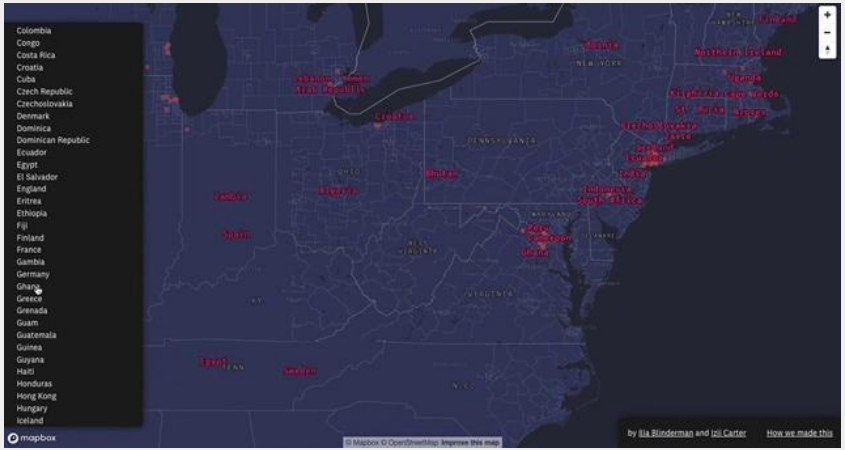
Visualize

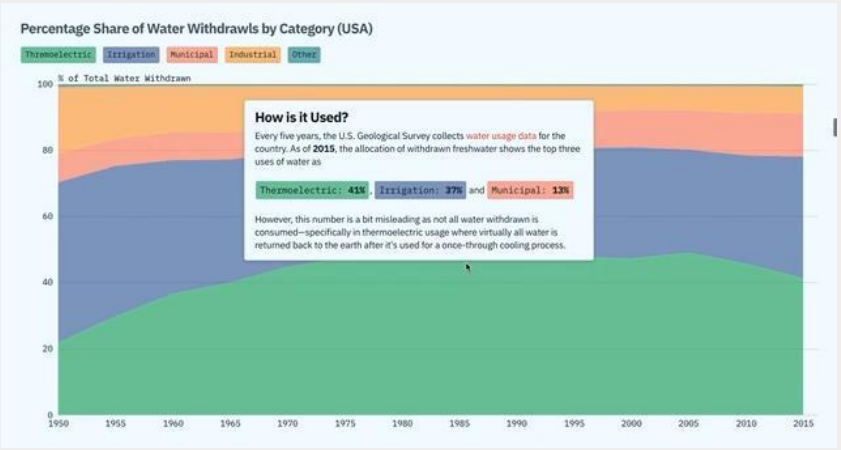
Tool of choice, white space, screen/ device type, output

Iterate

Debug, seek feedback, rebuild, change chart

Exploratory vs Explanatory Visualizations





Data Storytelling

Data Storytelling

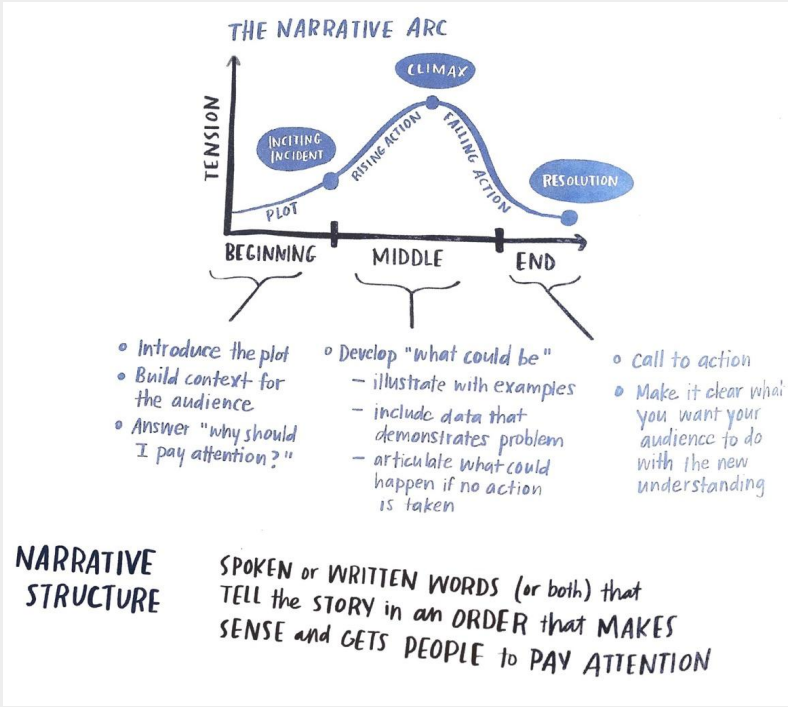
“The interdisciplinary nature of data storytelling is quantitative and poetic, machine and human”

- What is the objective? Call to Action?
- What do you want people to do with the information?
- Do you want people to think differently? Drive Change?

- Impact Behaviour

Data Storytelling Cont'd

- Know your audience
- Make it about them
- Keep the viz simple
  - Use take-away titles!
  - Fun charts vs basic charts



Source: Storytelling with data, let's practice!

Hans Rosling

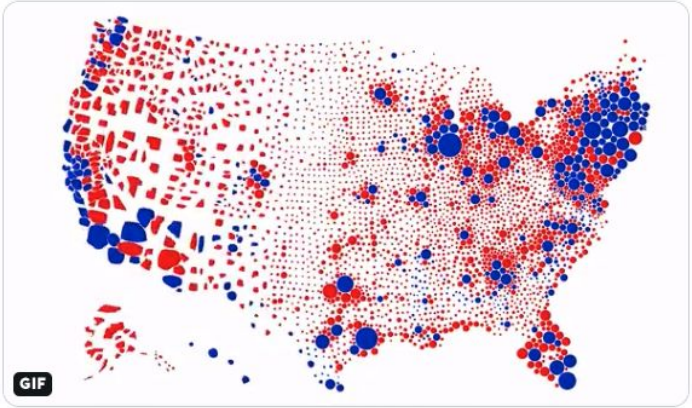
🙏Break🙏

Data Misinformation & Ethics

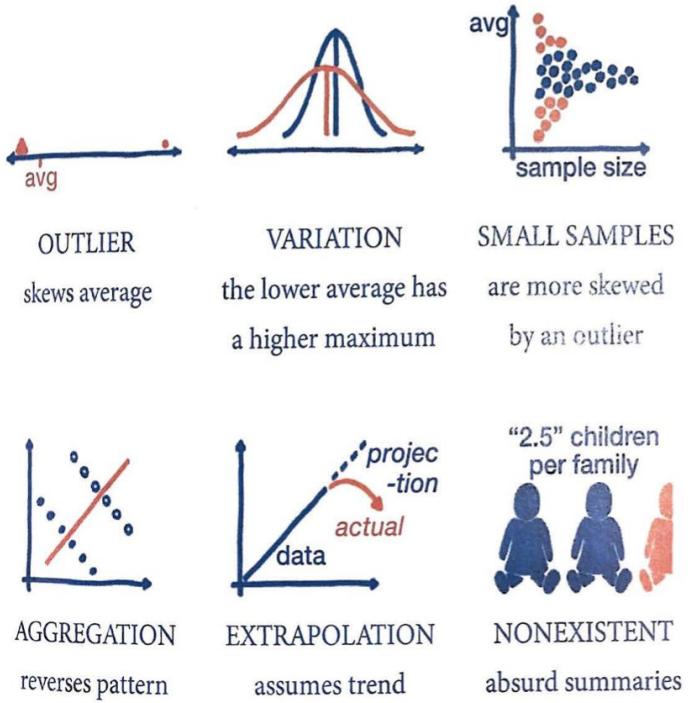
Data Quality

- Showing insufficient data
  - Are there nulls?
- Displaying dubious data
  - Are the columns or rows summed?
  - What's the source?
  - How was the data collected?
- Charts that are poorly designed
- Displaying insufficient data
  - What are you deciding to show or hide?

👉 What might be a shady source?



Data Quality



OUTLIER
skews average

VARIATION
the lower average has
a higher maximum

SMALL SAMPLES
are more skewed
by an outlier

AGGREGATION
reverses pattern

EXTRAPOLATION
assumes trend

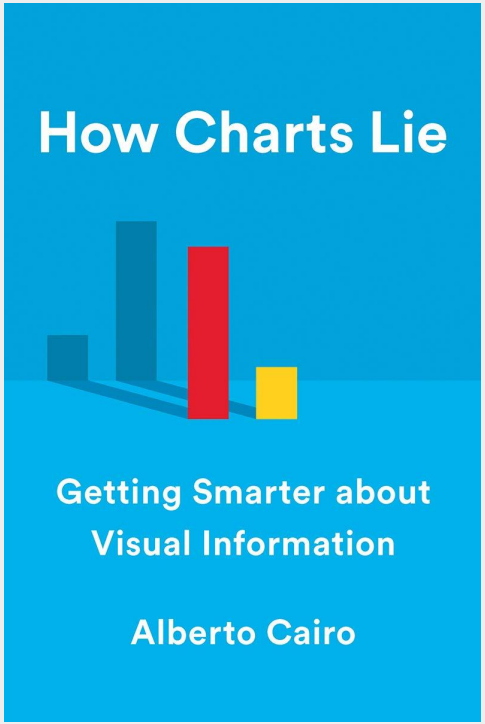
NONEXISTENT
absurd summaries

Source: Info We Trust, RJ Andrews

Data Quality

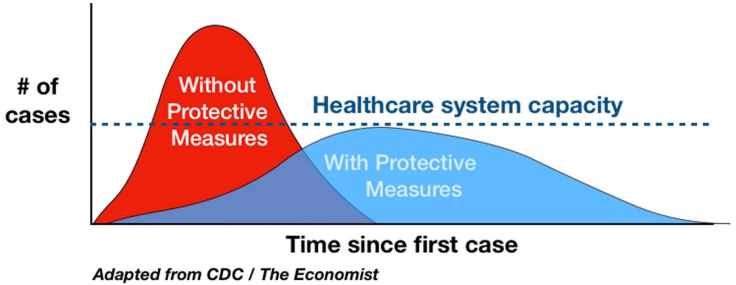
Charts can lie by:

- Displaying the wrong data
- Being badly designed
- Displaying insufficient data
- Suggesting Misleading Patterns
- Concealing or confusing uncertainty



Lessons From The Pandemic

- Data Scientist Rebekah Jones, Facing Arrest, Turns Herself In To Florida Authorities
- The Spiky Blob Seen Around the World
- Flatten the curve
- Linear Growth vs Exponential Growth

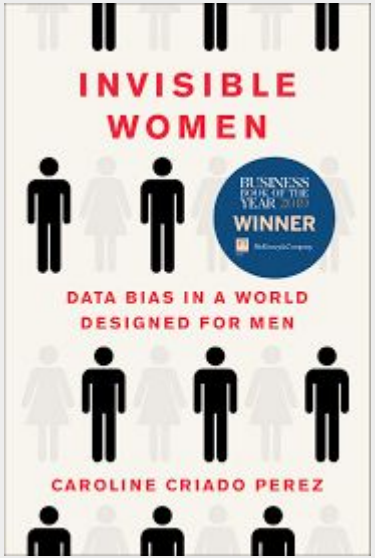


Mona Chalabi - How to Spot A Bad Statistic

Data is Inherently Biased

- Who is counted and who isn't?
- Cleaning data
- Proximity to community being counted
- Not up to date

👉 Examples of Data bias?



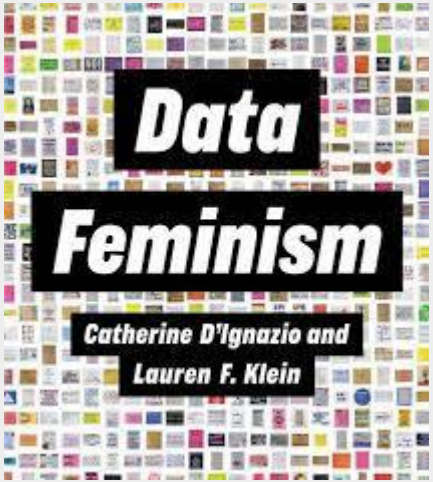
Algorithmic Bias

- Algorithms learn from biased datasets (who built them, why were they built etc.)
- Facial Recognition Systems used to enhance police powers (recidivism, surveillance, etc.)
- Orgs to Follow: Data For Black Lives, Data & Society, ACLU

Data Feminism

- Coined by Catherine D'Ignazio & Lauren Klein
- Principles:
  - Examine Power
  - Challenge Power
  - Elevate Emotion and Embodiment
  - Rethink Binaries and Hierarchies
  - Embrace Pluralism
  - Consider Context
  - Make Labour Visible

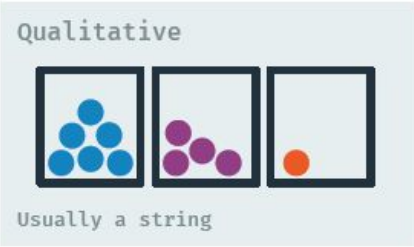
"Intersectional Feminism examines unequal power. And in our contemporary world, **data is power too**. Because the power of data is wielded unjustly, it must be challenged and changed."



Basics of BI Tools

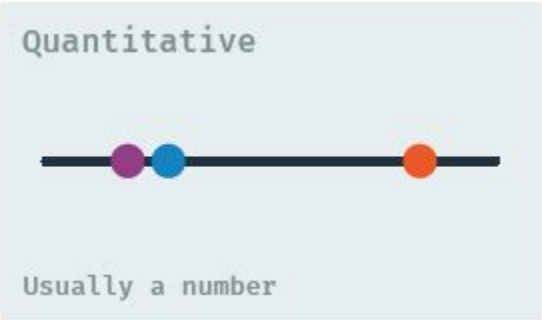
Qualitative Measures

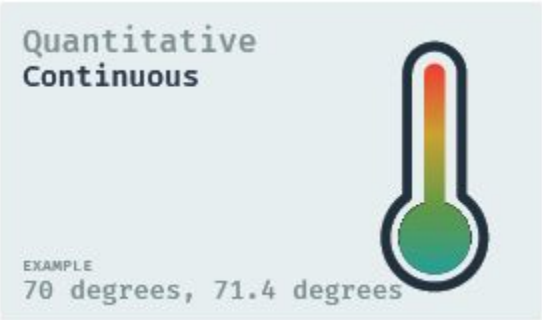
- Usually a string
- Binary
- Nominal/ordinal
- Examples: Dates & names



Quantitative Measures

- Usually a number
- Discrete/continuous
- Example: Profit, height, weight, temperature





Measures & Dimensions

- Common to have qualitative and quantitative measures named as this in BI tools (SAP, Looker, Tableau)
- Measures = Quantitative or numeric values, usually dependent (y)
- Dimensions are qualitative or categorical variables, usually independent (x)

Measure or Dimension?	
Sales in US $	
Months	
Order ID	

Introduction to Tableau

Tableau Data Source Page

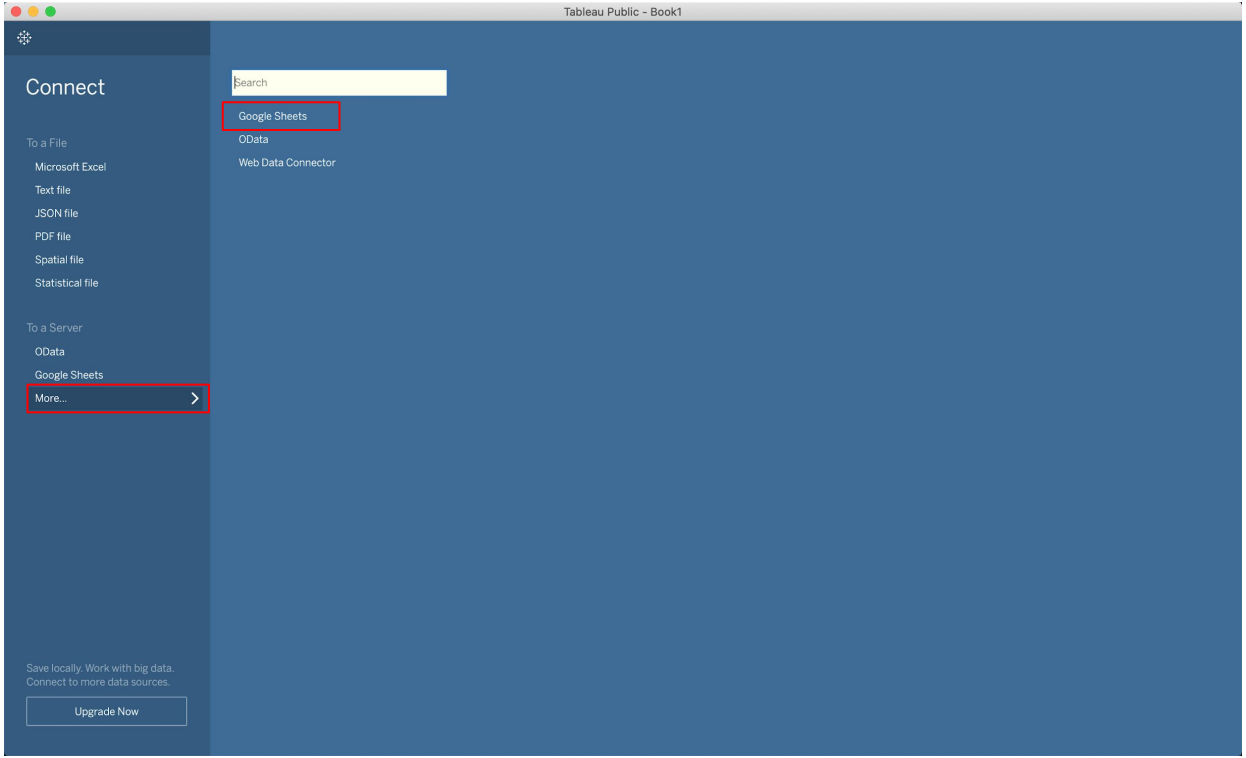
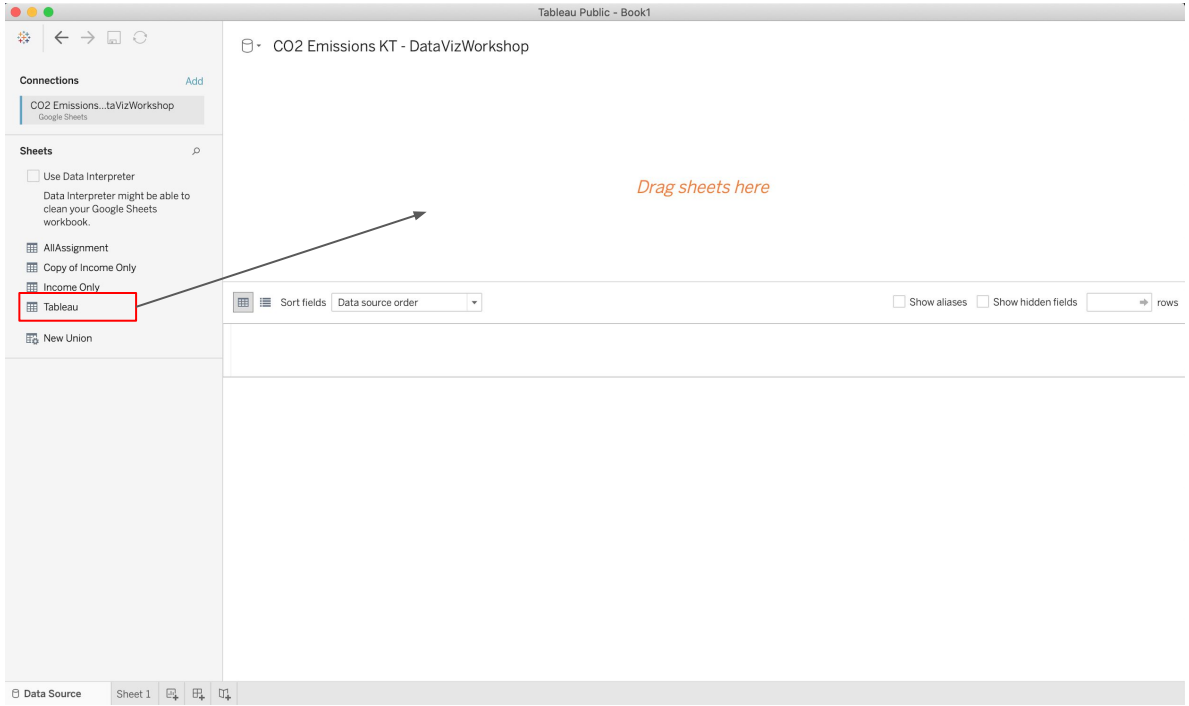
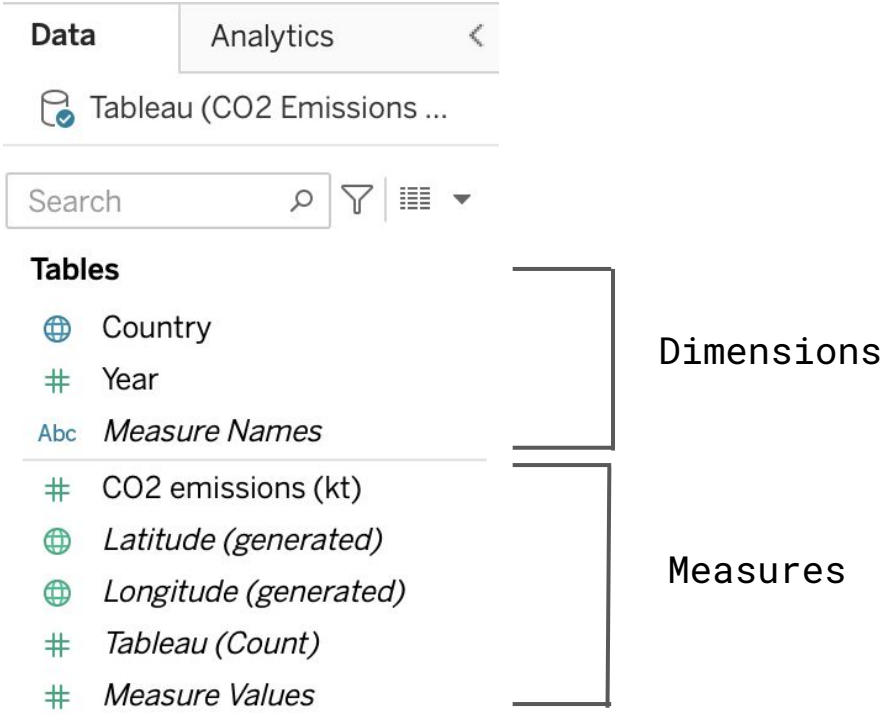


Tableau Data Source Page

Data Source



Measures & Dimensions in Tableau



Assignment

Create a Visualization in Tableau using given data on Google Sheets or on GitHub ("DataVizWorkshop_AssignmentData.csv")

- Make a copy of data in Sheets
- Connect to Tableau
- Choose a story
- Employ a Takeaway Title
- Remove any "chart-junk" (gridlines, unnecessary labels)
- Add a legend and a colour palette
- Use a Readable Font
- Consider Annotations, Tooltips or Labels *if it makes sense*
- Make good use of whitespace
- Seek Feedback

Questions?

Thank you!

Please submit your feedback here
Say hi hello@simonebetito.com