

Expanding your graphical repertoire

2019 MIDFIELD Institute

Richard Layton

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Data structure determines which graph types are feasible



Number of observations?

Number of variables?
Continuous or discrete?



Number of variables?
Nominal or ordinal?
Number of levels each?

Graphical repertoire determines which graph types you explore

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strip plot

box and whisker plot

multiway

scatterplot

dot plot

line graph

conditioning plot

scatterplot matrix

parallel coordinate plot

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cycle plot

quantile-quantile plot

Sankey diagram

diverging stacked bar

multivariate bar

micromaps

proportional symbol map

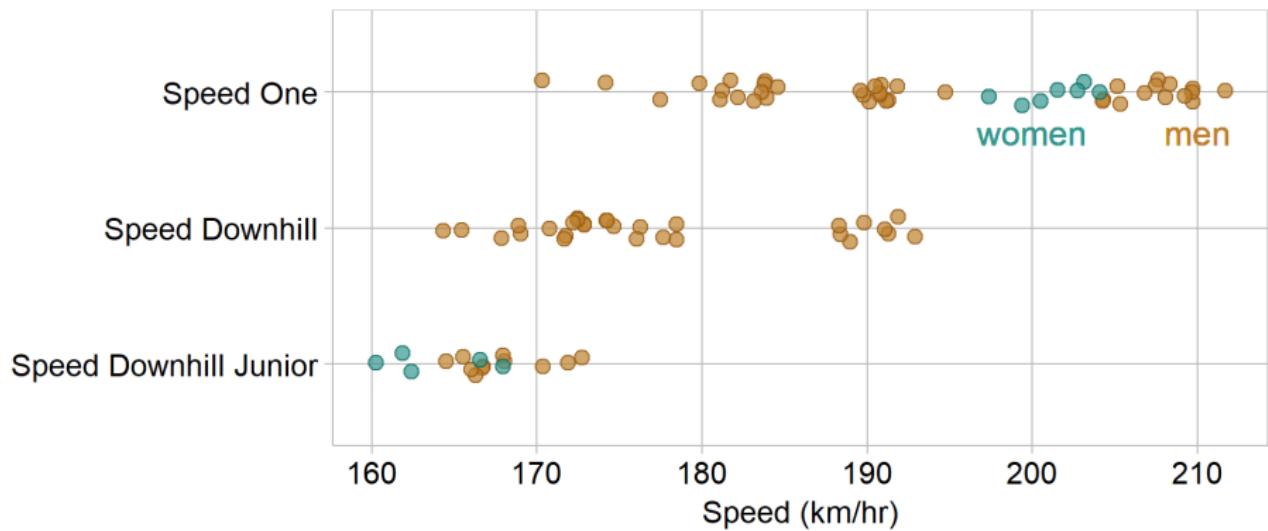
dot density map

Gallery of graph types

Strip plot – or jitter plot or 1D scatterplot

Quantitative: Speed

Categorical: Event, sex

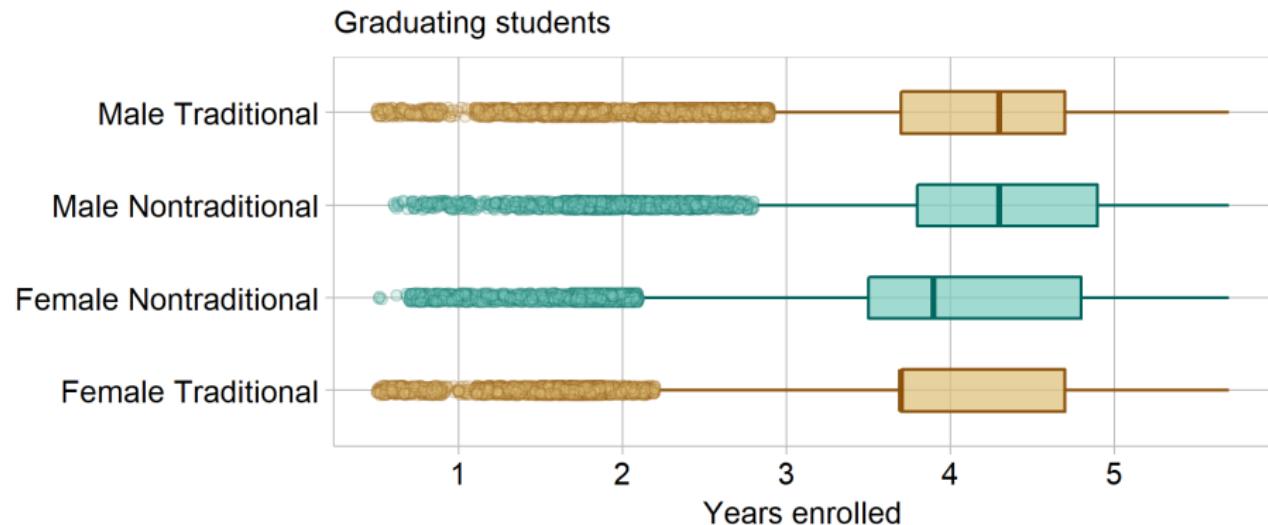


Data from Unwin, Antony. 2015. GDAdata: Datasets for the book Graphical Data Analysis with R.

Box and whisker plot or box plot

Quantitative: Years enrolled

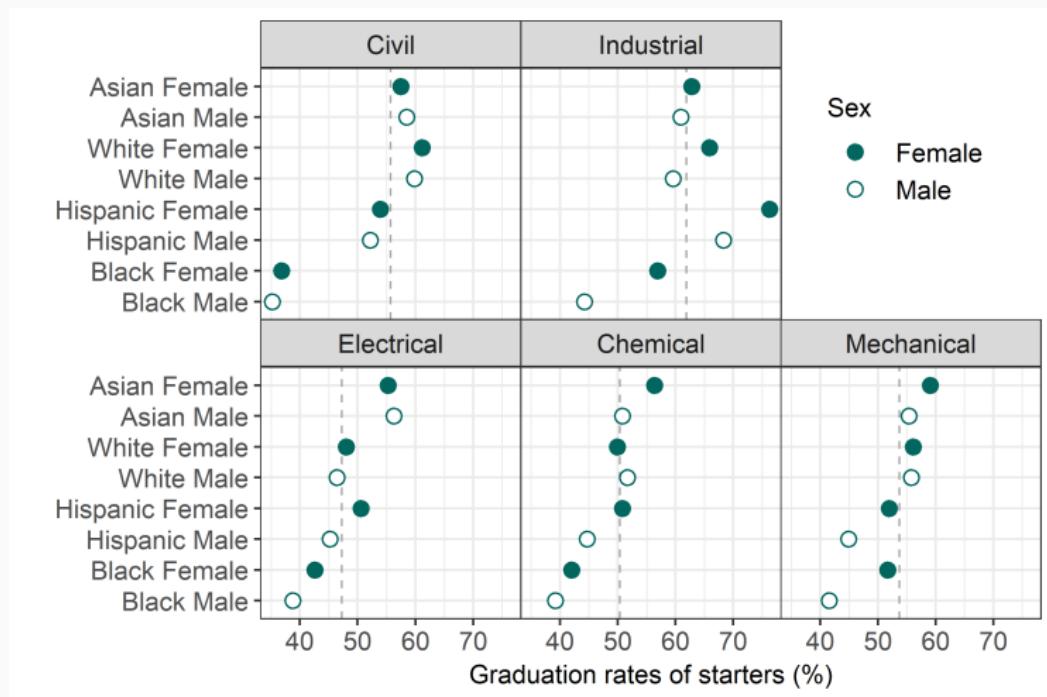
Categorical: Path + sex



Multiway plot

Quantitative: Graduation rate

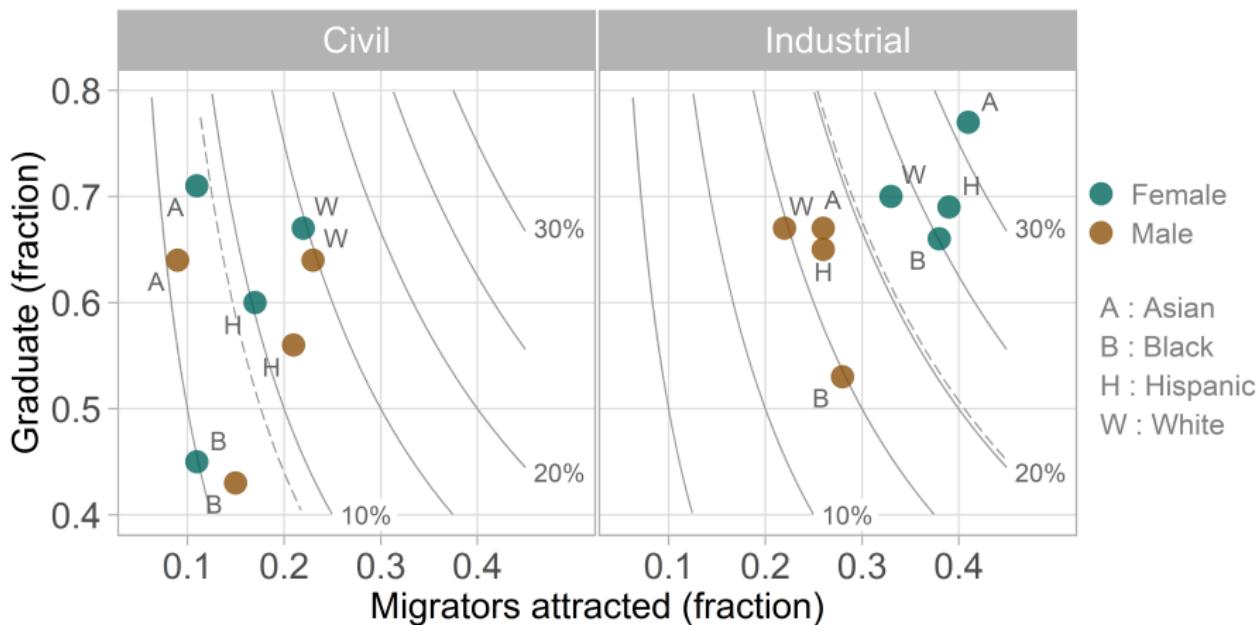
Categorical: Race/ethnicity/sex, major



Scatterplot

Quantitative: Migrators attracted, migrants graduated

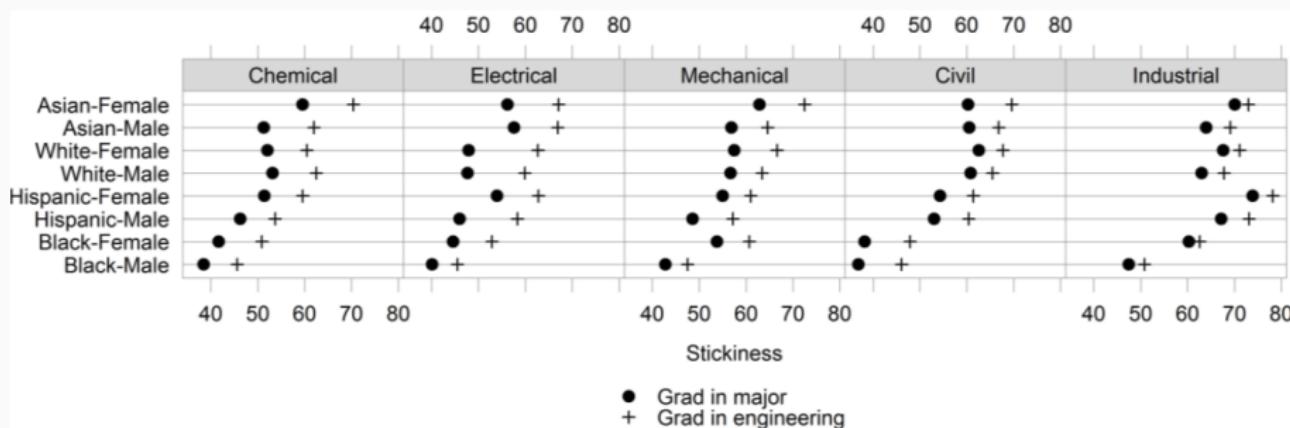
Categorical: Race/ethnicity, sex, major



Cleveland dot plot

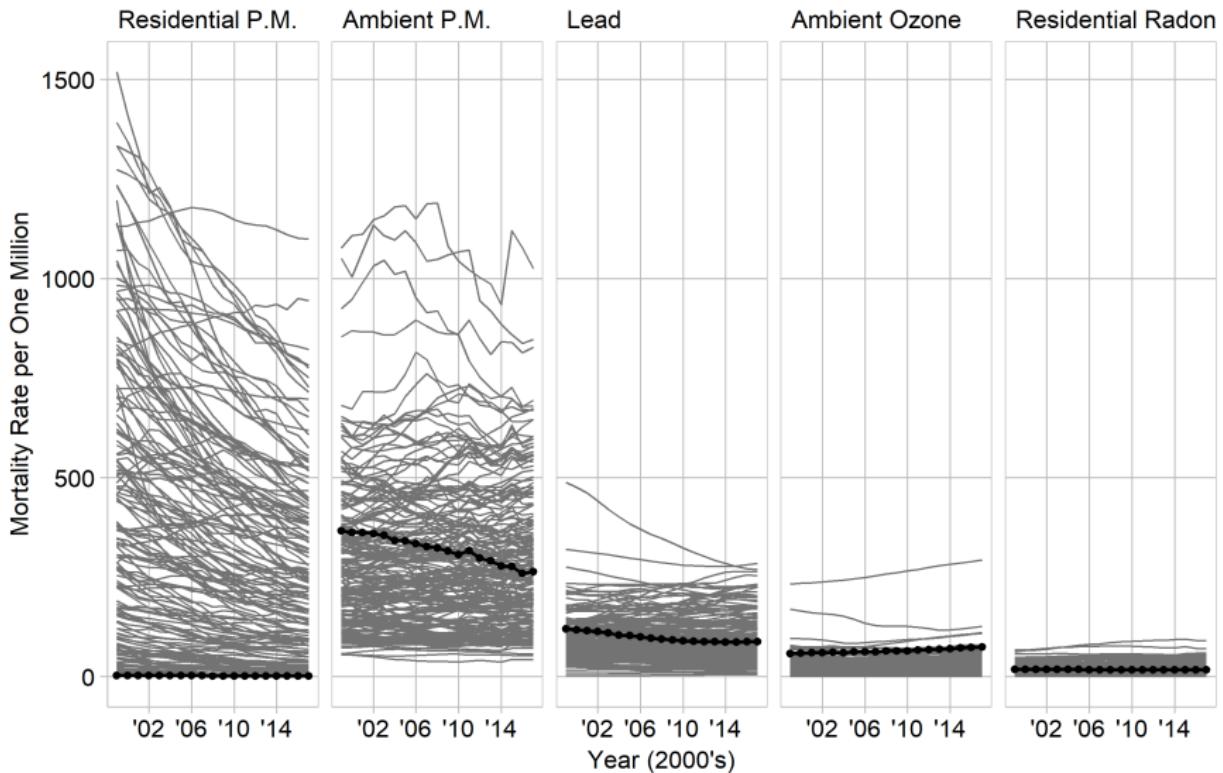
Quantitative: Stickiness

Categorical: Race/ethnicity/sex, major, graduation destination



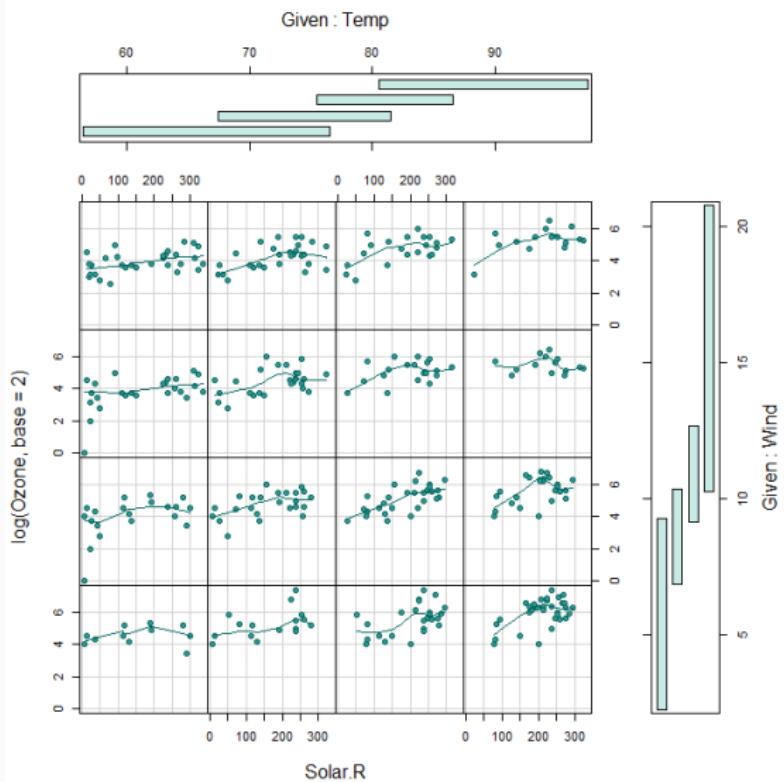
Line graph

Death by Air Pollution in the United States Compared with the World



Conditioning plot or co-plot

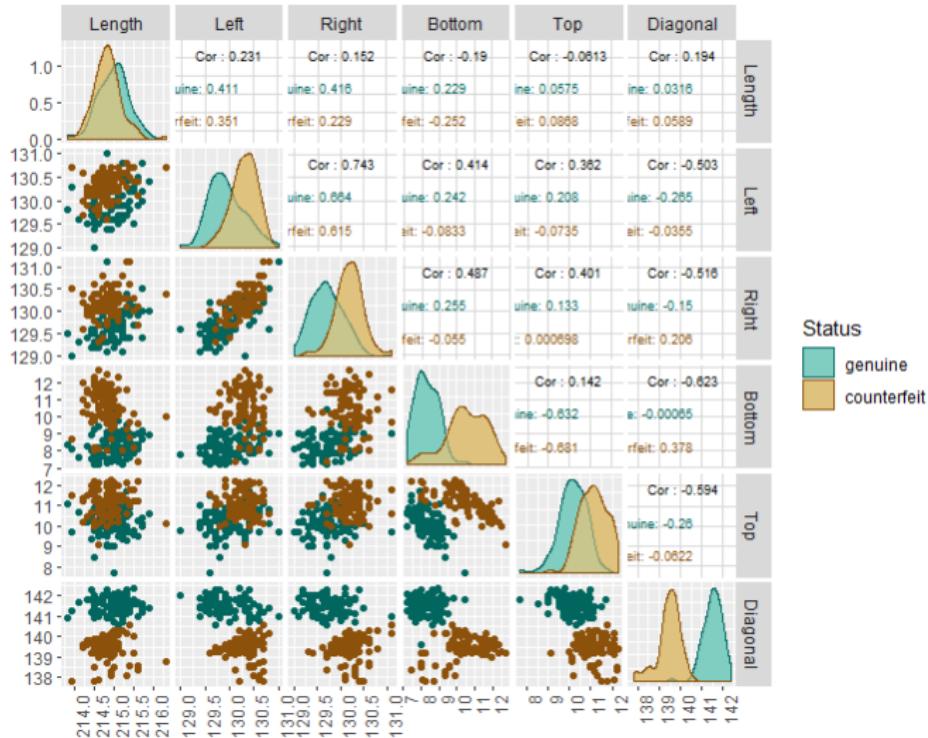
Quantitative: Ozone, temperature, wind speed, solar radiation



Scatterplot matrix

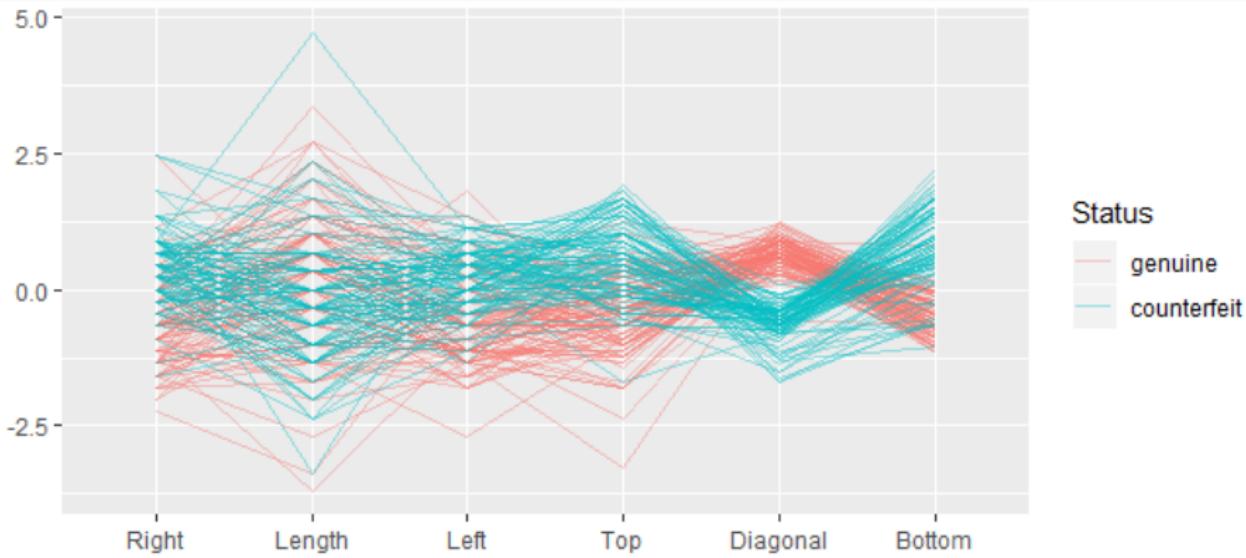
Quantitative: Six dimensions of Swiss banknotes

Comparing Swiss banknote dimensions (mm)



Parallel coordinate plot

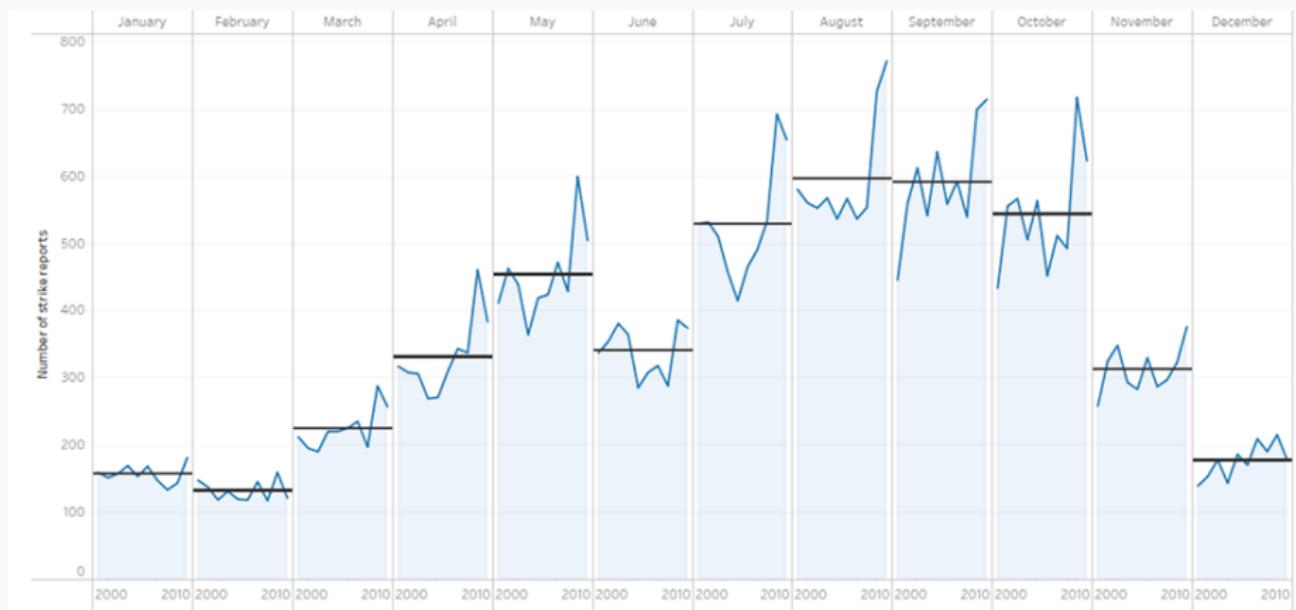
Quantitative: Six dimensions of Swiss banknotes



Cycle plot or month plot

Quantitative: Number of wildlife strikes on aircraft

Categorical: Month, year

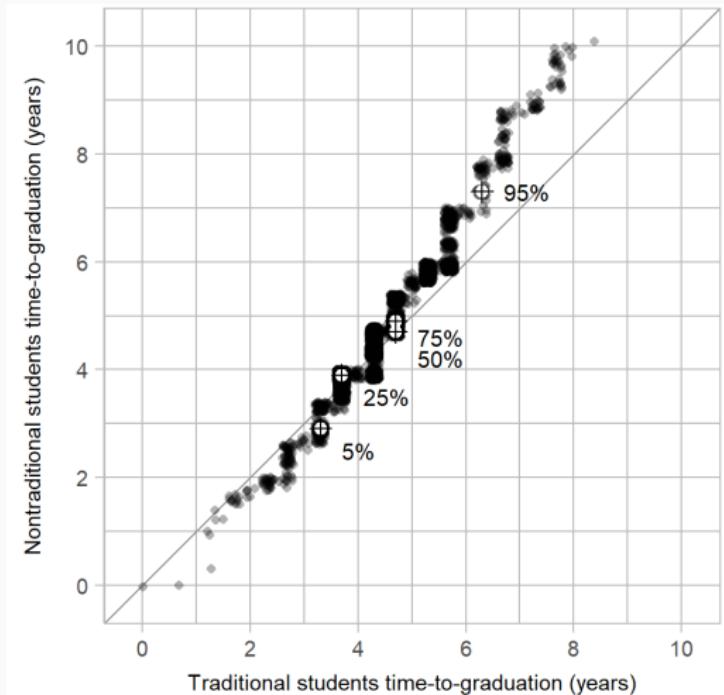


<https://canonicalized.com/cycle-plots-tableau/>

Quantile-quantile plot or q-q plot

Quantitative: Years to graduate quantiles

Categorical: Traditional students, nontraditional students



Sankey diagram

Quantitative: Numbers of students

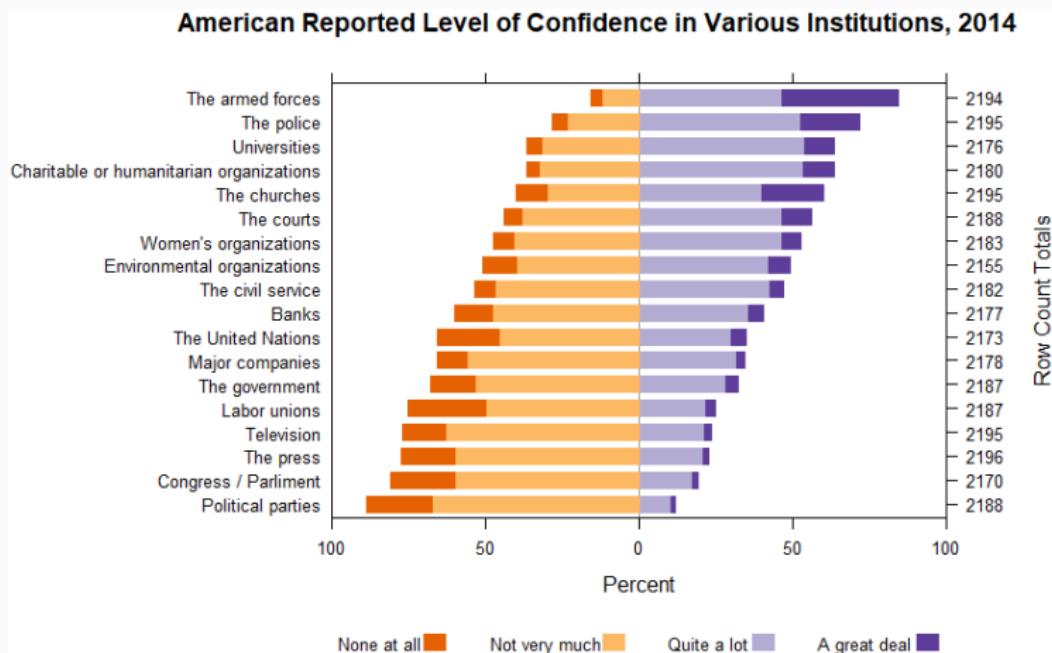
Categorical: Starting major, destination major



Diverging stacked bar chart

Quantitative: Frequency of response, count totals

Categorical: Survey questions, level of confidence



Multivariate bar chart

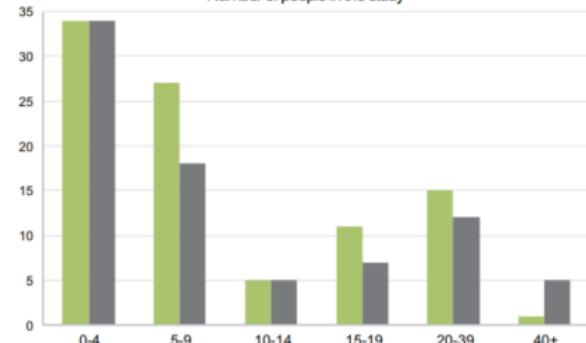
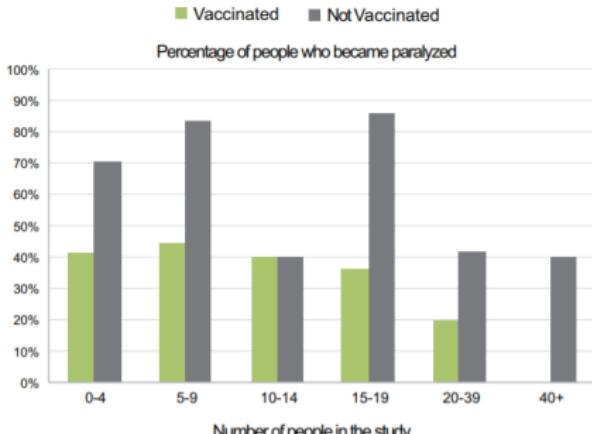
Quantitative

- number of people
- percent became paralyzed

Categorical

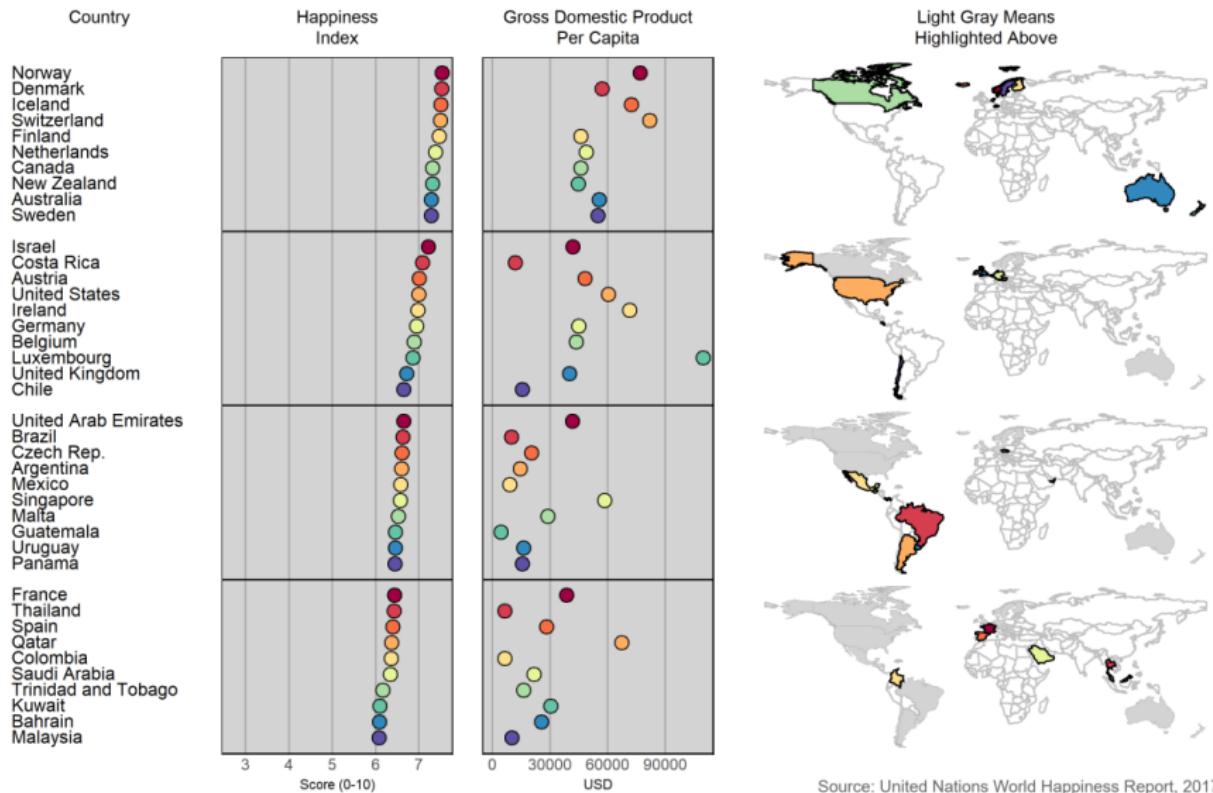
- age group
- vaccination status

Mantel-Haenszel-Cochran test of the Salk polio vaccine



Few S (2014) Are mosaic plots worthwhile? Visual Business Intelligence Newsletter. Perceptual Edge
<https://tinyurl.com/y23majn2>

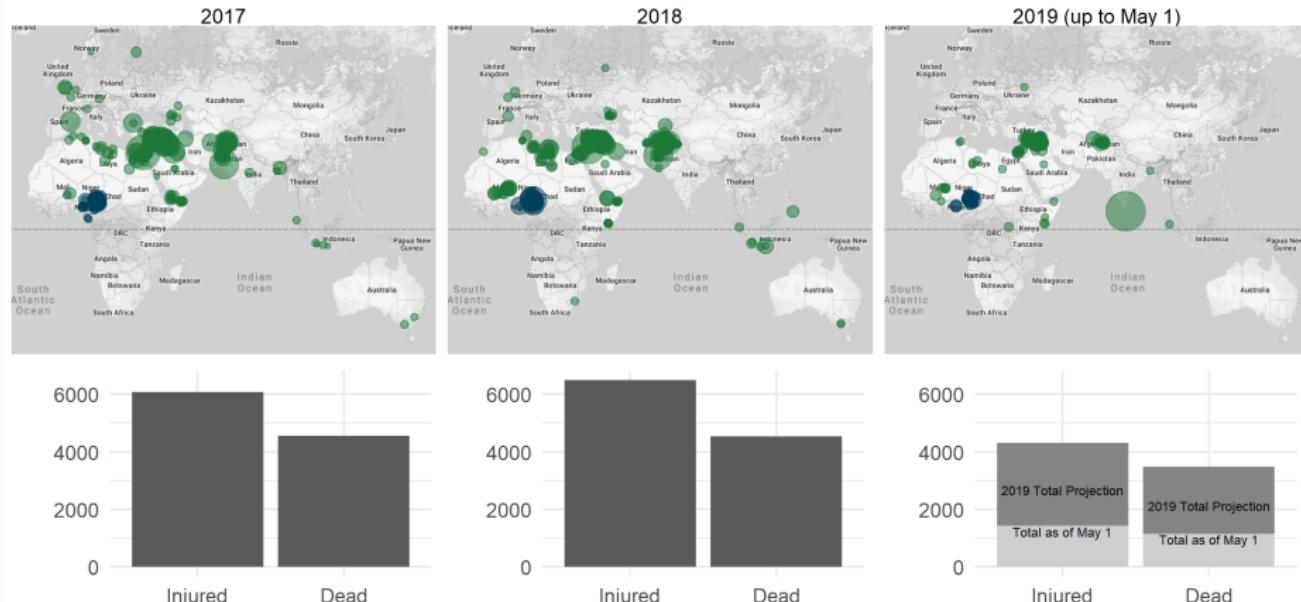
Linked micromaps



Proportional symbol map

Attacks claimed by the Islamic State and Boko Haram, 2017-2019

Point size is proportional to the number of deaths and injuries in each attack.
ISIS in green, Boko Haram in blue.

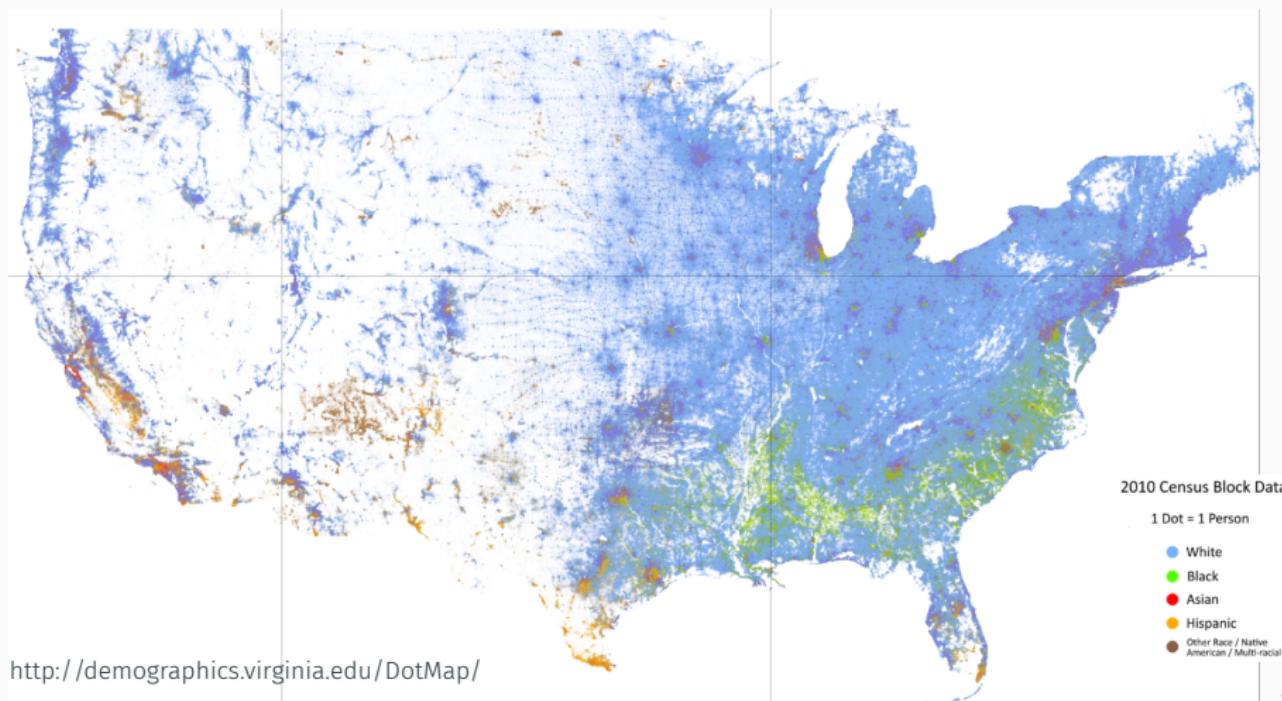


Source: Wikipedia, List of terrorist incidents

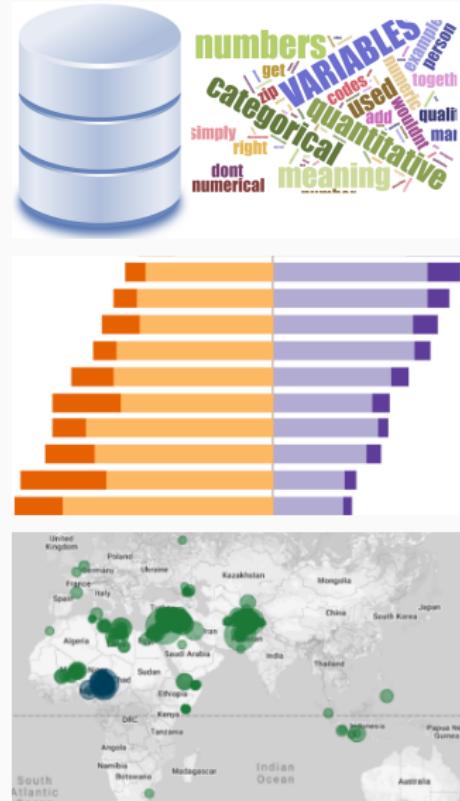
Dot density map

Quantitative: Latitude, longitude

Categorical: Race/ethnicity



In summary, three precepts guide one's choice of graph type



Data structure determines which graph types are feasible

Graphical repertoire determines which graph types you explore

Design choices align your visual argument with your rhetorical goals