Bias

* Cause to feel or show inclination or prejudice for or against someone or something

Confirmation Bias

* Persistence of mindset
  + Humans tend to stick with an “opinion” for a long time

Visualization can support bias

* Appeals to cultural bias
  + Color representation of data

Graphical Bias

* Perspective distortion in 3D rendering causes bias
  + Shape
  + Pointe of view

Cognitive Biases

* Impede proper decision making
* Comes in many guises

Confirmation Bias

* Favor information that confirms previously held beliefs
* Example
  + Clustering

Hindsight Bias

* See events, even random ones, as more predictable than they are
  + look back on events and believe that we “knew it all along”

Anchoring Bias

* Tendency to be overly influenced by the first piece of information that we hear or see
* AKA priming
  + Example
    - First price heard in pricing negotiation
    - Separability study by Valdez

The Availability Heuristic

* A strategy that people use to make quick decision
  + This can lead to systematic errors, misconception, prejudices
* Examples:
  + Smokers who have never known someone to die of a smoking-related illness, might underestimate the health risks of smoking
  + Death from COVID-19 (wear mask)
* Visualization can help overcome this problem
  + It can alter the way our memory stores the events for later recall, so as to improve user’s long-term intuitions

The Halo Effect

* AKA Physical attractiveness stereotype
* Plain charts vs fancy vs really fancy

Other biasses

* The Optimism Bias
  + Overestimating the likelihood that good things will happen while underestimated the probability that negative events will occur
* The self-serving bias
  + Give yourself credit for successes but lay the blame for failures on outside causes
* The false consensus effect
  + Spend too much time with like-minded people
  + User studies often fall victim to that
* Solution
  + Look at data in several ways
  + Visualize different metrics computed from the data

Selection Bias

* Occurs when the data sample is not an accurate representation of population
  + Sampling bias
  + Time bias
    - Occur when sampling is terminated too early
  + Attrition bias
    - Loss of participants over time
  + Cherry picking
    - When one only uses the favored samples
  + Rejection of considered bad (loss of objectivity)
  + Susceptibility bias
    - Example
      * When one disease predisposes for a second disease, and the treatment for the first disease erroneously appears to predispose to the second disease

Attraction bias

* Adding the inferior option to emphasize the other options
* Placement of decoys will always make A or C most attractive in selection and attention tasks
* Chart, scatter chart

  Description automatically generated