Data visualization: Part 2

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August 17th, 2017

Why powerpoint

- Great for storing notes
- Organizing ideas when starting to write
- But what about presentations themselves?

Cognitive style

- The software tool doesn't determine how good the content of the presentation is, does it?
  - Yes
- Powerpoint has a cognitive style that influences the way you think about your presentation
  - 'human factors' engineering

Power point marketing

- 'A cure for the presentation jitters'
- 'Get yourself organized'
- 'use the content wizard to figure out what you want to say'

- Who are these aimed at?

Who is power point for?

- Presenter focused

- Not Audience focused

- Nor content focused

Presenter focused

- ## Memory aid
  - Don't forget points in a long talk (or class!)
- ## Storage aid
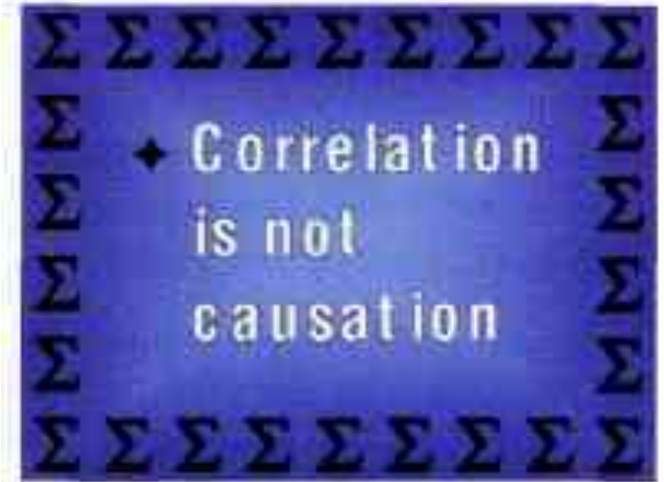 - Maintain an outline of the talk for others

'Some' Audience focus

- ## Multimodal
  - Sounds, words, graphs
  - Reading can be easier than speech for non native speakers

Resolution

- Projectors have limited screen space and 800x600 pixels resolution
  - This can result in too much cutting
- Reduction is good, but not if we cut important parts of the message
  - We want precision not brevity

These slide leaves out the small detail that correlation is necessary for causation, but not sufficient

Resolution (2)

- So each slide has minimal space and Powerpoint solves this with linear time

- Add more slides to the sequence to expand on the story

- But memory and reasoning work better when information is available in adjacent space

- Statistic and scientific data in particular require us to make comparisons

Bullet outlines

- Bullet phrases are compressed language
- But do we really need help understanding when a phrase begins?
  - Language already has many helpful punctuation marks
- Powerpoint also provides explicit orderly structure
  - But only linear structure
  - No possibility for relational structure

• Increase market share by 25%.
• Increase profits by 30%.
• Increase new-product introductions to ten a year.

What is the relationship here? Causal? Circular?

Heirarchy
Level 1 Title of Slide

- Level 2 • Very Big Bullet
  - Level 3 — dash
    - Level 4 • little bullet
      - Level 5 —little dash
        - » Level 6 >> arrows ending level 5

- What does this progression imply?

(depth) General to specific?

(Font) Important to less important

Review of Test Data Indicates Conservatism for Tile Penetration

- **The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data**
  - **Crater overpredicted penetration of tile coating <mark>significantly</mark>**
    - **Initial penetration to described by normal velocity**
      - Varies with volume/mass of projectile (e.g., 200ft/sec for 3cu. In)
    - **<mark>Significant</mark> energy is required for the softer SOFI particle to penetrate the relatively hard tile coating**
      - Test results do show that it is possible at sufficient mass and velocity
    - **Conversely, once tile is penetrated SOFI can cause <mark>significant</mark> damage**
      - Minor variations in total energy (above penetration level) can cause <mark>significant</mark> tile damage
  - **Flight condition is <mark>significantly</mark> outside of test database**
    - **Volume of ramp is 1920cu in vs 3 cu in for test**

Unable to Predict Damage to Columbia

- **The Crater software used to predict tile damage was calibrated using a foam hit 600 times smaller than the foam that hit Columbia on lift-off.**
  - 1920 in^3 vs. 3 in^3 for test.
  - Therefore, as a predictor, Crater is useless in this case.
  - Nonetheless, it should be noted that even the tiny foam particles used to calibrate Crater can penetrate the tiles when they strike with sufficient velocity.
  - Once tiles are penetrated, significant damage to the spacecraft is possible.
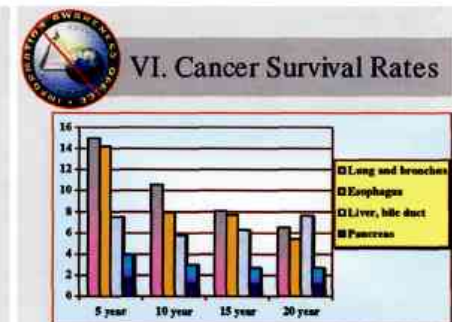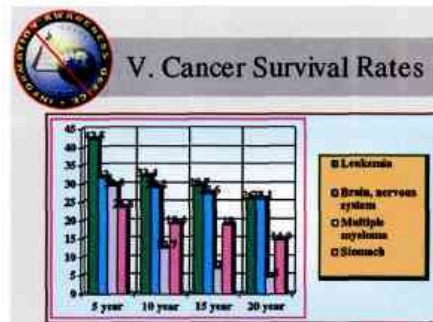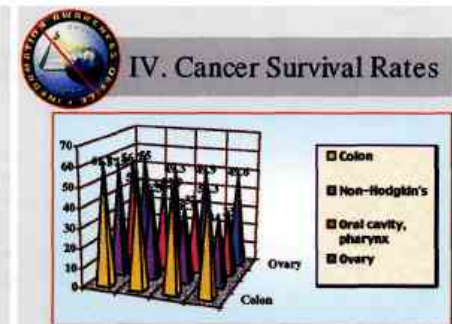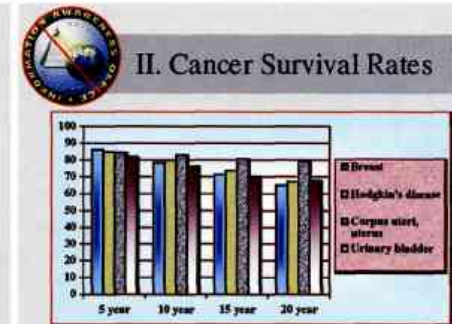- **We recommend immediate visual inspection of the wing to assess damage.**

High resolution visual channels

- Speakers typically proceed at 100 – 160 words per minute
- This is slower than reading and much slower than browsing visual information
- But Powerpoint slides slow it further still!
  - Typically 40 words
- 'Data thin' format
- 'Less' doesn't help understanding when you remove all of the context
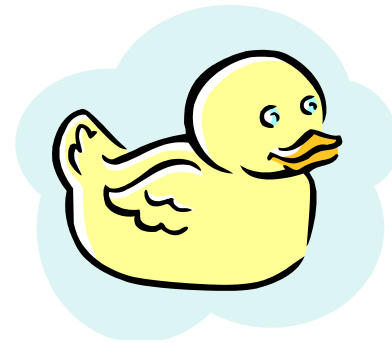
Powerpoint statistics

- Just remember not to use 3D, pies, and the default colours

Powerpoint animations

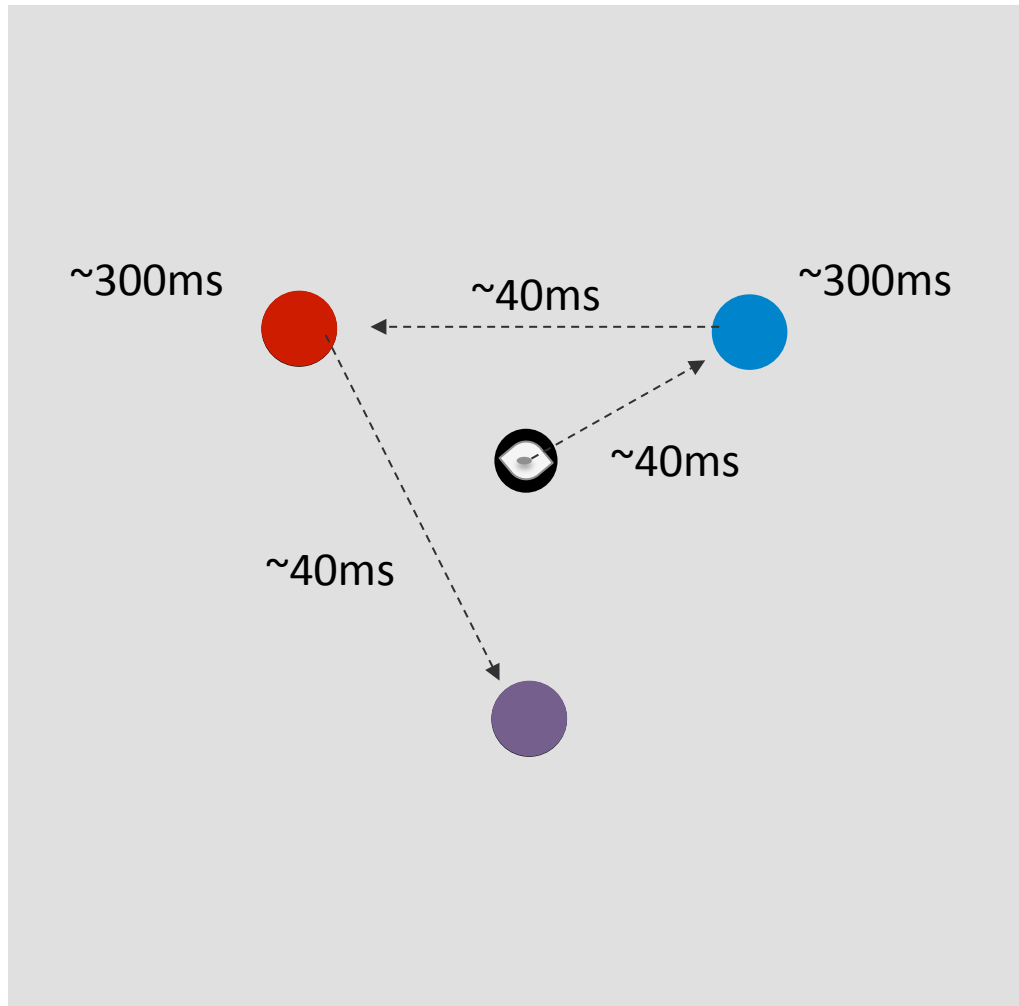- Information
- Provided
- One line
- At a time
- To build suspense
- Where none exists

Animations: to show things in motion

~300ms   ~40ms   ~300ms

~40ms

~40ms

- 3 saccades every second
  - Fixation (stability)
  - Saccade (ballistic)

Is there hope?

- Can a Powerpoint presentation be brought to the level of information for a scientific article?
  - Tufte recommends going back to paper
- Power point **IS** a competent slide manager for low resolution material

Tips

- Stick to key points and repeat
- Don't abuse hierarchy
- Provide an overview
- Let listeners know where they are in the talk
- Minimal colour

Make it about the audience

- Powerpoint is about making things easier for the presenter
- Turn that around and make it about the audience, and the content
- The audience begins the presentation asking these questions
  - What is the presentation really about
  - Why is it important
  - What is the structure of the presentation
  - Will they understand the presentation
- Give them this information early on

Alternatives?

- Prezi
  - A different 'zoom' cognitive model
- But animation can simply be a duck
- http://www.youtube.com/watch?v=izDAF7fPtDI

- R

- R commander
- Must install from R interface
  - install.packages("Rcmdr")
  - library(Rcmdr)

- R studio
  - Can be combined with R commander, in theory, but I don't know how

- Kepler
  - 'workflow software'
  - Excellent for saving full data process

- Scopus
- http://www.ucl.ac.uk/ion/library/documents/Guide_to_Scopus.pdf

- extra

Indefinite Article (a,an)

- Countable nouns the first time they are introduced
  - I have two laptops: **A** sony and **an** Acer.
- Professions
  - I am a student
- In place or 'per' when describing rates
  - 140 kilometres an hour.
- To lessen the impact of adjectives like 'little' or 'few'
  - 'Few friends' vs 'a few friends'

Definite Article (The)

- Any noun the reader already knows about
  - I have two laptops: **A** sony and **an** Acer. **The** Sony is my favourite.
- Nouns that are common knowledge, obvious in context or considered unique
  - I was at my dacha and worked in **the** garden
  - **The** sun, **the** air
- Nouns preceded by superlatives or numbers
  - **The** best day, **the** 22nd of june
- Referring to an entire class on nouns
  - **The** smart phone is a wonderful gadget
- Titles when using 'of'
  - **The** queen of England
  - But is sometimes dropped when only one such person exists at a time (John is chairman of the board)
- Replacing a possessive with parts of body or clothing
  - He grabbed **the** boy's arm
- Currencies (**the** ruble), forms of entertainment (**the** cinema), musical instruments (I play **the** fiddle), newspaper names, hotel names

No articles

- Abstract nouns
  - Freedom, love, crime, unless you are talking about a specific one
- *Most* company names, place names, street names, parks, bridges, individual mountains, sports
  - An exception is often made if these are used for anything other than their primary purpose
    - He went to church. He went to the church to paint the walls.
  - American English 'in the hospital'; British/Canadian 'in hospital' to refer to services provided
  - Both use 'at the hospital' to refer to the building itself
- Any noun followed by a number (gate 32)
  - However its 'the thirty-second gate'
- Titles of articles or books can drop articles for emphasis, even if the original used an article
  - 'Police stop suspect at border'; I love the new 'Lord of the Rings' movie
    - It would unusual to drop articles for a science paper
    - 'The' from the title of the book can be dropped but 'The' referring to 'the new movie' is still used