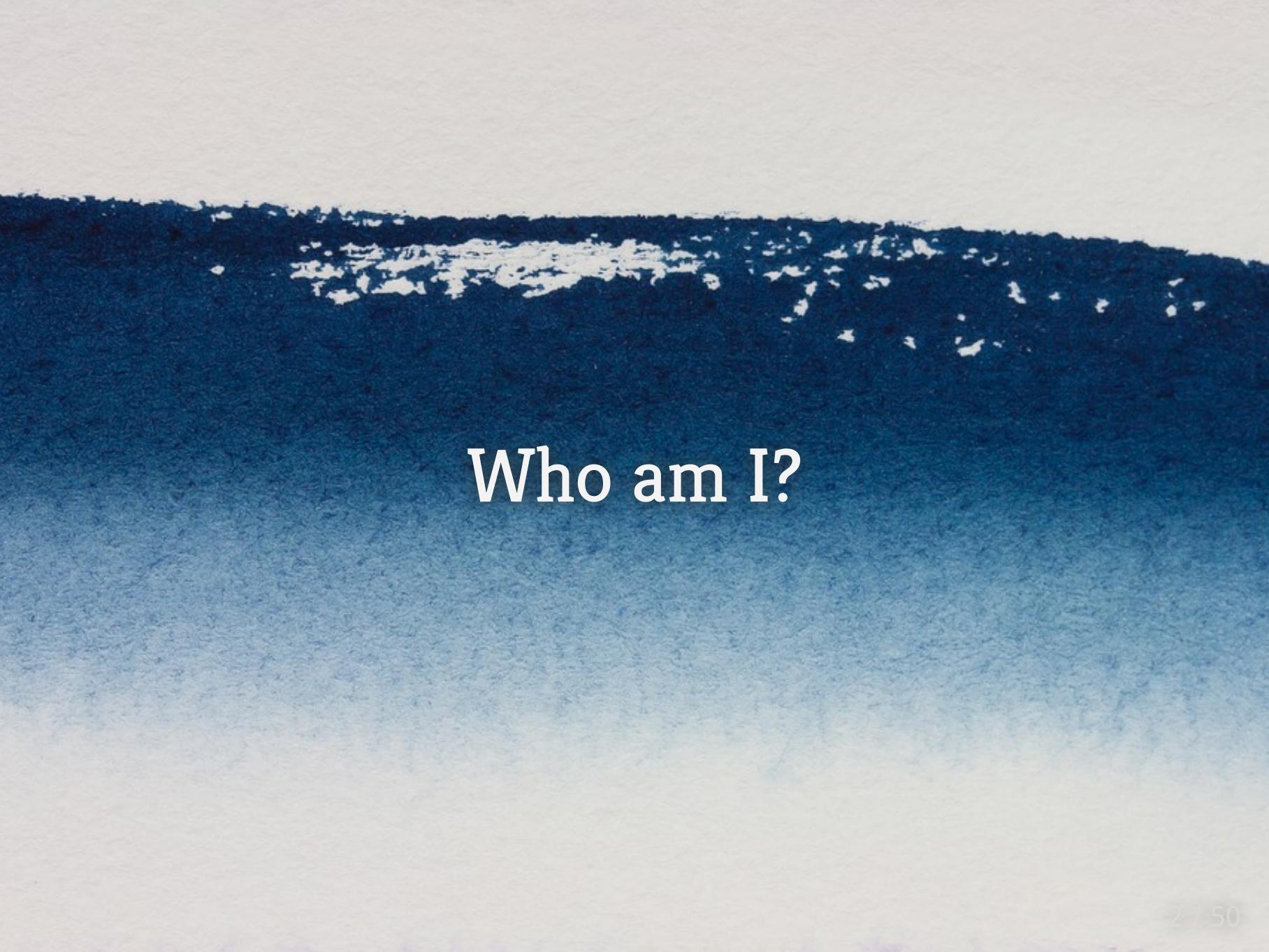


Data visualisation in sport

Dr Jacque Tran | @jacquietran | 26 April 2018

The background of the slide features a wide, calm body of water, possibly an ocean or a large lake, with small white waves breaking near the shore. The water has a deep blue hue. Above the water, the sky is filled with scattered, white, puffy clouds against a lighter blue sky.

Who am I?





JARROD
HYDE
PHOTOGRAPHY









The long and winding road...

2005

UNDERGRAD

2009

HONS

2010

RTW!

2011

PhD

2015

DEAKIN &
GEELONG FC

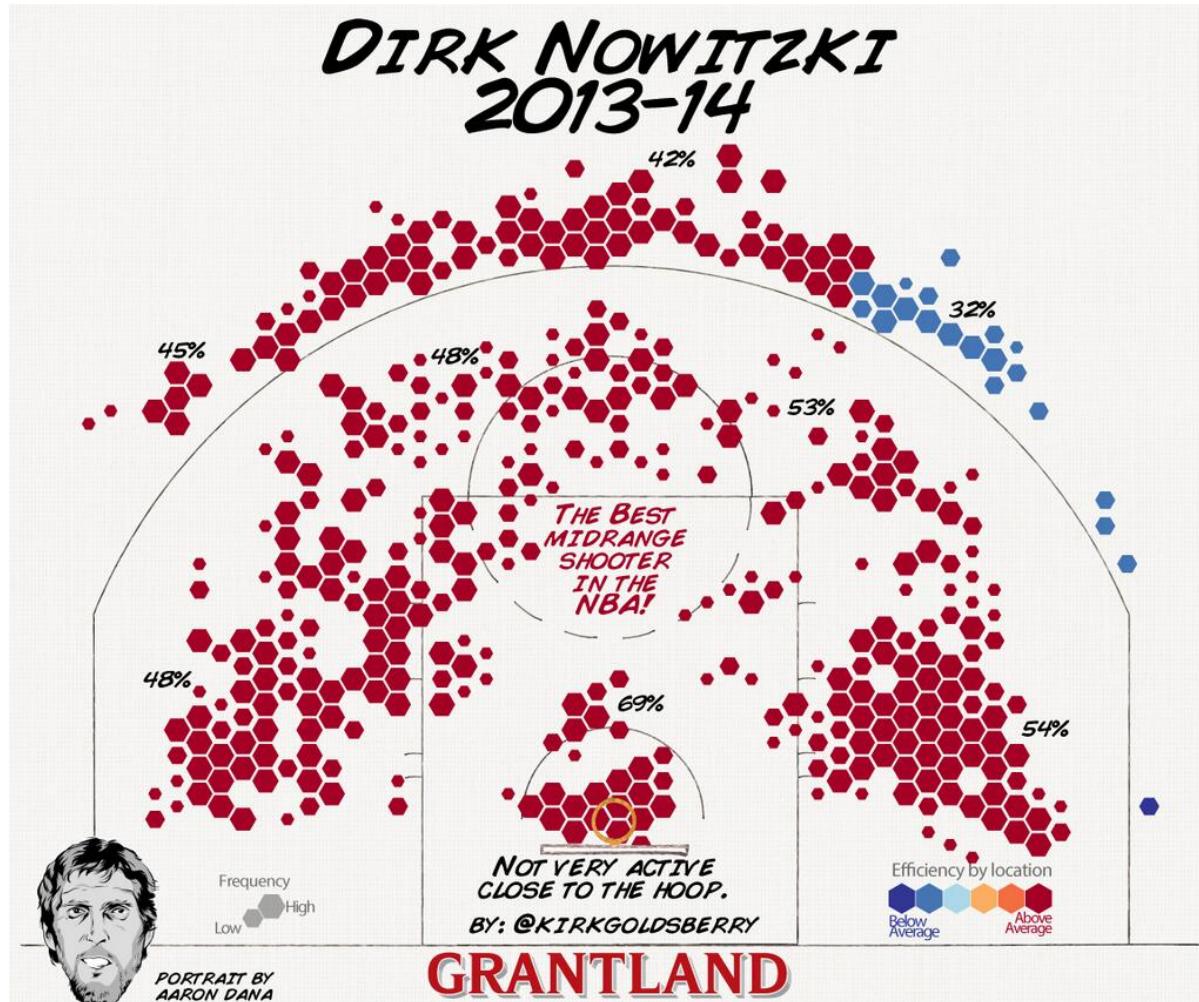
2018?

HPSNZ ...

The background of the slide is a photograph of a vast, calm sea under a clear blue sky. The water is a deep navy blue, and the sky above is a lighter shade of blue with a few wispy white clouds near the horizon.

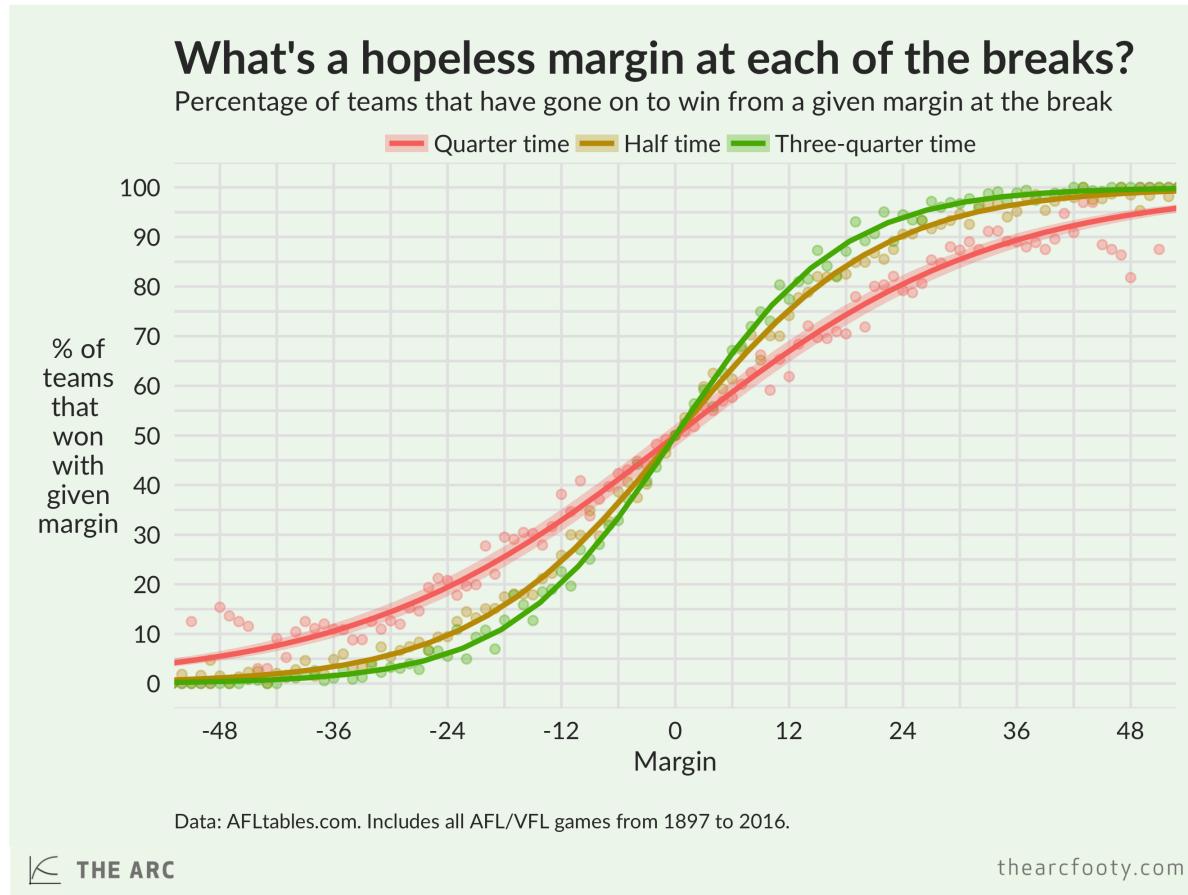
What makes visualisations effective?

'Complex ideas communicated with clarity, precision, and efficiency'



Source: Kirk Goldsberry

'Gives the viewer the greatest number of ideas in the shortest time with the least 'ink' in the smallest space'

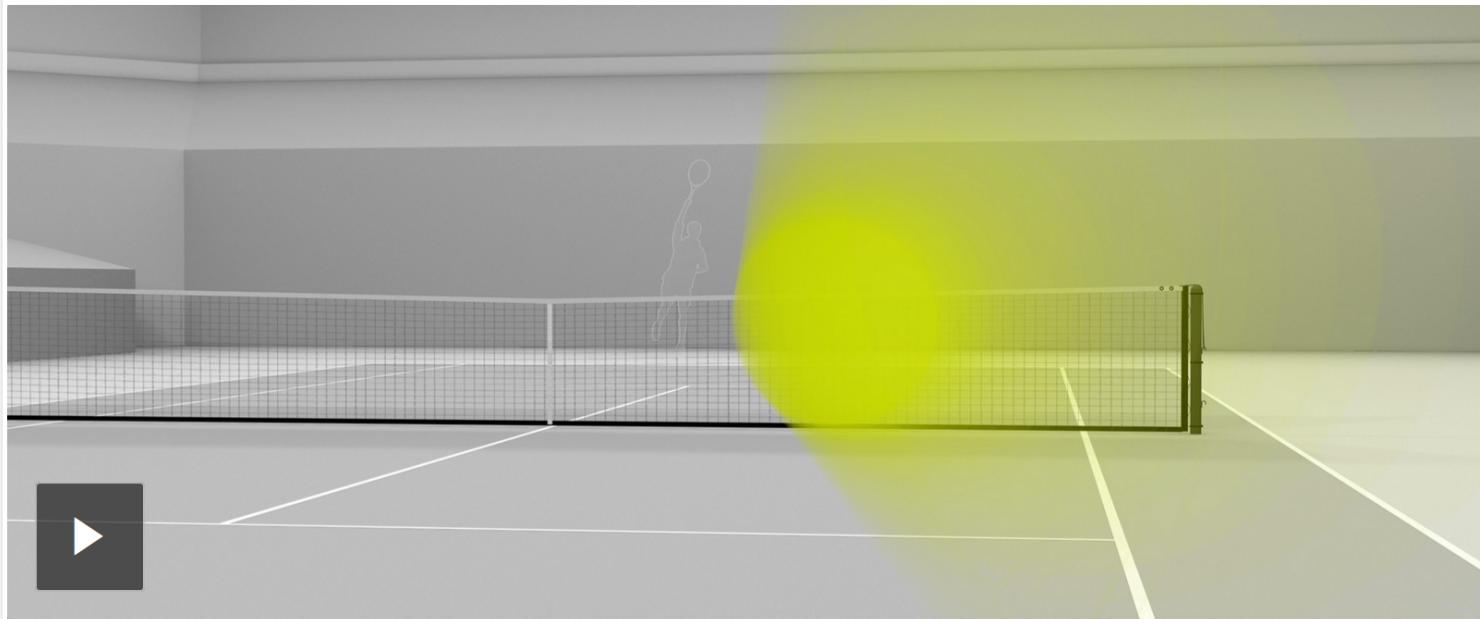


Source: The Arc Footy, 'When should footy fans lose hope?'

'Tells the truth about the data'

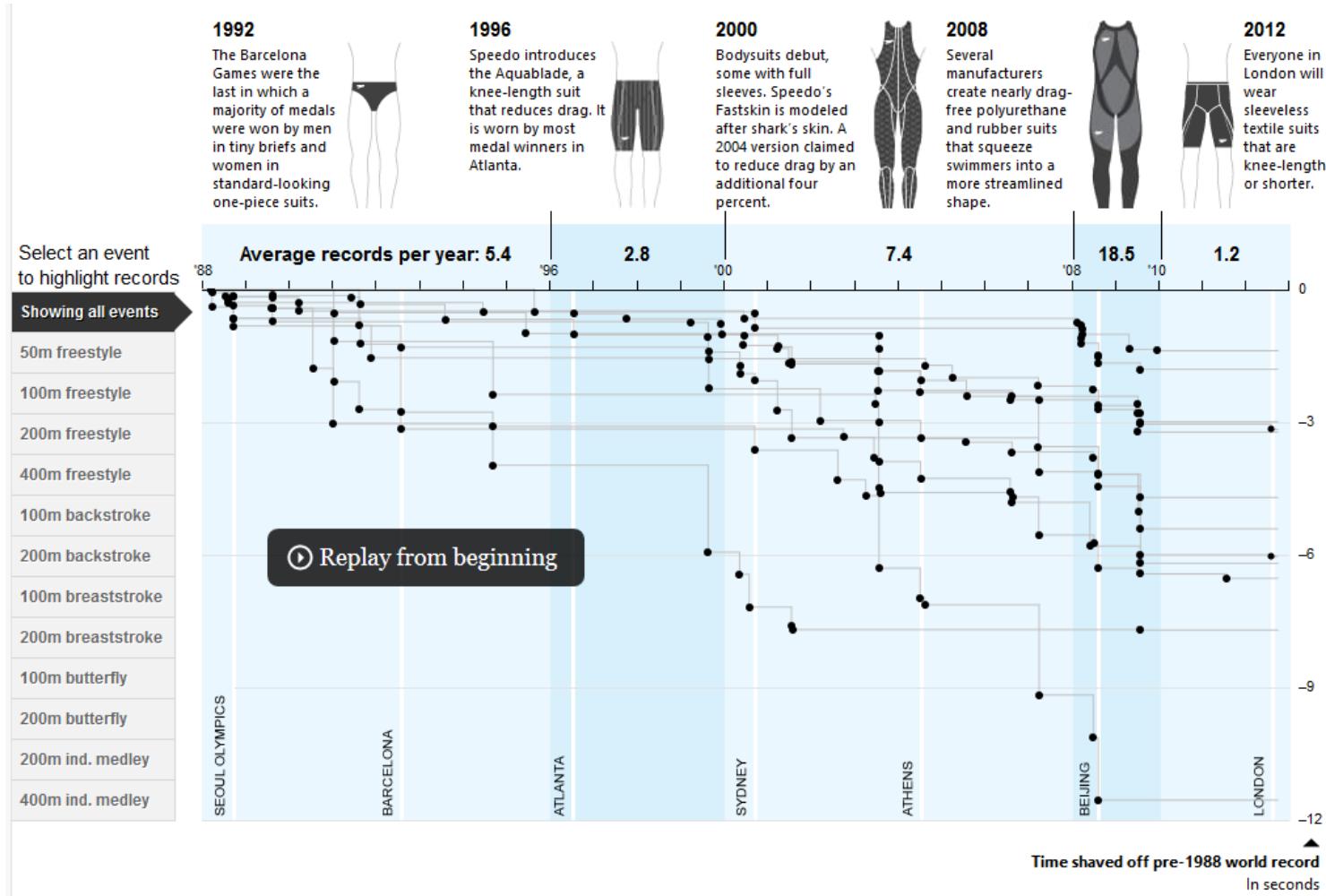
What It's Like to Face a 150 M.P.H. Tennis Serve

By GRAHAM ROBERTS, JOE WARD and JEREMY WHITE JULY 10, 2015



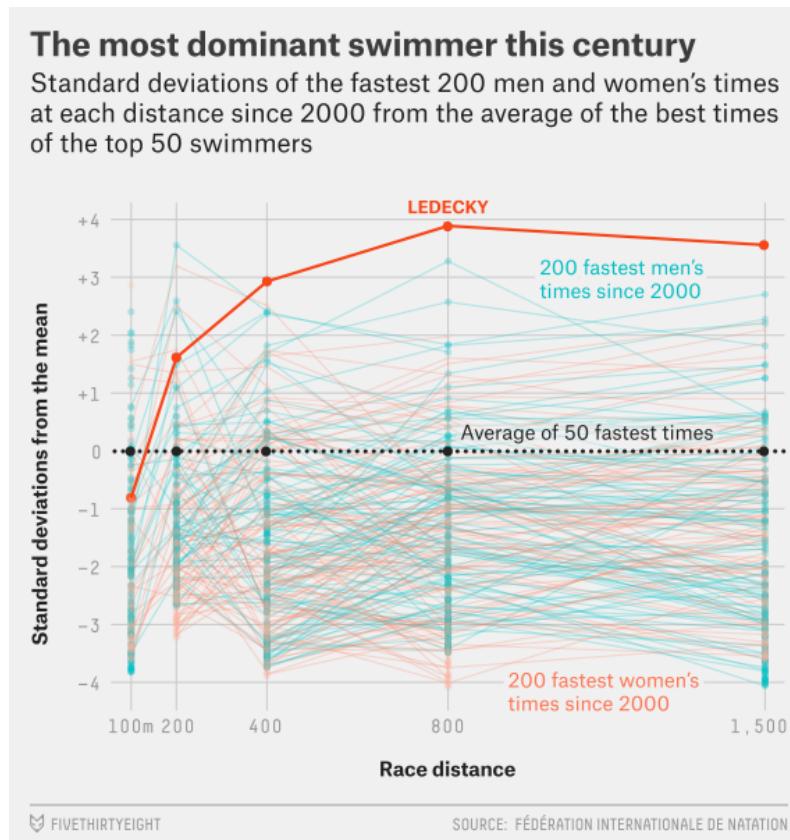
Source: Roberts, Ward, and White for the New York Times, 'What it's like to face a 150 m.p.h. tennis serve'

'Induces the viewer to think about its substance'



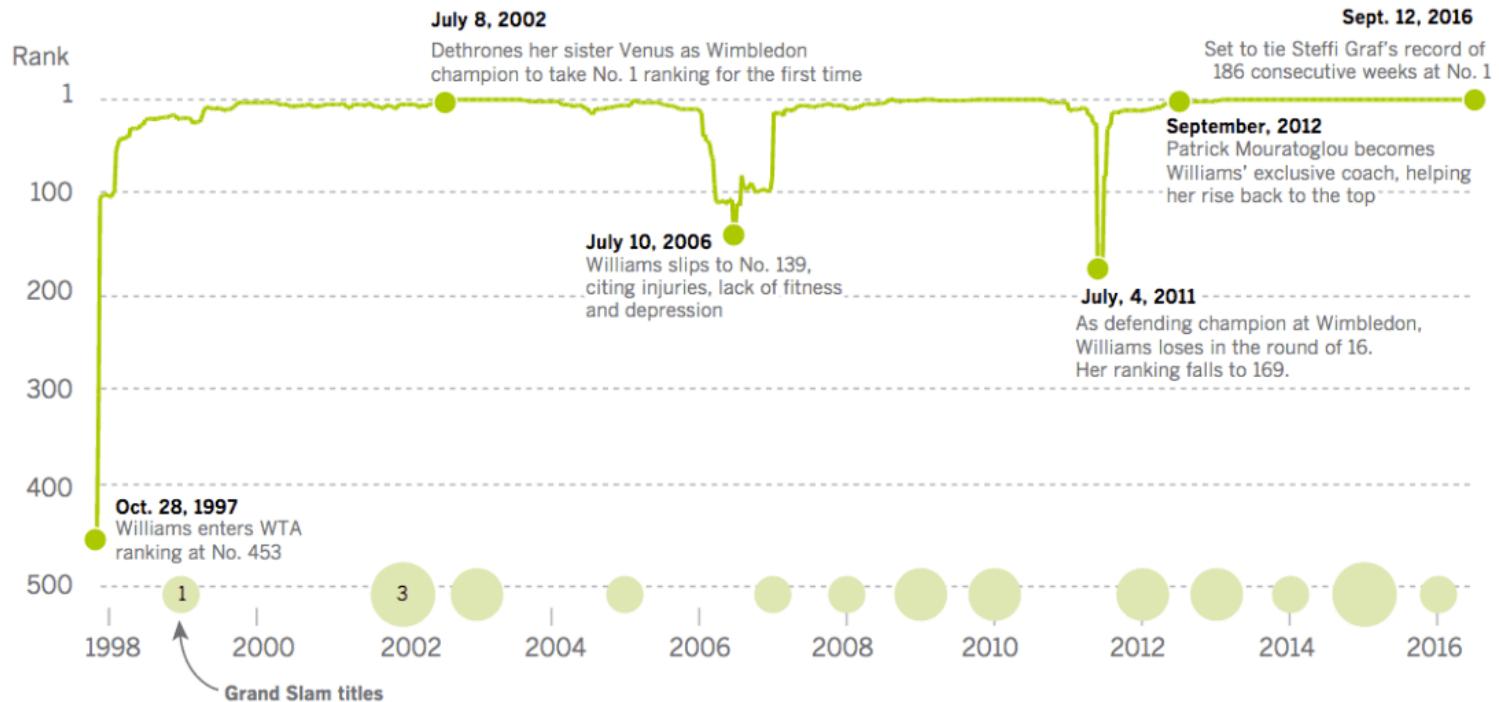
Source: Andrews, Berkowitz, Flaherty, and Lindeman for The Washington Post, 'Dressed for a world record?'

'Encourages the eye to compare different pieces of data'

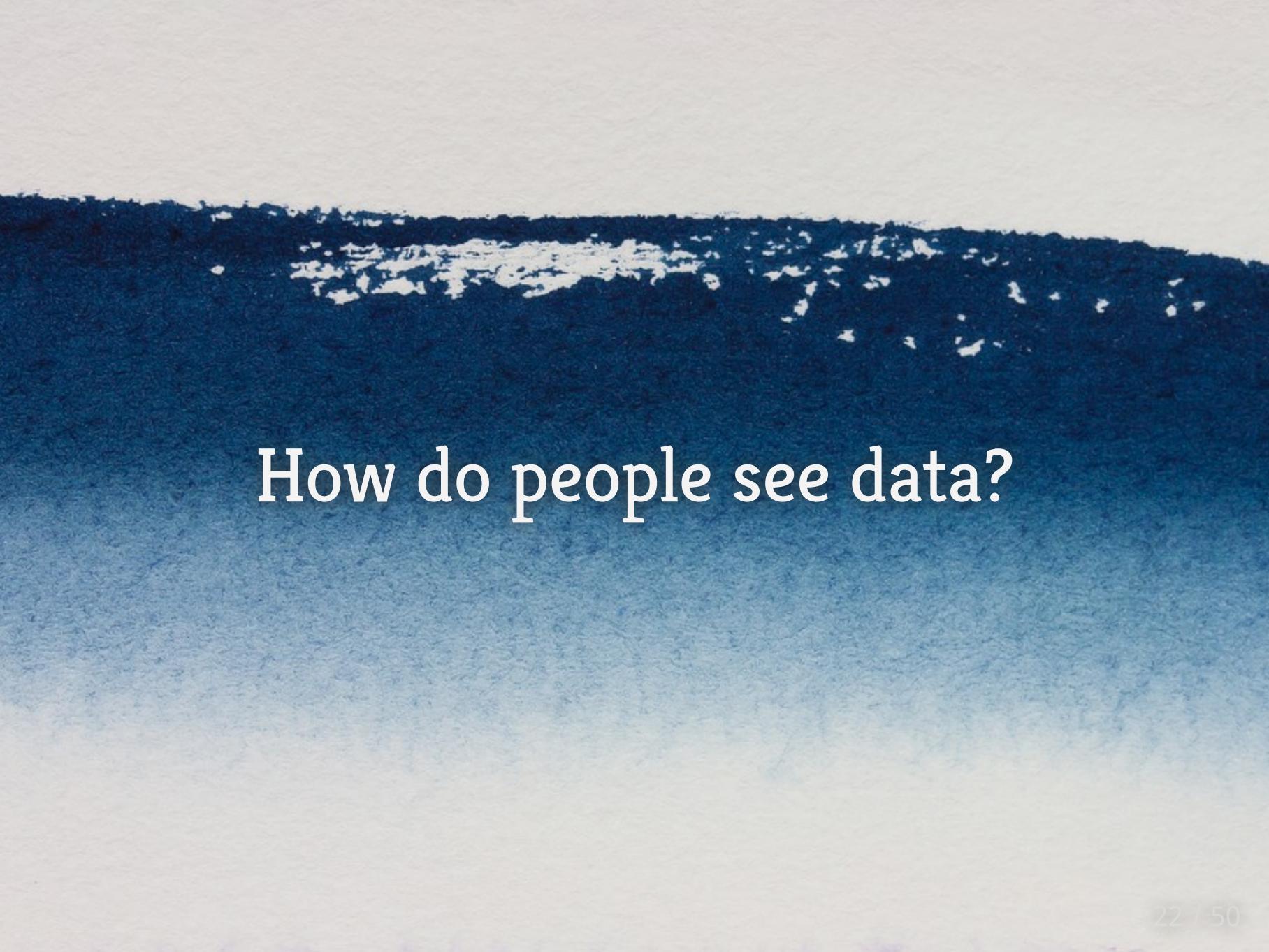


Source: Benjamin Morris for FiveThirtyEight, 'Katie Ledecky is the present and the future of swimming'

'Reveals the data at several levels of detail'



Source: Kyle Kim & Los Angeles Times Staff, 'Greatest of all time'



How do people see data?

Aspects of the visualisation

Source: [Seeing Data research](#)

Subject matter

Trustworthiness of the source / location

Visual elements used

The viewer's state and circumstances

Source: [Seeing Data research](#)

Beliefs and opinions

Time

Emotions

Confidence

The viewer's skills

Source: [Seeing Data research](#)

Language skills

Mathematical / statistical skills and visual literacy

Computer skills

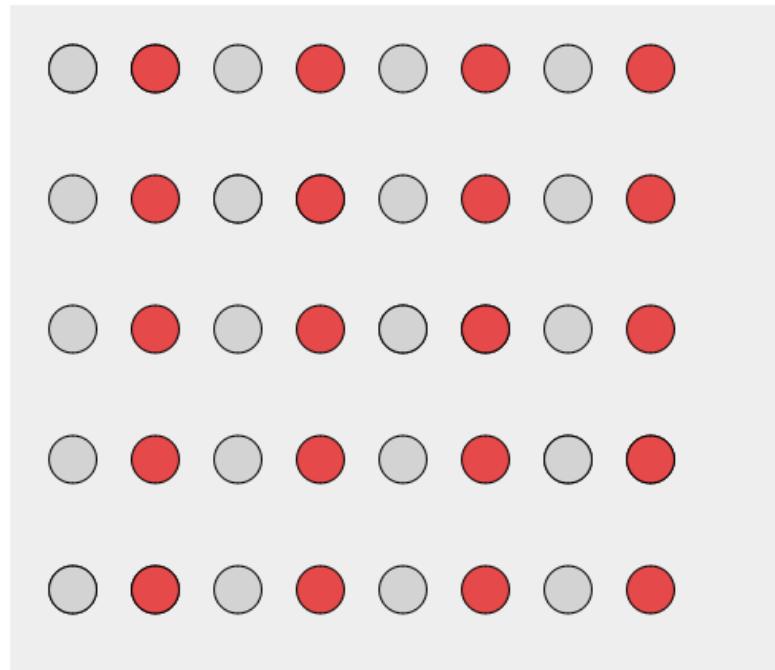
Critical thinking skills

Gestalt principles of perception

A very brief introduction

Similarity

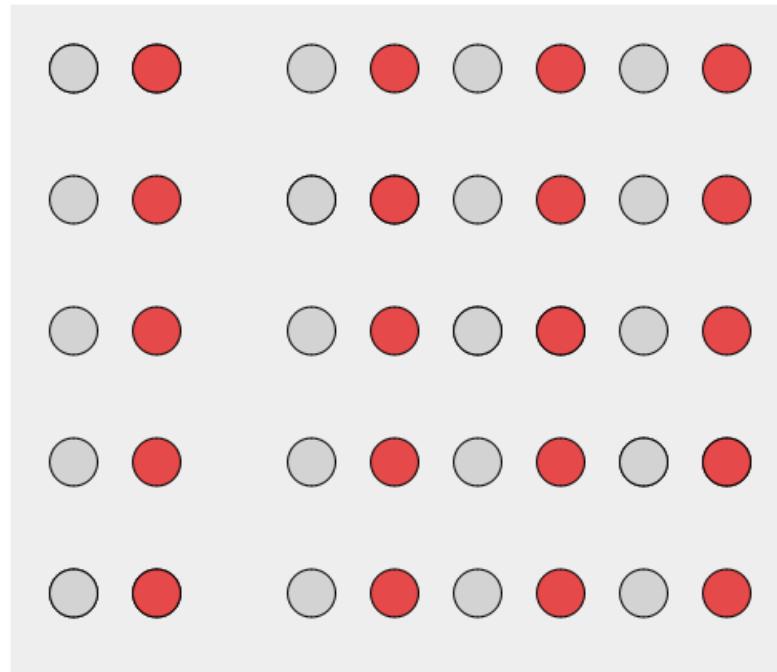
Graphical elements with shared visual properties are seen to belong to the same group.



Source: Elijah Meeks, 'Gestalt principles for data visualization: Similarity, proximity & enclosure'

Proximity

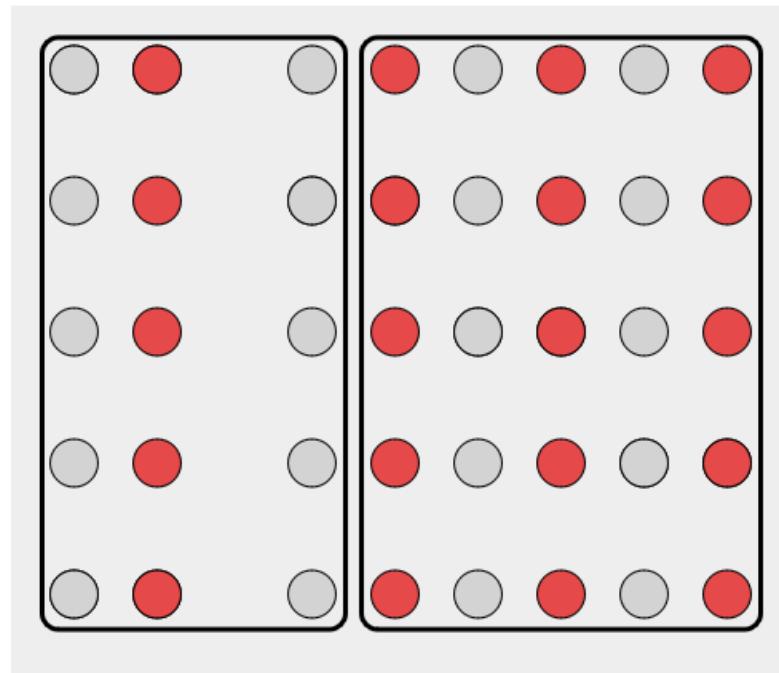
Objects that are close to each other tend to be perceived together in a group.



Source: Elijah Meeks, 'Gestalt principles for data visualization: Similarity, proximity & enclosure'

Enclosure

Enclosing or surrounding a group of related elements with a border is a powerful indicator of grouping.

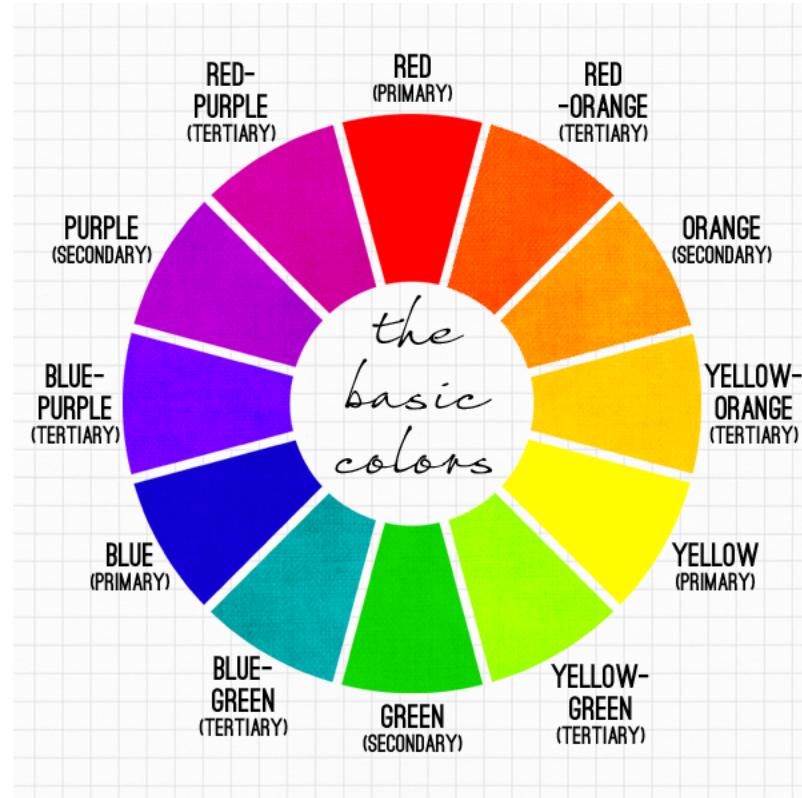


Source: Elijah Meeks, 'Gestalt principles for data visualization: Similarity, proximity & enclosure'



Basic colour theory

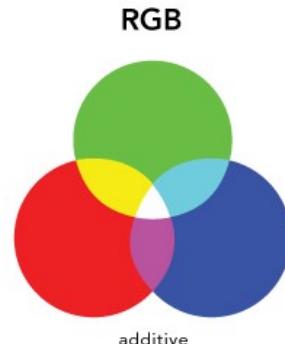
The colour wheel



Source: Tubik Studio, 'Color theory: Brief guide for designers'

Colour models

The Difference Between **RGB** and **CMYK**



Used for Digital and Web Media



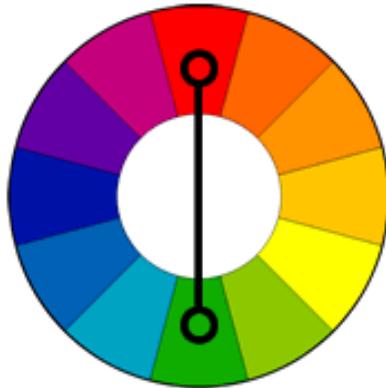
Used for Print Media

printaura.com

Source: Tubik Studio, 'Color theory: Brief guide for designers'

Colour harmony: Complementary

Colours that are opposite each other on the colour wheel.

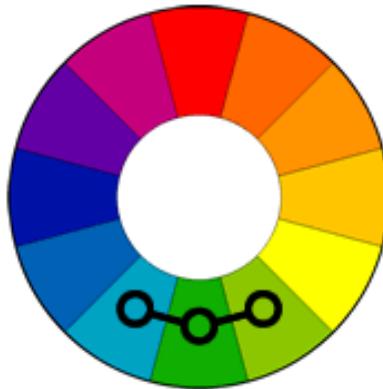


Source: [Tiger Color, 'Color harmonies'](#)

High contrast, attention-grabbing, can be jarring, poor for text.

Colour harmony: Analogous

Colours that are next to each other on the colour wheel.

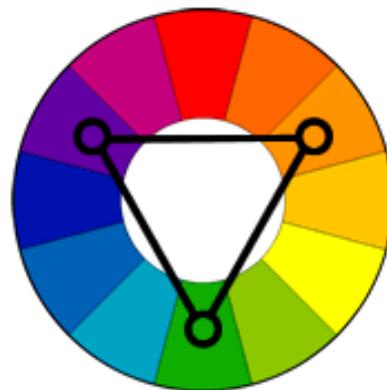


Source: [Tiger Color](#), 'Color harmonies'

Usually considered pleasing to the eye. When using analogous colour schemes, ensure sufficient contrast between the selected colours.

Colour harmony: Triad

Triadic colour schemes draw from colours that are evenly spaced around the colour wheel.

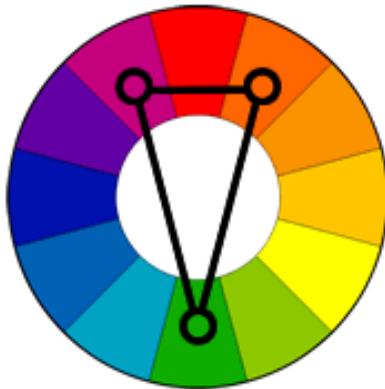


Source: [Tiger Color, 'Color harmonies'](#)

Tends to be seen as vibrant, irrespective of colour saturation.

Colour harmony: Split-complementary

Consists of the base colour, and the two colours adjacent to its complement.



Source: [Tiger Color, 'Color harmonies'](#)

Also seen as vibrant, a more modern appearance than the triadic colour scheme.

Colourblind-friendly palettes

Viz Palette By: Elijah Meeks & Susie Lu

PICK

- Use Chroma.js
- Use Colorgorical
- Use ColorBrewer

EDIT

- 1 #fd700
- 2 #fb14e
- 3 #fa8775
- 4 #ea8594
- 5 #cd34b5
- 6 #d02d27
- 7 #0000ff

GET

- String quotes
- Object with metadata

```
[ "#fd700",
  "#fb14e",
  "#fa8775",
  "#ea8594",
  "#cd34b5",
  "#d02d27",
  "#0000ff" ]
```

COLORS IN ACTION

Color Population: No Color Deficiency - 96% Deuteranomaly - 2.7% Protanomaly - 0.66% Protanopia - 0.59% Deutanopia - 0.56%

Background color: #ffff

Font color: #000000

Charts made with Sematic

Sample font Randomize Data Stroke: Dark None

Source: [Viz Palette](#)

'Can you graph it for me?'

Doing data vis in sport

Articulate the end-user's needs

- Ask questions that help to position the value of your data vis work
- Listen to what they mean, it's not always what they say

Learn and practice the fundamentals:

- Working with data
- Visual information design
- Colour theory

Seek out and embrace feedback

NOTHING
IS
ORIGINAL.



<https://github.com/jacquietran/aut-postgrads-2018-04>

Dr Jacquie Tran | @jacquietran | <https://www.jacquietran.com>



Looking for more?

Books

Claus O. Wilke, 'Fundamentals of Data Visualization'

Alberto Cairo, 'The Functional Art'

Edward Tufte:

- 'Visual Explanations'
- 'Beautiful Evidence'
- 'Envisioning Information'
- 'The Visual Display of Quantitative Information'

Dr Stephanie Evergreen, 'Effective Data Visualisation'

Andy Kirk, 'Data Visualisation: A Handbook for Data Driven Design'

Nancy Duarte, 'Resonate'

Blog posts

Visual information design and colour theory

Steven Bradley (*Smashing Magazine*), 'Design principles: Visual perception and the principles of Gestalt'

Elijah Meeks, 'Gestalt principles for data visualisation'

Tubik Studio, 'Color theory: Brief guide for designers'

Harshita Arora, 'An intro to color theory: How to combine colors and set the mood of your designs'

Color Matters, 'Basic color theory'

Sam Hampton-Smith (*Creative Bloq* blog), 'How to master colour theory'

Blog posts

Data visualisation methods and techniques

Susie Lu, 'Storytelling in dashboards'

Dr Stephanie Evergreen, 'What #TLDR Means for your report'

Dr Stephanie Evergreen, 'How to build data visualisations in Excel'

Stuart Lee & Prof Di Cook (*Visiphilia* blog), 'Rookie mistakes and how to fix them when making plots of data'

Cole Nussbaumer Knaflic, *Storytelling With Data* blog

Nathan Yau (*Flowing Data* blog), 'Real chart rules to follow'

Tools, resources, and guides

Cookbook for R - Graphs

Elijah Meeks & Susie Lu, '[Viz palette](#)': Interactive tool for selecting colour-blind-friendly palettes

Dr Stephanie Evergreen, '[Data visualization checklist](#)'

Jennifer Lyons, '[Qualitative chart chooser](#)'

Podcasts, videos, and online courses

Data Stories podcast, with Enrico Bertini and Moritz Stefaner

Hans Rosling, 'The best stats you've ever seen' (TED2006)

David McCandless, 'The beauty of data visualisation' (TEDGlobal 2010)

Dr Stephanie Evergreen & Andy Kirk for SAGE, 'Learn the essentials of data visualization'

Visualisations using sports data

Prof Di Cook (*Visiphilia* blog), 'Better cricket plots'

Todd W. Schneider, 'BallR: Interactive NBA shot charts with R and Shiny'

Joe Fox, Ryan Menzies, and Armand Emamdjomeh for the LA Times, 'Every shot Kobe Bryant ever took. All 30,699 of them'

Stephanie Kovalchik (*Stats On The T* blog), 'Measuring match fatigue'

Programming (R, CSS)

xaringan demo presentation

xaringan wiki

Image credit

Map of Australia

Jarrod Hyde - Rowers on the Yarra River, Melbourne

Torquay Front Beach

Japan female kata team, competing at the 2016 WKF World Senior Championships