



Crash Course in Data Visualization

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1. What is data visualization?

What is data viz?

Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively.

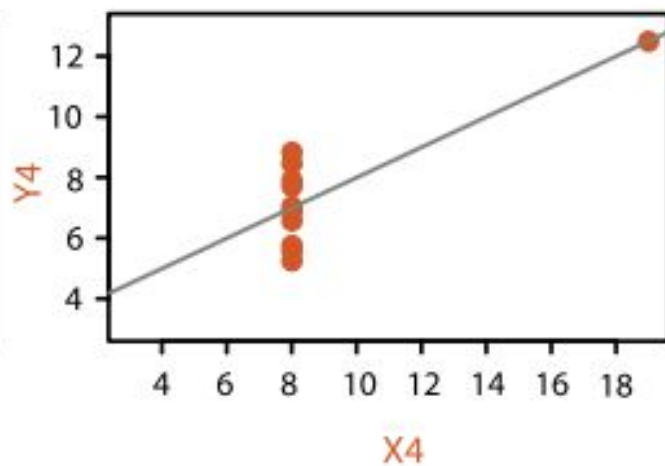
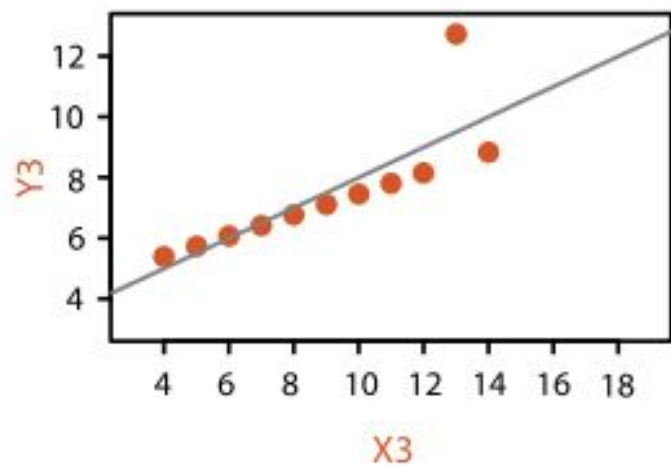
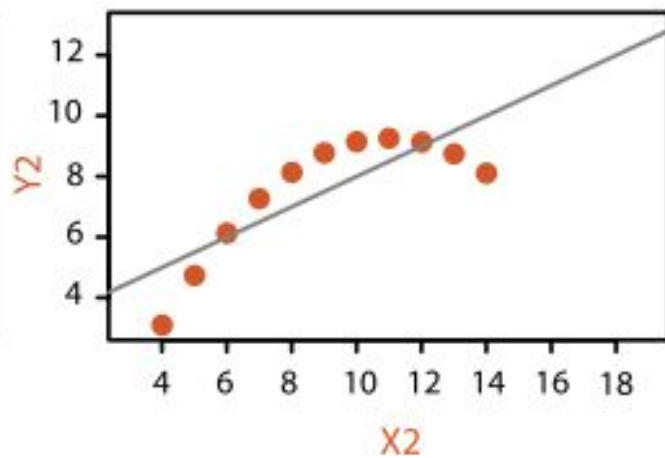
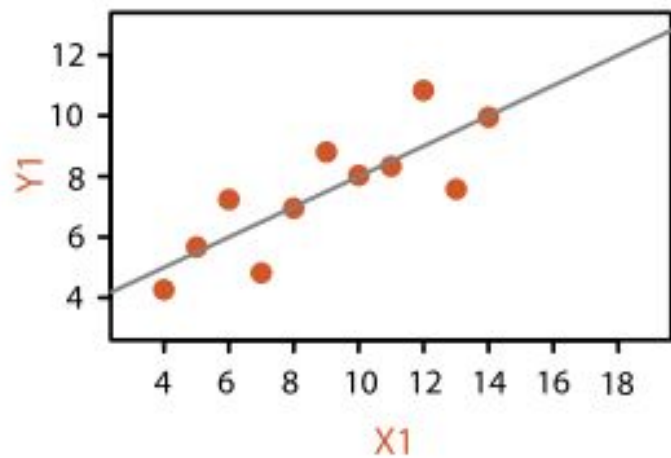
What is data viz?

Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively.

Why do we viz?

Anscombe's Quartet: Raw Data

	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
	10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
	8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
	13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
	9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
	11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
	14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
	6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
	4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
	12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
	7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
	5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89
Mean	9.0	7.5	9.0	7.5	9.0	7.5	9.0	7.5
Variance	10.0	3.75	10.0	3.75	10.0	3.75	10.0	3.75
Correlation	0.816		0.816		0.816		0.816	



2. How to focus audience attention

Pre-attentive attributes

How should our audience interact with our visualization?

How can we focus their attention?

Count the 8s

01001011018000101010010101100101081
01081011000101180010100101800010110
00101001018000101100010100101100810
11000101001011000101100810100101100
01011080101001081000101100010180101

There are eleven

0 1 0 0 1 0 1 1 0 1 8 0 0 0 1 0 1 0 1 0 0 1 0 1 0 1 1 0 0 1 0 1 0 8 1
0 1 0 8 1 0 1 1 0 0 0 1 0 1 1 8 0 0 1 0 1 0 0 1 0 1 8 0 0 0 1 0 1 1 0
0 0 1 0 1 0 0 1 0 1 8 0 0 0 1 0 1 1 0 0 0 1 0 1 0 0 1 0 1 1 0 0 8 1 0
1 1 0 0 0 1 0 1 0 0 1 0 1 1 0 0 0 1 0 1 1 0 0 8 1 0 1 0 0 1 0 1 1 0 0
0 1 0 1 1 0 8 0 1 0 1 0 0 1 0 8 1 0 0 0 1 0 1 1 0 0 0 1 0 1 8 0 1 0 1



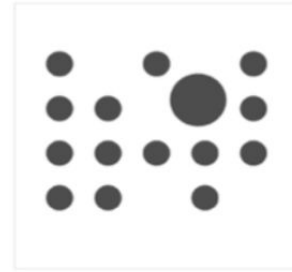
Length



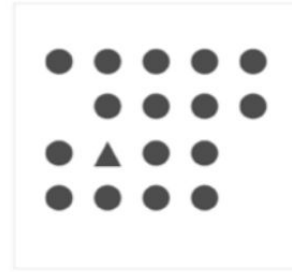
Width



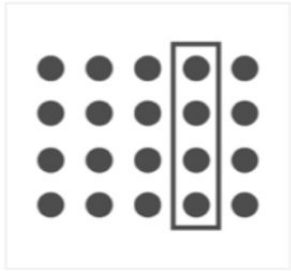
Orientation



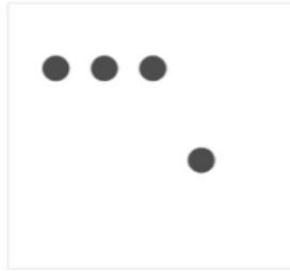
Size



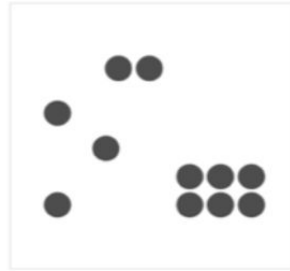
Shape



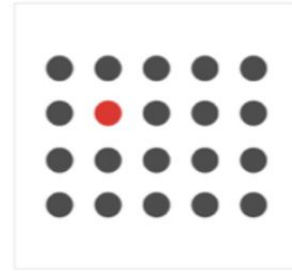
Enclosure



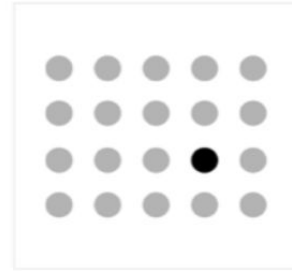
Position



Grouping



Color Hue



Color Intensity

Textual pre-attentive attributes

Bold

Color

Italics

Size

separation

Outline (enclosure)

Underline (added marks)

color, and position

Size

Size, color, and position

State Level Ad Platform Ranking: Top 3													
	Ad Platform												
State	Google	Facebook	Bing	Twitter	Outbrain	State	Google	Facebook	Bing	Twitter	Outbrain		
Arizona	1	2	3	4	5	Arizona	1	2	3	4	5		
Mass.	1	2	5	4	3	Mass.	1	2	5	4	3		
Vermont	2	1	5	4	3	Vermont	2	1	5	4	3		
Wisconsin	3	2	5	1	4	Wisconsin	3	2	5	1	4		
Washington	1	2	5	4	3	Washington	1	2	5	4	3		
Georgia	4	5	4	2	1	Georgia	4	5	4	2	1		
Virginia	3	1	2	4	5	Virginia	3	1	2	4	5		
Cali.	2	3	4	5	1	Cali.	2	3	4	5	1		
Ohio	1	3	5	2	4	Ohio	1	3	5	2	4		
Iowa	2	3	4	1	5	Iowa	2	3	4	1	5		

Size, color, and position

Use visual cues, or your audience may look at visuals in a “zig zag” pattern

3. We are all designers

Sullivan: Form follows function

Form: what the user is interacting with

Function: what the user is intended to do

(Louis Sullivan)

“Form follows function” for dataviz

What do we want our audience to do with our data graphics?

How can we design the graphics to enable this function?

RAILWAYS



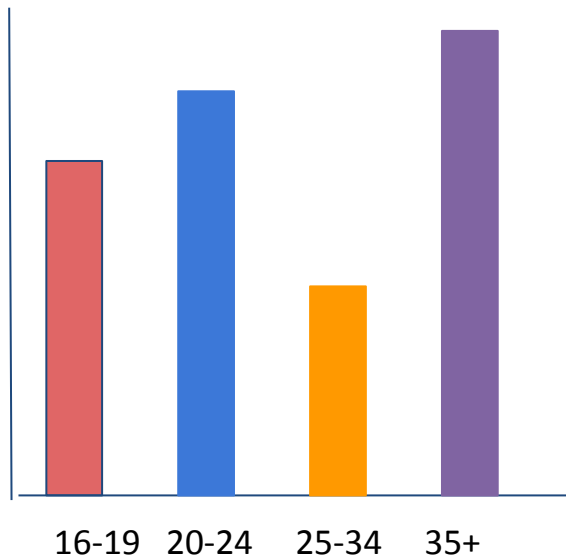


H. C. BECK - Recreated by ARTURS D.

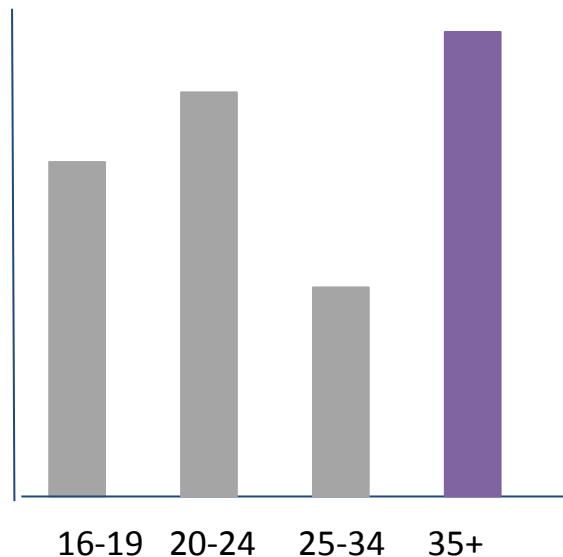


De-emphasize what's not important

Click-through rate by age bracket

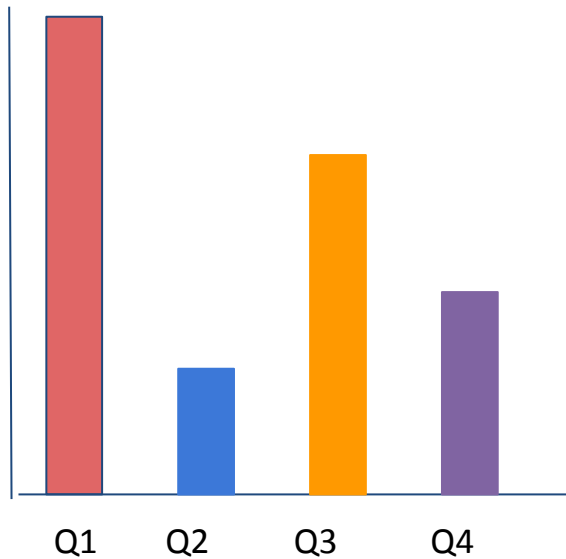


35+ has the highest click-through rate

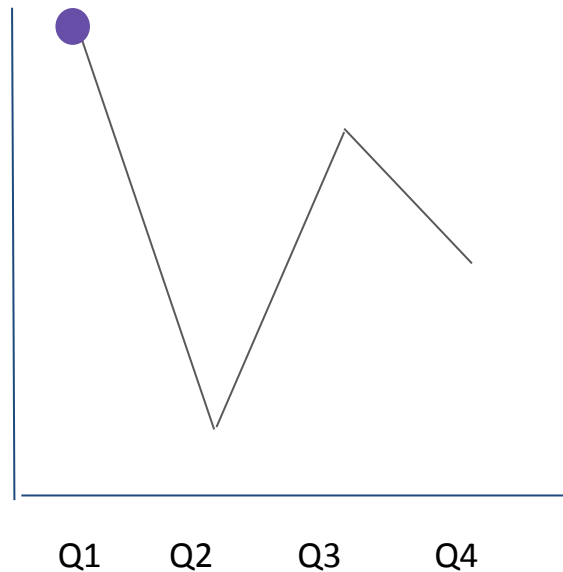


Clean it up

Click-through rate for 35+ by quarter



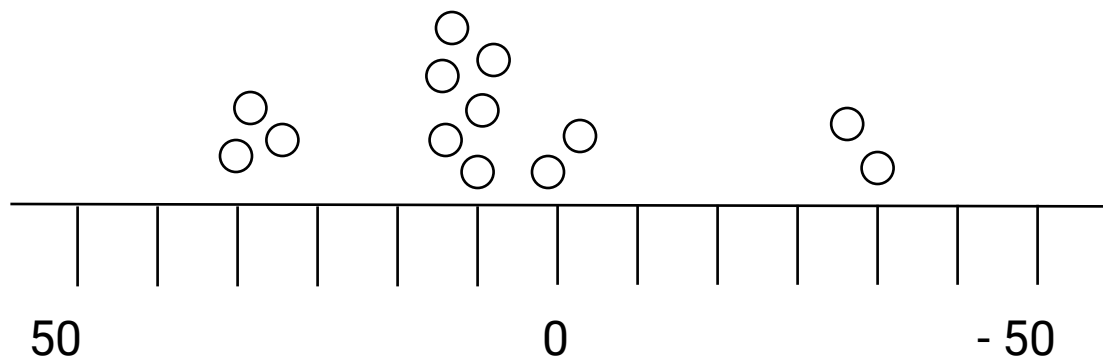
Q1 has highest click-through rate



Avoid overcomplicating

- Use legible fonts consistently
- Strive for “clean” aesthetic
- Use simple language
- Avoid complexity

Consider your audience's intuition



4. What is a dashboard?

What is a dashboard?

“A **dashboard** is a visual display of the most important information needed to achieve one or more objectives that has been consolidated in a single computer screen so it can be monitored at a glance.”

- Stephen Few,
Information Dashboard Design (2006)

What is a dashboard?

- . Display information for specific objectives
- . Fits on one “screen”
- . Frequency of data relates to objectives
- . User can monitor information "at a glance"

3 main types of dashboards?

- **Strategic** - for managers and executives; simple visual elements
- **Analytical** - enable deeper data analysis and drill downs
- **Operational** – built for constant change; focus on the “now”