



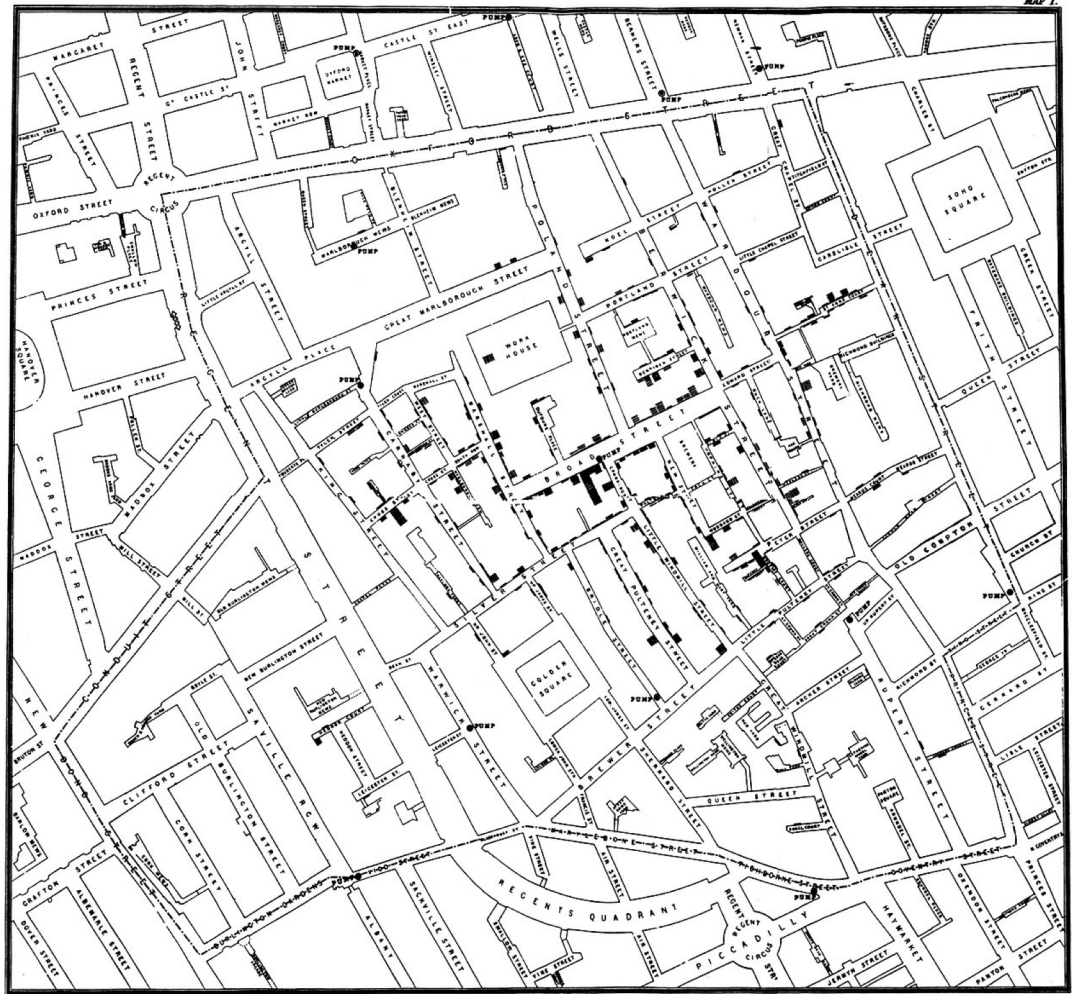
Health and Visual Information

Considerations for health communication

Michael Simeone, PhD
Arizona State University

John Snow

1854 cholera epidemic in
London



Key considerations: LRVW

Literacy

Risk

Vernacular

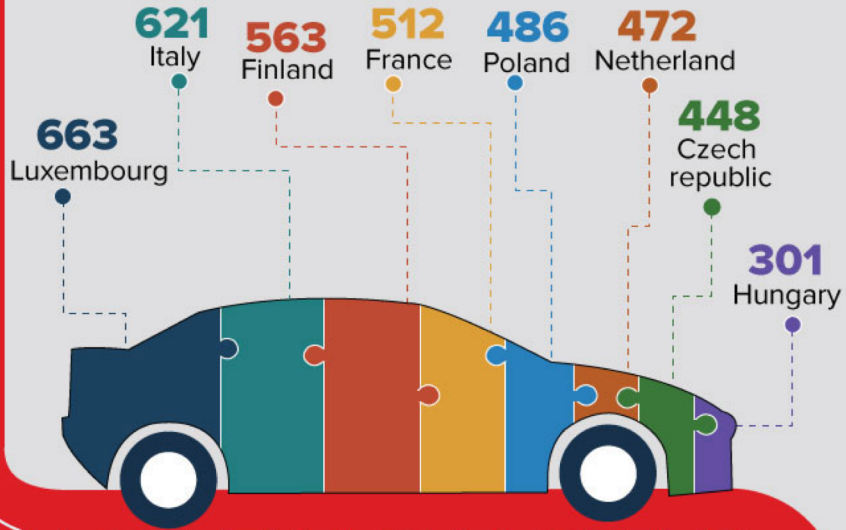
Well-being



Passenger Car Density per 1,000 Inhabitants - A Quick Look at Some European Nations

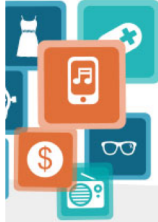
2012

Figures in actuals

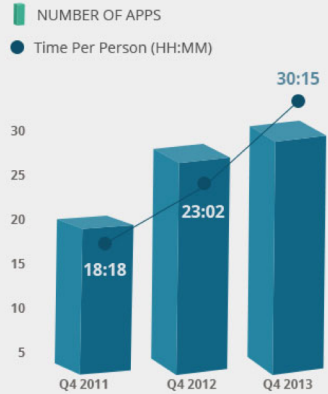
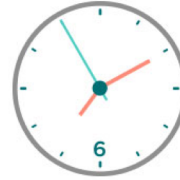


3

Rise in Usage of Mobile Apps

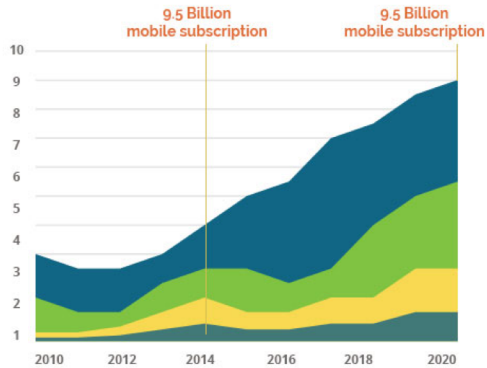


The time spent on app has gone up by 7 hours in a Year



1

Mobile Device Usage is Exploding



7.1 billion

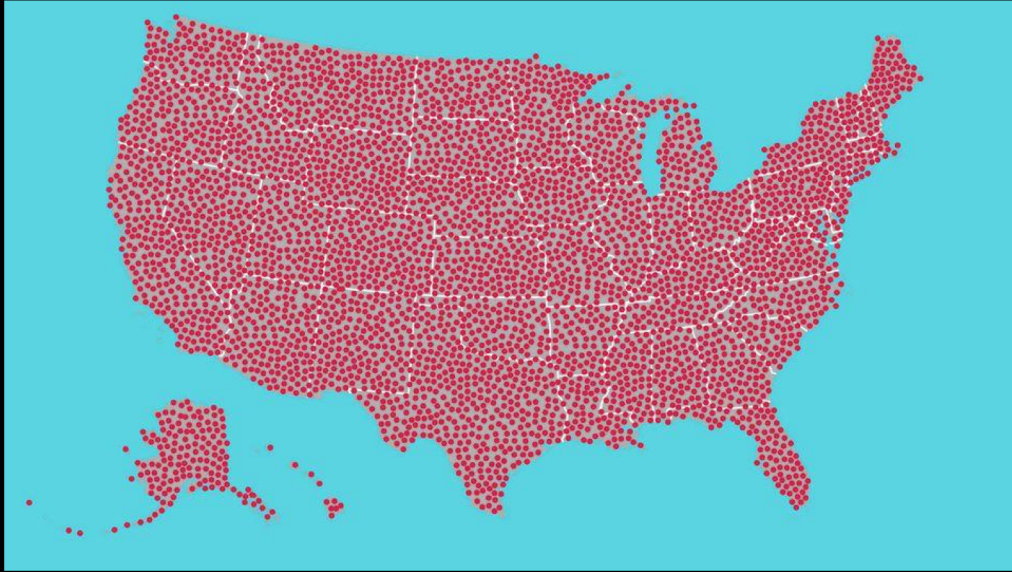
Mobile Subscriptions in 2014

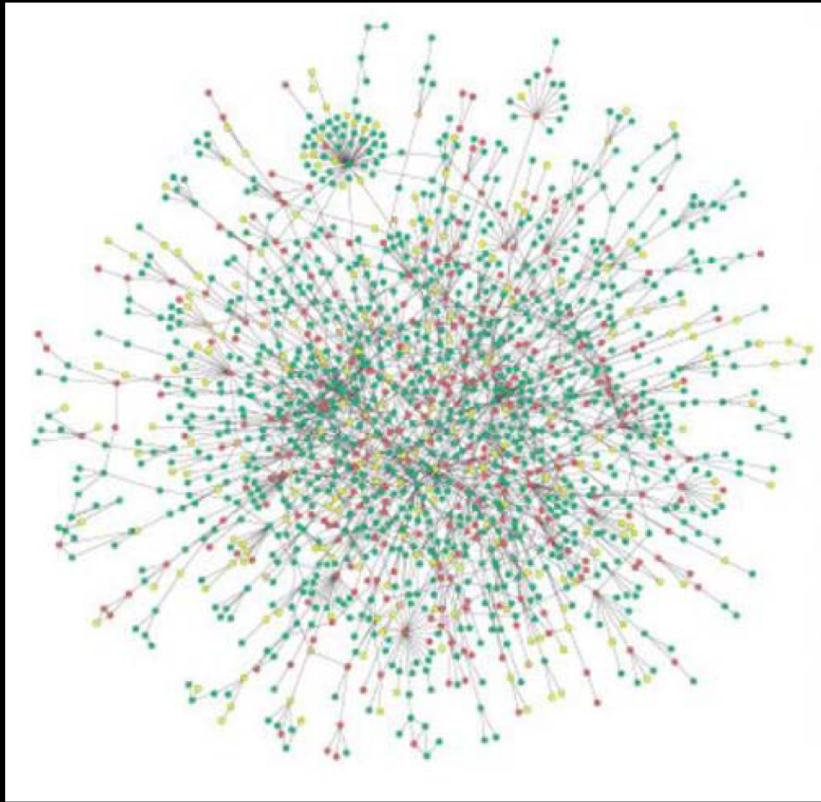
95.5% of the world population



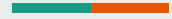
9.5 billion

Mobile Subscriptions by 2020









Perception





What we're good at (Johnson, 2010)

Recognition (expectation)

Comparison

Color

Learning



What we're bad at:

Reading

Peripheral vision

Attention

Problem Solving



Summary: Don't forget recall

Recognition (expectation)

Reading

Comparison

Peripheral vision

Color

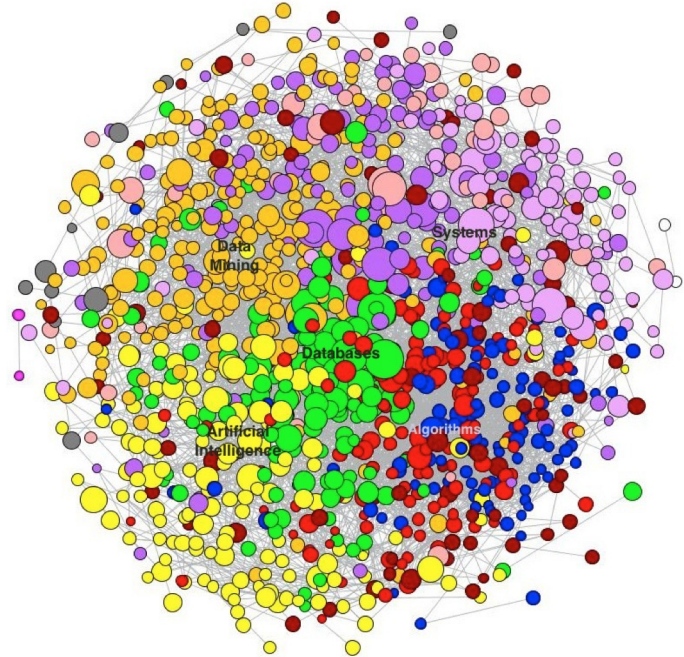
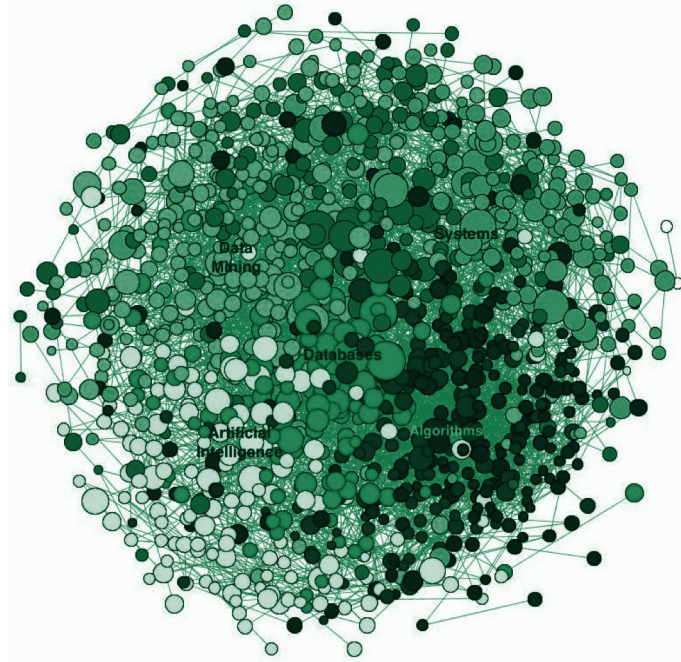
Attention

Learning/doing learned things

Problem Solving



Understand/control what audience looks for





Color



Paleness, Separation, Size

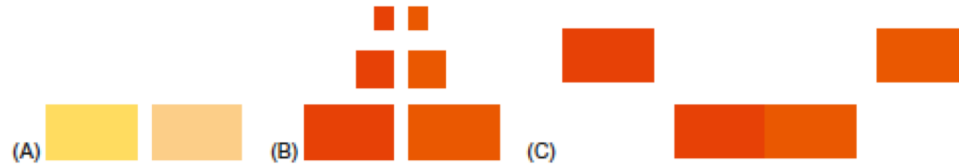
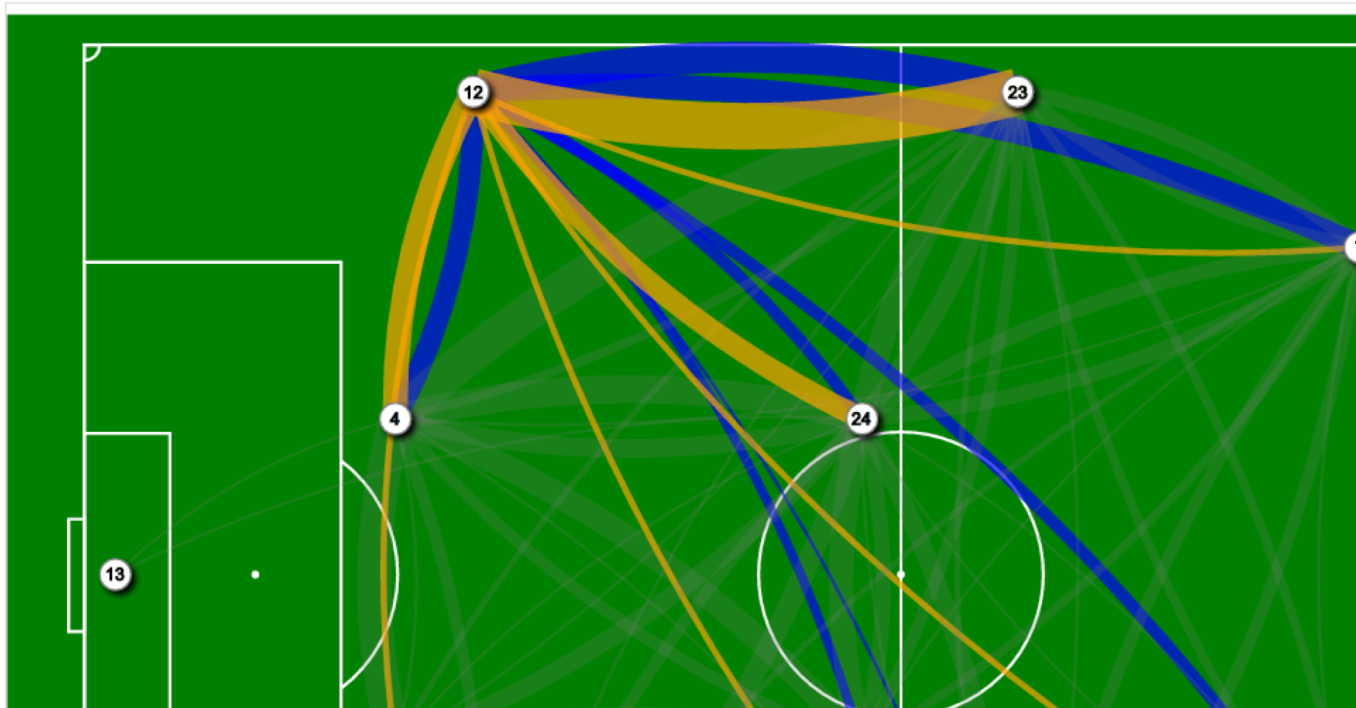


FIGURE 5.4

Factors affecting the ability to distinguish colors: (A) paleness, (B) size, (C) separation.

Johnson, 2010

Visualization of passes in a soccer game



“[T]his readiness to assume the guilt for the threats to our environment is deceptively reassuring: We like to be guilty since, if we are guilty, it all depends on us. We pull the strings of the catastrophe, so we can also save ourselves simply by changing our lives.

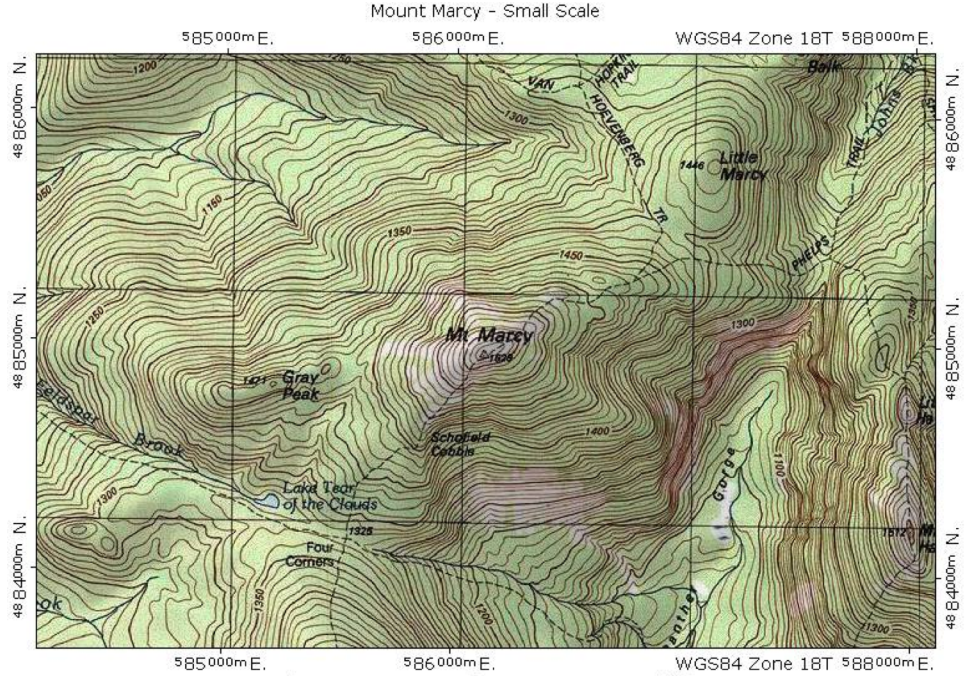
What is really hard for us (at least in the West) to accept is that we are reduced to the role of a passive observer who sits and watches what our fate will be.

To avoid this impotence, we engage in frantic, obsessive activities. We recycle old paper, we buy organic food, we install long-lasting light bulbs—whatever—just so we can be sure that we are doing something.

We make our individual contribution like the soccer fan who supports his team in front of a TV screen at home, shouting and jumping from his seat, in the belief that this will somehow influence the game's outcome.”

— Slavoj Žižek

Color moves the eyes



Quiz: Good or Bad?

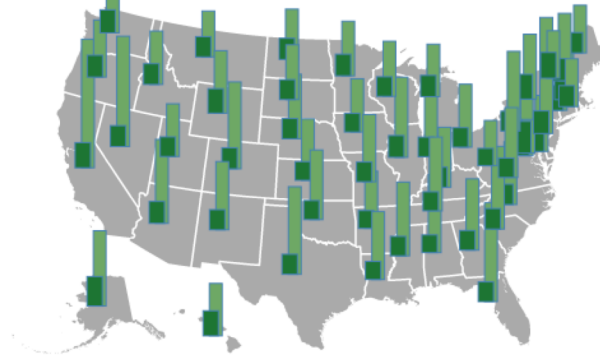
Medical Cost of Hip Replacement by State

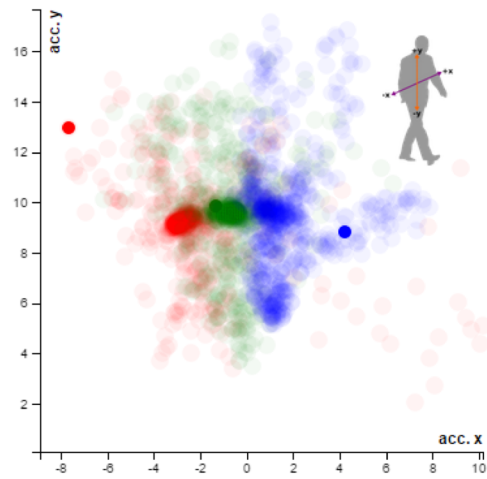
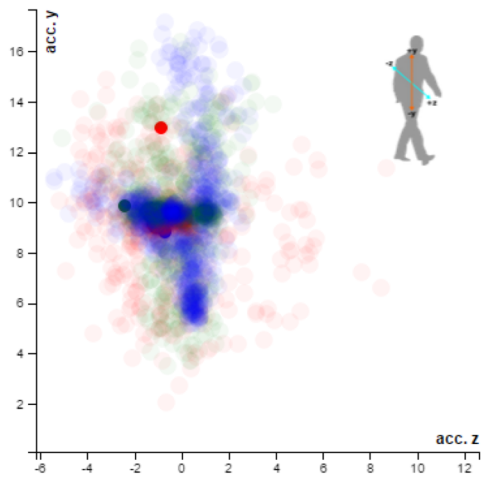
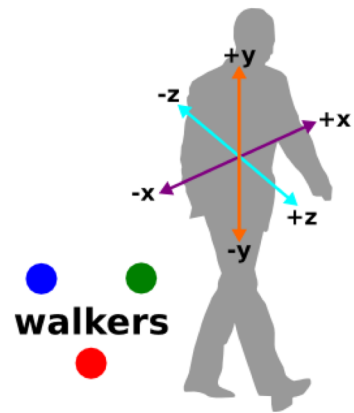
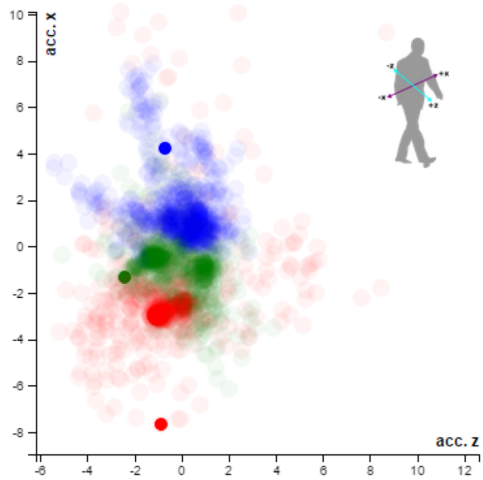
Data from [cms.gov](https://www.cms.gov)

by Phuoc Do 0 views 16 stars 619 clones

Map Us Map

Charge
Pay







Data Ink and Layering

Controlling density of information



What is “data ink?”

Consider:

proportion of a graphic's **ink** devoted to the non-redundant display of **data**-information

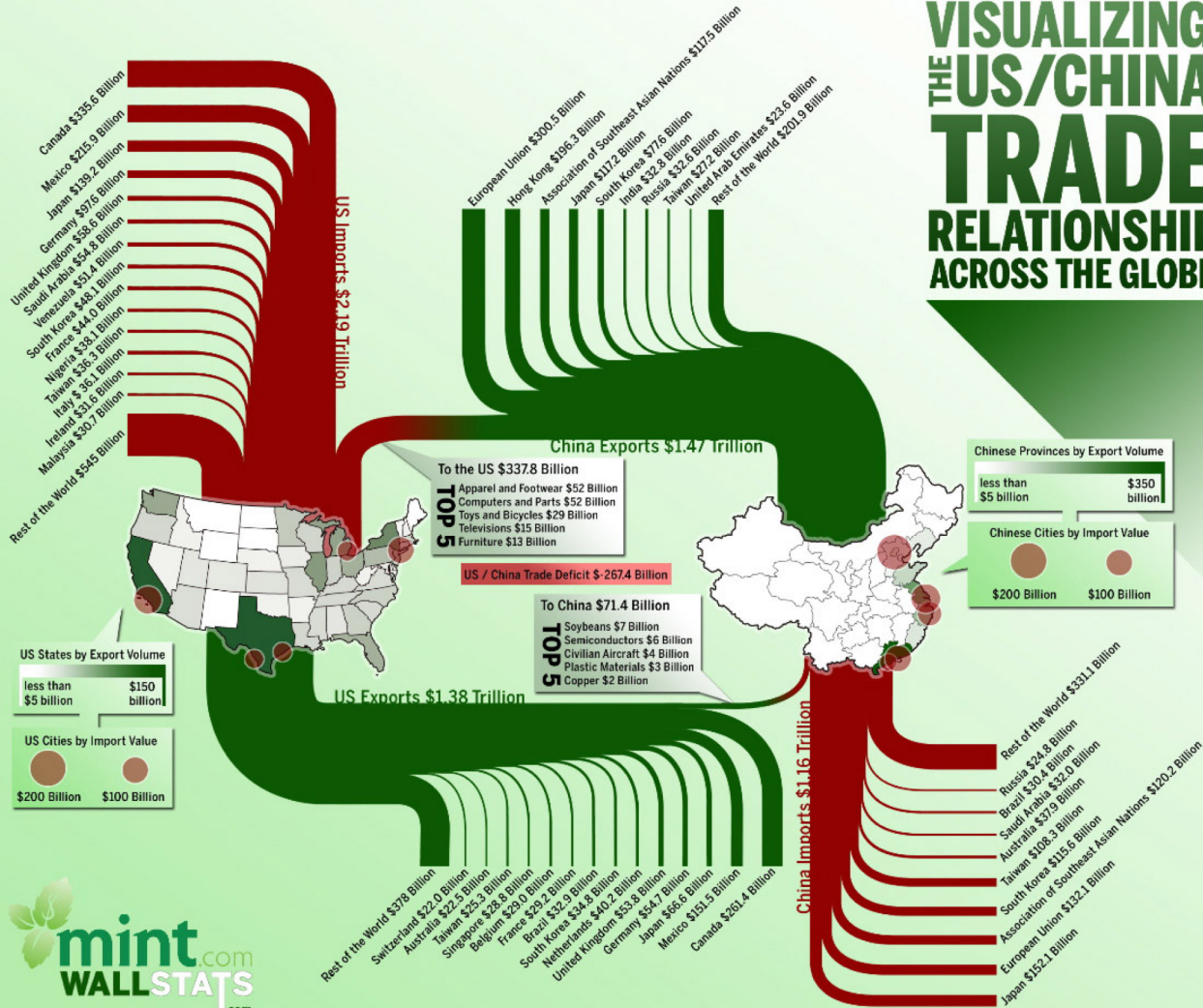
proportion of a graphic that can be erased without loss of **data**-information

(The Visual Display of Quantitative Information, Edward R. Tufte, Graphics Press, Cheshire CT)

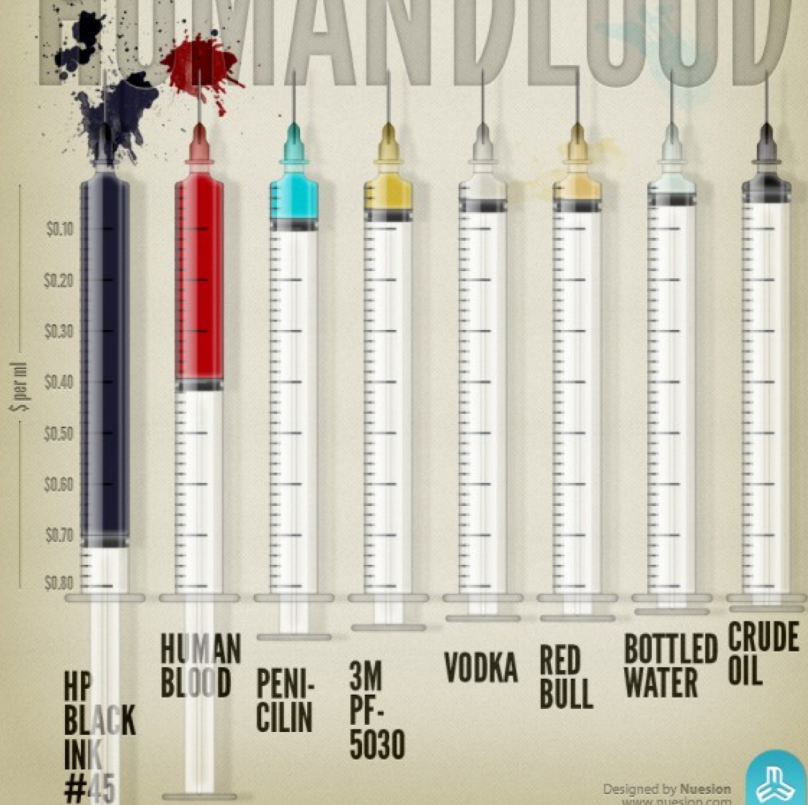
Clarity from more not less data (relatively)



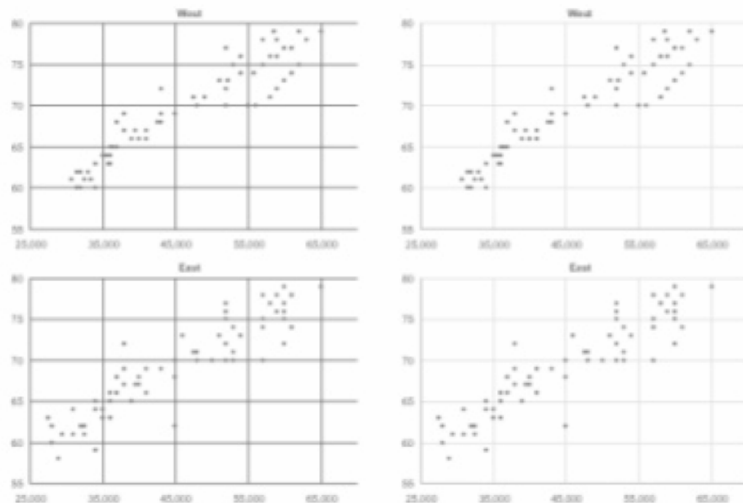
VISUALIZING THE US/CHINA TRADE RELATIONSHIP ACROSS THE GLOBE



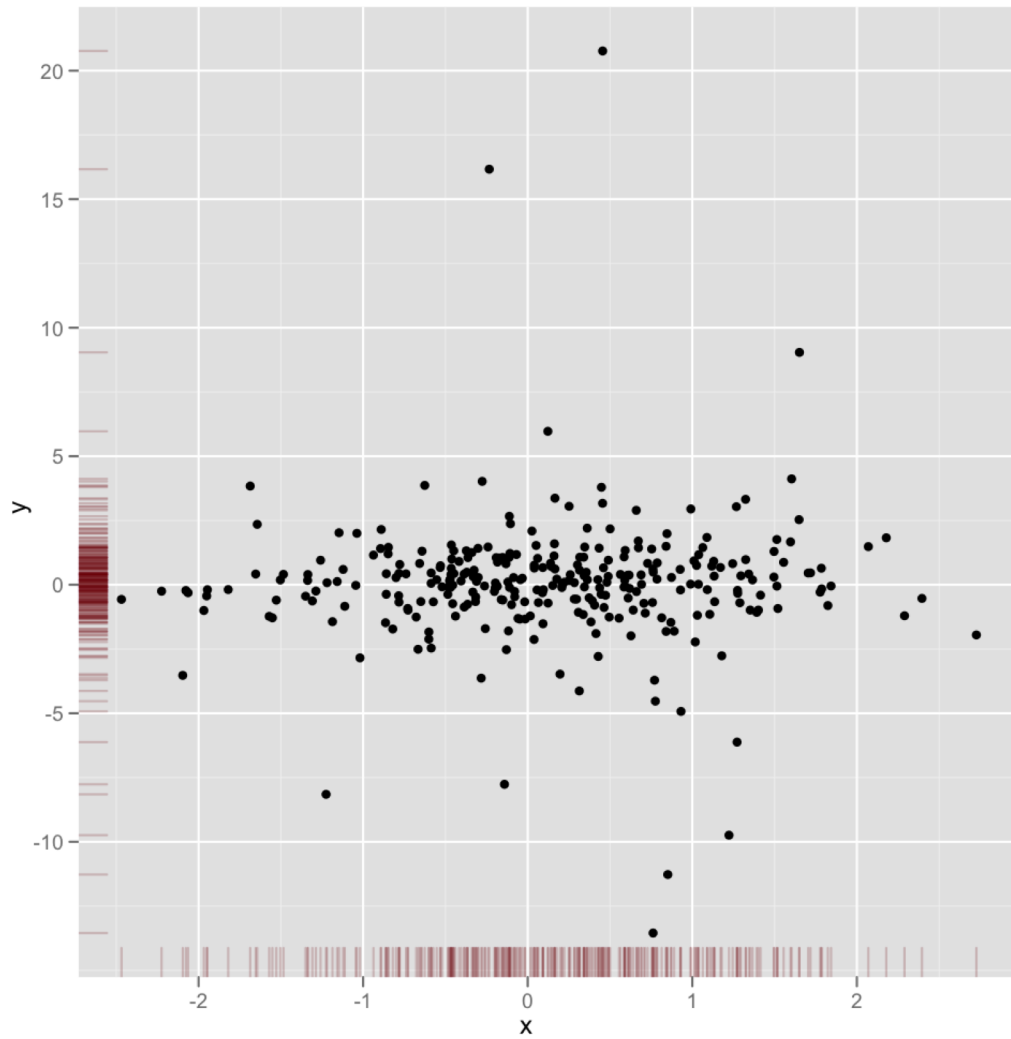
INK COSTS MORE THAN HUMAN BLOOD

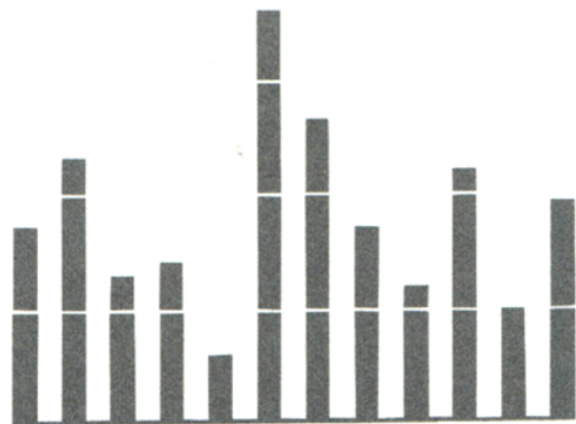
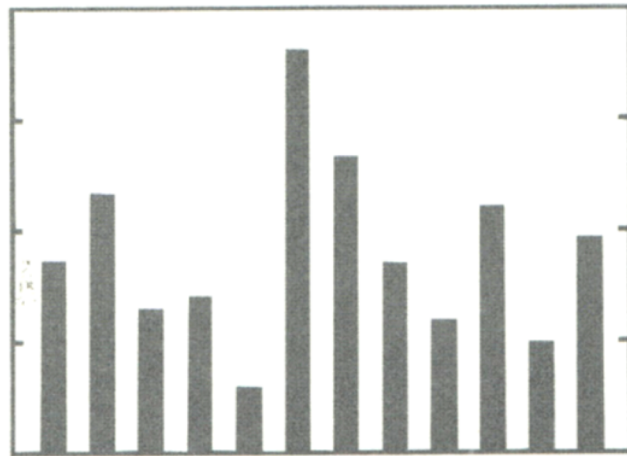


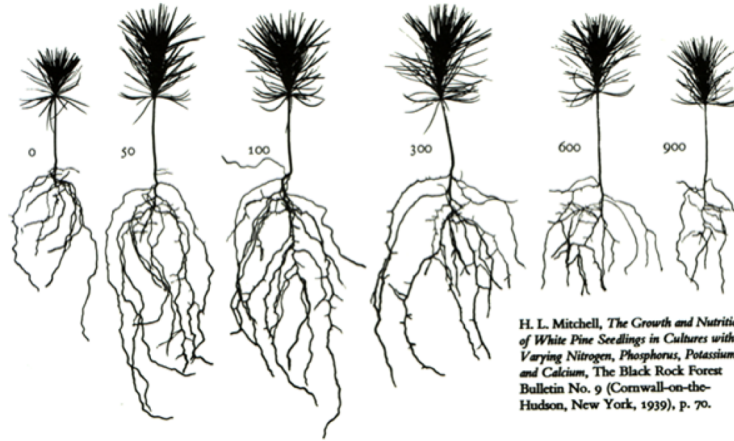
When the non-data ink is removed or reduced, the data become more manifest and it is easier to find the trending or pattern among them.



(Few, 2006)



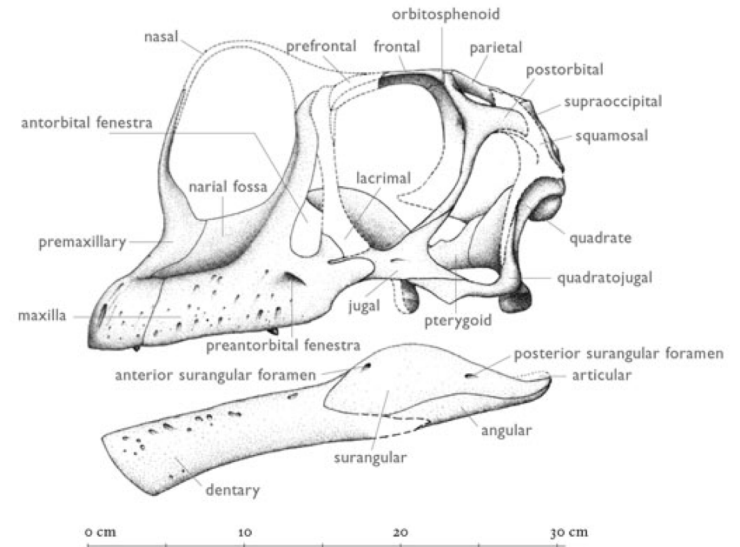
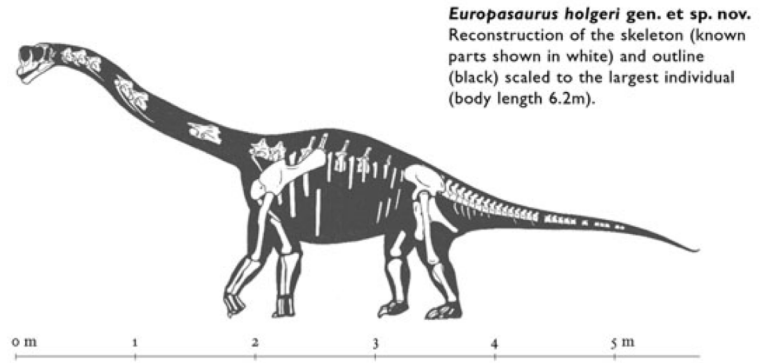




H. L. Mitchell, *The Growth and Nutrition of White Pine Seedlings in Cultures with Varying Nitrogen, Phosphorus, Potassium and Calcium*, The Black Rock Forest Bulletin No. 9 (Cornwall-on-the-Hudson, New York, 1939), p. 70.

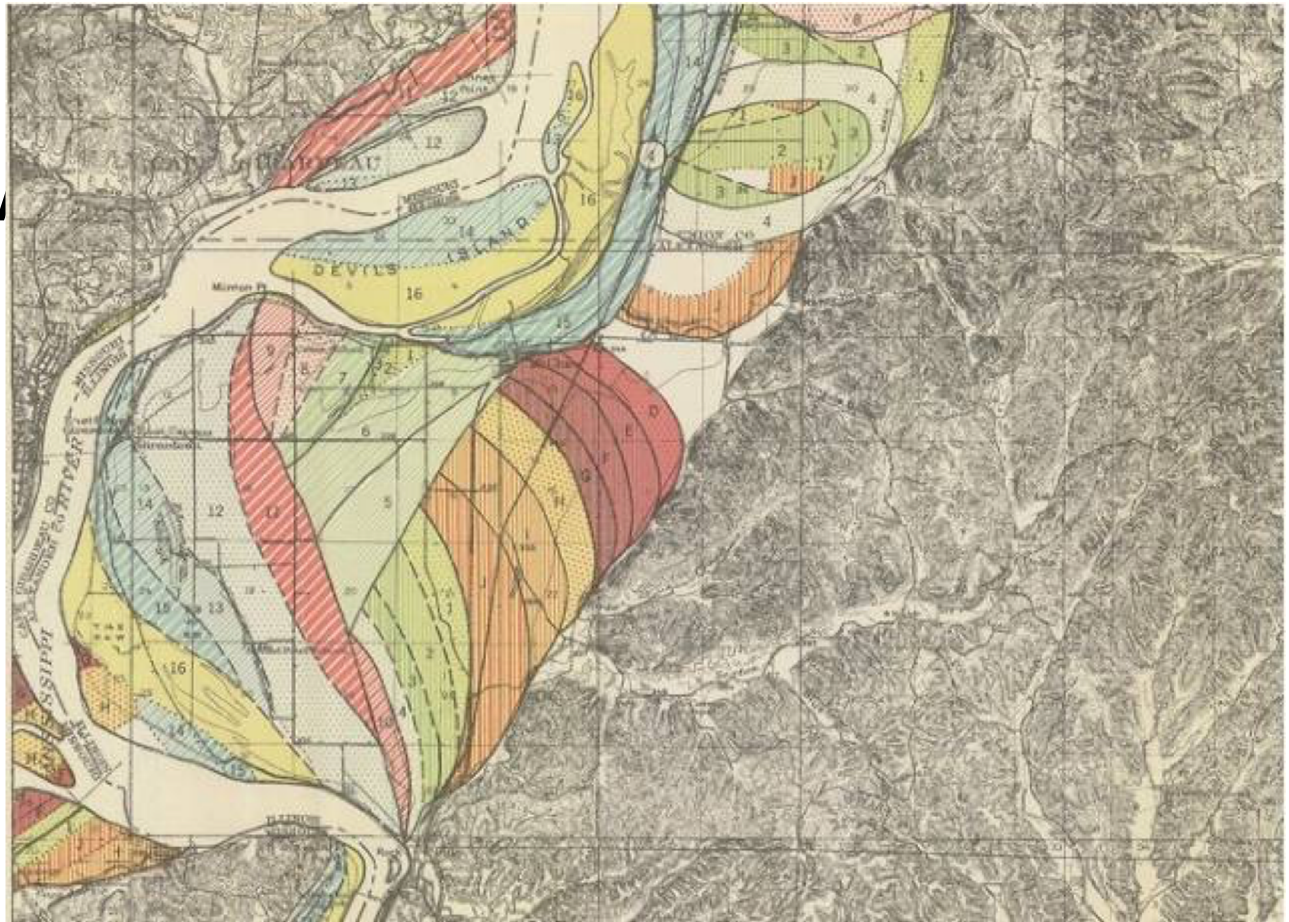
Layers

Density + Object Recognition = Layering



Skull reconstruction based on several individuals but scaled to the holotype.

Color mov



Harold Fisk, Mississippi River Flood Plain map, 1944



GANGNAM STYLE!!!

The 5 basic steps

The sudden explosion of a South Korean entertainer called Psy, has given the world Gangnam Style. It is setting the music and dance world on fire and has a set sequence. We simplify them for your perusal

★ When to use the steps during the chorus ★			
	Step 1	Step 2	
Oppa is Gangnam style,	ahhhh...	Gangnam style...	Oh, oh oh oh oh, Oppa is Gangnam style...
Step 1	Step 2	Step 3 or Step 1 (in the last chorus)	
ahhhh...	Gangnam style...	Oh, oh oh oh oh, Oppa is Gangnam style...	Eeeehh- Sexy Lady...
Step 1 or Step 2 (in the last chorus)		Step 4	Step 5 (only at the end)
Oh, oh oh oh oh, Oppa is Gangnam style...		Eeeehh- Sexy Lady oh oh oh oh.	Oppa is Gangnam style.

Step 1
Riding the horse

Dress classy and dance cheesy

Cross your hands like taking the horse reins and pulse up and down

Do small jumps with your legs spread like you are riding a horse

Footsteps

Step 2
Lassoing the sexy lady

Lassoing motion with your right arm

Continue with the horse-riding movement

Footsteps

Step 3
Now everybody is looking at me

A Hands in pockets or waist and small hip side movements combined with the foot steps

Slight kick with the right leg. Alternate with small jumps with the left leg

B Finish this move dragging the right leg to the left leg.

Footsteps A

Footsteps B

Step 4
Combine a few 'sexy' moves

C Now move your hips to the outside with quick movements twice

A Cross your hands over your left leg

B Spread and flex your legs. Move your body up and down three times

D Rotate your right leg three times, maintaining the body position.

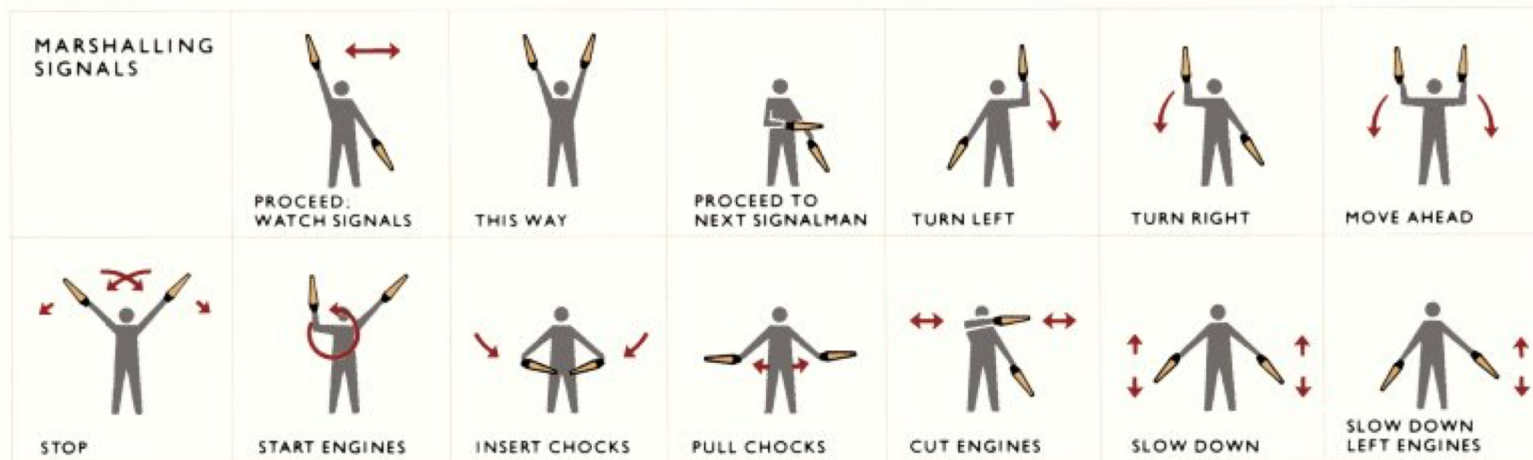
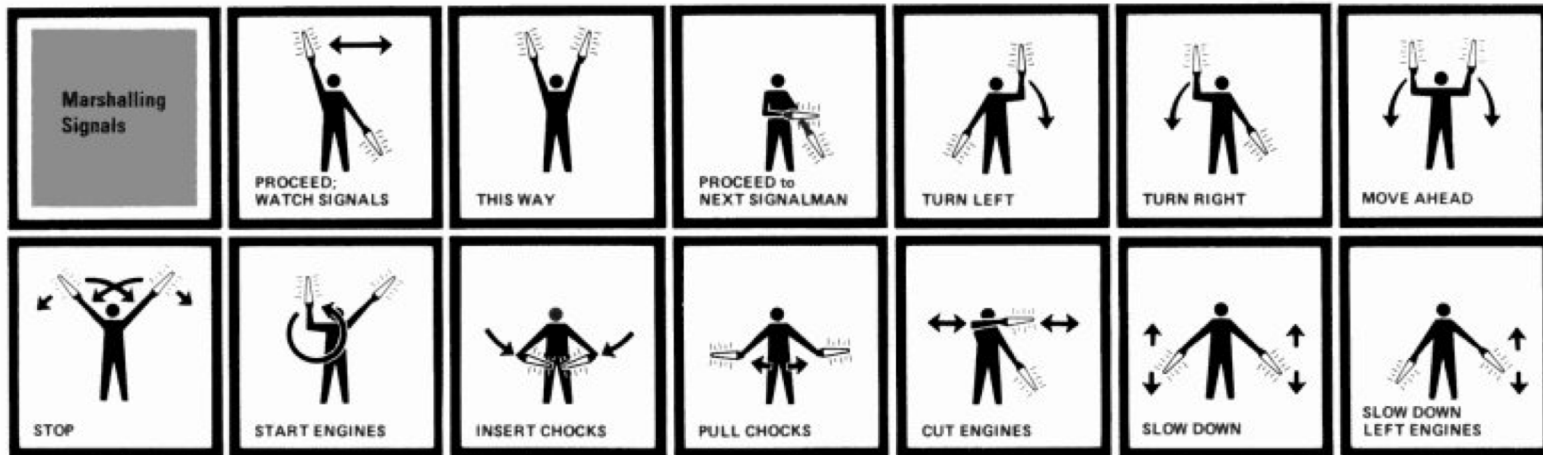
Step 5
Finish with a cool pose

A

B

"L" shape with your fingers

Spread your arms and raise your right leg (position A). Now get down quickly on your right leg and flex the left one. Now rotate your right arm and with your hand touch your chin doing a "L" shape with your thumb and index fingers (position B)





Multiples

Comparison is the heart of visualization



Comparisons

Individual visualizations can use comparison as a logic to move the eye to unfold a story









We can also use comparison as a way to predict or nudge views across displays

2000: State-level support (orange) or opposition (green) on school vouchers, relative to the national average of 45% support

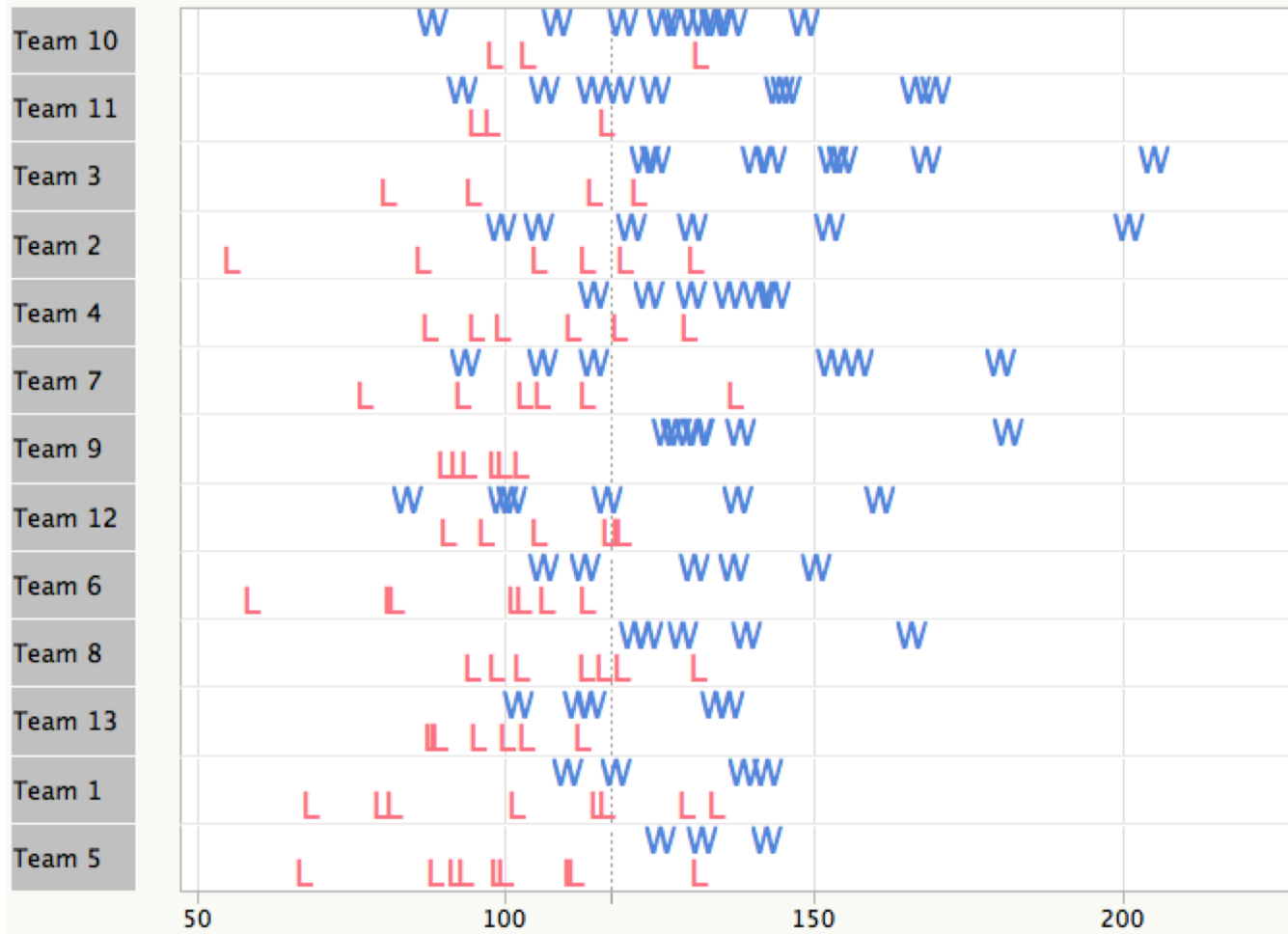


Orange and green colors correspond to states where support for vouchers was greater or less than the national average. The seven ethno-religious categories are mutually exclusive. "Evangelicals" includes Mormons as well as born-again Protestants. Where a category represents less than 1% of the voters of a state, the state is left blank.

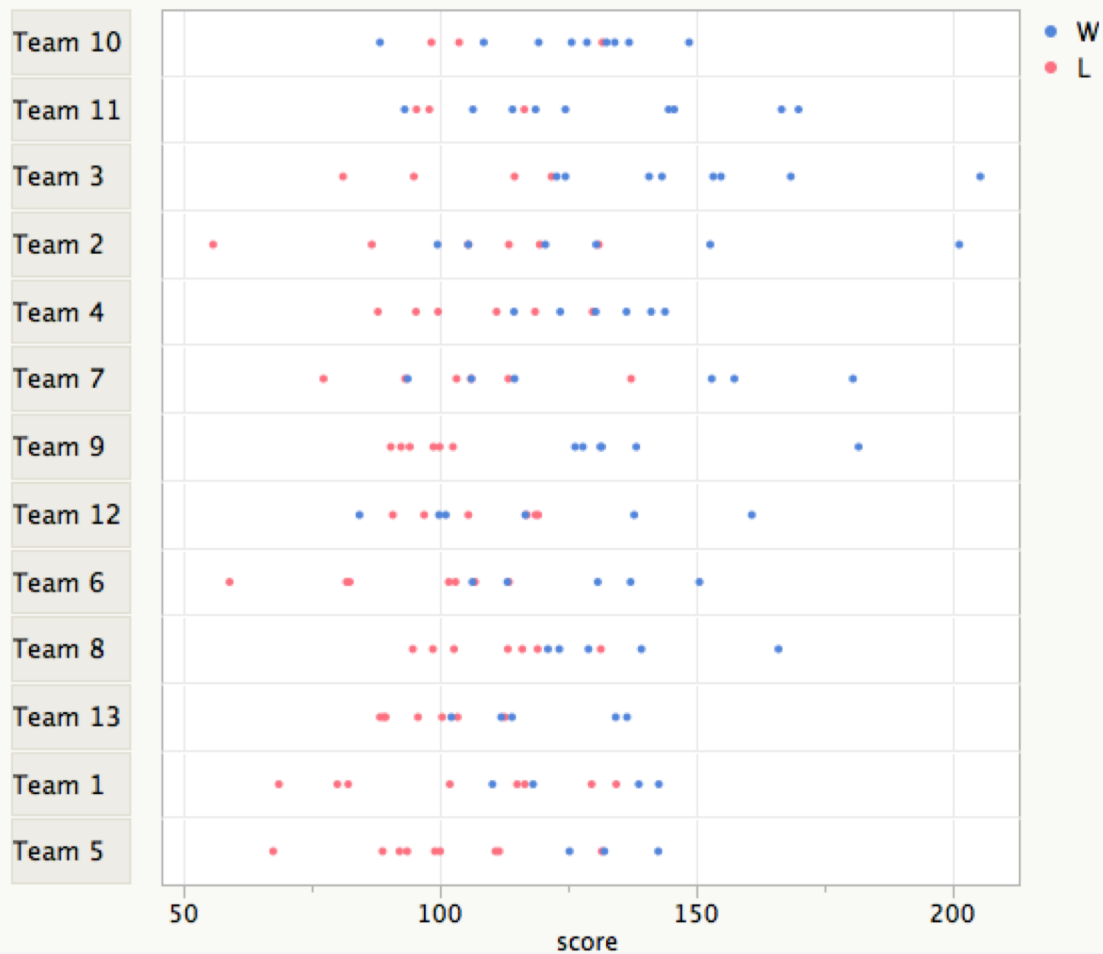
American Football Conference

AFC EAST	W	L	T	PCT ▾	HOME	ROAD	DIV	CONF	PF	PA	DIFF
** -  New England Patriots	12	4	0	.750	7-1	5-3	4-2	9-3	468	313	+155
 Buffalo Bills	9	7	0	.563	5-3	4-4	4-2	5-7	343	289	+54
 Miami Dolphins	8	8	0	.500	4-4	4-4	3-3	6-6	388	373	+15
 New York Jets	4	12	0	.250	2-6	2-6	1-5	4-8	283	401	-118
AFC NORTH	W	L	T	PCT ▾	HOME	ROAD	DIV	CONF	PF	PA	DIFF
z -  Pittsburgh Steelers	11	5	0	.688	6-2	5-3	4-2	9-3	436	368	+68
y -  Cincinnati Bengals	10	5	1	.656	5-2-1	5-3	3-3	7-5	365	344	+21
y -  Baltimore Ravens	10	6	0	.625	6-2	4-4	3-3	6-6	409	302	+107
 Cleveland Browns	7	9	0	.438	4-4	3-5	2-4	4-8	299	337	-38

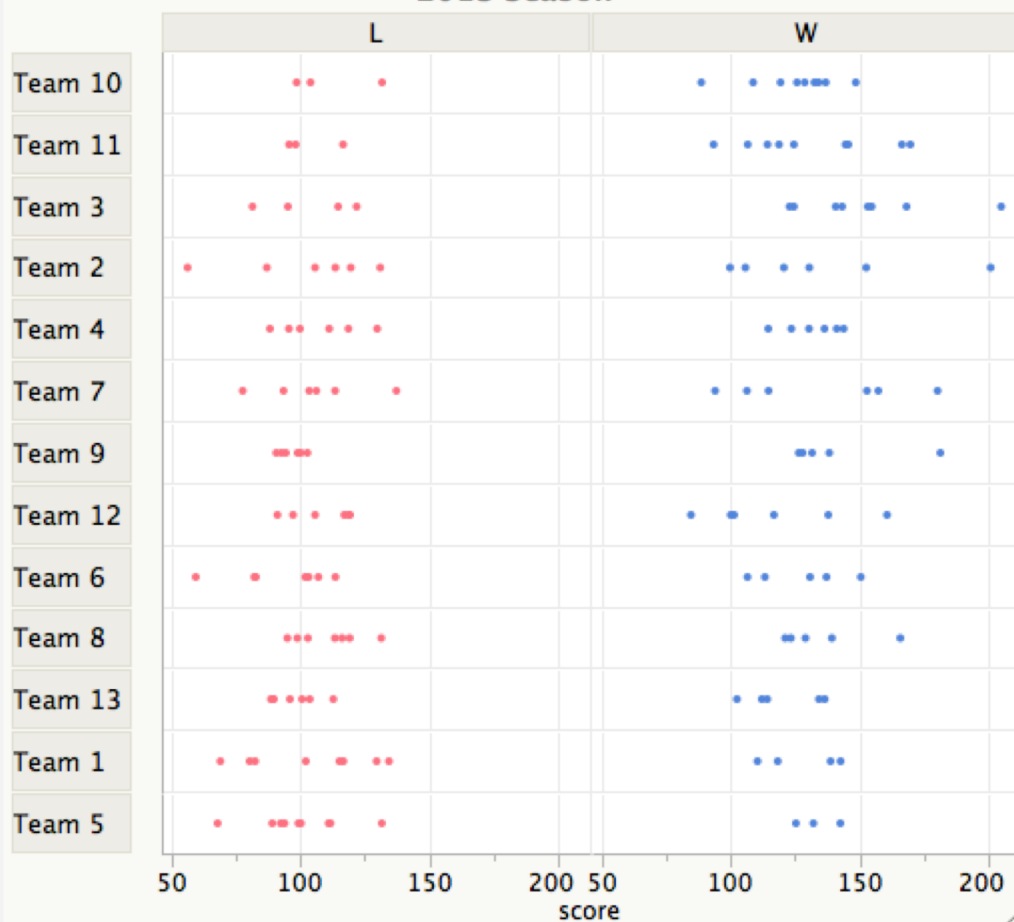
2013 Season

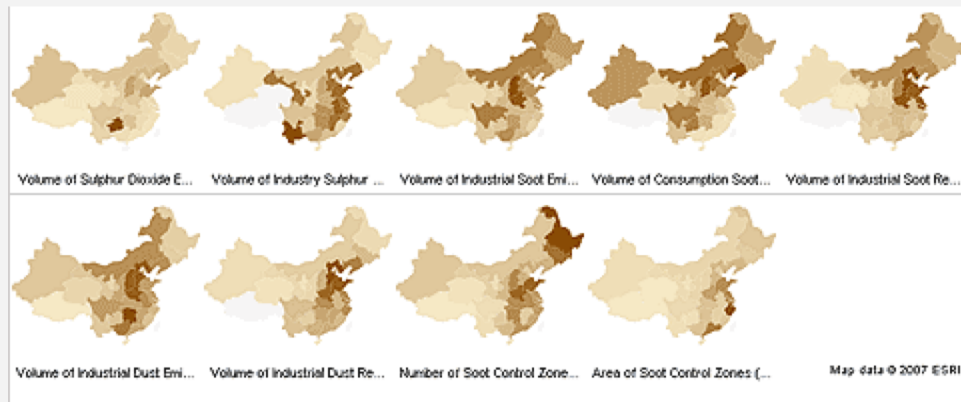


2013 Season



2013 Season





Small-multiples view: map of China showing several dimensions of air pollution.



Agriculture



Construction



Finance



Information



Manufacturing



Other



Transportation and Utilities



Business services



Education and Health



Government



Leisure and hospitality



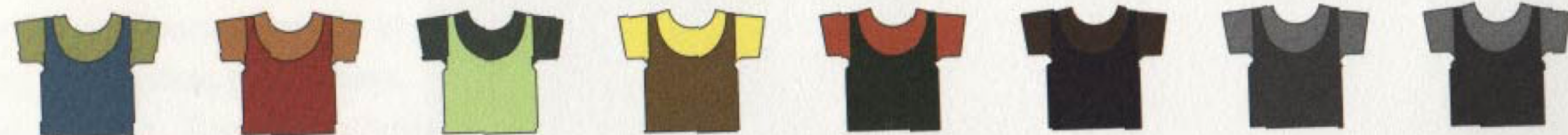
Mining and Extraction



Self-employed



Wholesale and Retail Trade





What does it all mean?



Linear relationship between data and scenario

Colors have emotions

Clarity is relative

Keep percentages and ratios consistent

Percentages better for more educated audiences

No decision without comparison

Color, Ink, Multiples are means not ends