

# STORYTELLING

KIRELL BENZI, PH.D



@KirellBenzi

[www.kirellbenzi.com](http://www.kirellbenzi.com)

# Value of storytelling

In a data viz, storytelling helps to:

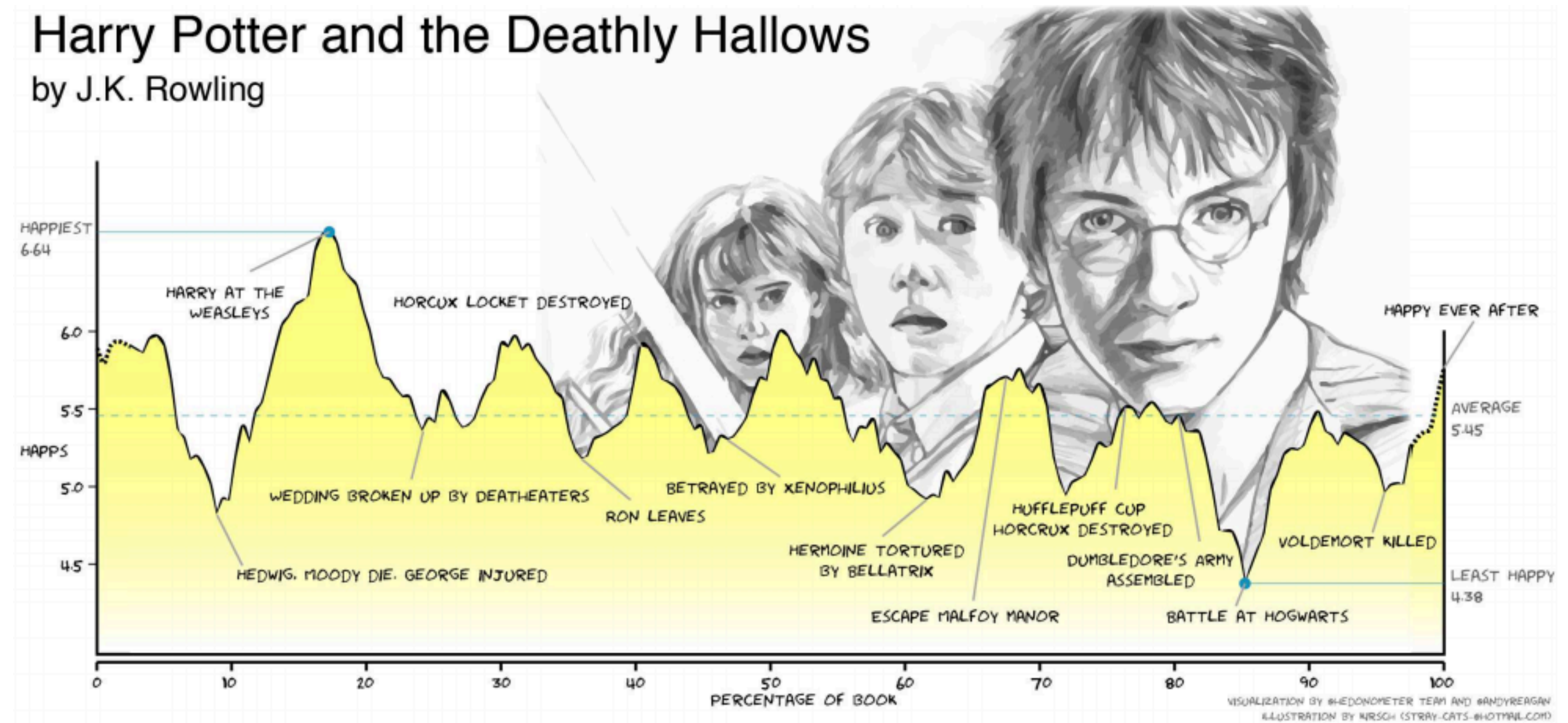
- Explore
- Discover
- Develop cognition / extract value





# Why stories?

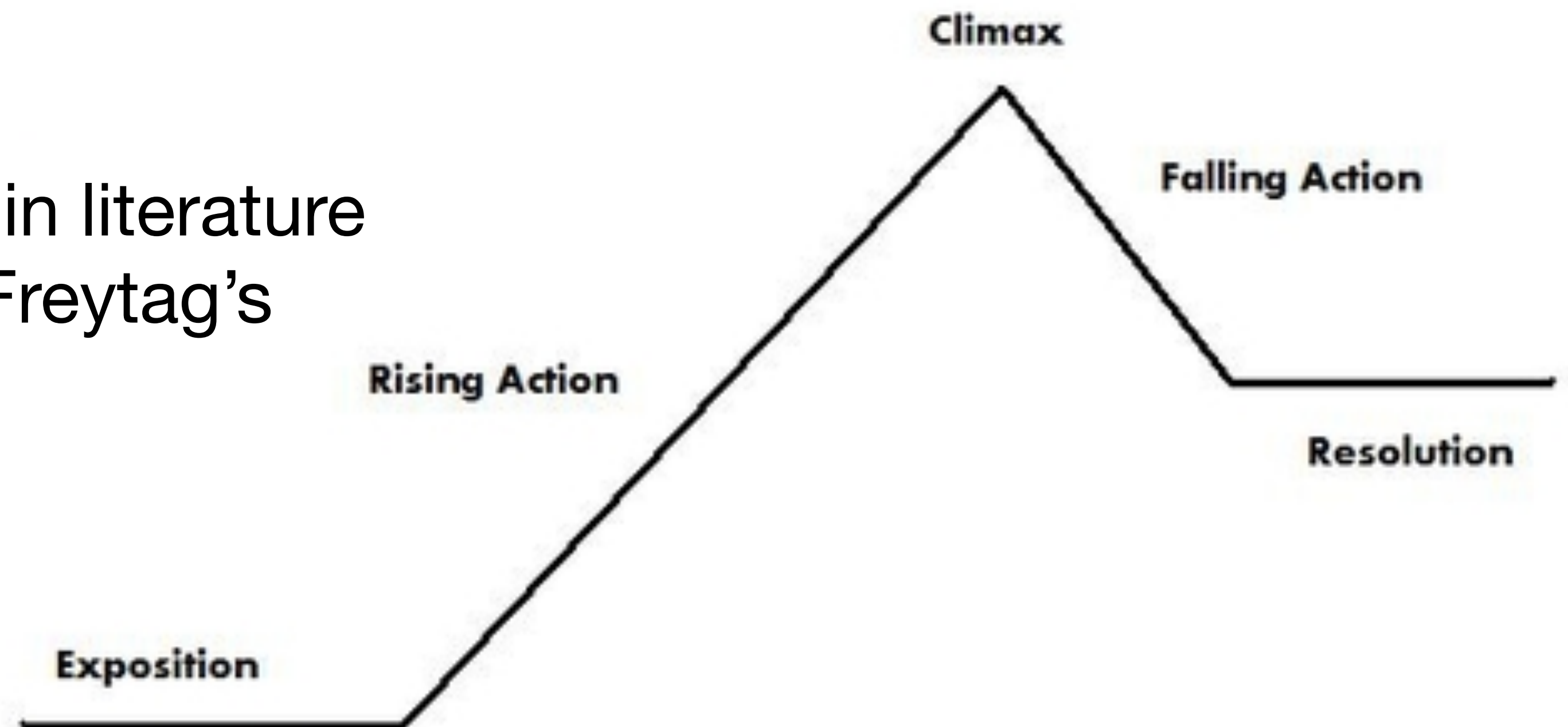
- Stories are emotional
- Stories are memorable
- Stories are impactful



[Reagan et al.]

# Narrative

- The art of narrating, or of telling a story
- Different narrative structures are used depending on the medium
- The most common structure in literature follow a modified version of Freytag's pyramid







Jamie Foxx on Playing Mike Tyson



# Story with data?

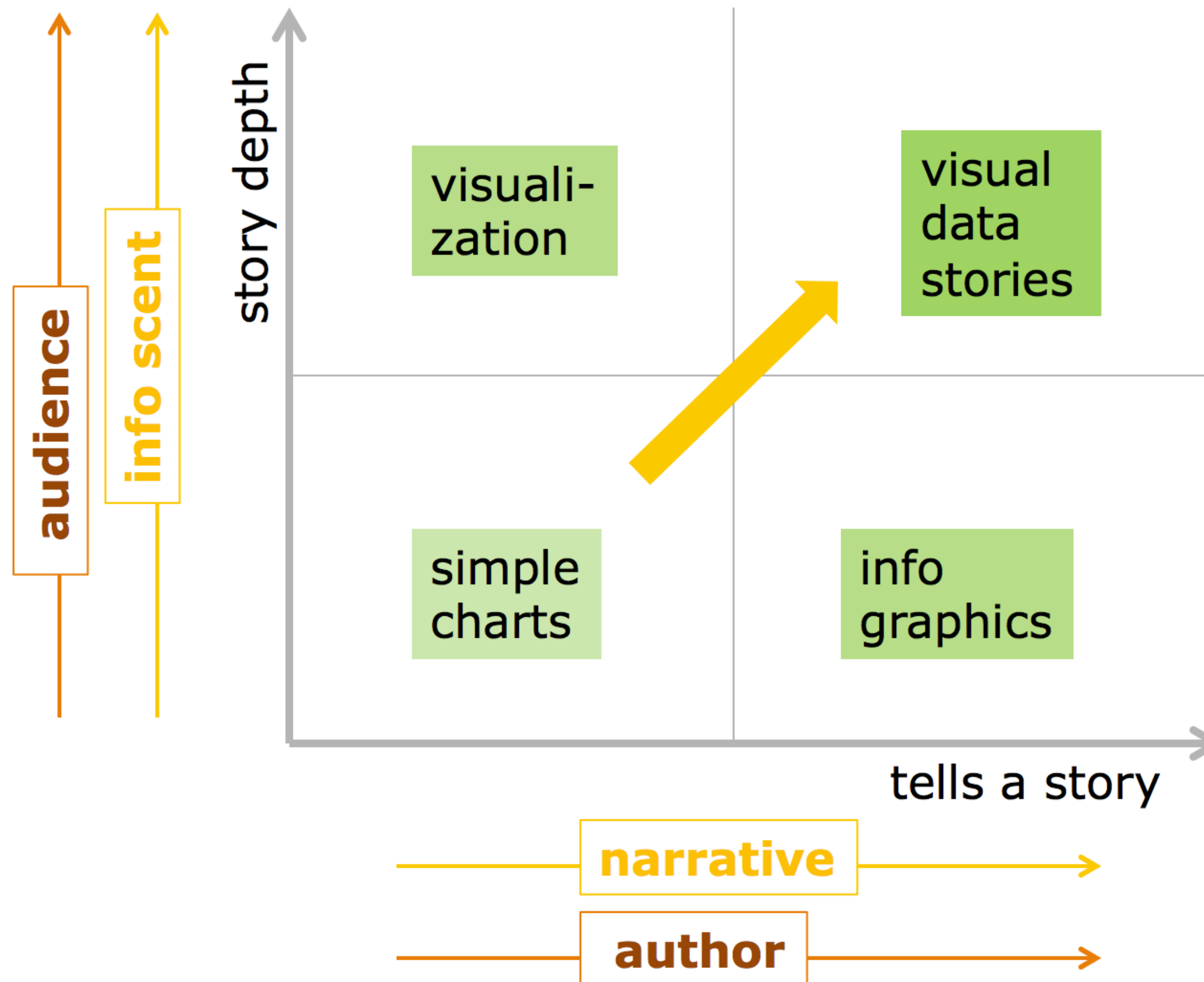
In essence, a story is built on a ordered sequence of steps

text, images, visualizations, video

Our goal is to define the different paths through the steps

not necessarily linear!

# Visual data stories



# Two main approaches

## Journalist model

Collect information (research, interviews, photos, etc. ) on the subject to assemble key facts

Link together the key facts to produce a story

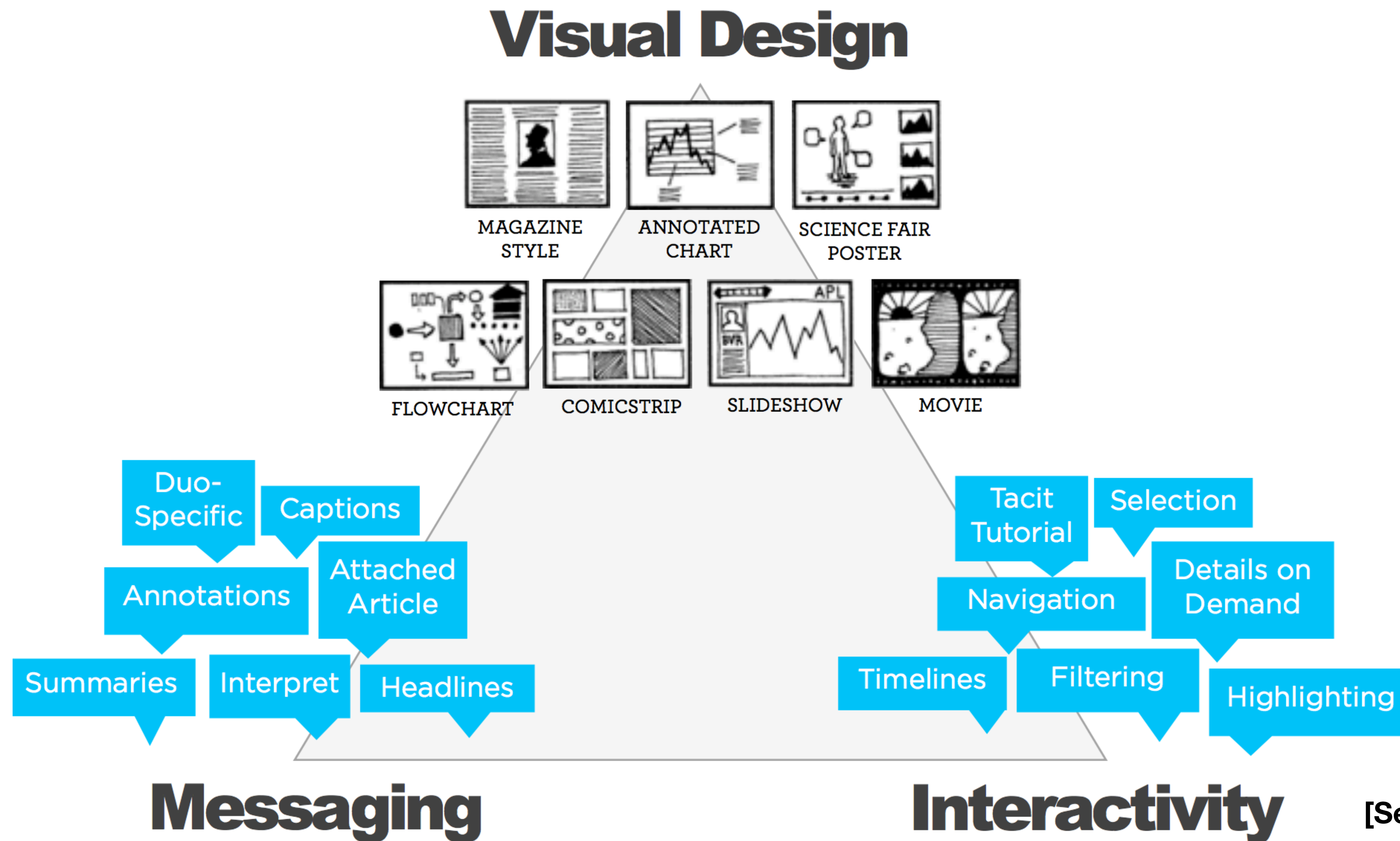
## Data scientist model

Exploration and analysis via visualization

Storytelling via visualization using the results of the analysis



# Narrative Visualization: Telling Stories with Data



# Design space

STORYTELLING

CLARITY

SPEED

**Author Driven**

strong ordering  
heavy messaging  
limited interactivity

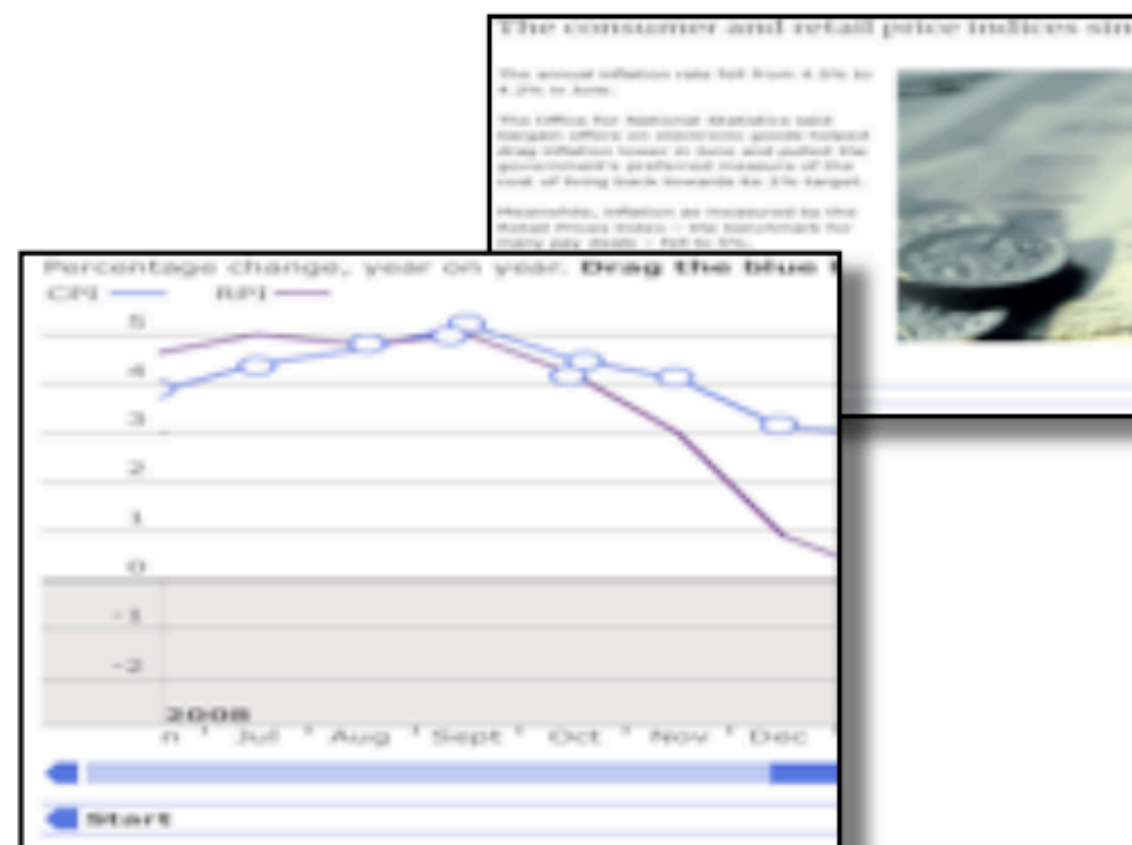
**Reader Driven**

weak ordering  
light messaging  
free interactivity

ASK QUESTIONS

EXPLORE

FIND



martini  
glass

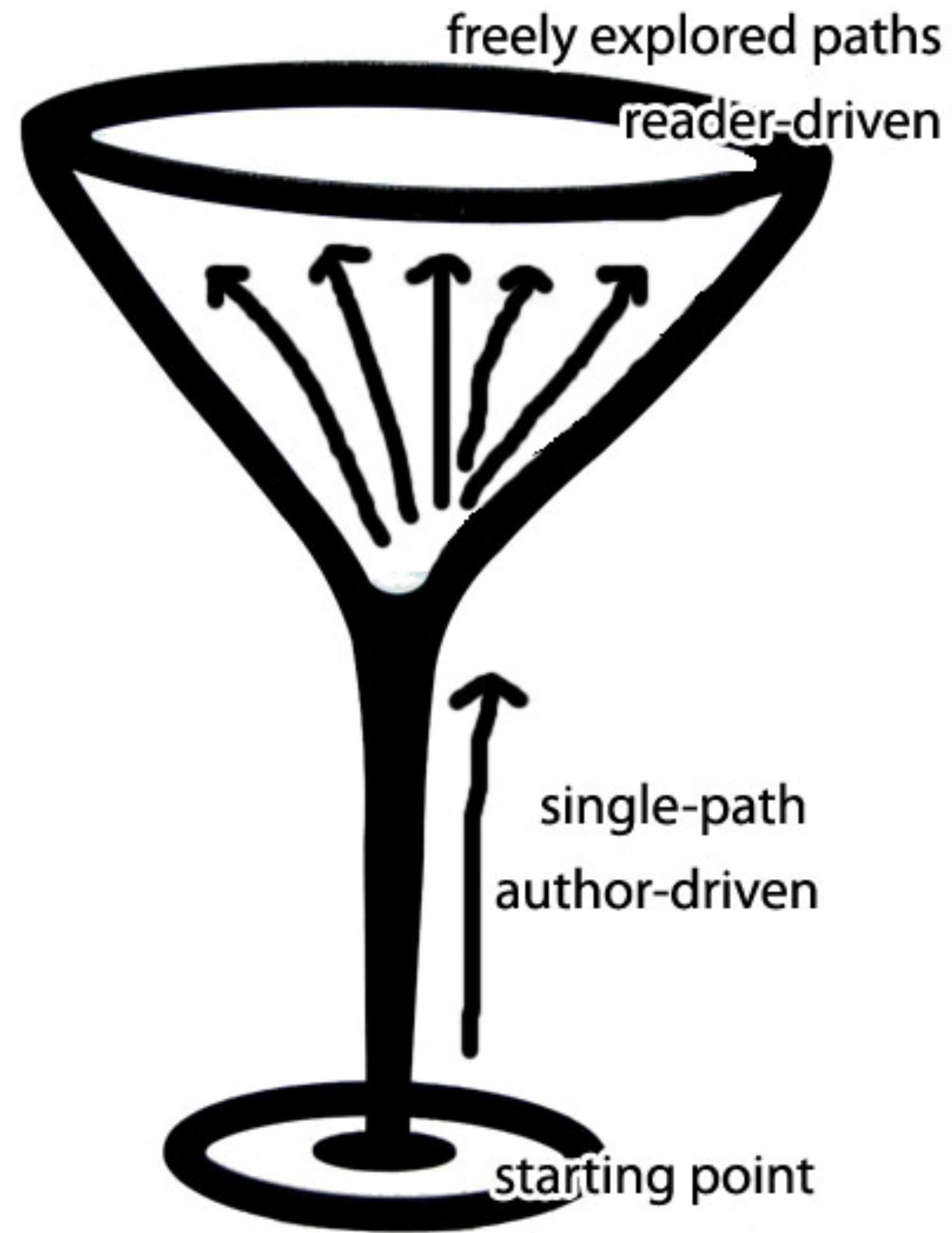


interactive  
slideshow



drill-down  
story





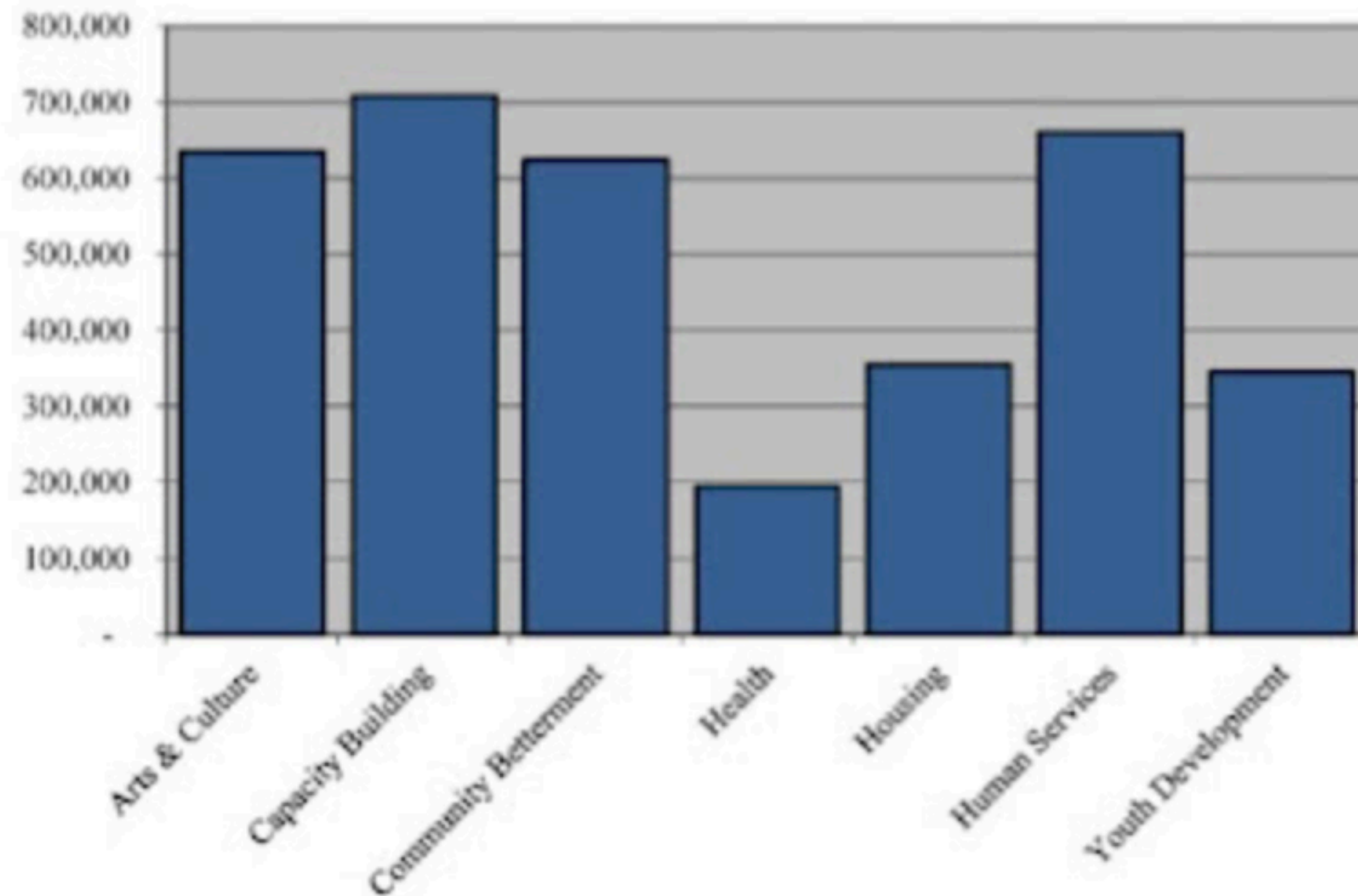
Add structure!



# Compare this

## Investment by area of impact

2006 - Present



# to this?

Replaced the descriptive title with an active one

Added insights with text (using the preattentive attributes of bold & color to draw your attention to the important part)

Ordered the data from greatest to least

Labeled the x-axis (what was the y-axis in the original version) to make it unquestionable what you're looking at.

Eliminated unnecessary clutter

Reduced the width (or height, now that we've flipped it on its side) of the bars.

Used color strategically

## We invest primarily in four areas

Since we began investing in 2006, **four areas have received more than \$600K each, accounting for 75% of total grantmaking activity**

Investment by Area of Impact  
2006 - Present





# A good story is structured

755



## Steroids or Not, the Pursuit Is On

Barry Bonds is taking aim at the career home run record. He needs only six more to tie Babe Ruth and 47 to equal Hank Aaron.

Lines are cumulative home runs.

**Hank Aaron**  
755 homers  
23 seasons



**Babe Ruth**  
714 homers  
22 seasons



**Barry Bonds**  
708 homers  
20 seasons

**Bonds takes lead**  
Home runs  
after 16 seasons:  
Bonds 567  
Aaron 554  
Ruth 516

400

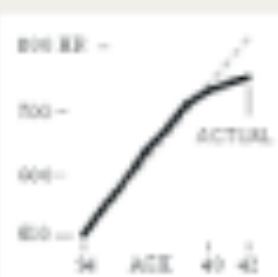
According to allegations in a book about Bonds, he began taking steroids before the 1999 season, his 14th in the league. Two seasons later, he hit 73 home runs, surpassing Aaron's career pace.

### Homer Pace After Age 34

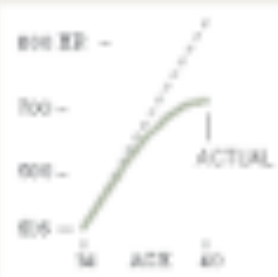
If the accusations are correct, Bonds was 34 in his first season on steroids. Here are projected home run paces for each player after age 34.

----- PROJECTED PACE BASED ON AVERAGE OF PREVIOUS FIVE SEASONS

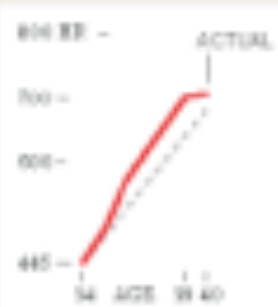
**Aaron**  
Actual homers slightly outpace projected homers for five seasons.



**Ruth**  
Averaged 46.4 homers a season from age 30 to 34. Averaged 42.5 for next four seasons.



**Bonds**  
From age 35 to 39, he averaged 14 more homers a season than projected.



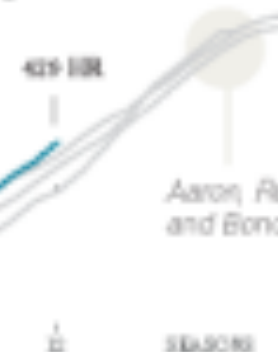
Note: Ages as of July 1 of each season.

### Others Taking Aim



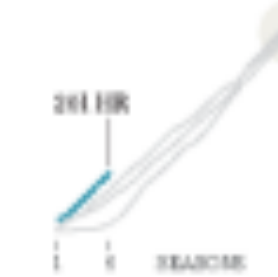
**Alex Rodriguez**

Is ahead of the pace set by all three home run leaders.



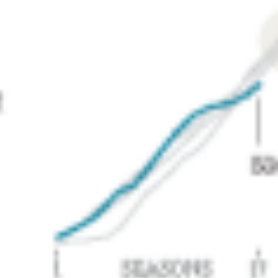
**Albert Pujols**

Averaging 40 homers a season, he has started stronger than the three leaders did.



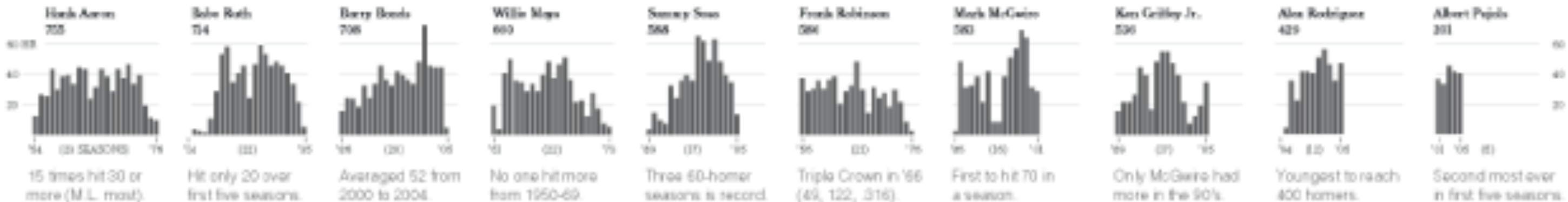
**Ken Griffey Jr.**

Many thought he would be the first to catch Ruth and Aaron until injuries limited his output.



### Differing Paths to the Top of the Charts

The top seven players on the career home run list, along with a look at Griffey (12th), Rodriguez (37th) and Pujols (tied 257th).



755

## Steroids or Not, the Pursuit Is On

Barry Bonds is taking aim at the career home run record. He needs only six more to tie Babe Ruth and 47 to equal Hank Aaron.

Lines are cumulative home runs.

**Hank Aaron**  
755 homers  
23 seasons



**Babe Ruth**  
714 homers  
22 seasons



**Barry Bonds**  
708 homers  
20 seasons

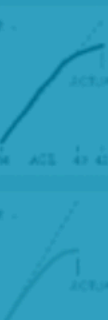
**Bonds takes lead**  
Home runs  
after 16 seasons:  
Bonds 567  
Aaron 554  
Ruth 516

### Homer Pace After Age 34

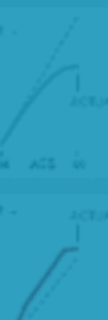
If the accusations are correct, Bonds was 34 in his first season on steroids. Here are projected home run paces for each player after age 34.

----- PROJECTED PACE BASED ON AVERAGE OF PREVIOUS FIVE SEASONS

**Aaron**  
Actual homers slightly outpace projected homers for five seasons.



**Ruth**  
Averaged 46.4 homers a season from age 30 to 34. Averaged 42.5 for next four seasons.



**Bonds**  
From age 35 to 39, he averaged 14 more homers a season than projected.



Note: Ages as of July 1 of each season.

**BEGINNING**

**END**



**Alex Rodriguez**

Is ahead of the pace set by all three home run leaders.



**Albert Pujols**

Averaging 40 homers a season, he has started stronger than the three leaders did.



**Ken Griffey Jr.**

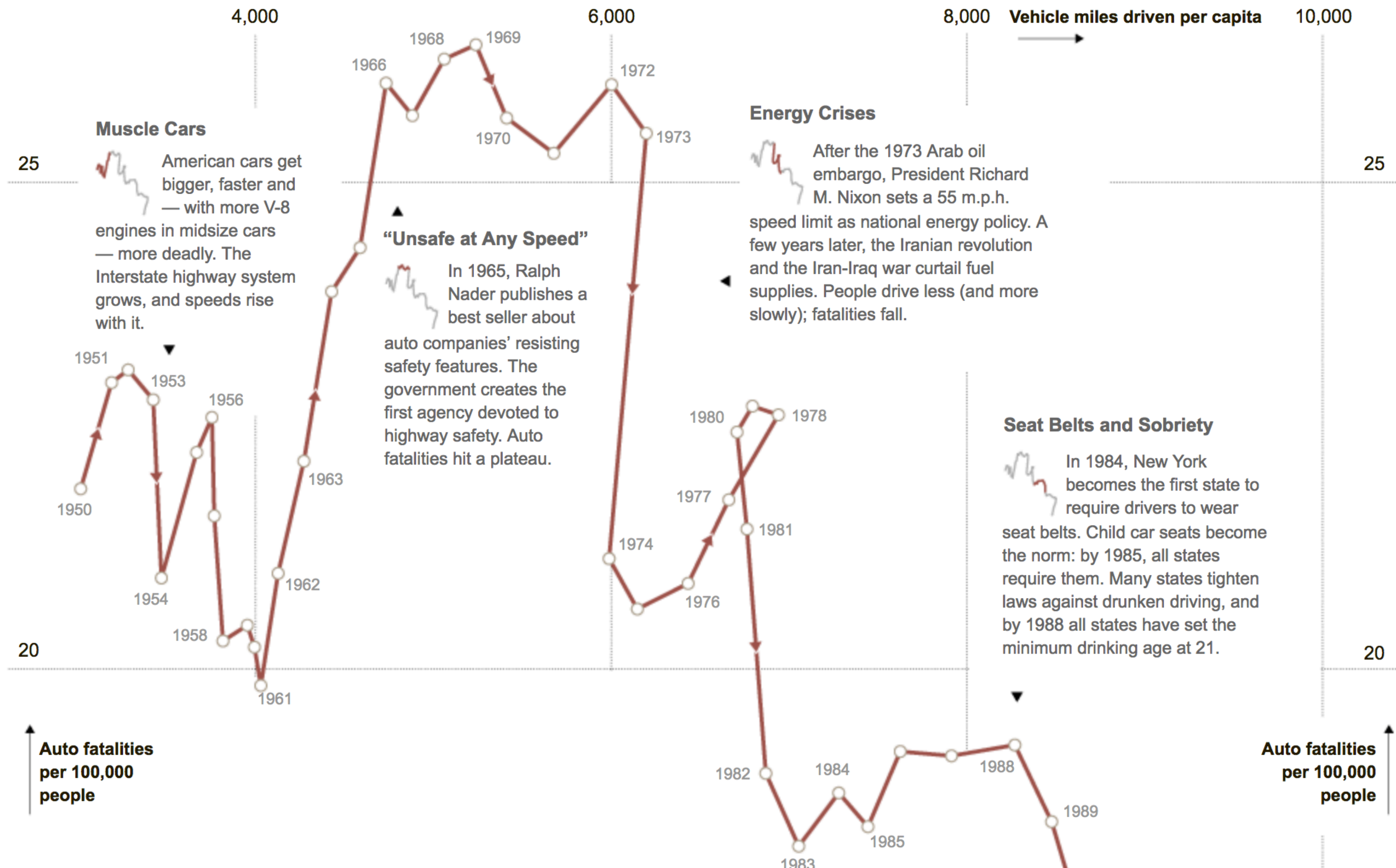
Many thought he would be the first to catch Ruth and Aaron until injuries limited his output.



[NY times]

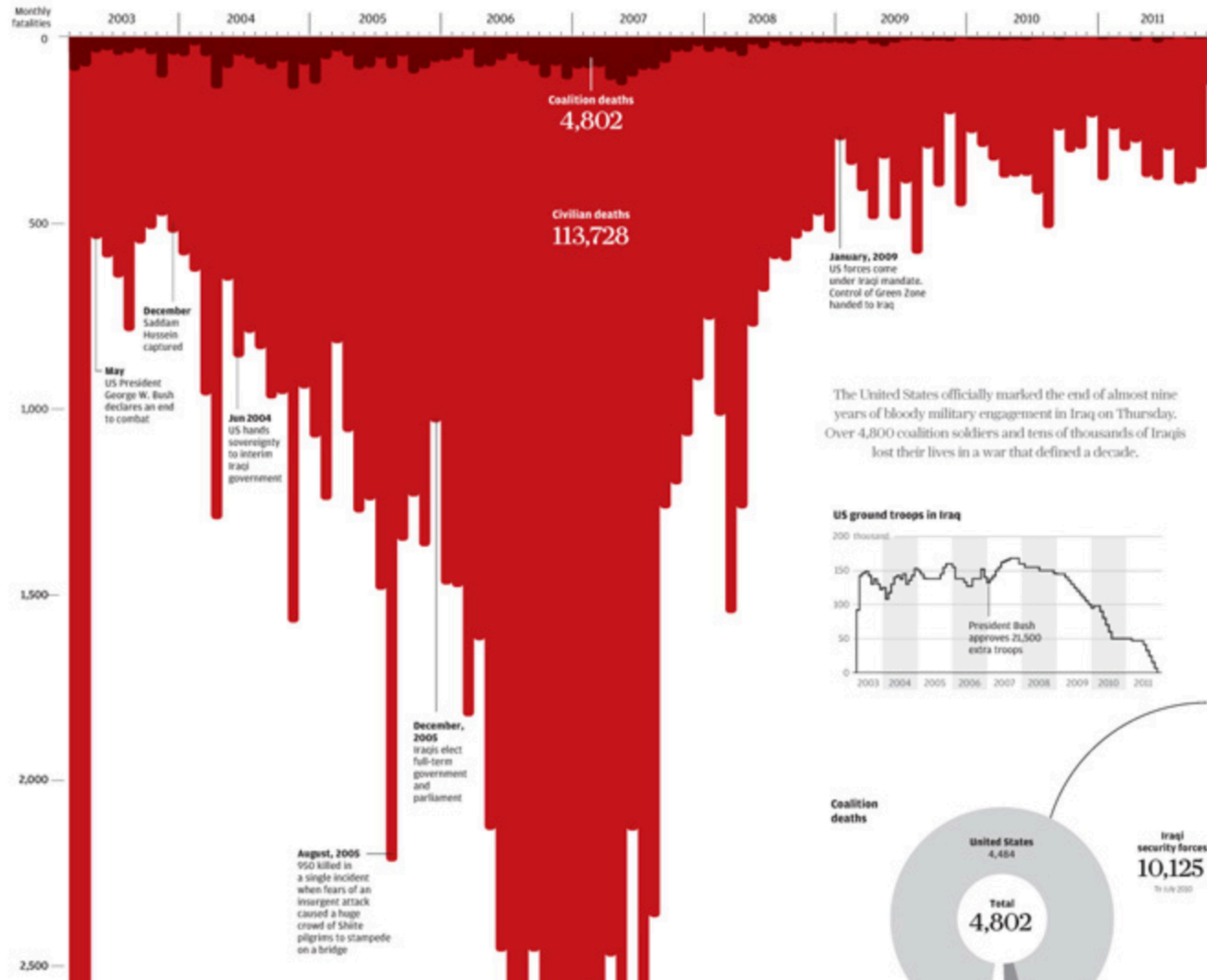


# Connected scatterplot

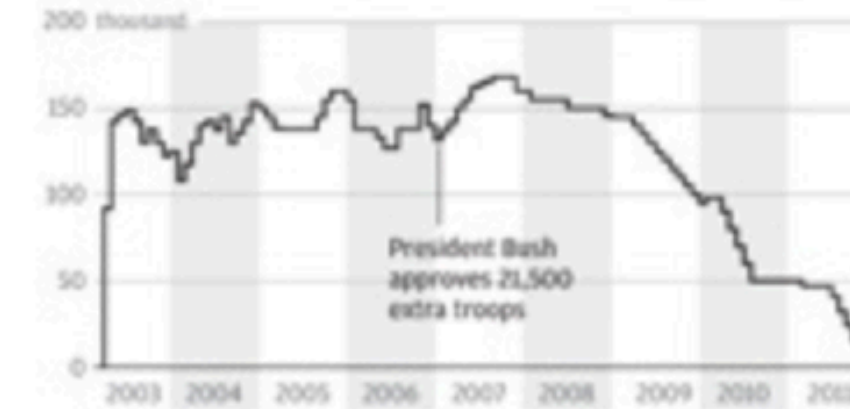




# Iraq's bloody toll



US ground troops in Iraq



Coalition deaths

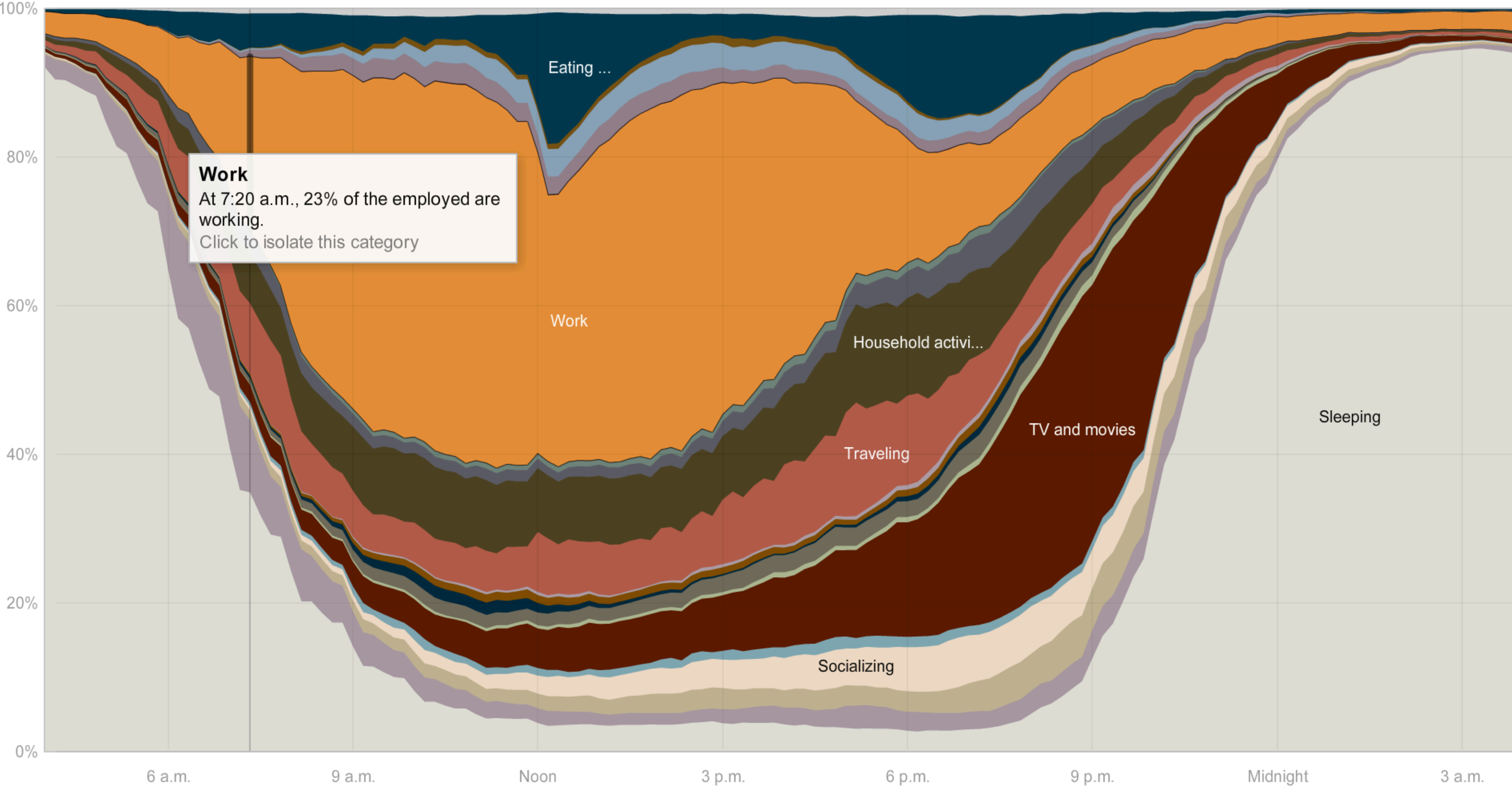


# How Different Groups Spend Their Day?

## The employed

At 6 a.m., about 60 percent of employed people are sleeping, compared with more than 80 percent of those who are unemployed.

|          |                 |          |           |            |               |
|----------|-----------------|----------|-----------|------------|---------------|
| Everyone | <b>Employed</b> | White    | Age 15-24 | H.S. grads | No children   |
| Men      | Unemployed      | Black    | Age 25-64 | Bachelor's | One child     |
| Women    | Not in lab...   | Hispanic | Age 65+   | Advanced   | Two+ children |



Focus attention



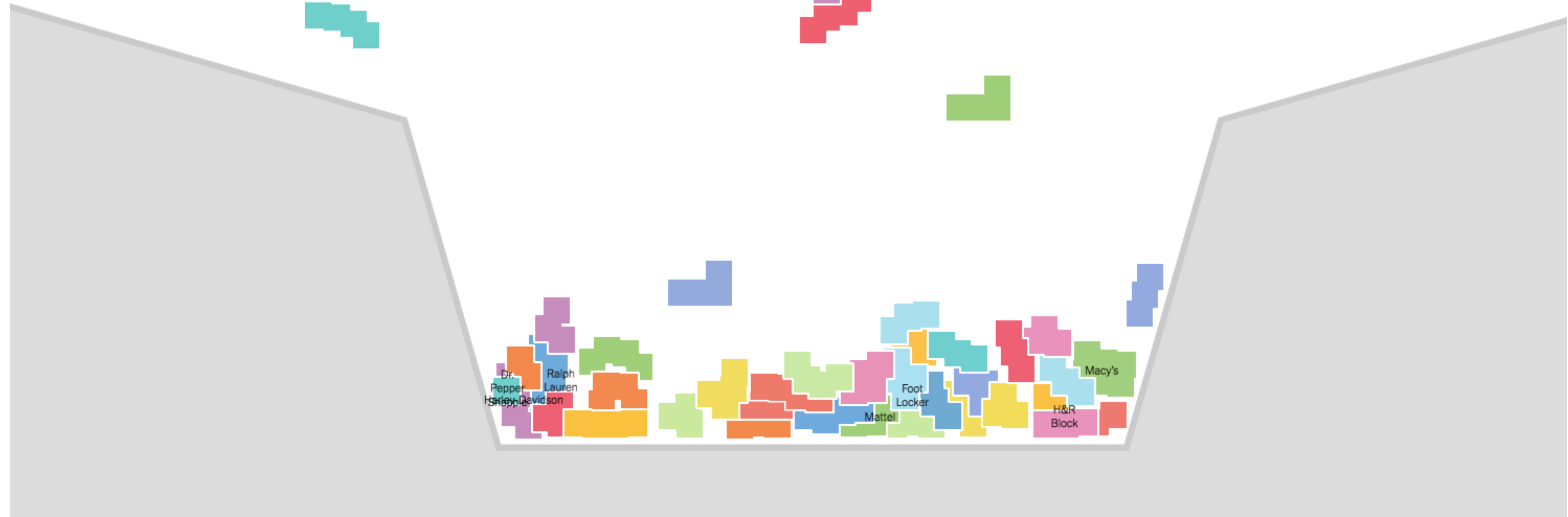
# Drones strikes





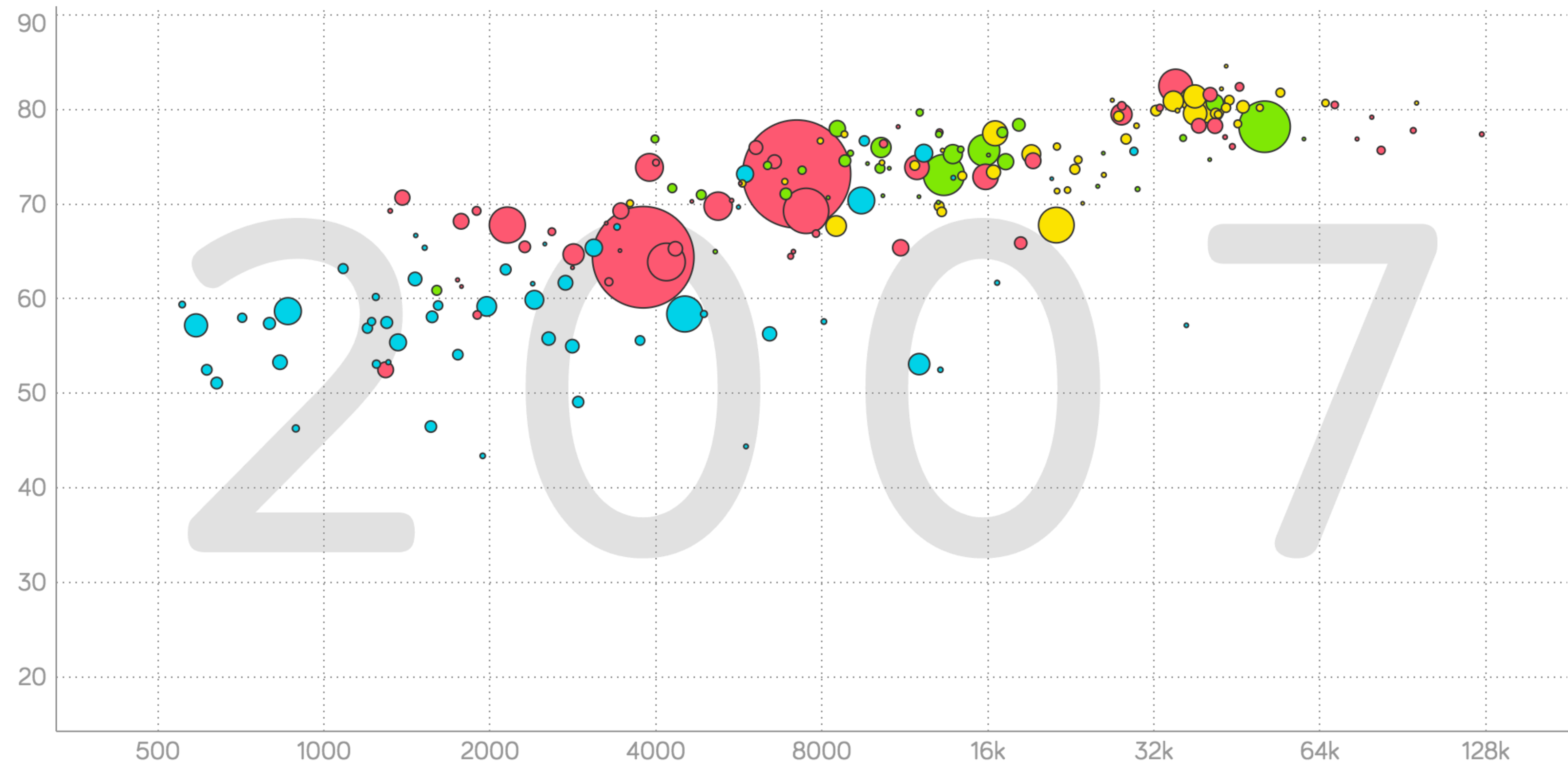
\$319 Billion

Now let's add 108 of the other smallest S.&P. 500 companies.



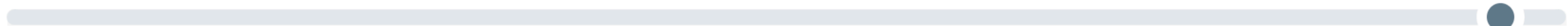
# Gapminder

Life expectancy, years ?



Income per person, GDP/capita in \$/year adjusted for inflation & prices ?

⚠ DATA DOUBTS

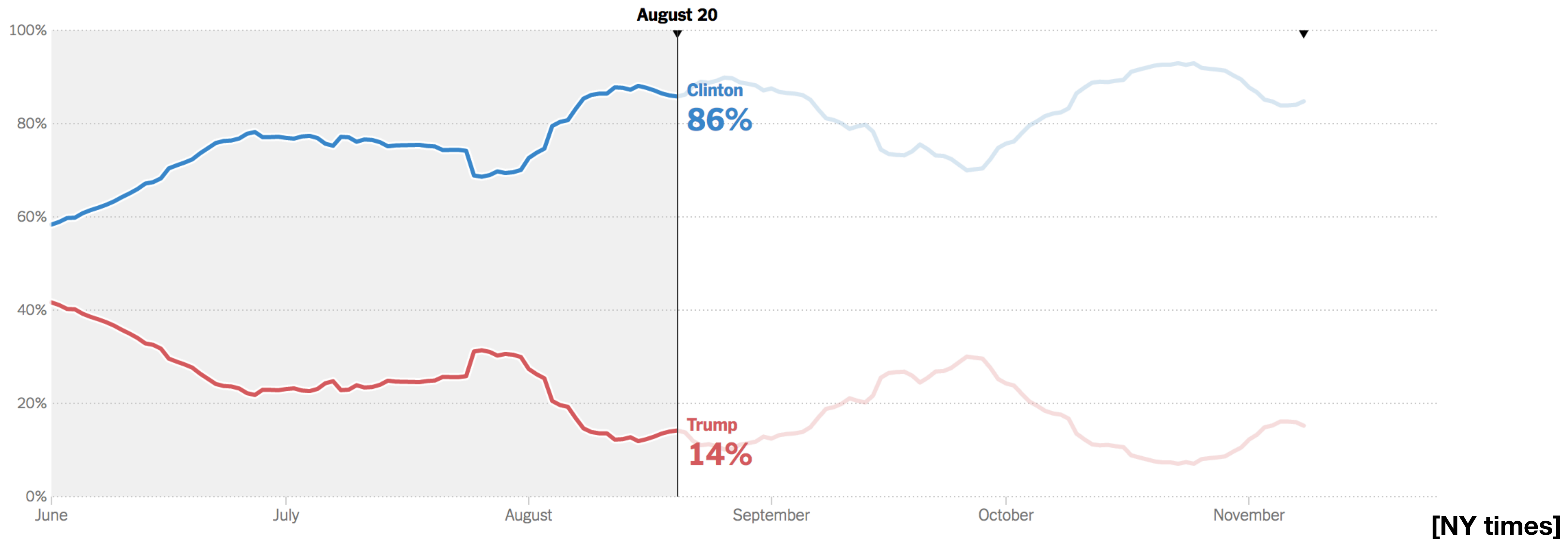




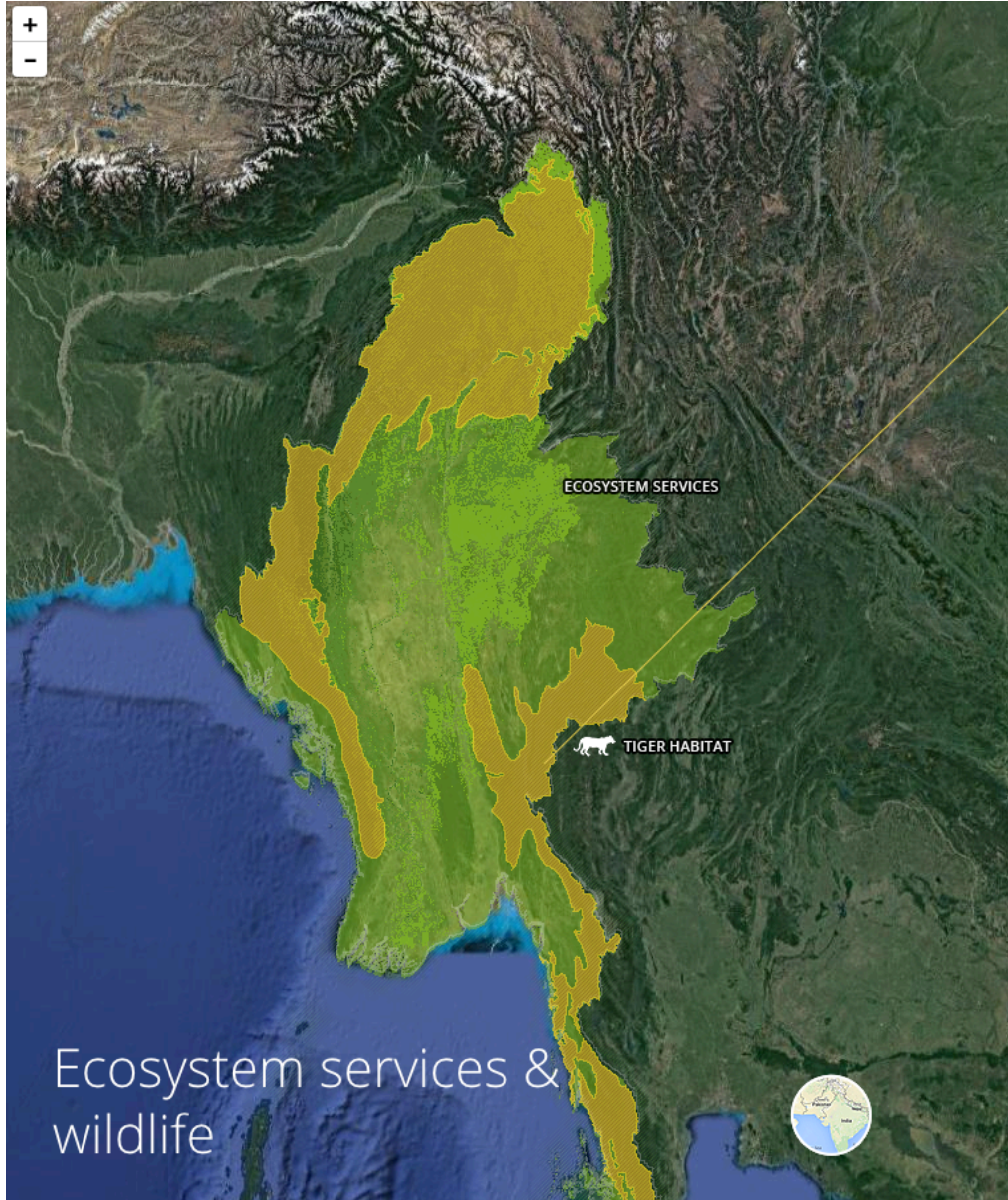
Limit interactivity

# Who Will Be President?

For months, we've been updating our estimates with each new poll. Today, it's Election Day, what we've all been waiting for, and there will be no more updates. You can chart different paths to victory below. Here's how our estimates have changed over time:







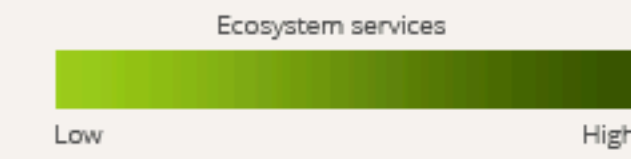
Areas: [Myanmarbiodiversity.org](http://Myanmarbiodiversity.org)

## Ecosystem services & wildlife

☐ TIGER



Tiger



☐ ELEPHANT



Elephant



Areas that provide ecosystem services coincide with tiger and elephant habitat, especially in the **Kachin** state of northern Myanmar and the **Chin** and **Rakhine** states of western Myanmar.





# Take home message: structure

Understand the audience: what are the takeaway/  
outcomes, the context

Cool vs readability tradeoff

Choose the right visual idioms (as always)

Remove clutter: Gestalt principles, color theory, do's  
and don'ts

Try to be linear for an improved storytelling





# Take home message: messaging

Start with an interesting point

Remember that a textual description is always good for storytelling

Don't let the reader wondering, take a side, state your point

Put numbers and facts in context with careful attention to the significant digits

Label important numbers

Add TLDR;, a summary, a conclusion “so what?”



# Take home message: interaction

Interactions with the viz should be obvious (going back, reset views, etc.)

Limit interactivity to key elements

Adapt to the platform: touch screen vs mouse, single-click table





# Last tips

## Use Google fonts for faster rendering

Viewing 846 of 846 font families

Roboto  
Christian Robertson (12 styles)

All their  
equipment and  
instruments are  
alive.

Open Sans  
Steve Matteson (10 styles)

■ Almost before

Encode Sans Expanded  
Impallari Type, Andres Torresi, Jacques Le Bailly (9 styles)

A red flair  
silhouetted  
the jagged  
edge of a  
wing.

Try typing directly into the text fields.

GOT IT

Lato  
Łukasz Dziedzic (10 styles)

A shining

Mukta  
Ek Type (7 styles)

I watched the  
storm, so  
beautiful yet  
terrific.

Slabo 27px  
John Hudson (1 style)

It was going to be

