Lecture 11: Last Lecture: Putting Things Together

April 23, 2018

Overview

Course Administration

Good, Bad and Ugly

Tying Things Together: Stories

Tying Things Together: Visualizations that Communicate

R Functions

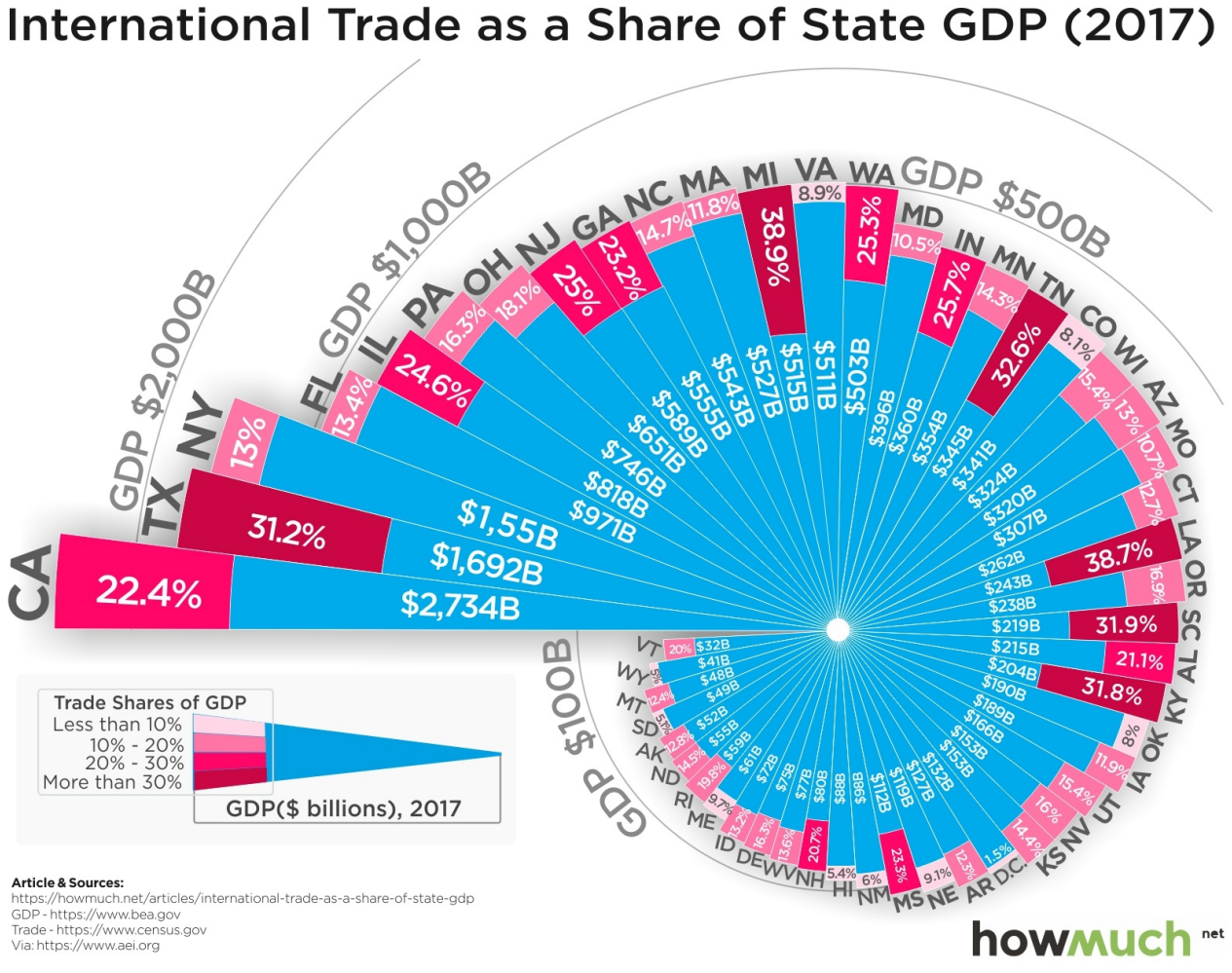
Course Administration

1. Presentations next week
2. Policy brief and presentation handout
3. Updated (?) grades online
4. Online evaluations open! Please give feedback
5. Missing anything from me?

Today's Final Good Bad and Ugly

- Alex Sexton

Alex's Chart



From https://howmuch.net/articles/international-trade-as-a-share-of-state-GDP

Knaflic: Graphics to Tell Stories

Knaflic's 5 Case Studies

1. Color considerations with a dark background
2. Leveraging animation in the visuals you present
3. Establishing logic in order
4. Strategies for avoiding the spaghetti graph
5. Alternatives to pie charts

Wording is all Knaflic's.

Knaflic's 5 Case Studies

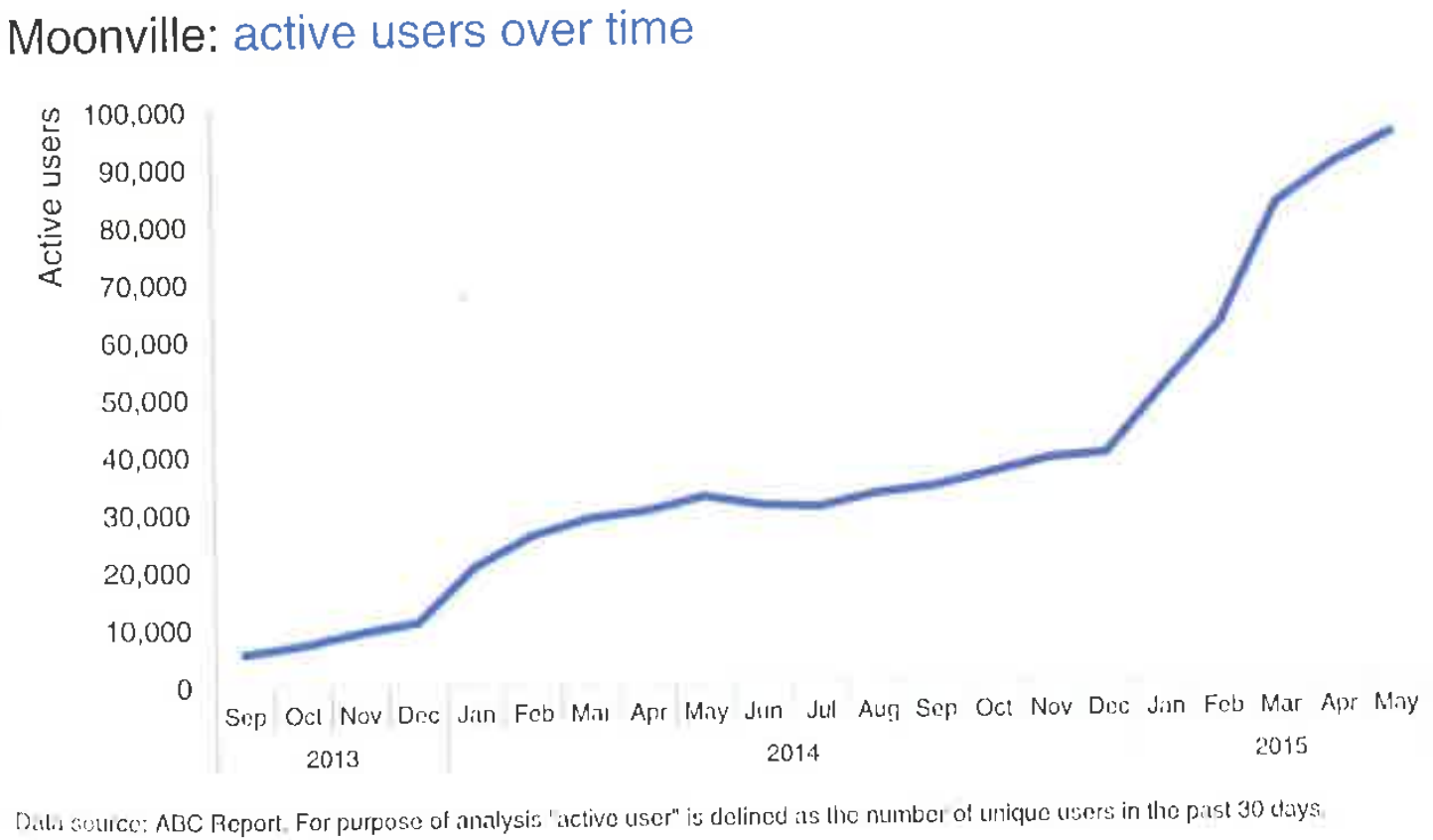
1. Color considerations with a dark background
2. **Leveraging animation in the visuals you present**
3. **Establishing logic in order**
4. **Strategies for avoiding the spaghetti graph**
5. Alternatives to pie charts

Wording is all Knaflic's.

2. Animation

- Don't use animation – figures that move without your guidance
- Do use sequential reveal
- Great example of same figure in presentation and paper

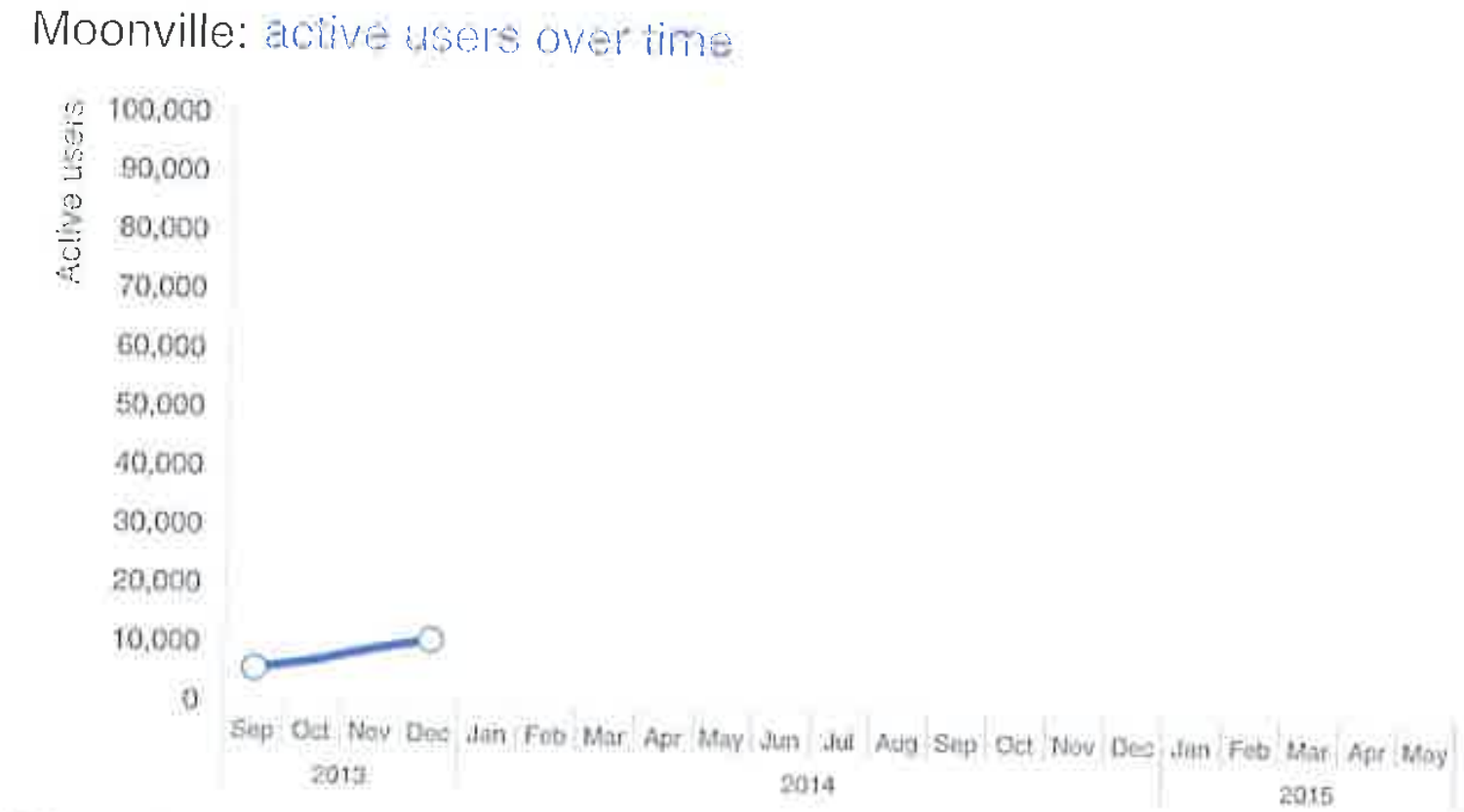
How Do You Get People to Pay Attention to the Important Parts?



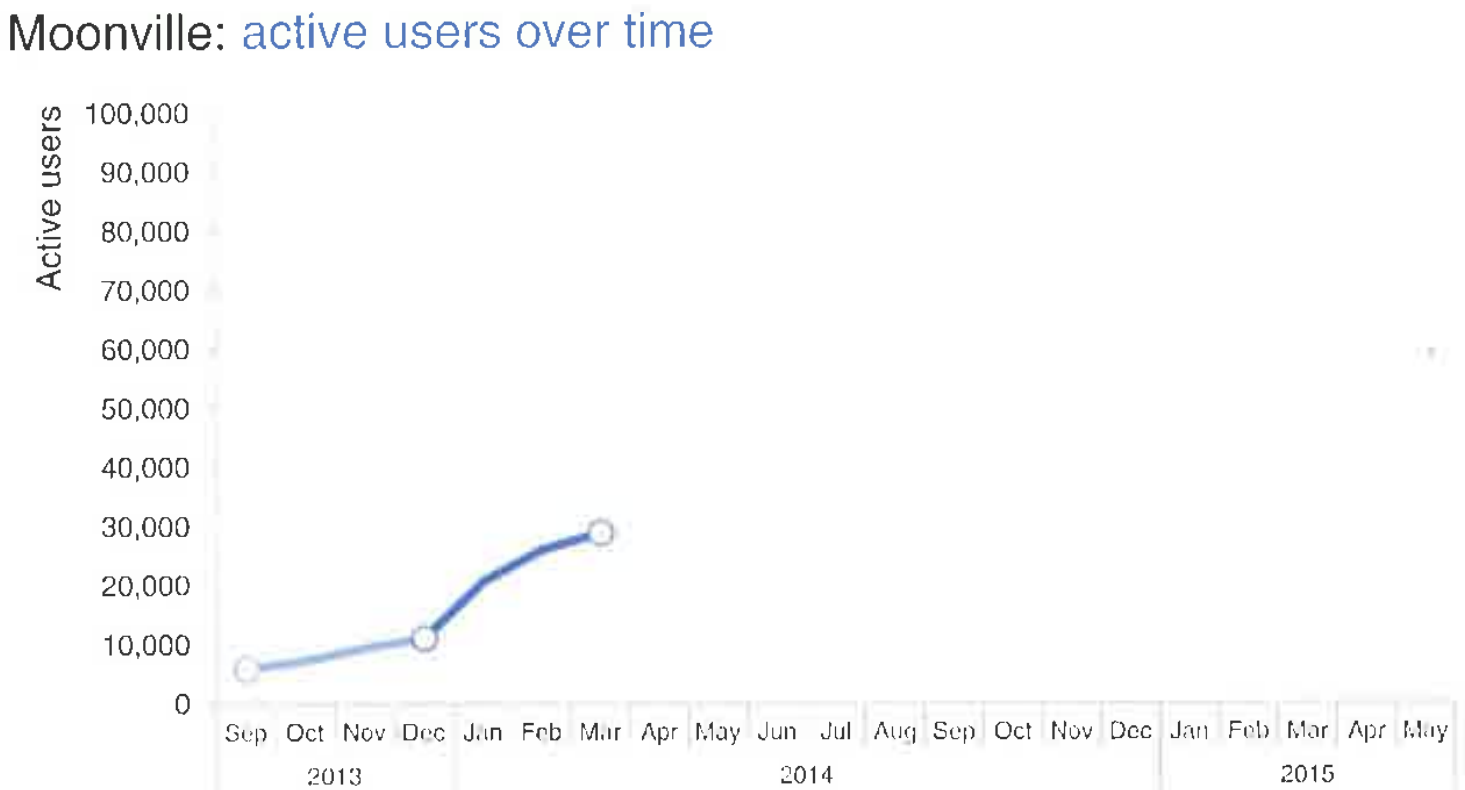
Frame the Analysis

Start at the Beginning

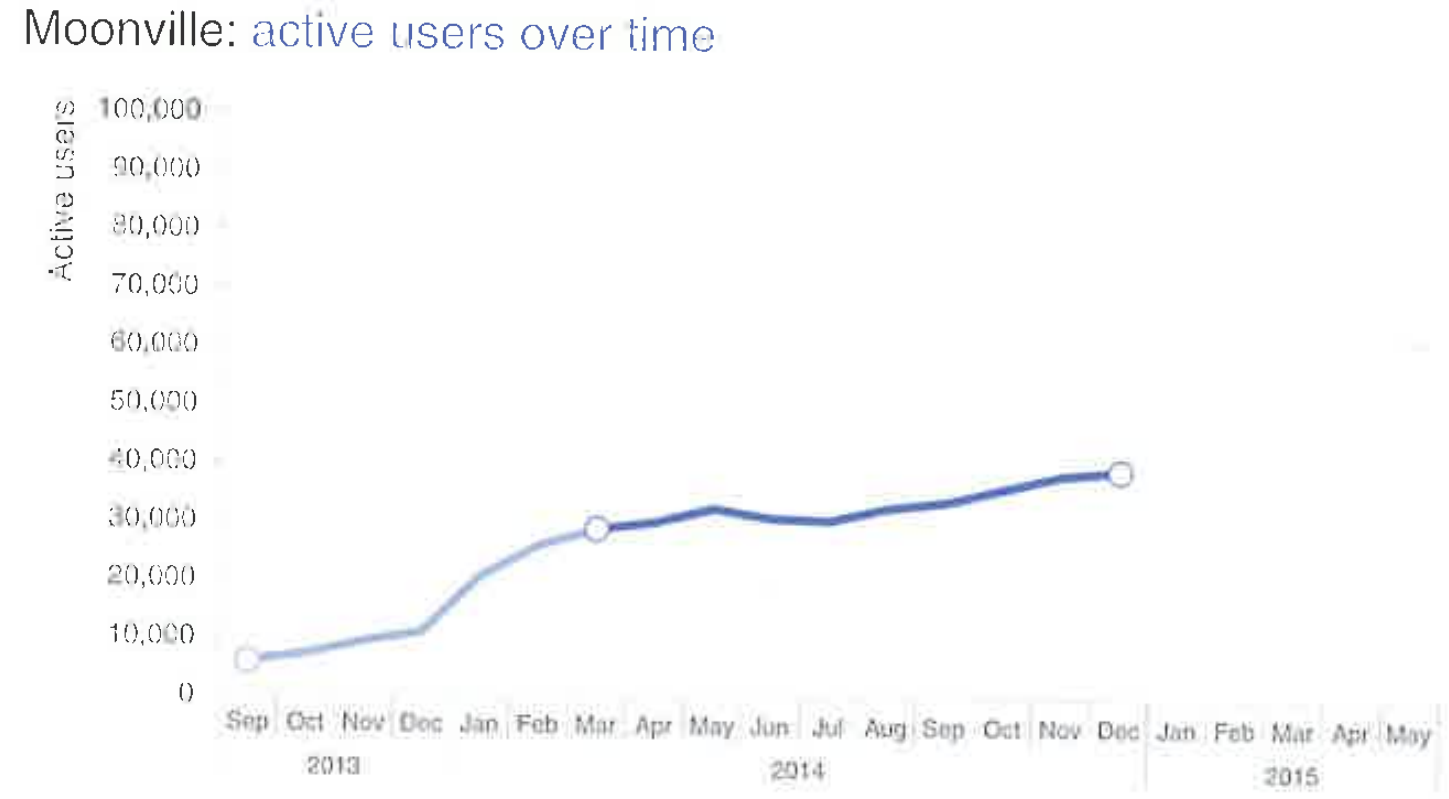
Add Step by Step



Step by Step


Moonville: active users over time
Active users
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
2013
2014
2015
Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

Step by Step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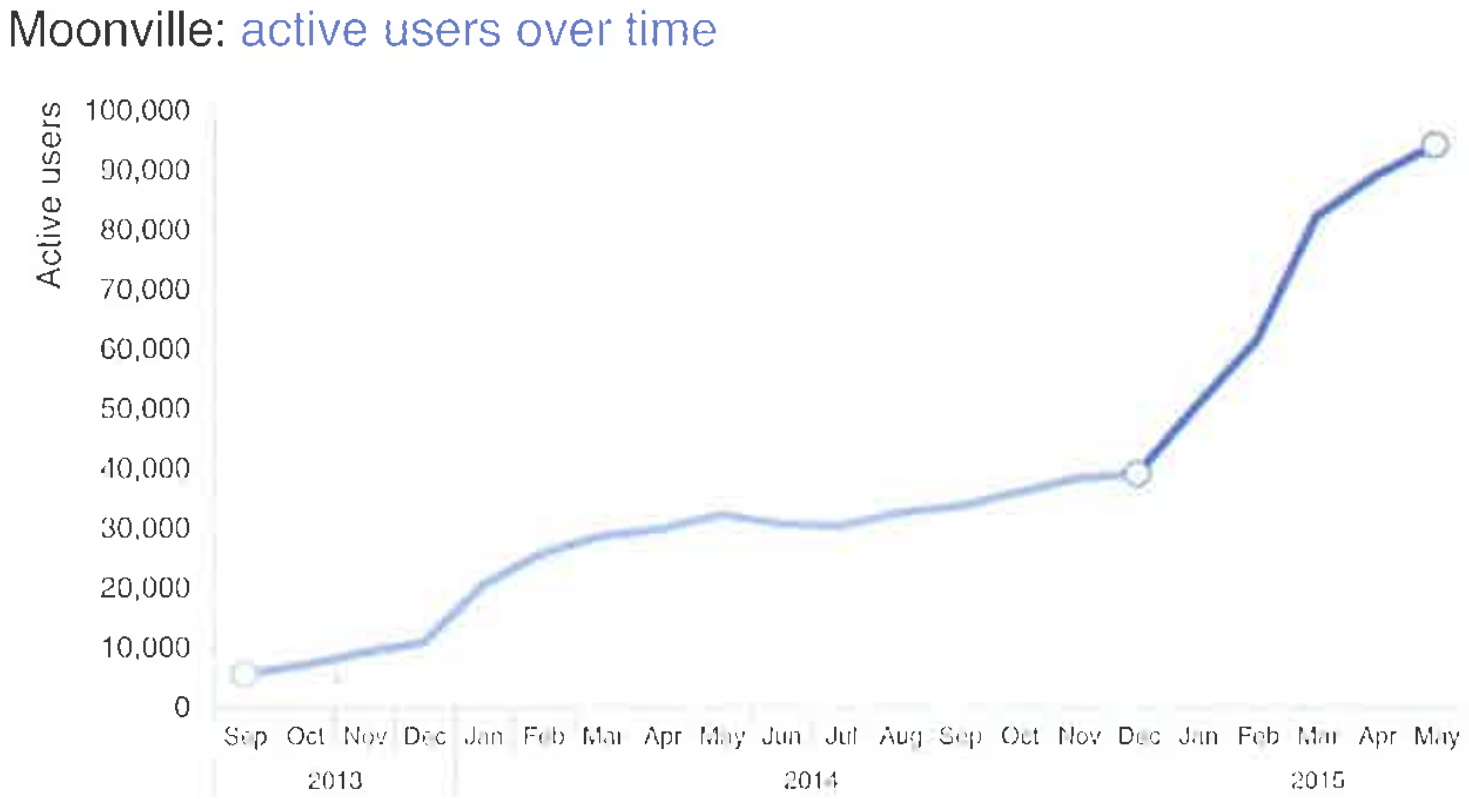
Till the End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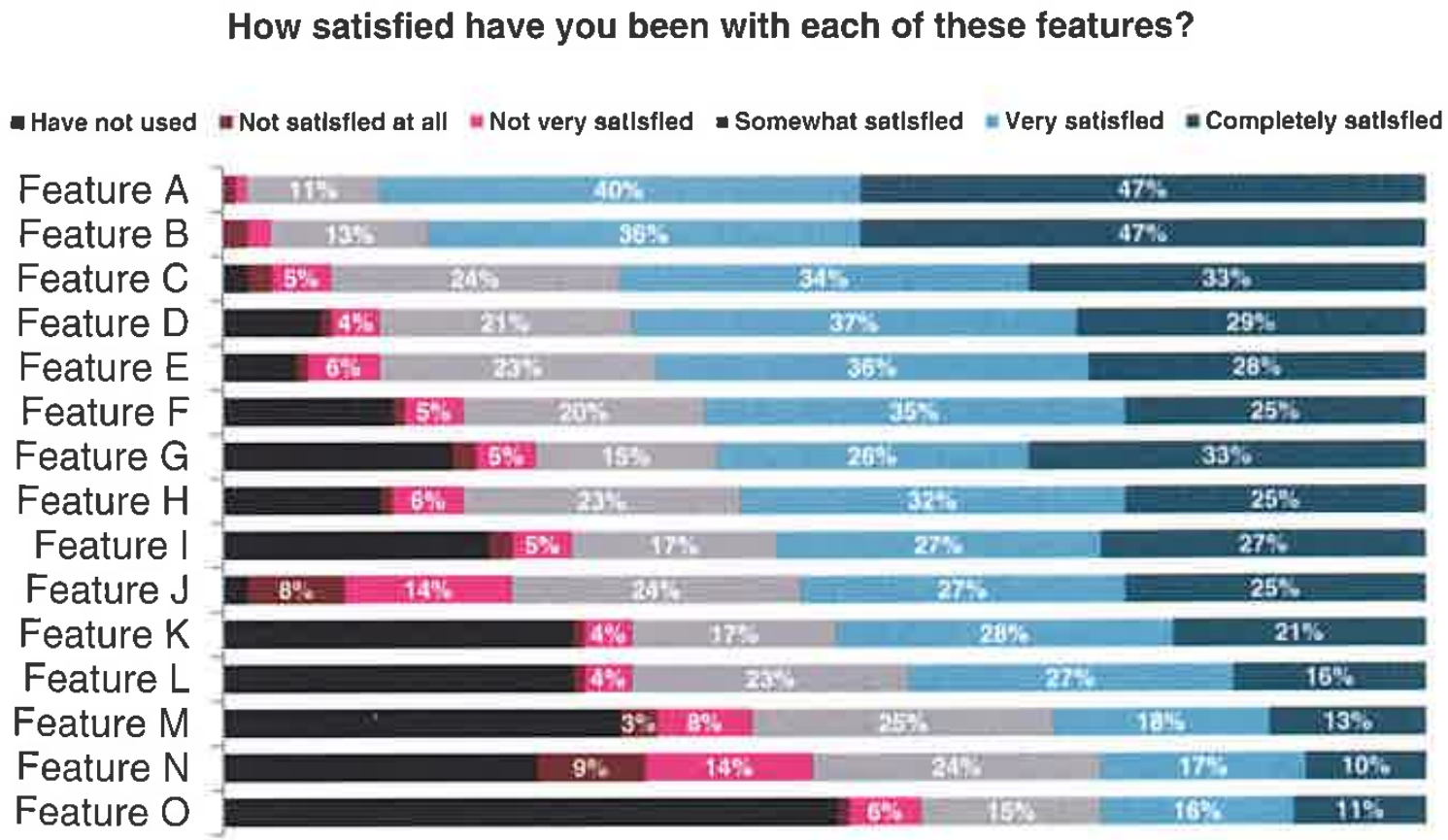
And For Print

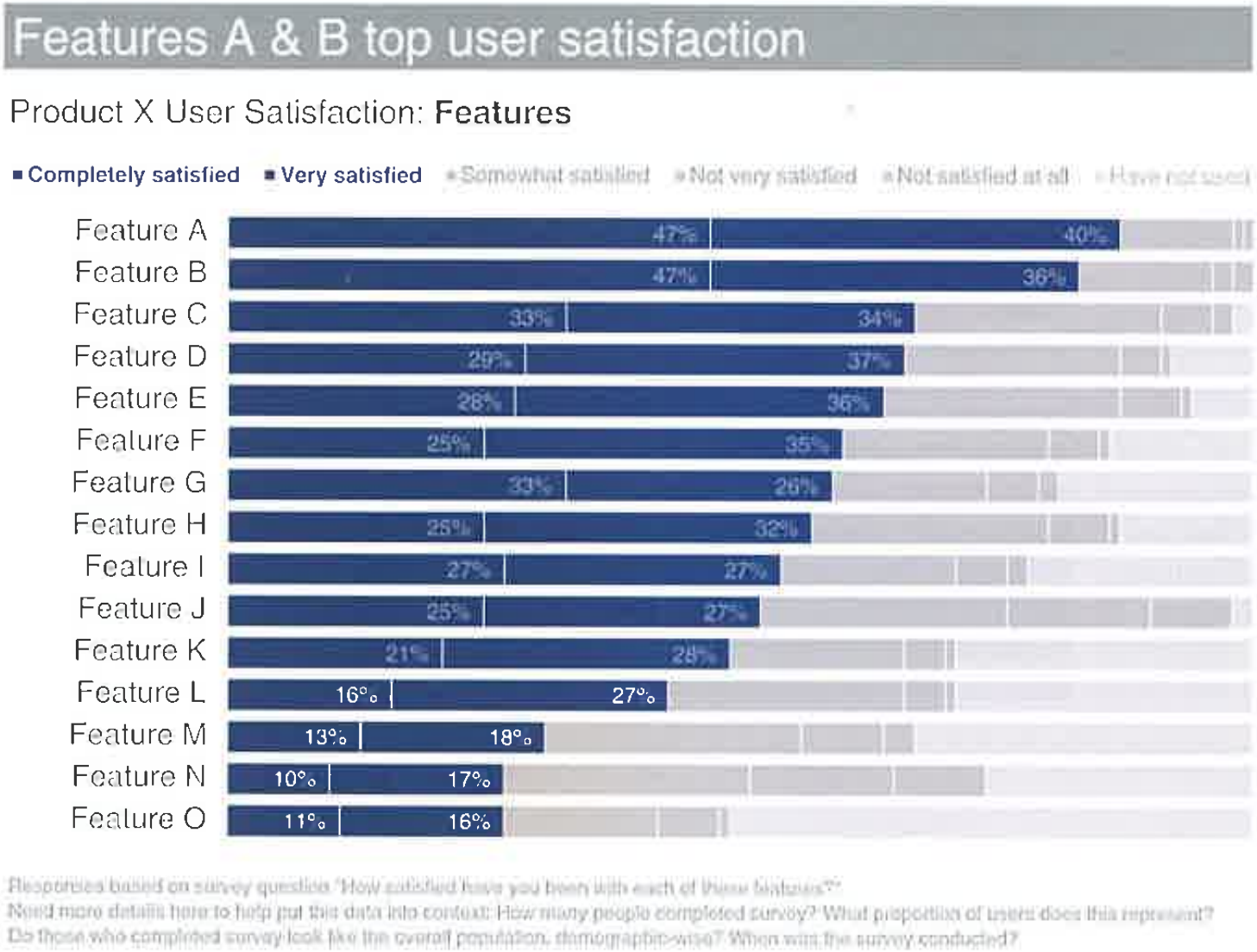
3. Logic in order

- Highlight what you want people to focus on
- With order
- With color
- With text

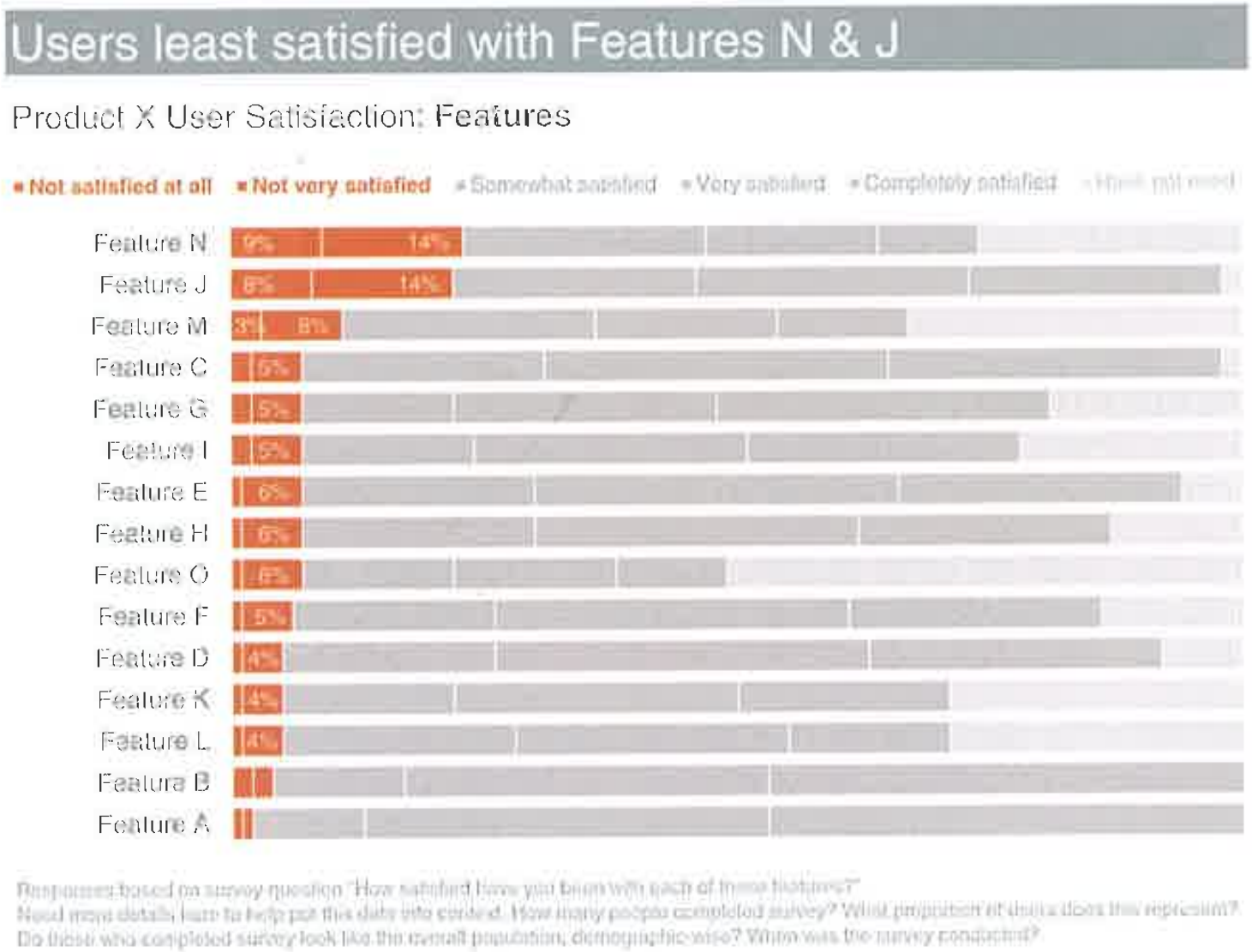
What's Important Here?



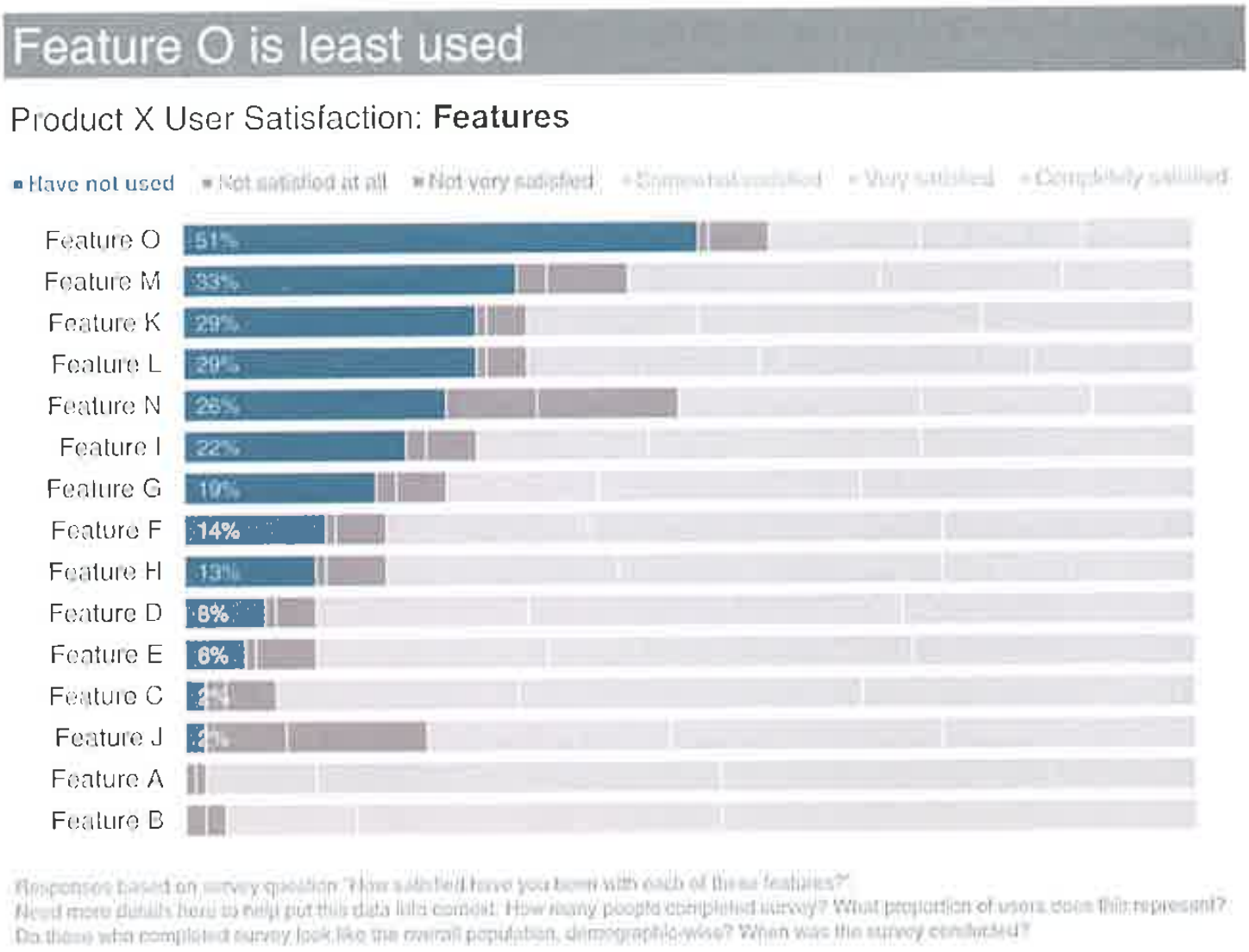
Suppose We Care Most About User Satisfaction



Suppose We Care Most About User Dissatisfaction



Or About Which Feature is Least Used



What if You Want to Highlight All Three?

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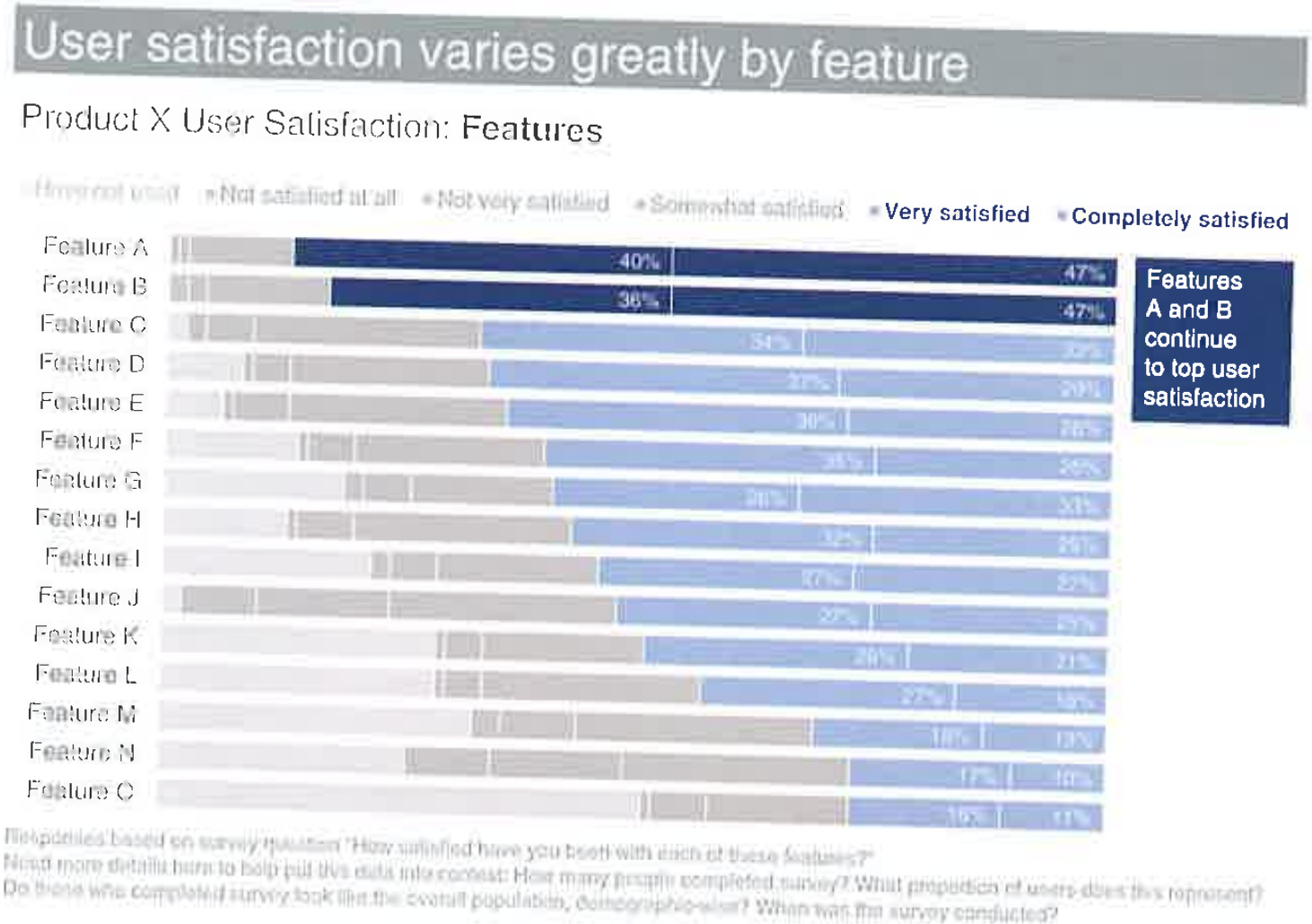
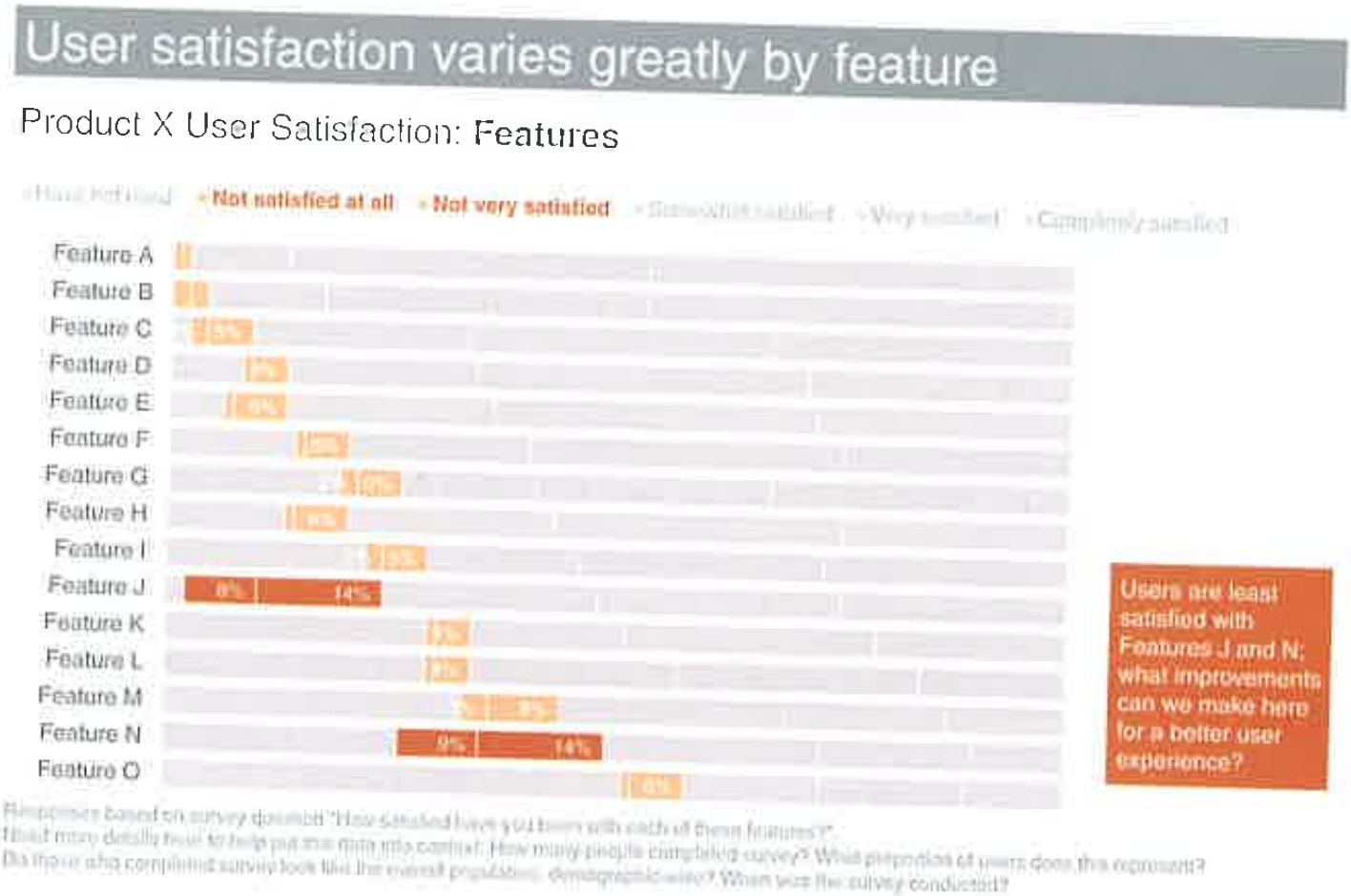
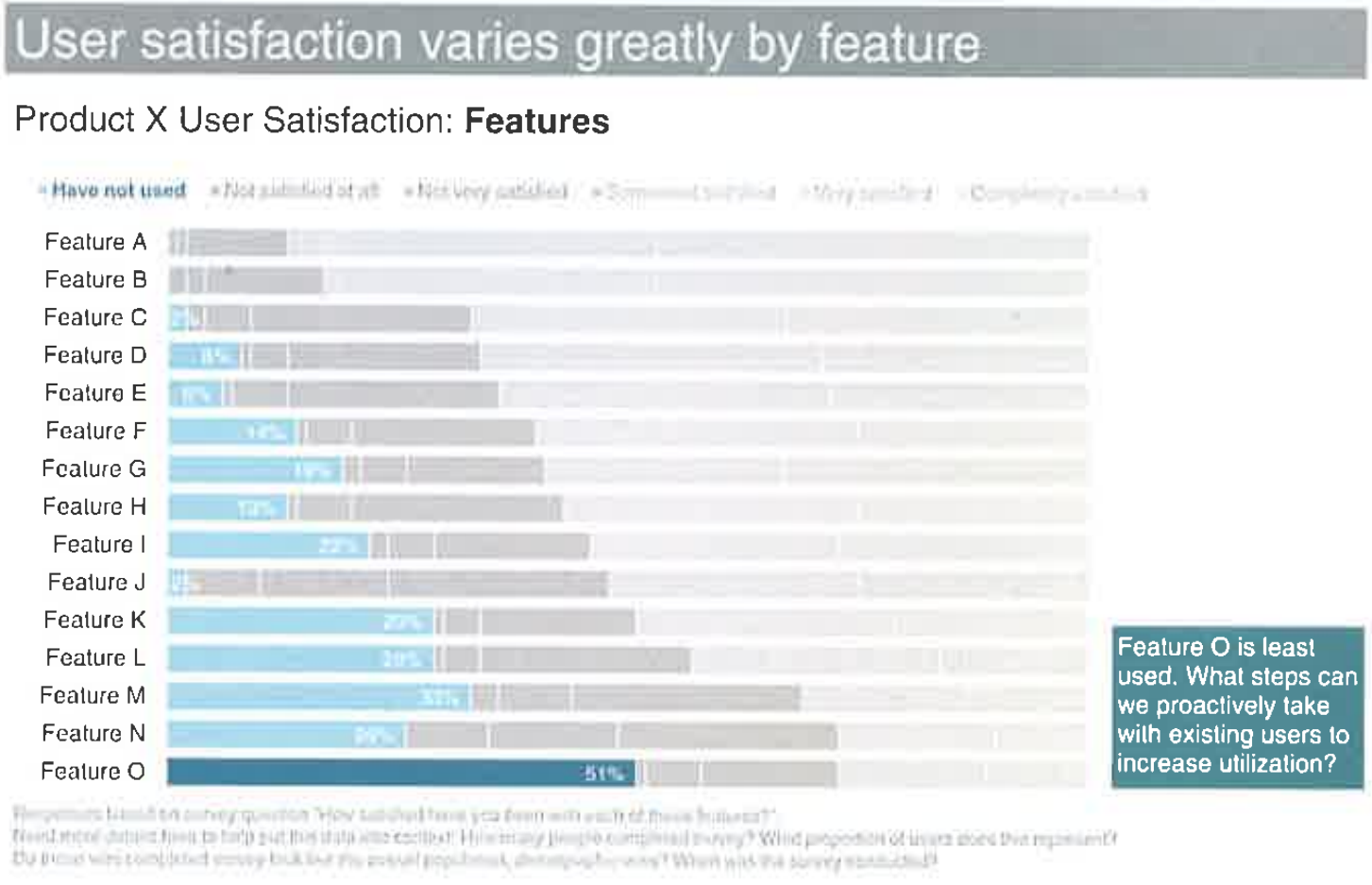


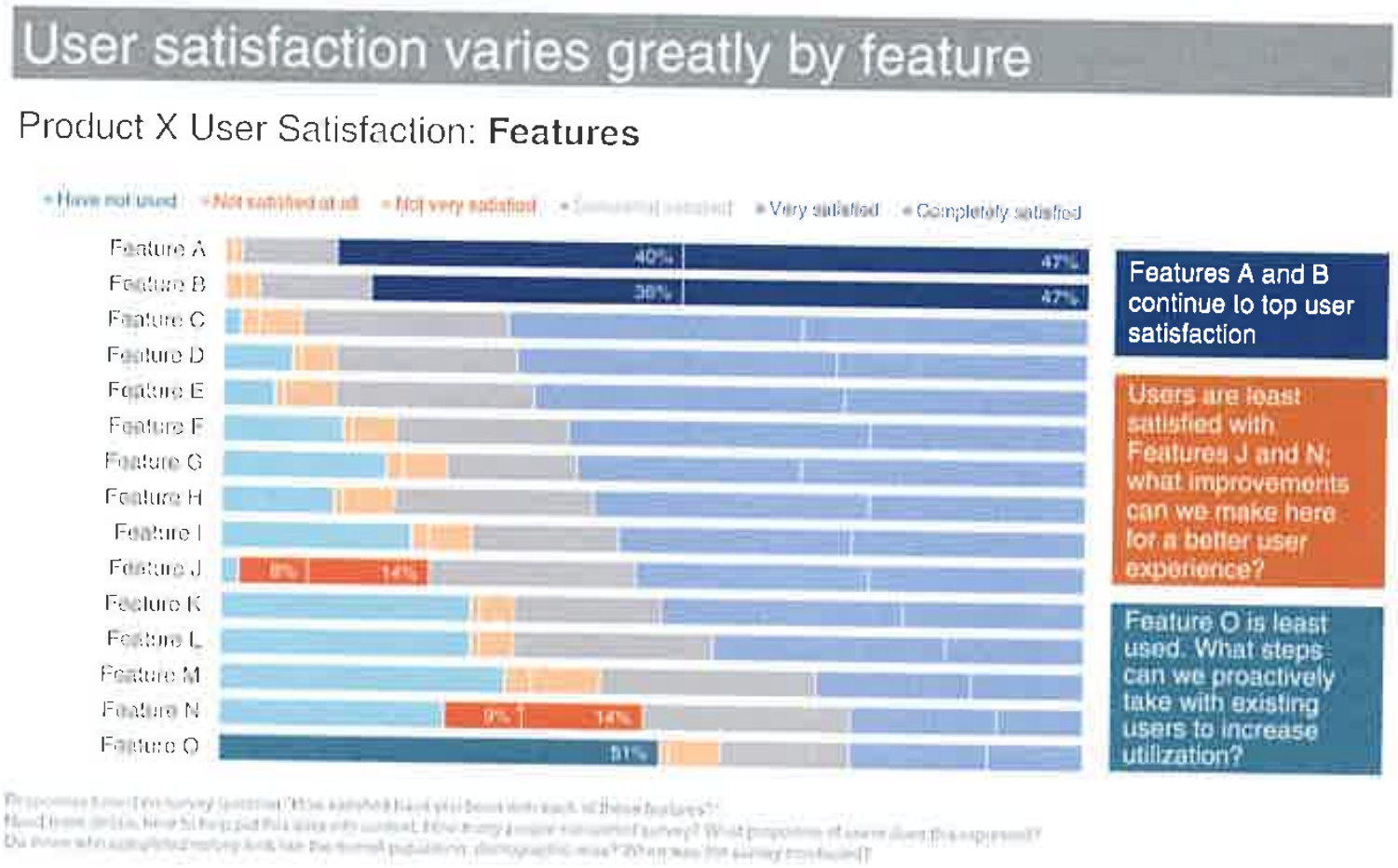
Highlighting All Three, Part 2



Highlighting All Three, Part 3



Putting It All Together: Best for Print



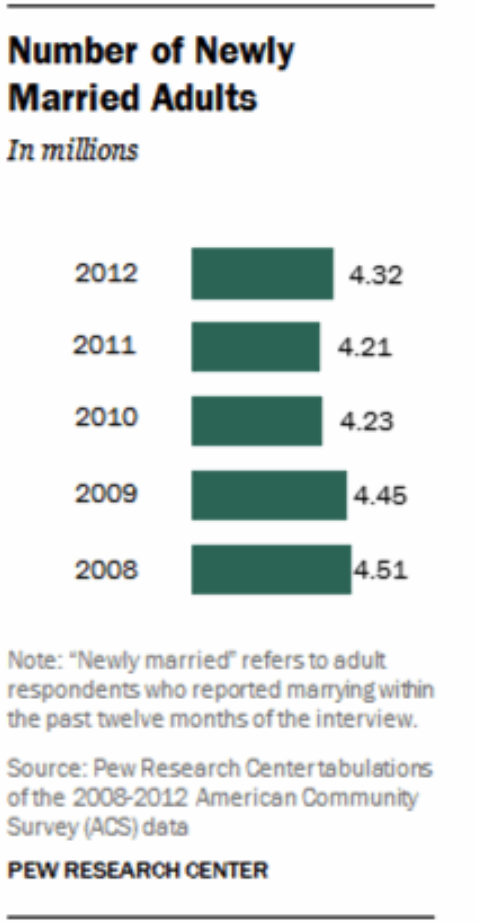
4. No Spaghetti

- Instead of the book's example, another from her website
- Transforming hard-to-read bars to easier-to-read formats
- Many similar ideas apply

Pew Charts on Number of Newly Married Adults

What's Wrong and How to Fix?

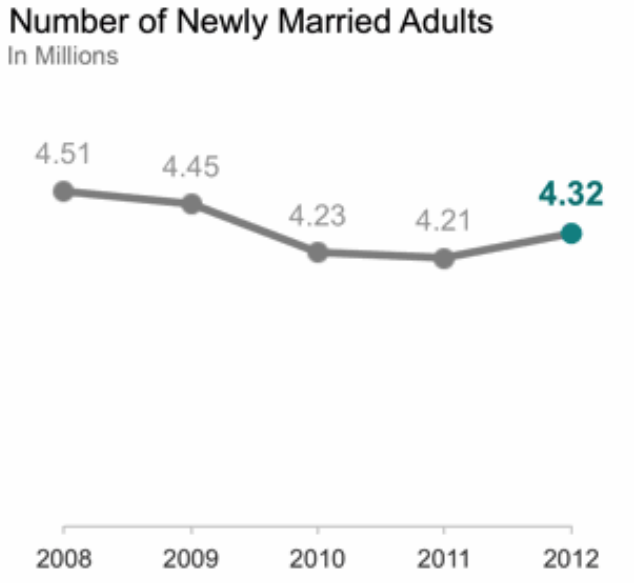
ORIGINAL



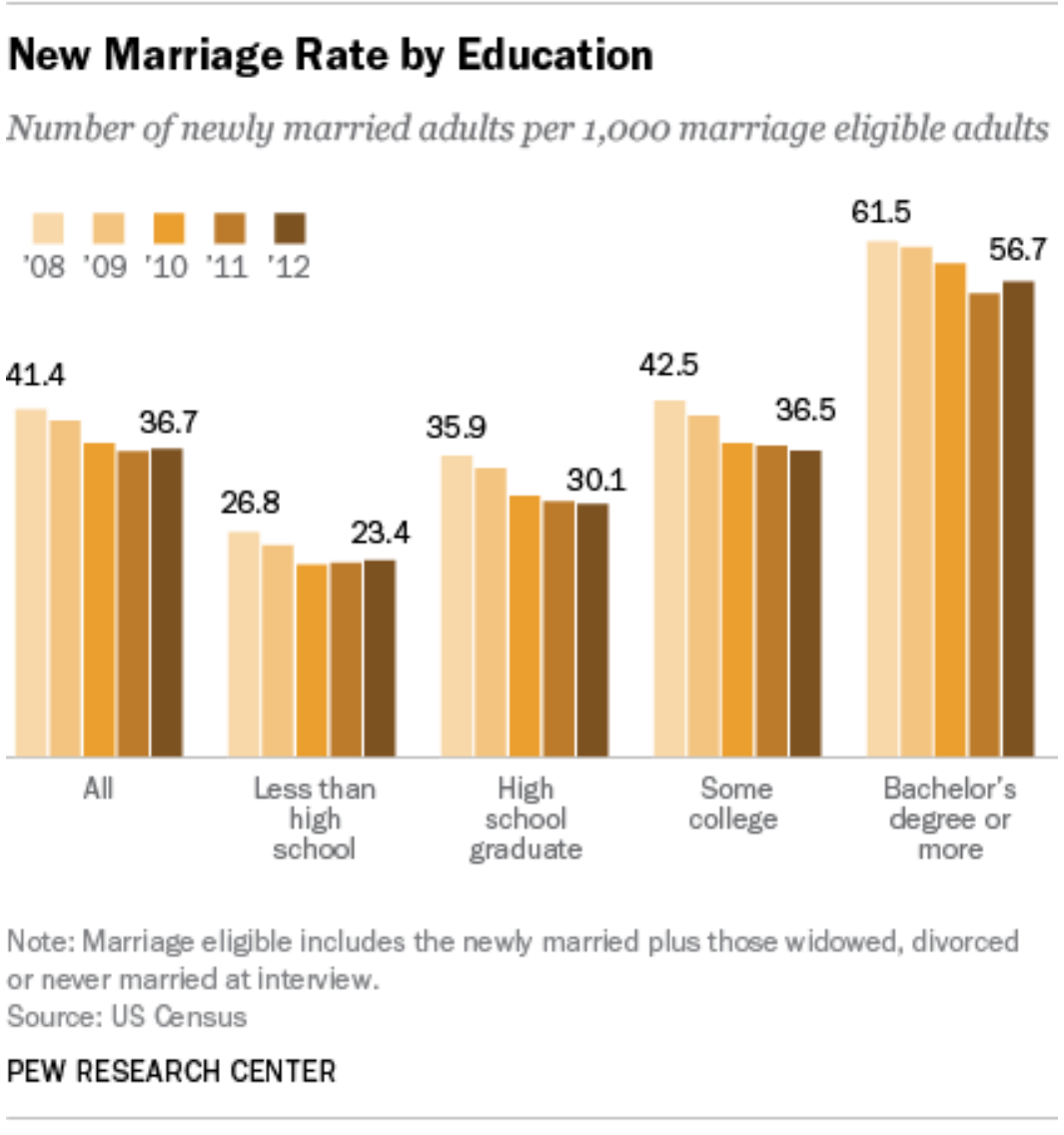
Show Change Over Time

ORIGINAL

COLE's MAKEOVER

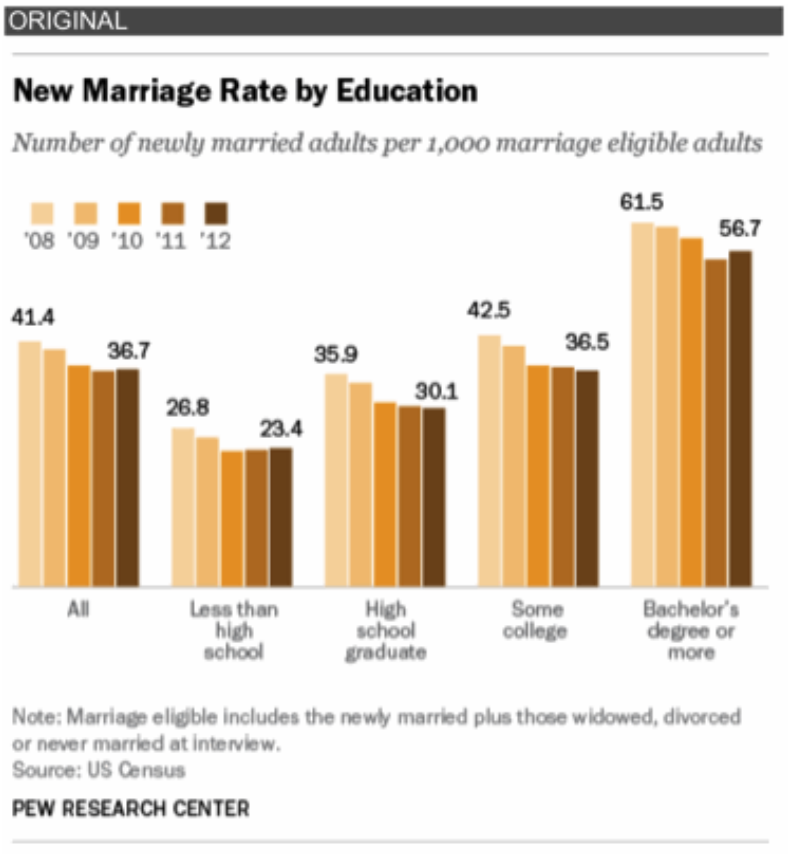


Can You Pick Out the Point Here?



Highlighting the Increase for You Guys

ORIGINAL



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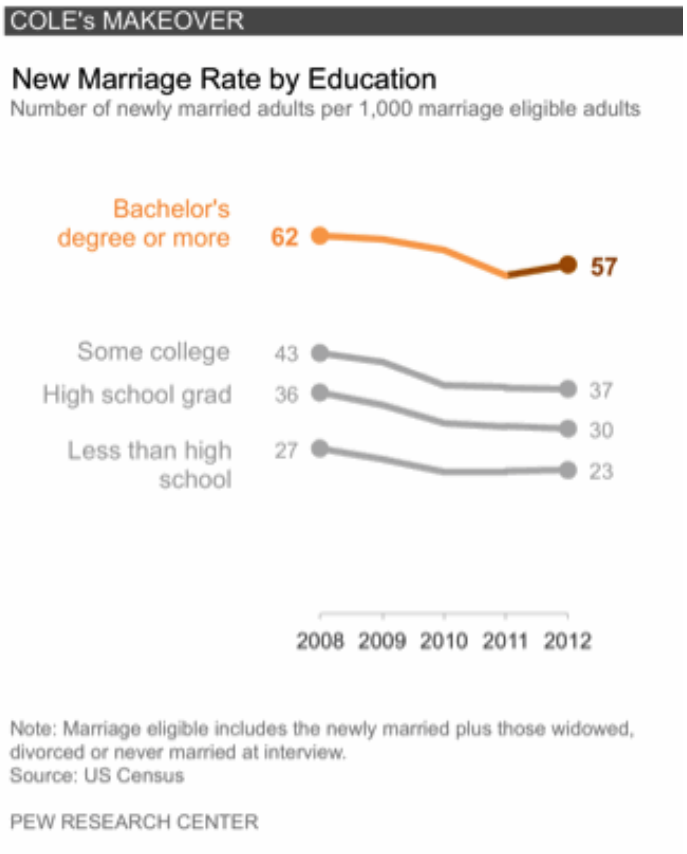
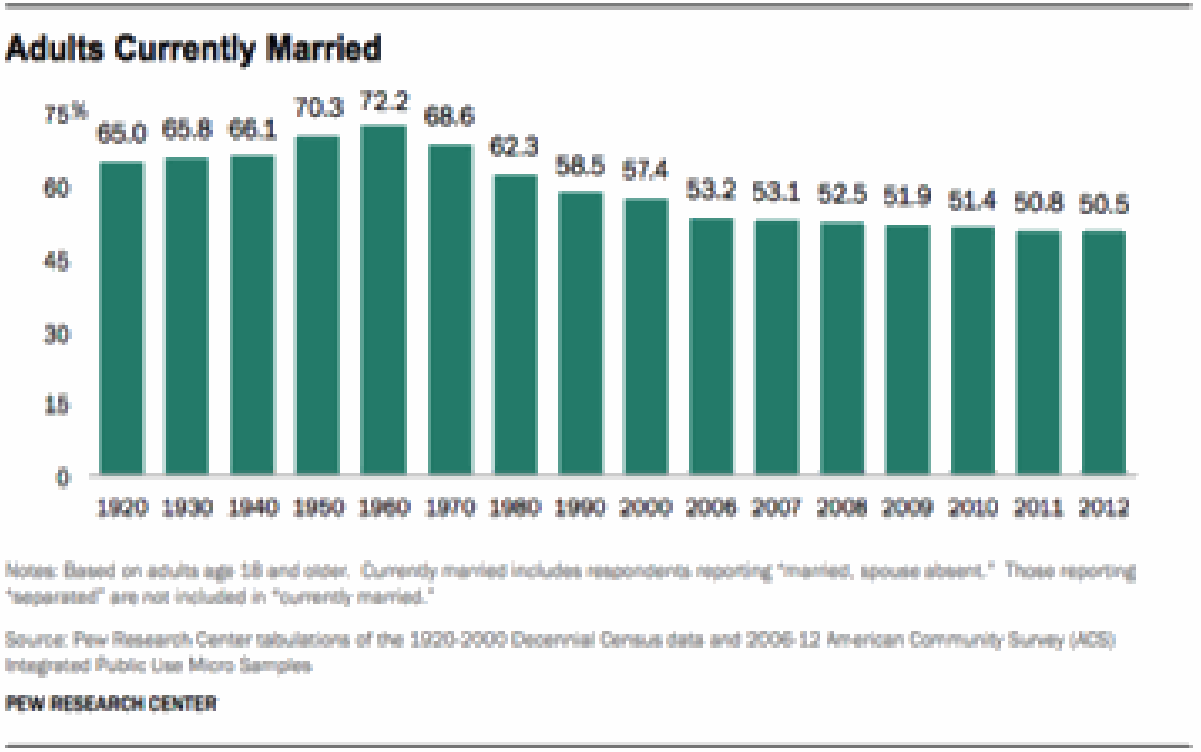


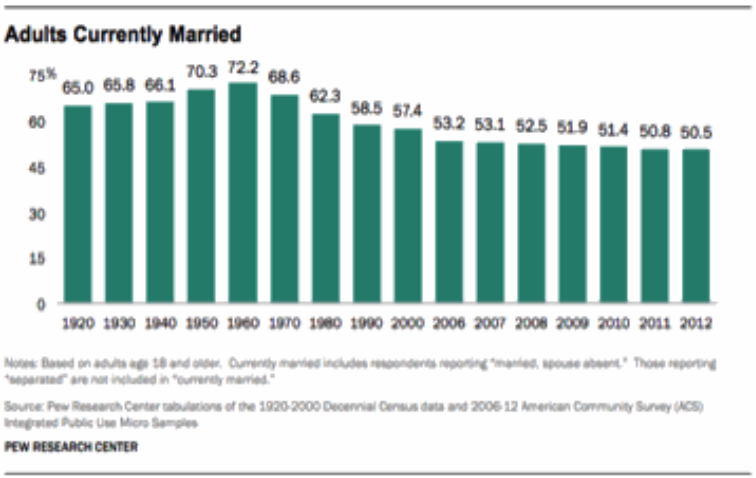
What Would You Want to Pull Out?

ORIGINAL



Highlighting Peak and Trough

ORIGINAL



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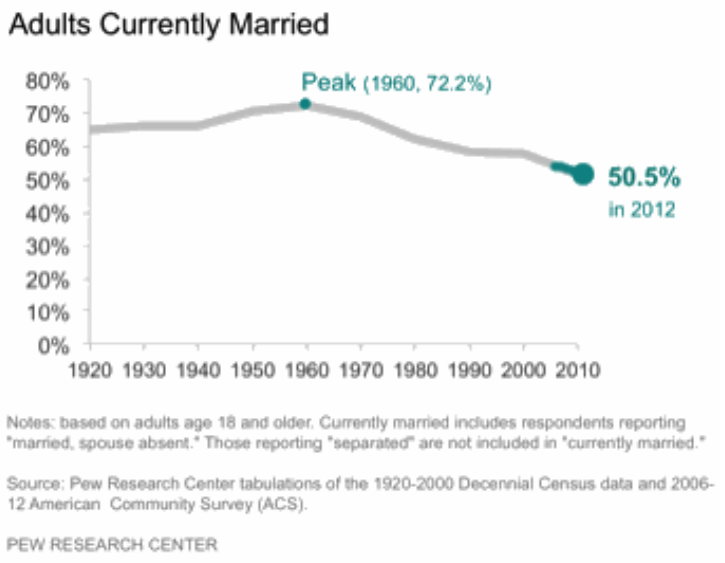


Mulbrandon's Graphics

Visualizing Economics

- Mulbrandon has a BA in economics, and a postgraduate degree in design
- Experience in finance industry
- Now runs a data visualization firm
- To make this book she used Excel, OmniGraphSketcher (no longer available), Illustrator, R and InDesign (publishing)

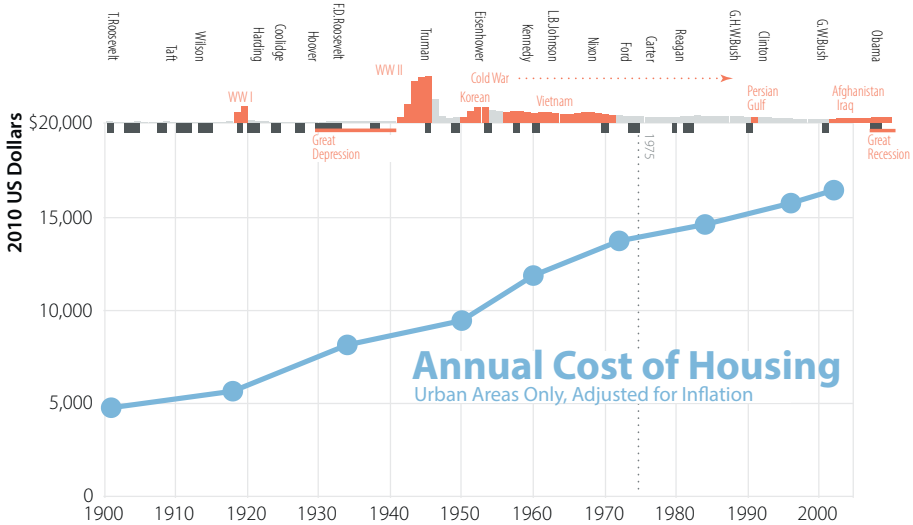
Which Techniques is She Using?

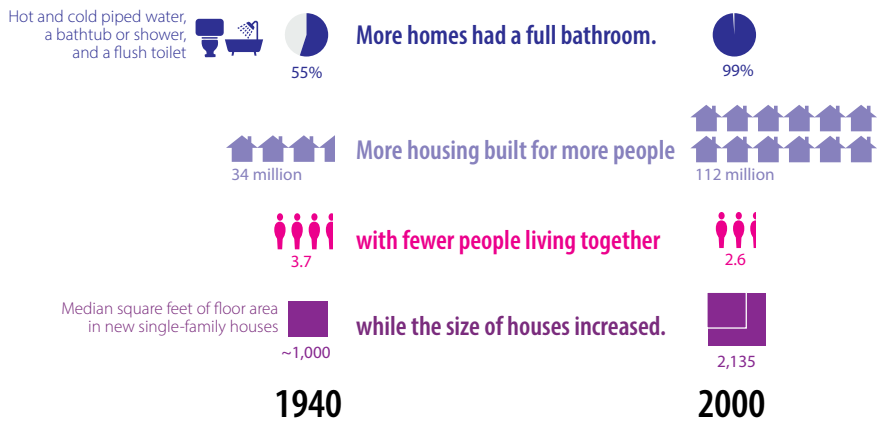
- What's the story she's trying to convey?
- Look at each graph and think about the underlying techniques
- Two static and two building

1901–2002

Cost of Housing in the 20th Century

BLS





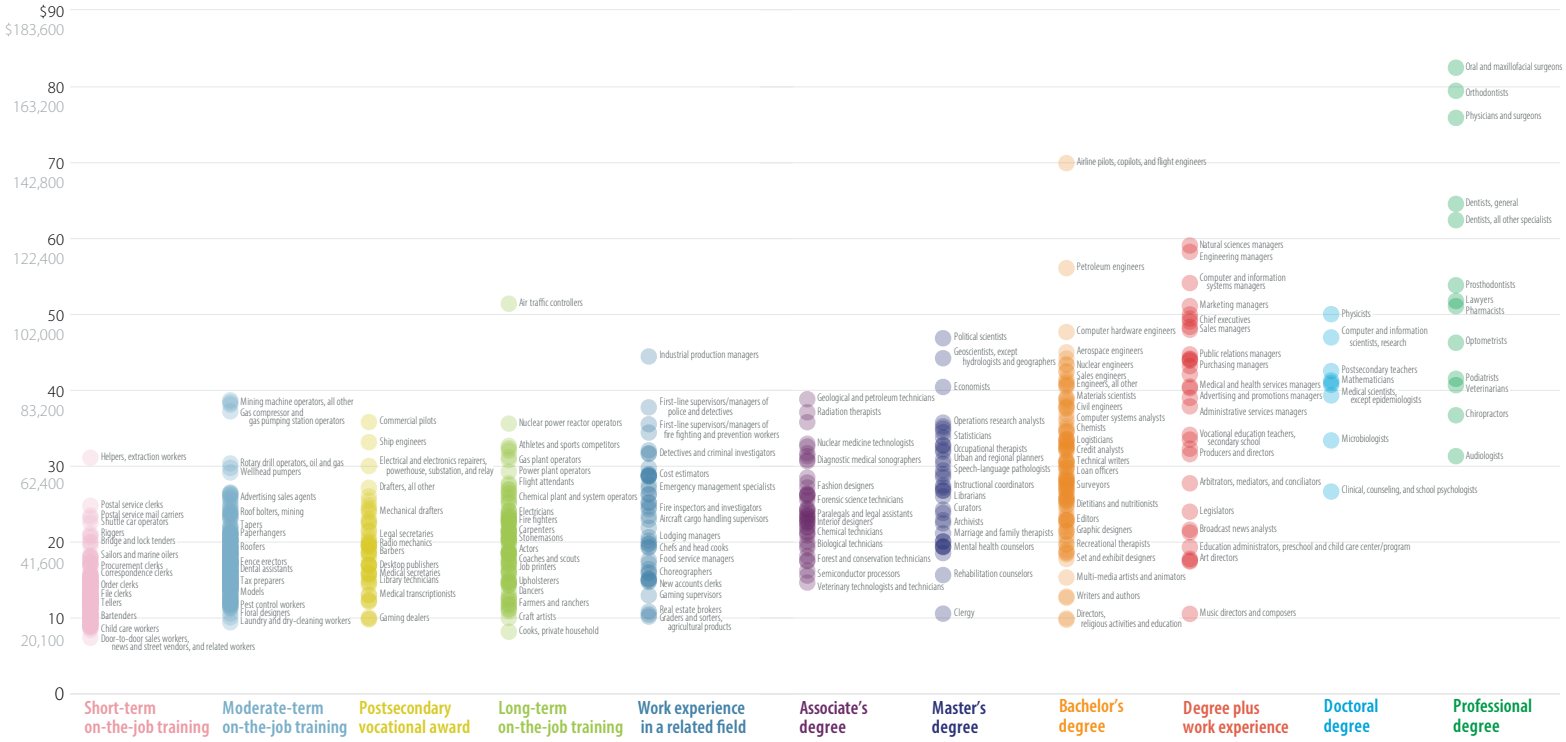
Sources: US Bureau of Labor Statistics, "100 Years of US Consumer Spending: Data for the Nation, New York City, and Boston," Report no. 991 • US Census Bureau

2011

Wages of All Occupations by Education

Median Hourly Wage
(2011 US Dollars)

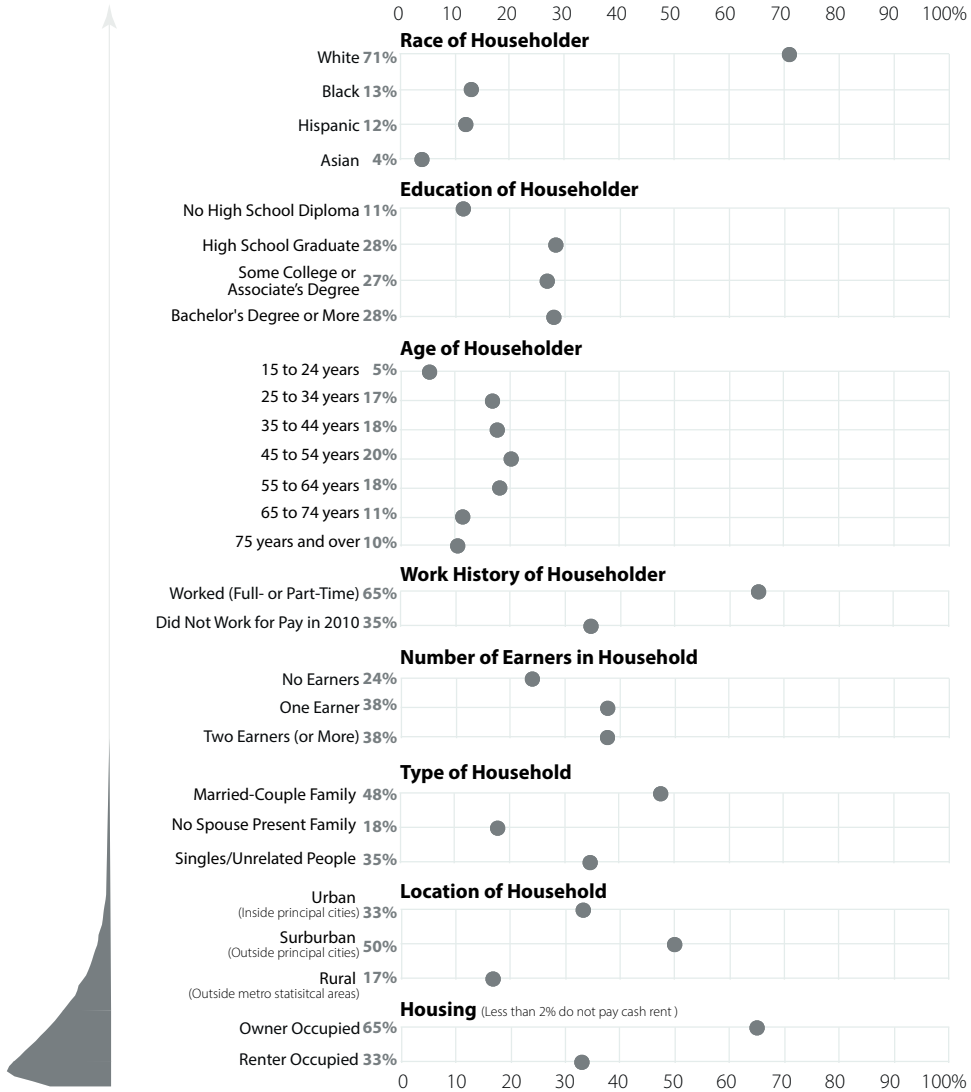
Estimated
Annual Salary



 Source: EMSI EconomicModeling.com (Compiled from data collected by BLS, BEA and US Census Bureau)

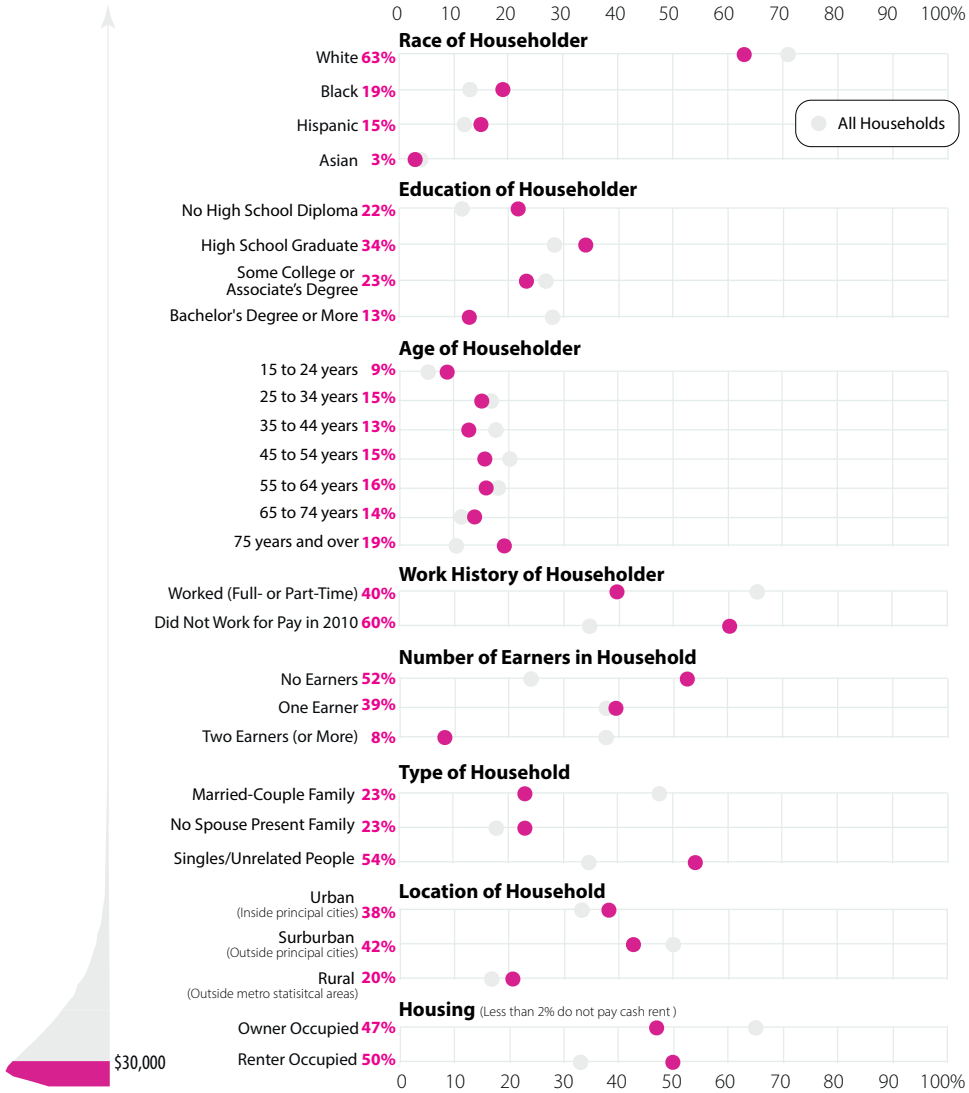
Census 2010

Demographics of All Incomes



 Source: US Census Bureau, 2006–2010 American Community Survey

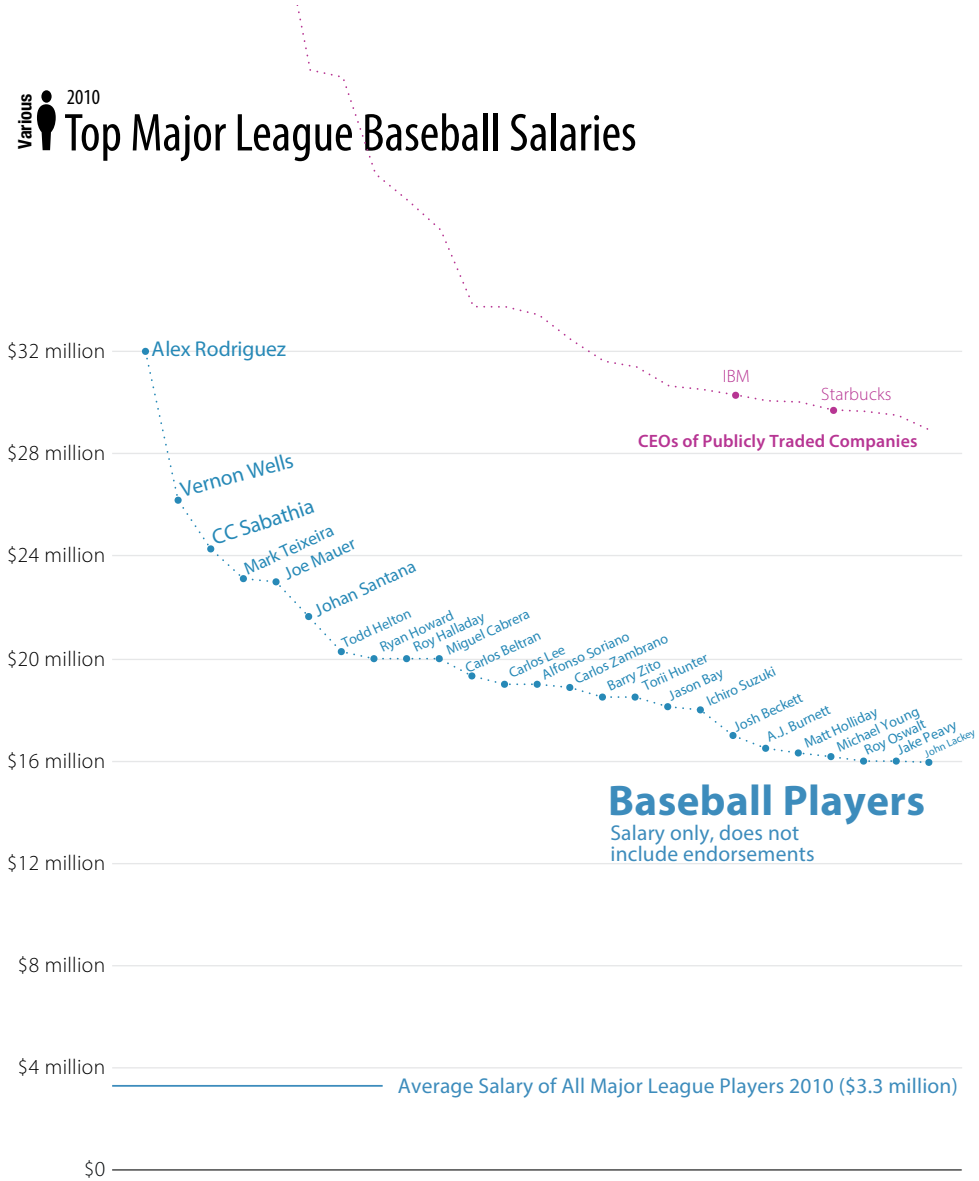
2010
Census Demographics of Incomes below $30,000



Source: US Census Bureau, 2006–2010 American Community Survey

Various 2010

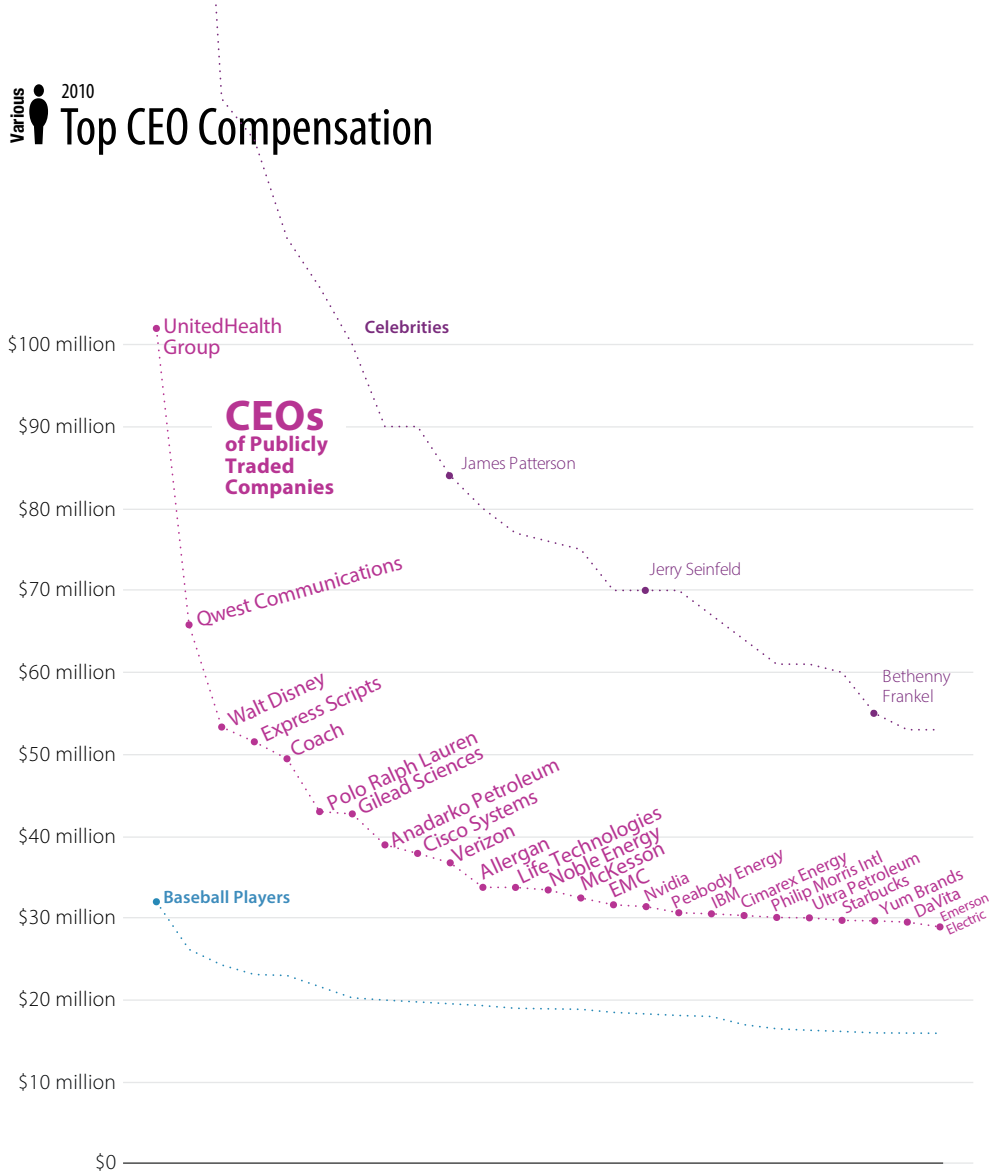
Top Major League Baseball Salaries



Sources: *AR: Absolute Return + Alpha,* "The Rich List," April 2011 • *Forbes,* "Celebrity 100, 2011" • *Forbes,* "CEO Compensation, 2011." • *USA Today,* "USATODAY Salaries Databases"

Various 2010

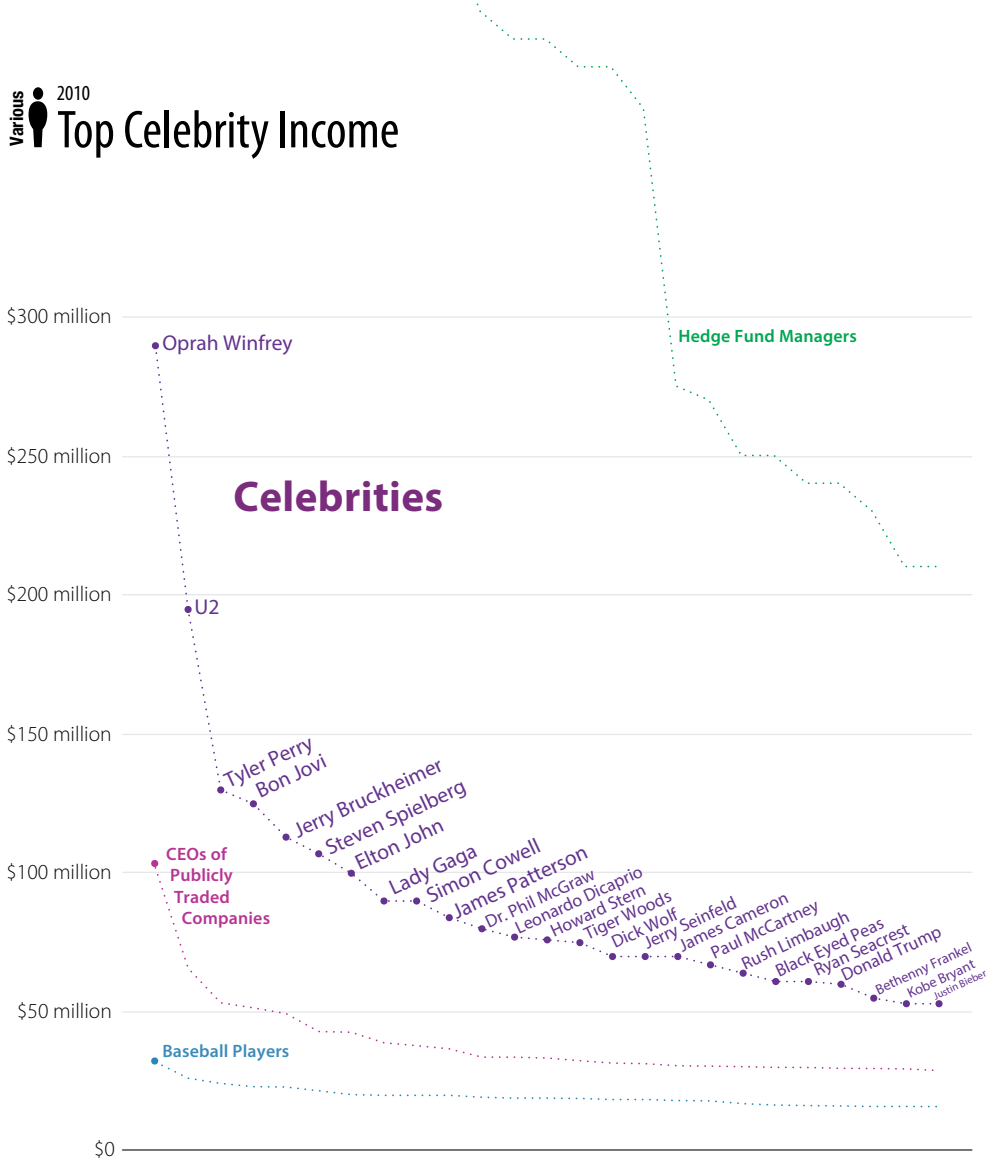
Top CEO Compensation



Sources: *AR: Absolute Return + Alpha,* "The Rich List," April 2011 • *Forbes,* "Celebrity 100, 2011" • *Forbes,* "CEO Compensation, 2011." • *USA Today,* "USATODAY Salaries Databases"

Various 2010

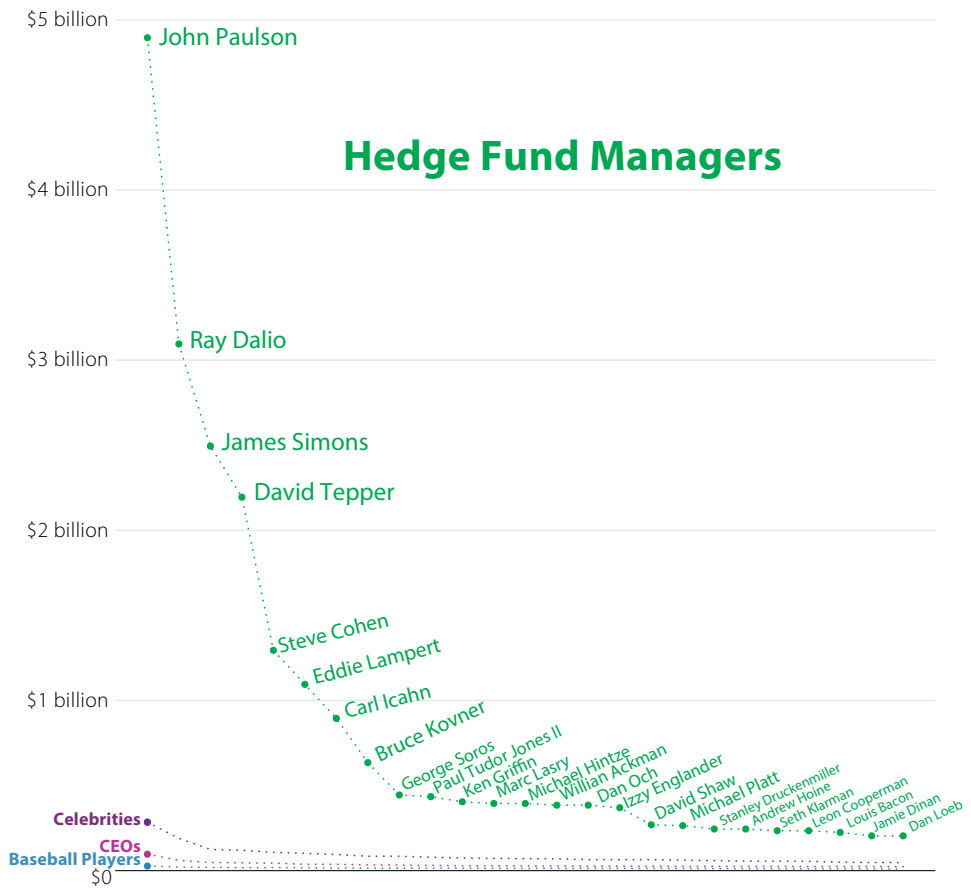
Top Celebrity Income



Sources: *AR: Absolute Return + Alpha,* "The Rich List," April 2011 • *Forbes,* "Celebrity 100, 2011" • *Forbes,* "CEO Compensation, 2011." • *USA Today,* "USATODAY Salaries Databases"

Various 2010

Top Hedge Fund Manager Income



Sources: *AR: Absolute Return + Alpha,* "The Rich List," April 2011 • *Forbes,* "Celebrity 100, 2011" • *Forbes,* "CEO Compensation, 2011." • *USA Today,* "USATODAY Salaries Databases"

Tying Things Together: Functions in R

From Animate to Automate

- Today's R tutorial: functions
- How to automate repetitive tasks
- Usually slower in the short run
- Faster in the long run
- Less error prone

Functions Plan

- Introduce a simple function in class
- Tutorial takes to you automating graph production

Defining a Function

```
function.name <- function(arg1, arg2){
  # stuff your function does
}
```

- `function.name`: what you call the function
- `function`: needed to tell R this is a function
- `arg1`: first argument of the function
- inside the curly braces: what you want the function to do

Simple Function Example

```
summer <- function(x,y){
  x^y
}
```

- function name?
- arguments?
- body of the function?

Calling a Function

```
summer <- function(x,y){
  x^y
}
```

```
summer(x=2,y=3)
```

Calling a Function

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```
## [1] 8
```

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```
summer(3,2)
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```

```
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```

```
## [1] 8
```

```
summer(3,2)
```

```
## [1] 9
```

To the Tutorial!

- Good luck
- Do the evaluation
- Presentations next week