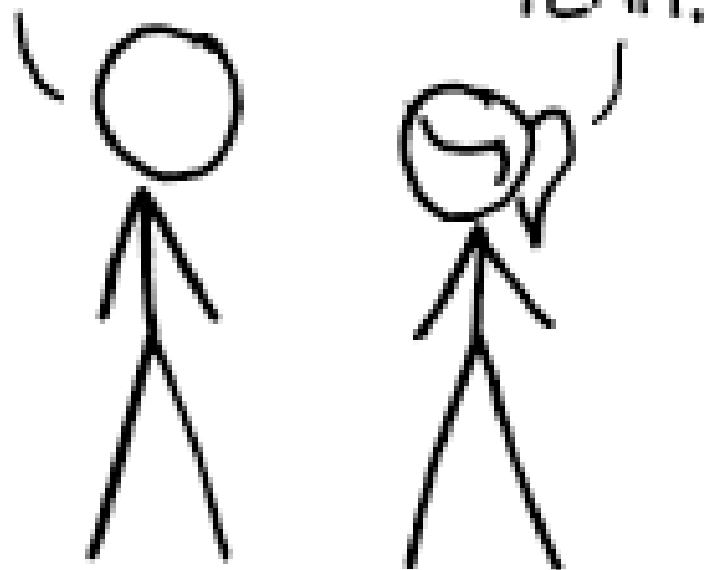


HOW STANDARDS PROLIFERATE:

(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



SOON:

SITUATION:
THERE ARE
15 COMPETING
STANDARDS.

Data Visualization Types: The Basics

- Introduction to Data Visualization
- The Graduate Center at CUNY
- Michelle A. McSweeney

Forum Question

In recent years, there has been an explosion of visualizations, but for the most part, they fall back to a few familiar types. How many different chart types can you think of? As you make this list, do you notice any patterns or features they have in common?

Three ingredients Three ways

Shapes

- Points
- Lines
- Areas/
Polygons

➔ Points



➔ Lines



➔ Areas



Three ingredients Three ways

Shapes

- Position
- Color
- Size/Scale

→ Position

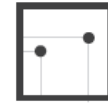
→ Horizontal



→ Vertical



→ Both



→ Color



→ Size

→ Length



→ Area



→ Volume



Four Essential Features

Title

Scale (linear, logarithmic, or custom)

Coordinate System (cartesian, polar, geographic, or custom)

Context/Sources



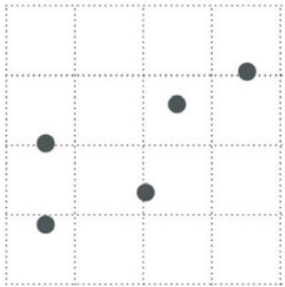
Visual Cues for Quantitative Data

1. Position
2. Length
3. Angle
4. Direction
5. Shape
6. Area / Volume
7. Color: Hue & Saturation/Intensity

Position

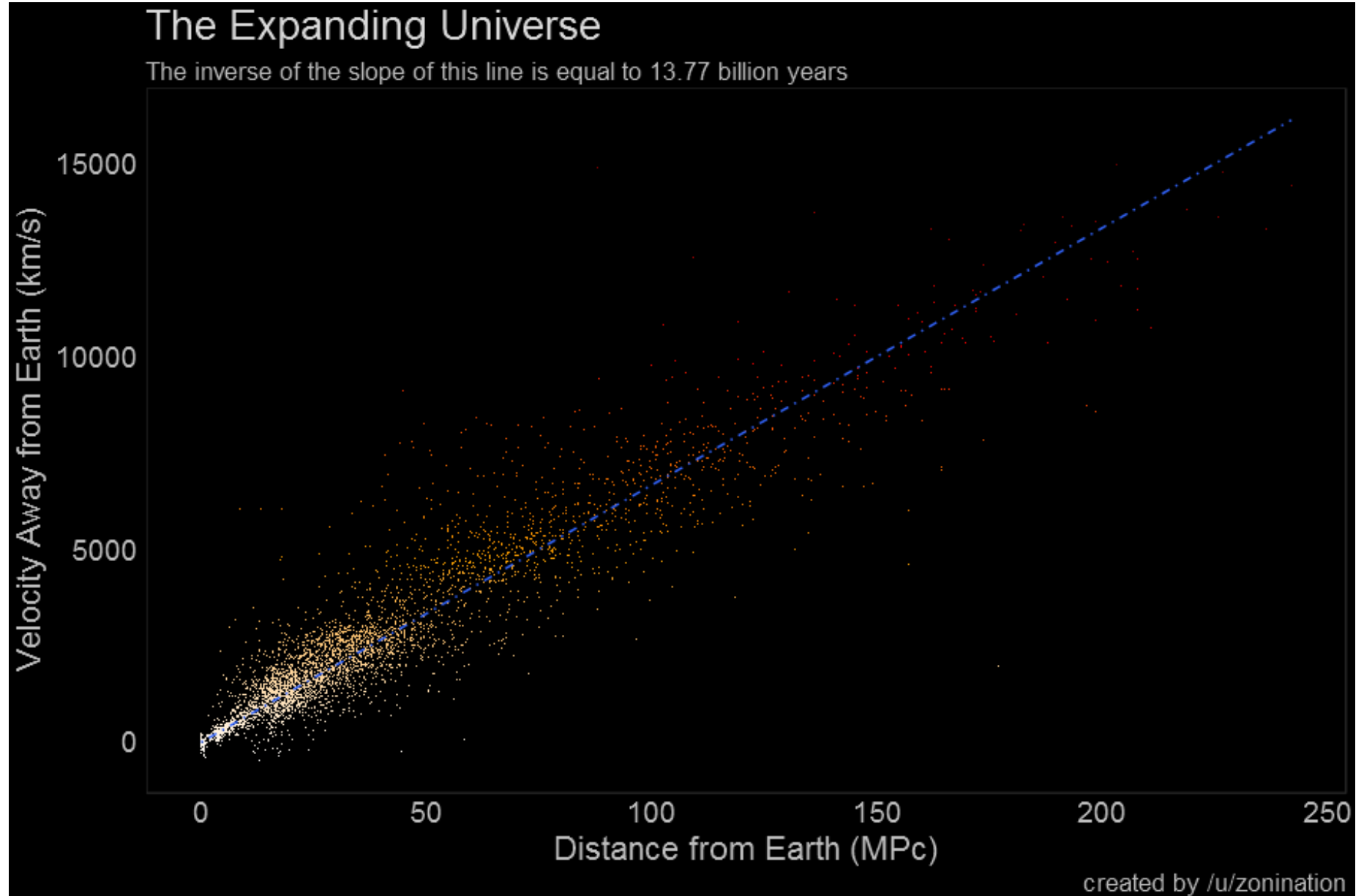
Position

Where in space the data is



Yau 2013

<https://github.com/zonation/galaxies>



Length

Length

How long the shapes are



Yau 2013

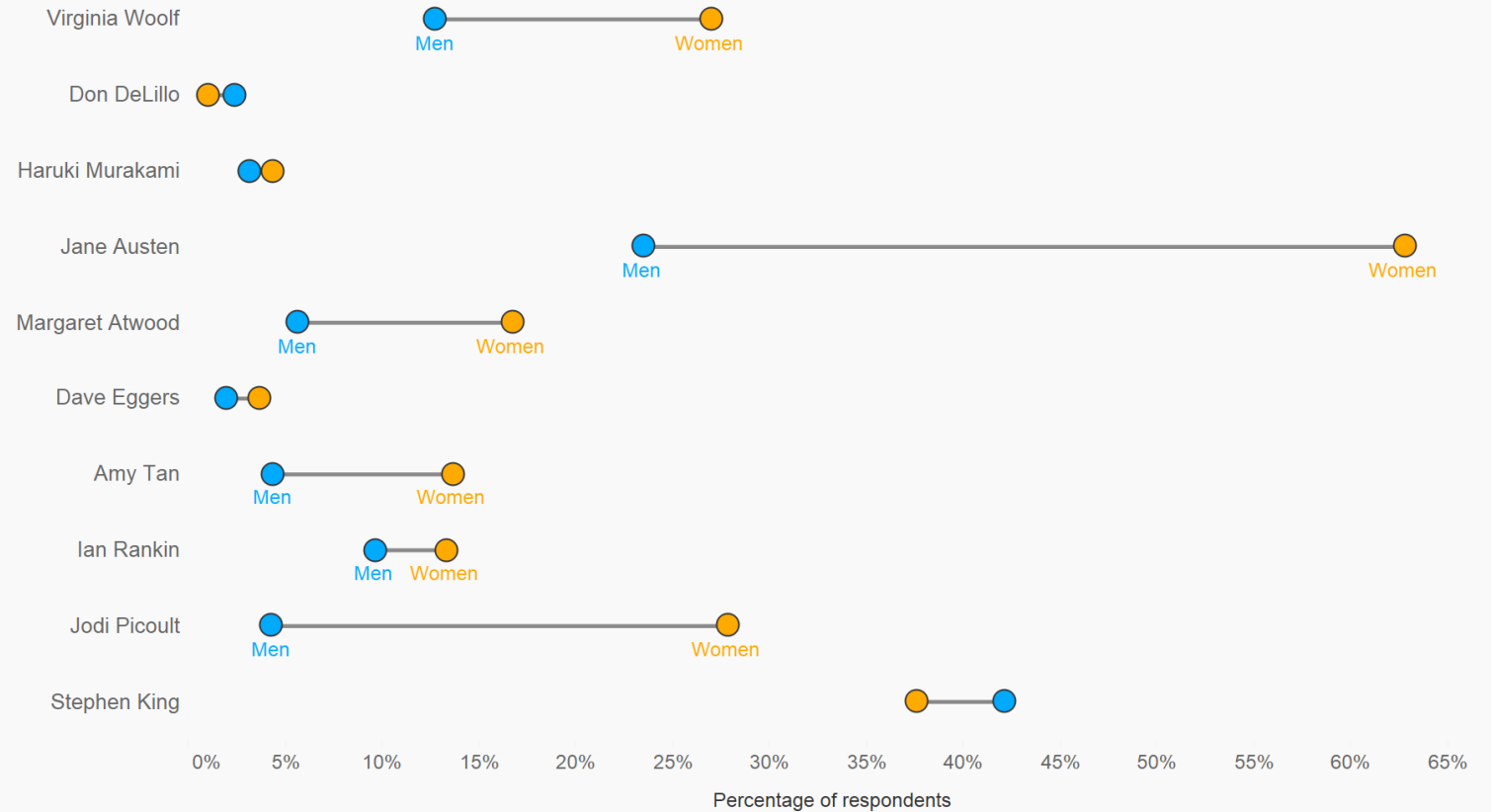
Women are more likely than men to engage in literary culture, regardless of social class.

See responses by
Gender

Type of author
International authors

Men Women

Which authors have you read and liked?
Authors are ranked from "highbrow" to "lowbrow"



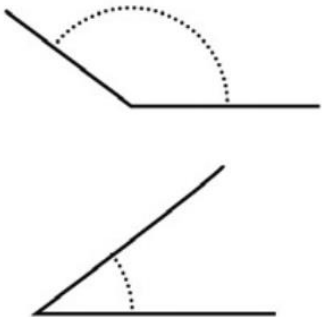
Source: Australian Cultural Fields project

<https://public.tableau.com/en-us/s/gallery/cultural-tastes-gender-class-and-age>

Angle

Angle

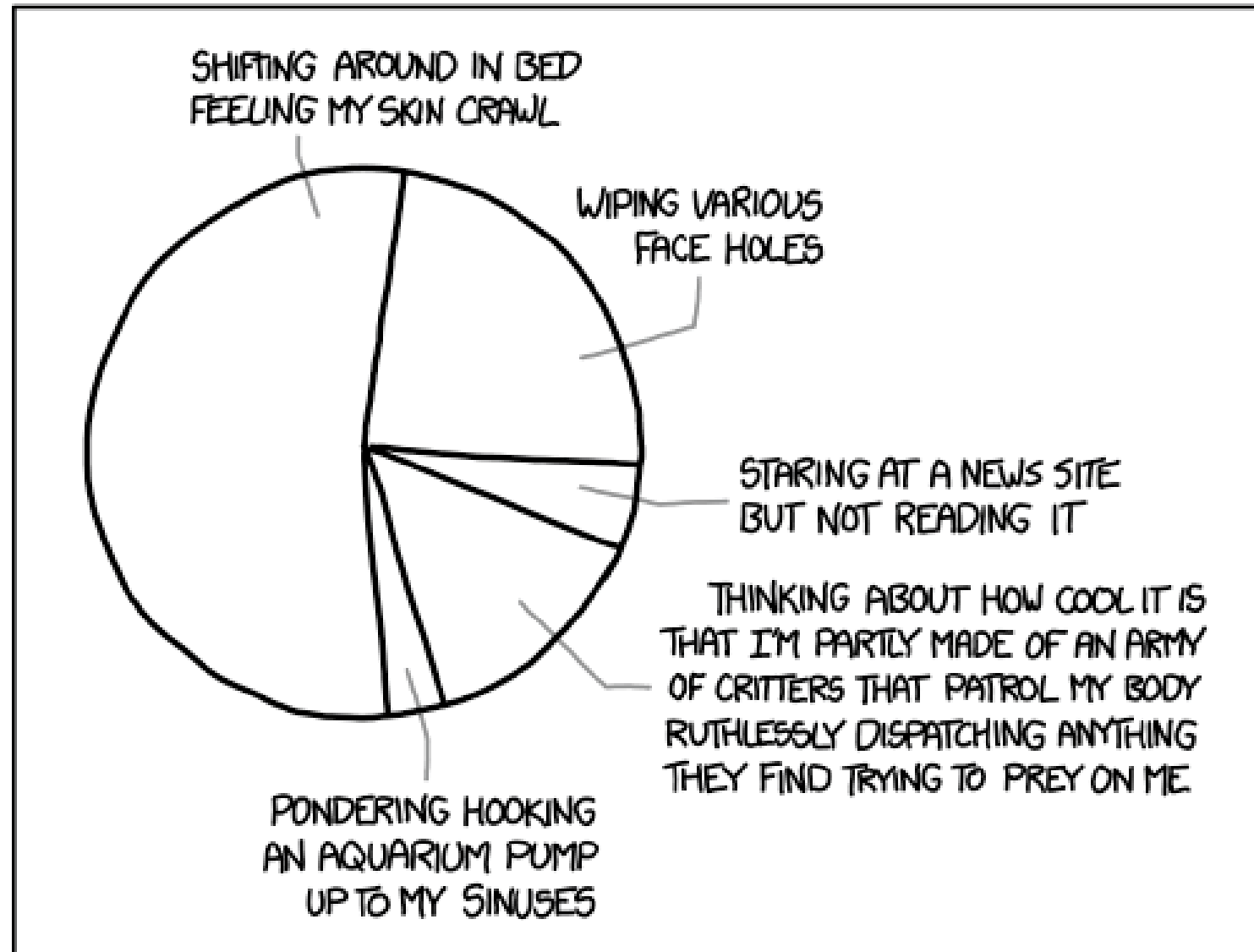
Rotation between vectors



Yau 2013

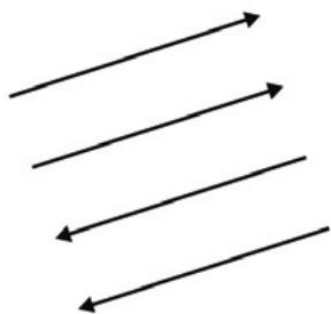
<https://xkcd.com/1157>

ACTIVITIES WHILE SICK:



Direction

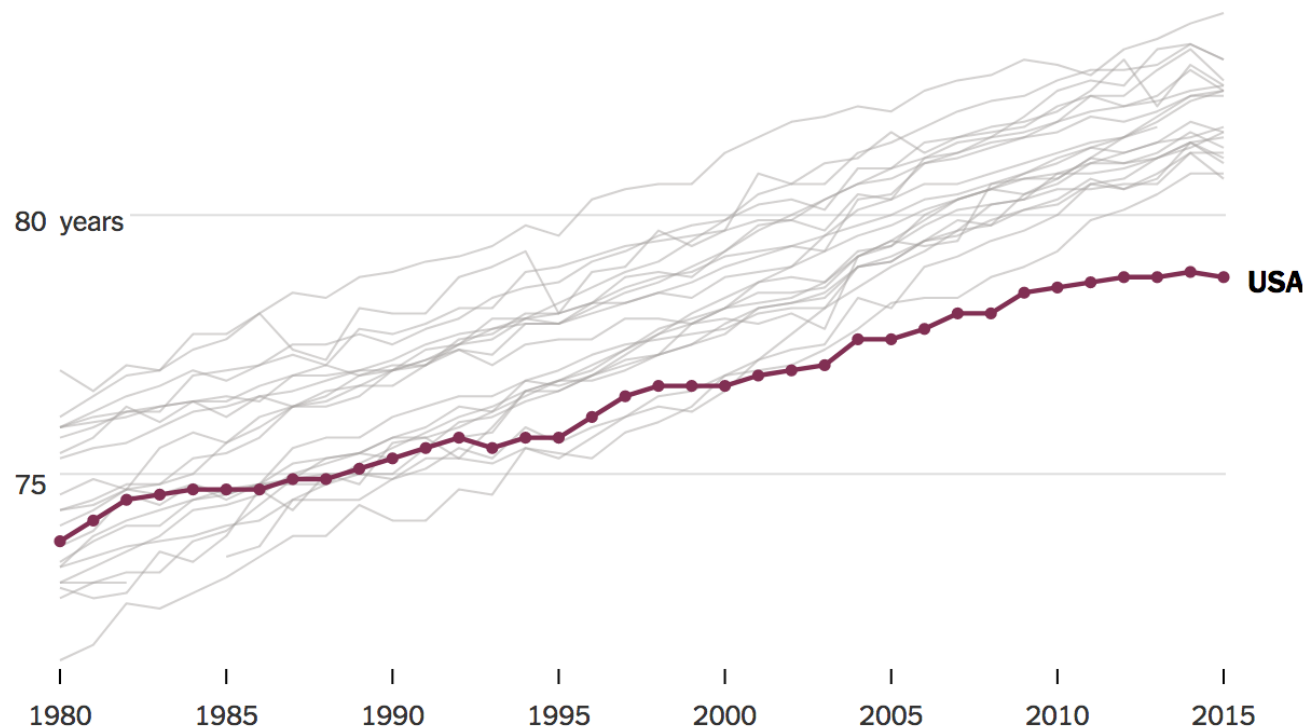
Direction
Slope of a vector in space



Yau 2013

Falling Behind

In life expectancy, the United States went from middle of the pack of peer nations in 1980 to below average.



The list of peer nations in the chart, ordered by life expectancy based on 2015 result: Japan (83.9), Switzerland, Spain, Italy, Australia, France, Luxembourg, Norway, Sweden, Canada, New Zealand, Finland, the Netherlands, Iceland, Ireland, Austria, Portugal, Belgium, Britain, Denmark, Germany (80.7). The U.S. is at 78.8.

Source: National Research Council

<https://www.nytimes.com/2018/05/14/upshot/medical-mystery-health-spending-1980>

Shapes

Panama Papers The Power Players i



Sigmundur Davíð Gunnlaugsson
Prime minister of Iceland (2013–present); Member of Parliament (2009–present); Chairman of the Progressive Party (2009–present)

Related countries
[Iceland](#)
[Luxembourg](#)
[Virgin Islands, British](#)

Sigmundur Davíð Gunnlaugsson is the prime minister of Iceland. A former journalist and radio personality, Gunnlaugsson helped lead a campaign against bank bailouts after the Icelandic financial crisis in 2008 and became chairman of the Progressive Party shortly thereafter. He entered parliament in 2009 and led the Progressives to victory in 2013, becoming at age 38 the nation's youngest prime minister. His wife, Anna Sigurlaug Pálsdóttir, is the daughter of a wealthy Toyota dealer in Iceland.



Inside the Mossack Fonseca data » Offshore company held millions of dollars worth of bonds in Iceland banks that failed [Read more...](#)

[Offshore glossary](#) i

had ever owned an offshore company in a television interview in March, son said no. "Myself? No. Well, the Icelandic companies I have worked with had s with offshore companies, even the — what's it called? The worker's unions. So ve been through such arrangements, but I have always given all of my assets my family up for taxes. "A spokesman said in a subsequent statement that "the ister and his wife have adhered to Icelandic law, including declaring all assets, nd income in Icelandic tax returns since 2008."

Explore the data: **Sigmundur Davíð Gunnlaugsson**



Category <ul style="list-style-type: none">CompanyOfficerAddressClient	Category <ul style="list-style-type: none">OfficerAddressCompanyClient	Type <ul style="list-style-type: none">Is officer ofRegistered addr...Registered
--	--	---

Shapes
Symbols as categories



Area

Area

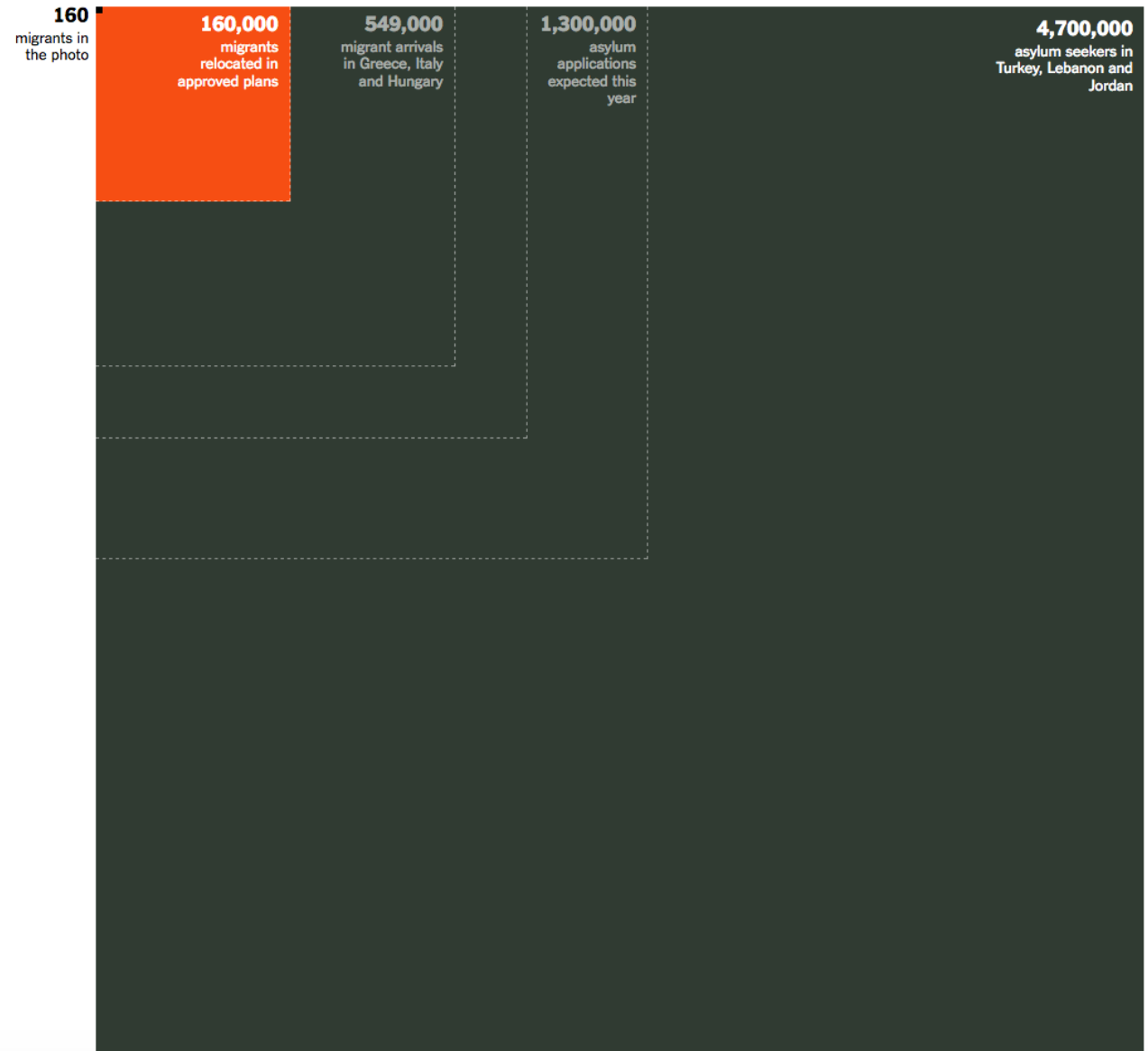
How much 2-D space



Yau 2013

<https://www.nytimes.com/interactive/2015/09/10/world/europe/scale-of-migrant-crisis-in-europe.html>

The Scale of the Migrant Crisis, From 160 to Millions



Squares show the relative sizes of the numbers and are not meant to convey that they are parts of a whole.

Volume

Volume

How much 3-D space



Yau 2013

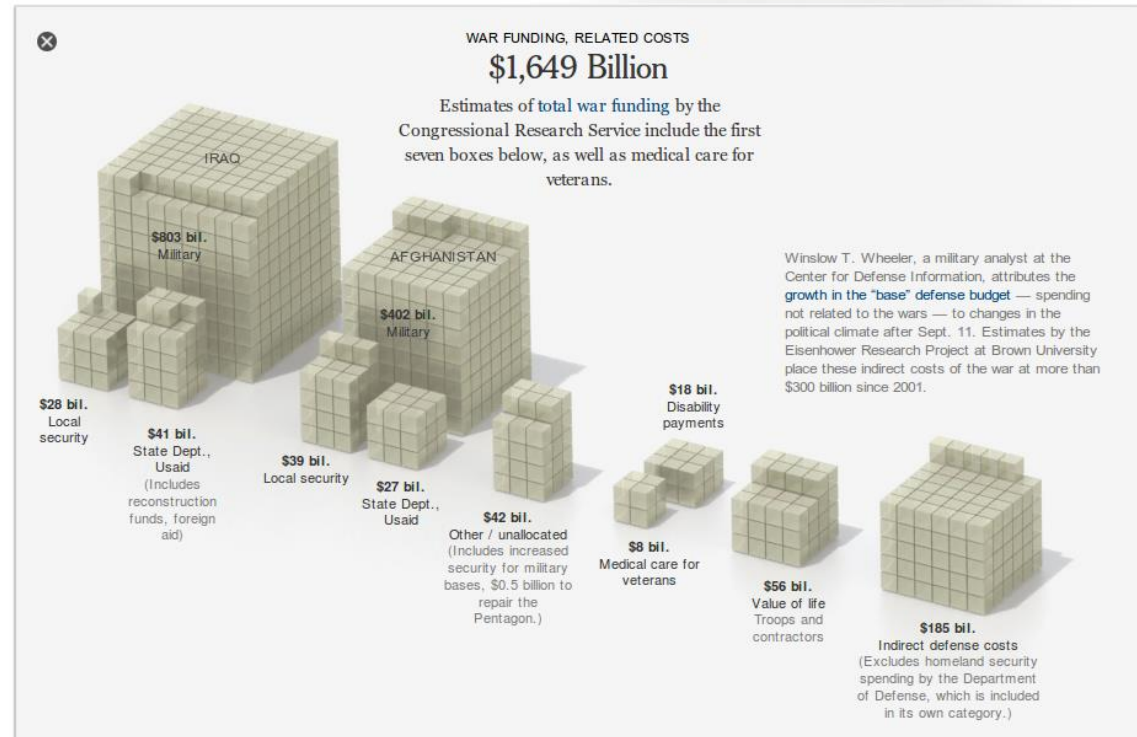
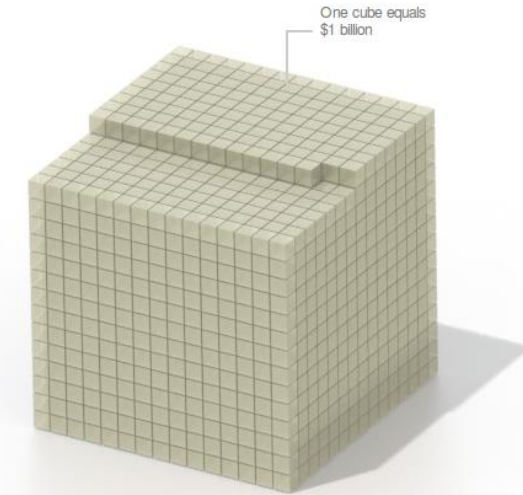
<https://archive.nytimes.com/screenshots/www.nytimes.com/interactive/2011/09/08/us/sept-11-reckoning/cost-graphic.jpg>

One 9/11 Tally: \$3.3 Trillion

By SHAN CARTER and AMANDA COX Published: September 8, 2011

Al Qaeda spent roughly half a million dollars to destroy the World Trade Center and cripple the Pentagon. What has been the cost to the United States? In a survey of estimates by The New York Times, the answer is \$3.3 trillion, or about \$7 million for every dollar Al Qaeda spent planning and executing the attacks. While not all of the costs have been borne by the government — and some are still to come — this total equals one-fifth of the current national debt. All figures are shown in today's dollars.

RELATED ARTICLE: [The Price of Lost Chances](#) »



Color: Hue & Saturation

Color hue

Usually referred to as color



Color saturation

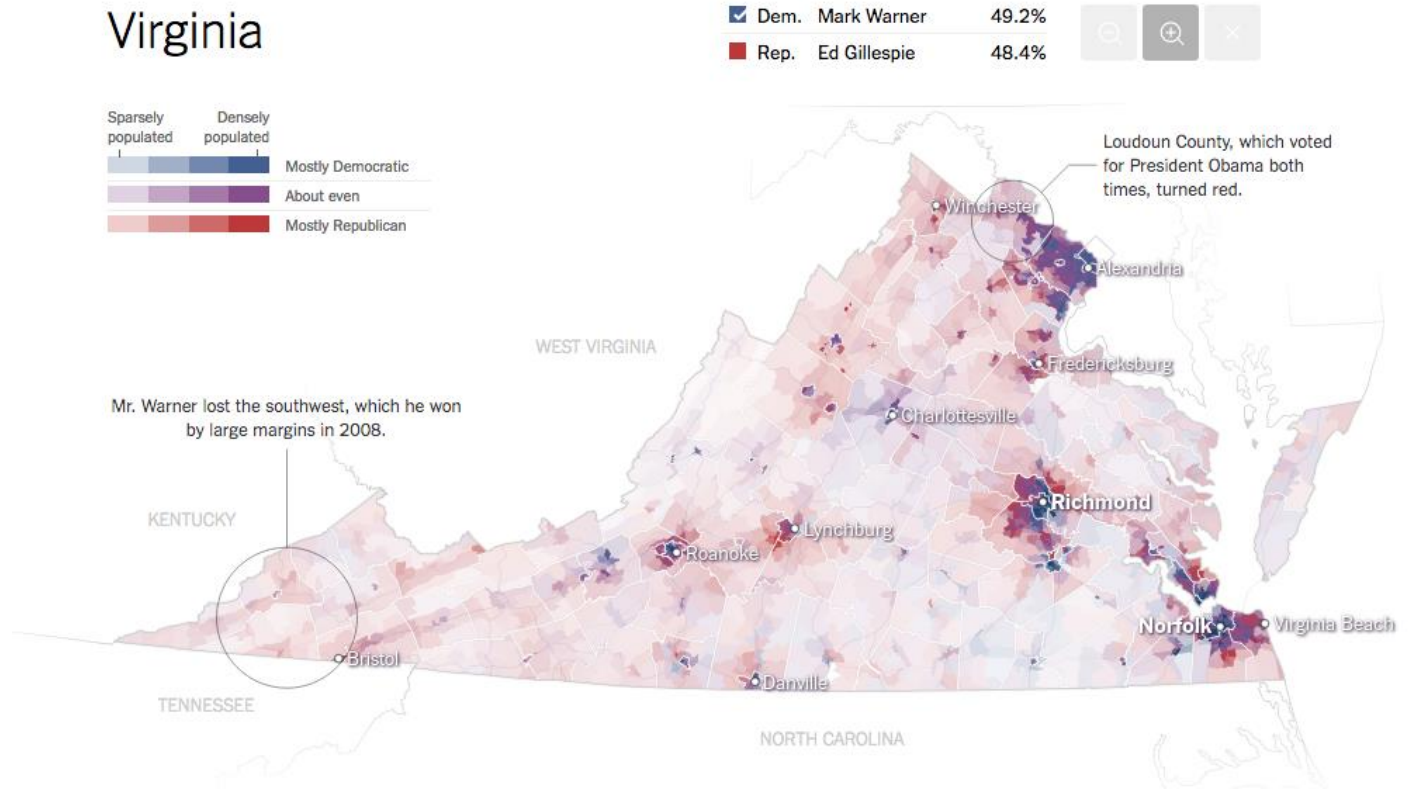
Intensity of a color hue



Yau 2013

The Most Detailed Maps You'll See From the Midterm Elections*

By Amanda Cox, Mike Bostock, Derek Watkins, and Shan Carter Nov. 6, 2014 04:03 PM



<https://www.nytimes.com/interactive/2014/11/04/upshot/senate-maps.html>

Chart Types

- <https://datavizcatalogue.com/>
- <http://rethinkingvis.com/#all>

Perception Ranking

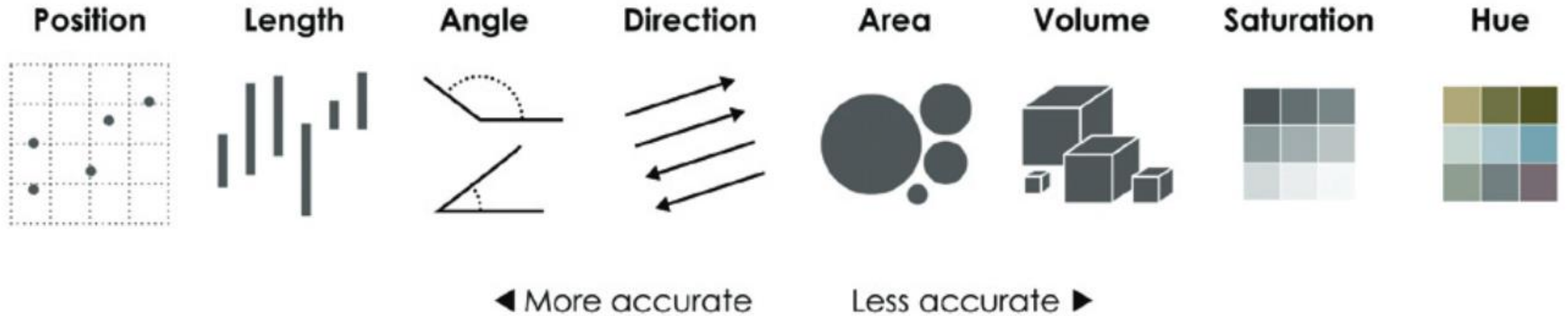
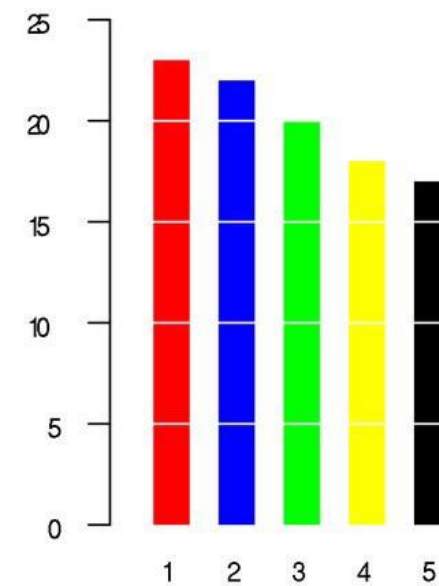
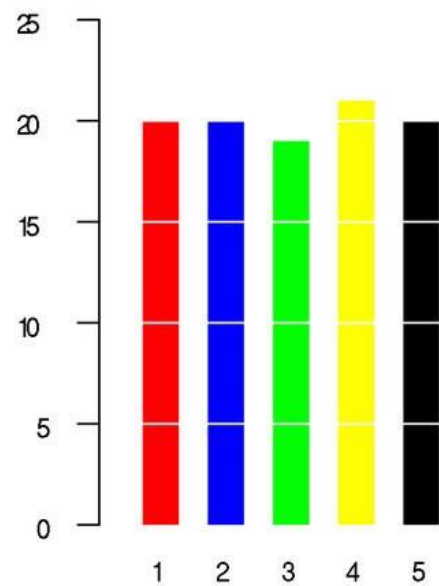
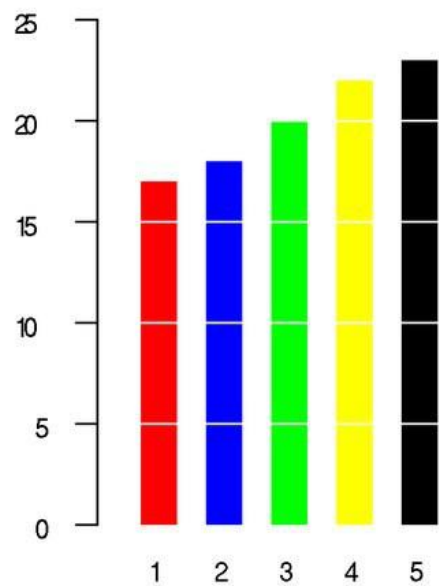
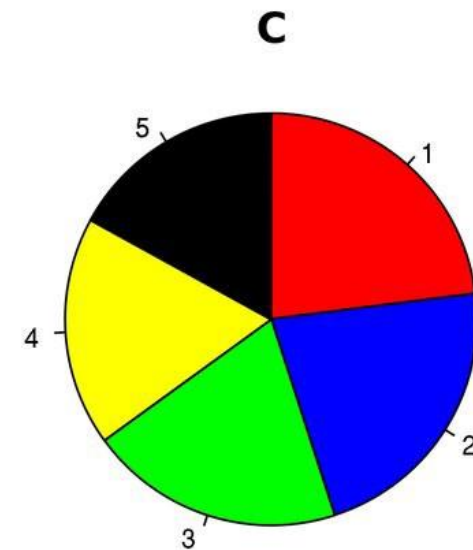
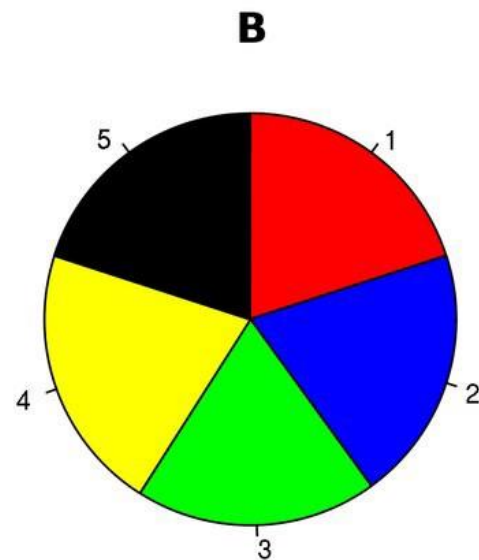
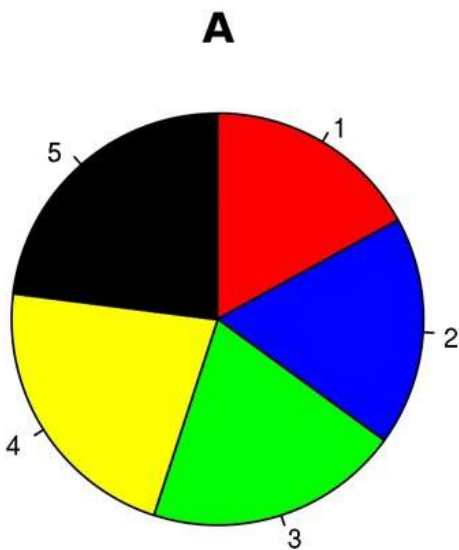


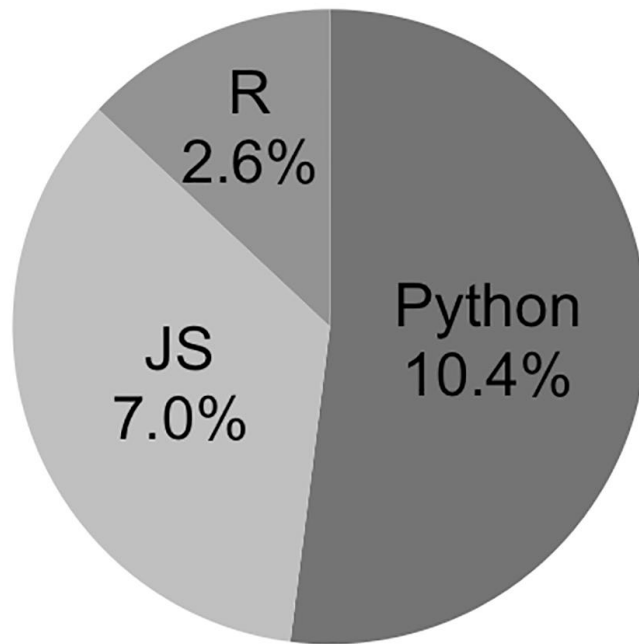
FIGURE 3-12 *Visual cues ranked by Cleveland and McGill*

Pie Chart vs. Bar Chart

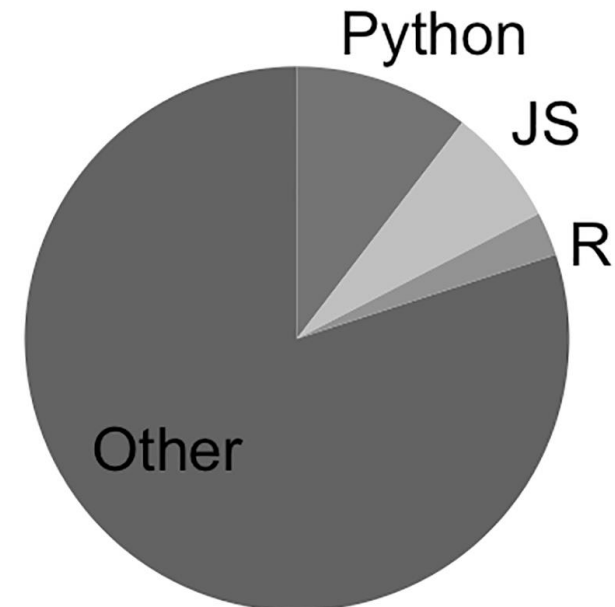


More on Pie Charts

Google tutorial searches



Google tutorial searches



Scales – Logarithmic

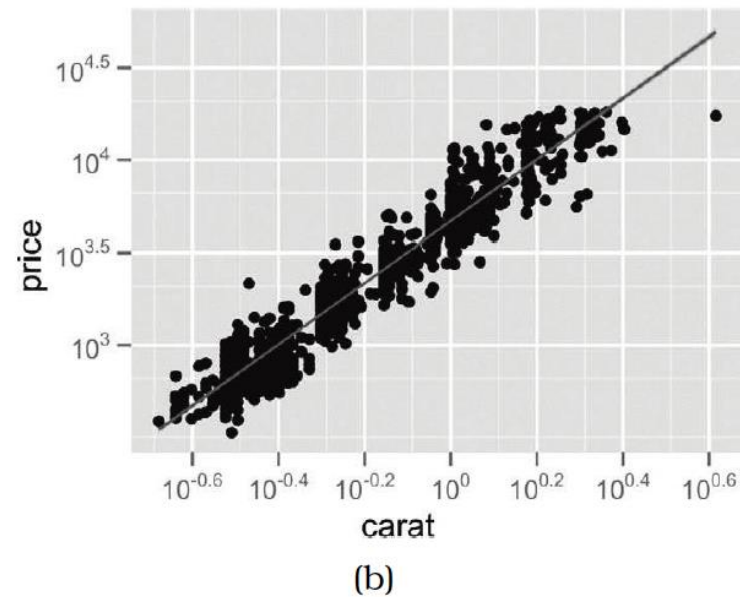
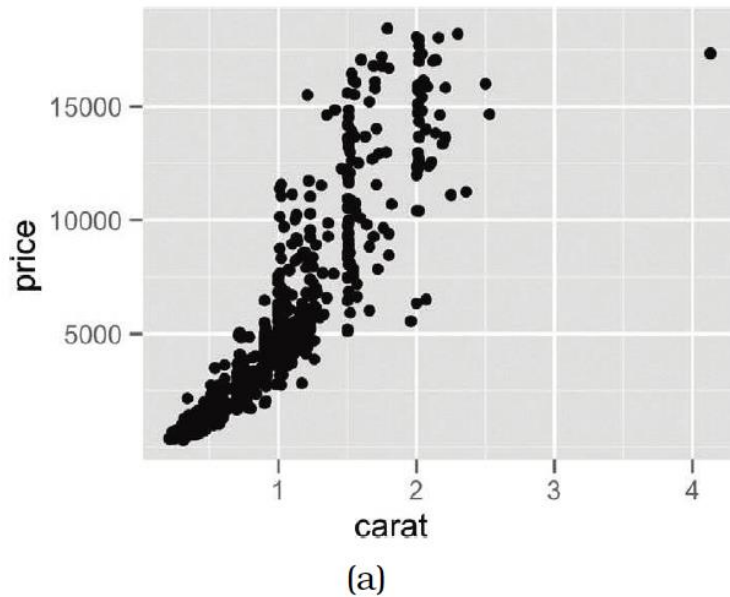


Figure 7.3. Scatterplots. (a) Original diamond price/carat data. (b) Derived log-scale attributes are highly positively correlated. From [Wickham 10, Figure 10].

Bins and Breaks

Bins: the
number of
categories

Breaks: How
those categories
are split up

Bins

- 3 line widths
- 3 areas

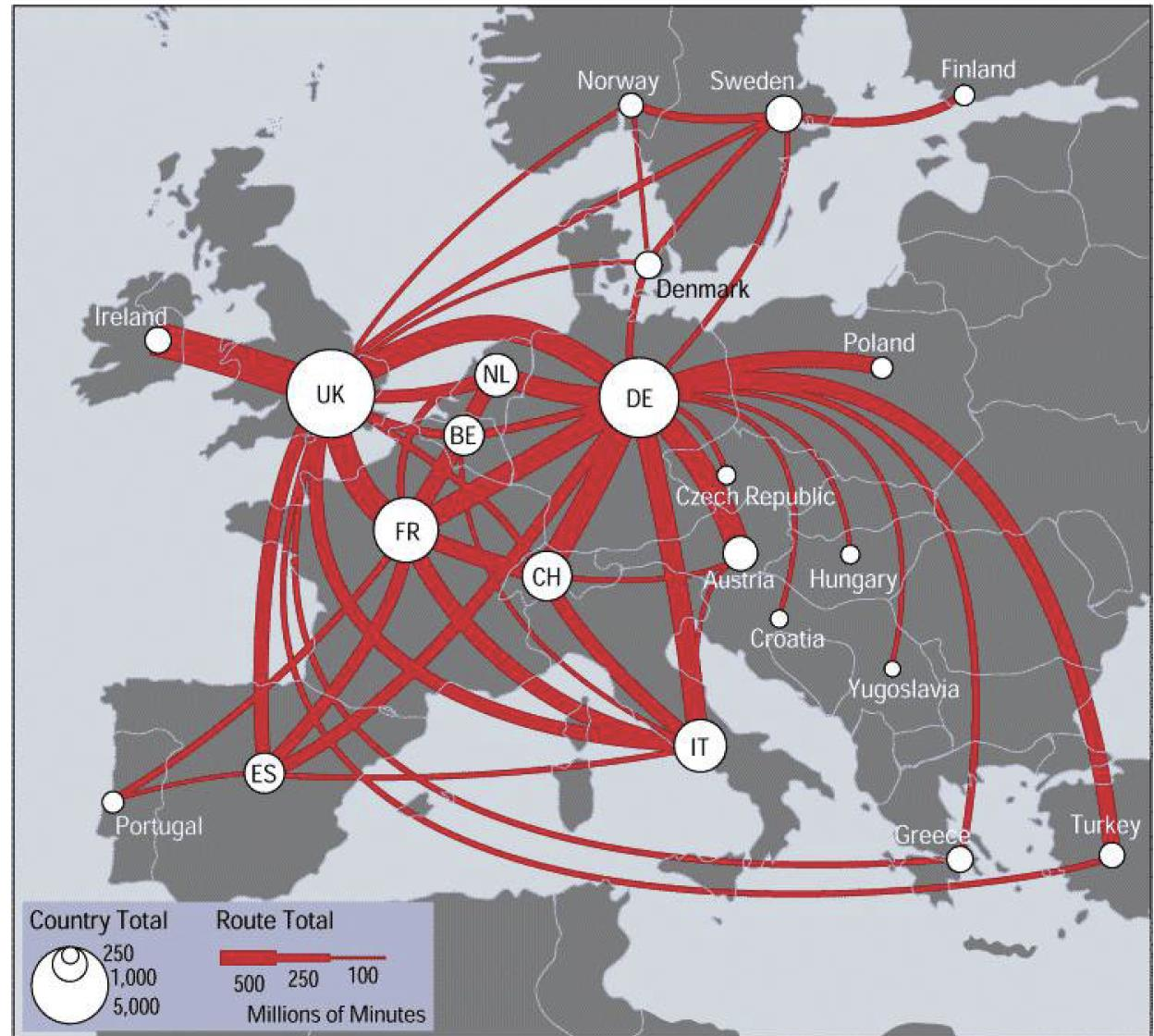
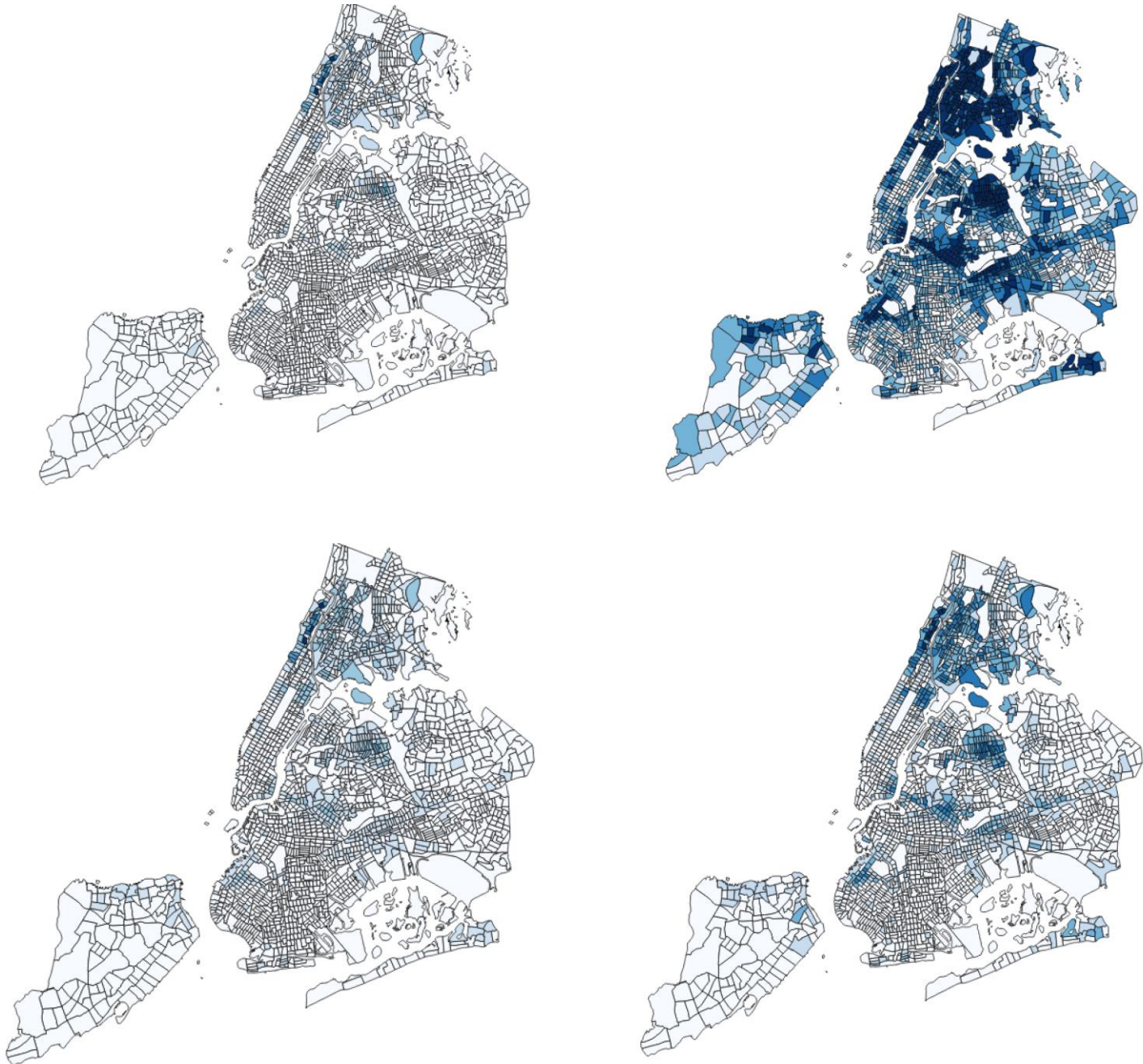


Figure 5.9. Linewidth has a limited number of discriminable bins.

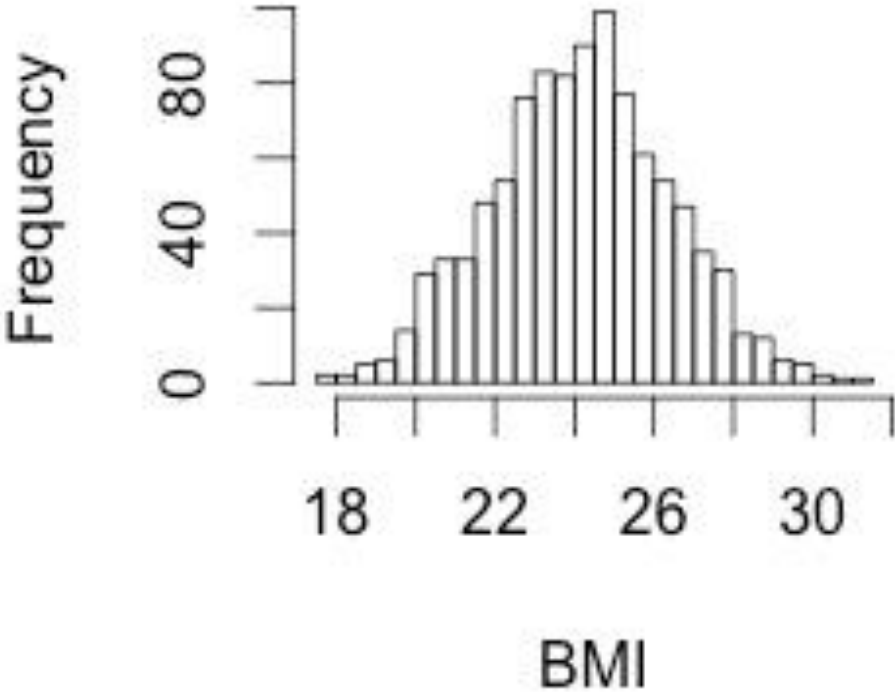
Breaks

- Equal Intervals
- Quantiles
- Standard Deviation
- Jenks

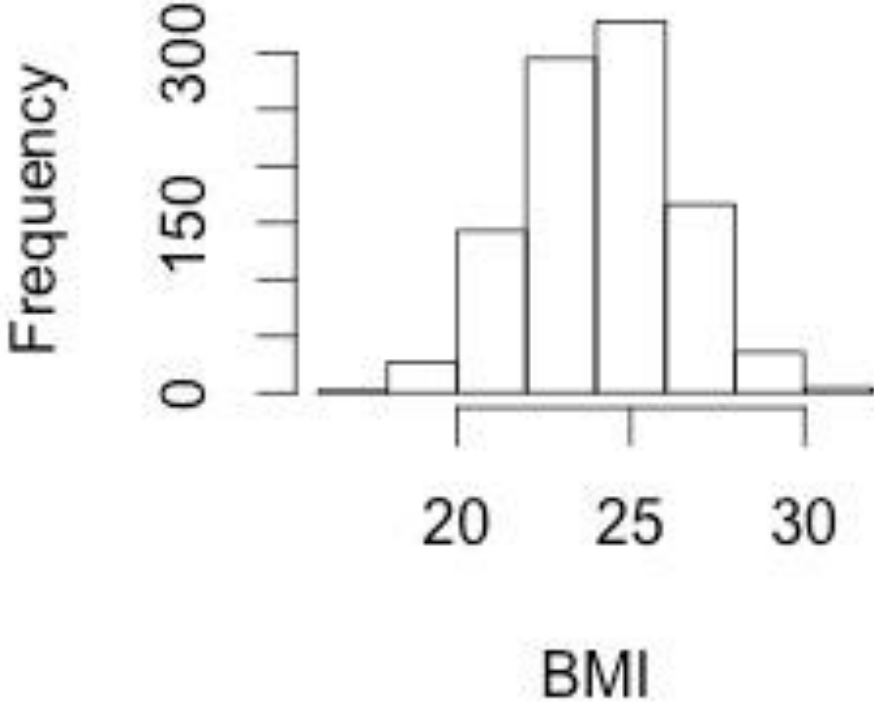


Bins & Breaks

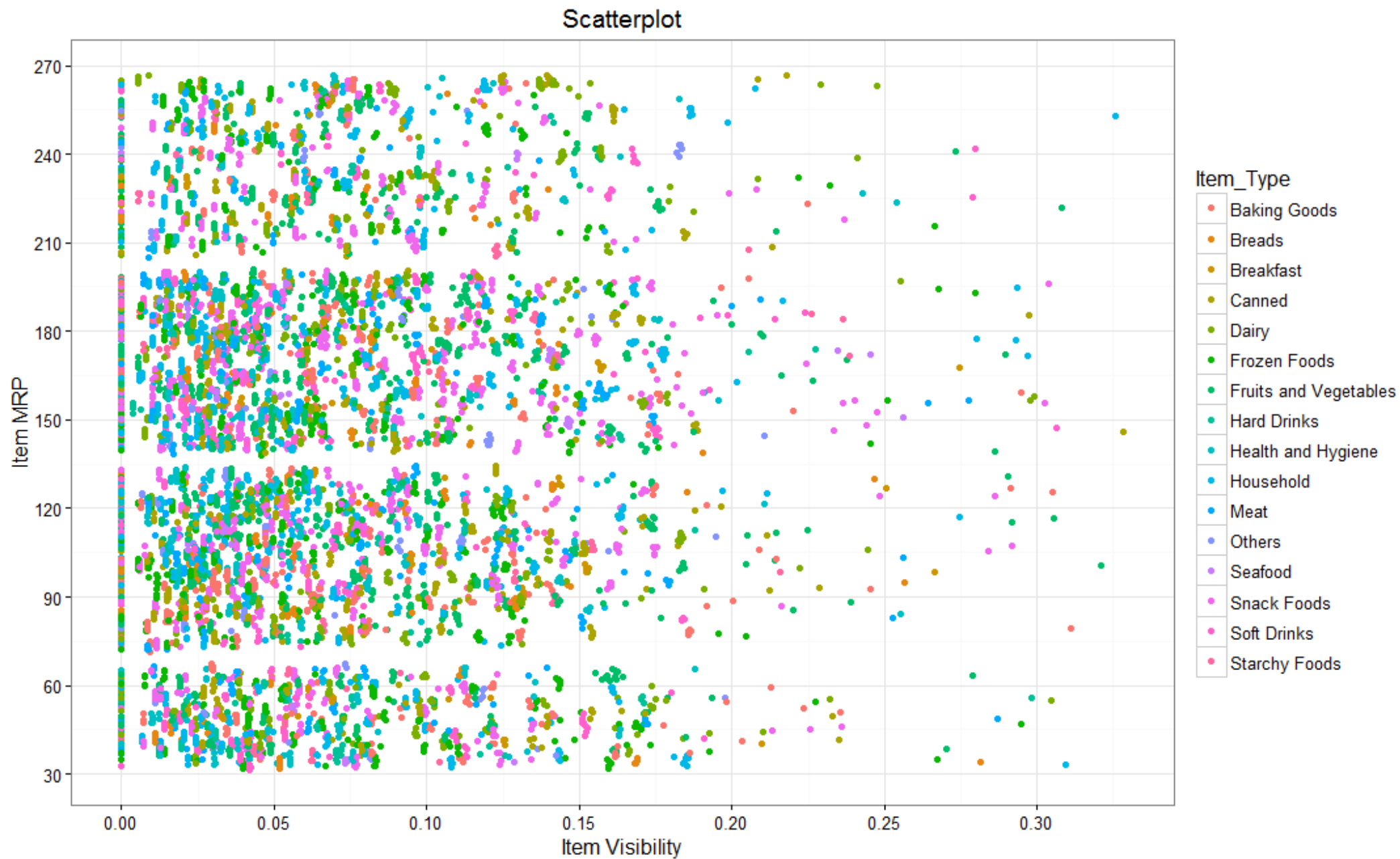
Breaks=20



Breaks=5



Bins & Breaks



Bins & Breaks: Small Multiples

