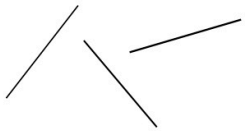
Data visualization: basic principles

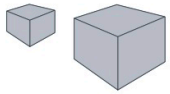
Length

Slope



Color hue

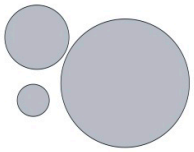
Volume



Angle

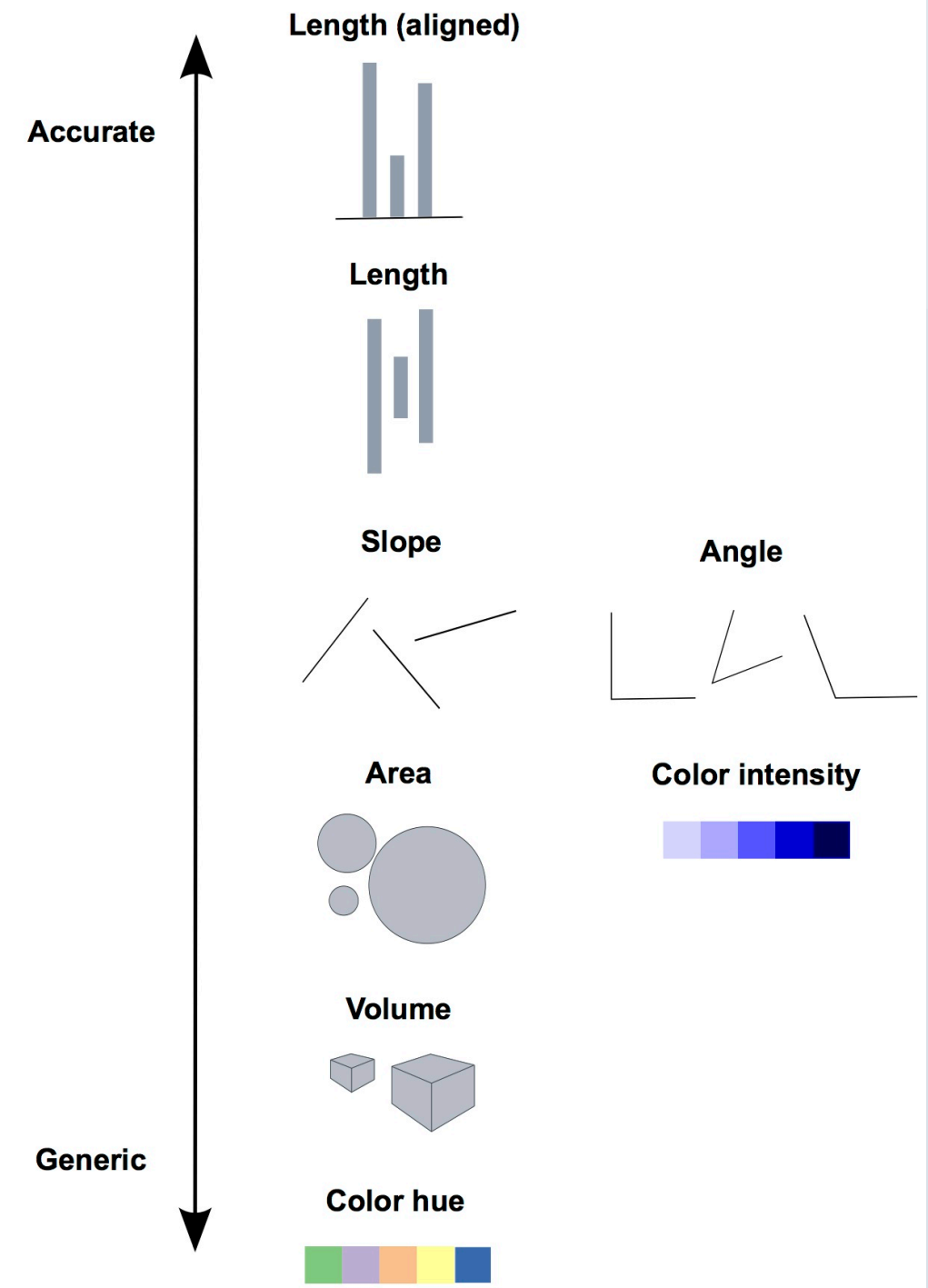
Length (aligned)

Area



Color intensity

Visualization: encoding data by visual cues

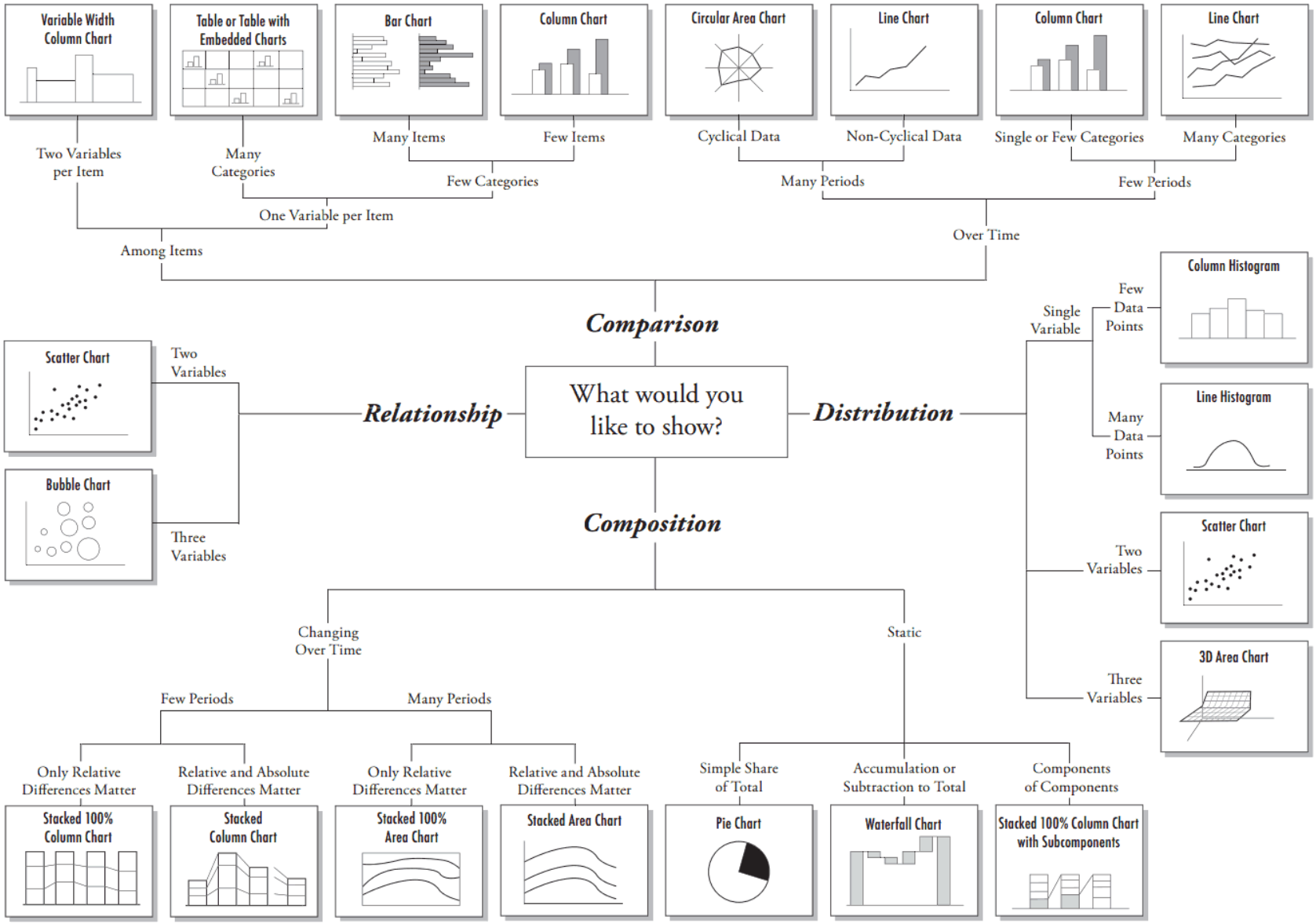


Our brains do not treat those cues equally!

Design for the human brain!

What type of chart should I use?

Chart Suggestions—A Thought-Starter



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Distribution

Relationship

Comparison

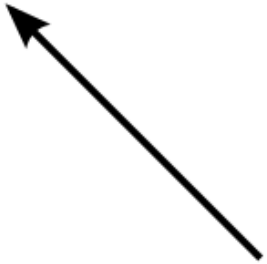
What do you want to show?

Connection

Composition
(parts of the whole)

Location

Distribution Relationship Comparison



What do you want to show?

Connection

Composition
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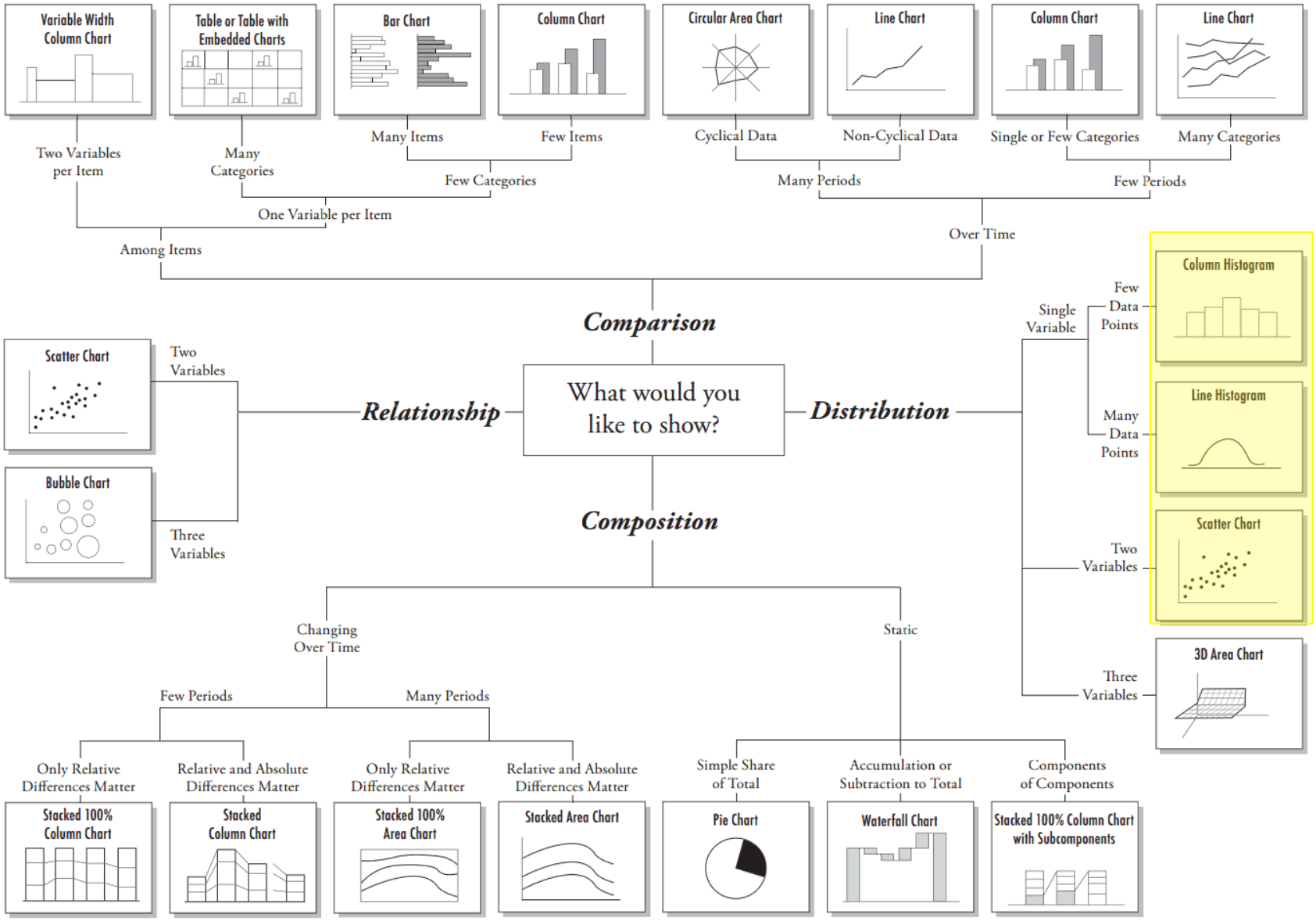
Location

Chart Suggestions—A Thought-Starter



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Consider the distribution

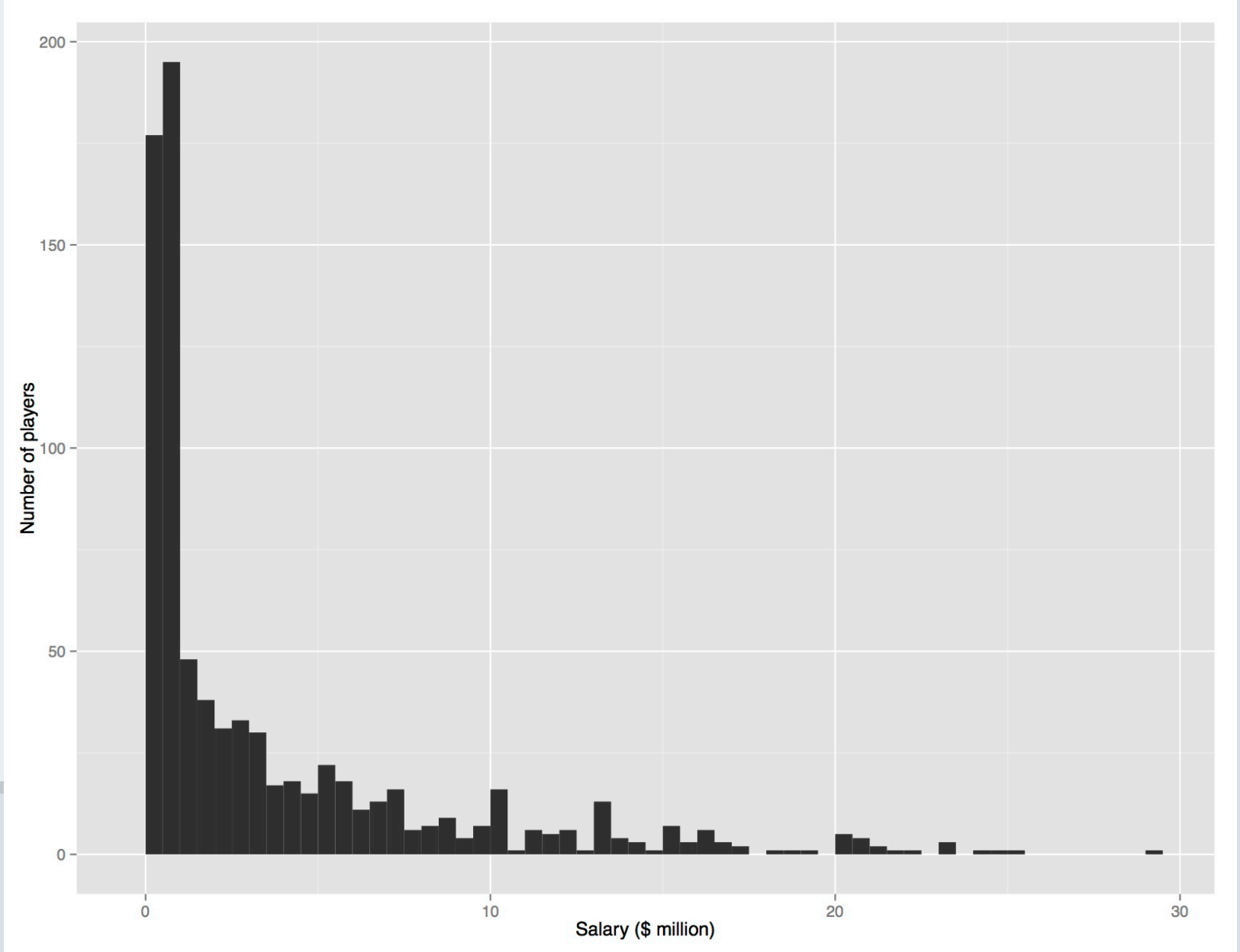

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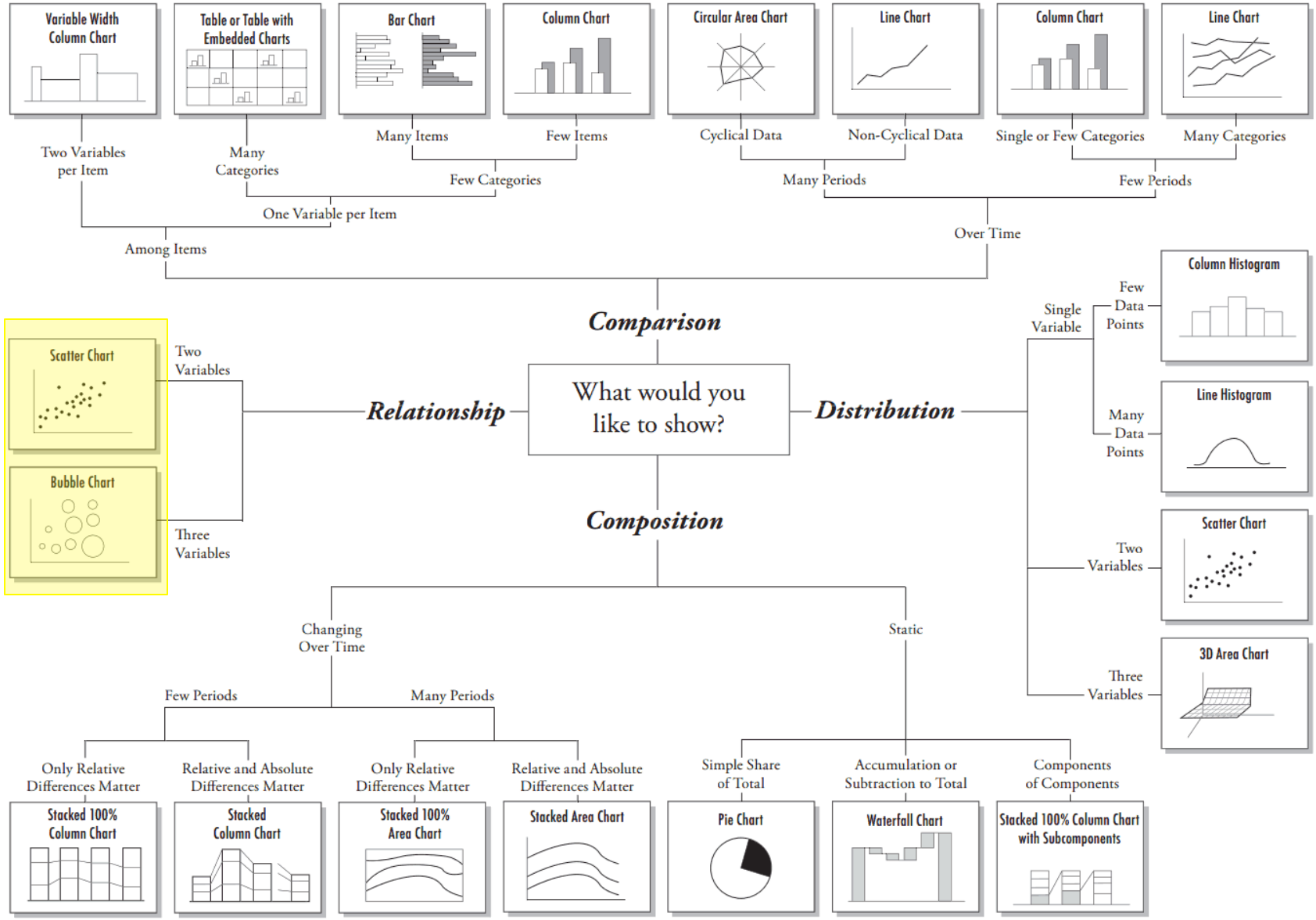
Chart Suggestions—A Thought-Starter



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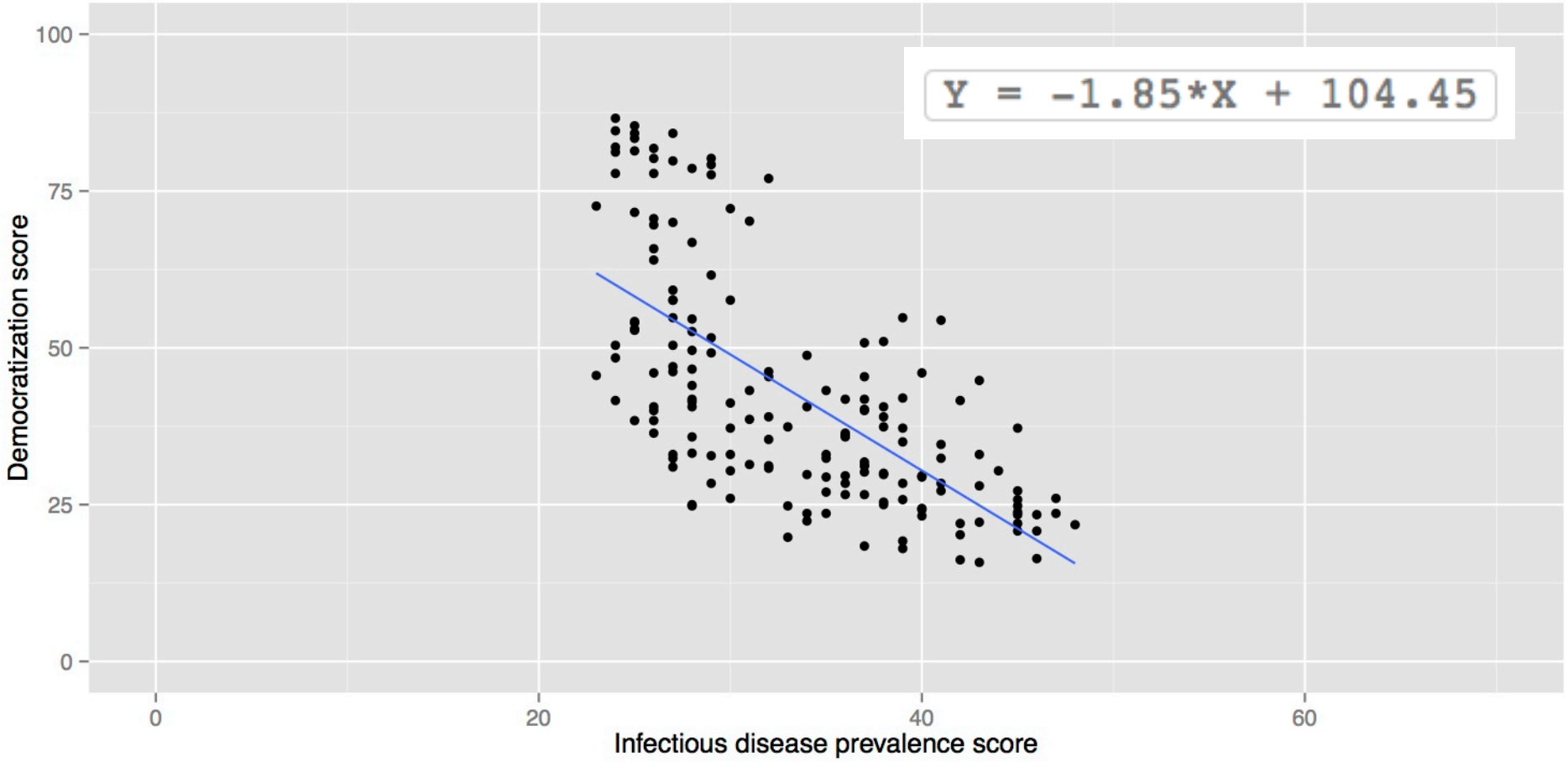
Relationships between variables: scatter plots and trend lines



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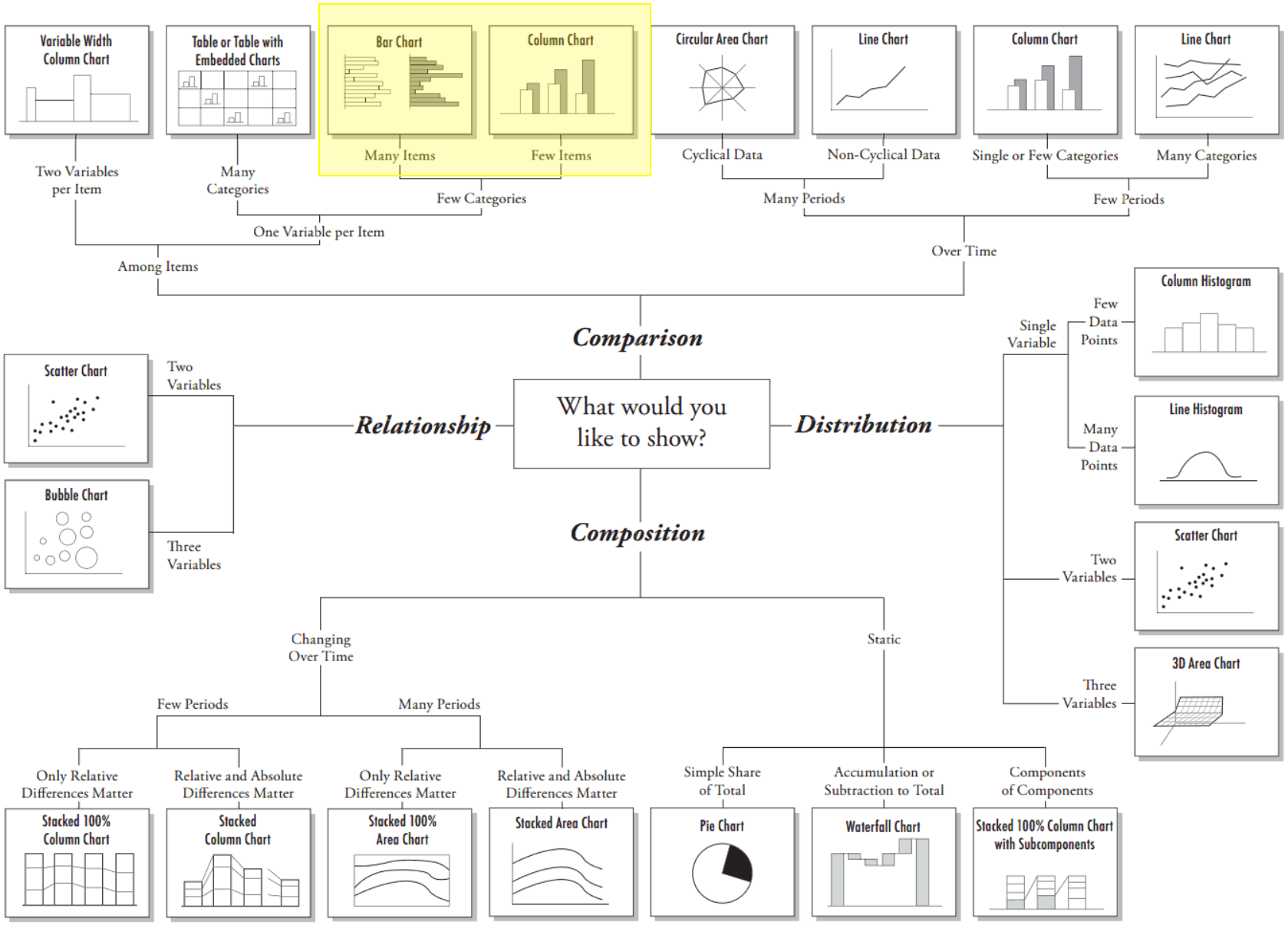

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Simple comparisons: bars and columns

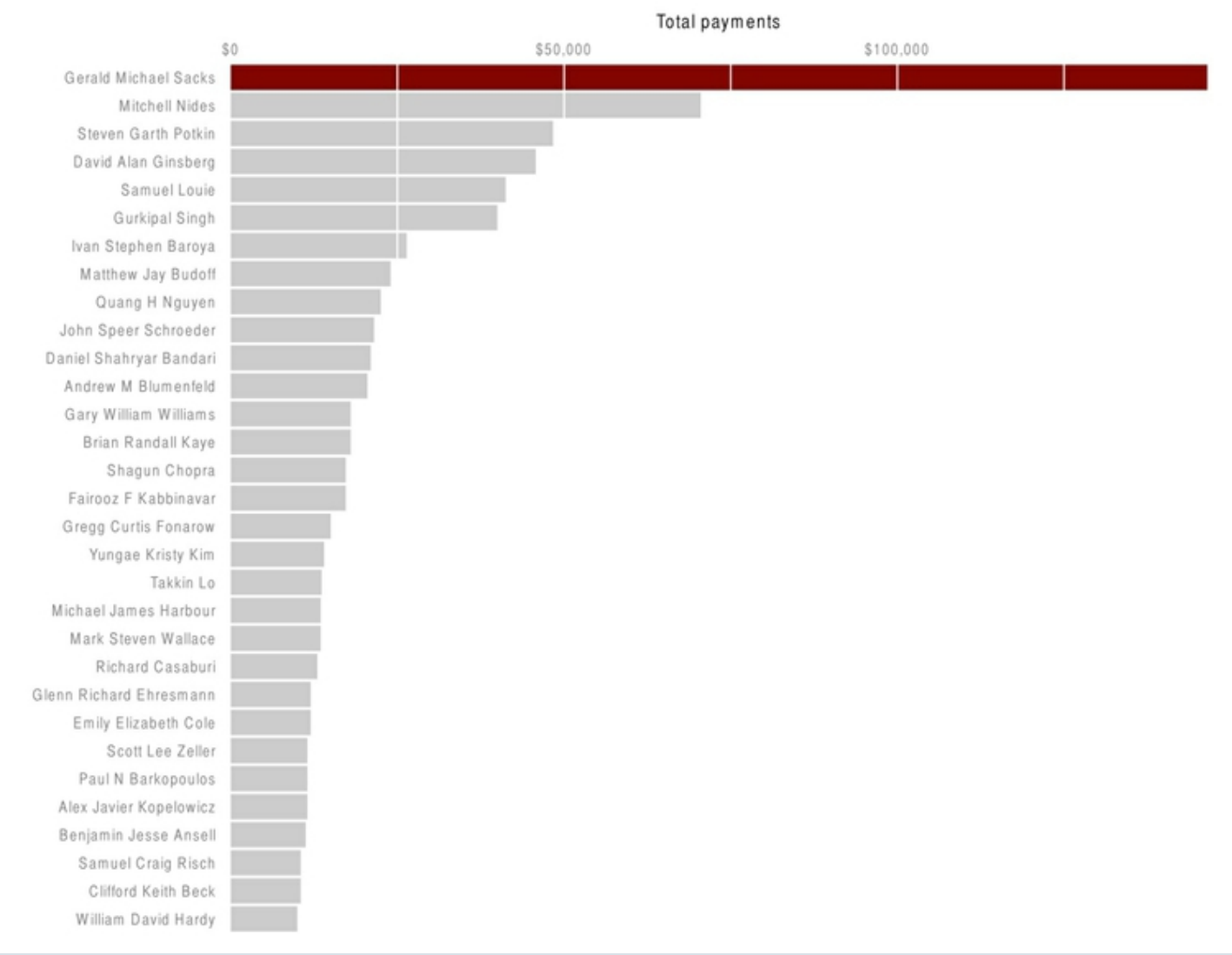
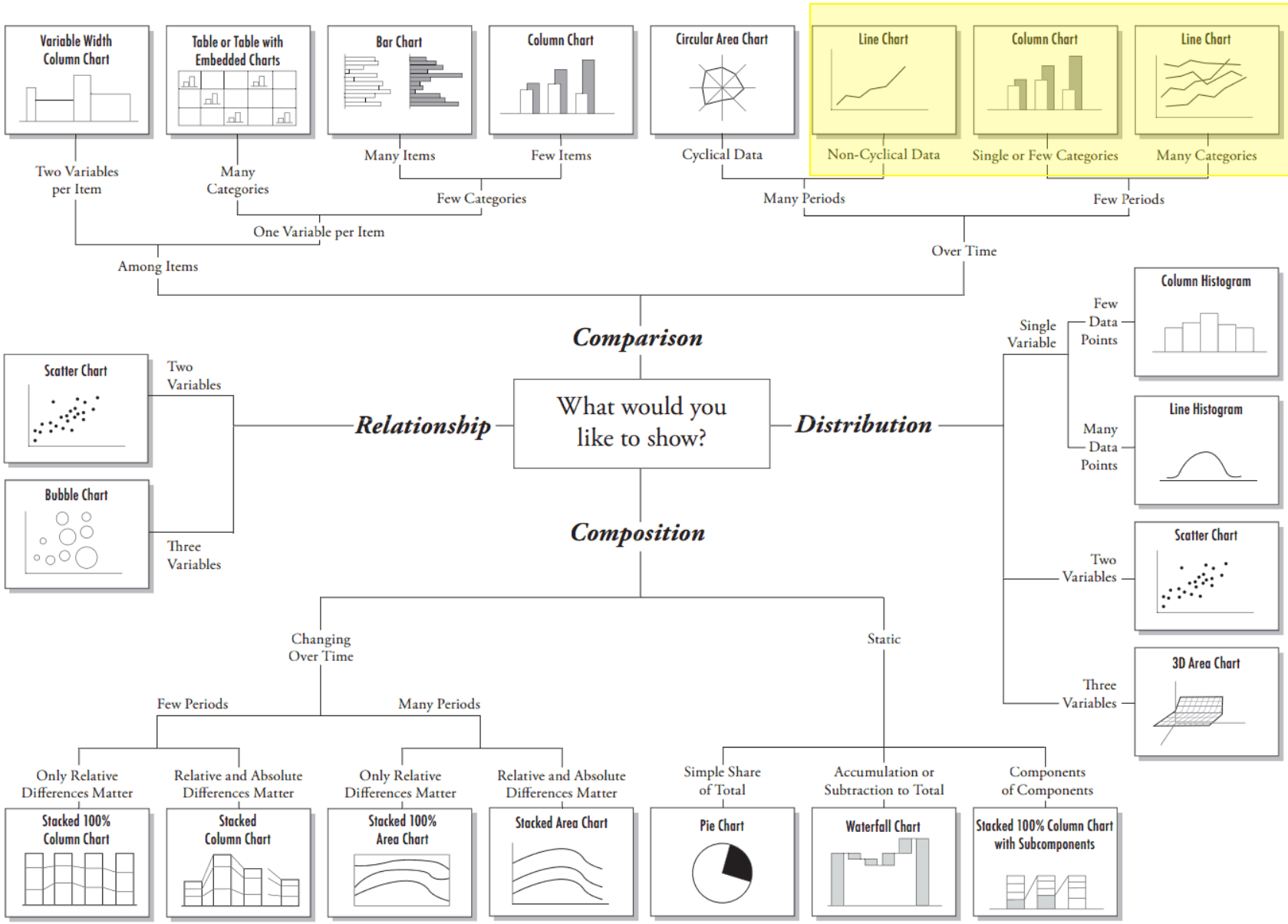


Chart Suggestions—A Thought-Starter



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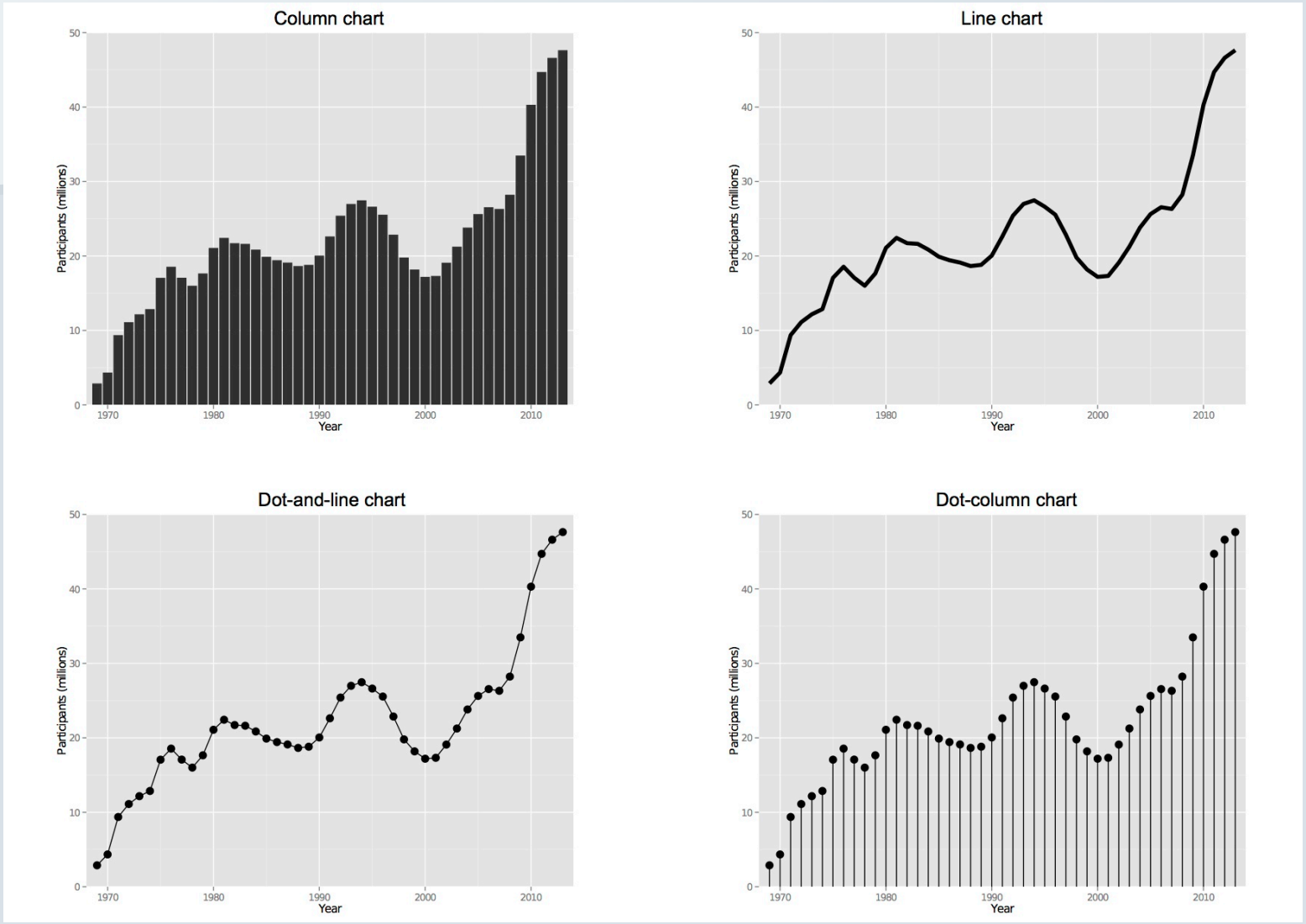
Comparisons: change over time



Distribution

Relationship

Comparison

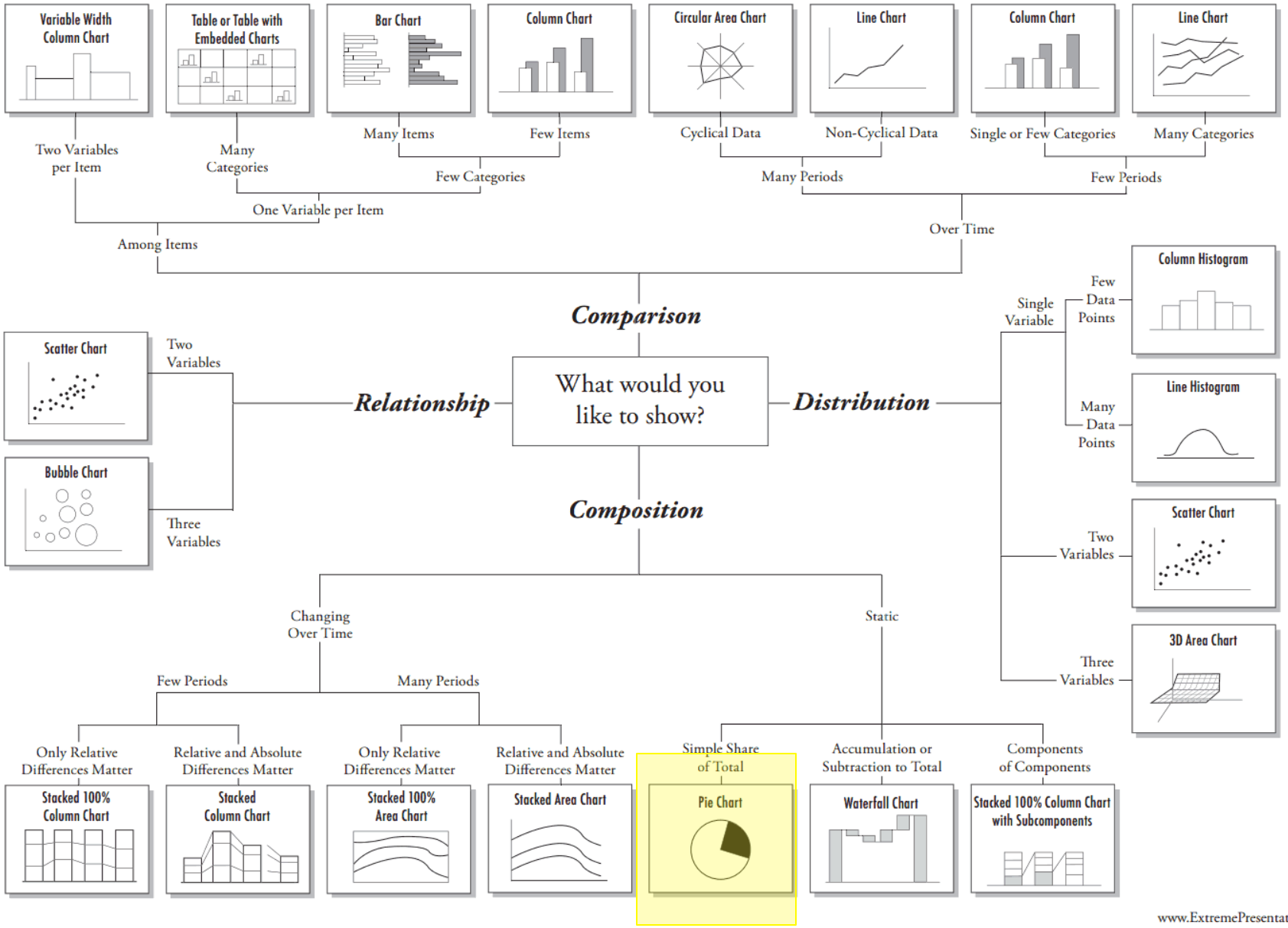
What do you want to show?

Connection

Composition
(parts of the whole)

Location

Chart Suggestions—A Thought-Starter



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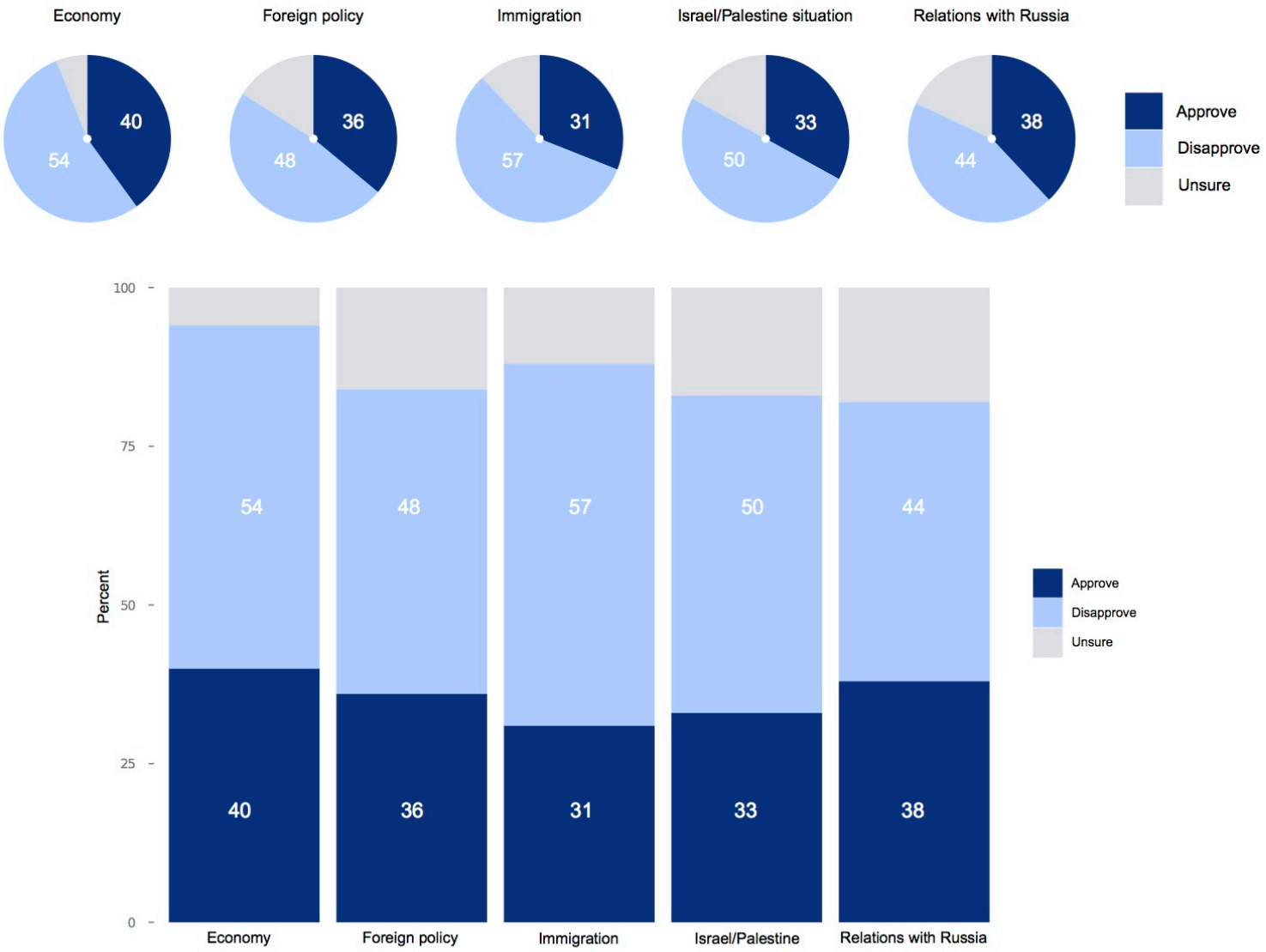
Composition: parts of the whole



Composition: parts of the whole

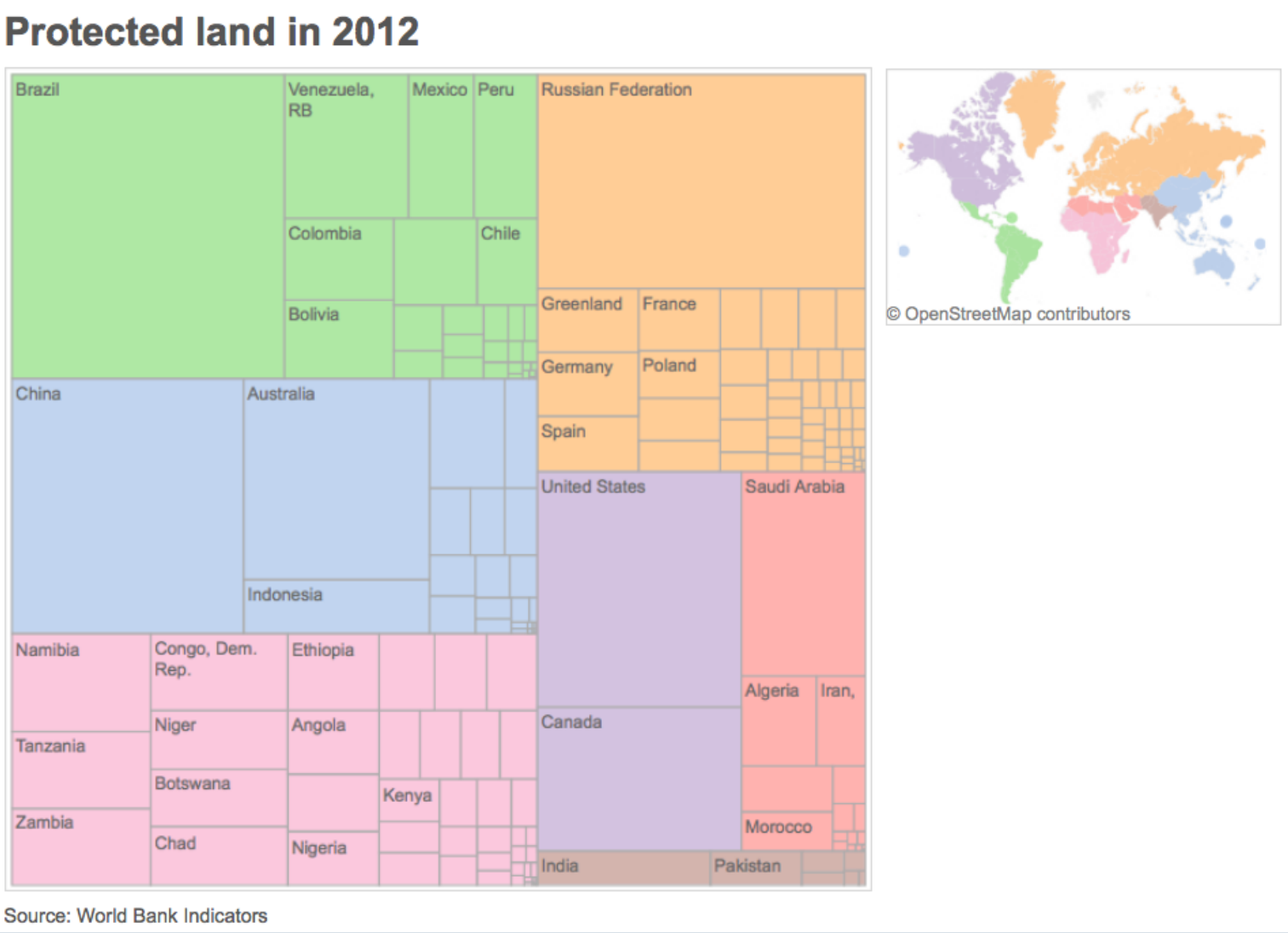
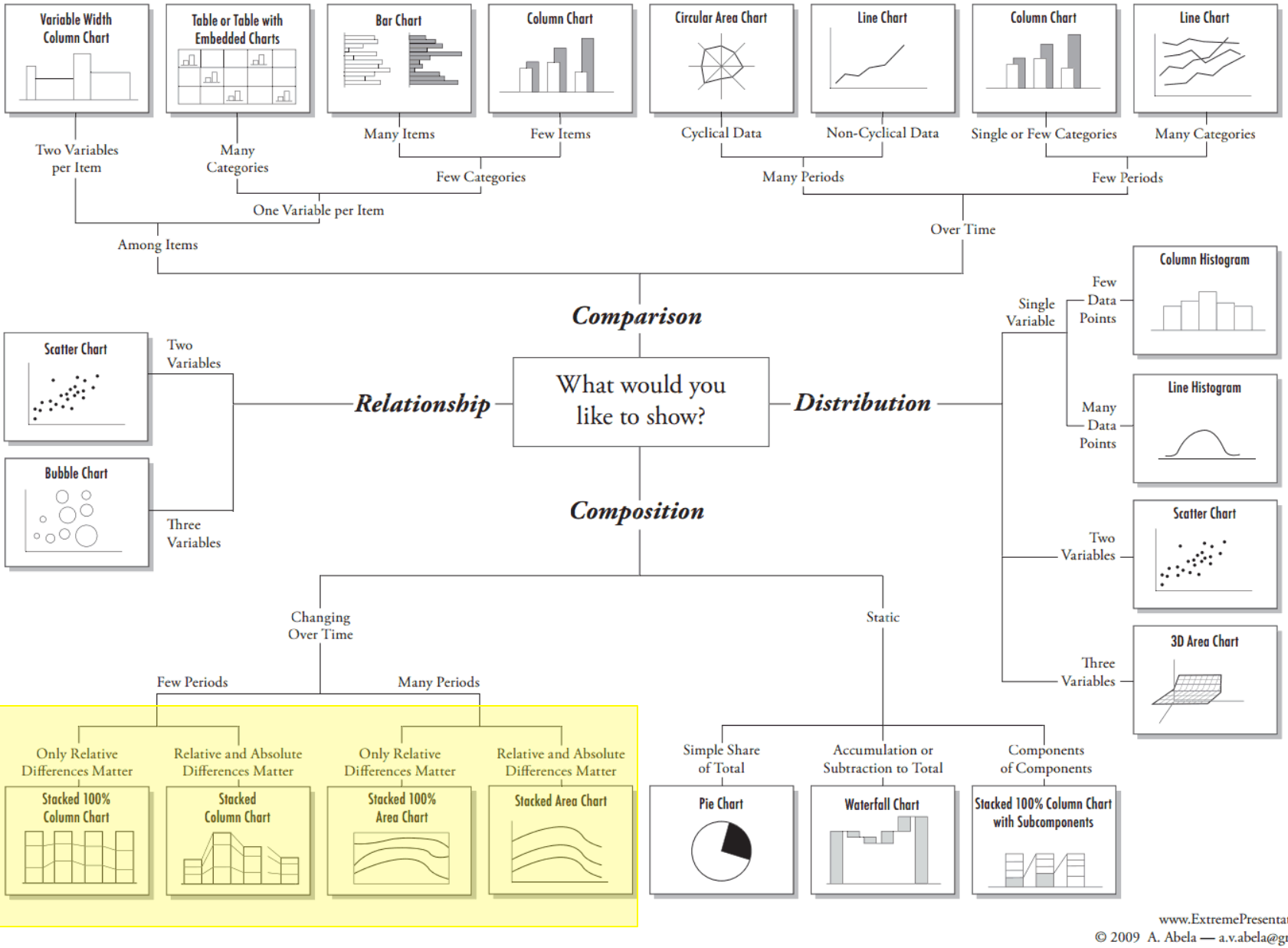


Chart Suggestions—A Thought-Starter



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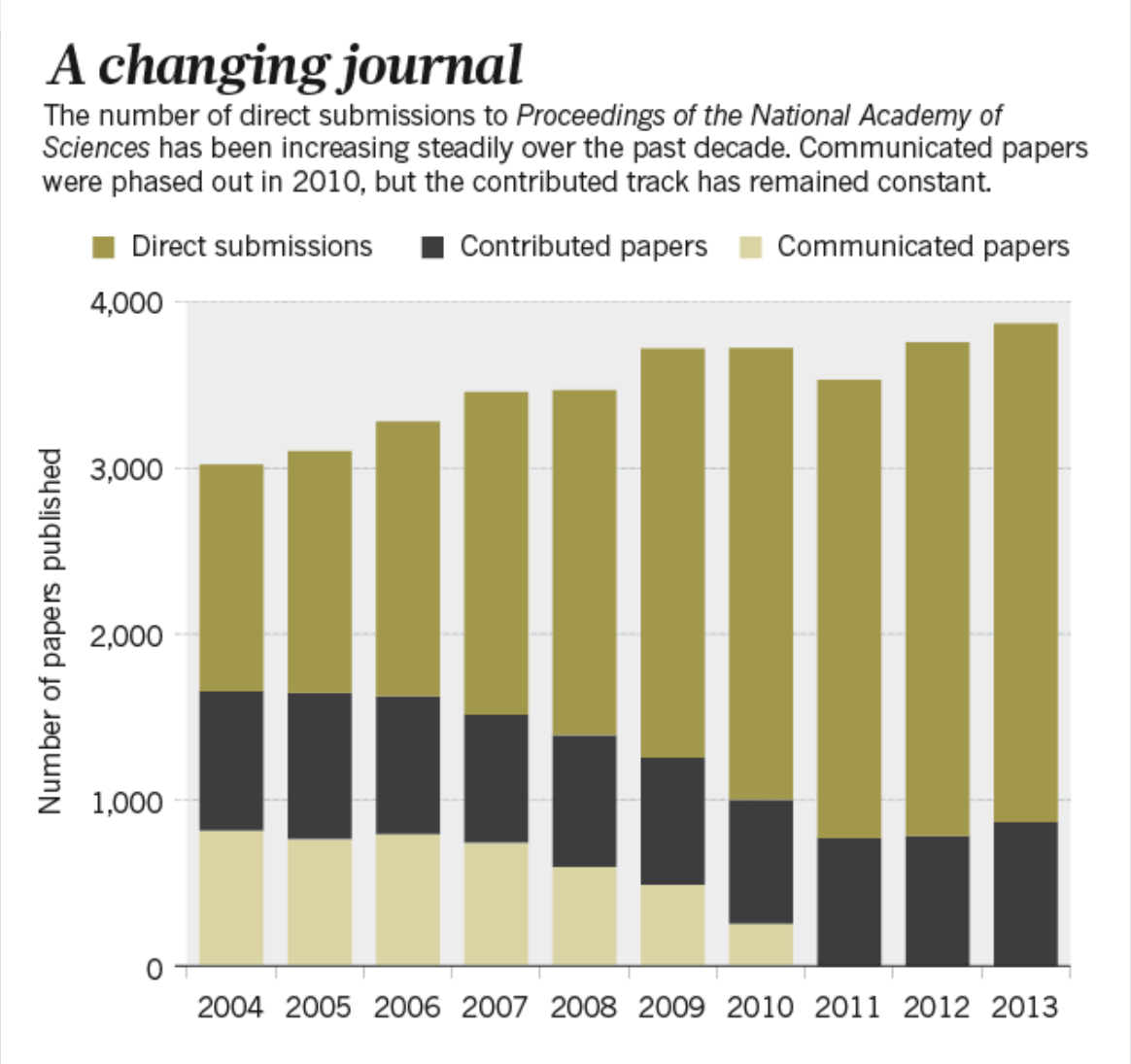
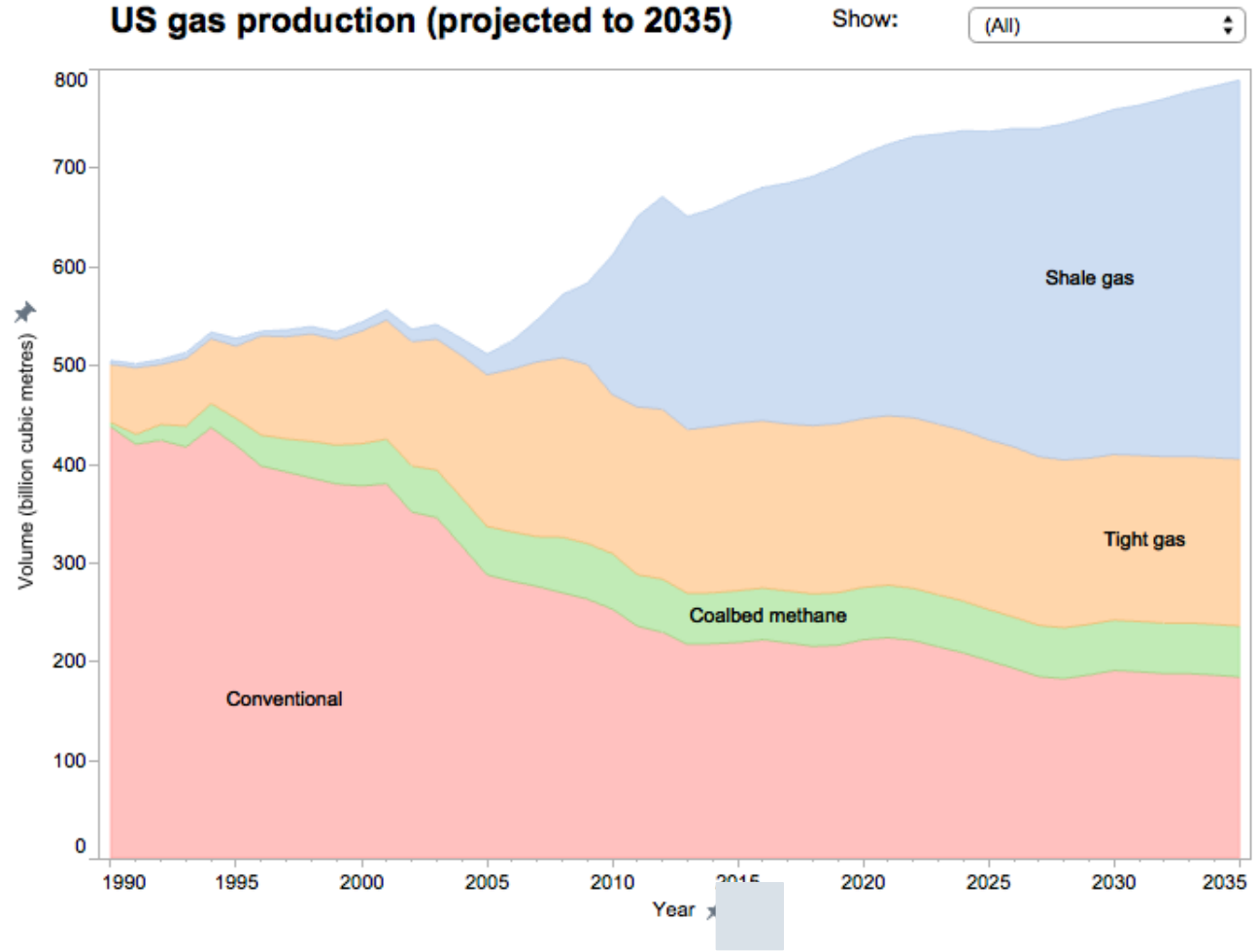
Composition: change over time



Composition: change over time



Distribution

Relationship

Comparison

What do you want to show?

Connection

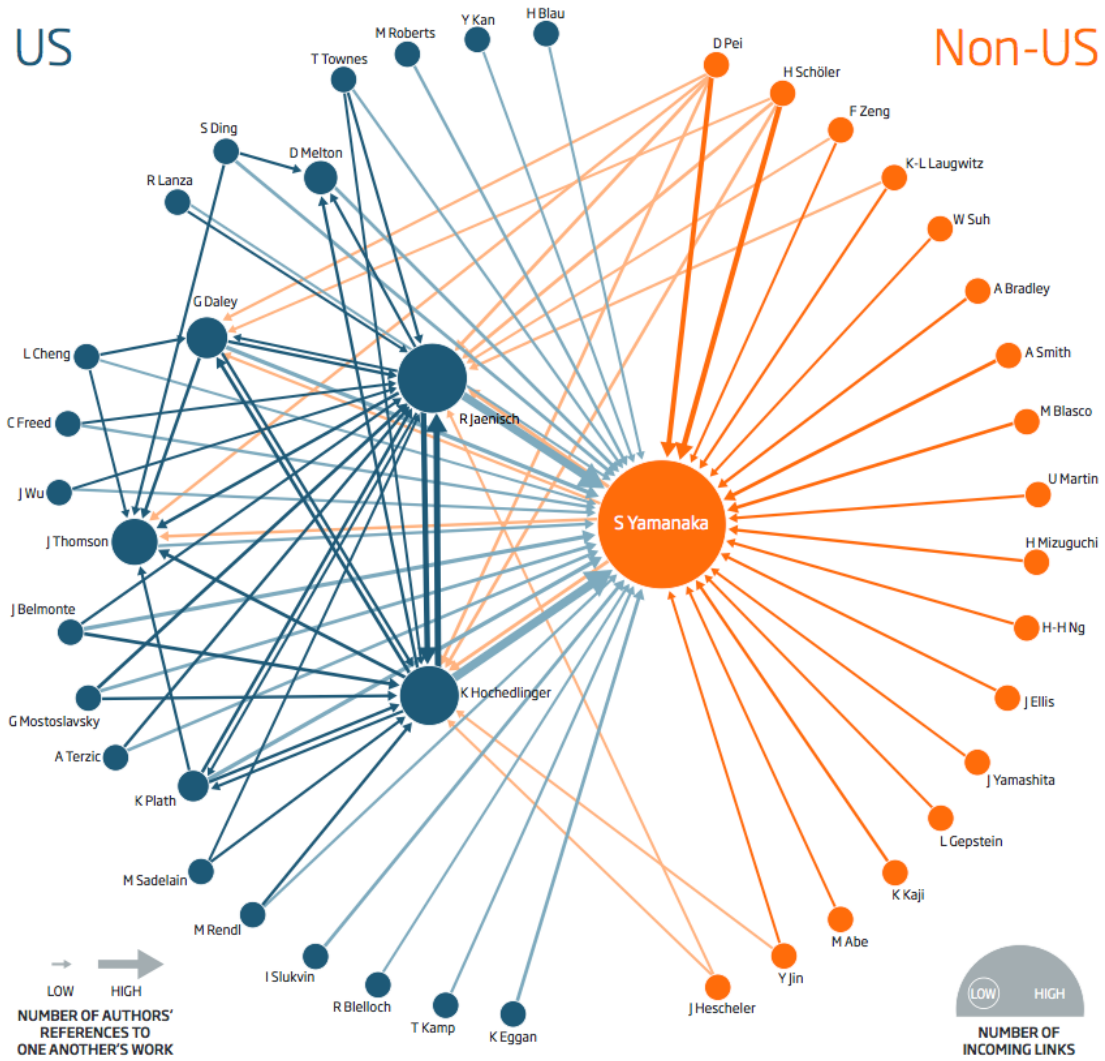
Composition
(parts of the whole)

Location

THE STEM CELL WARS

When a Nobel prize is up for grabs, do scientists across the globe compete on a level playing field? **Peter Aldhous** investigates

The most influential players in cellular reprogramming are revealed by recording how many times the scientists have referred to each other's work. Each link shows where one researcher cited another four or more times in papers in leading journals (for analysis, see "The strongest link", below right)



Connection: network graphs

Distribution

Relationship

Comparison

What do you want to show?

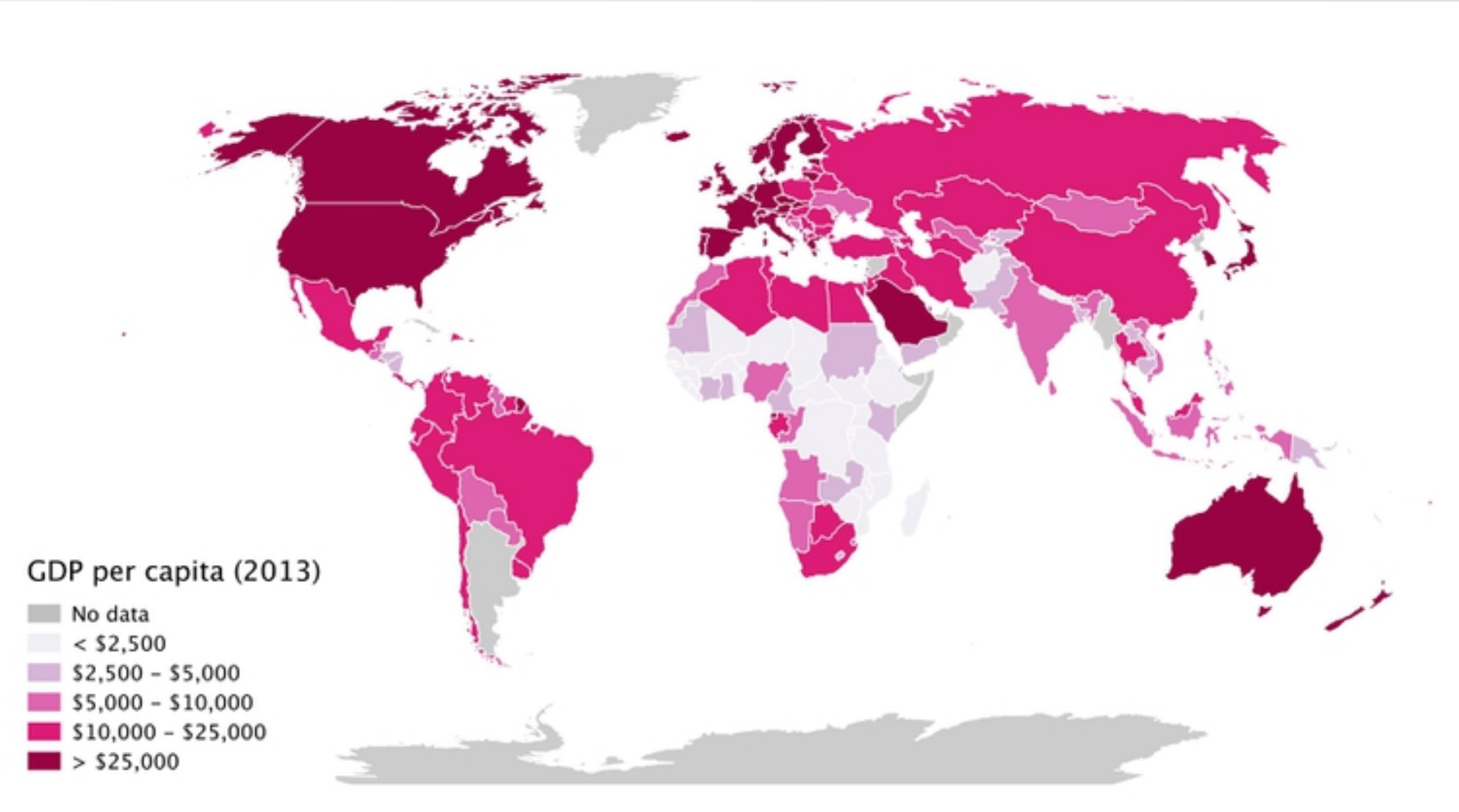
Connection

Composition
(parts of the whole)

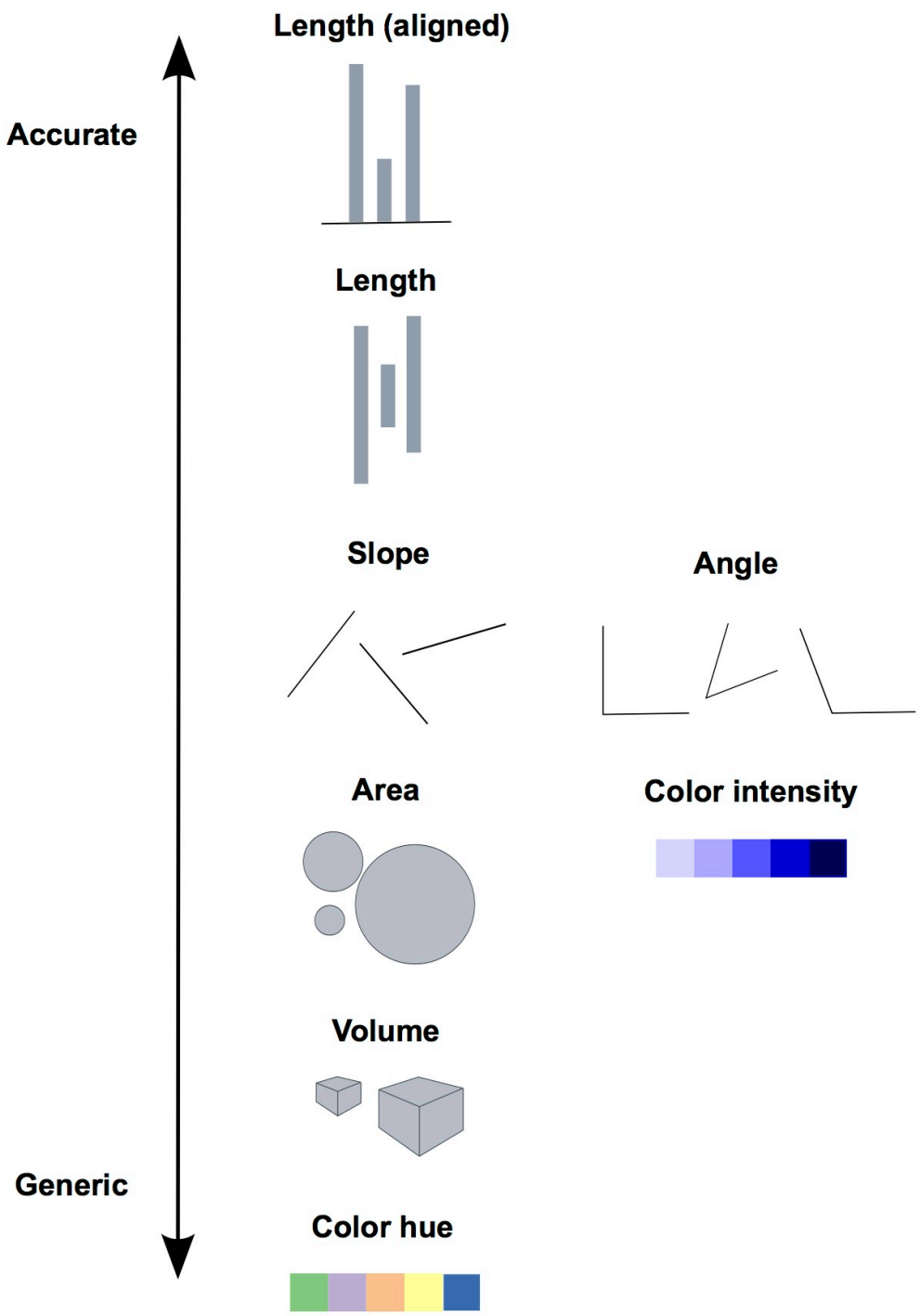
Location

Location plus data: scaled circles

Location plus data: choropleth maps



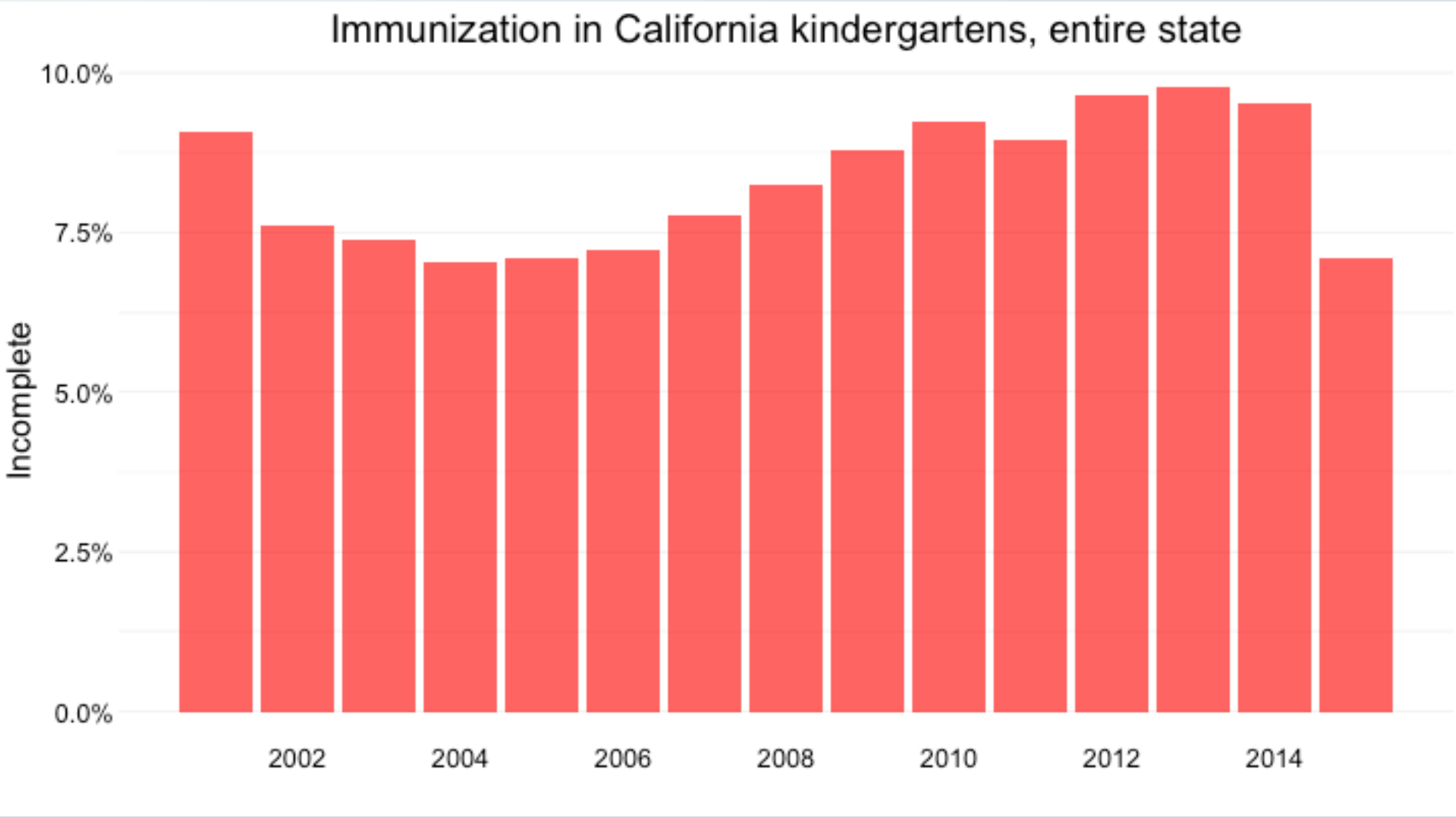
Remember the perceptual hierarchy of visual cues!



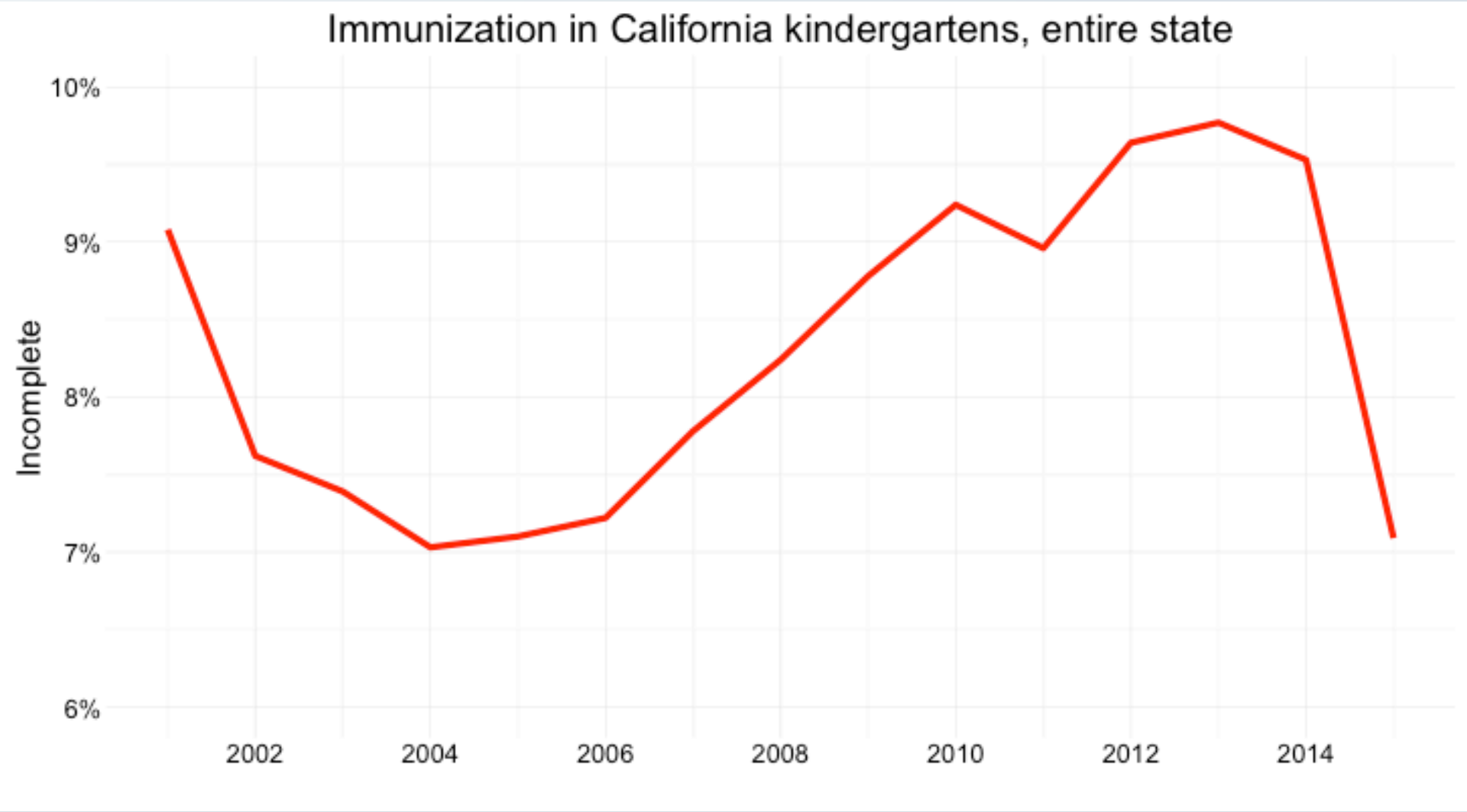
So ask yourself: Is a map the best way to tell the story?

Case study: Immunization in California kindergartens

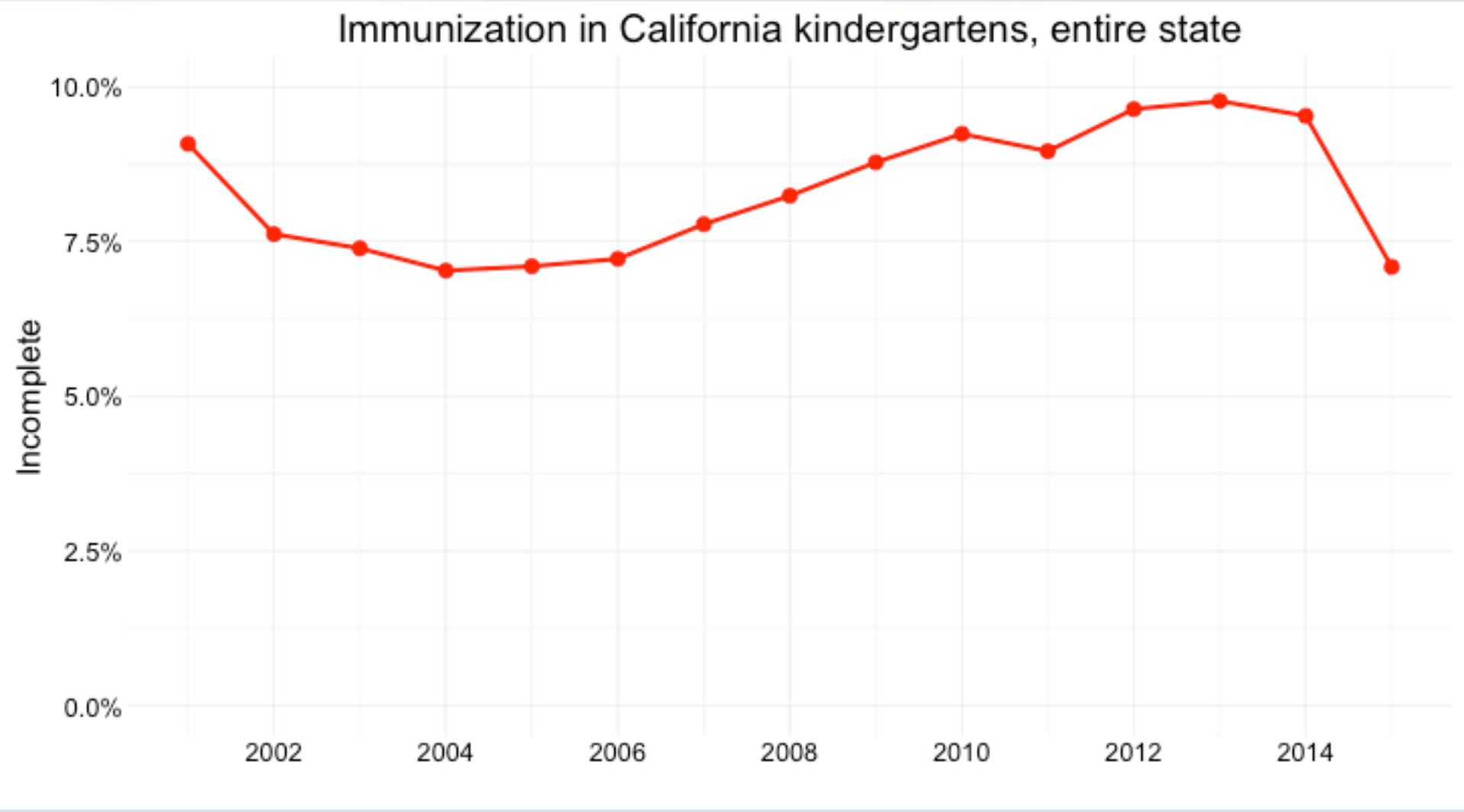
Length on aligned scale



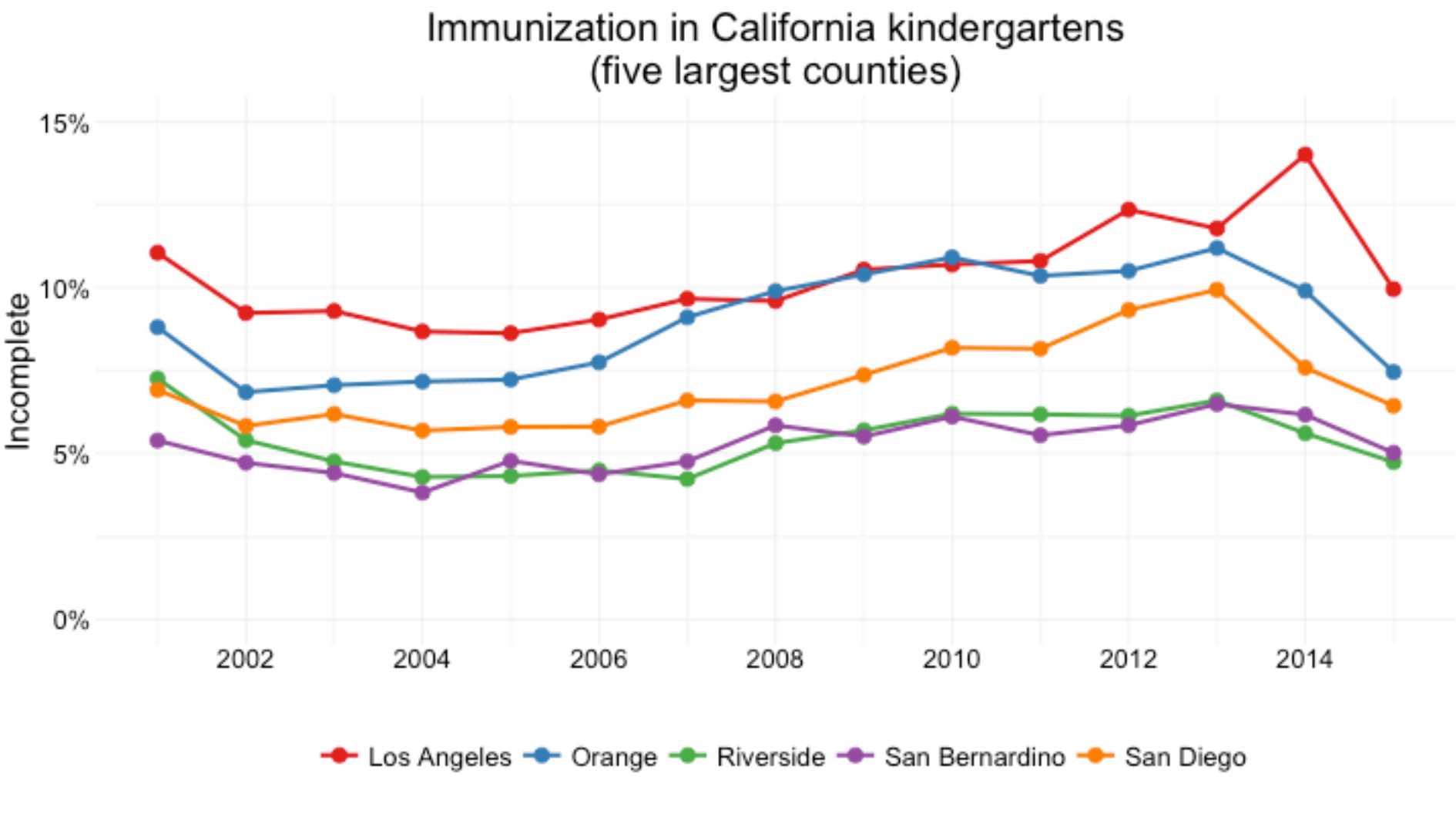
Slope, note the y axis scale



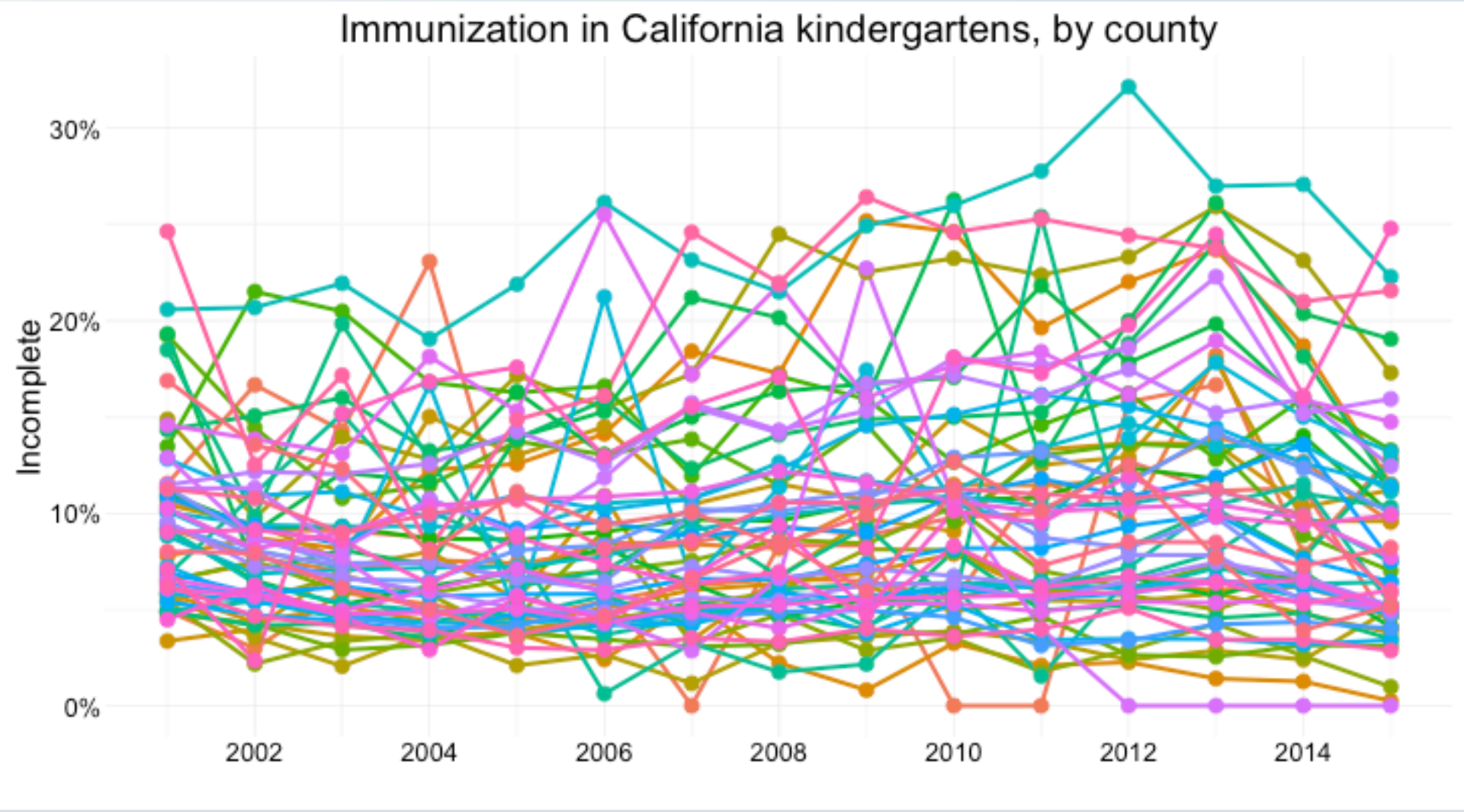
Position on aligned scale + slope



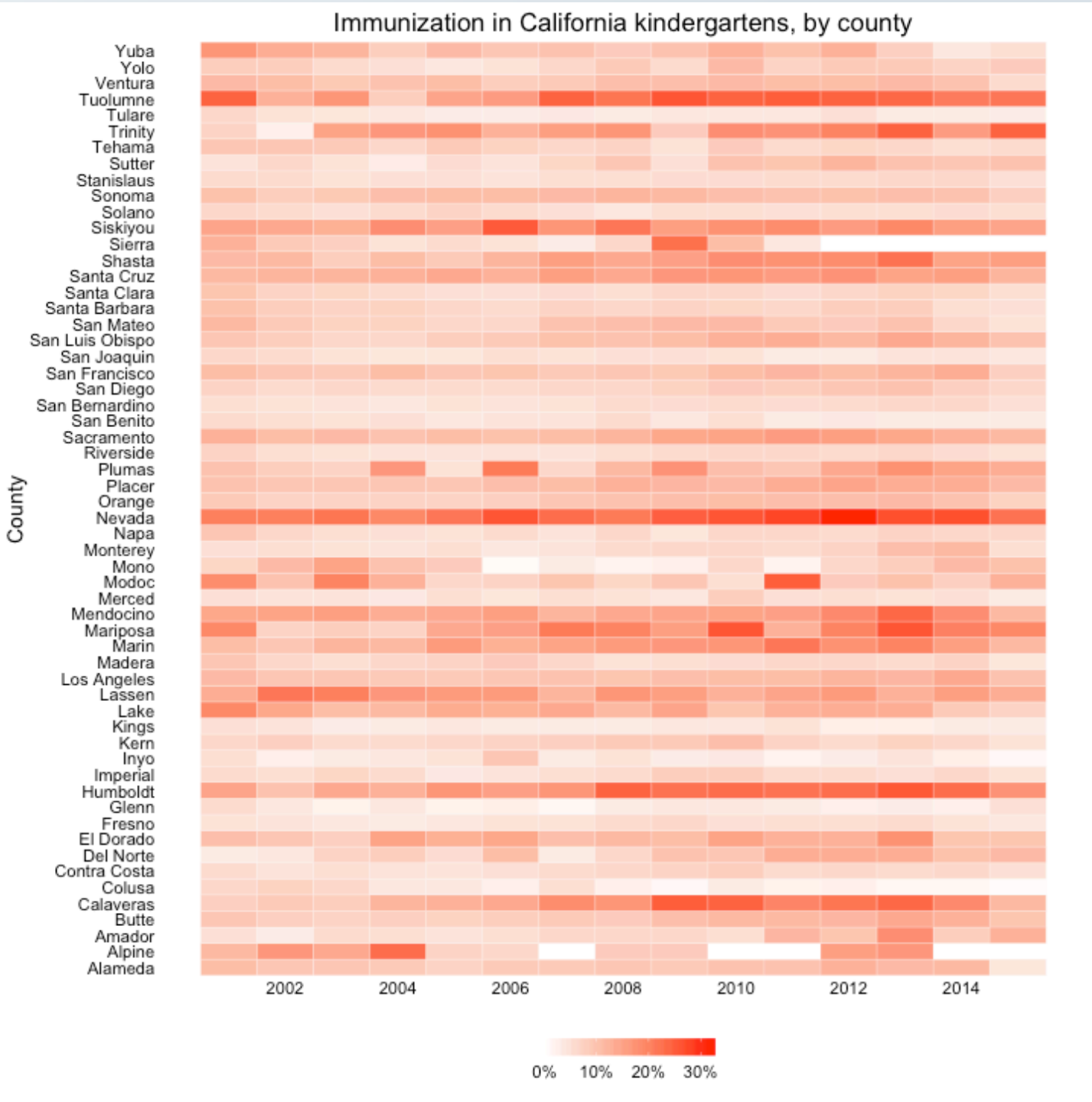
Several counties



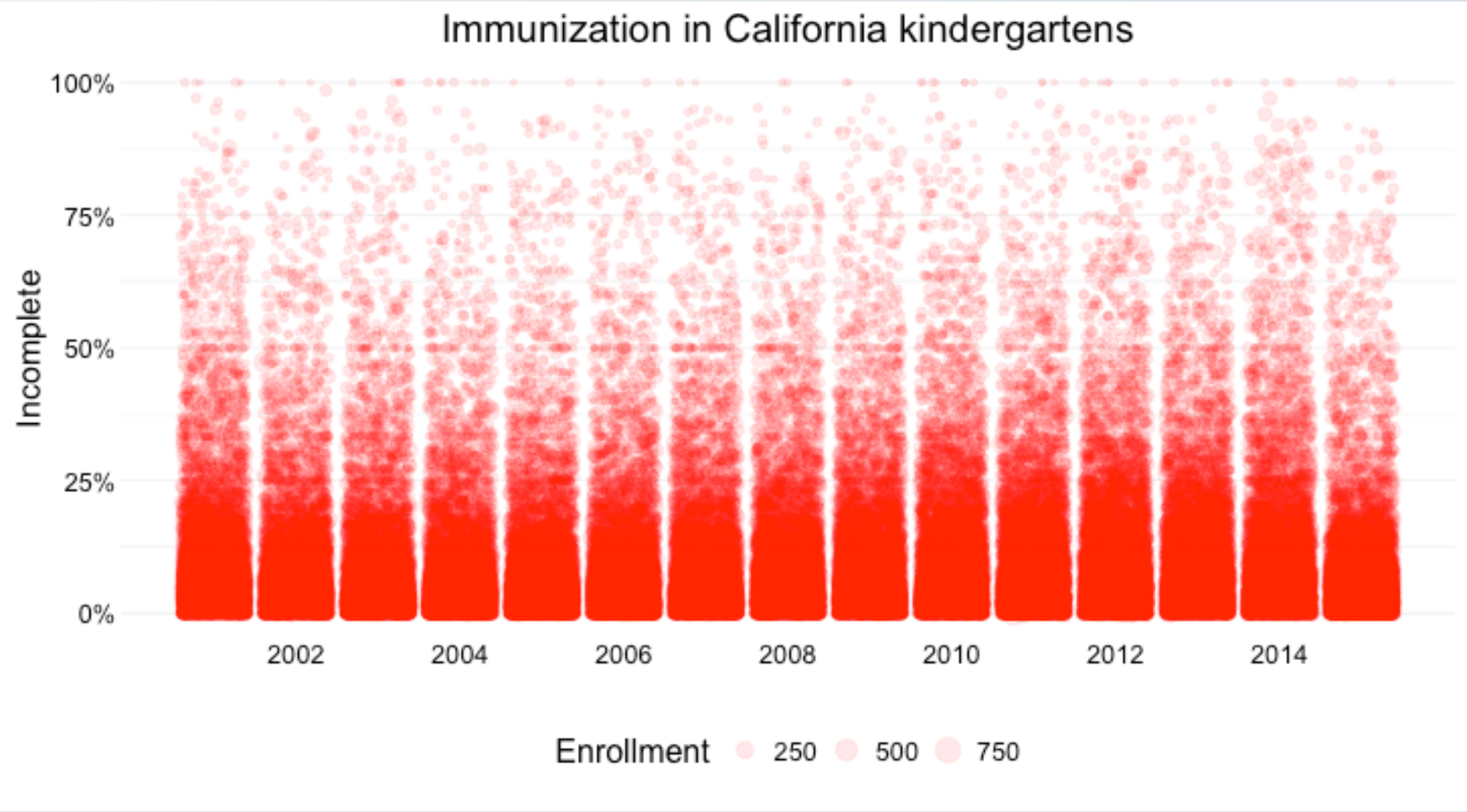
All the counties: Too many lines, too few colors



A solution: color intensity



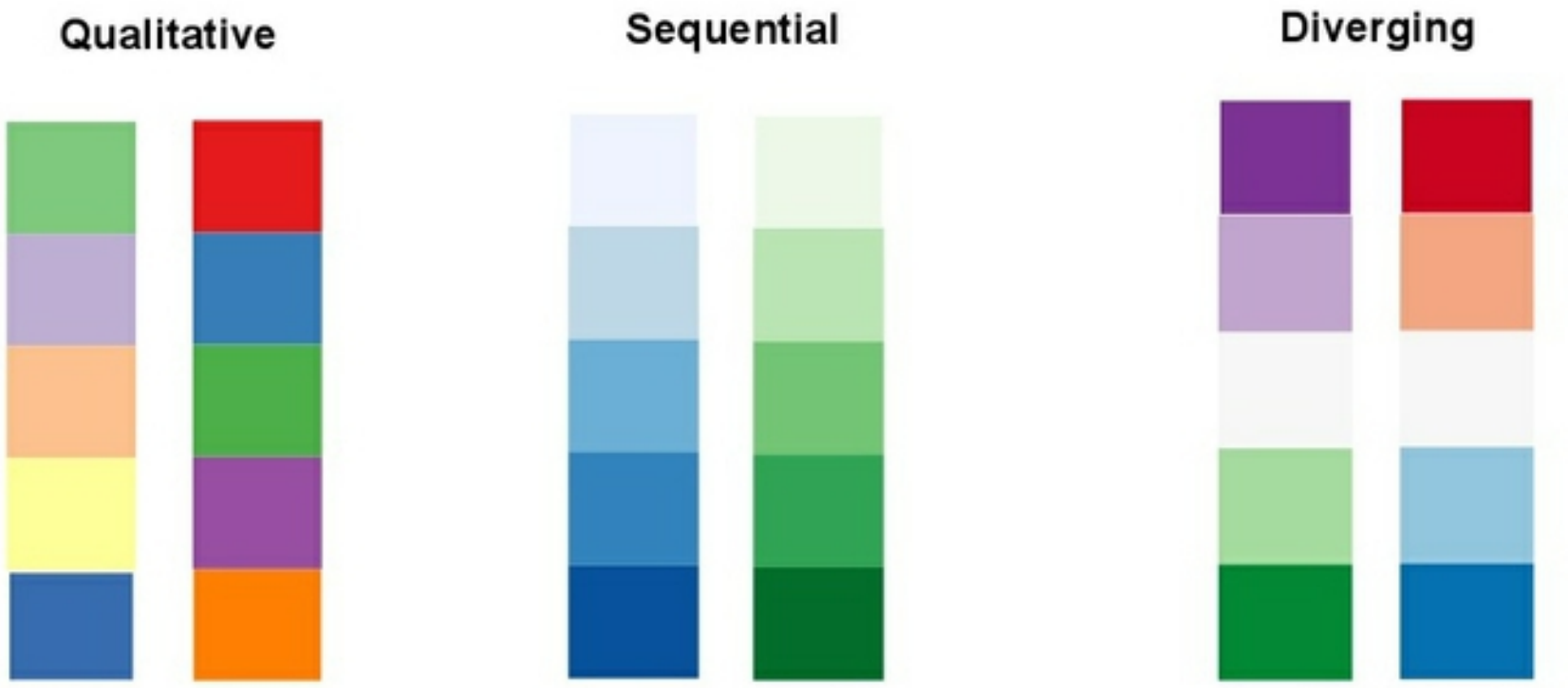
All the schools: Position on aligned scale + area



Using color effectively

The color wheel

Using color: fit to your data



ColorBrewer is your friend

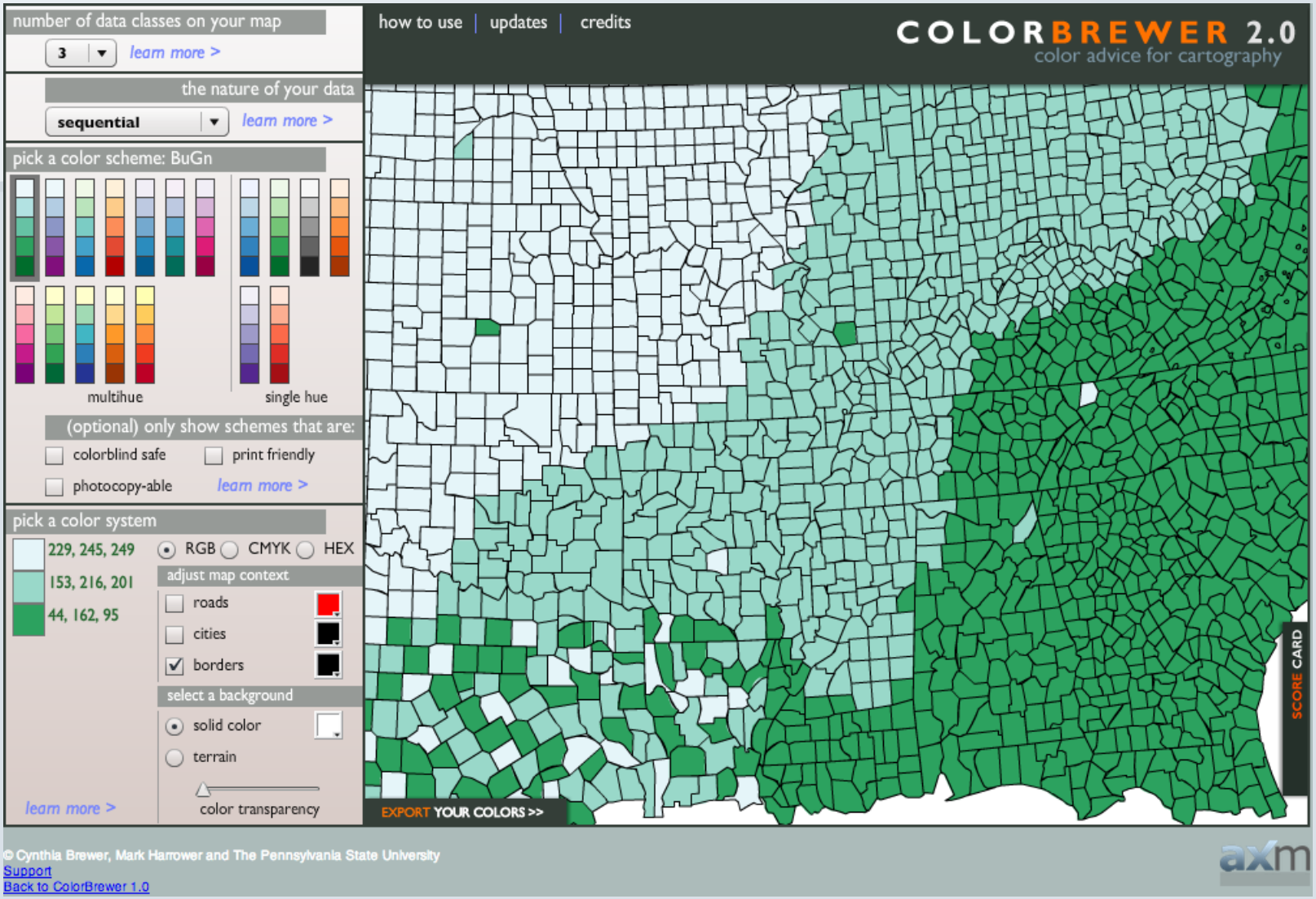
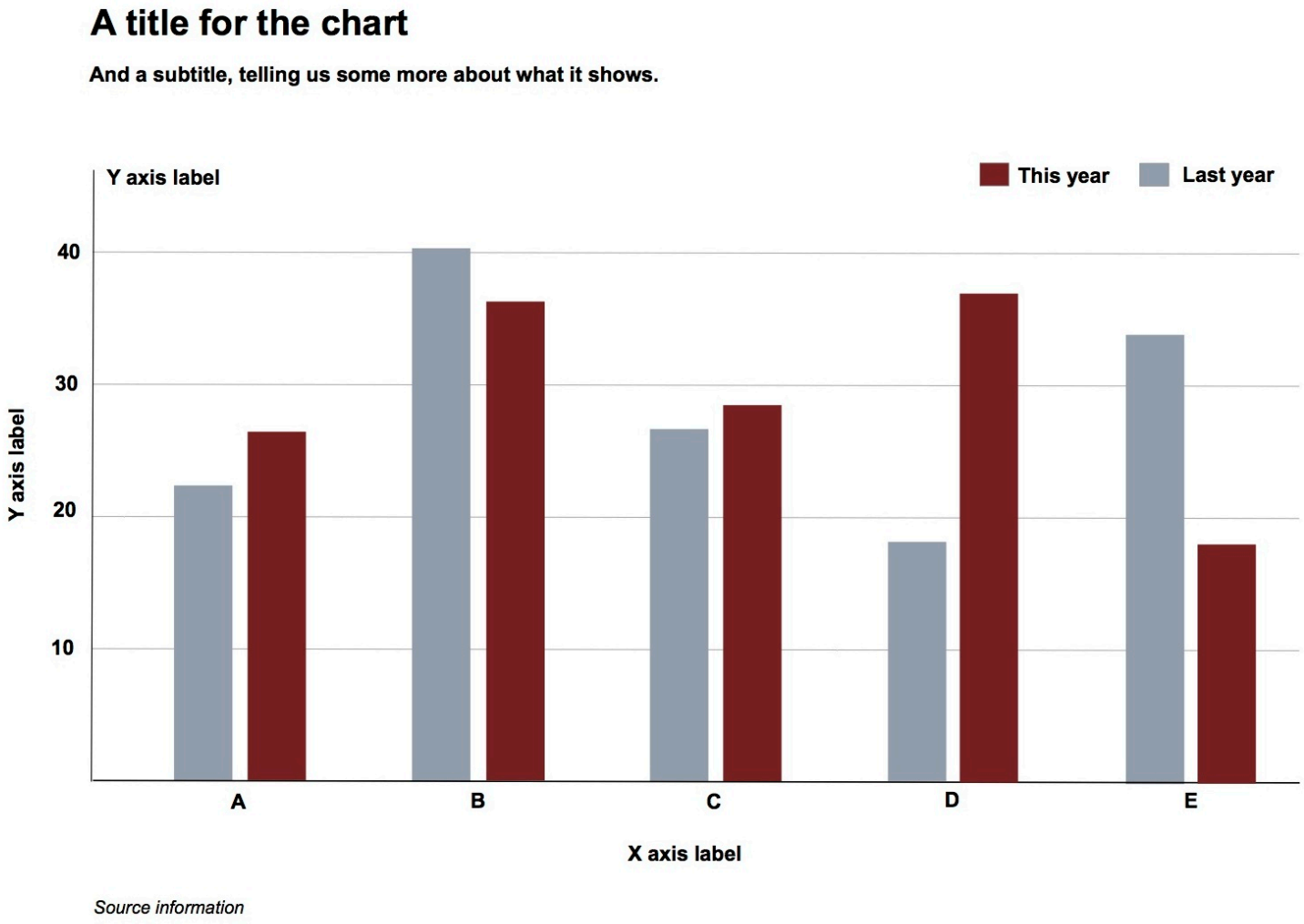
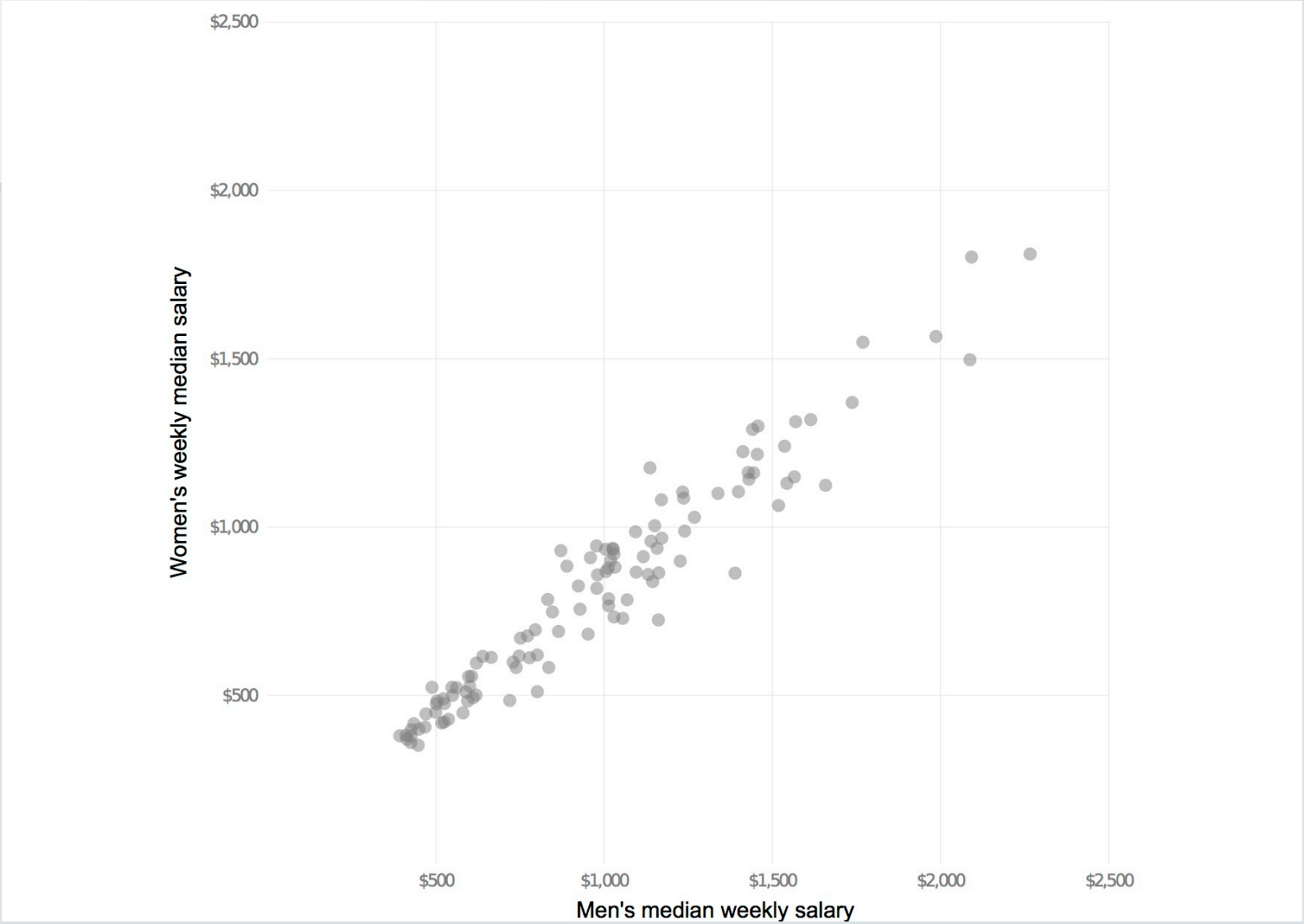


Chart furniture



Highlight the story: labels and annotation



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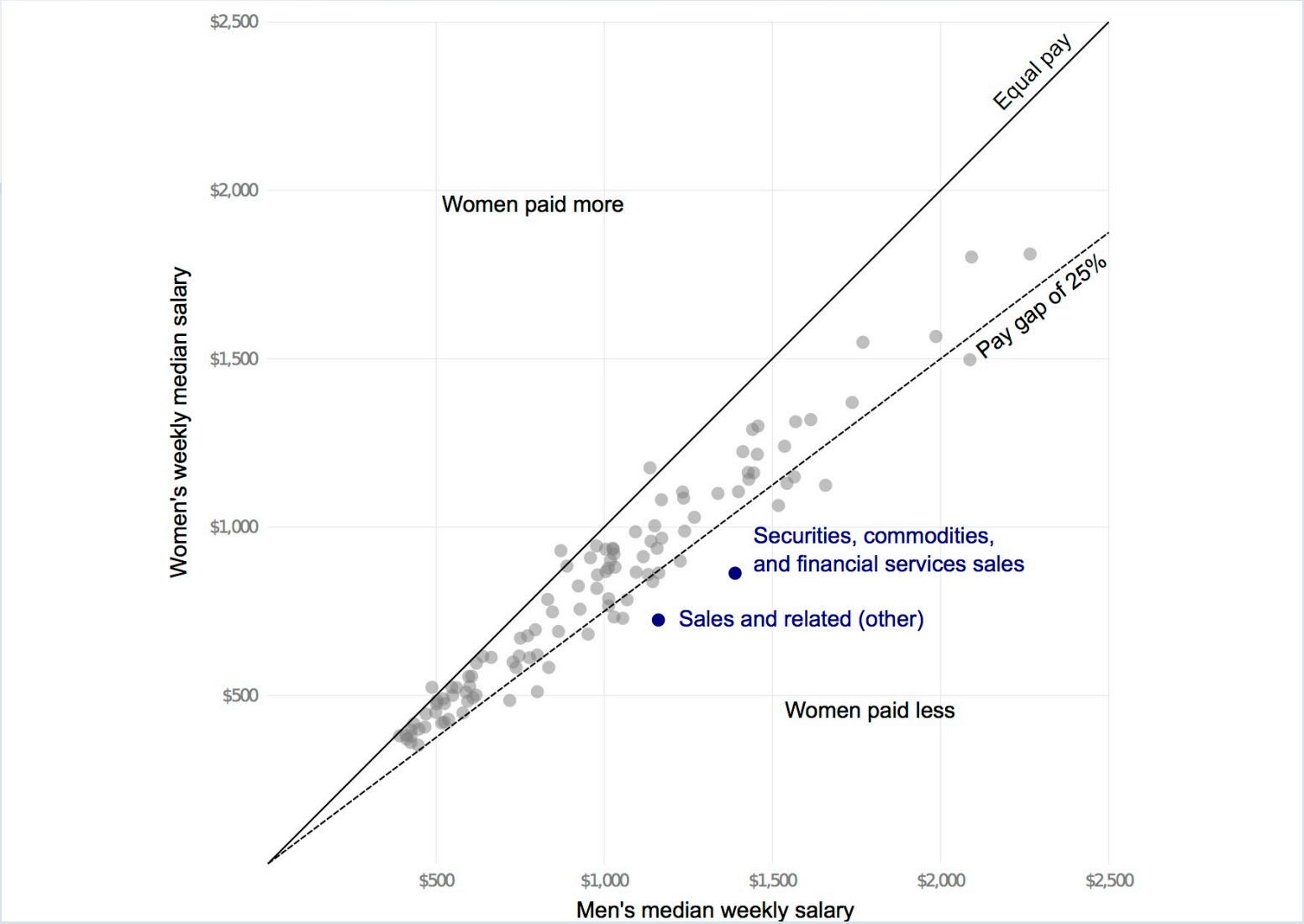


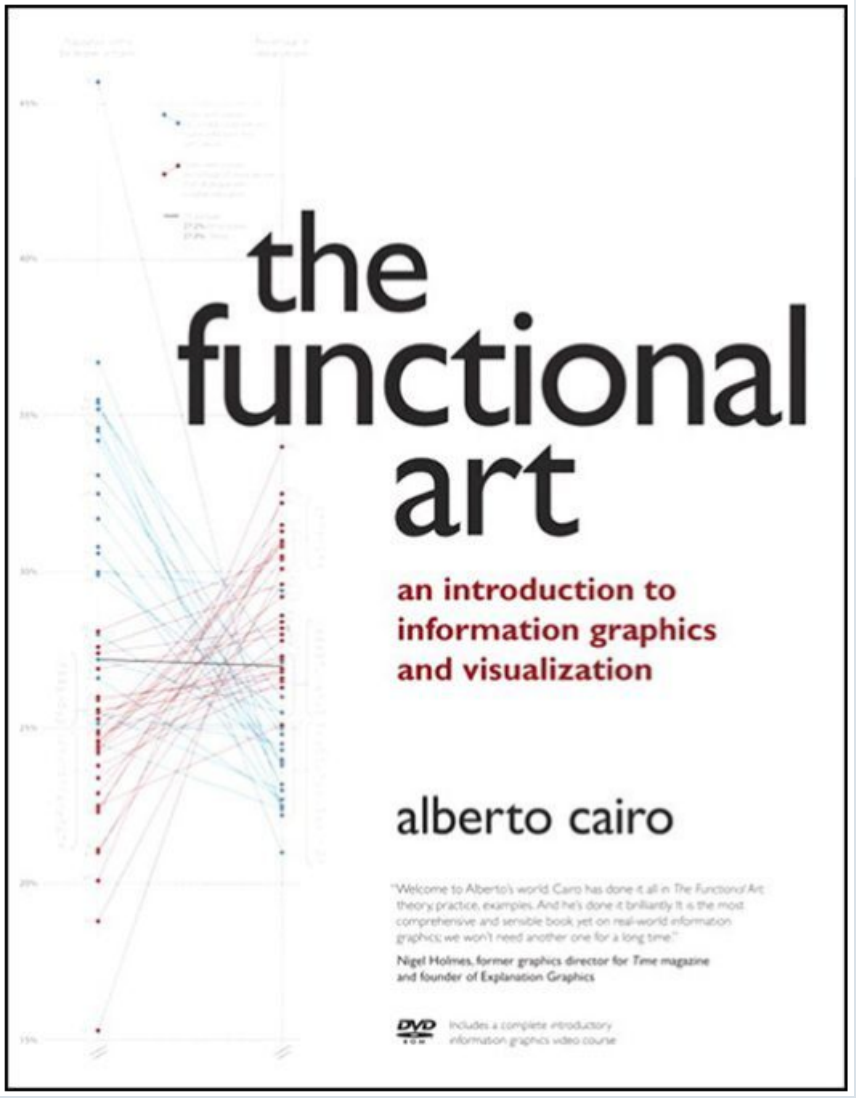
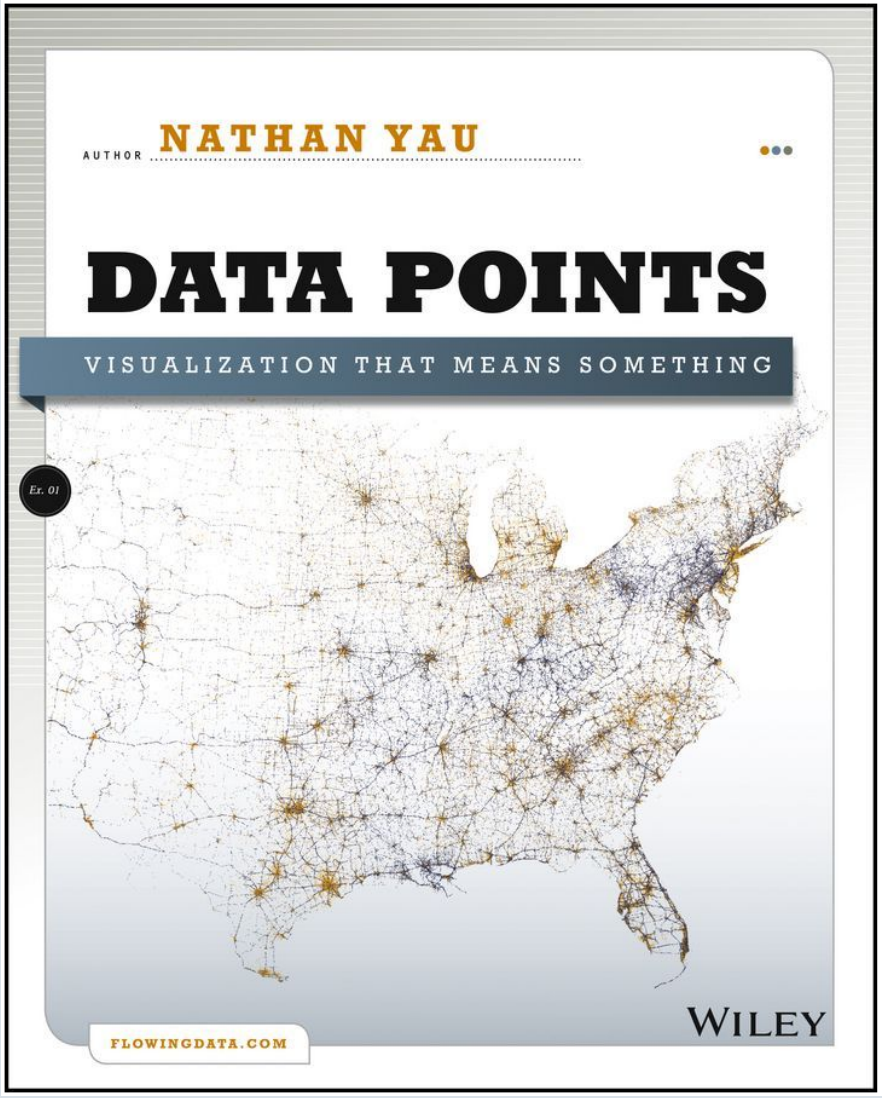
When in doubt:

keep it clean, clear and simple!

(But aim for clarity over simplicity)

Experiment! Sketch!

That may be how you find the story

Show people. If they’re confused, try another approach

Recommended reading