

COS30045

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# DATA VISUALISATION

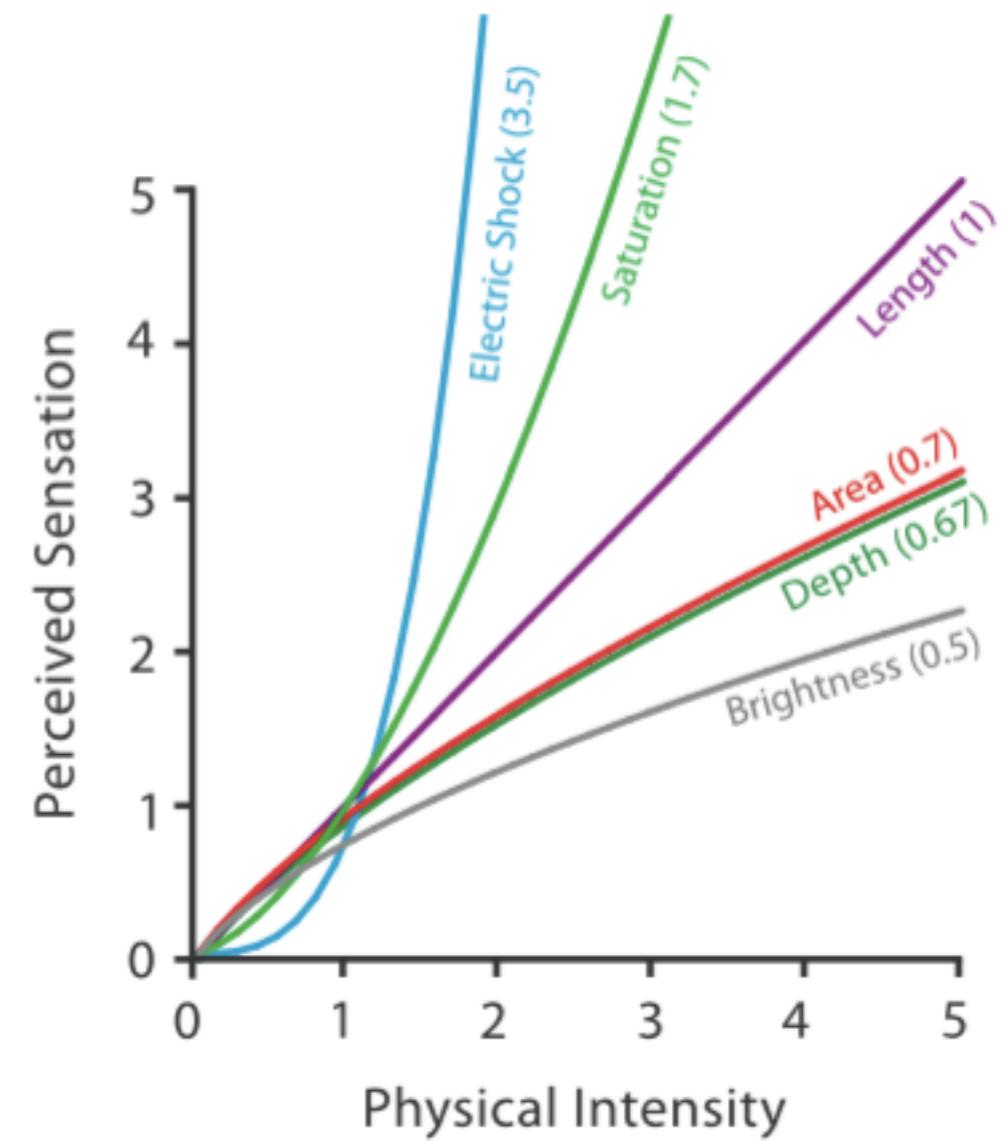
TOPIC 02-4: DESIGN GUIDELINES 3D

# GUIDELINES - MUNZNER

## Avoid Unjustified 3D

- ▶ Depth judgment is poor
- ▶ Occlusion
- ▶ Perspective Distortion
- ▶ Colour: Lighting / Shadows / Shading
- ▶ Tilted Text illegible

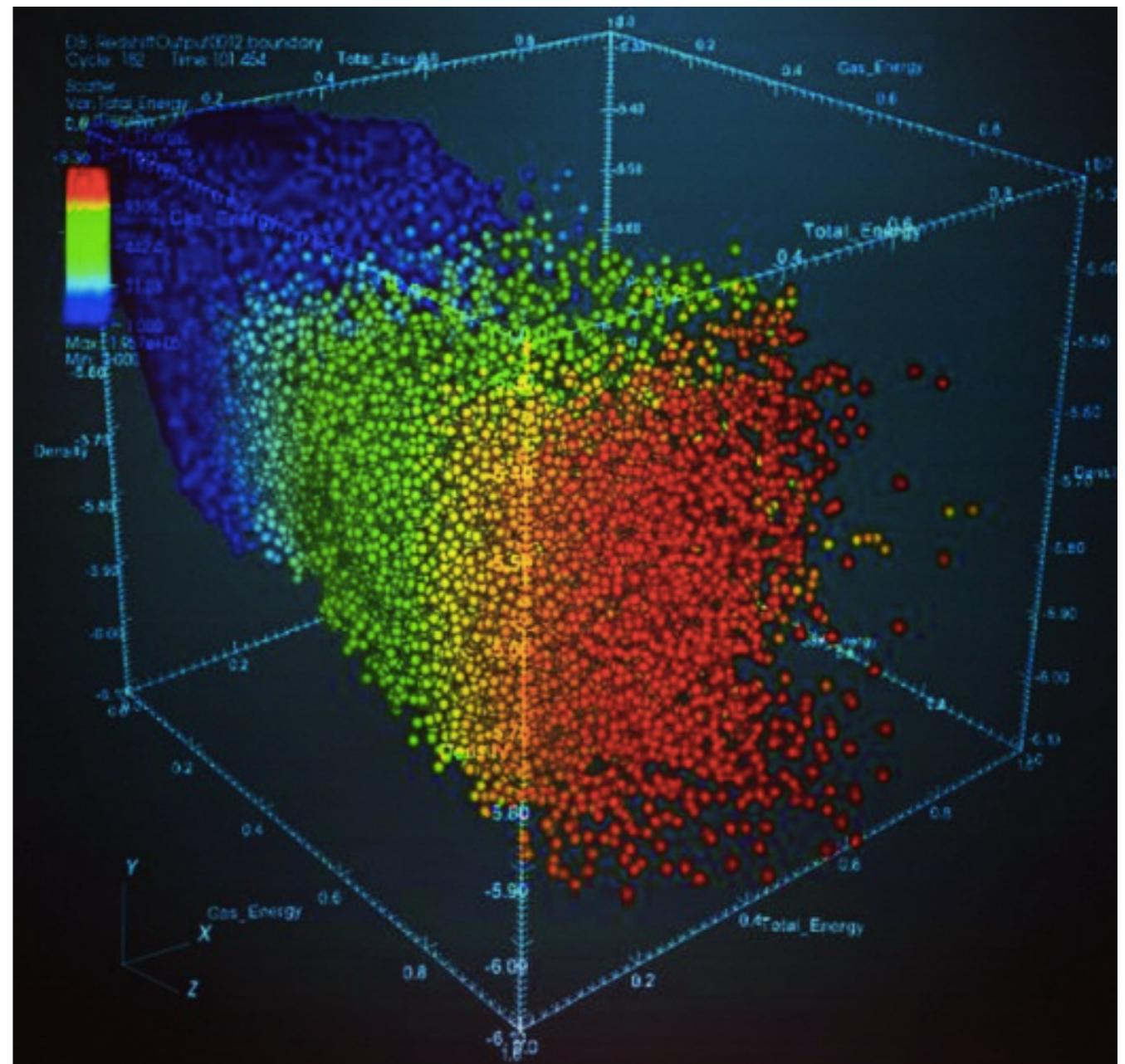
Steven's Psychophysical Power Law:  $S = I^N$



# GUIDELINES - MUNZNER

## Avoid Unjustified 3D

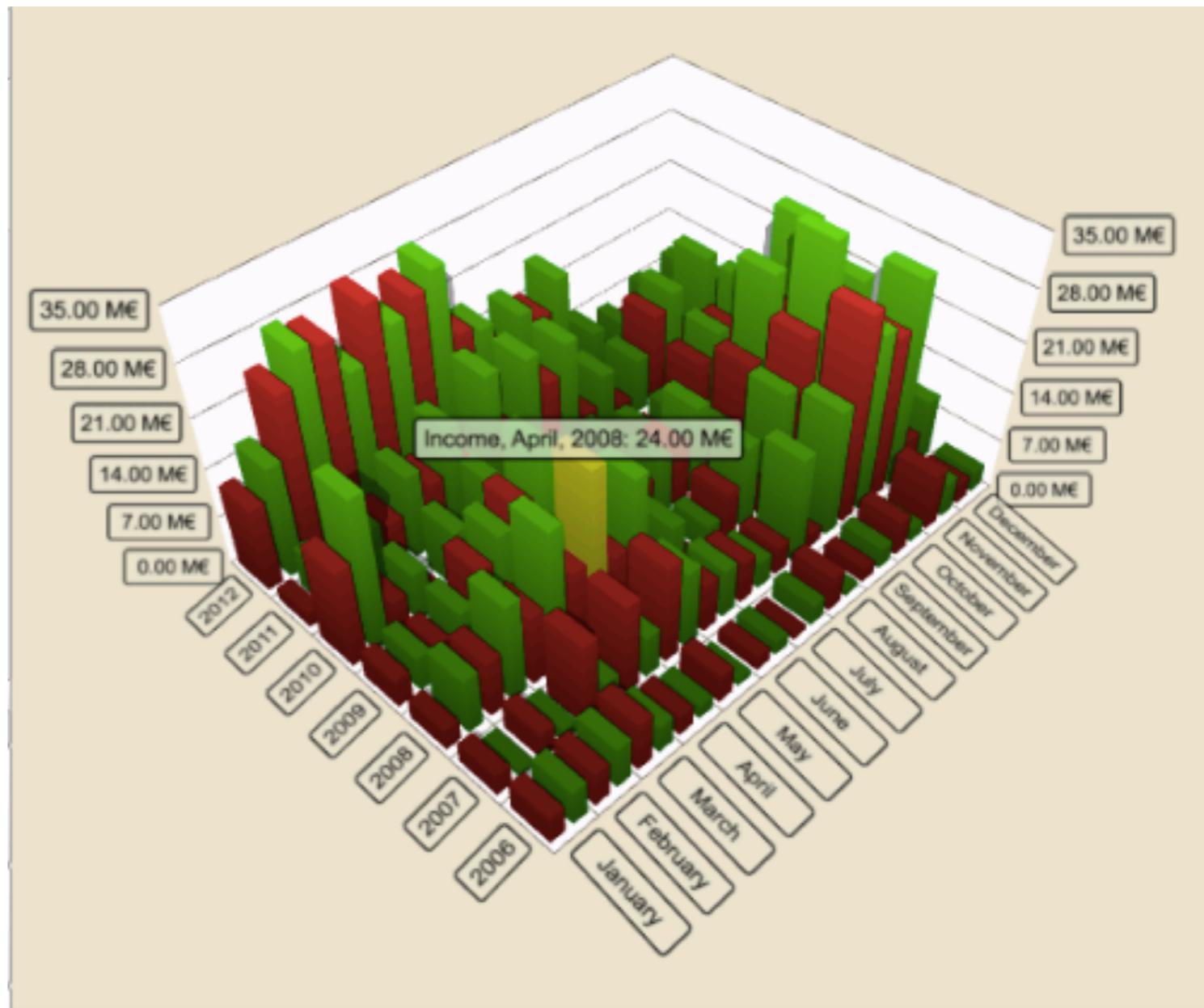
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- ▶ Tilted Text illegible



# GUIDELINES - MUNZNER

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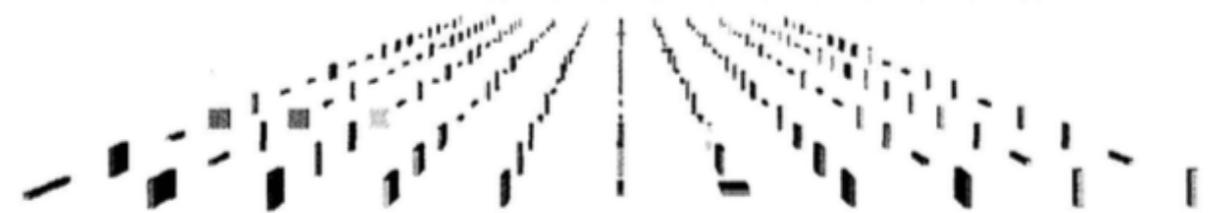
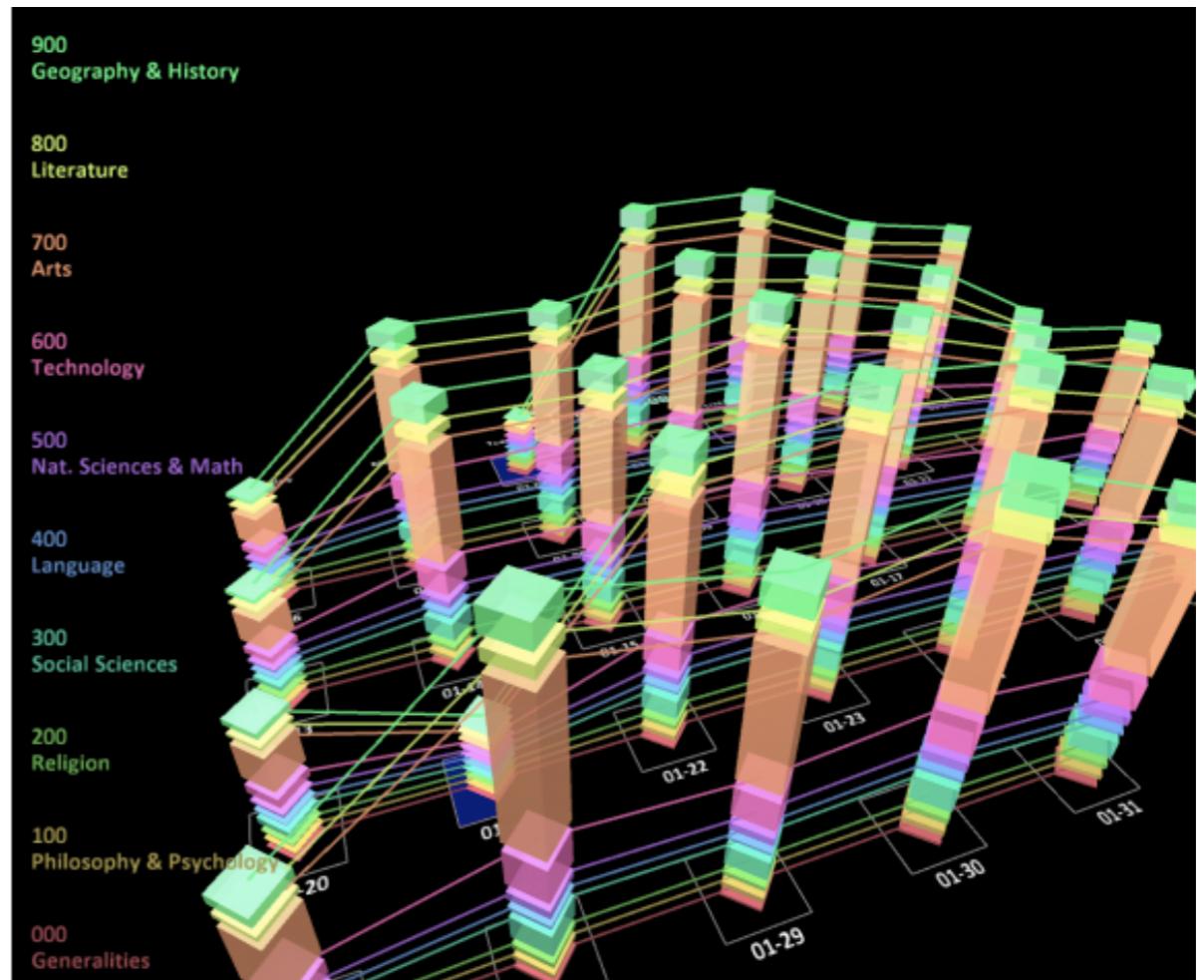
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- ▶ Occlusion
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- ▶ Colour: Lighting / Shadows / Shading
- ▶ Tilted Text illegible



# GUIDELINES

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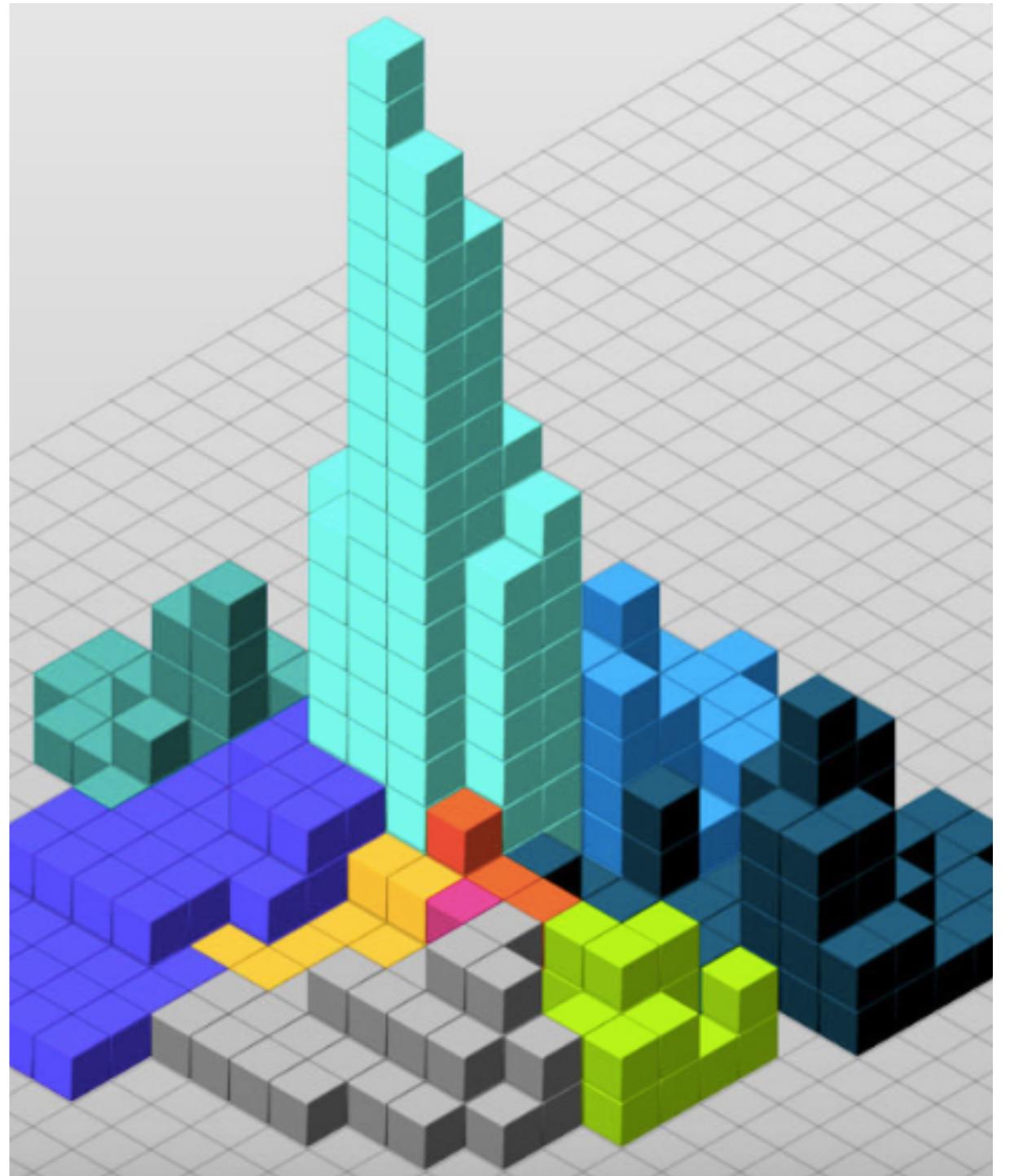


**Figure 6.5.** With perspective distortion, the power of the planar spatial position channel is lost, as is the size channel. From [Mukherjea et al. 96, Figure 1].

# GUIDELINES - MUNZNER

## Avoid Unjustified 3D

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# DATA VISUALISATION

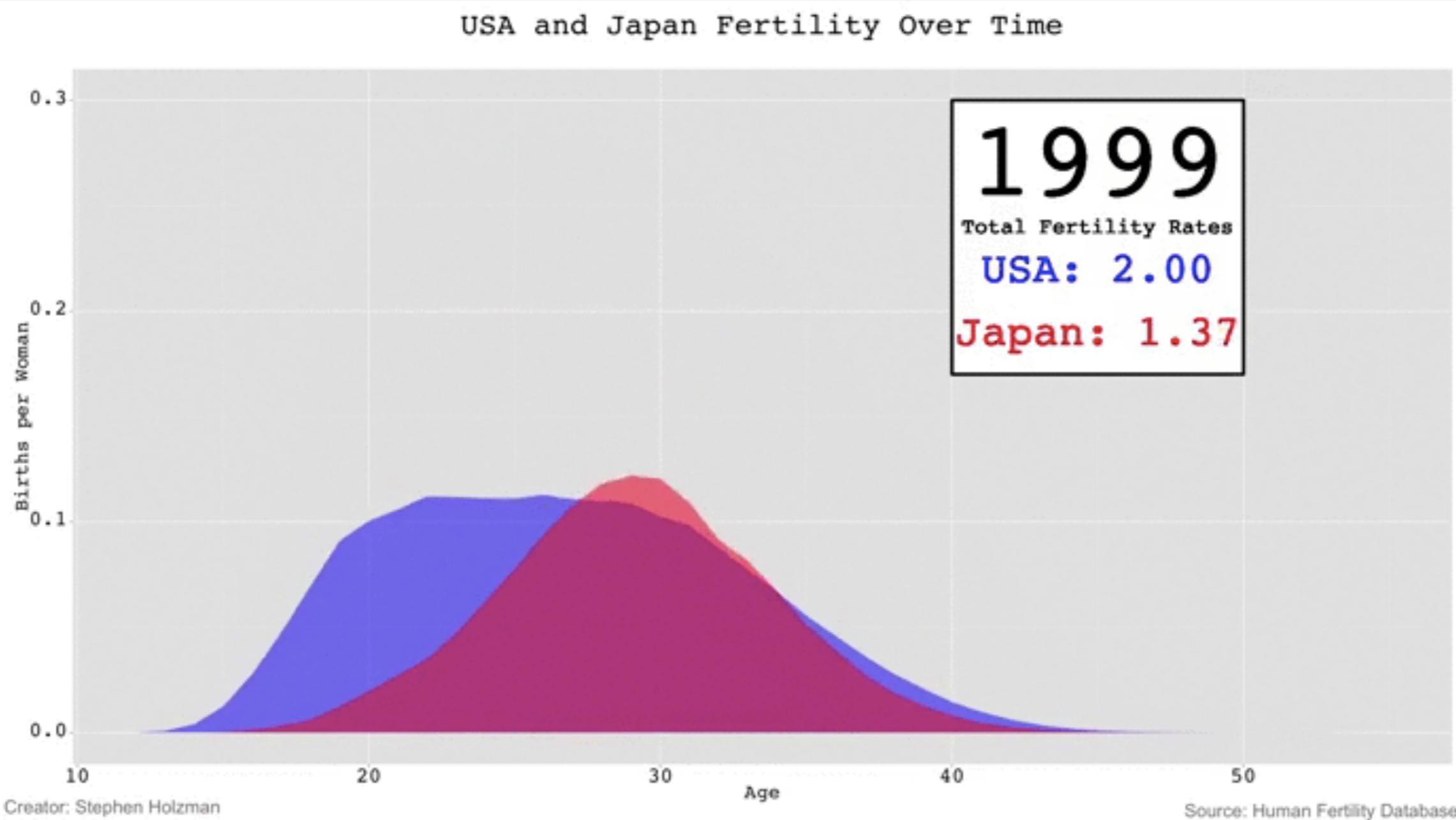
TOPIC 02-5: DESIGN GUIDELINES ANIMATIONS

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## GUIDELINES - MUNZNER

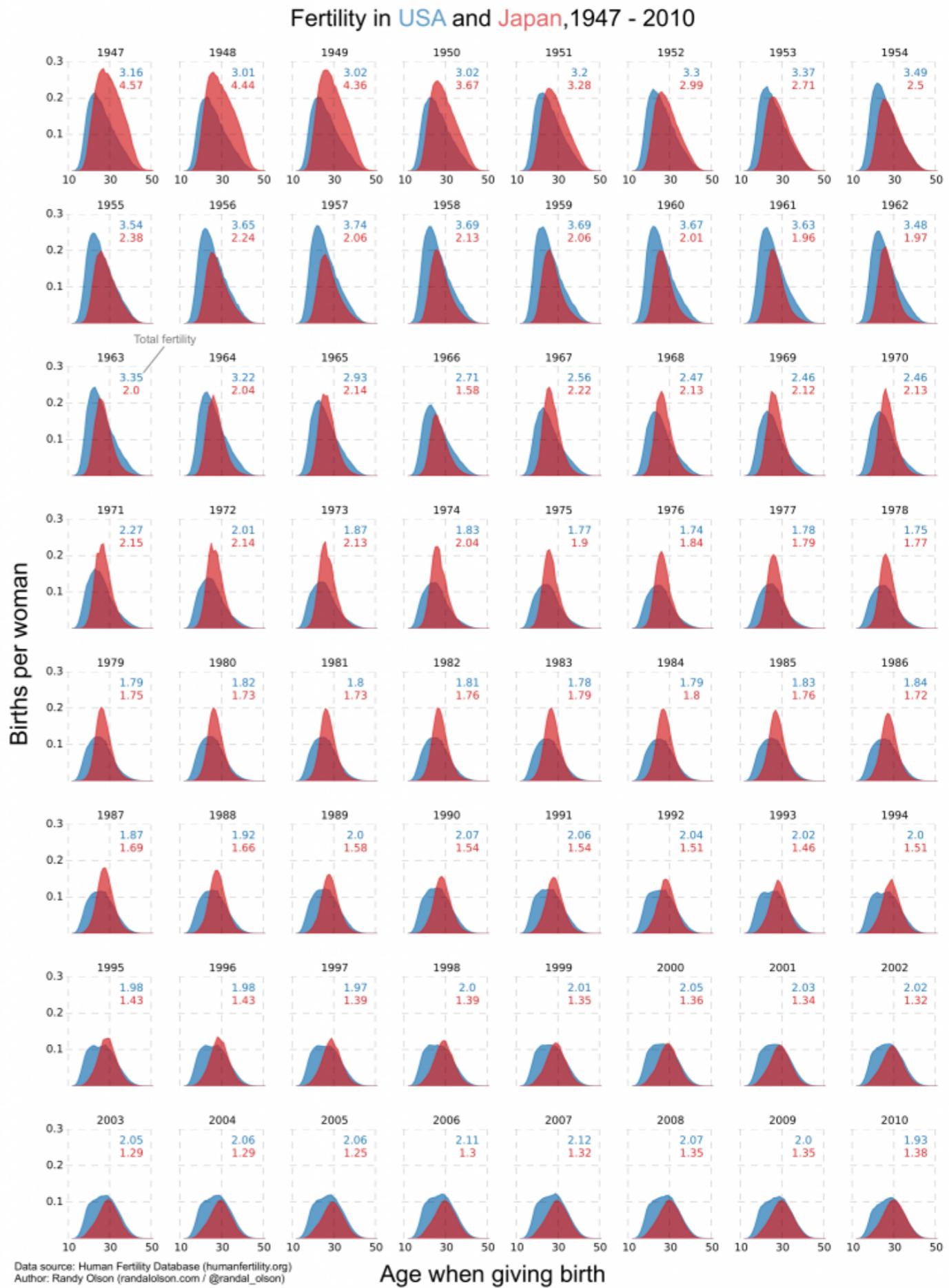
- ▶ Eyes beat memory
- ▶ Cognitive limitations (working memory)
- ▶ Animation vs Side by Side Views
- ▶ Change blindness

# ANIMATION



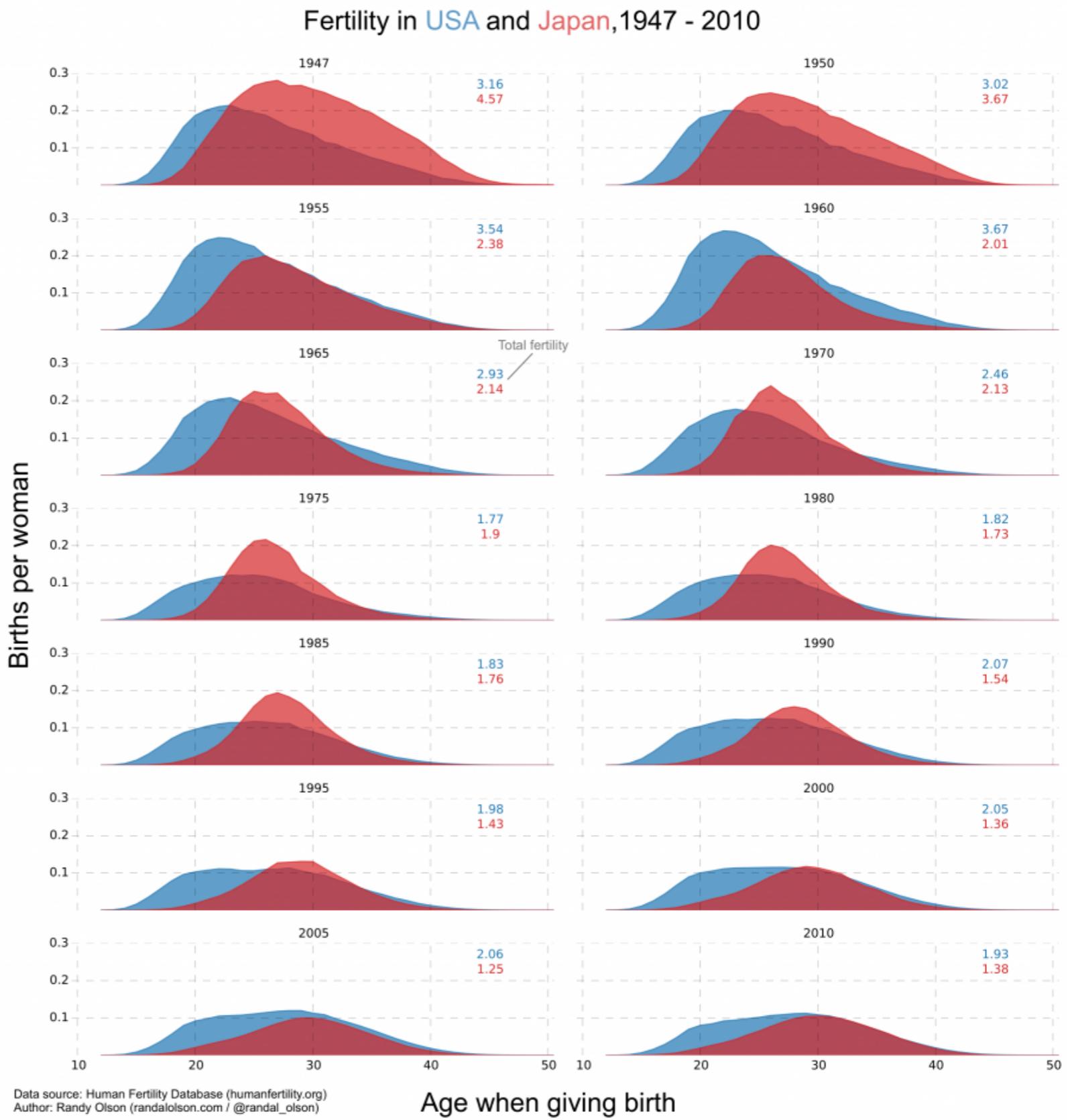
# SMALL MULTIPLES

- ▶ data shown in small frames
- ▶ the same combination of variables...



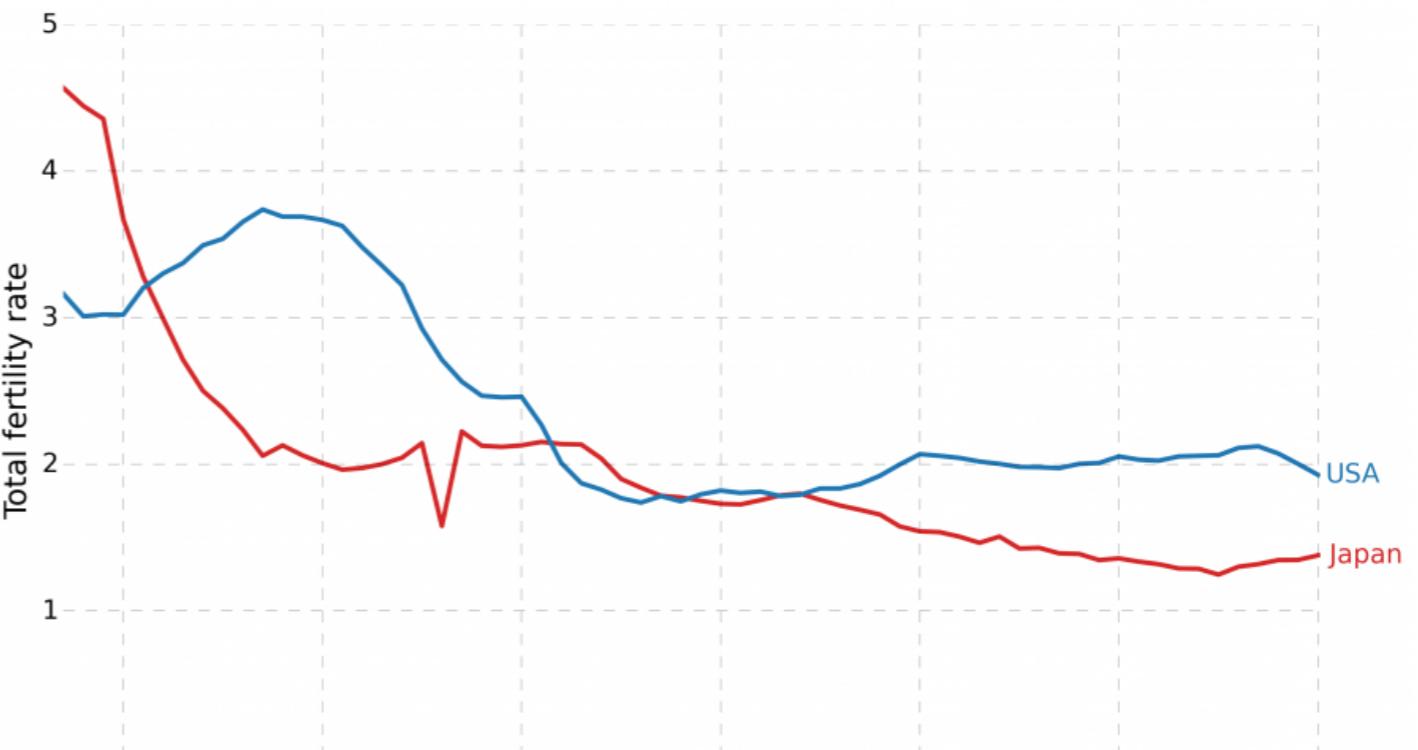
# LESS SMALL MULTIPLES

- ▶ Make a judgement about how small the multiples need to be...

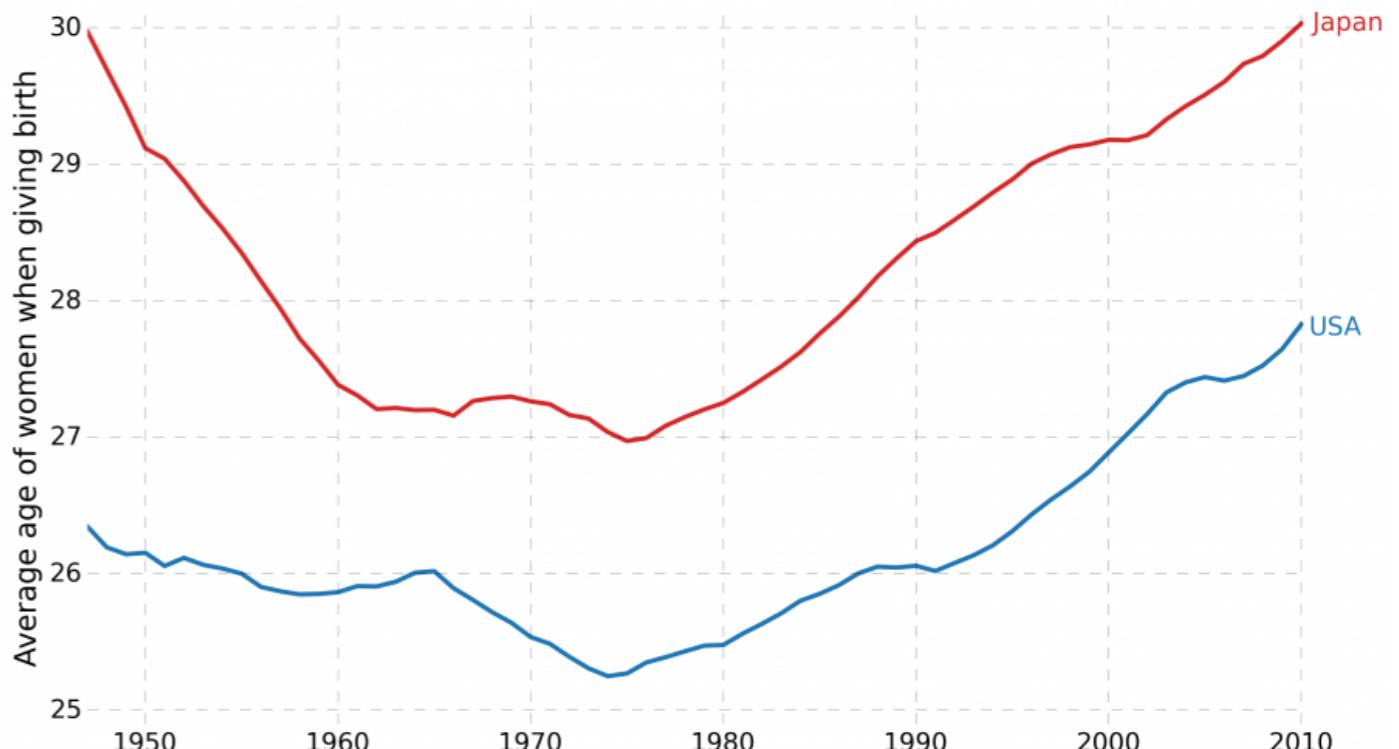


# OLD FAITHFUL!

Total fertility rate in USA and Japan, 1947 - 2010

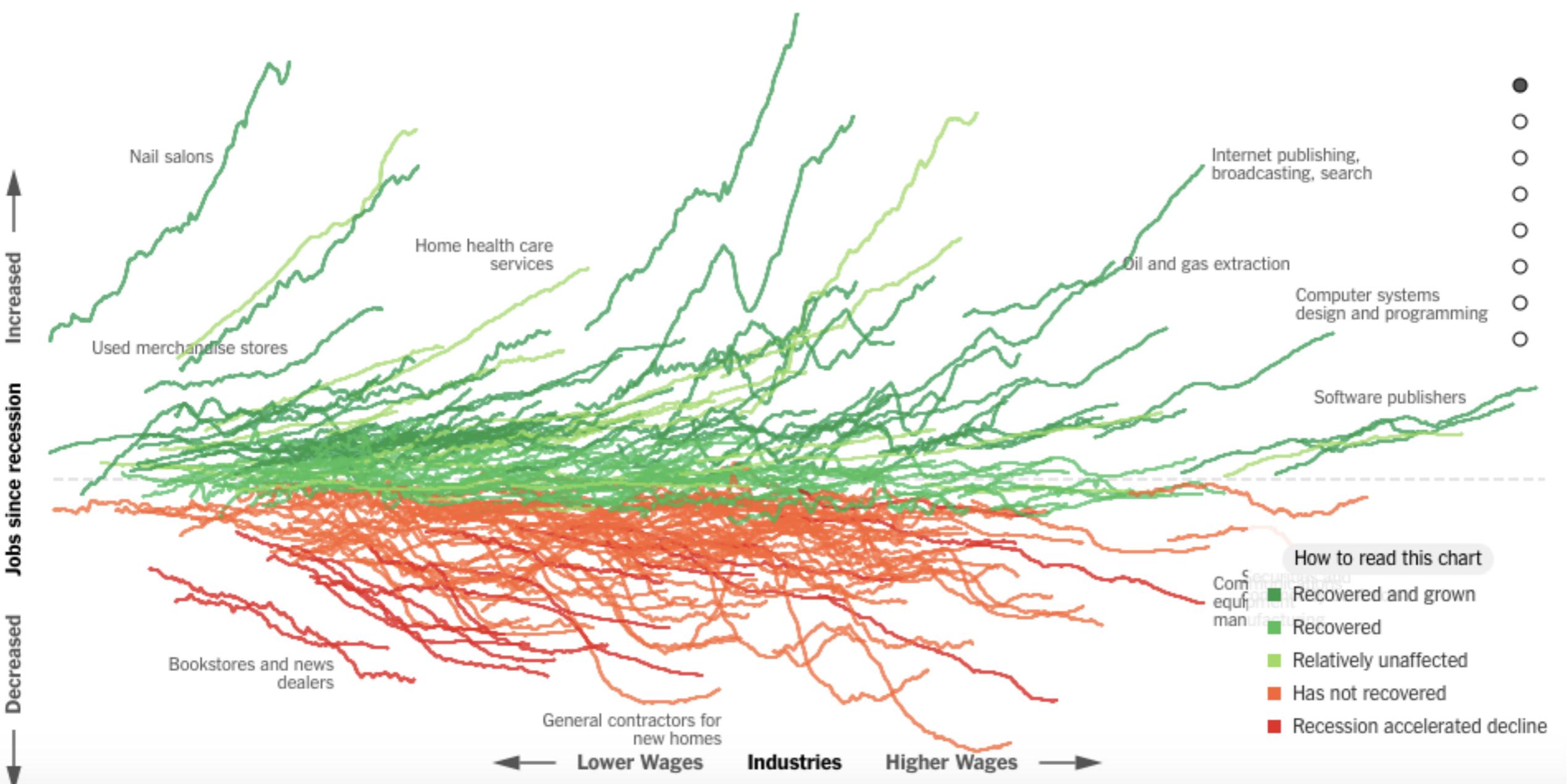


Average age when giving birth in USA and Japan, 1947 - 2010



# SMALL MULTIPLES

# How the Recession Reshaped the Economy, in 255 Charts





Photographic images  
used in this presentation:

mostly from Microsoft Clipart circa 2009  
(unless otherwise specified)  
Note references are linked to images in PDF  
version of this presentation.

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# DATA VISUALISATION

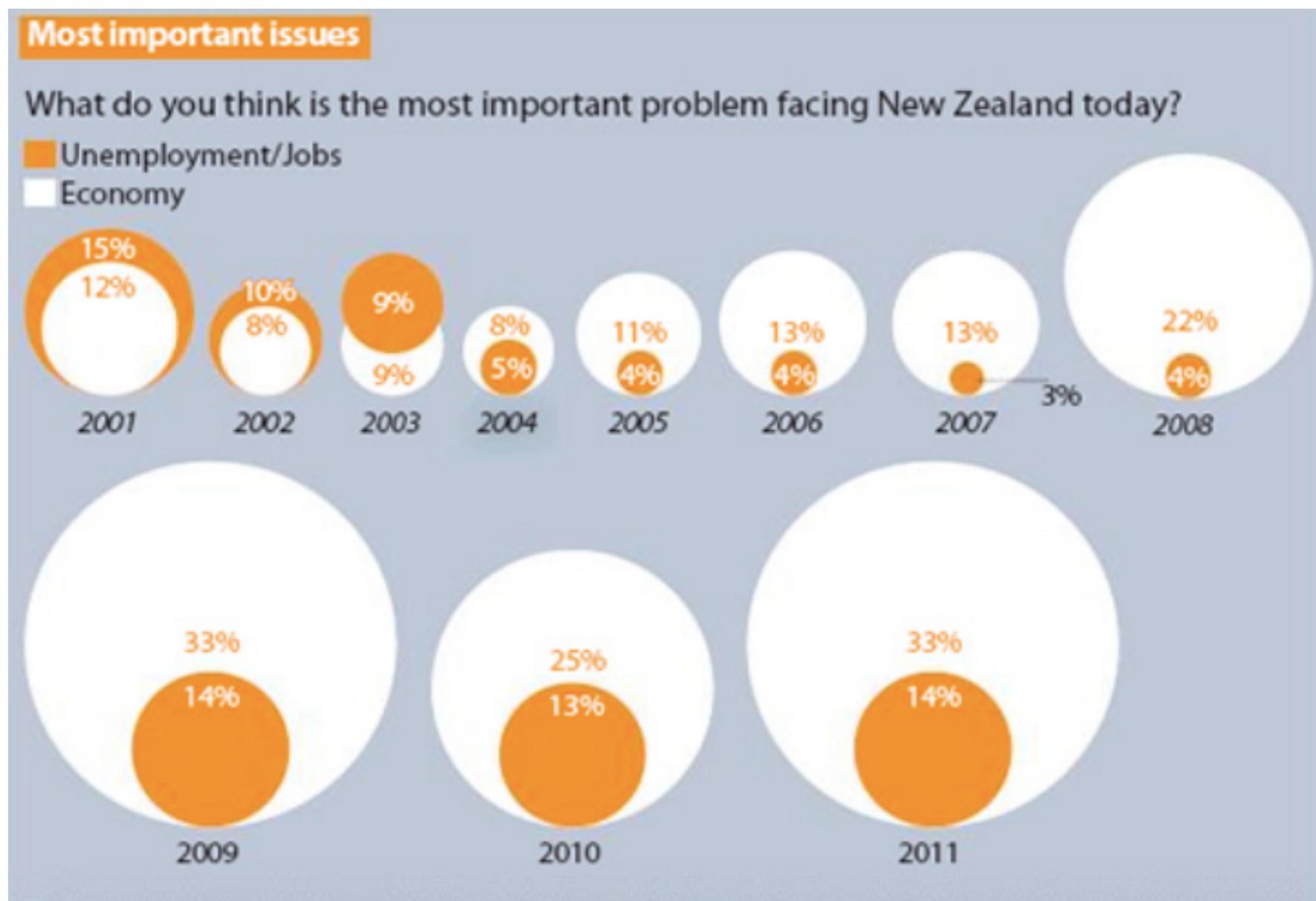
TOPIC 02-6: BUBBLE CHART DISCUSSION

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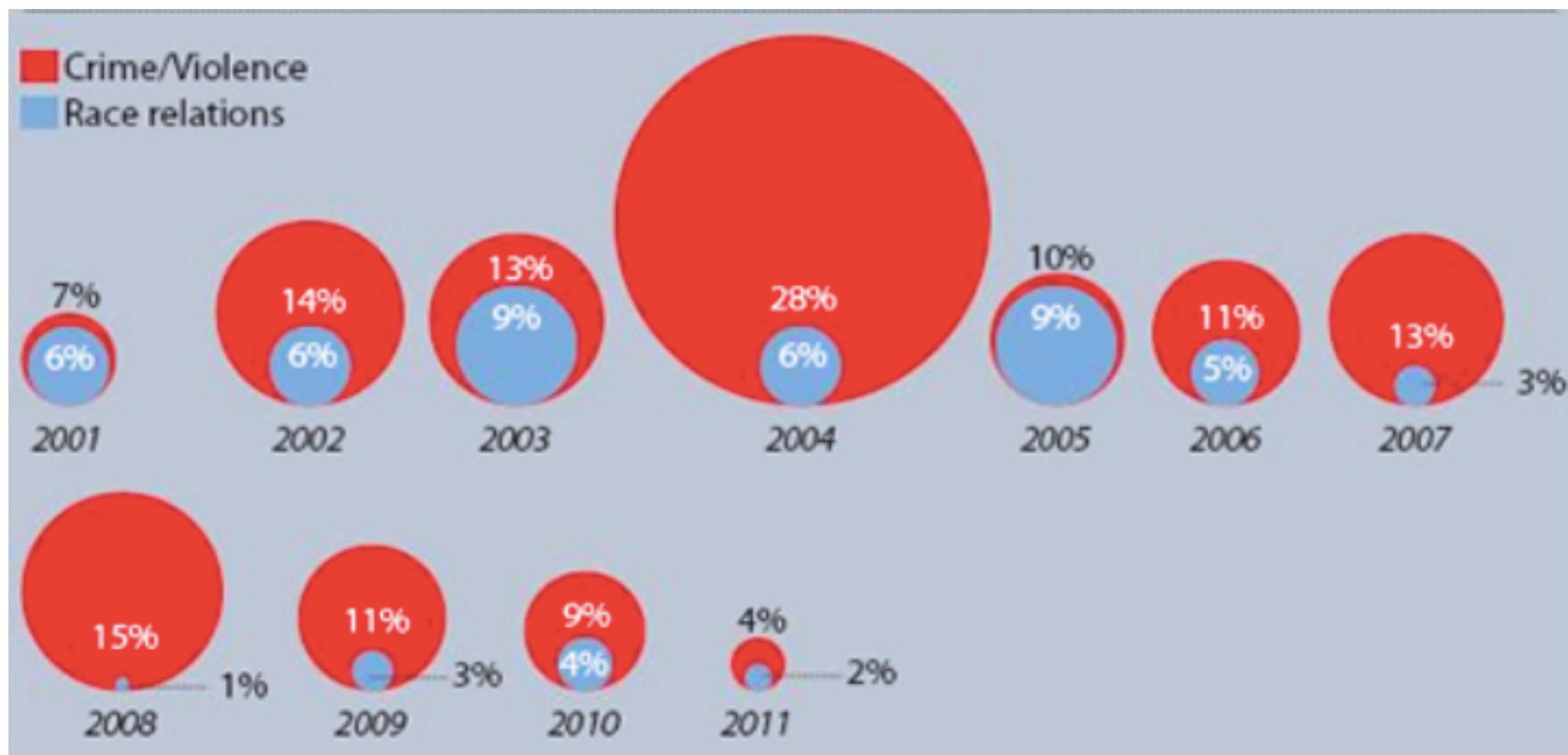
## DESIGN CRITIQUE

- ▶ Who is the audience? (expert? non-expert?)
- ▶ What questions does this visualization answer?
- ▶ What design principles best describe why it is good / bad?
- ▶ Why do you like / dislike this visualization? Can you suggest any improvements?

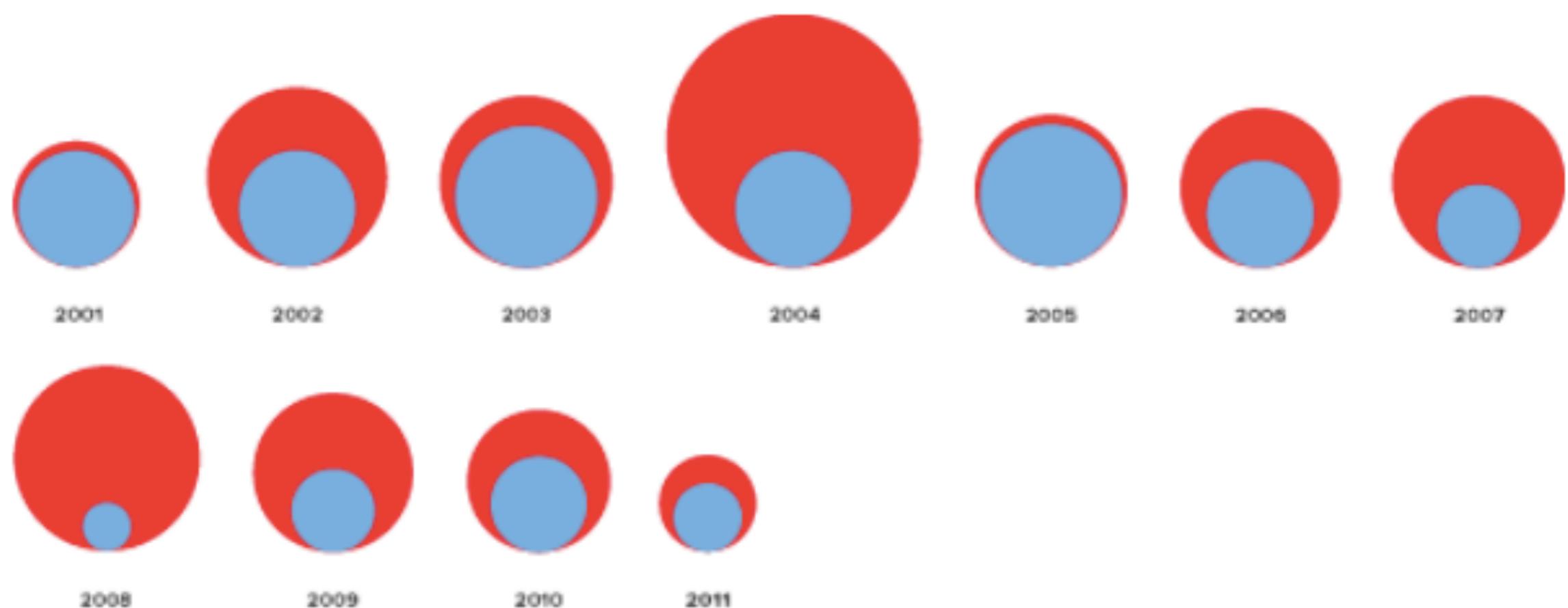
# BUBBLE CHART - DIAMETER



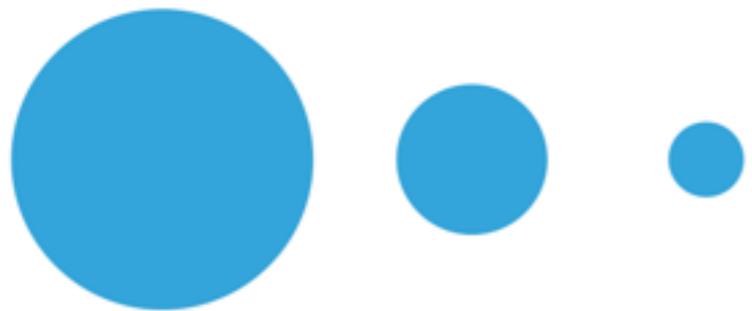
# BUBBLE CHART



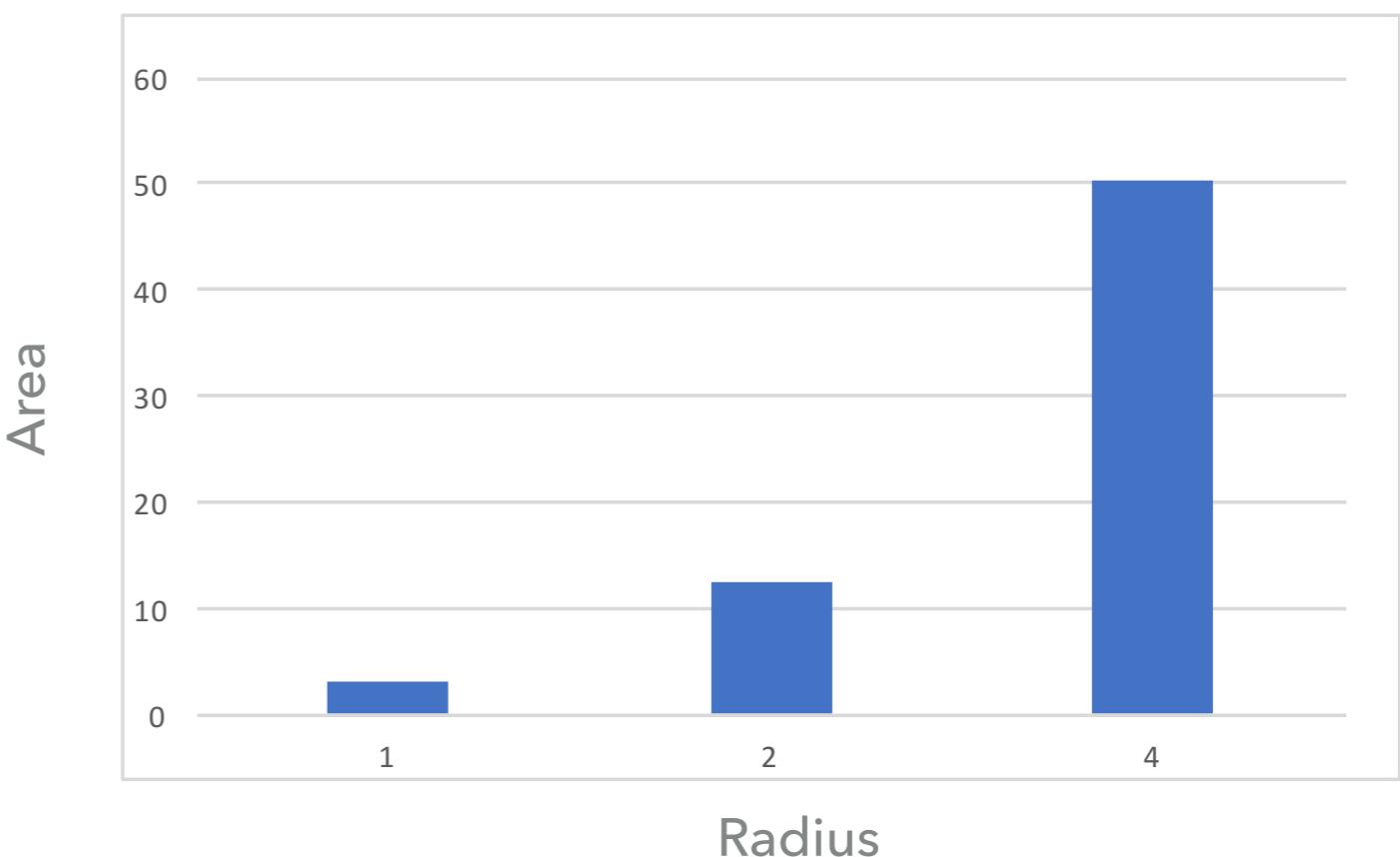
# BUBBLE CHART - AREA CODING



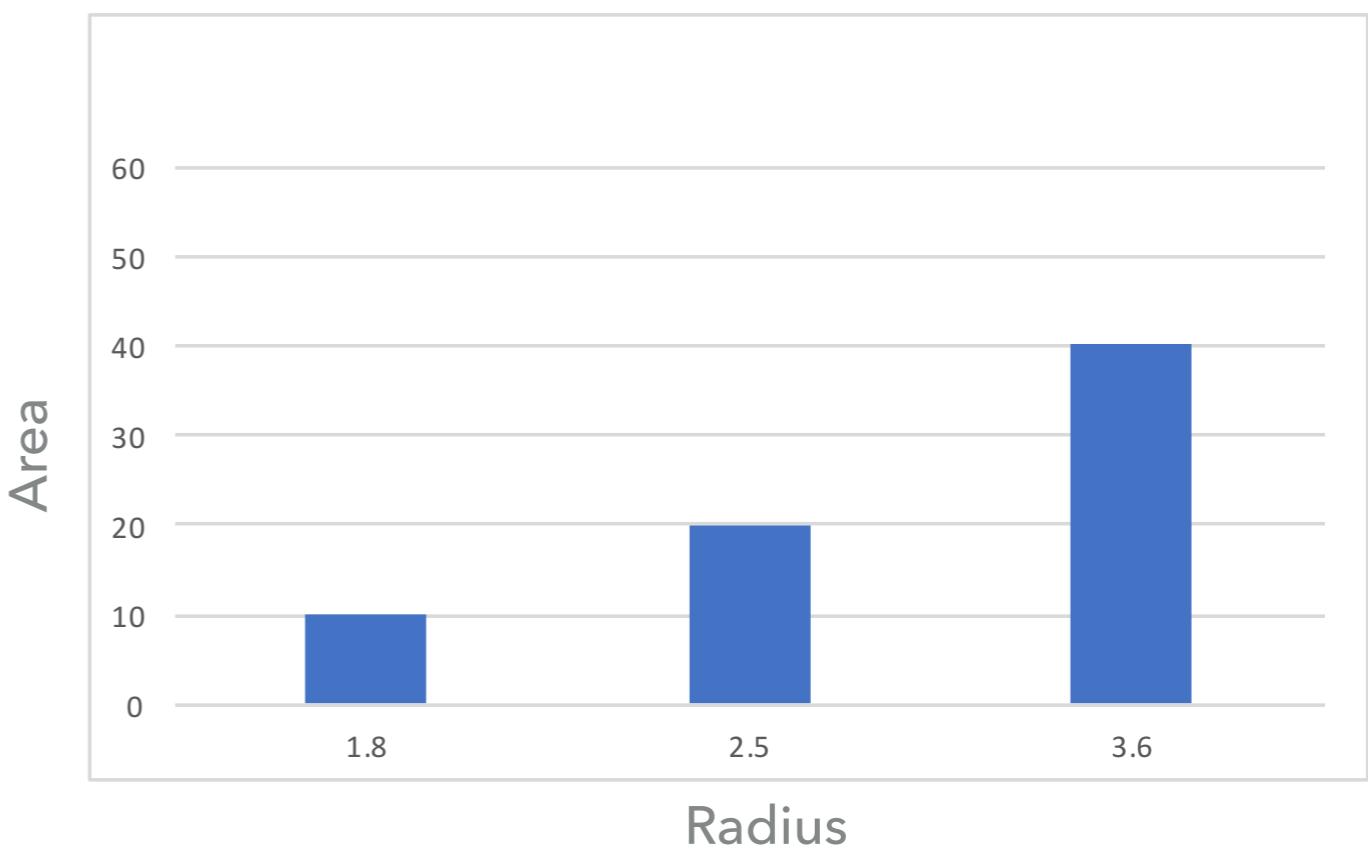
# AREA vs RADIUS CODING



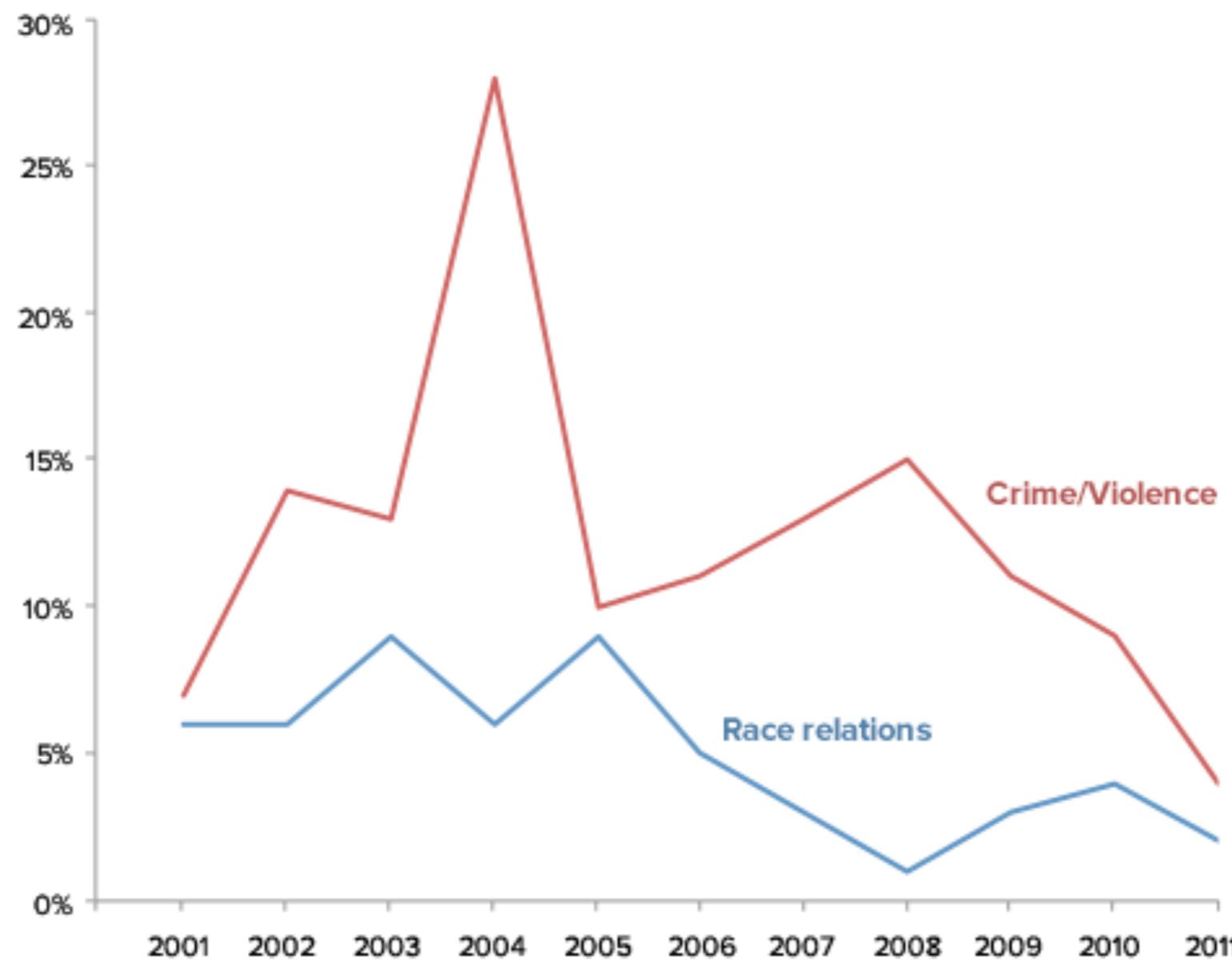
Double the radius



Double the area



# LINE GRAPH



# TEST YOUR CHART SENSE

**Graph Design I.Q. Test**

Question 1: Which graph makes it easier to determine whether Mid-Cap U.S. Stock or Small-Cap U.S. Stock has the greater share? (Click one of the two buttons below the graphs.)

**Investment Portfolio Breakdown**

Category	Approximate Share (%)
International Stock	20%
Large-Cap U.S. Stock	18%
Bonds	15%
Real Estate	12%
Mid-Cap U.S. Stock	10%
Small-Cap U.S. Stock	8%
Commodities	5%

Pie Chart

**Investment Portfolio Breakdown**

Category	Share (%)
International Stock	18%
Large-Cap U.S. Stock	17%
Bonds	16%
Real Estate	15%
Mid-Cap U.S. Stock	13%
Small-Cap U.S. Stock	12%
Commodities	9%

Bar Graph

**Back** **Next**

Clutter and confusion are not attributes of information, they are failures of design.

Edward Tufte

Statistician and data  
visualisation guru





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used in this presentation:

mostly from Microsoft Clipart circa 2009  
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