Why do we chart?

US debt as percentage of gross domestic product, 1855—2011

1855	0.9%	1887	11.2	1919	33.4	1951	63.7	1983	33.1
1856	0.7	1888	10.2	1920	27.3	1952	61.8	1984	34.0
1857	0.9	1889	8.6	1921	31.6	1953	60.2	1985	36.4
1858	1.2	1890	7.8	1922	31.1	1954	60.7	1986	39.5
1859	1.5	1891	7.0	1923	25.2	1955	55.5	1987	40.6
1860	1.9	1892	6.6	1924	23.5	1956	51.2	1988	41.0
1861	7.2	1893	6.8	1925	21.6	1957	48.1	1989	40.6
1862	16.8	1894	7.9	1926	19.0	1958	49.5	1990	42.1
1863	23.8	1895	7.9	1927	18.0	1959	47.0	1991	45.3
1864	25.6	1896	8.5	1928	17.0	1960	44.8	1992	48.1
1865	31.0	1897	8.0	1929	14.9	1961	44.6	1993	49.3
1866	31.4	1898	8.4	1930	16.5	1962	42.9	1994	49.2
1867	31.4	1899	7.5	1931	22.3	1963	41.4	1995	49.1
1868	30.5	1900	6.6	1932	34.5	1964	39.0	1996	48.4
1869	30.0	1901	5.7	1933	39.1	1965	36.5	1997	45.9
1870	27.9	1902	5.4	1934	44.0	1966	33.7	1998	43.0
1871	25.7	1903	5.0	1935	42.9	1967	33.4	1999	39.4
1872	24.4	1904	4.7	1936	43.0	1968	31.2	2000	34.7
1873	23.2	1905	4.3	1937	40.1	1969	28.5	2001	32.5
1874	24.0	1906	4.0	1938	42.8	1970	28.0	2002	33.6
1875	23.7	1907	4.0	1939	43.0	1971	28.1	2003	35.6
1876	24.1	1908	4.3	1940	42.7	1972	27.4	2004	36.8
1877	23.9	1909	3.8	1941	43.3	1973	26.0	2005	36.9
1878	25.5	1910	3.7	1942	62.0	1974	23.9	2006	36.6
1879	23.0	1911	3.6	1943	77.1	1975	25.3	2007	36.3
1880	18.4	1912	3.4	1944	95.7	1976	27.5	2008	40.5
1881	16.8	1913	3.2	1945	112.7	1977	27.8	2009	54.1
1882	14.3	1914	3.5	1946	102.6	1978	27.4	2010	62.8
1883	13.5	1915	3.3	1947	90.4	1979	25.6	2011	67.7
1884	13.3	1916	2.7	1948	79.9	1980	26.1		
1885	13.2	1917	13.3	1949	81.4	1981	25.8		
1886	12.4	1918	30.2	1950	73.7	1982	28.7		

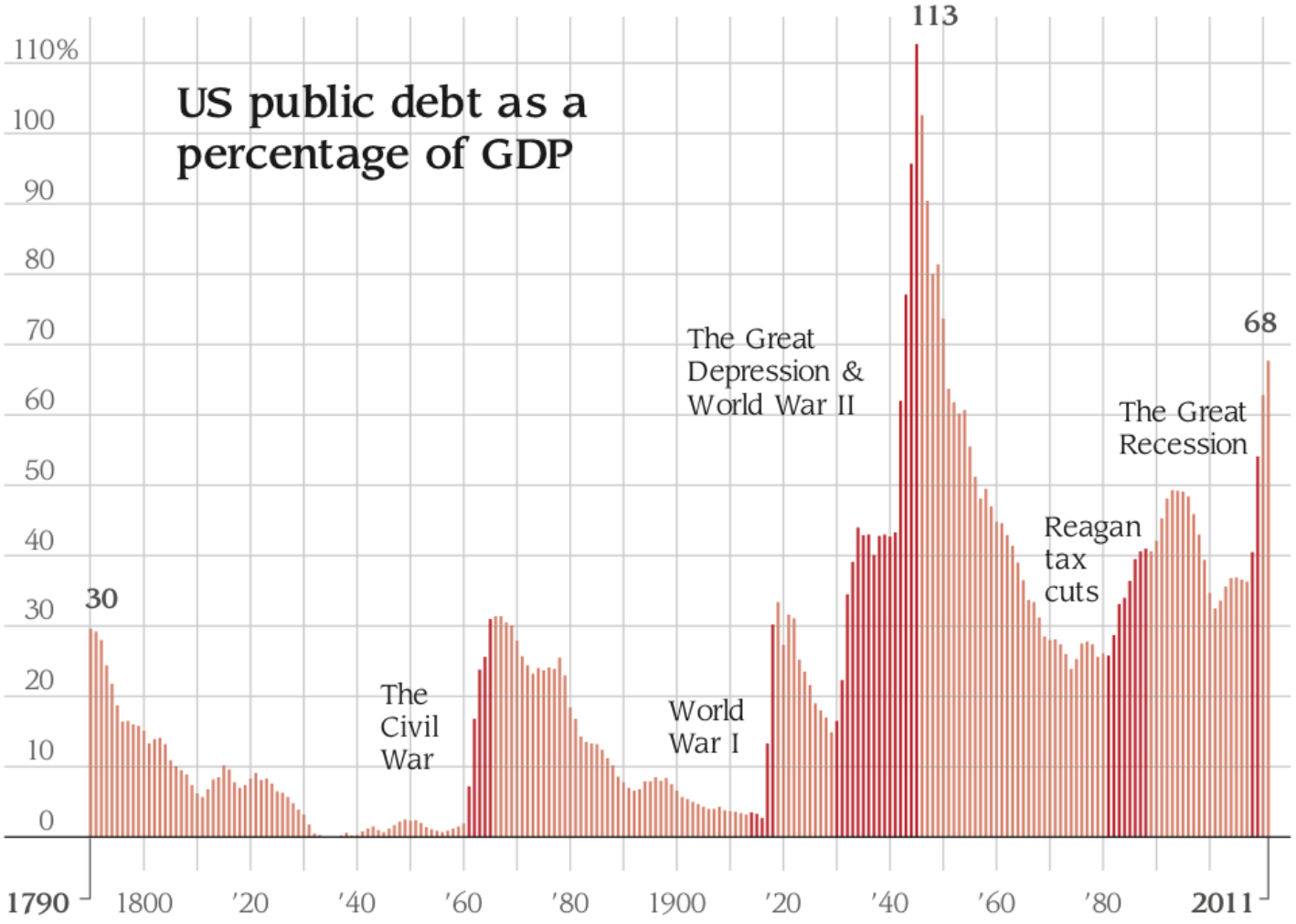
The Civil War

World War I

The Great Depression & World War II

Reagan tax cuts

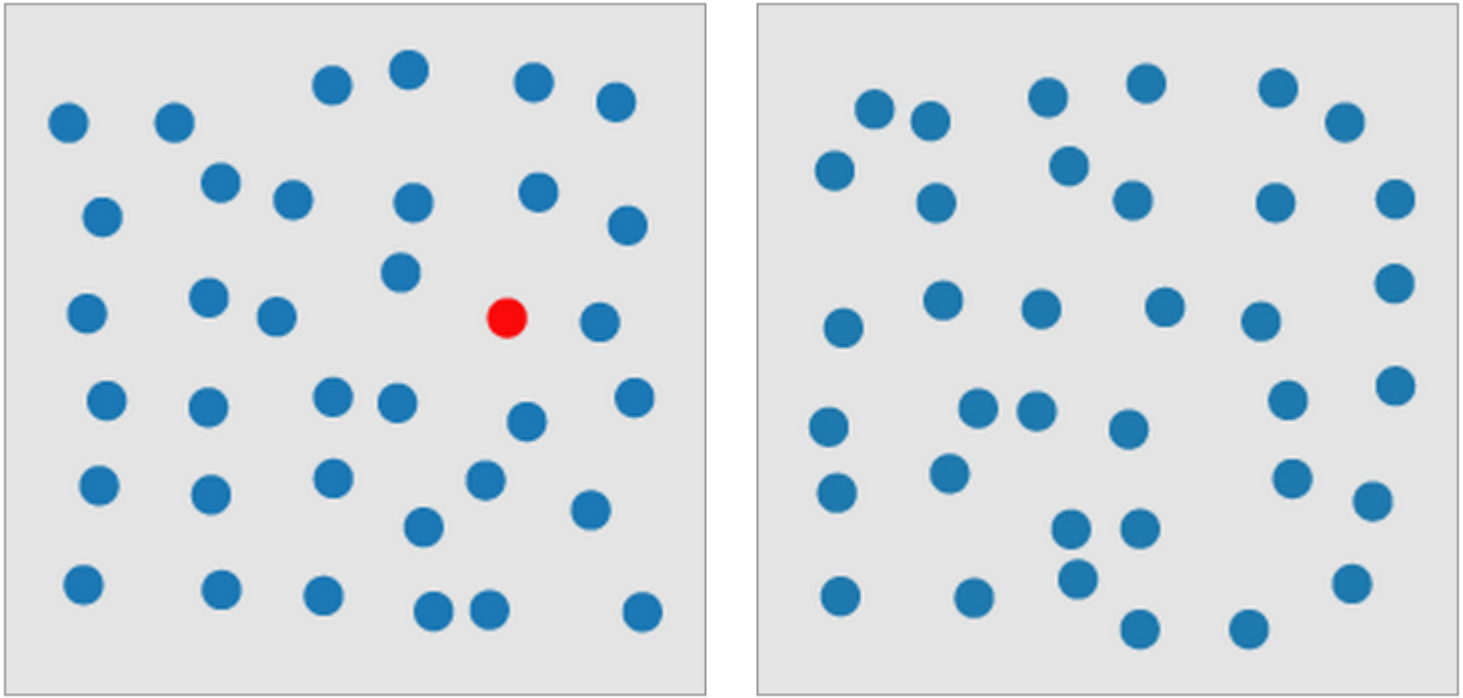
The Great Recession



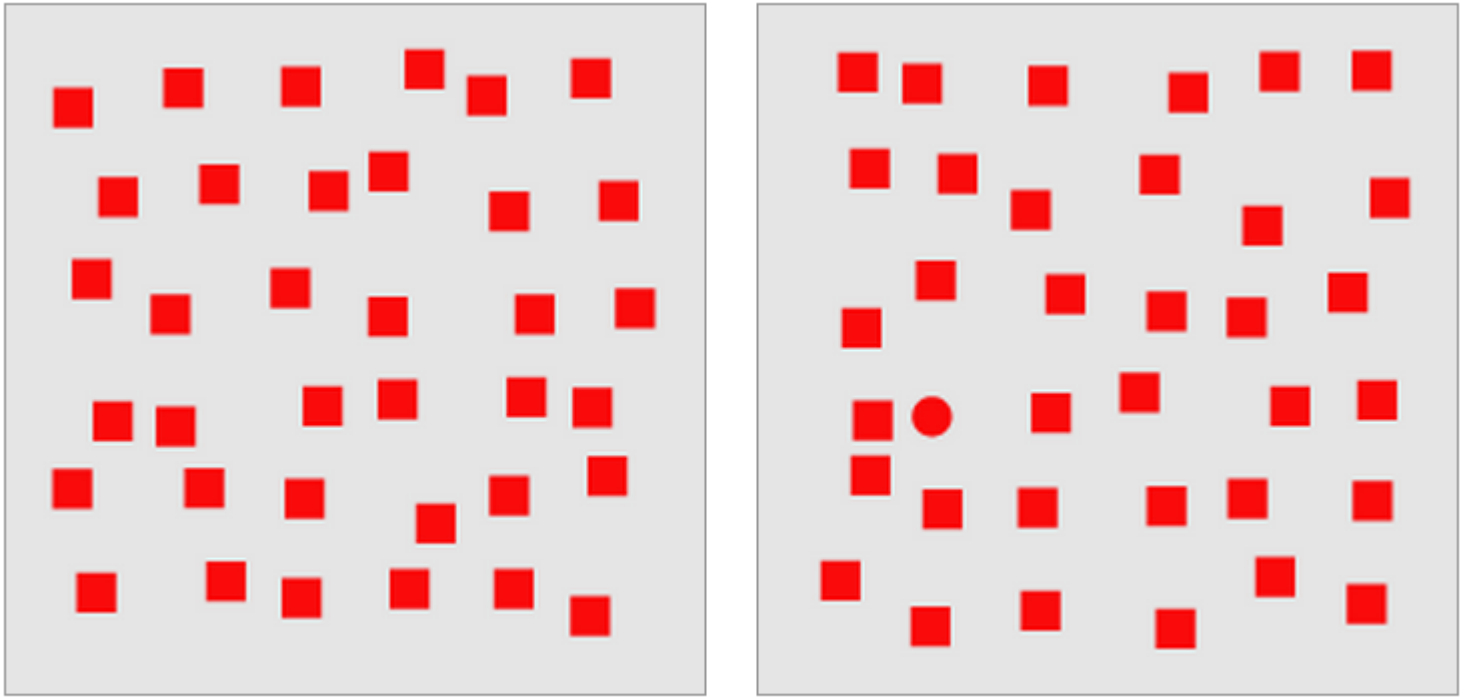
Pre-attentive processing

...visual properties that are detected very rapidly and accurately by the low-level visual system

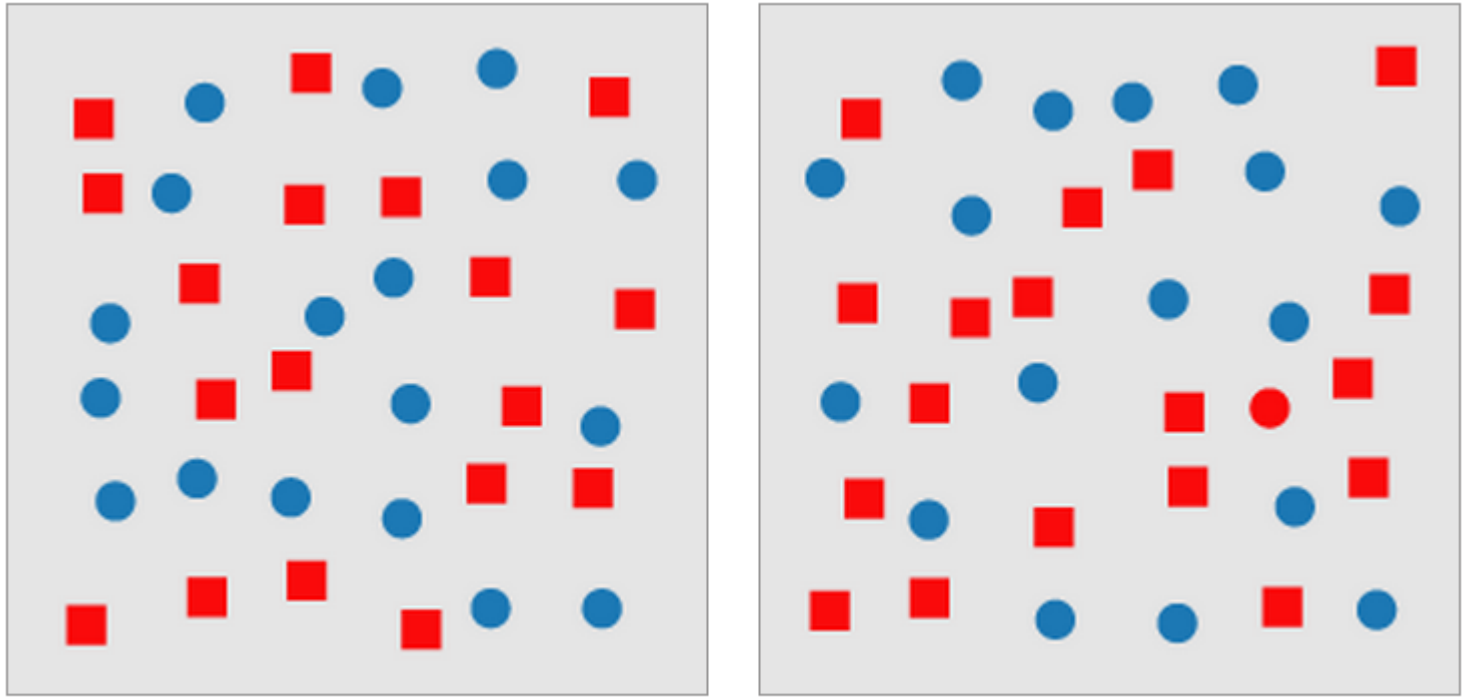
http://www.csc.ncsu.edu/faculty/healey/PP/



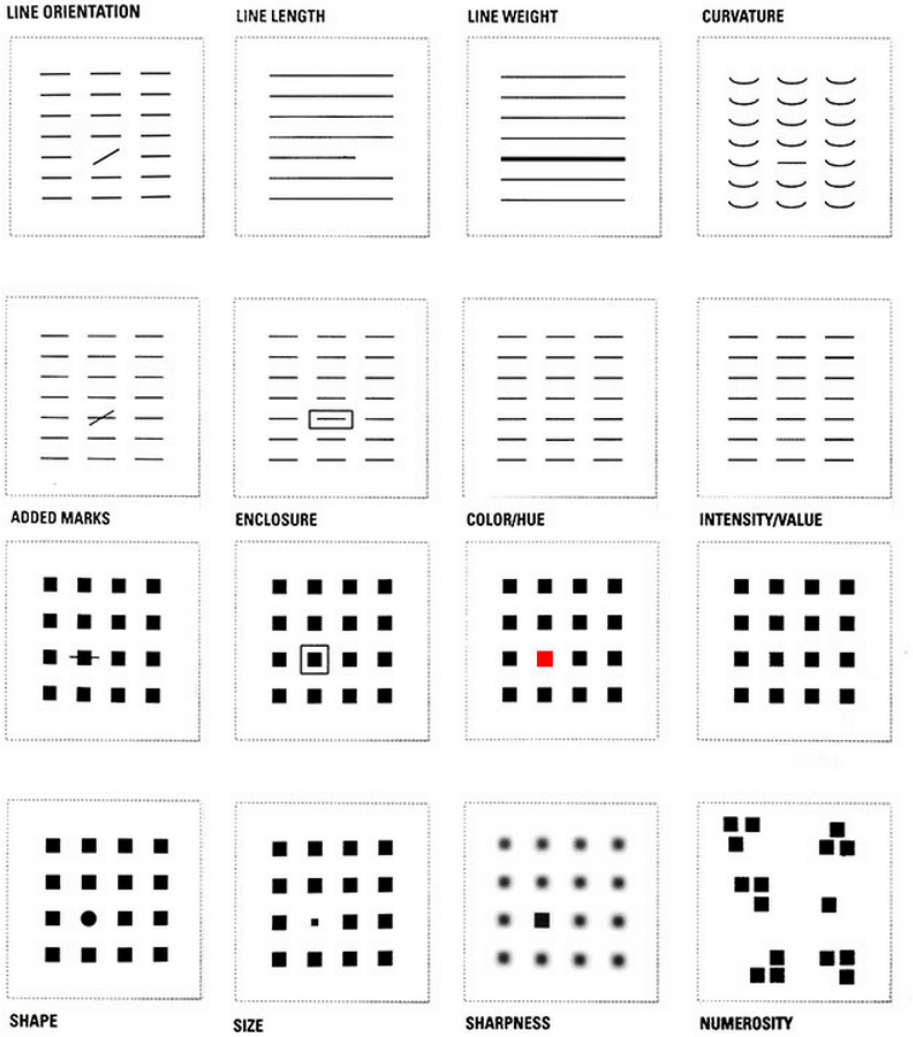
(a) (b)



(a) (b)

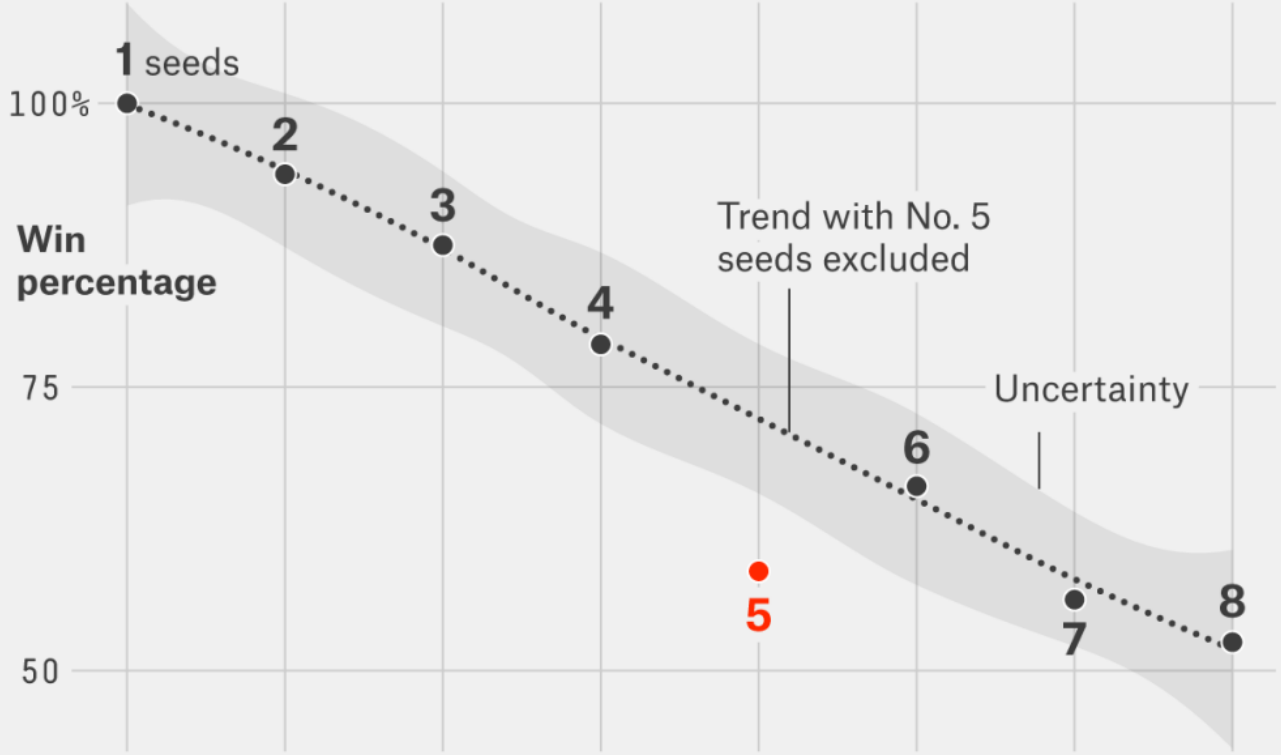


(a) (b)



Which One Doesn't Fit?

Win percentages in NCAA tournament round of 64 since 1995



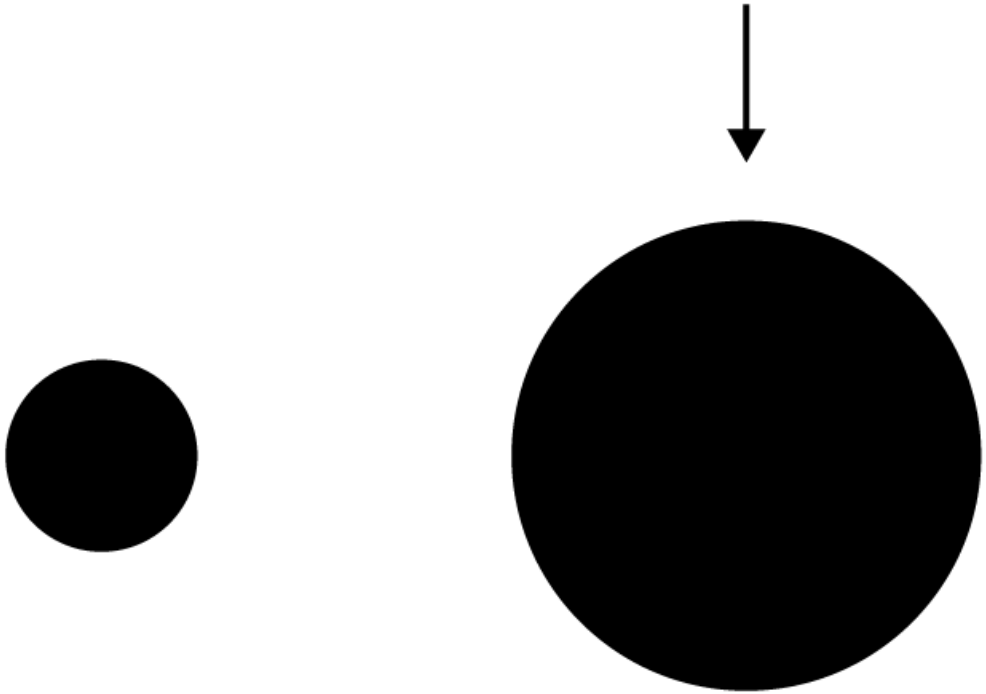
FIVETHIRTYEIGHT

Nowadays, we can also take advantage of animation

http://www.bloomberg.com/infographics/2014-05-23/flappy-bird.html

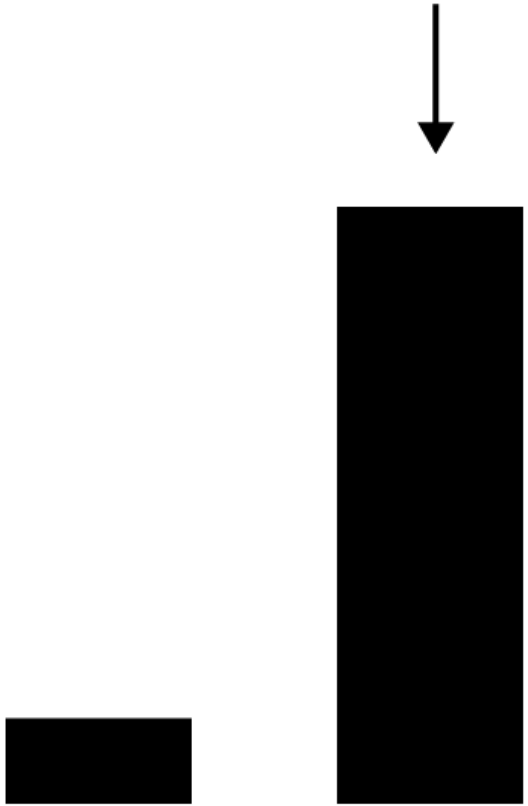
How do we chart?

How much bigger is this circle?



Idea from Jeff Heer

How much bigger is this bar?



Idea from Jeff Heer

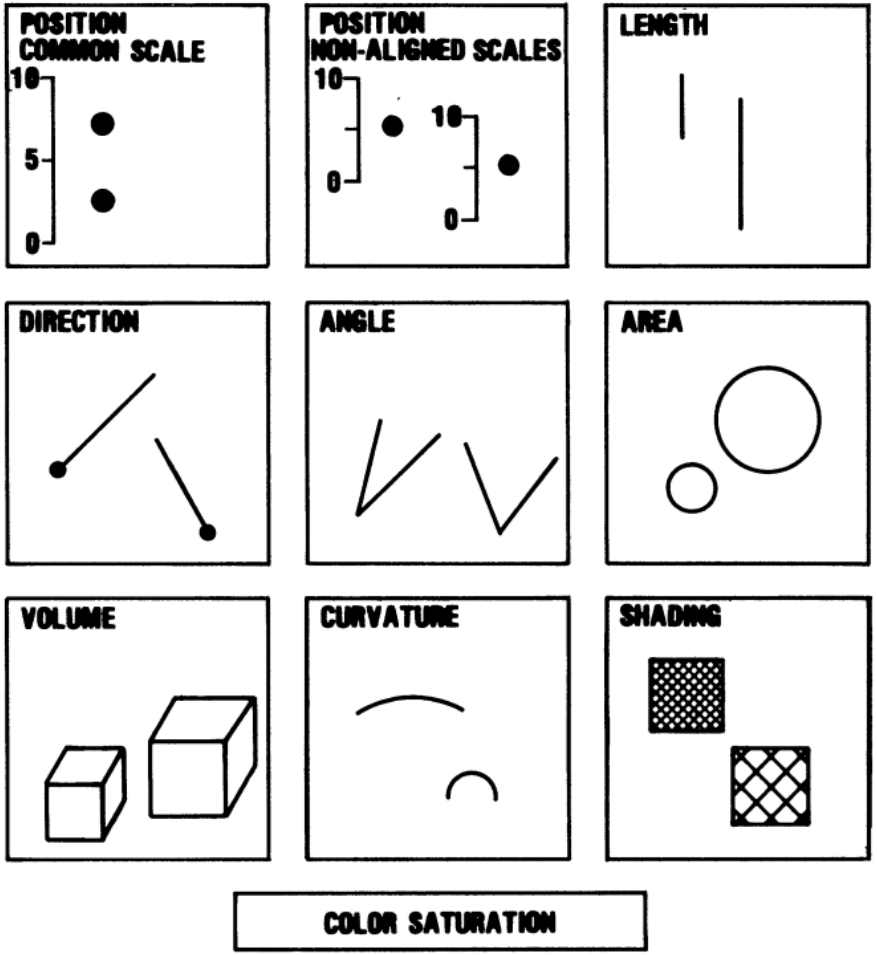


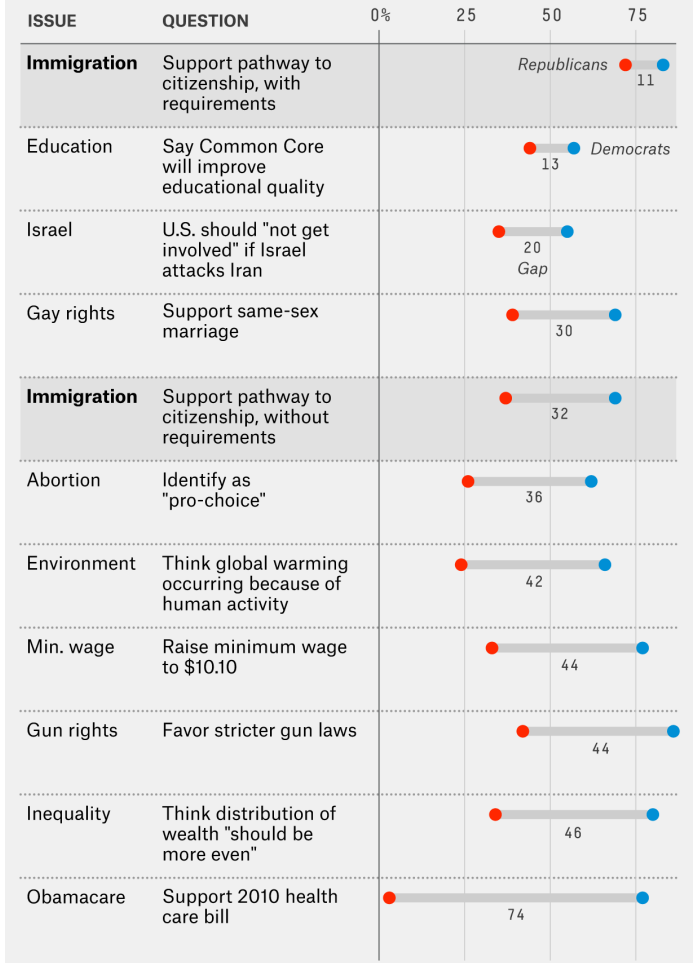
Figure 1. Elementary perceptual tasks.

The following are the 10 elementary tasks in Figure 1, ordered from most to least accurate:

1. Position along a common scale
2. Positions along nonaligned scales
3. Length, direction, angle
4. Area
5. Volume, curvature
6. Shading, color saturation

From Cleveland and McGill, 1984

Partisan Split on Major Issues



RITCHIE KING

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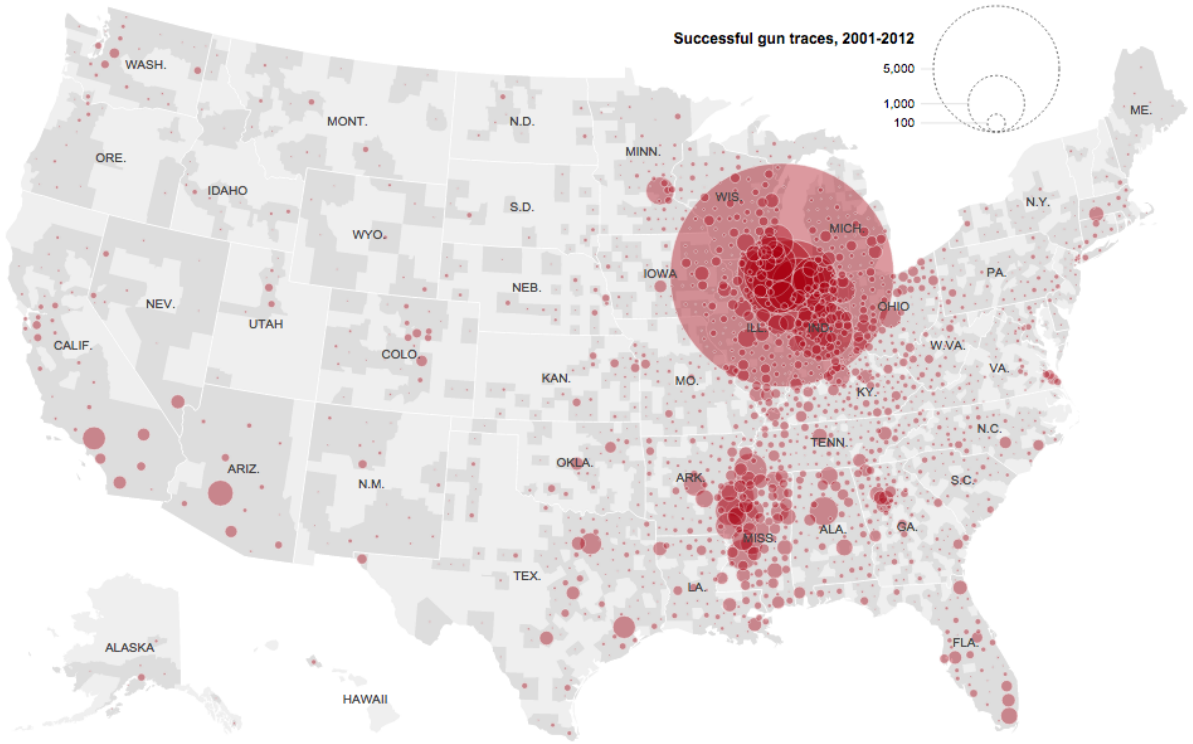
Where 50,000 Guns Recovered in Chicago Came From

The Chicago Police Department traced the origins of about 50,000 guns that it recovered between 2001 and March 2012. More than half of those guns came from outside the state. Related Article »



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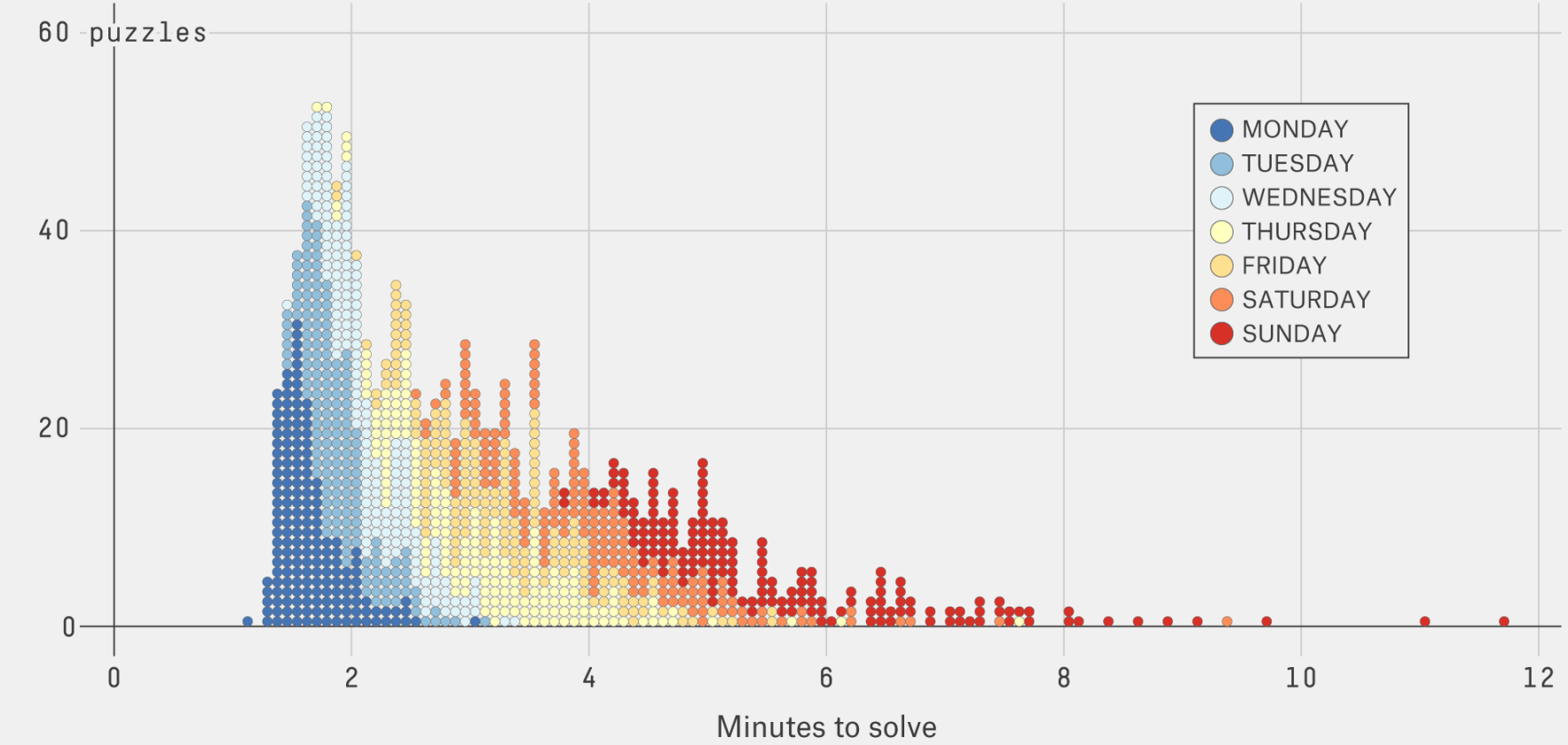
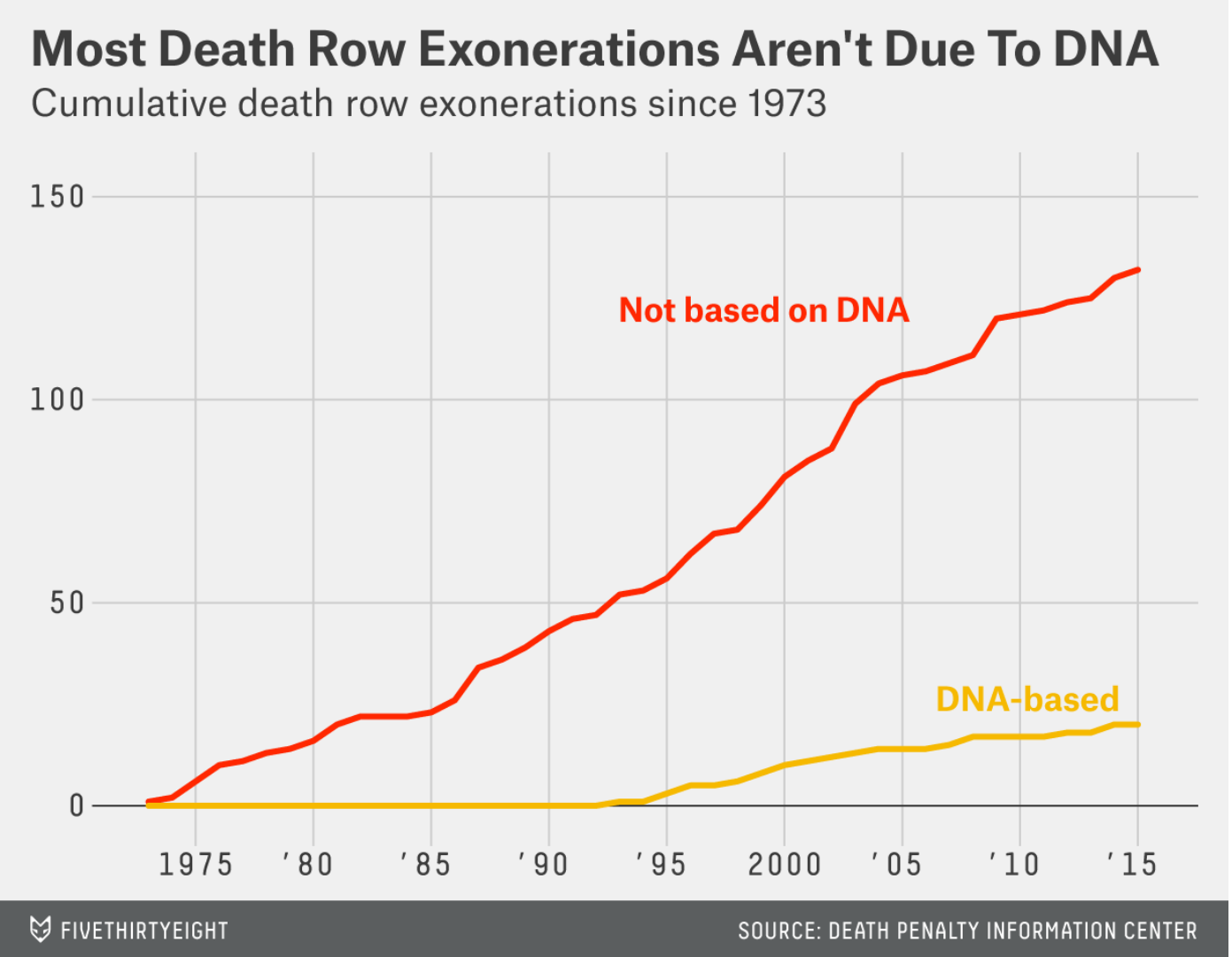
New York Times

The Puzzling Speed Of Dan Feyer

Solve times for the past 1,208 New York Times crossword puzzles, by day of the week



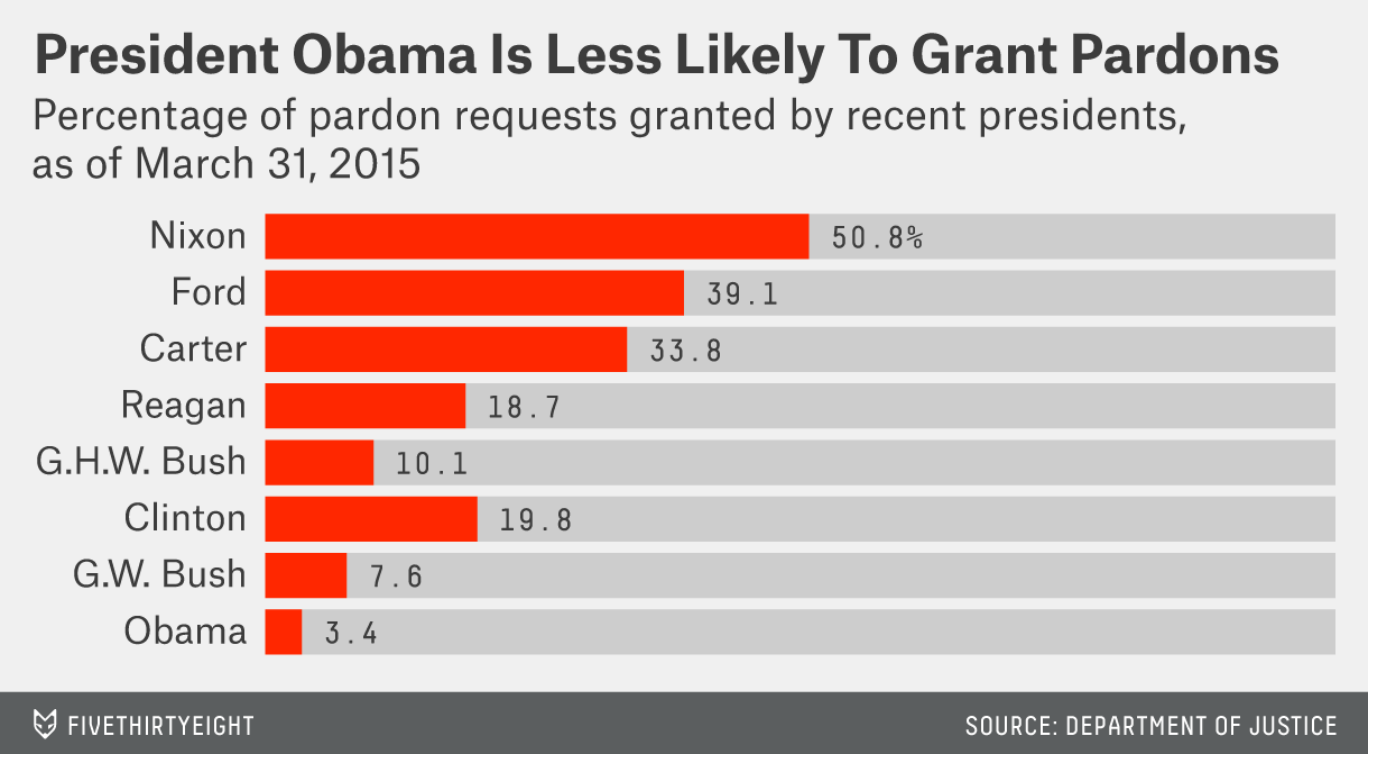


Line charts

Good for showing change over time

Pro tips:

- Put the labels close to the lines
- Don’t use too many lines



Bar charts

Good for comparing single quantities

Pro tips:

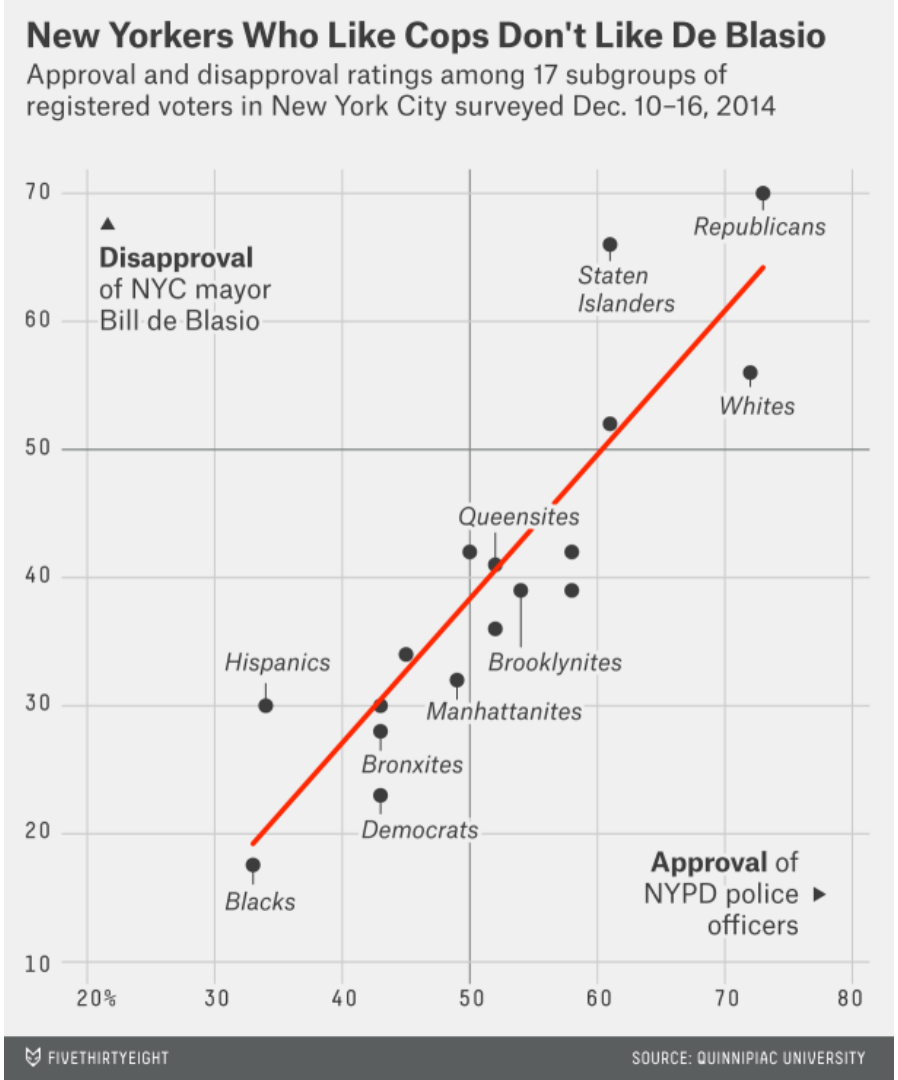
- Make sure they start at 0
- Sort the bars in a way that makes sense

Pie charts

Good for showing parts of a whole

Pro tips:

Really, they are best for showing a single part of a whole

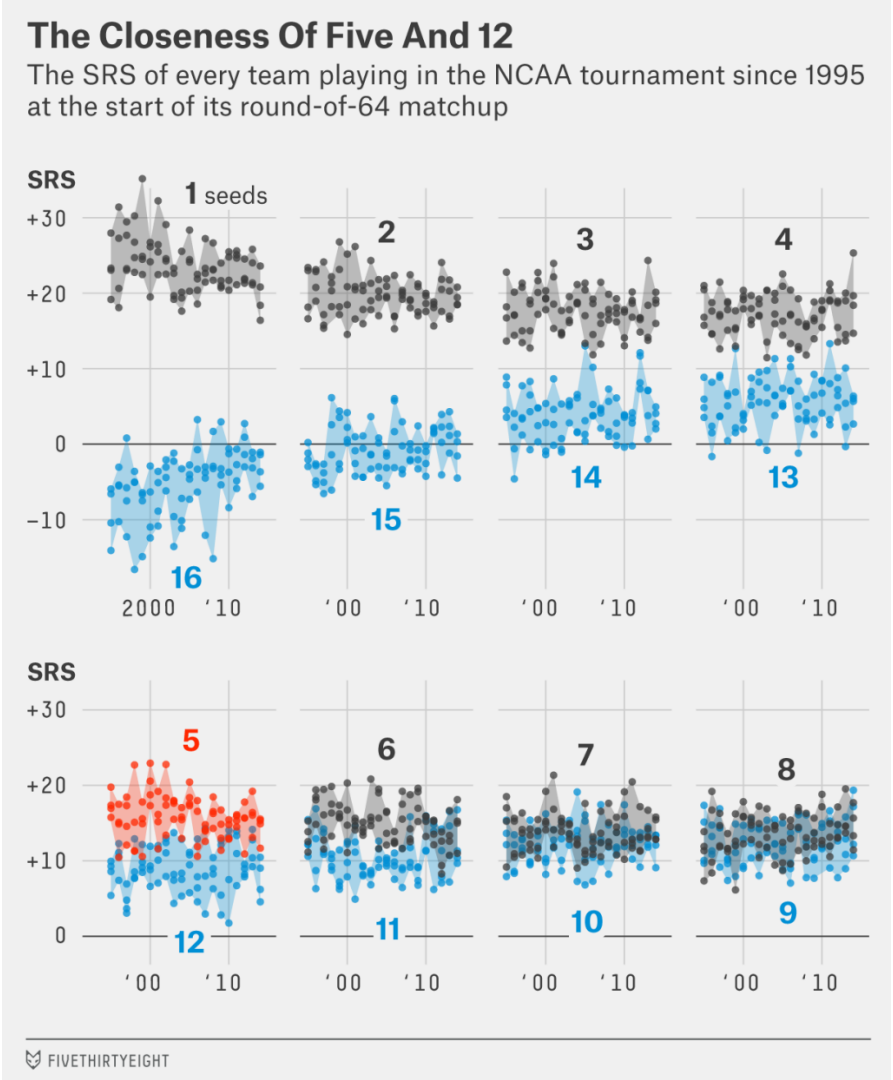


Scatterplots

Good for showing relationships

Pro tips:

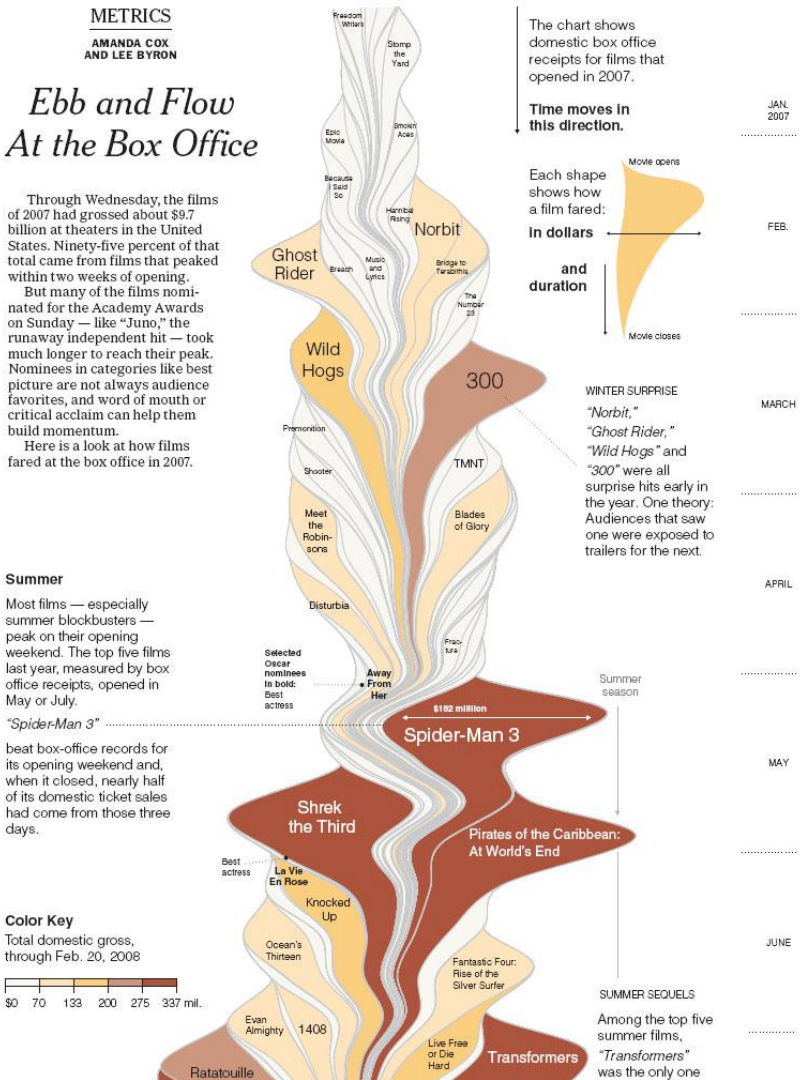
- Show a trend line or a 45-degree line



Small multiples

At the heart of quantitative reasoning is a single question: *Compared to what?* Small multiple designs, multivariate and data bountiful, answer directly by visually enforcing comparisons of changes, of the differences among objects, of the scope of alternatives. For a wide range of problems in data presentation, small multiples are the best design solution.

— Edward Tufte



Annotation Layer

Just generally crucial for explaining what your graphic is showing