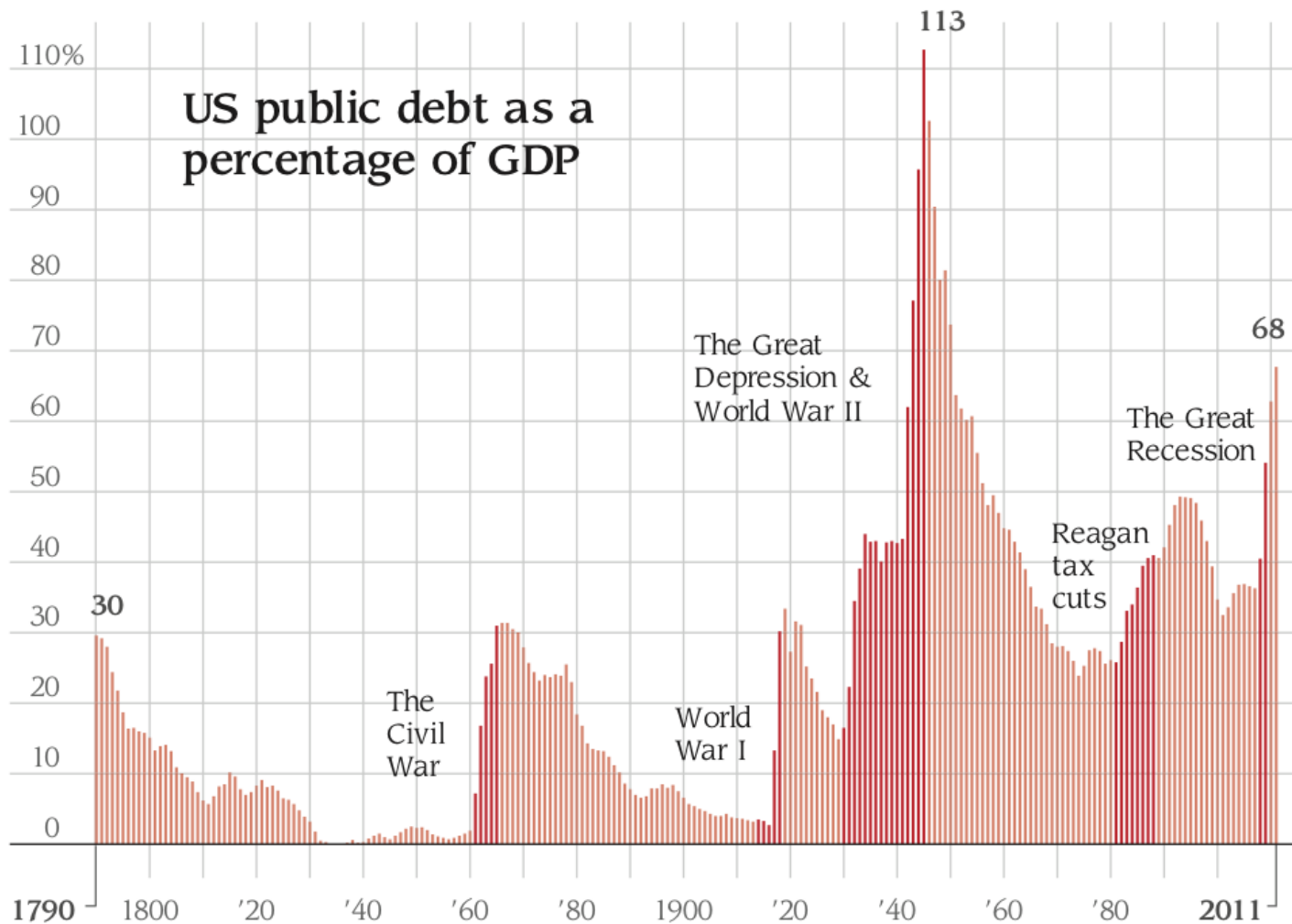


# Why do we chart?

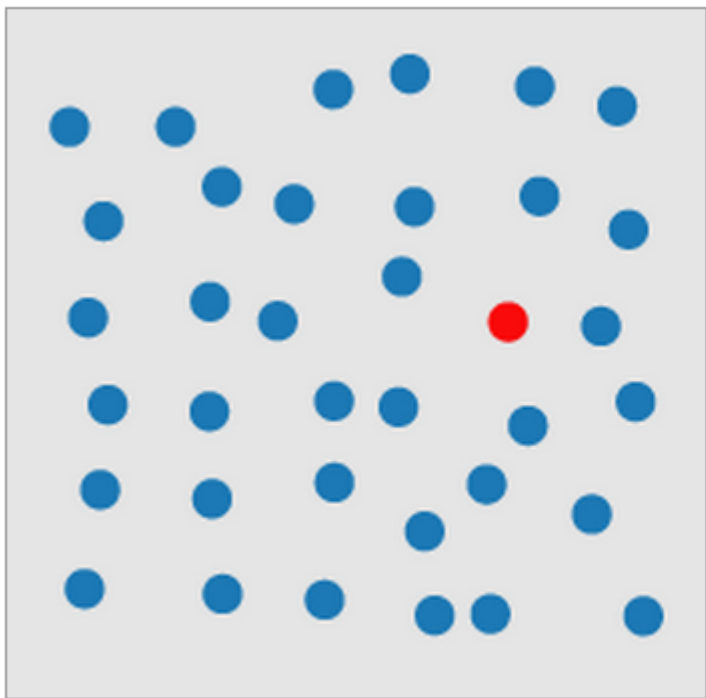
US debt as percentage of gross domestic product, 1855—2011

|      |      |               |      |      |             |      |       |                                     |      |      |      |      |                     |
|------|------|---------------|------|------|-------------|------|-------|-------------------------------------|------|------|------|------|---------------------|
| 1855 | 0.9% |               | 1887 | 11.2 |             | 1919 | 33.4  |                                     | 1951 | 63.7 | 1983 | 33.1 | Reagan tax cuts     |
| 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  | The Civil War | 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  | The Great Depression & World War II | 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 | The Great Recession |
| 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  | World War I | 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 |      |      |                     |

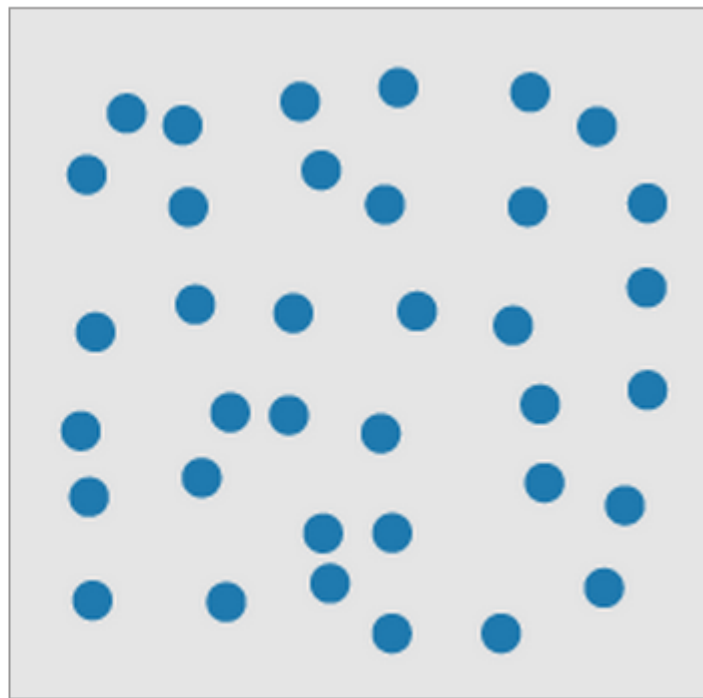


# Pre-attentive processing

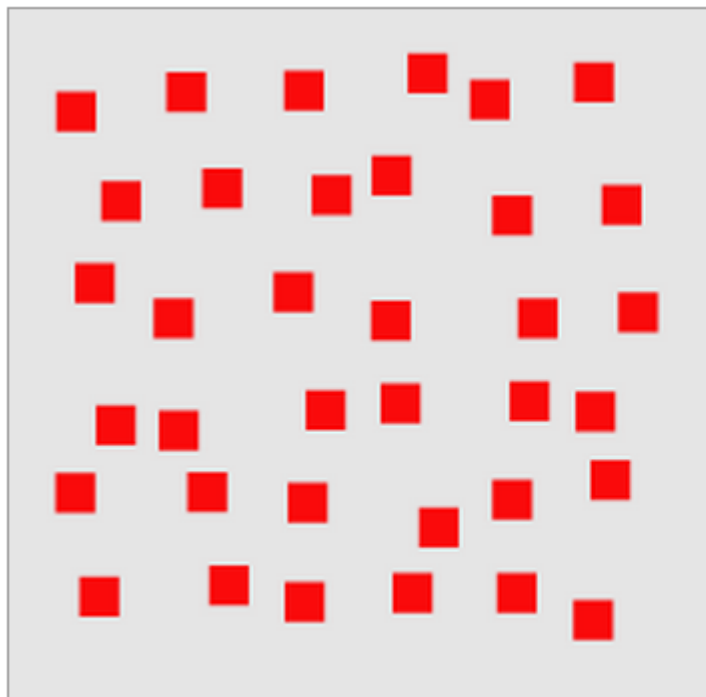
*...visual properties that are detected very rapidly and accurately by the low-level visual system*



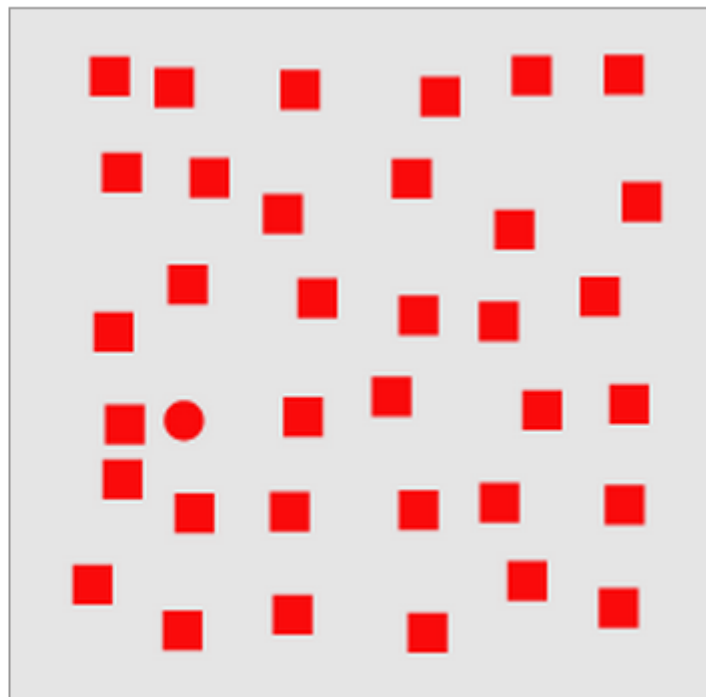
(a)



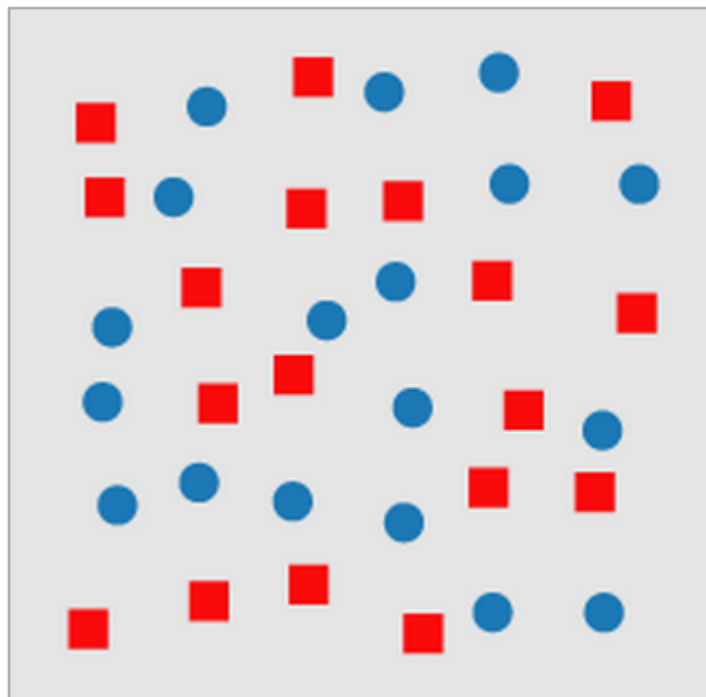
(b)



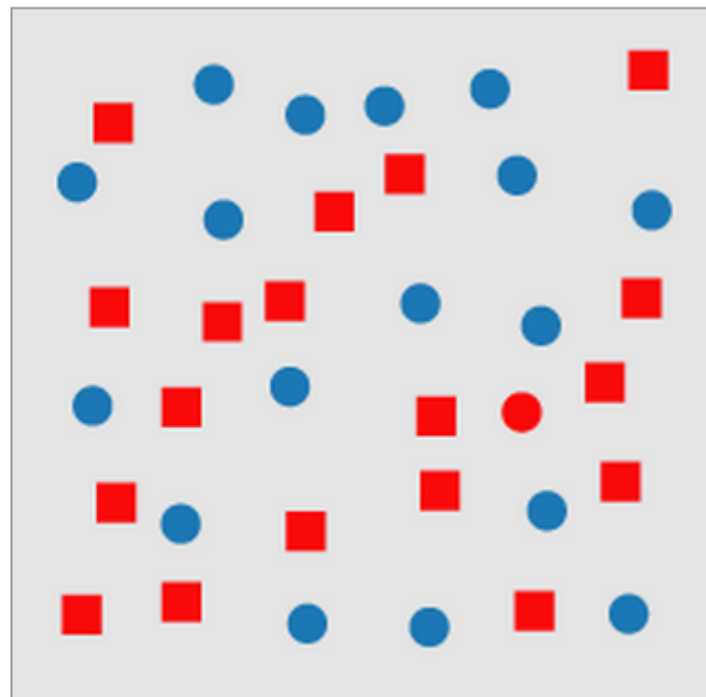
(a)



(b)

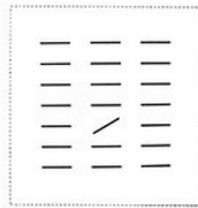


(a)

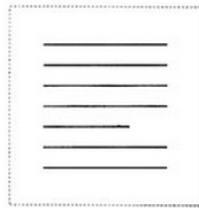


(b)

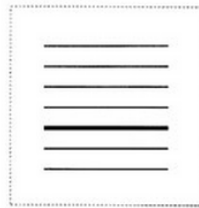
LINE ORIENTATION



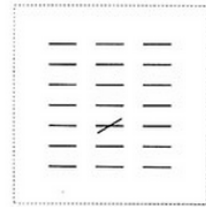
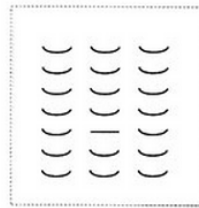
LINE LENGTH



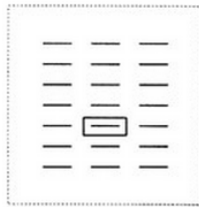
LINE WEIGHT



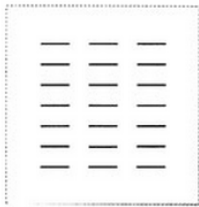
CURVATURE



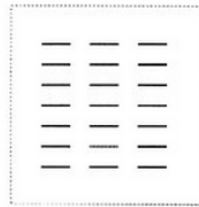
ADDED MARKS



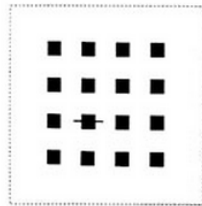
ENCLOSURE



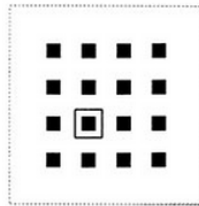
COLOR/HUE



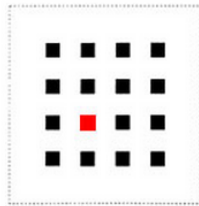
INTENSITY/VALUE



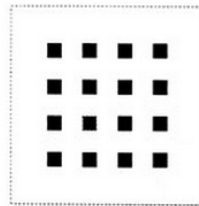
SHAPE



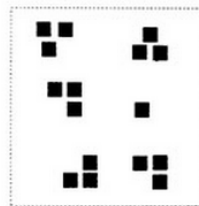
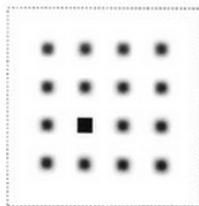
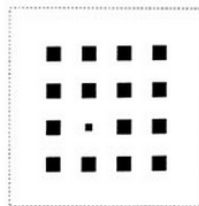
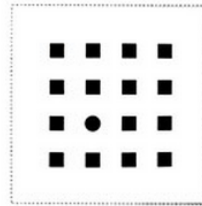
SIZE



SHARPNESS



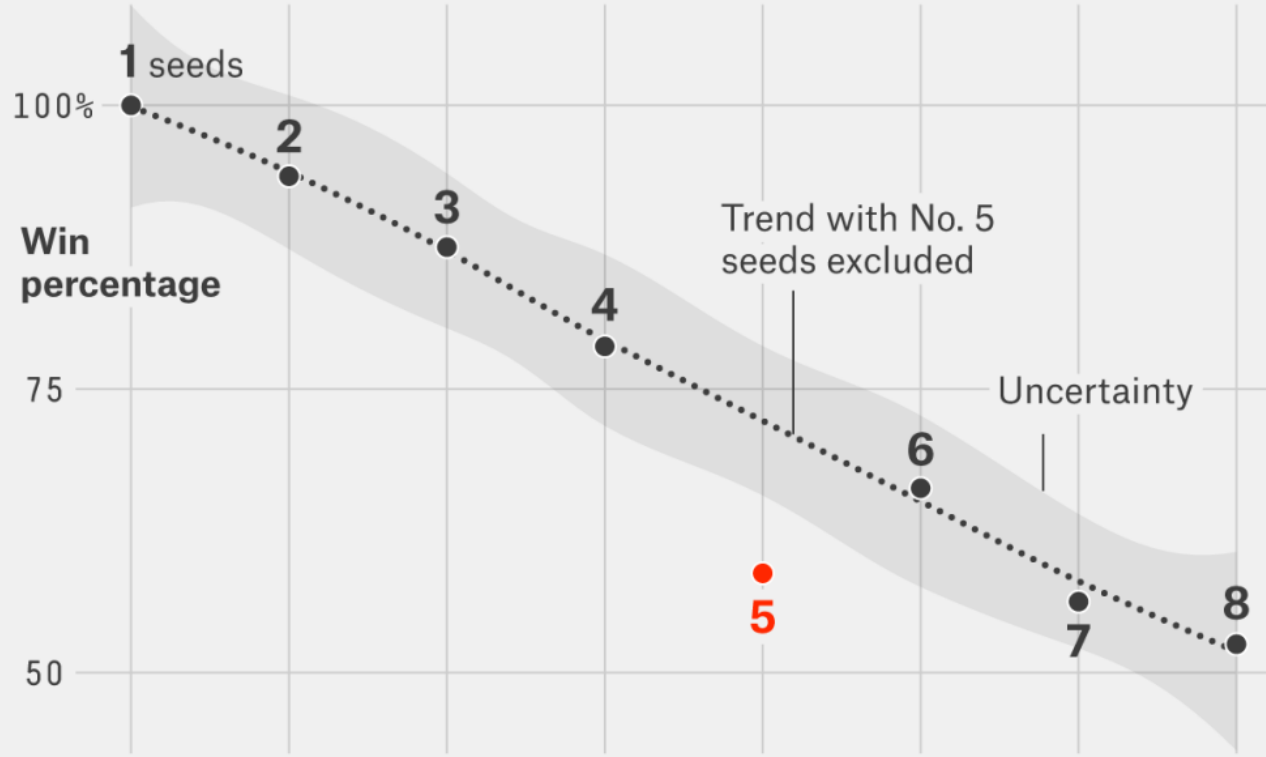
NUMEROSITY





# Which One Doesn't Fit?

Win percentages in NCAA tournament round of 64 since 1995

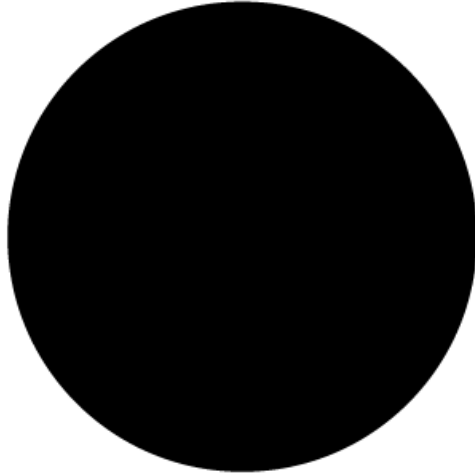


Nowadays, we can also  
take advantage of  
animation

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

How do we chart?

How much bigger is this circle?

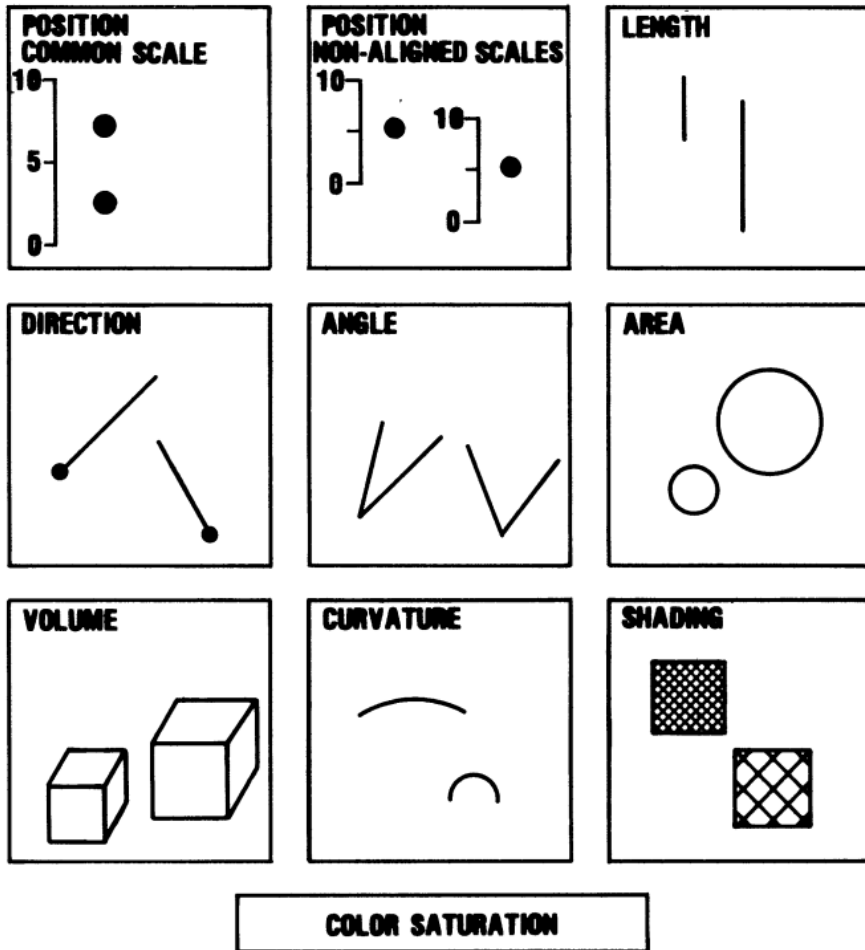


Idea from Jeff  
Heer

How much bigger is this bar?



Idea from Jeff  
Heer

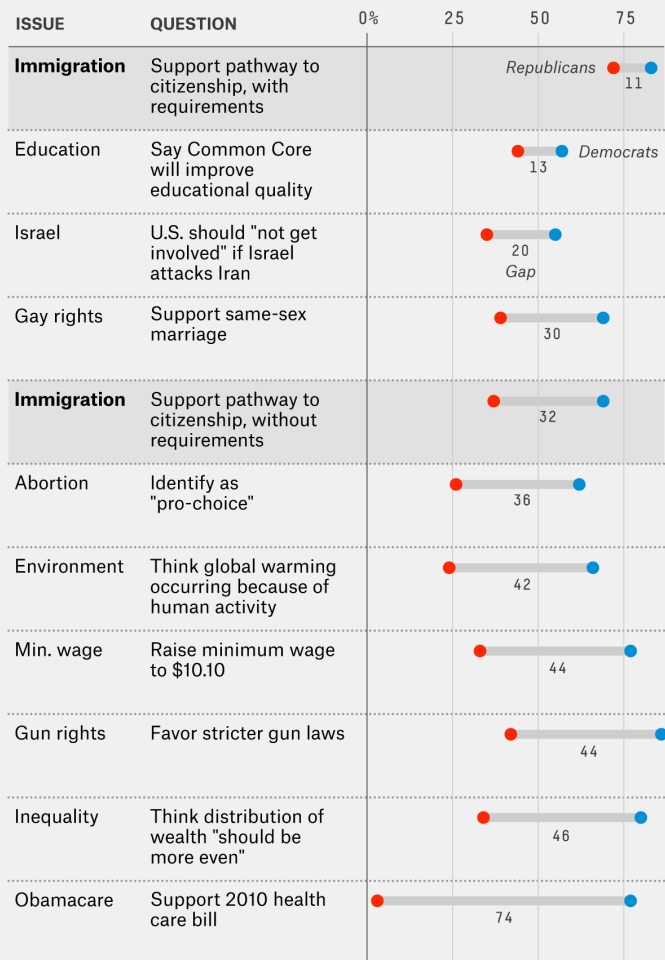


The following are the 10 elementary tasks in Figure 1, ordered from most to least accurate:

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

*Figure 1. Elementary perceptual tasks.*

## Partisan Split on Major Issues



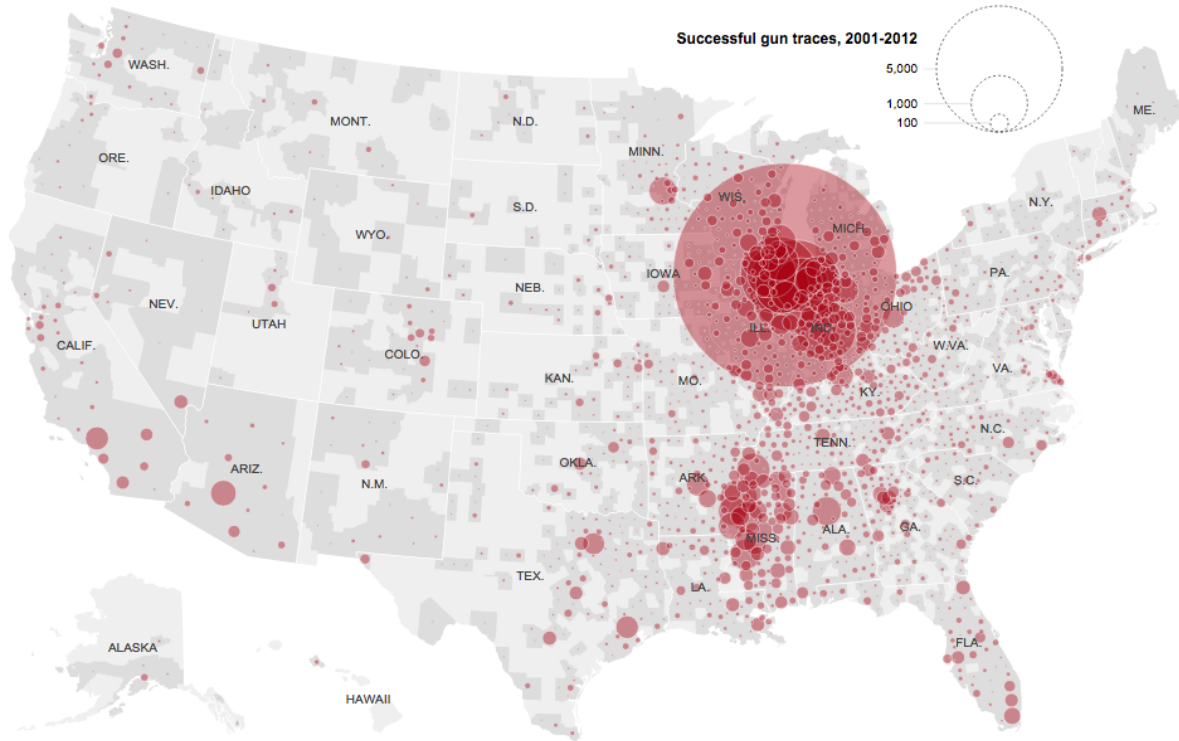
The following are the 10 elementary tasks in Figure 1, ordered from most to least accurate:

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

# 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 »](#)



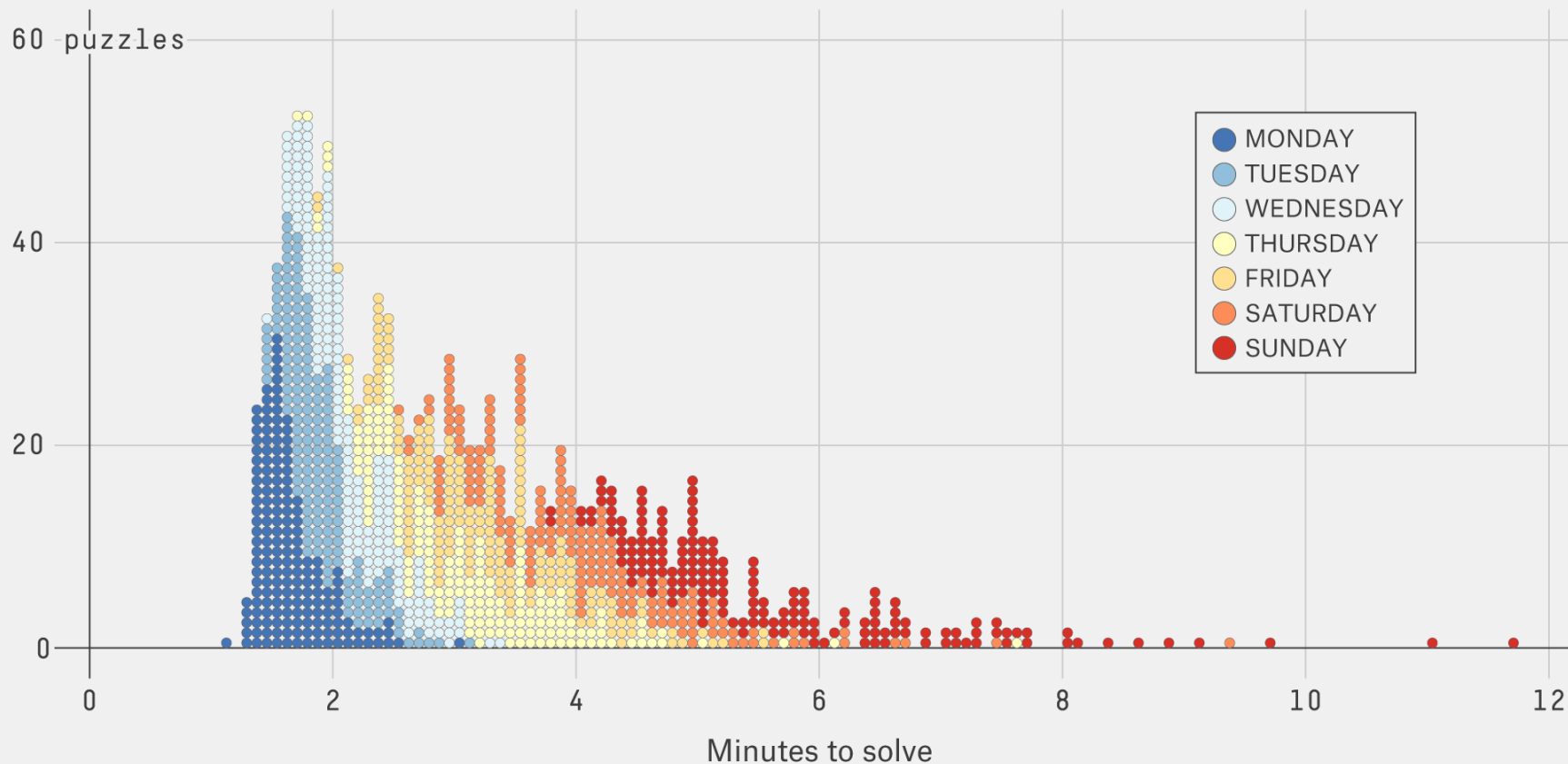
The following are the 10 elementary tasks in Figure 1, ordered from most to least accurate:

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



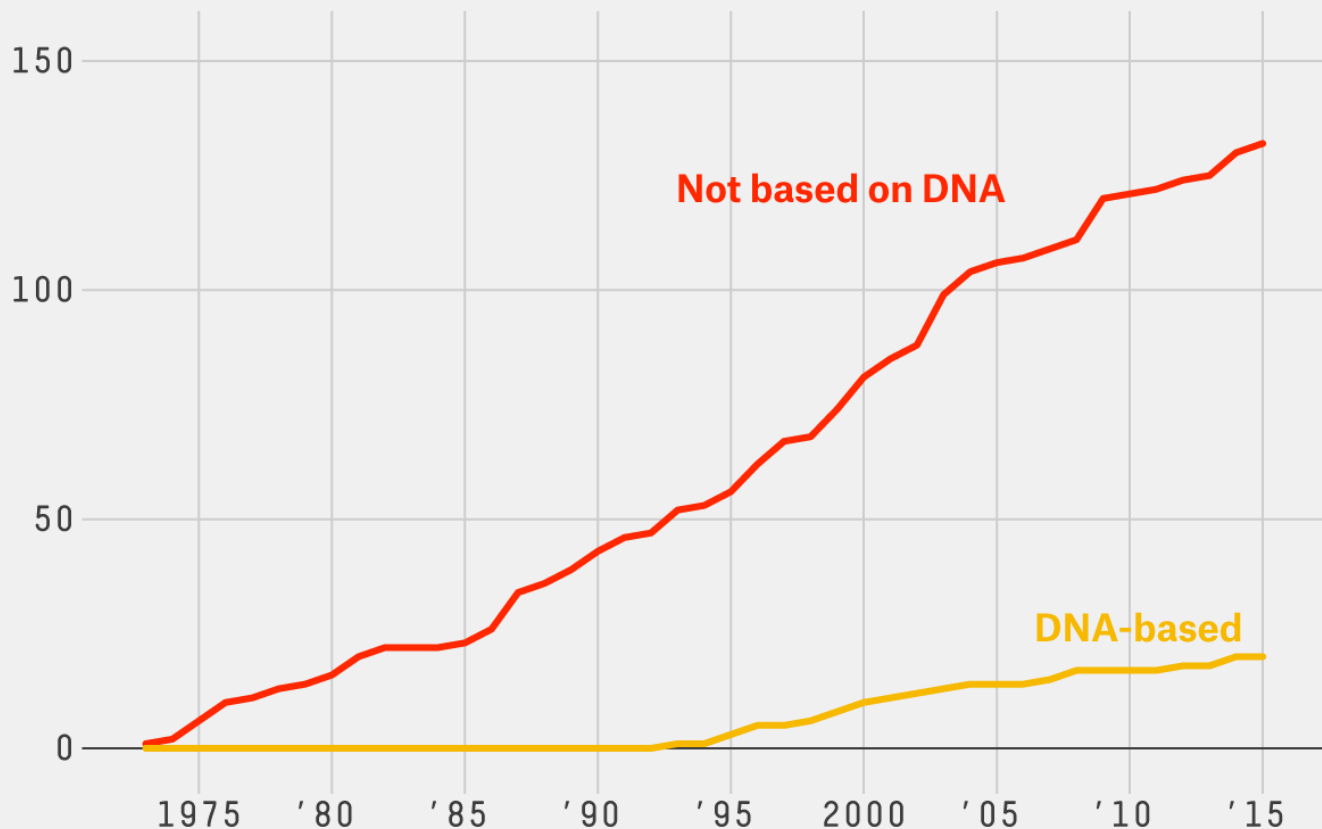
# The Puzzling Speed Of Dan Feyer

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



# Most Death Row Exonerations Aren't Due To DNA

Cumulative death row exonerations since 1973



## Line charts

Good for showing change over time

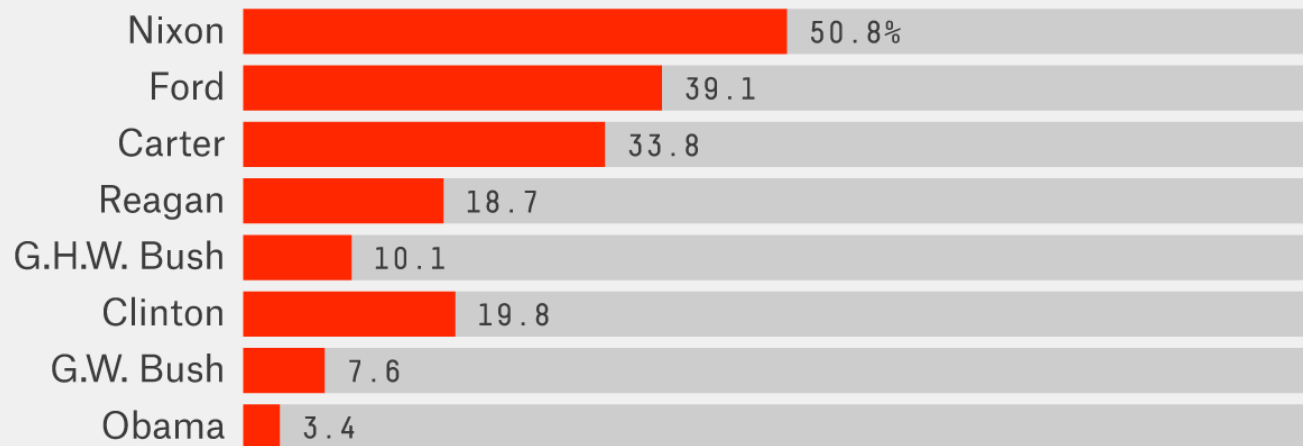
Pro tips:

Put the labels close to the lines

Don't use too many lines

# President Obama Is Less Likely To Grant Pardons

Percentage of pardon requests granted by recent presidents, as of March 31, 2015



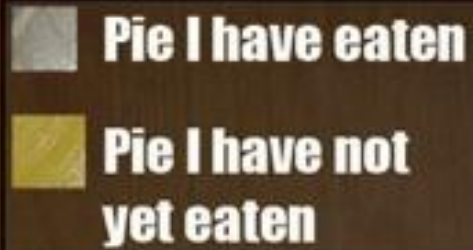
## Bar charts

Good for comparing single quantities

Pro tips:

Make sure they start at 0

Sort the bars in a way that makes sense



## Pie charts

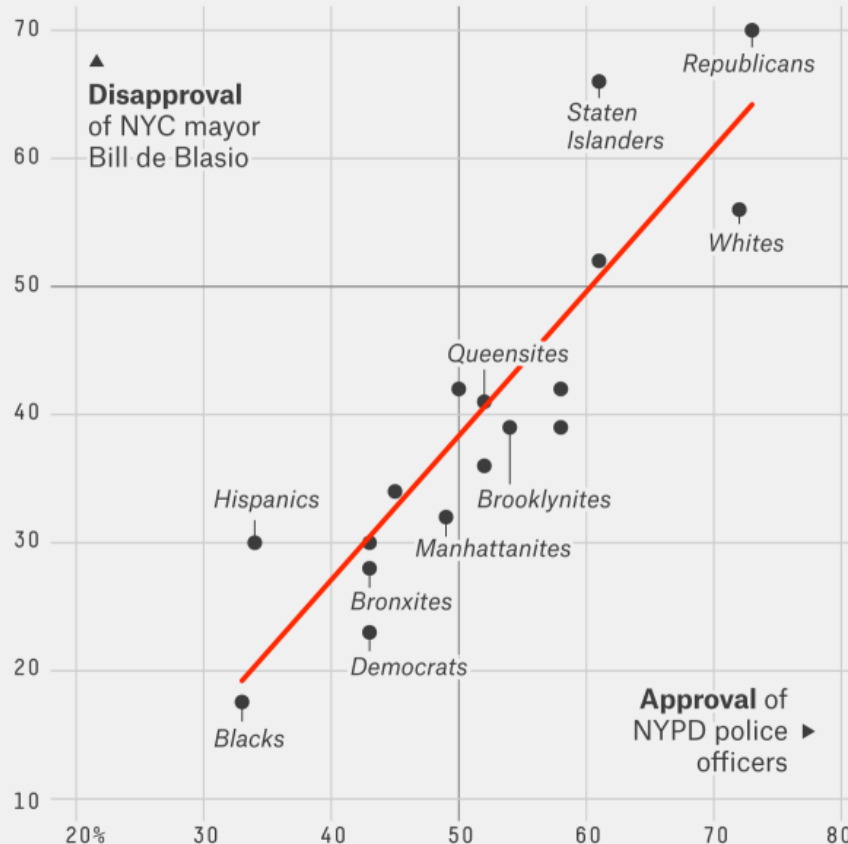
Good for showing parts of a whole

Pro tips:

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

## New Yorkers Who Like Cops Don't Like De Blasio

Approval and disapproval ratings among 17 subgroups of registered voters in New York City surveyed Dec. 10–16, 2014



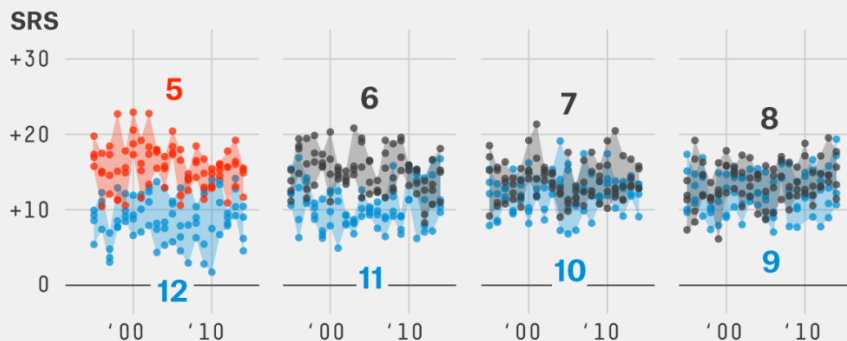
## Scatterplots

Good for showing relationships

Pro tips:

Show a trend line or a 45-degree line

The SRS of every team playing in the NCAA tournament since 1995 at the start of its round-of-64 matchup



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.

 FIVETHIRTYEIGHT

## Ebb and Flow At the Box Office

Through Wednesday, the films of 2007 had grossed about \$9.7 billion at theaters in the United States. Ninety-five percent of that total came from films that peaked within two weeks of opening.

But many of the films nominated for the Academy Awards on Sunday — like “Juno,” the runaway independent hit — took much longer to reach their peak. Nominees in categories like best picture are not always audience favorites, and word of mouth or critical acclaim can help them build momentum.

Here is a look at how films fared at the box office in 2007.

### Summer

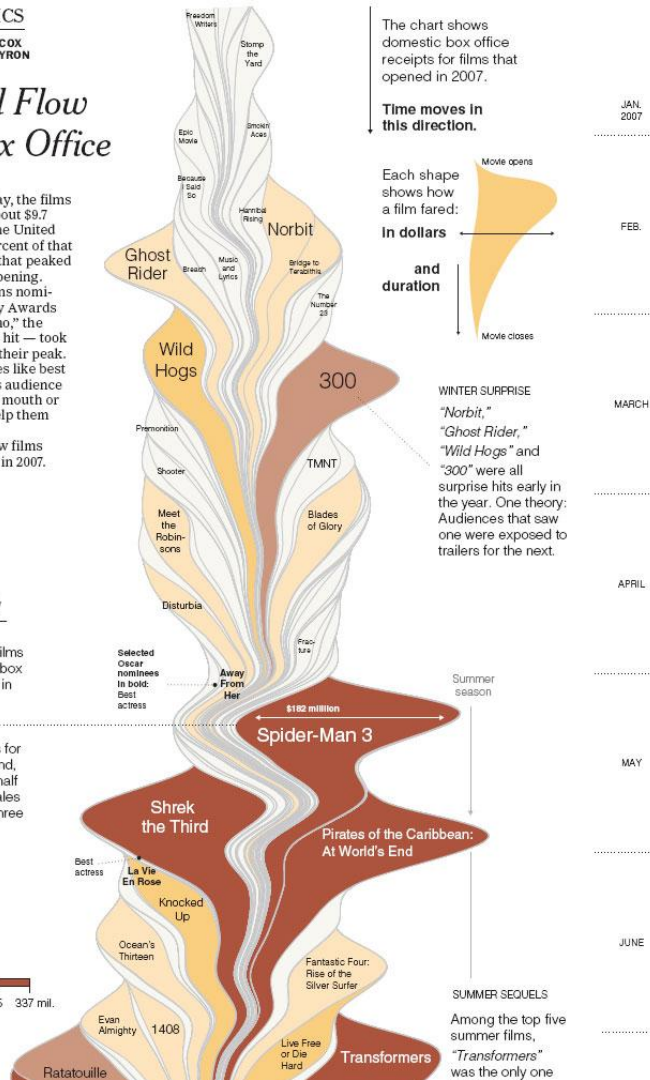
Most films — especially summer blockbusters — peak on their opening weekend. The top five films last year, measured by box office receipts, opened in May or July.

“Spider-Man 3”

beat box-office records for its opening weekend and, when it closed, nearly half of its domestic ticket sales had come from those three days.

### Color Key

Total domestic gross, through Feb. 20, 2008



## Annotation Layer

Just generally crucial for explaining what your graphic is showing