

Children names – simulations and facts

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outline

1. The American data *
2. The Simmel effect and some stylized facts
3. Three big regions in the U.S.
4. Cult of personality - how it ended
5. Conclusions

* <https://www.ssa.gov/OACT/babynames/limits.html>

1. The data: network of correlations

www.ssa.gov
 $x(i,t,a)$

i,j – name

a,b – state

$t = 1910, \dots, 2011$

Correlations ρ_{ij} of the state profiles of names' popularity:

$$y(i,t,a) = \frac{x(i,t,a)}{\sum_b x(i,t,b)}$$

$i, j = 1, \dots, 100$

Communities - Calculations

- The matrix elements
- The time evolution*

$$w_{ab} = \frac{1 + \rho_{ab}}{2}$$

$$\frac{dw_{ab}}{dt} = G(w_{ab}) \sum_c (w_{ac} w_{cb} - \beta)$$

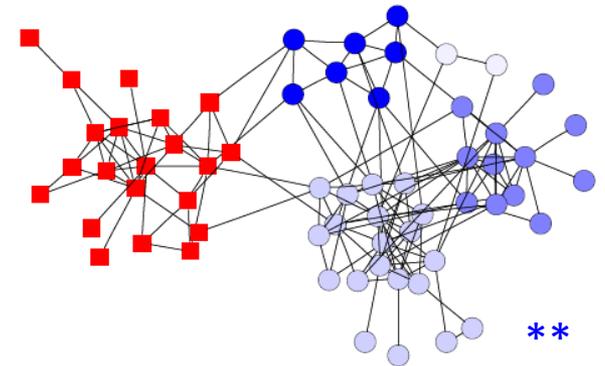
$$G(x) = \Theta(x)\Theta(1-x)$$

where β is a free parameter to maximalize Q ** :

$$Q = \frac{1}{m} \sum_{ab} \left(w_{ab} - \frac{k_a k_b}{m} \right) \delta(a, b)$$

$$k_a = \sum_c w_{ac}$$

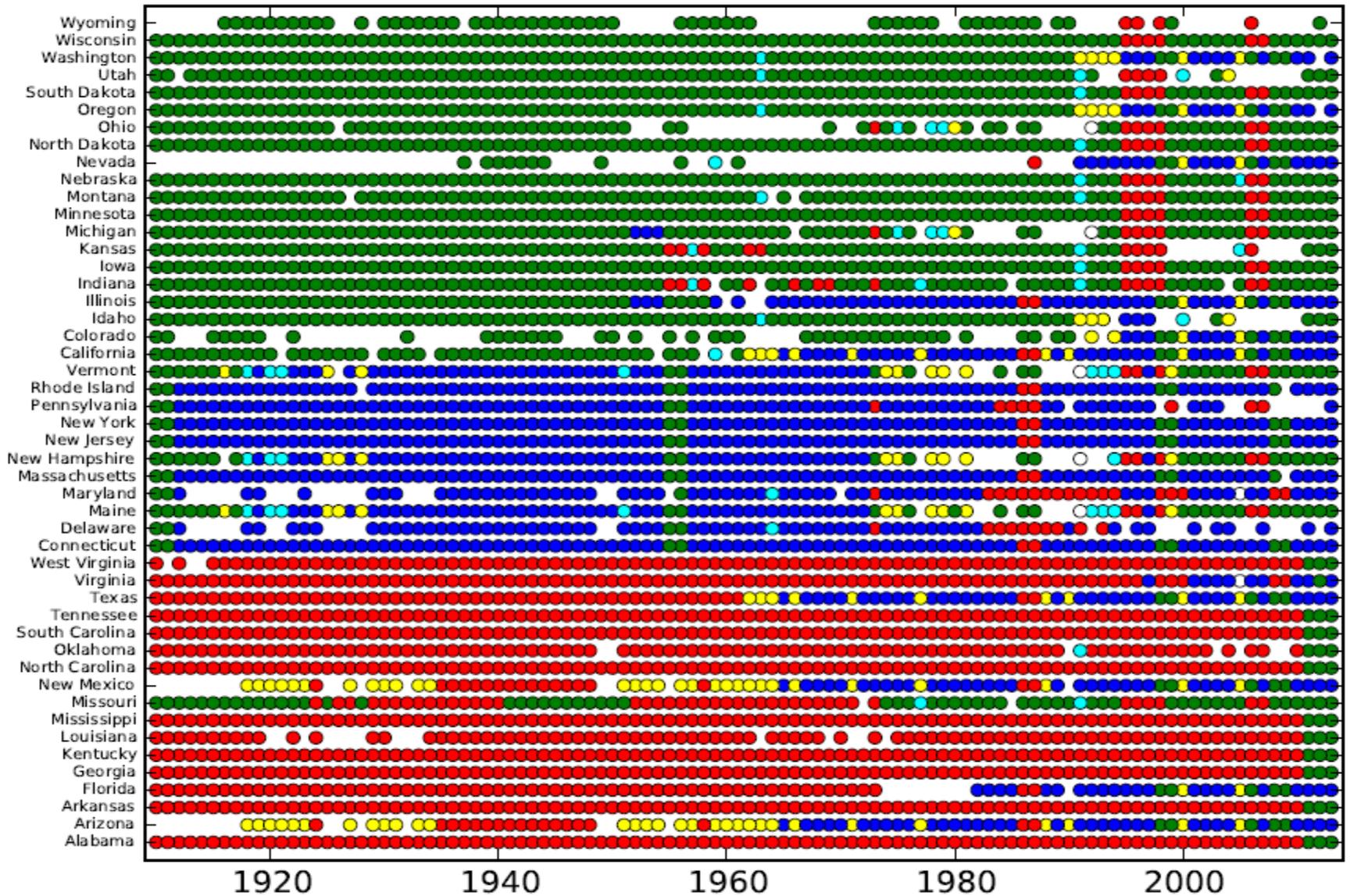
$$m = \sum_a k_a$$



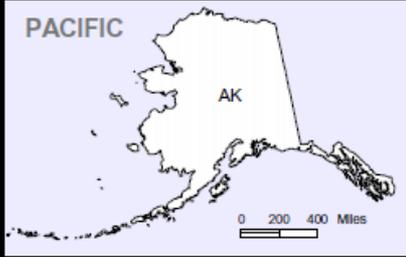
* M. J. Krawczyk, PRE 77 (2008) 065701

** M. E. J. Newman, M. Girvan, PRE 69 (2004) 026113

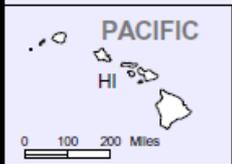
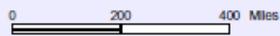
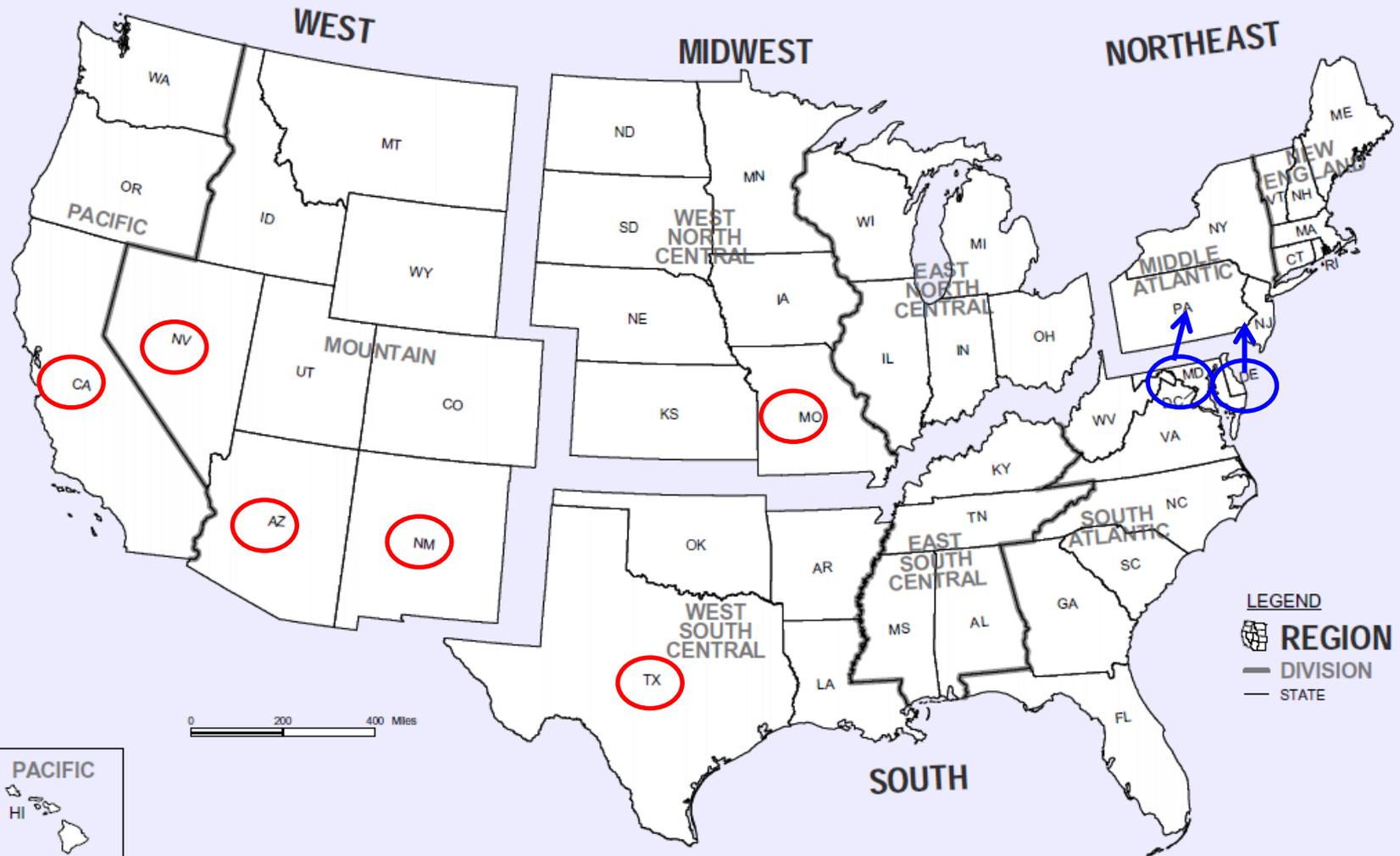
3. Three big regions in the U.S.



PACIFIC



Census Regions and Divisions of the United States



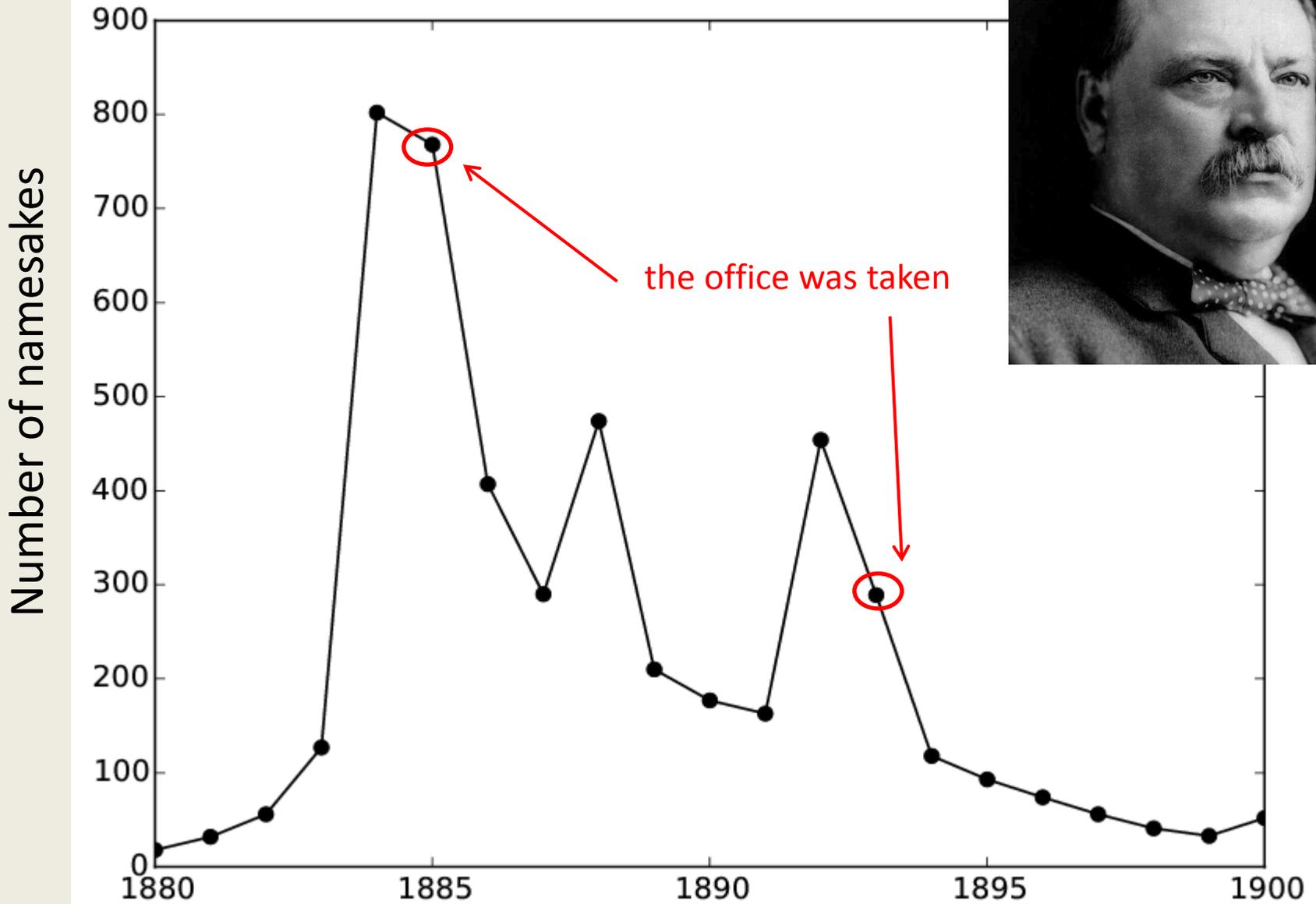
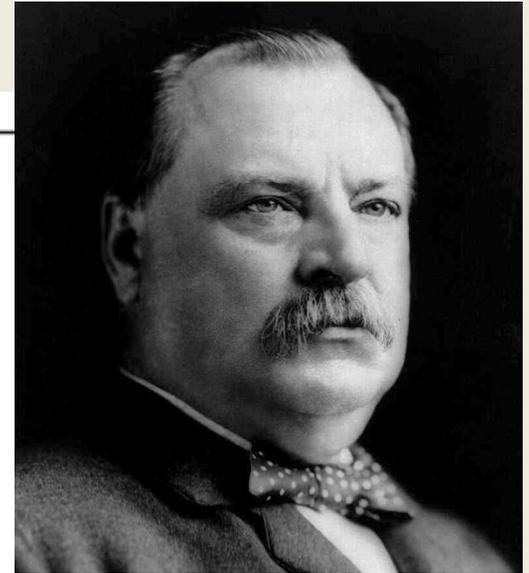
LEGEND

-  **REGION**
-  **DIVISION**
-  **STATE**

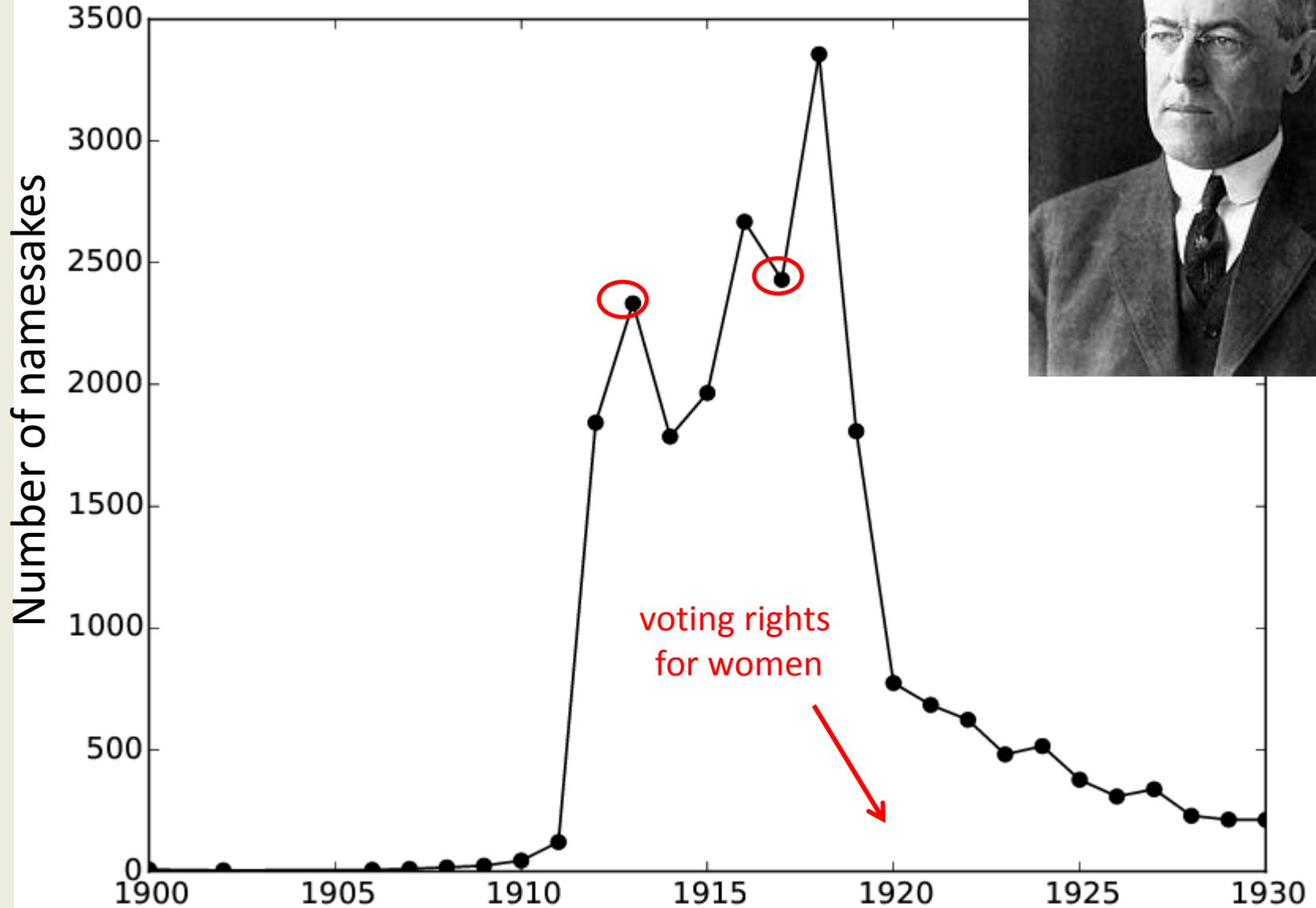
4. Cult of personality



Grover Cleveland, 1885-89, 1893-97



Woodrow Wilson, 1913-21



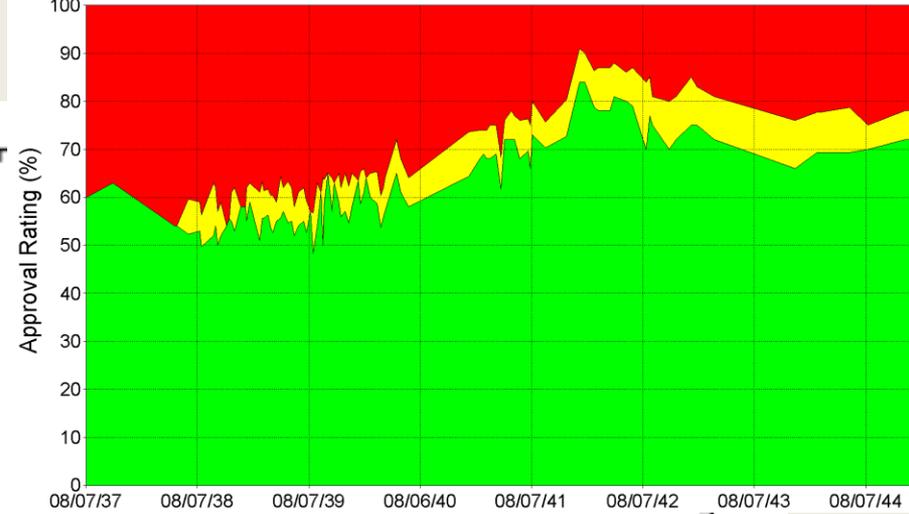
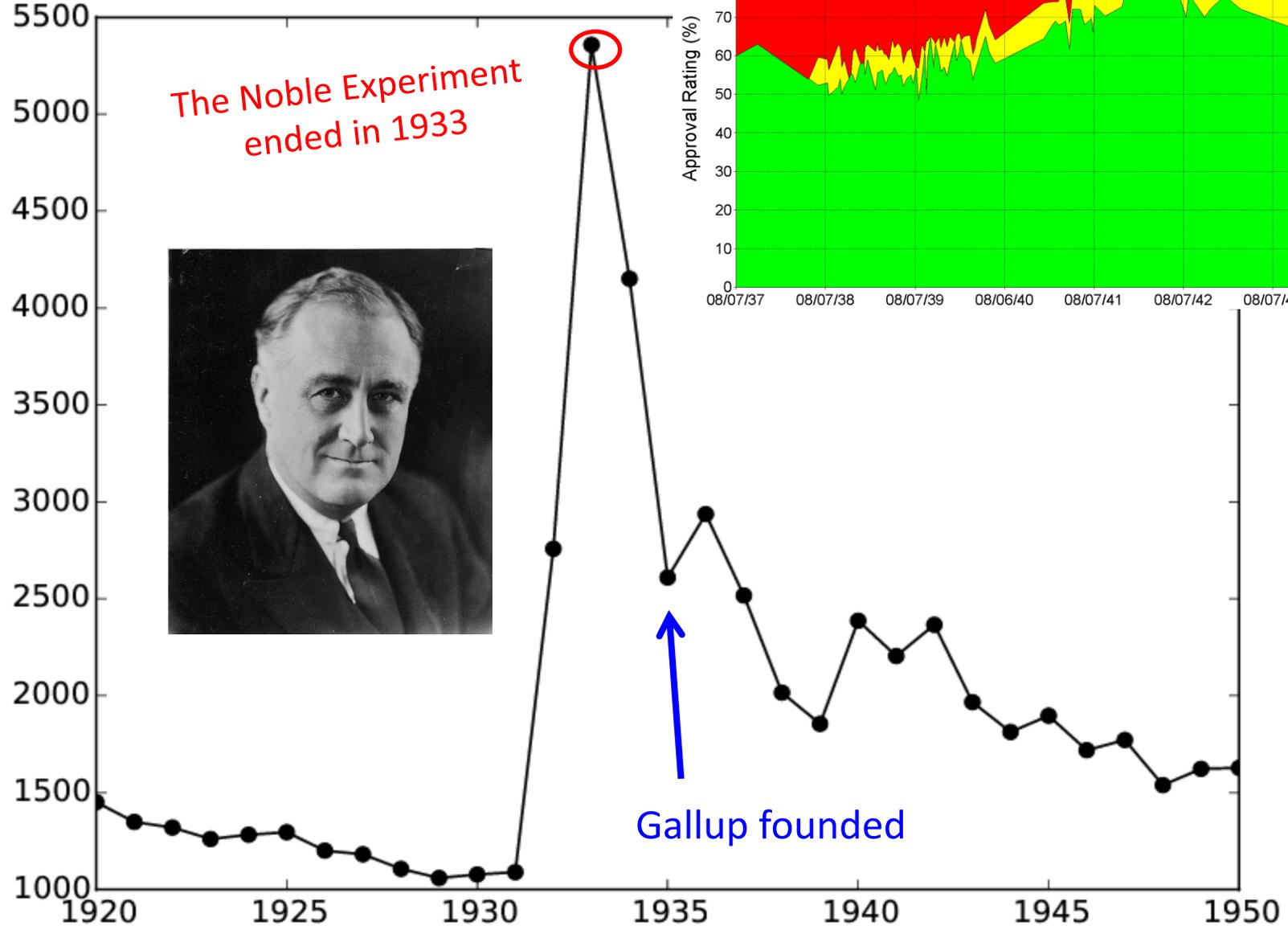
Franklin D. Roosevelt, 1933-45

Number of namesakes

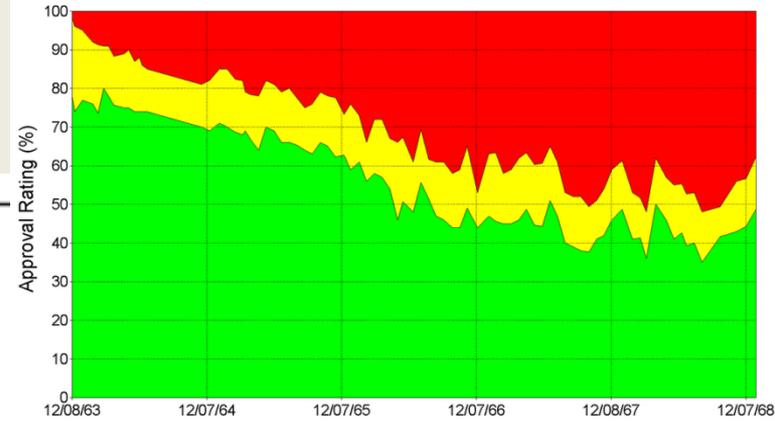


The Noble Experiment ended in 1933

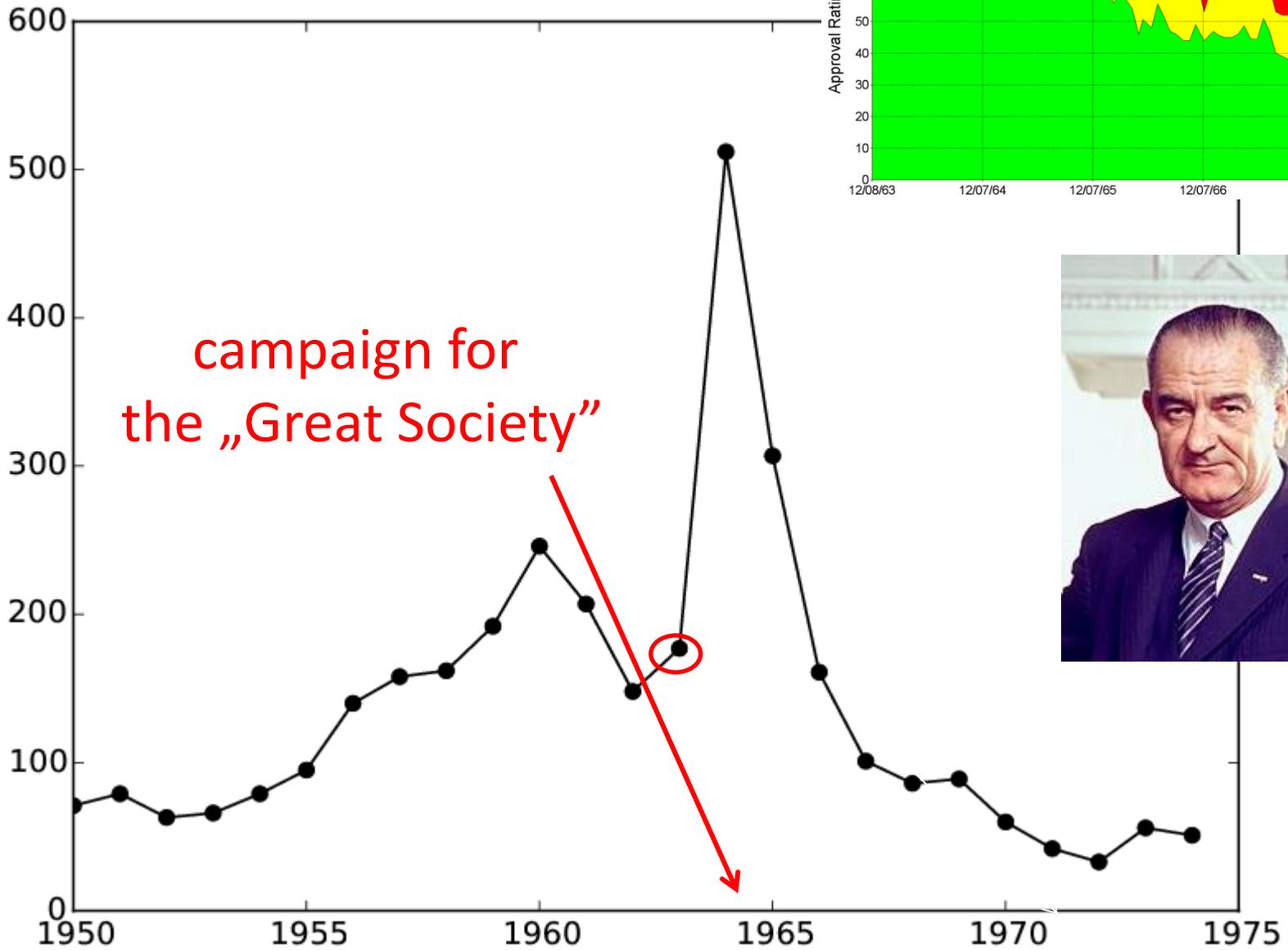
Gallup founded



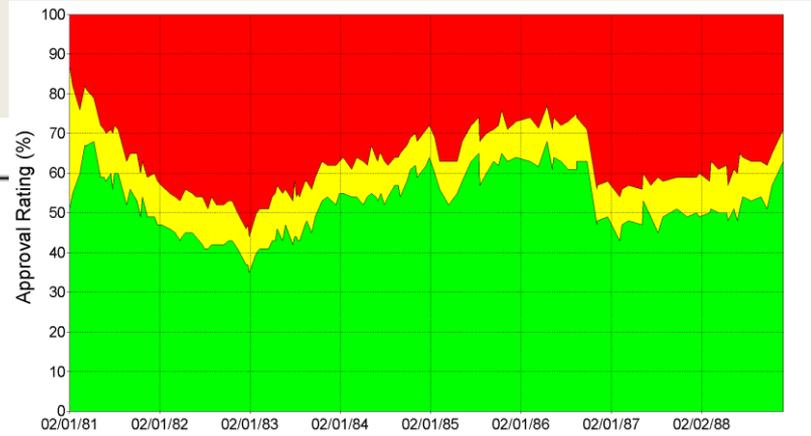
Lyndon B. Johnson, 1963-69



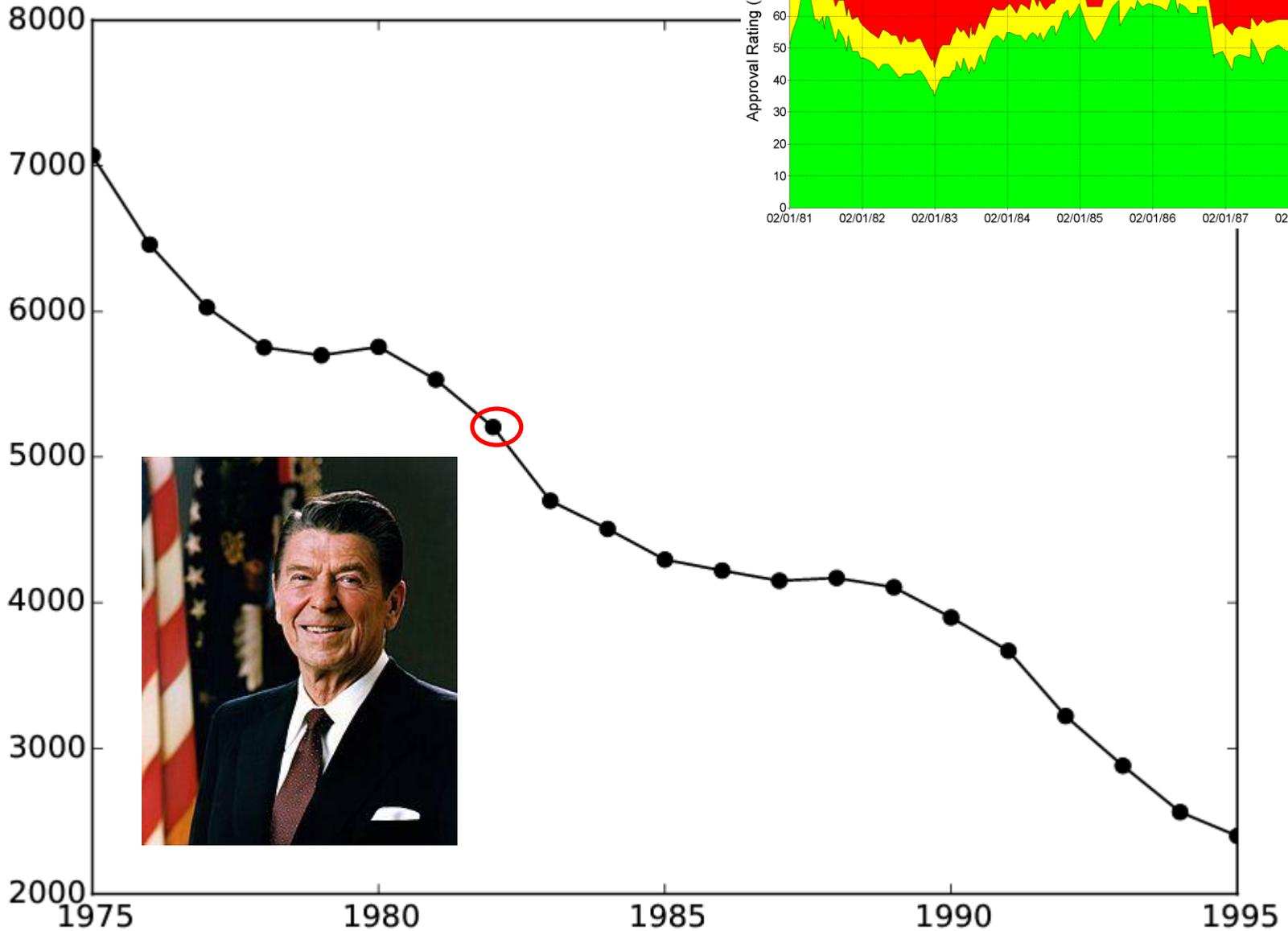
Number of namesakes



Ronald Reagan, 1981-89



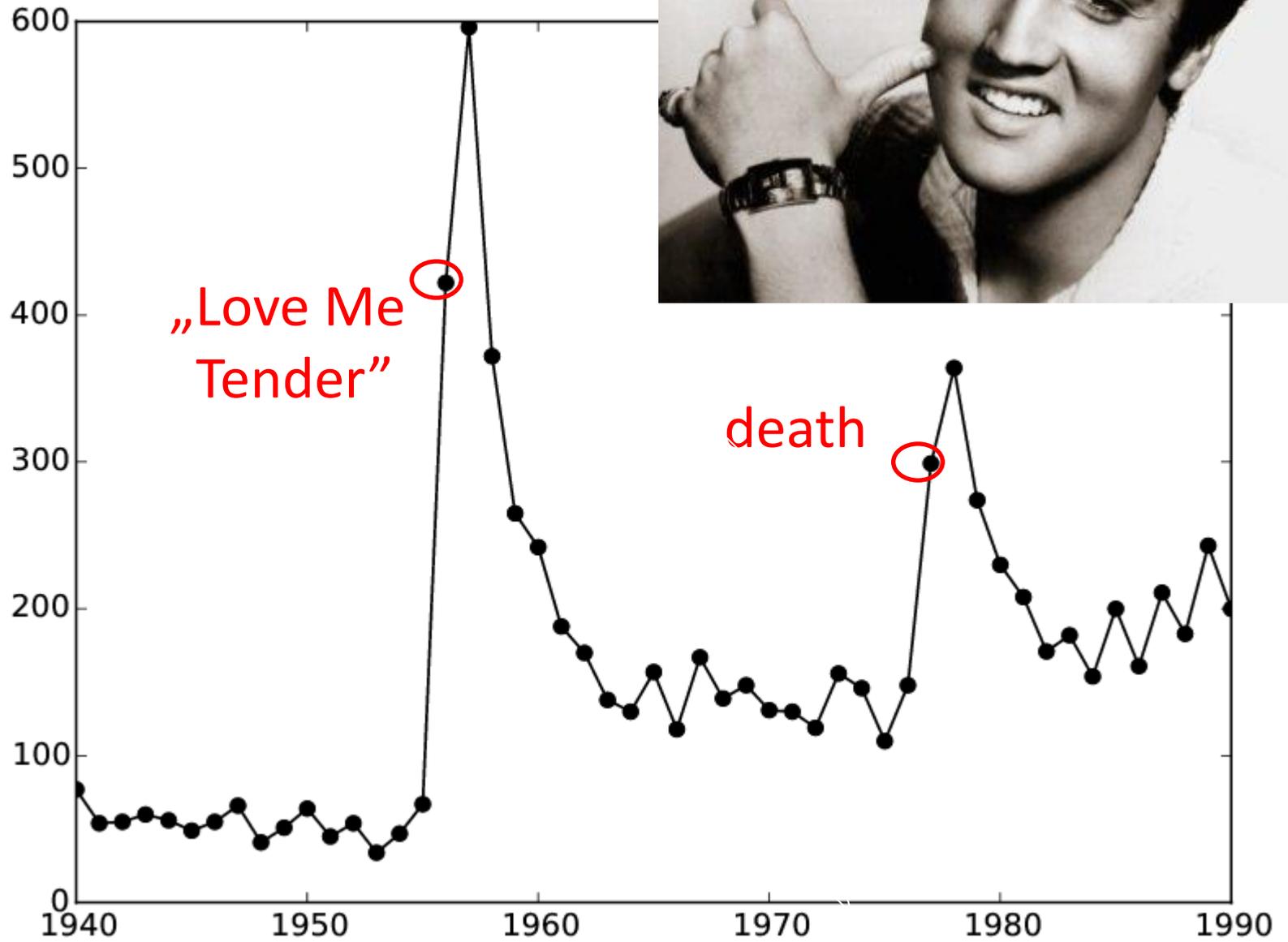
Number of namesakes



Elvis Presley



Number of namesakes



How to measure it? An example: LBJ

The data $\{y_i\}$:

1958; 162

1959; 192

1960; 246

1961; 207

1962; 148

1963; 177

1964; 512

The ordered data $\{z_i\}$:

148

162

177

192

207

246

512

$$y = \max\{148, 177, 512\} = 512$$

$$q_{0.5} = z_4 = 192$$

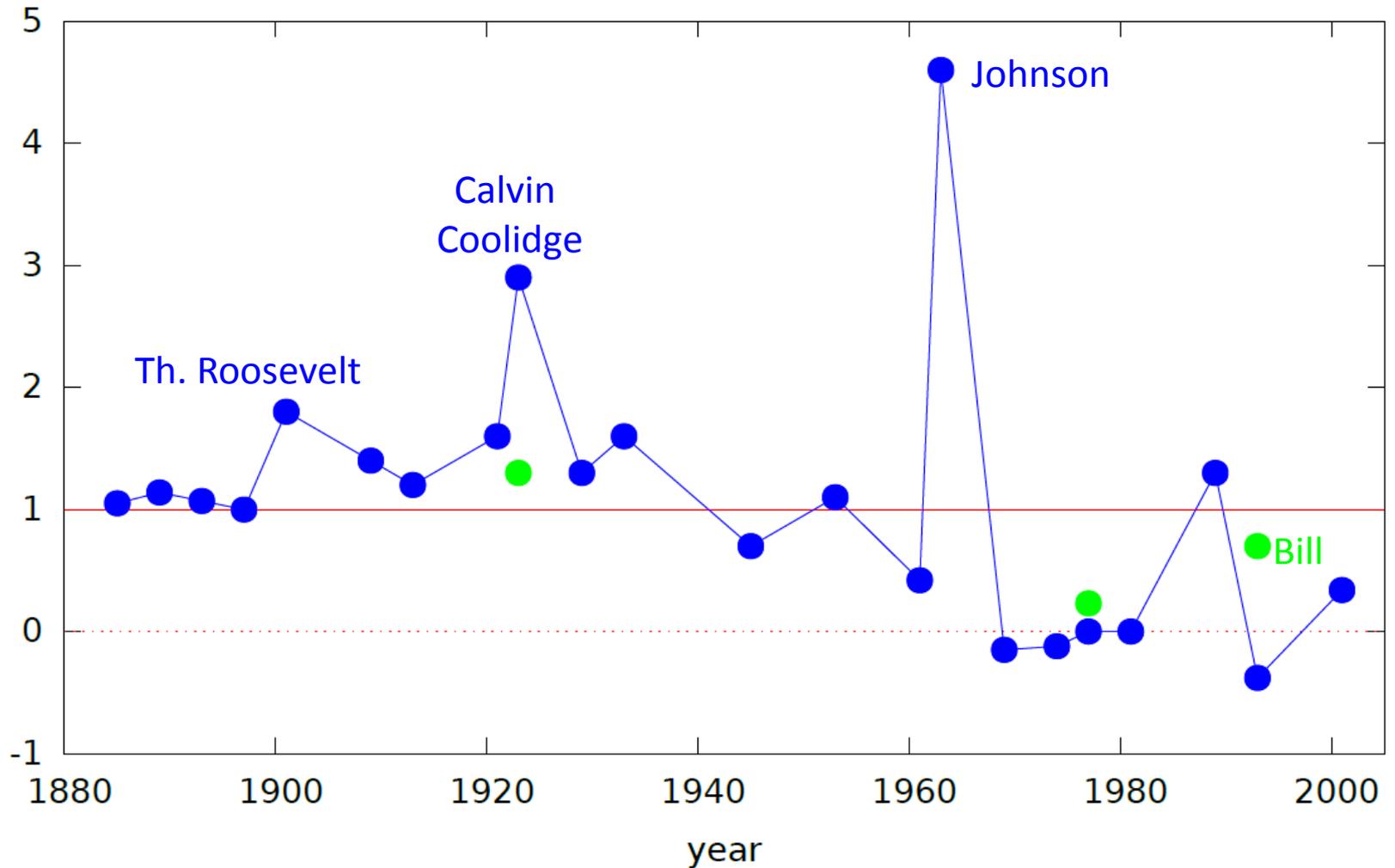
$$q_{0.25} = (3z_2 + z_3) / 4 = 166$$

$$q_{0.75} = (z_5 + 3z_6) / 4 = 236$$

$$c = \frac{512 - 192}{236 - 166} = 4.6$$

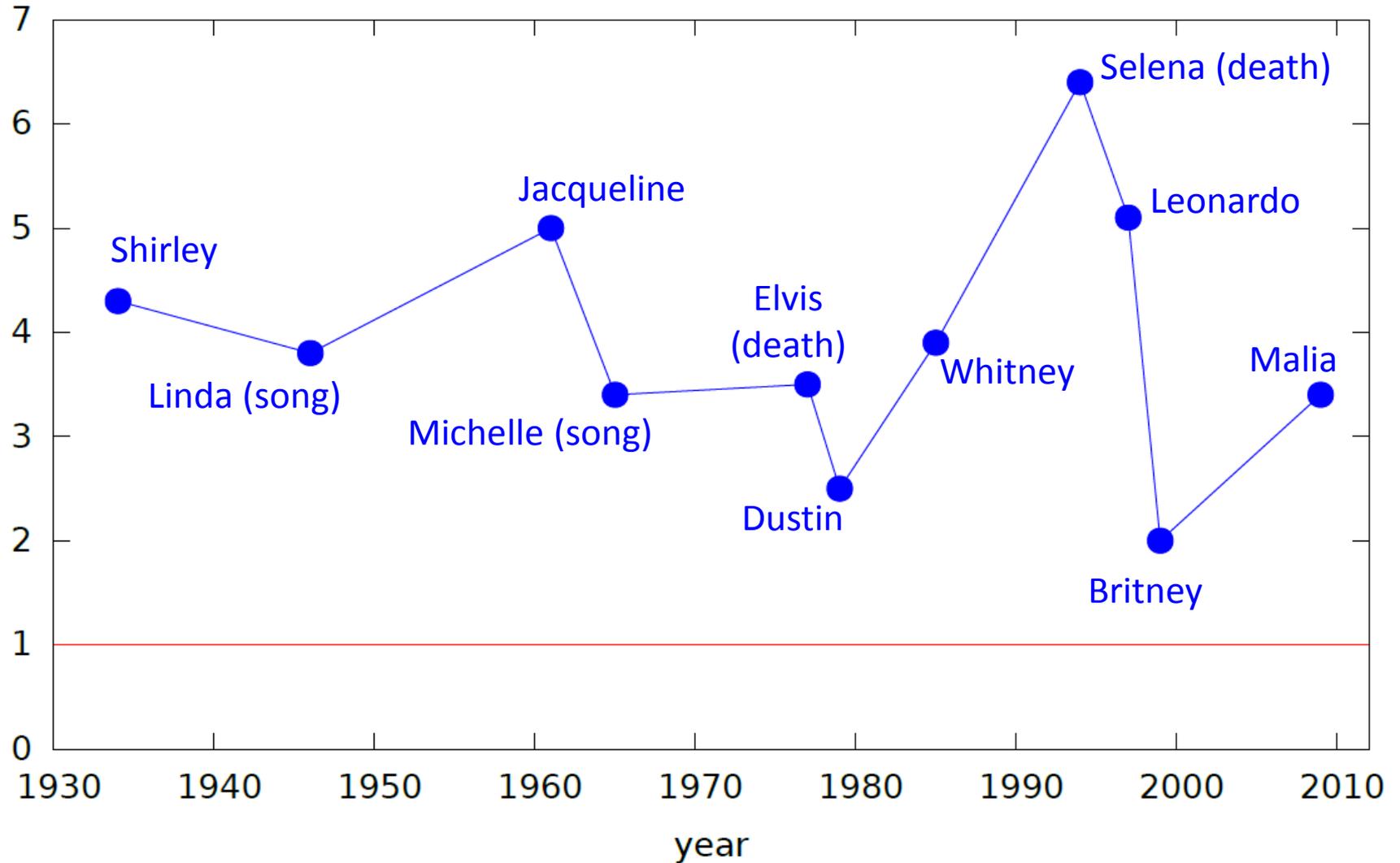
The results - presidents

C



● the names after www.whitehouse.gov/1600/Presidents

The results – selected celebrities



5. Conclusions

1. The simulations reproduce:
 - the reduction of names' lifetime with the number of used names
 - the asymmetry of rise and fall of fashion
2. The results are a good match for the administrative regions of the U.S.
3. A simple index shows that the cult of personality of American presidents ended at the term of Nixon

* M. J. Krawczyk, A. Dydejczyk and K. K., *The Simmel effect and babies' names*, *Physica A* 395 (2014) 384.

* M. Pomorski, M. J. Krawczyk, K. K., J. Kwapien and M. Ausloos, *Inferring cultural regions from correlation networks of given names*, *Physica A* 445 (2016) 169.

* K.K., P. Kulczycki, K. Misztal, A. Dydejczyk, P. Gronek, M. J. Krawczyk, *Naming boys after presidents in U.S. in 20th century*, *Acta Phys. Pol. A* 129 (2016) 1038.

thanks for
cooperation

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Thank you for attention