

Opinion formation in an open system and the spiral of silence

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Elisabeth Noelle-Neumann
1916-2010

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- H3. This fear of isolation makes individuals scan continuously the opinion climate.
- H4. The perceived climate of opinion influences their behaviour in public, specially in speaking out.
- H5. (...) Those who think their opinion is the majority tend to speak out; otherwise they remain silent. Thus, the majority opinion seems to be more supported than it is in reality; the minority one seems to be less supported than it is. (...) At last stage, the minority opinion reduces to a small core group or disappears.



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- Pluralistic Ignorance: The majority of people in a group may privately disagree with a norm, but publicly support it, because they believe that the majority accepts it.
- The mass media can create pluralistic ignorance by focusing on the spread of one opinion and muting the minority opinion.

Open social systems



Zoya Samoilenko, Conversation in a Train Compartment



pl.wikipedia.org/wiki/Kolejka_zbiorowość

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$$p_i(t) = \frac{c}{1 + \exp(a(|x(t)| - b))}$$

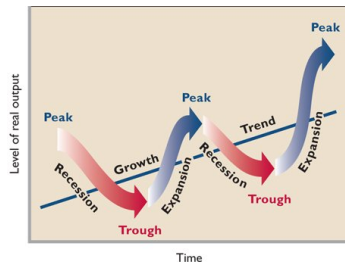
where $x(t) = S(i) - \langle S \rangle_i(t)$, $a = 4$, $b = \frac{1}{2}$, $c = \frac{1}{5}$.

Spiral of silence

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- Q1: How long a leader is remembered?

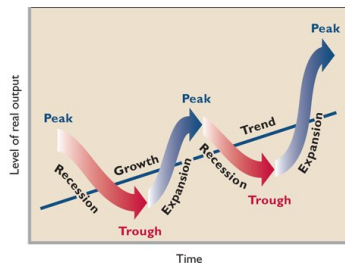
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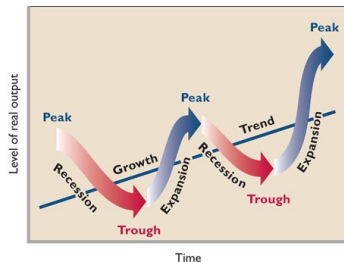
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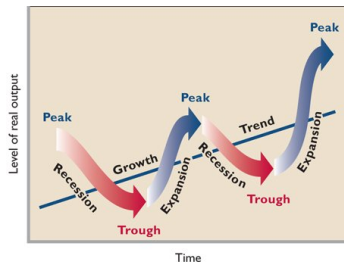
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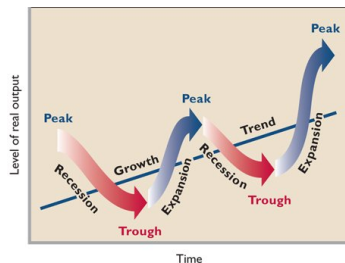
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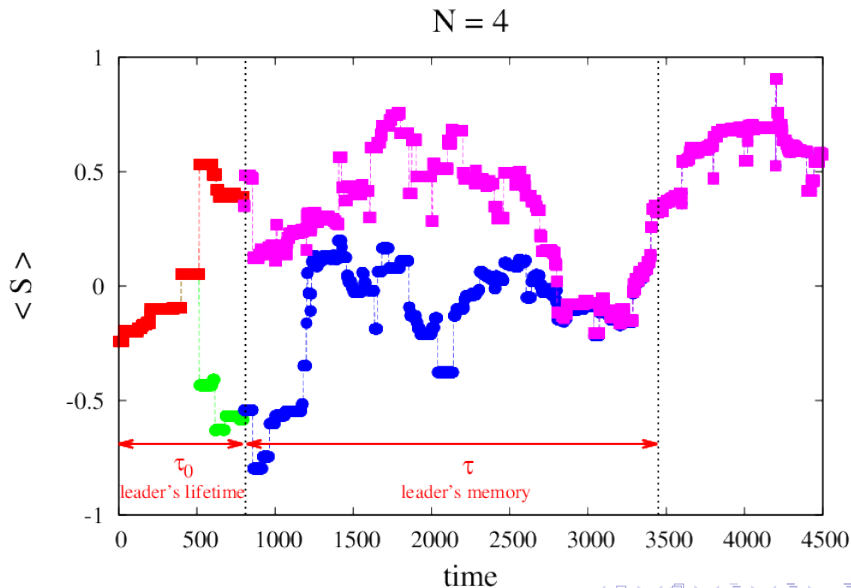
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- The pendulum effect $\equiv \langle \Delta S \rangle$ changes sign.

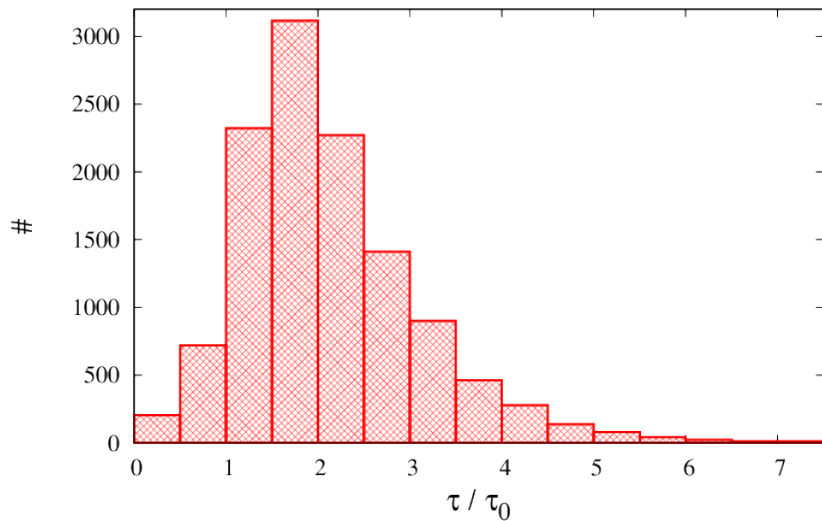


Spiral of silence - an numerical example

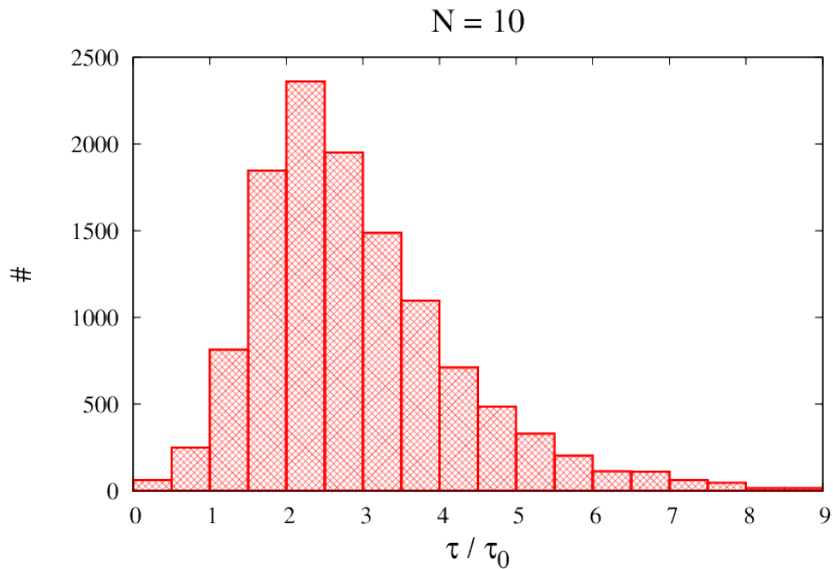


Spiral of silence - memory effect

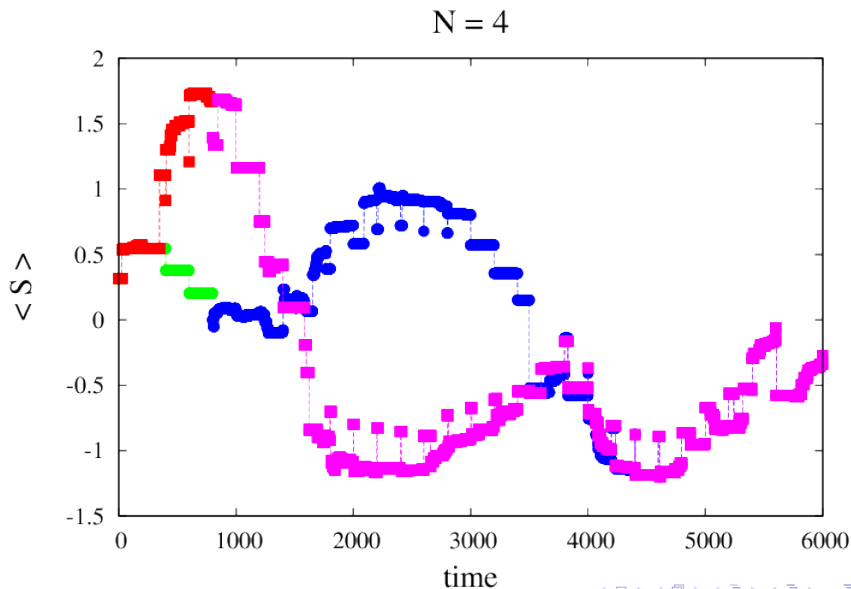
$N = 4$



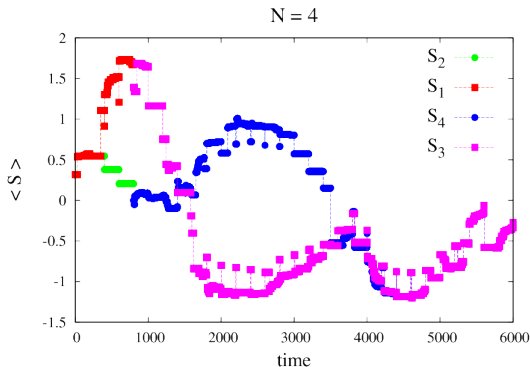
Spiral of silence - memory effect



Pendulum effect - an numerical example



Looking for a pendulum effect

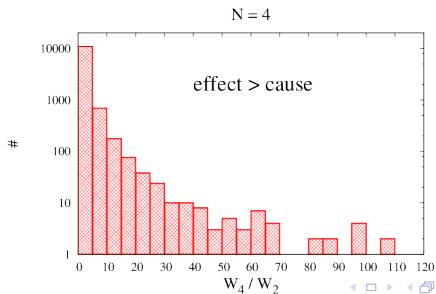
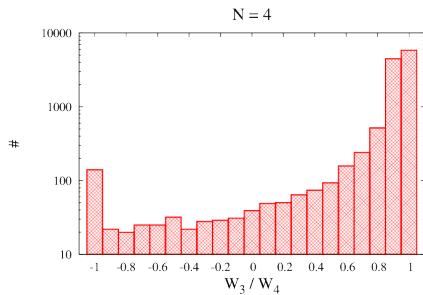
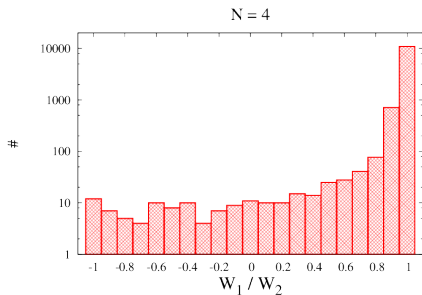


$$W_1 = \int_0^{\tau_0} (S_1 - S_2) dt \quad W_3 = \int_{\tau_0}^{\infty} (S_3 - S_4) dt$$

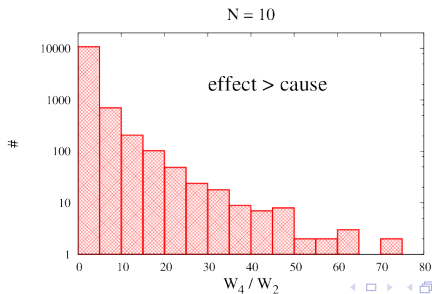
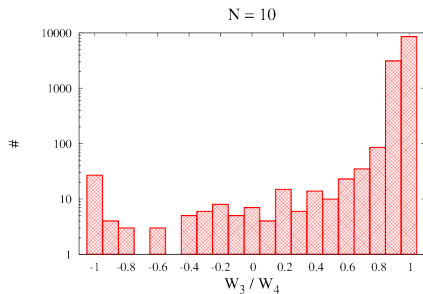
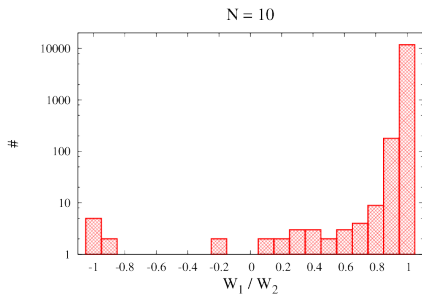
$$W_2 = \int_0^{\tau_0} |S_1 - S_2| dt \quad W_4 = \int_{\tau_0}^{\infty} |S_3 - S_4| dt$$

cause effect

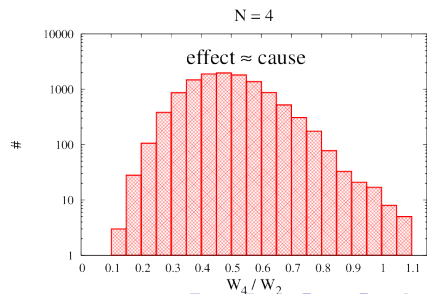
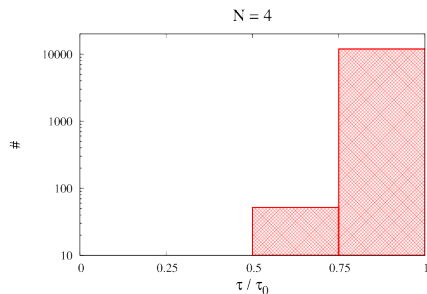
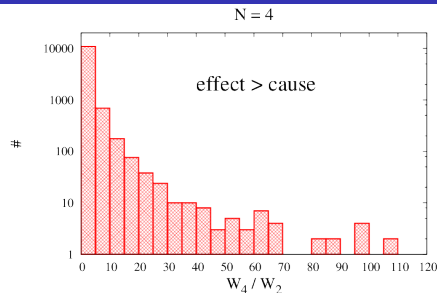
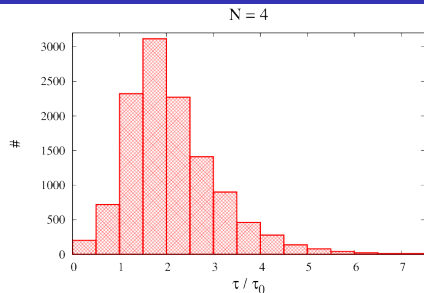
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With or without spiral of silence - comparison



- As a consequence of the effect of spiral of silence, a leader is remembered longer than his lifetime.
- In most cases, the sign of polarization caused by the leader persists. Yet its change may happen.
- When the effect of the spiral of silence is removed, we get $W_2 = W_1$ and $W_4 = W_3$. Also, the memory effect is much smaller.

Thank you for your attention!