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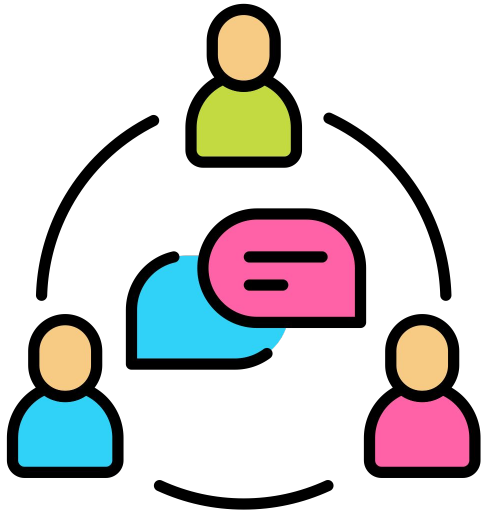
2.4

A Simulation of Echo Chamber Dynamics

dortmund university

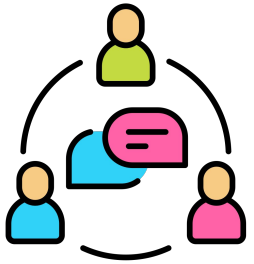
Note

- Interactive symbol: tasks for groups



Echo chambers

- Build groups: How would you define an “online echo chamber”?

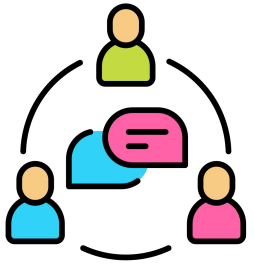


Echo chambers

- Definitions
  - Online users tend to find and stick to online environments where they encounter other users with similar world views. In that way, homogeneous clusters emerge, where beliefs and memes are assimilated and amplified (Choi et al., 2020)
  - Describes a social phenomenon in contrast to the concept of “Filter Bubbles”, which describes an algorithmic phenomenon.
  - The scientific evidence for the self-segregating effect of echo chambers on the spread of (mis-)information is stronger than the evidence for the impact of filter bubbles

Echo chambers

- In your groups: What cognitive biases and social factors are driving the emergence of echo chambers?

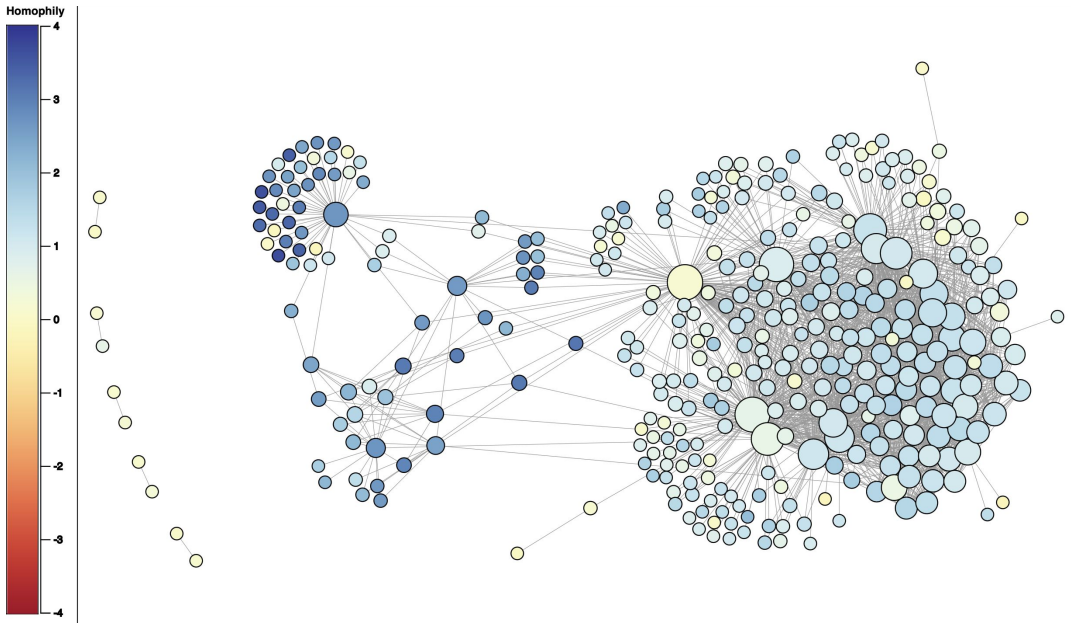


Echo chambers

- Factors for the emergence and reproduction of echo chambers (Choi et al., 2020; Törnberg, 2018)
  - **Selective exposure**: Tendency to seek content that aligns with one's beliefs and avoid content that does not
  - (**Political**) **homophily**: The tendency to connect to and interact with individuals that share similar characteristics and beliefs
  - **Opinion polarisation**: People in an echo chamber are inclined to share similar views with each other in relation to a given topic than with the outside network
  - **Network polarisation**: people in an echo chamber are more densely connected with each other than with the outside network

Echo chambers

- Echo chamber networks
  - Echo chambers with like-minded users connected via weak ties build a so-called hub of echo chambers (Choi et al., 2020)



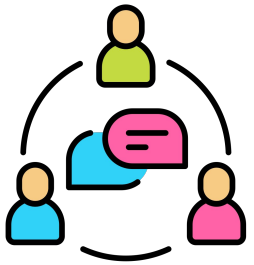
Source: Daejin Choi Github

Echo chambers

- Echo chamber networks
  - Rumours and misinformation spread fast between homogenous networks (Törnberg, 2018)
  - Members of homogenous echo chambers with biased (political) views tend to participate in other homogenous groups with similar biased (political) views (Choi et al., 2020)

“Complexity Explorables” Echo chamber model

- In your group: Visit complexity-explorables.org to find an interactive model of an echo chamber. Explore the model and try to answer the following questions:
  - What do the **nodes** stand for? What does it mean if two nodes have the **same** or a **different colour**?
  - How do the **links** between the nodes work?
  - What do the two sliders “**Rewiring probability**”, and “**Open-mindedness**” do?
  - Try out the first two **slider settings** suggested under “Observe this”. What happens? What does it mean?



“Complexity Explorables” Echo chamber model

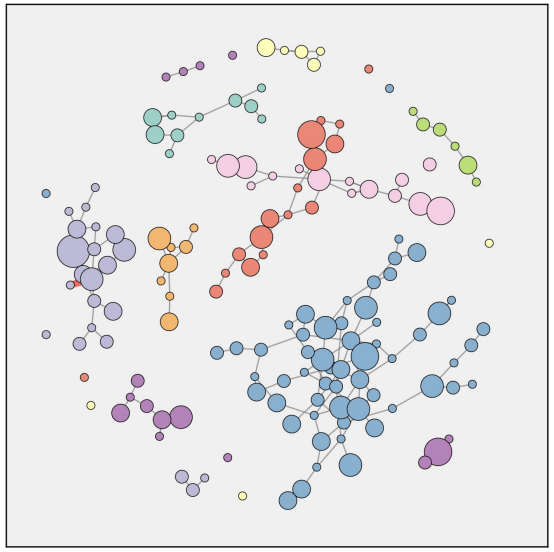
- Different colours represent **nods** (persons) with similar or different opinions, respectively. There are 10 different opinion options indicated by different colours
- Concordant **links** share the same colour, discordant links have different colours
  - Either, one node takes the other nod’s opinion (50/50), or the link is cut. If the link is cut, one of the nods **rewires** it to a different nod under a certain rewiring probability. If **open-minded**, the nod will more probably rewire with a nod of different colour.

Social network logics and echo chambers

- **Rewiring probability**: probability with which the link between nods (people) with different colours (opinions) is cut. In this case, one of the nodes connects to another random node in the network
- **Open-mindedness**: tendency of nodes to choose from all possible nodes, concordant (same opinion) and discordant (different opinion), or to seek nodes with similar colour (like-minded people) only (low open-mindedness).

Social network logics and echo chambers

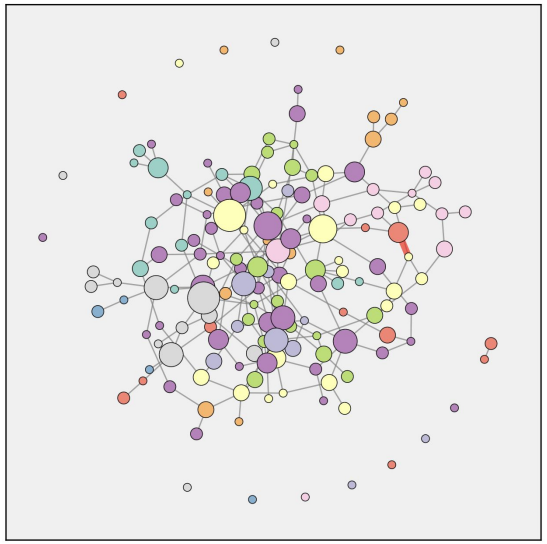
- **Setting 1**: With (**rather**) **high Rewiring Probability** and (**rather**) **low Open-mindedness**, the network develops into a so-called *fixed state* of isolated groups with likeminded individuals. An ***echo-chamber* dynamic** is at play

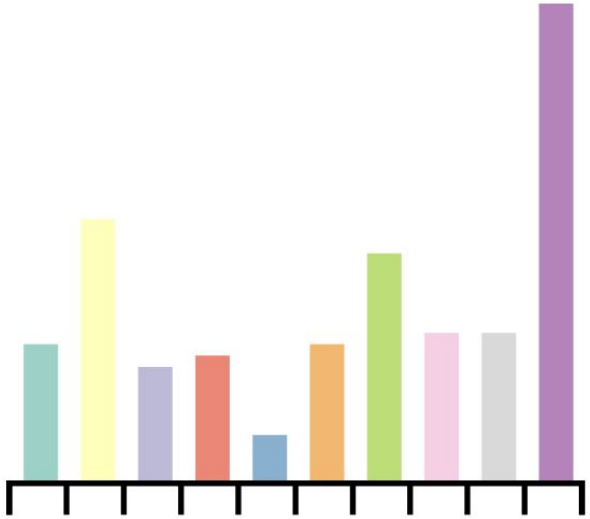


Source: complexity-explorables.org (link)

Social network logics and echo chambers

- **Setting 2**: With **low(er) Rewiring probability** and **medium Open-mindedness** (default option on the slider), the system develops into another *fixed state*: a dominant opinion emerges, driving out other opinions.





Source: complexity-explorables.org (link)

Literature

Choi, D., Chun, S., Oh, H., Han, J., & Kwon, T. “. (2020). Rumor Propagation is Amplified by Echo Chambers in Social Media. Scientific Reports, 10(1). https://doi.org/10.1038/s41598-019-57272-3

Törnberg, P. (2018). Echo chambers and viral misinformation: Modeling fake news as complex contagion. PLoS ONE, 13(9), e0203958. https://doi.org/10.1371/journal.pone.0203958

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