

5.3 Polarization Part II

Heckman Library 406C

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Keywords agent-based modeling, social sciences, computational methods

1. SESSION A (LECTURE)




Here are the main topics covered in your “Polarization II” lecture:

1. **Echo Chambers & Network Formation:** How homophily (like-seeks-like) creates clustering that leads to self-reinforcing bubbles with limited cross-group contact
2. **Filter Bubbles & Algorithms:** The synergy between user-driven selective exposure and algorithm-driven personalization that creates parallel information universes
3. **Evidence & Modeling:** Real-world data from Twitter and Facebook paired with agent-based models (ABM) showing how network structure and algorithmic filtering produce polarization
4. **Misinformation Advantage:** Why false news spreads $6\times$ faster than truth, driven by novelty, emotion, and confirmation bias in polarized clusters
5. **The Vicious Cycle:** How echo chambers arrow.r misinformation arrow.r biased assimilation arrow.r hardened attitudes arrow.r deepened polarization form a self-reinforcing spiral
6. **Intervention #1: Breaking Echo Chambers:** Cross-cutting communication that works (gradual, civil, credible) versus approaches that backfire (hostile exposure)
7. **Intervention #2: Algorithmic Design:** Platform changes like diversified feeds, downranking extremes, and user control tools that can limit fake news spread
8. **Intervention #3: Inoculation & Trusted Voices:** Prebunking tactics, accuracy nudges, counter-attitudinal validators, and media literacy as resistance-building strategies
9. **NetLogo Modeling Opportunities:** Teaching applications for simulating echo chamber formation, misinformation cascades, and testing interventions

Polarization Part II (Slides)

2. SESSION B (SRG)

Discussion of readings.

1.  Chueca Del Cerro (2024) The power of social networks and social media's filter bubble in shaping polarisation: an agent-based model. *Applied Network Science*, 9(1).
 2.  Vosoughi et al. (2018) The spread of true and false news online. *Science*, 359(6380), 1146–1151.
 3.  Dandekar et al. (2013) Biased assimilation, homophily, and the dynamics of polarization. *Proceedings of the National Academy of Sciences*, 110(15), 5791–5796.
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- Chueca Del Cerro, C. (2024). The power of social networks and social media's filter bubble in shaping polarisation: an agent-based model. *Applied Network Science*, 9(1). <https://doi.org/10.1007/s41109-024-00679-3>
- Dandekar, P., Goel, A., & Lee, D. T. (2013). Biased assimilation, homophily, and the dynamics of polarization. *Proceedings of the National Academy of Sciences*, 110(15), 5791–5796. <https://doi.org/10.1073/pnas.1217220110>
- Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359(6380), 1146–1151. <https://doi.org/10.1126/science.aap9559>