5.3 Polarization Part II

Heckman Library 406C

Eric Araújo, and **Jonathan Hill**

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× 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)

Published Nov 04, 2025

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.

References

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