Mood Radicalization in Hyperconnected Social Networks

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Introduction

• Two common theories explain why the internet radicalizes its users: ideological echo chambers, and increased access to different and opposing views.

• We test a different hypothesis: that hyperconnected users express more extreme emotions, which may also result in radicalization.

Method

• We created a simulation that first generates a network (a Watts–Strogatz graph) of interconnected nodes called *agents* and assign a random score to each agent called *mood*.

• Then we have each connected agent play a prisoner's dilemma-like game. With each interaction, the node's *mood score* determines whether it is agreeable (and cooperates) or disagreeable (and defects). [Fig. 1]

• After each interaction, both agents update mood change according to the payoff matrix. [Fig. 2]

• We introduced two types of noise to test the simulation's robustness: *mood regression,* in which an agent's mood will regress to the mean; and *random noise,* in which an agent will randomly become more or less agreeable.

Results

• The simulation suggested that agents were more likely to end up with extremely agreeable or disagreeable moods if they are in a hyper-connected network than in a sparsely-connected network. [Fig. 3]

Discussion

• The study made two contributions: an alternative explanation on what causes online radicalization and an alternative approach for studying social networks.

• While our current model has simple initial conditions and rules such that the result might be derived analytically, this method allows us to model social networks with more sophisticated topology, such as those with different centrality measures.

• We plan to create more realistic social network simulations and collect network and sentiment data from social media platforms such as Twitter to validate this prediction.

People in hyperconnected networks are more likely to have extreme moods than those in sparsely connected networks.

How?
We have agents play prisoner's dilemma-like games on a WS graph to simulate how people's moods change when they interact on social media.

So what?
Radicalization on social media could be triggered by the fact that users are hyperconnected and have too many interactions in short periods of time.

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Agent A/B	cooperate	defect
cooperate	A mood +x B mood +x	A mood -y B mood +z
defect	A mood +z B mood -y	A mood -w B mood +w

x, y, z, w > 0, x > w

Fig 1: interaction payoff matrix

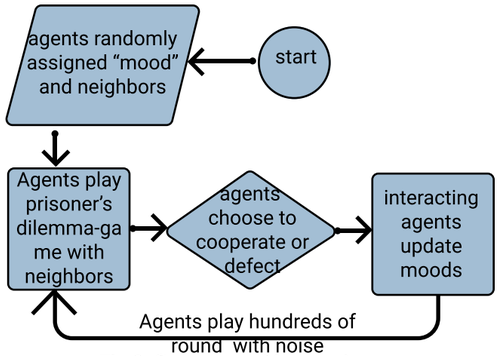

Fig 2: flow chart of interaction

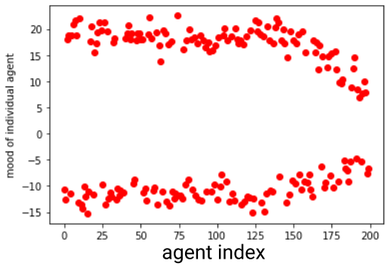

Fig 3.1: mood in hyperconnected network
average connection = 151, node = 200

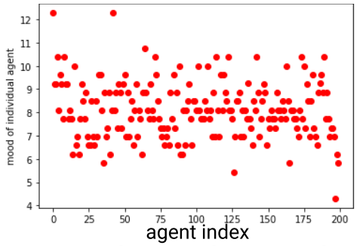

Fig 3.2: mood in sparsely connected network
average connection = 21, node = 200

Simulation (with random noise and mood regression) output after 5000 rounds of iterations. Agents' moods in the hyper-connected network diverged into two stripes, indicating mood radicalization, while those in the sparsely-connected network showed no sign of divergence.