Cultural polarization depends on whom we learn from and how well we communicate

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Preview: the roots of polarization

Social network: Network structure biases system polarization.

Preview: the roots of polarization

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Extremists: Extremists make polarization more likely.
Excluding extremists does not guarantee consensus.

Preview: the roots of polarization

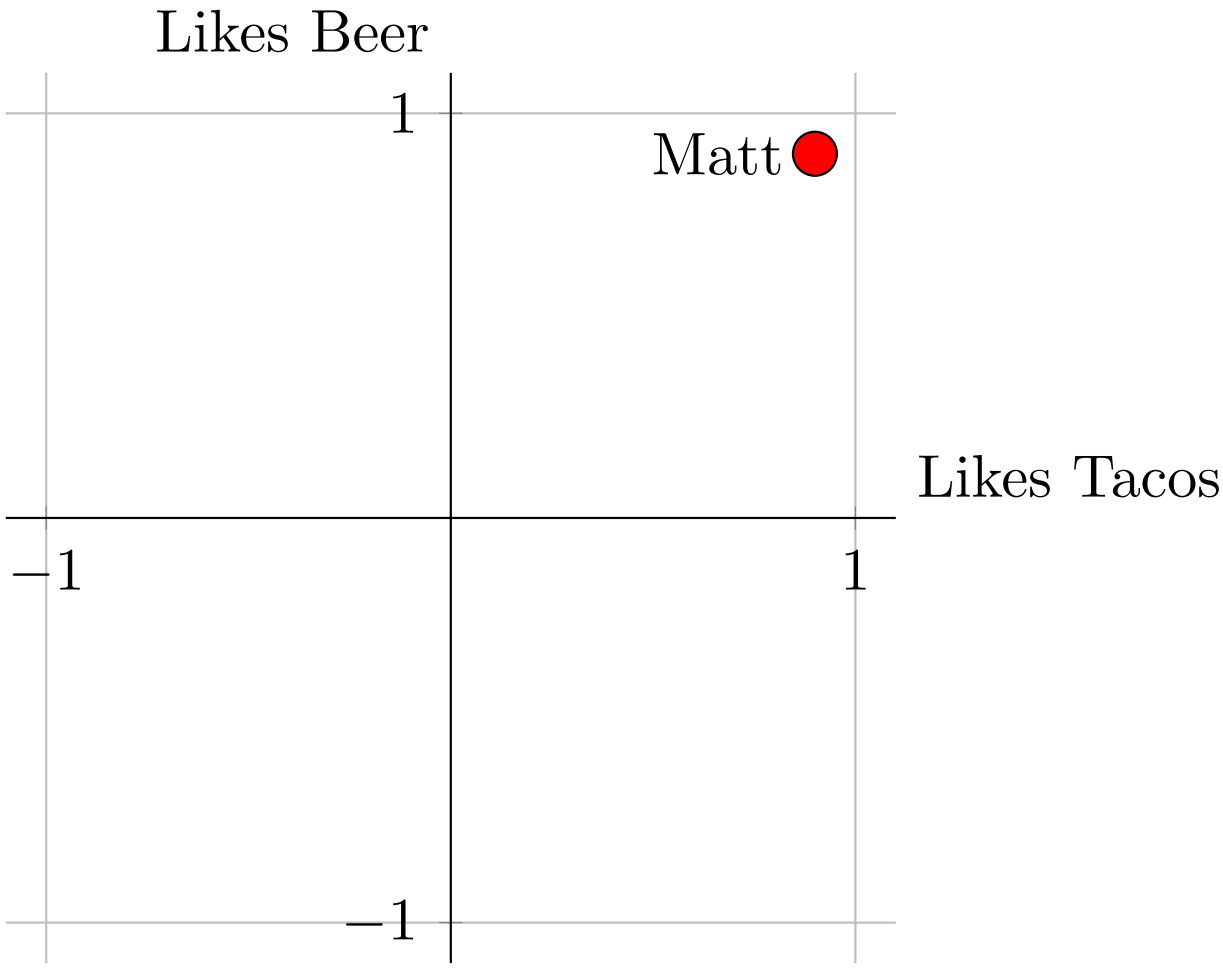
Social network: Network structure biases system polarization.

Extremists: Extremists make polarization more likely.
Excluding extremists does not guarantee consensus.

Communication: Miscommunication makes polarization more likely.

Theory & model

Opinions as coordinates



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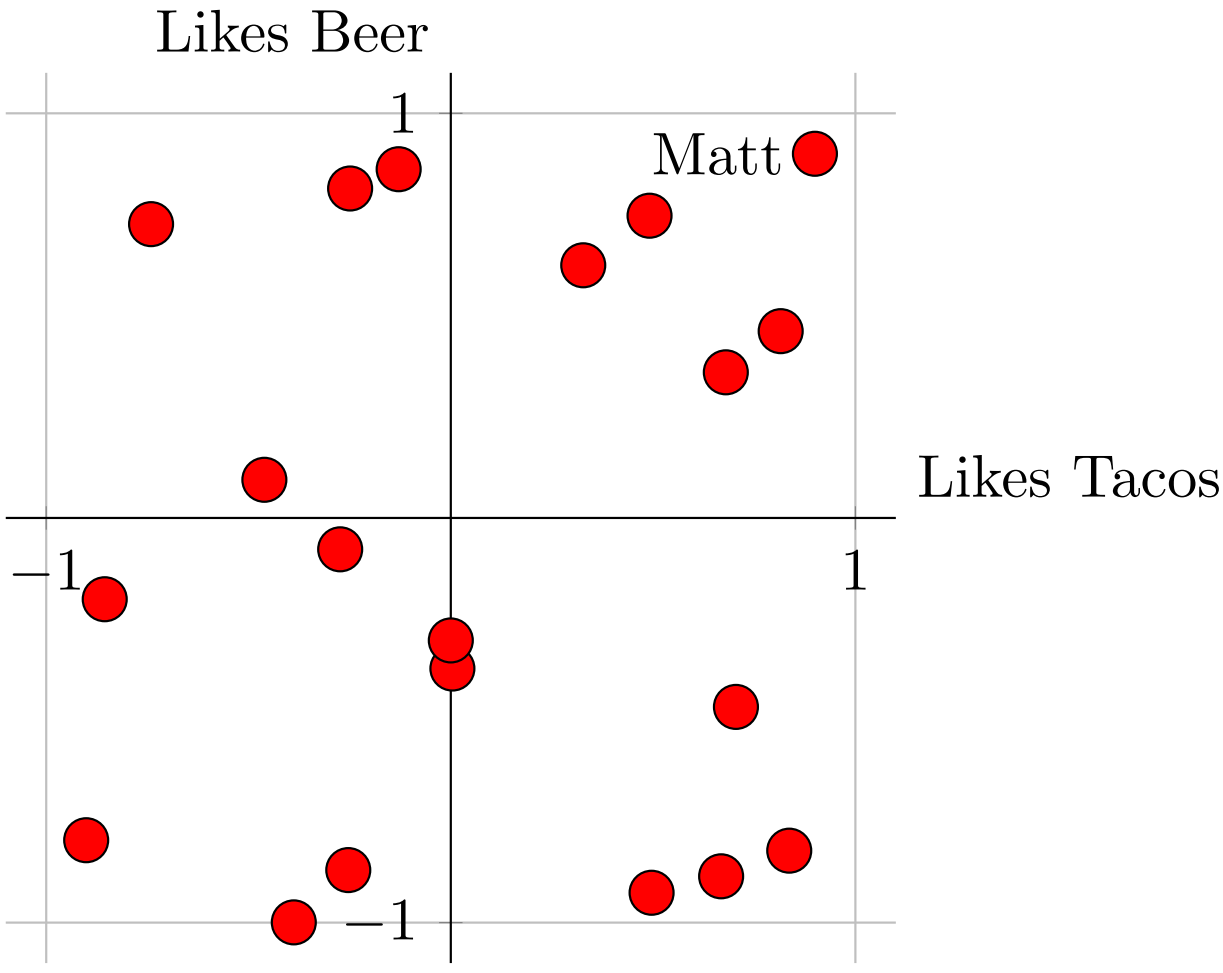
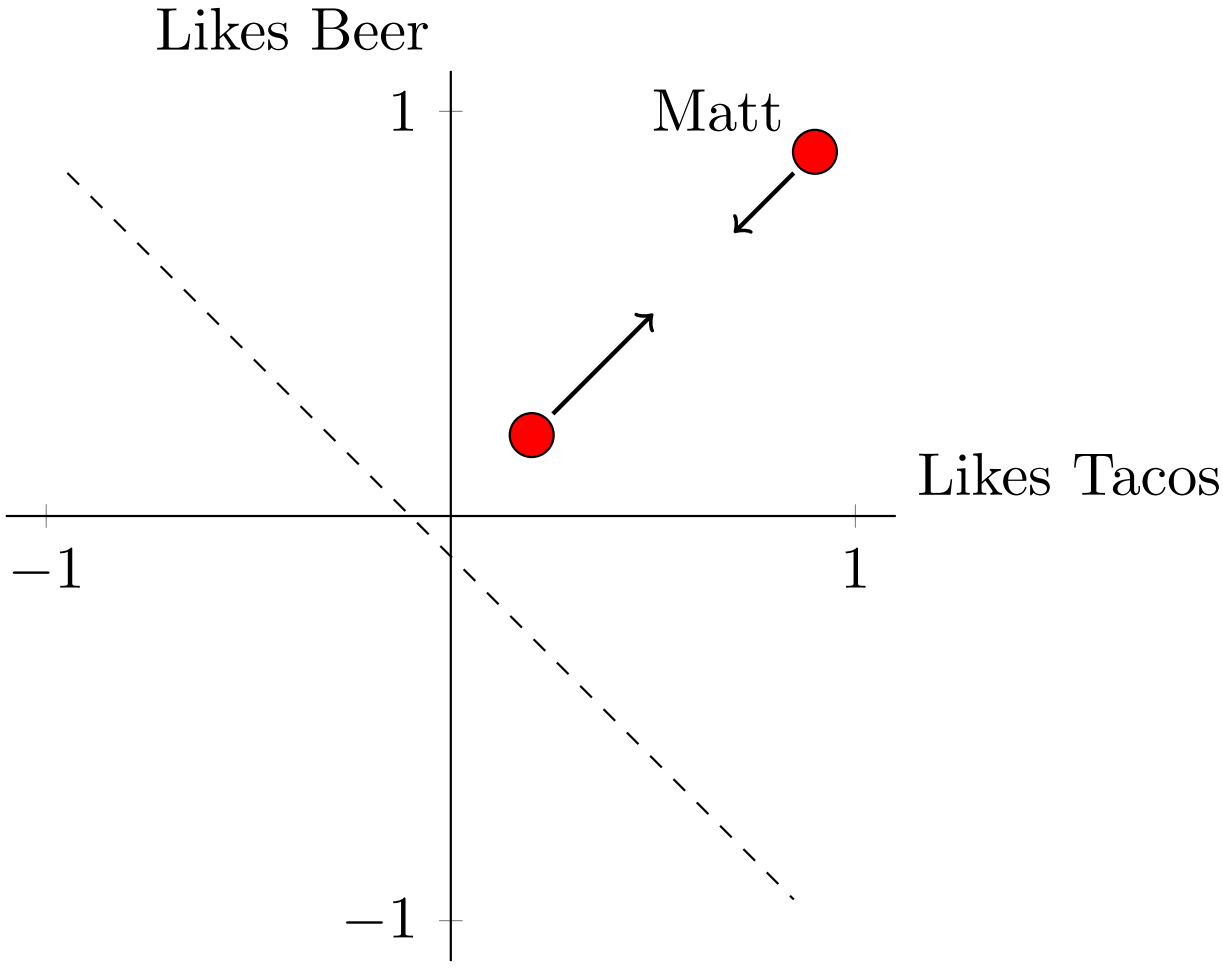


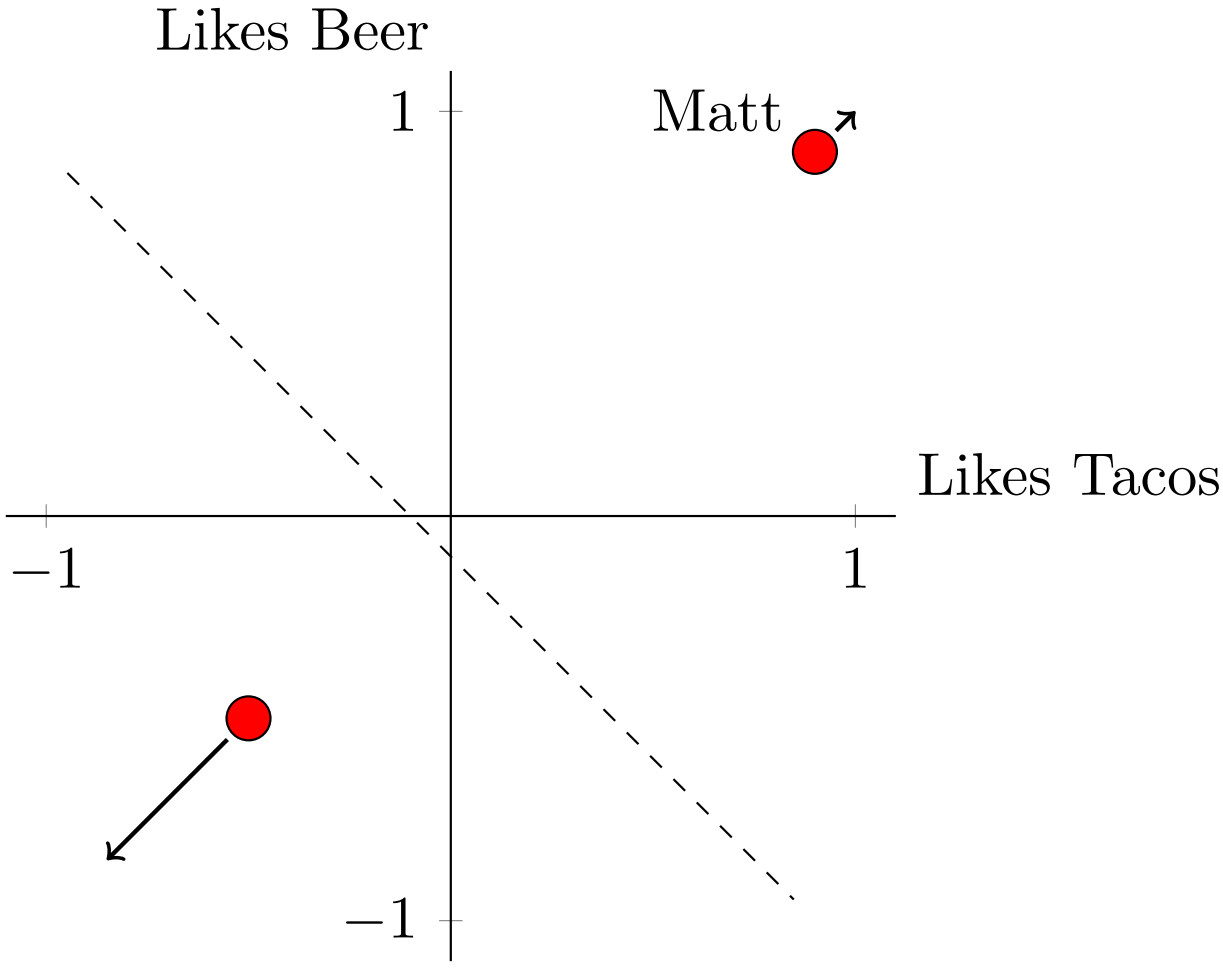
Modeling biased assimilation

Positive biased assimilation



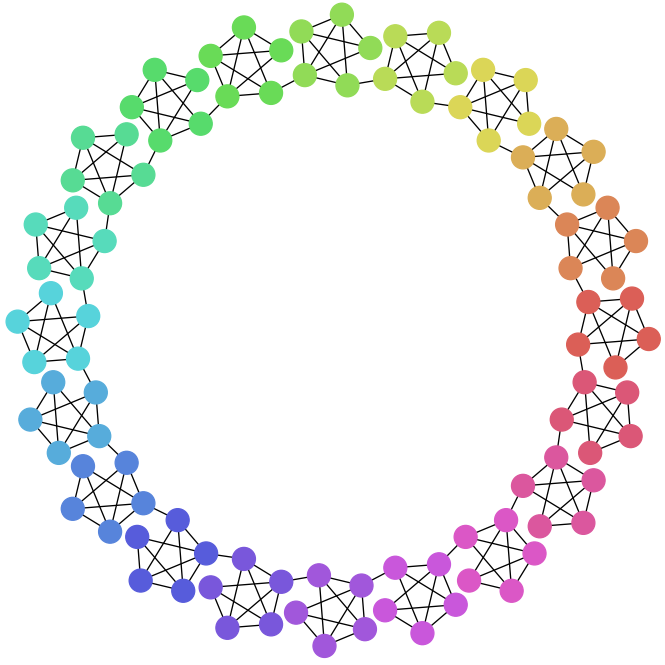
Modeling biased assimilation

Negative biased assimilation

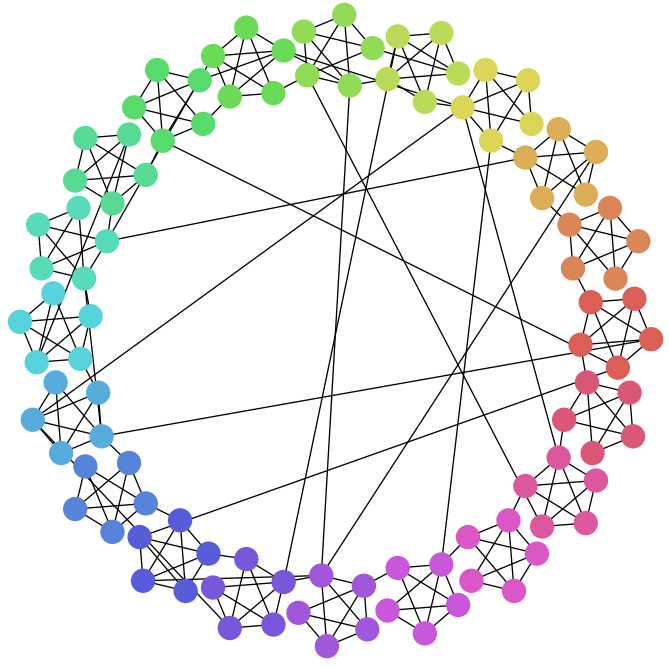


Social networks structure agent interactions

Connected caveman



Randomized (small-world)



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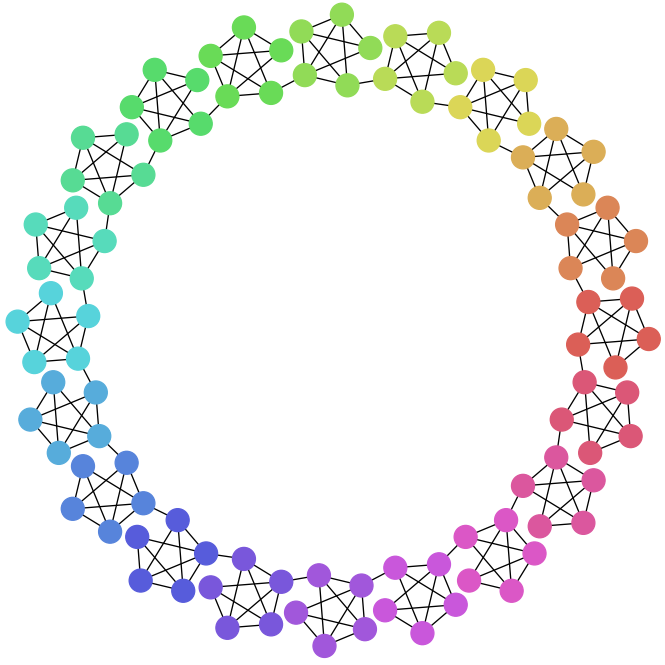

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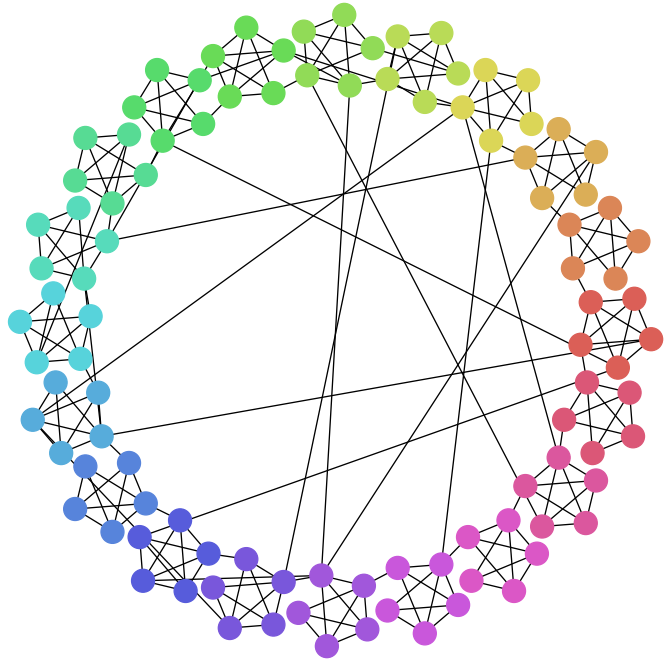
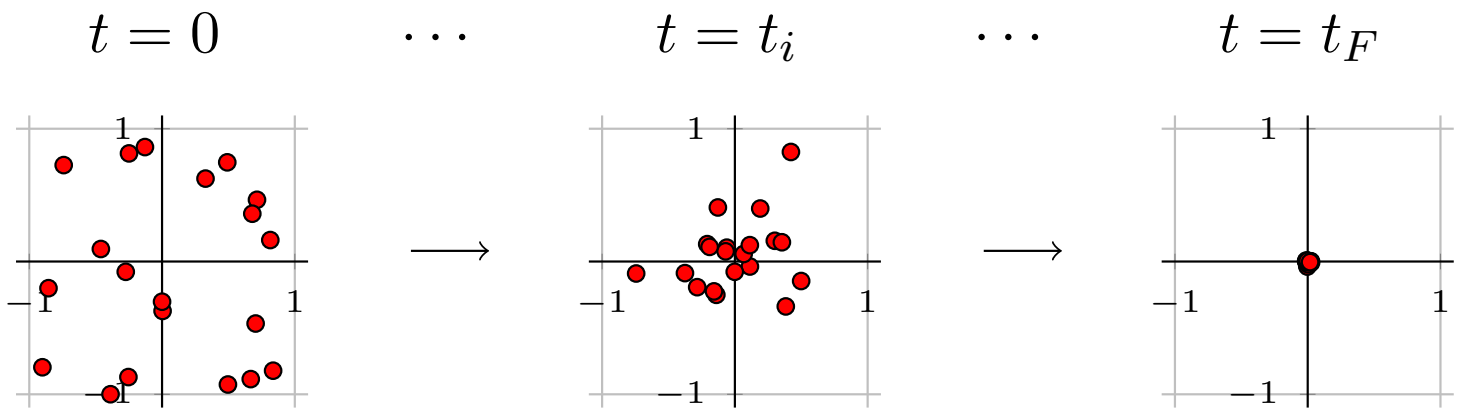


1M interactions per simulation
one pair at a time
in random order.

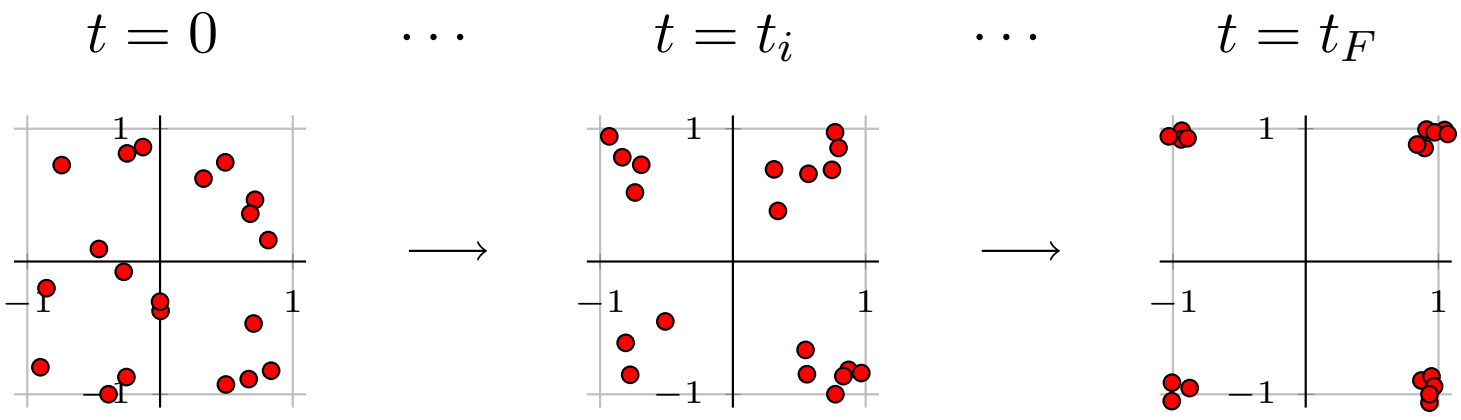
Opinion dynamics

No polarization



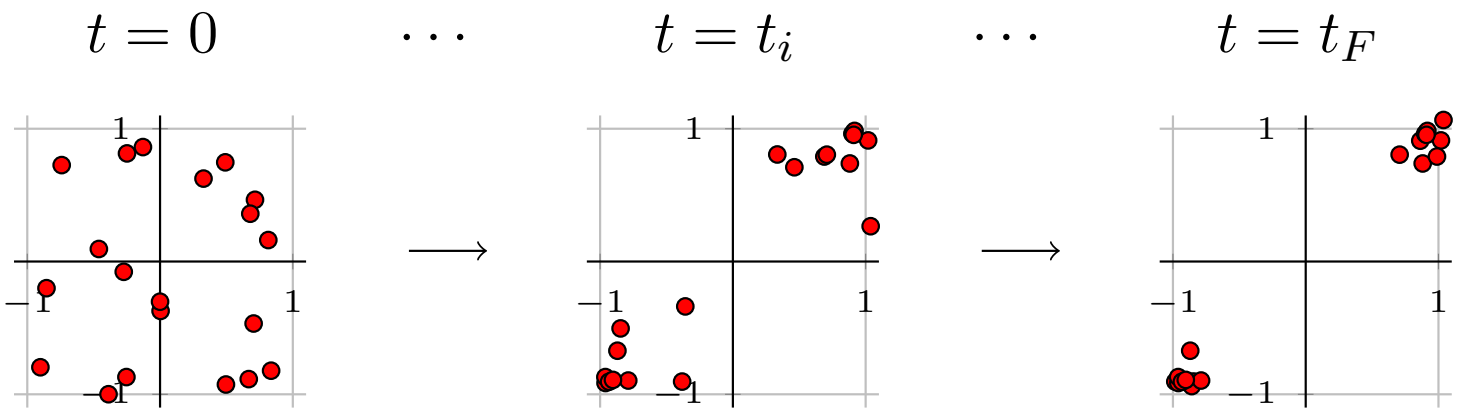
Opinion dynamics

Medium polarization



Opinion dynamics

High polarization



Computational experiments

Questions

1. Does network structure fully determine polarization?

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2. What if extreme opinions are excluded at the beginning?

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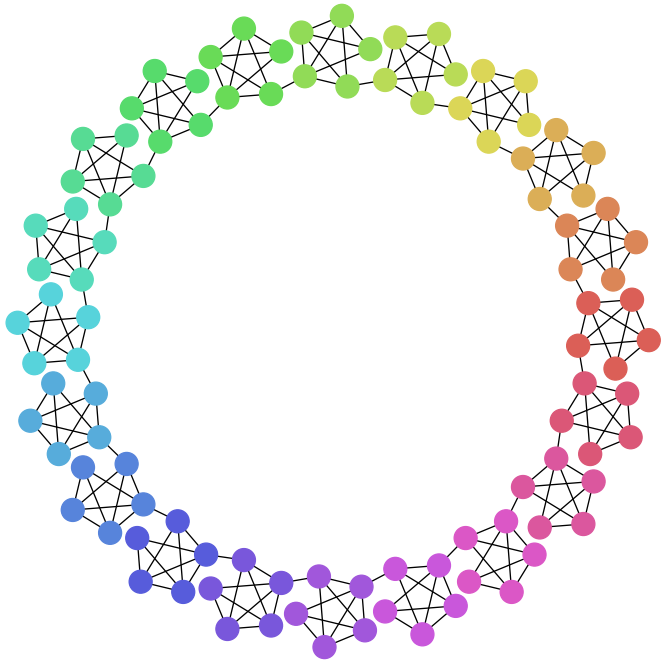
3. What if communication is not perfect, but distorted by noise?

Effect of small-world condition

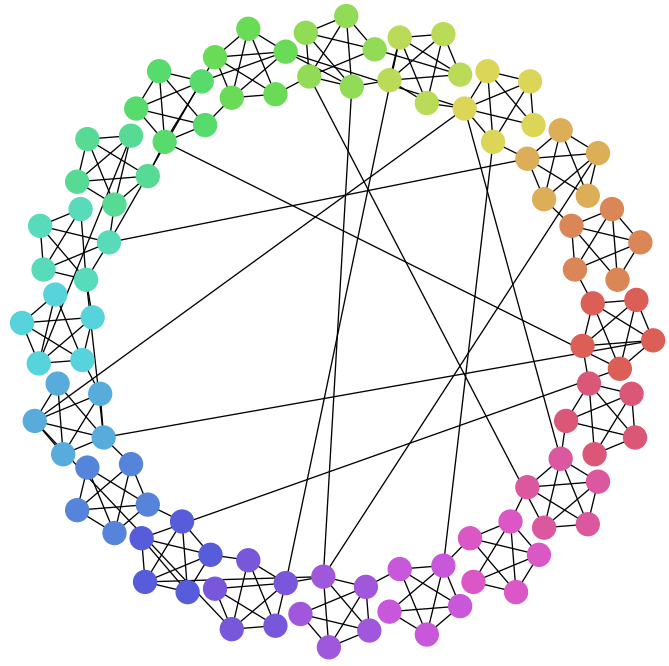
As found by Flache and Macy (2011)

Connected caveman



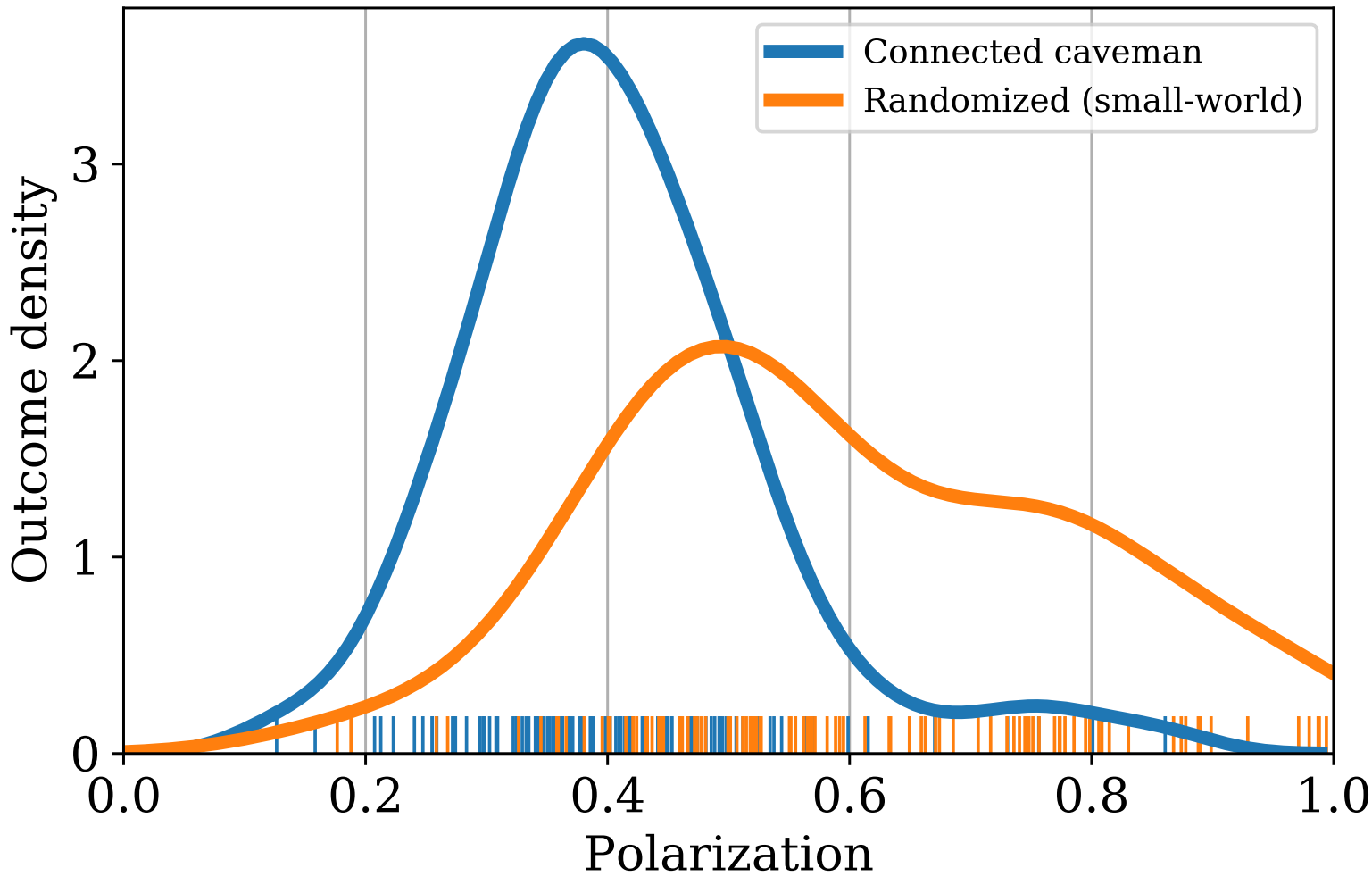
Average polarization = 0.4

Randomized (small-world)

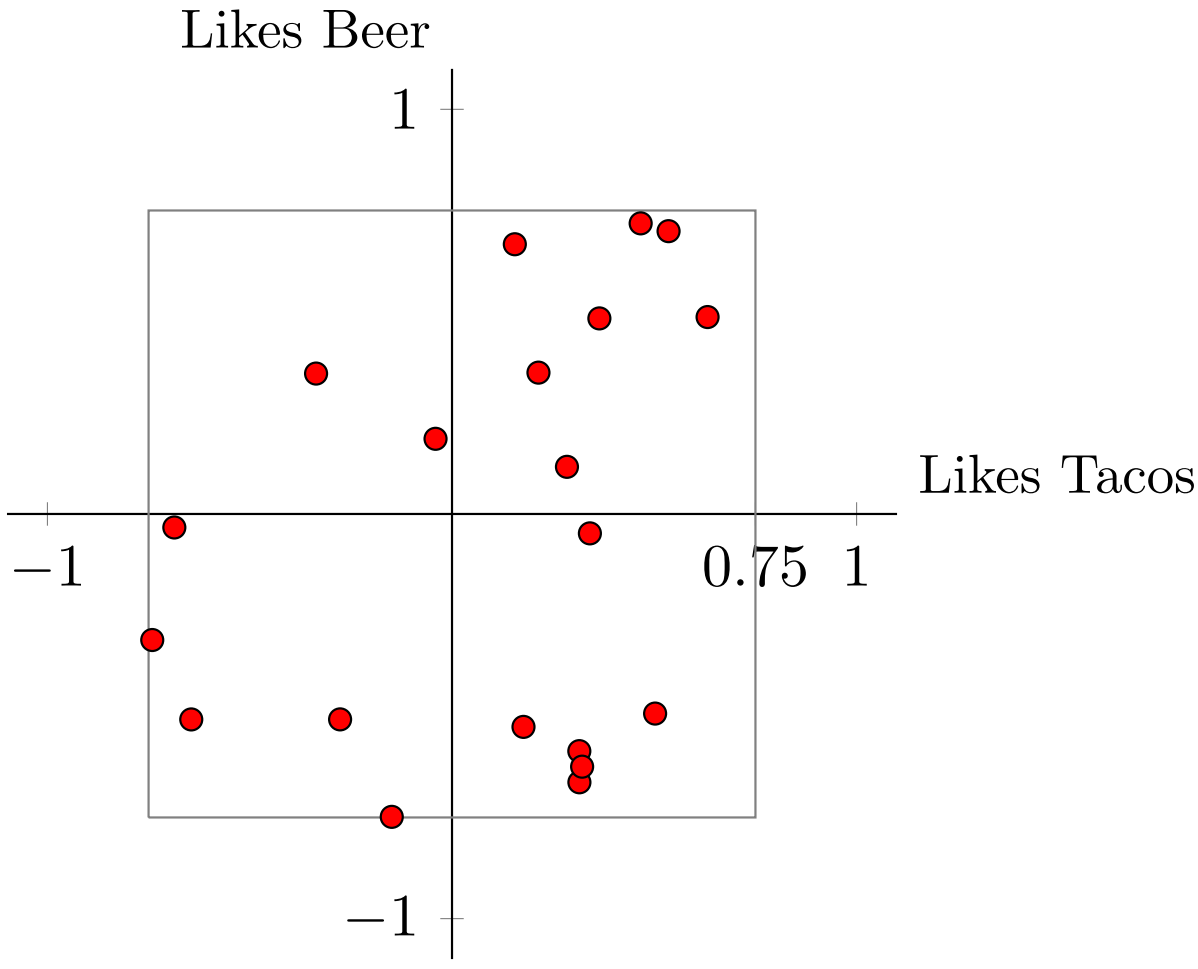


Average polarization = 0.6

Network structure biases polarization outcome



Limiting extremism often reduces polarization



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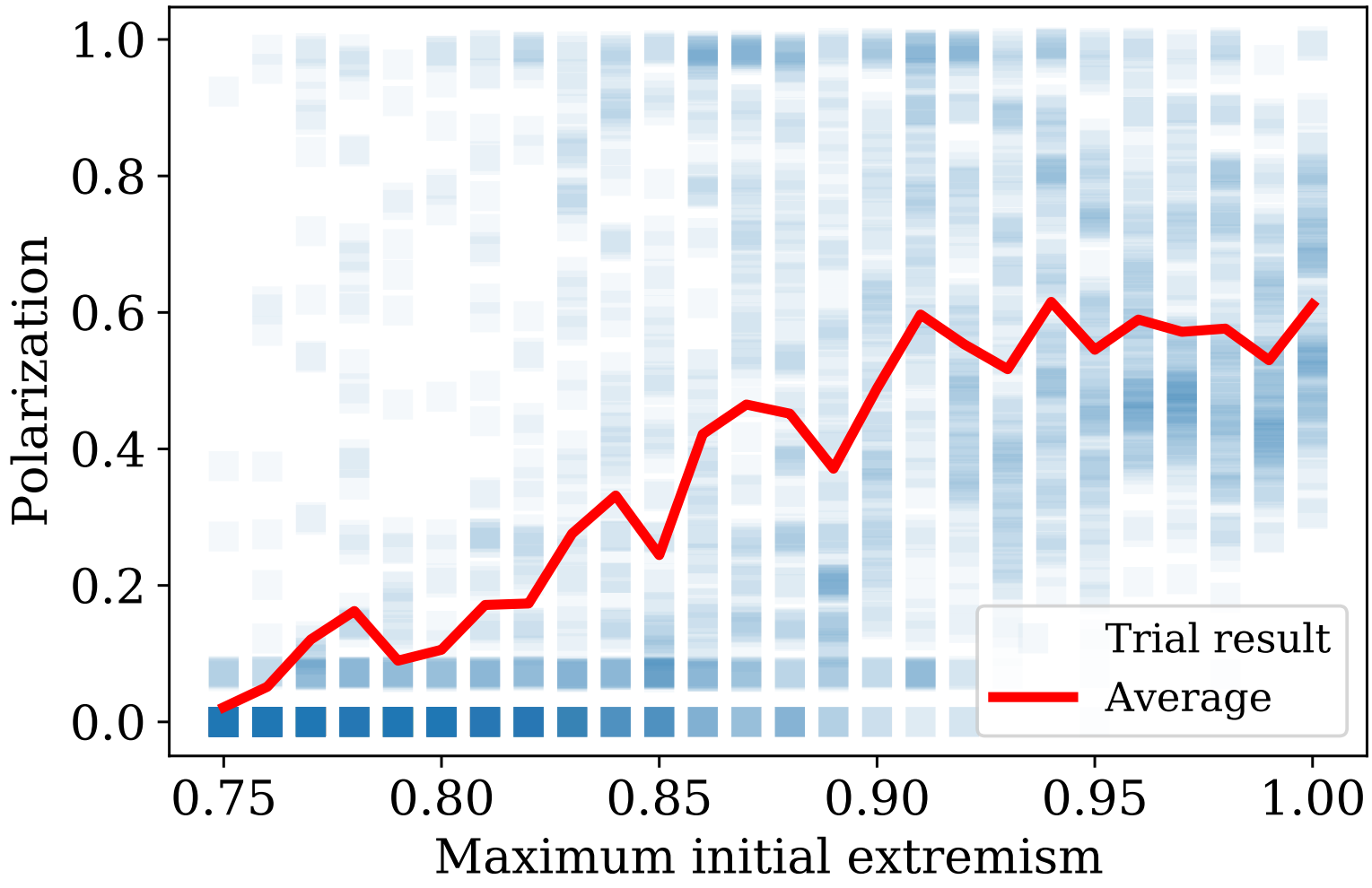

Communication noise often leads to polarization

Sketch:
You say: "I only like to eat tacos sometimes"

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You say: "I only like to eat tacos sometimes"
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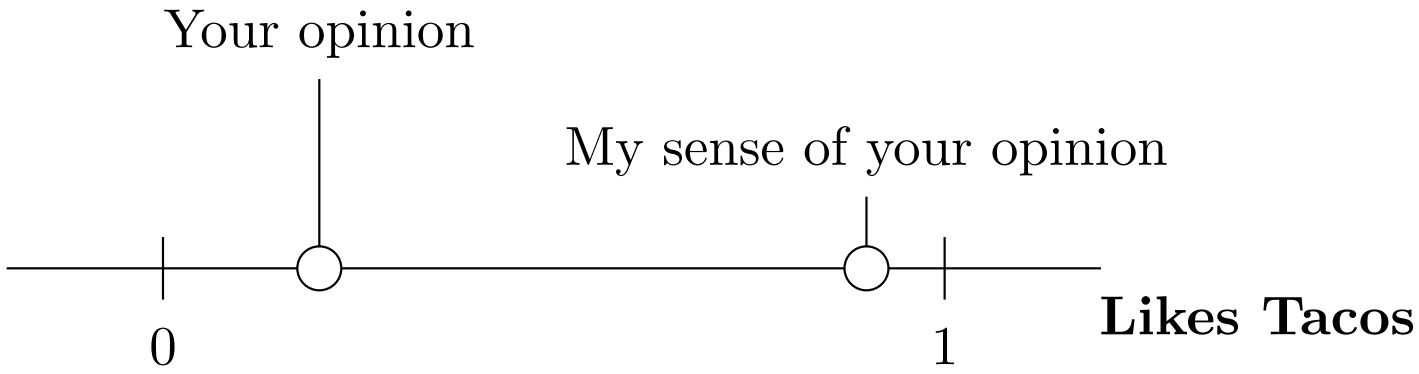

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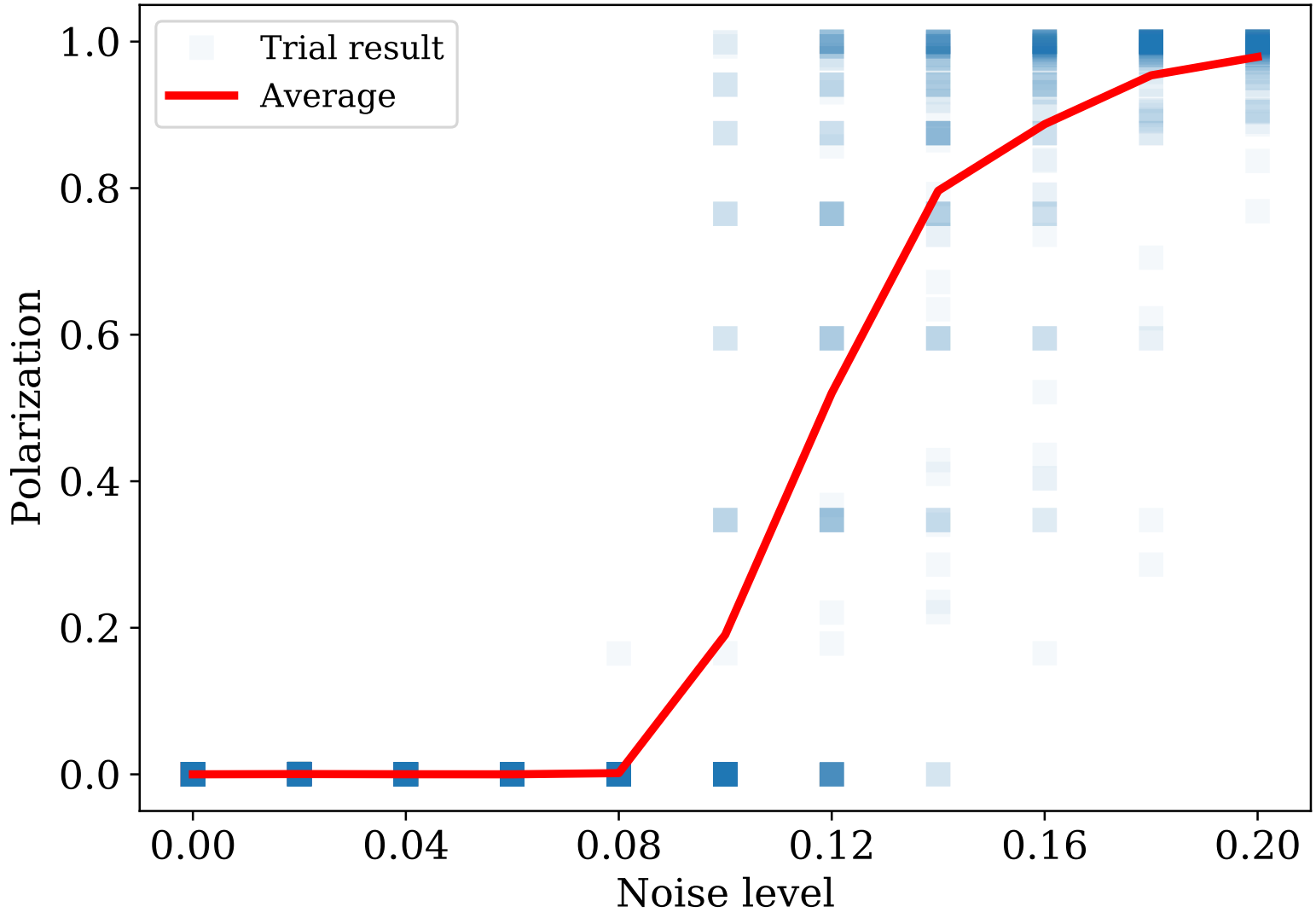
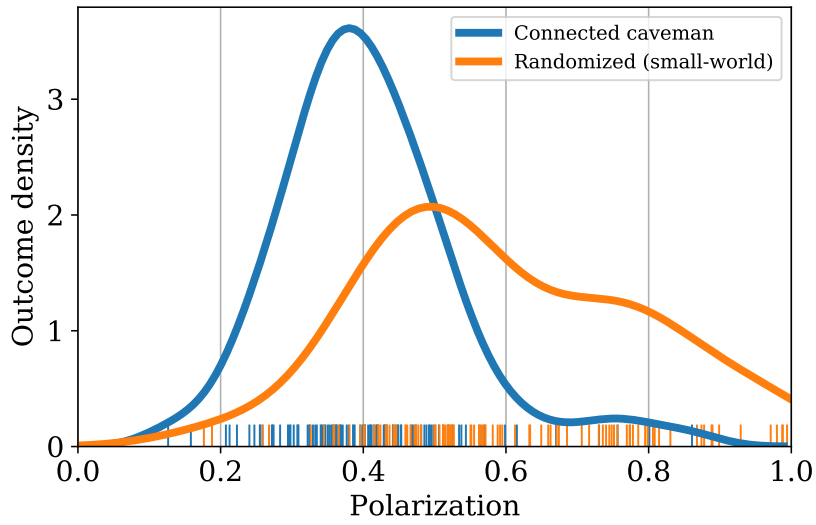


Conclusion

Used computational experiments to generate model predictions:

1. Polarization can emerge whether or not network is in small-world condition



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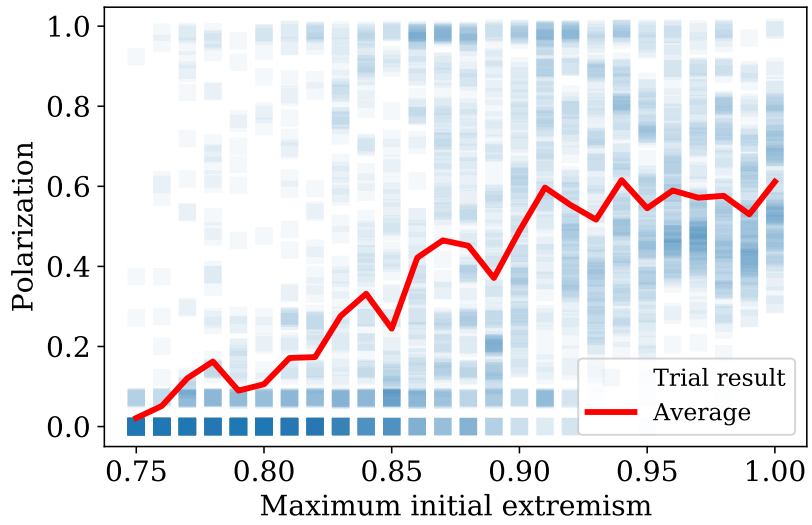

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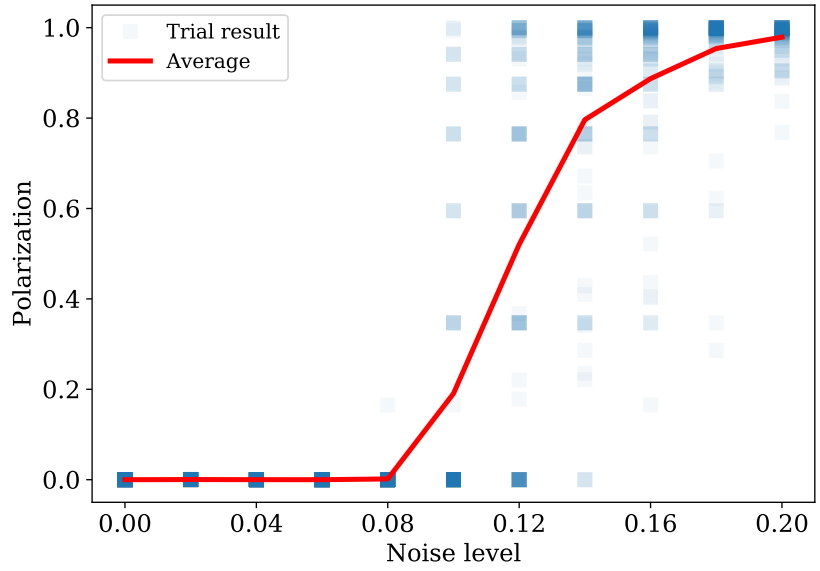

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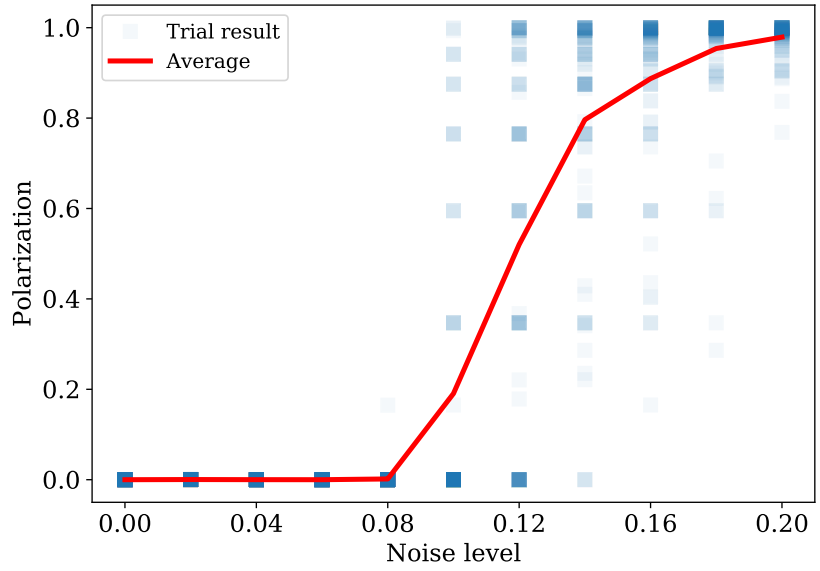

$\Rightarrow$ **Future:** apply this model to empirical data.

Thank you!

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