

LLM-Based Simulations on the Microfoundations of Homophily

Homophily is

“the tendency to associate with similar others.”

Ertug et al. (2022), p. 38

The Papers Examine a Consequence of Homophily, Polarization

	Smaldino (2023)	Kozlowski et al. (2024)	Piao et al. (2025)	Larooj & Törnberg (2025) (through Richter, 2025)
Overview	→ Introduces the Schelling model	→ Uses “older” LLMs to simulate partisan responses to pandemic-related questions	→ Uses GABMs to simulate interactions and examine consequences	→ Uses GABMs in artificial social media to examine the social media illnesses
Method and results	→ Agents have one observable identity and a preference for % of similar neighbors	→ Uses LLM trained on texts from pre-2020 to simulate responses from liberals and conservatives	→ 1000+ GAs interacting (forming relationships and communicating to form opinions) in network	→ 500 GAs interacting (through opinion post, repost, follow) for 10,000 cycles
Results	→ Homophilic clustering	→ Polarization over COVID-19 seems preconfigured in political discourse	→ Polarization, homophilic clusters (based on opinion), echo chambers, confirmation bias, etc.	→ Echo chambers, concentration of influence, and extreme voice amplification

Yet, They Neglect the Microfoundations of Homophily

Antecedent to homophily

Who do we see as similar to us? Which characteristics matter?

Salient characteristics (e.g., age, gender, ethnicity) may matter most in short interactions.

Deep-level characteristics (e.g., personality) may matter less in short interactions, becoming more important over time.

The process is biased.

➡ **Simulation 1**

Antecedent to homophily

Does similarity to others always matter?

Similarity between attributes of evaluators and evaluated individuals may positively affect evaluations.

Other characteristics, like status and context, moderate the effect of similarity.

➡ **Simulation 2**

Antecedent to homophily

How do we form similarity perceptions in realistic settings?

Individuals are more likely to anchor impressions when interacting.

Assumed similarity for some characteristics may be common.

➡ **Simulation 3**

**BUT MUCH
REMAINS
UNKNOWN**

Overview of Simulations

Set attributes

Freely create 2-3 personas by setting attribute values.

Example: risk_taking: 20.0/100 (0=risk-averse, 100=risk-seeking)

Create narratives

Based on these attributes, create using LLMs 10 sentence narratives for each persona.

Example: “You prefer steady routines and tend to choose familiar paths over sudden changes. [...]”

Simulations

1: Similarity Perception

1 agent reads a narrative of someone else, finally rating their similarity perception

2: Hiring Decisions

1 agent acts as a hiring manager, reading narratives of 2 candidates

3: Conversations

2 agents with different personas talk to each other, finally rating their similarity perception

Validation

We will use two criteria for validation:

Results: ~~What should the results look like?~~

Agents: *Are the agents believable/consistent/realistic?*

My Unsystematic Observations



1: Similarity Perception

Objective similarity is not directly related to perceived similarity.

Some characteristics (age) seem to matter more.

Behaviors seem more relevant.

It is interesting how the LLM translates characteristics into narratives.



2: Hiring Decisions

Candidates with similar characteristics are often preferred, sometimes while neglecting the context in which the decision takes place.

Goals and structured contexts do not override similarity biases.



3: Conversations

Similarity perceptions are incredibly inflated (often >80% for highly dissimilar individuals), perhaps because conversations are nice.

Topics of conversation seem to matter most.

Agents will spontaneously generate facts about themselves.

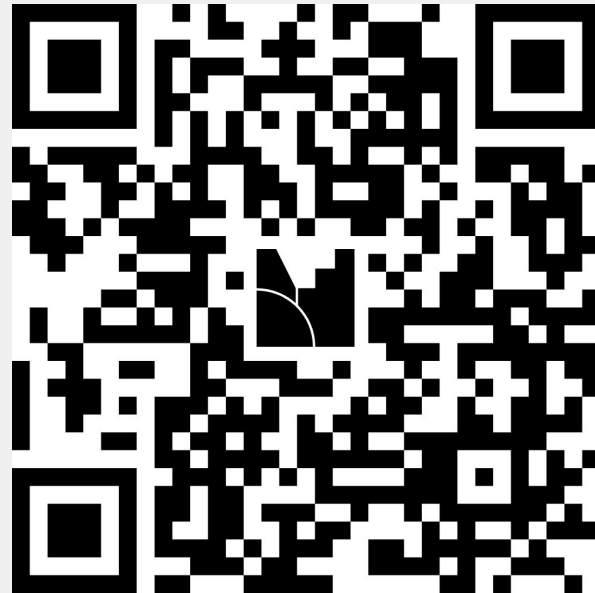
Examining Homophily in Generative Agents

Access the simulations by
scanning the QR code.



Are the Results and Agents Realistic?

Share your observations with the class by scanning the QR code.





Thank you!

References

- Ashby, S. R., Chaloupka, B., & Zeithamova, D. (2023). Category bias in similarity ratings: The influence of perceptual and strategic biases in similarity judgments of faces. *Frontiers in Cognition*, 2. <https://doi.org/10.3389/fcogn.2023.1270519>
- Cemalcilar, Z., Baruh, L., Kezer, M., Kamiloglu, R. G., & Nigdeli, B. (2018). Role of personality traits in first impressions: An investigation of actual and perceived personality similarity effects on interpersonal attraction across communication modalities. *Journal of Research in Personality*, 76, 139–149. <https://doi.org/10.1016/j.jrp.2018.07.009>
- Ertug, G., Brennecke, J., Kovács, B., & Zou, T. (2022). What Does Homophily Do? A Review of the Consequences of Homophily. *Academy of Management Annals*, 16(1), 38–69. <https://doi.org/10.5465/annals.2020.0230>
- Fischer, I., & Savranovski, L. (2023). The effect of similarity perceptions on human cooperation and confrontation. *Scientific Reports*, 13(1), 19849. <https://doi.org/10.1038/s41598-023-46609-8>
- Hughes, B. T., Flournoy, J. C., & Srivastava, S. (2021). Is perceived similarity more than assumed similarity? An interpersonal path to seeing similarity between self and others. *Journal of Personality and Social Psychology*, 121(1), 184–200. <https://doi.org/10.1037/pspp0000369>
- Ichien, N., Lin, N., Holyoak, K. J., & Lu, H. (2024). Cognitive complexity explains processing asymmetry in judgments of similarity versus difference. *Cognitive Psychology*, 151, 101661. <https://doi.org/10.1016/j.cogpsych.2024.101661>
- Thielmann, I., Hilbig, B. E., & Zettler, I. (2020). Seeing me, seeing you: Testing competing accounts of assumed similarity in personality judgments. *Journal of Personality and Social Psychology*, 118(1), 172–198. <https://doi.org/10.1037/pspp0000222>

Which Questions About Homophily Were Left Unanswered?

Share your thoughts with the class by scanning the QR code.

