

# Simulating Reddit Echo Chamber Communities Through Representative LLM Persona Agents

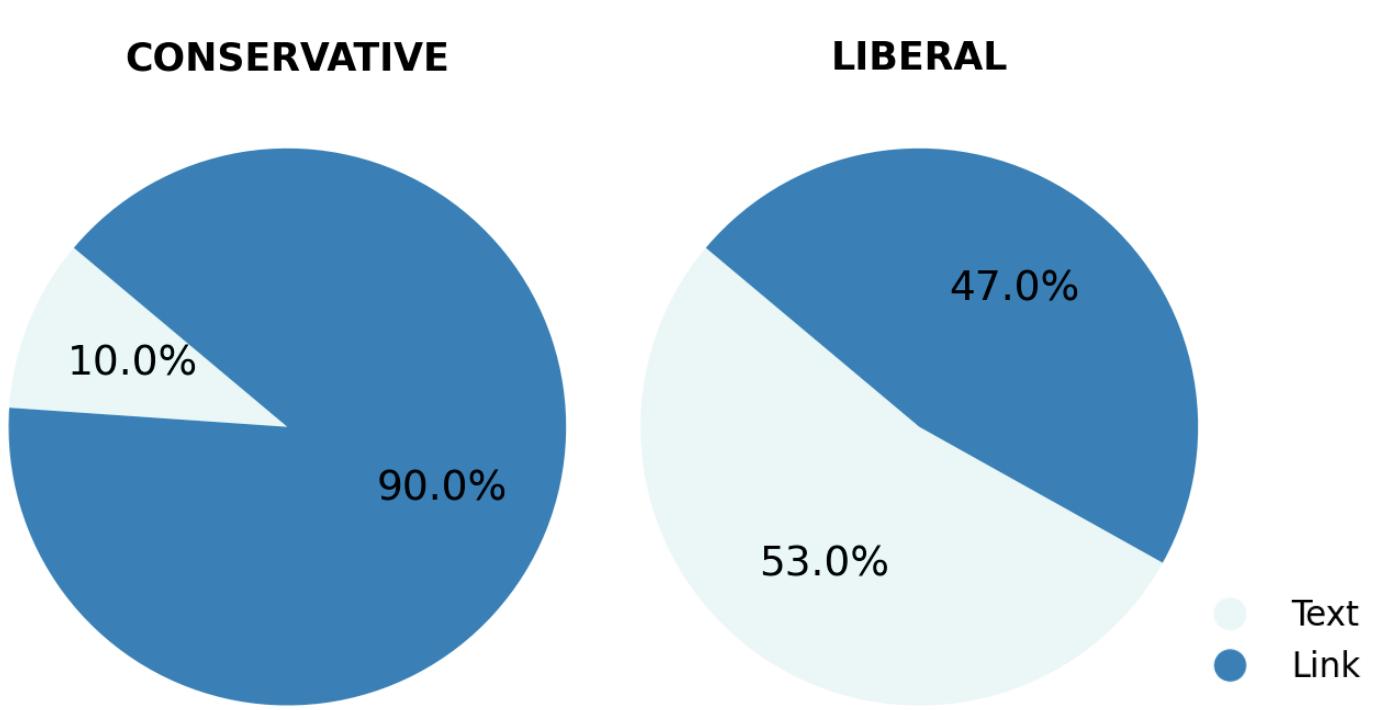
We create multiple **LLM-based persona agents** which personify the real world thoughts and opinions of identified **echo chamber communities** on popular online forum website Reddit. Our project leverages LLM advancements to detect echo chamber communities online, introduce a novel way of testing these agents on large scale real-world survey data, and predict the trajectory of these communities on novel topics before they transpire online.

## Motivation

Personalization algorithms manifest into polarized ideologies which corner users into echo chambers of their own beliefs and complicate mutual understanding in many social settings. We aimed to represent the views of radicalized groups online, and simulate discussions of various topics provide insights that policymakers and global citizens alike may benefit from.

## Data Collection

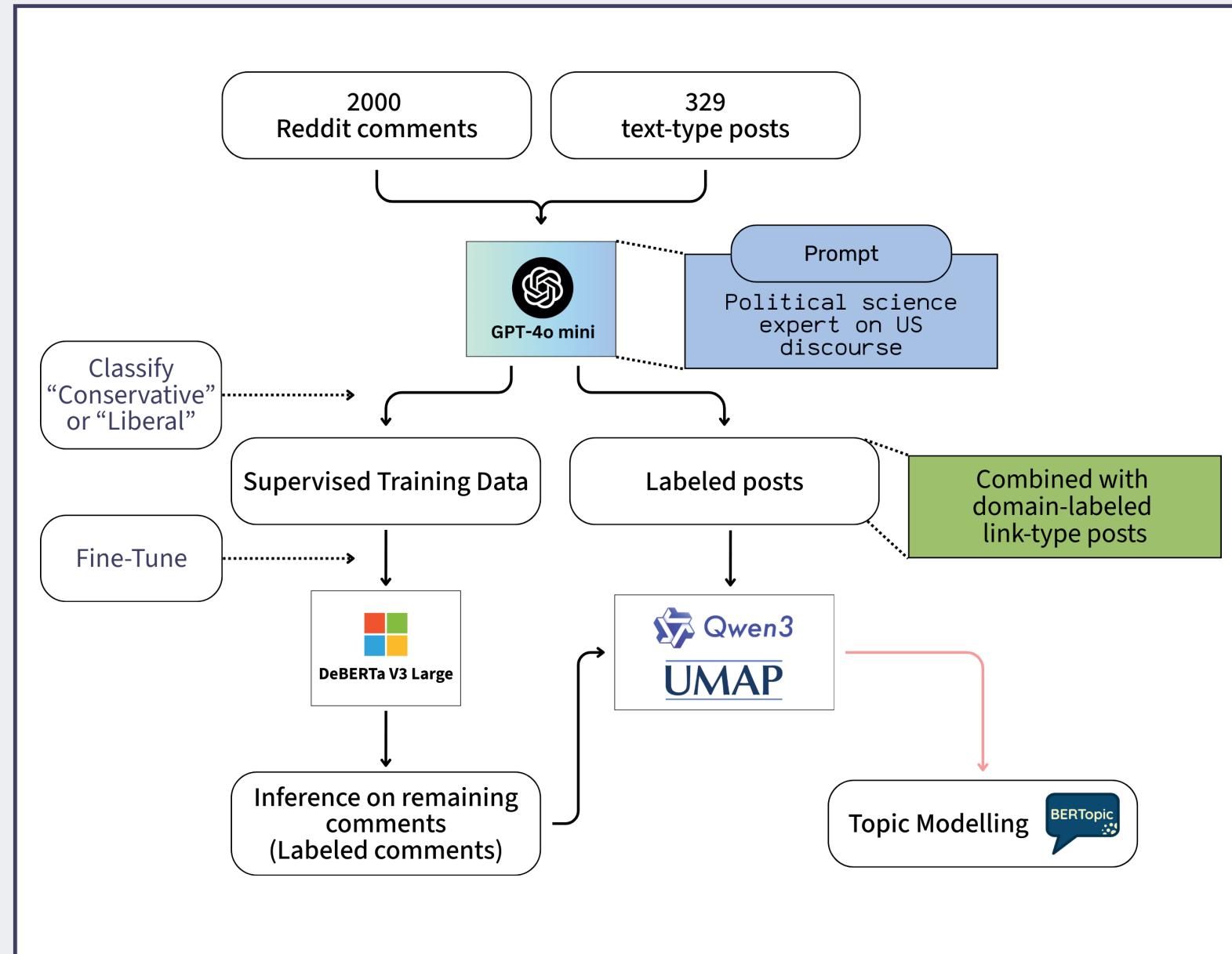
- r/Conservative & r/Liberal using PRAW
- HOT and monthly TOP posts
- Comments from each post
- User's past interacted subreddits



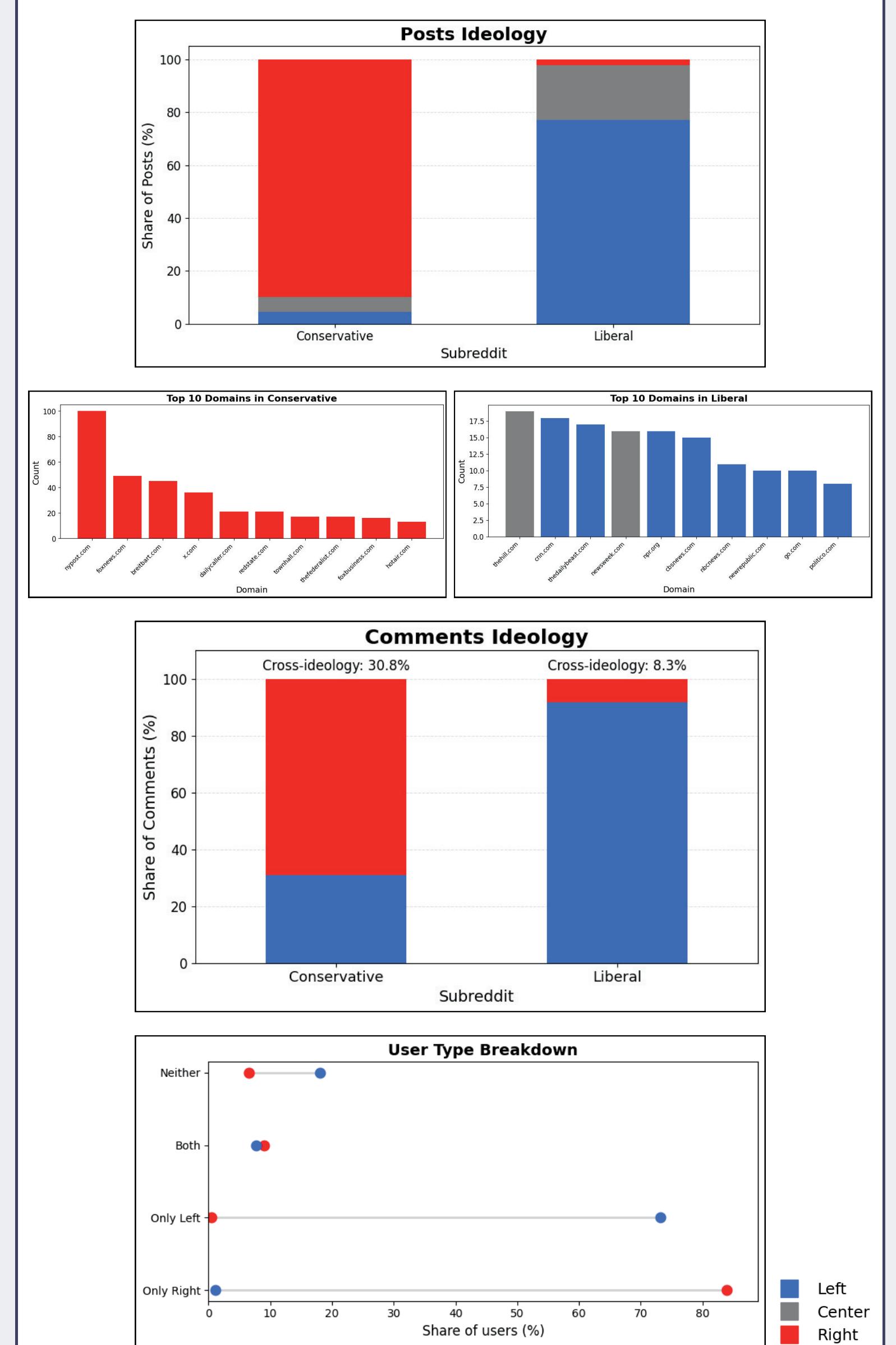
## Demographic Persona Agents

- Focus on groups of people sharing common characteristics (occupations, ethnic groups, personality types, etc.)
- Exploits the statistical stereotypes in LLMs
- Possible proxy human participants in significant numbers, a known challenge in social science research

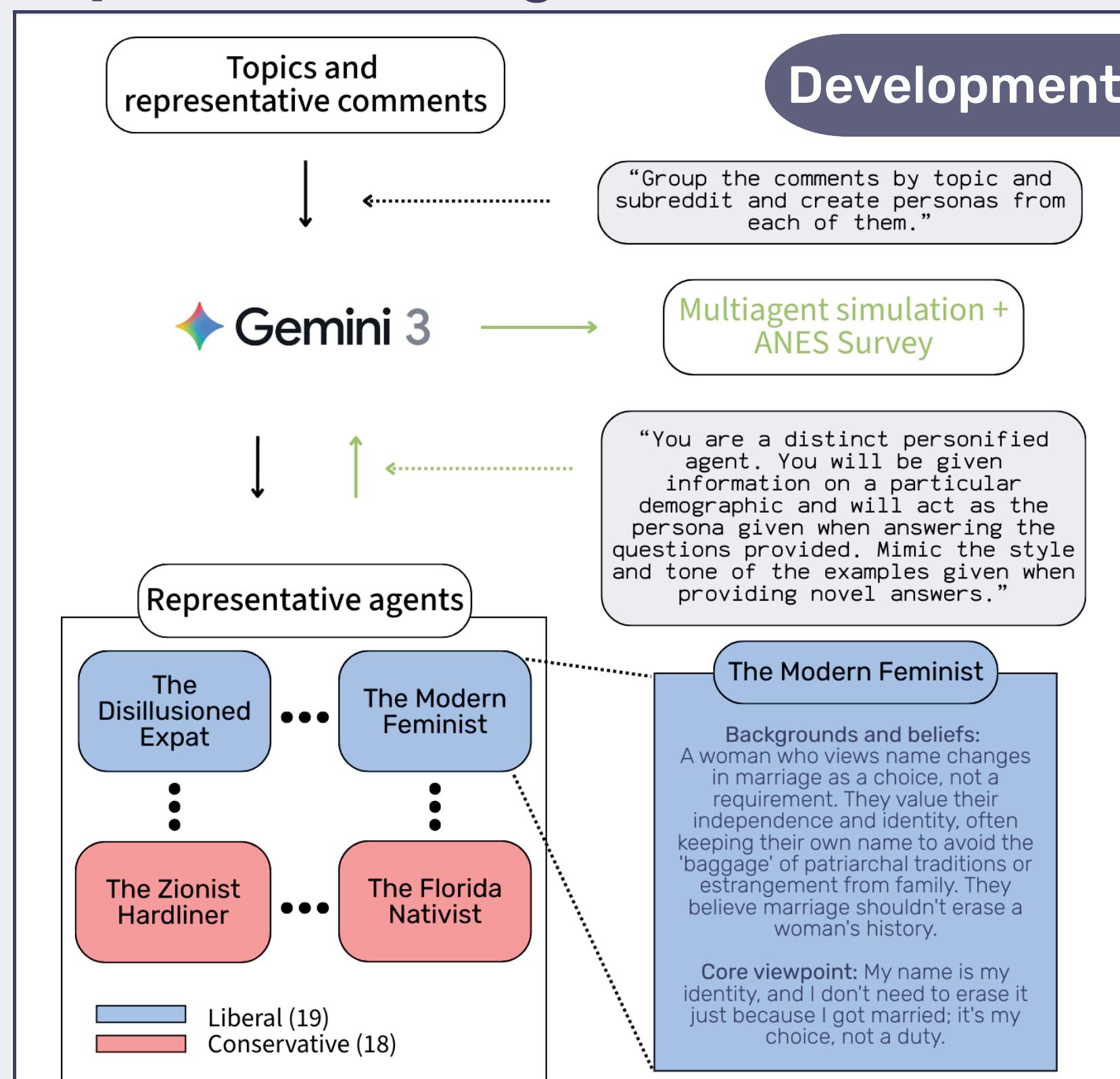
## Methodology



## Echo chambers in Reddit



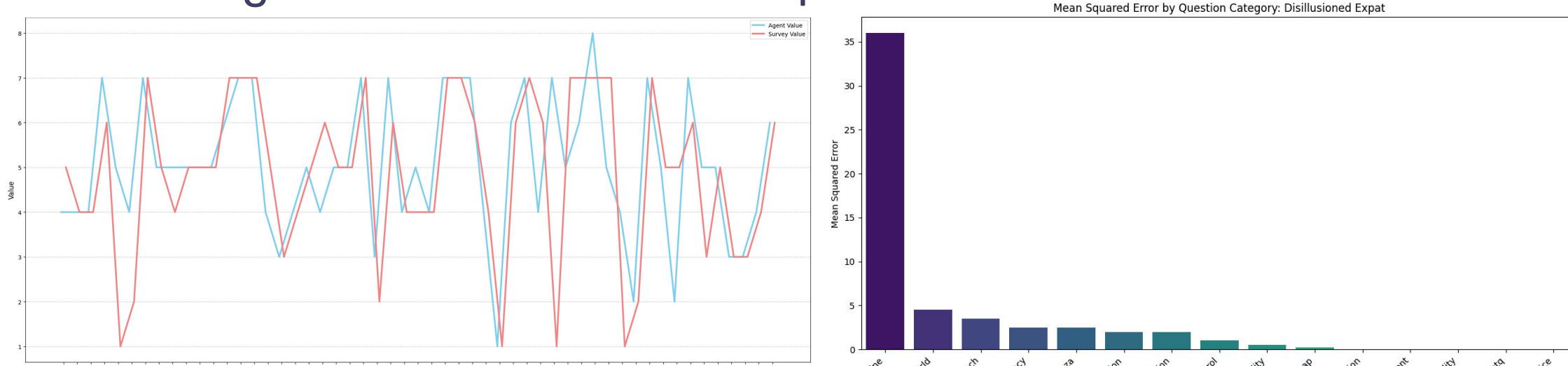
## Representative Agents & Discussion Simulation



**ANES** Agents answered same demographic (possible gender, states of origin, religions, etc.) and political ideology questions.

## Testing

### Persona Agent: The Disillusioned Expat



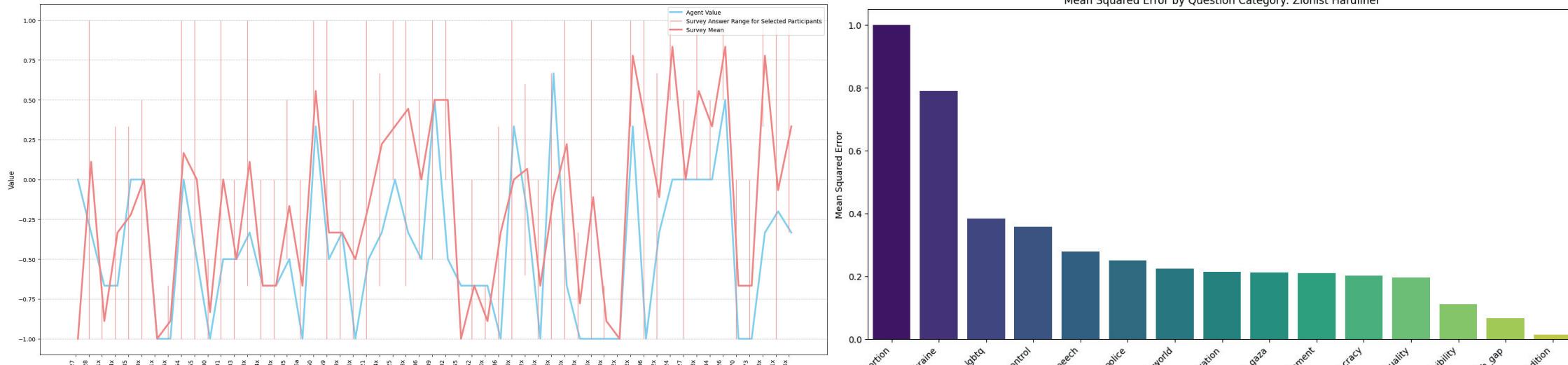
Watch a video of our discussion simulation on the future of AI

OR



Try it out yourself!

### Persona Agent: The Zionist Hardliner



## Findings & Conclusion

- Our data collection methodology **better informed the agents' development as compared to only LLM-based reddit analysis**.
  - Maintained **online linguistic style** and showed realistic answers in the online discourse.
- The agents generally **followed a similar pattern to the actual survey participants**, mostly staying within the range of the selected participants' answers.
- The **agents tend to go for extreme values or exact middle** whereas survey participants' answers were milder (stayed away from extreme answers)
  - May be attributed to nature of online forums – individuals who partake in online discussions tend to have stronger opinions

## Future work

- We see potential for expansion to more diverse subreddits
- Network and sentiment analysis for better echo chamber detection
- A feedforward network that 'trains' on the survey answers as finetuning data for the political subreddits