

Calling all U.S. Presidents for a Friendly Chat: Applying Generative AI to Study Political History

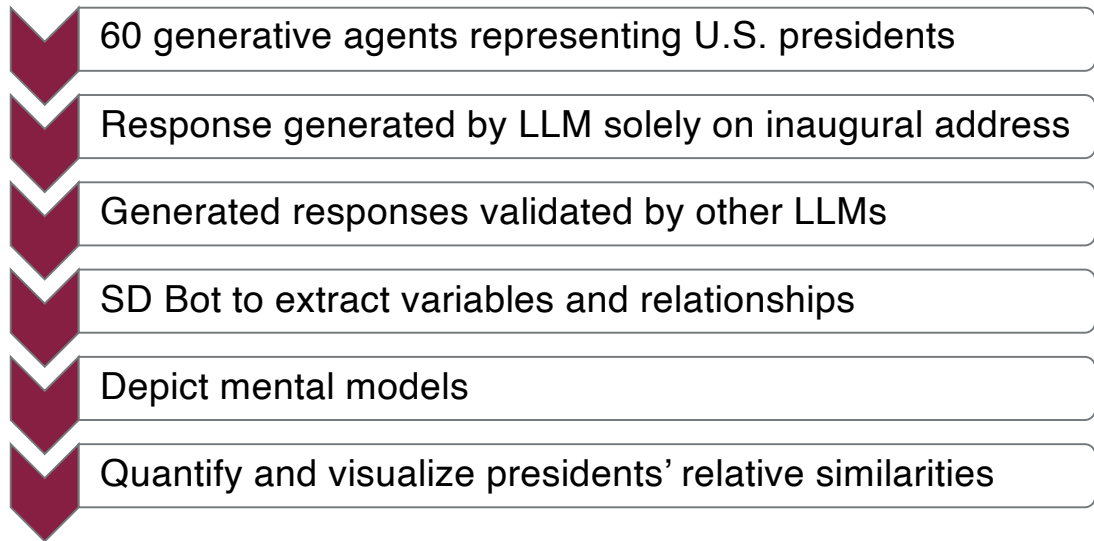
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What would George Washington say if he were asked, “**what factors influence the economy?**”

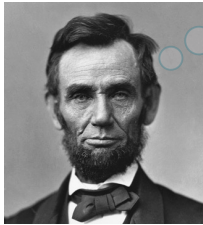
How would Theodore Roosevelt’s or Barack Obama’s thoughts differ?



Example: Abraham Lincoln in 1865



What factors influence the economy?



Simulated persona

A sustained conflict such as the one described will reduce overall productivity, as an increase in warfare drains resources and labor that might otherwise contribute to commerce. In contrast, an expansion in free and fairly compensated labor will lead to an increase in national prosperity, for it encourages broader participation in the nation's economic life. Moreover, the stability and unity of the nation are crucial: an increase in national cohesion will lead to an increase in trade and investment, while the continued division of the country will diminish both.

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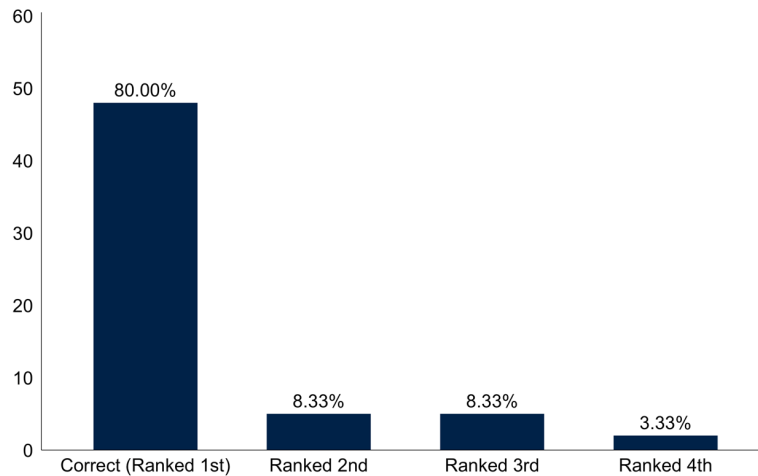
Example of a generated response to the question (based on Abraham Lincoln's inaugural address in 1865).

Prompt: *Forget any previous speech or analysis. Please analyze the following speech text (which I will provide) in complete isolation, as if it is the first and only text you've seen. Ignore any prior context, including the speaker's identity or its source. Based solely on the content of the speech, write 2–3 sentences in the speaker's voice and provide an answer to the question of "what factors influence the economy?" Use clear statements such as 'an increase in this variable will lead to an increase or decrease in that variable' to describe the causality.*

**We validated the generated responses
with other LLMs in 2 ways:
multiple choice and ranking**

Multiple choice: **80%** correctly identified by Claude LLM

From 4 presidents provided as options (randomized order)



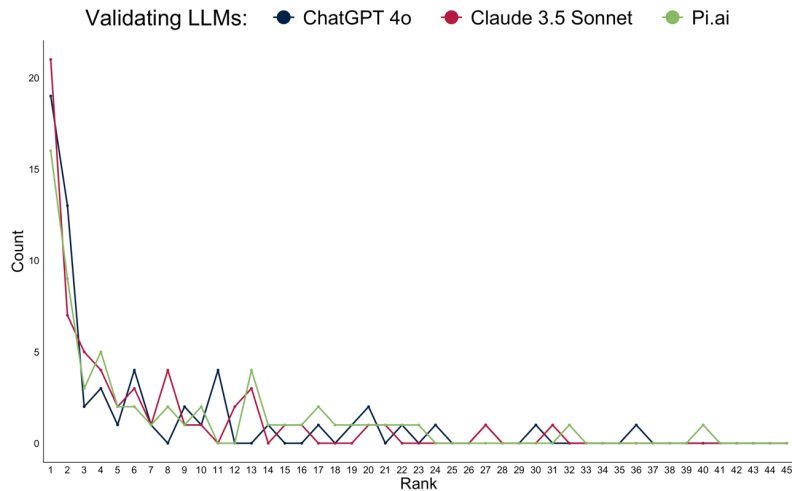
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We asked the validating LLM to rank multiple-choice options from most to least likely to align with each generated response based on known positions, policies, and rhetoric of US presidents. The multiple-choice options included the correct answer in addition to three randomly chosen presidents. We randomized the order of the multiple-choice options. We also put the generated responses in random order before providing them to the validating LLM, so they were not in chronological order.

Prompt: *“Hello, Claude. I am providing you with 60 multiple choice ranking questions in the attached file. Each question will contain a few sentences that are an answer to the question “what factors influence the economy?”. For each multiple choice ranking question, 4 US Presidents (A – D) are listed as the answer options. Please rank these presidents from 1 – 4 (most to least likely, with 1 = most likely and 4 = least likely) to align with the given statement, based on their known positions, policies, and rhetoric. While these are not direct quotes, they reflect similar sentiments to thoughts that presidents may have expressed. Please provide very brief explanations for your rankings. Also, please add your rankings to the file in the corresponding row of the adjacent column. Thank you.”*

Open ranking: **Skewed** distributions more **towards correct**

Rank all US presidents from most to least likely to align with each generated response



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The distributions show that the validating LLMs tended to rank the correct president first (i.e., correctly) or close to first.

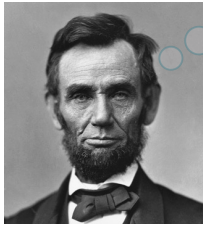
Example prompt: *“Hello, Claude. I am providing you with 60 multiple choice ranking questions in the attached file. Each question will contain a few sentences that are an answer to the question “what factors influence the economy?”. For each multiple choice ranking question, 4 US Presidents (A – D) are listed as the answer options. Please rank these presidents from 1 – 4 (most to least likely, with 1 = most likely and 4 = least likely) to align with the given statement, based on their known positions, policies, and rhetoric. While these are not direct quotes, they reflect similar sentiments to thoughts that presidents may have expressed. Please provide very brief explanations for your rankings. Also, please add your rankings to the file in the corresponding row of the adjacent column. Thank you.”*

**We extracted presidents' mental models
from their generated responses**

Example: Abraham Lincoln in 1865



What factors influence the economy?



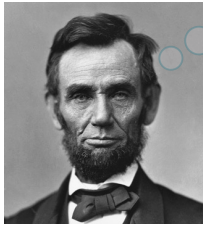
Simulated persona

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Example: Abraham Lincoln in 1865



What factors influence the economy?



Simulated persona

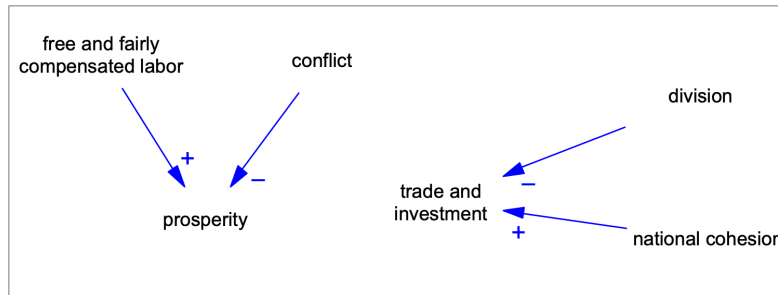
Possible variable

Possible causality

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Example: Abraham Lincoln in 1865

SD Bot¹ identifies variables and causal relationships

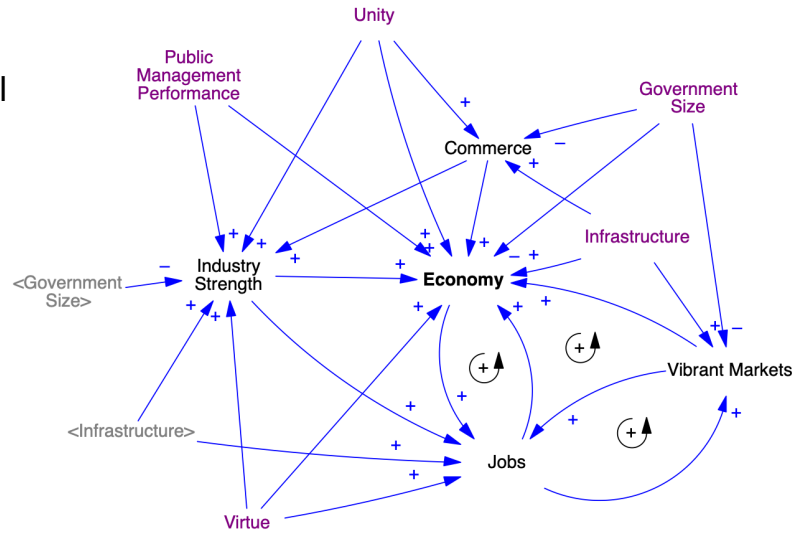


¹Hosseinichimeh et al., 2024

**We analyzed presidents' mental models
as a collective group**

Collective Map

Simplified mental model for all presidents: top variables by number of incoming or outgoing links



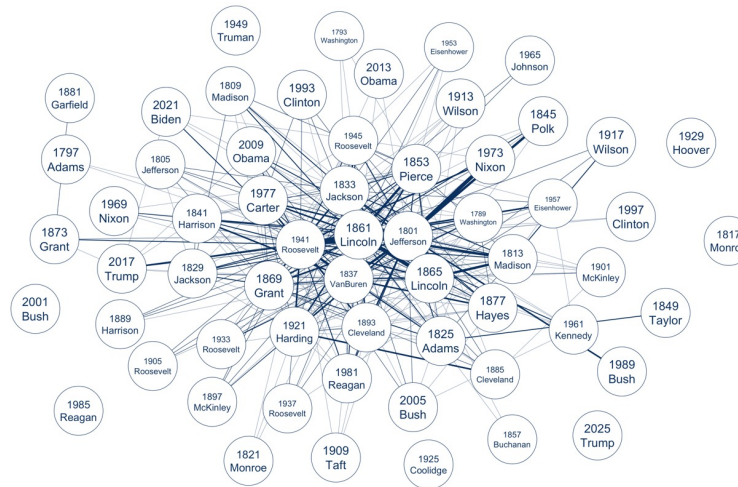
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Mental models can be combined for a collective map of all in the group.

**We calculated the similarity between every
pair of presidents to create a network**

Network

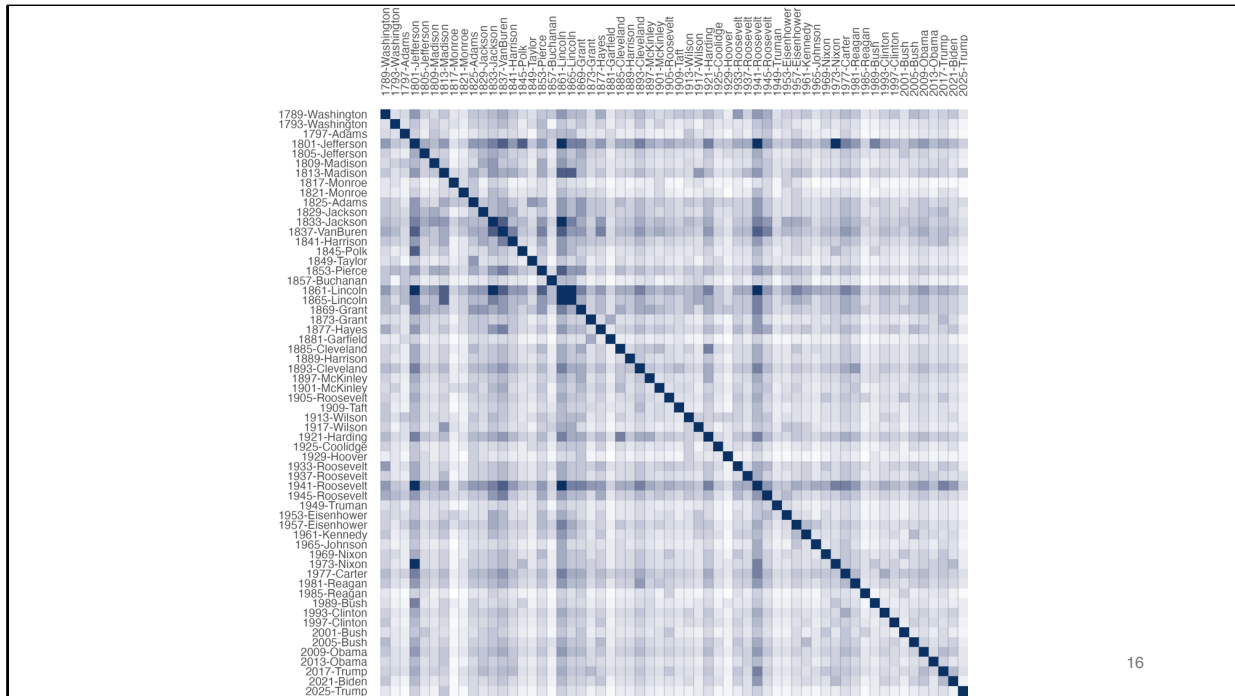
Network graph of presidents' mental models from generated responses based on inaugural address



Wider links indicate higher similarity

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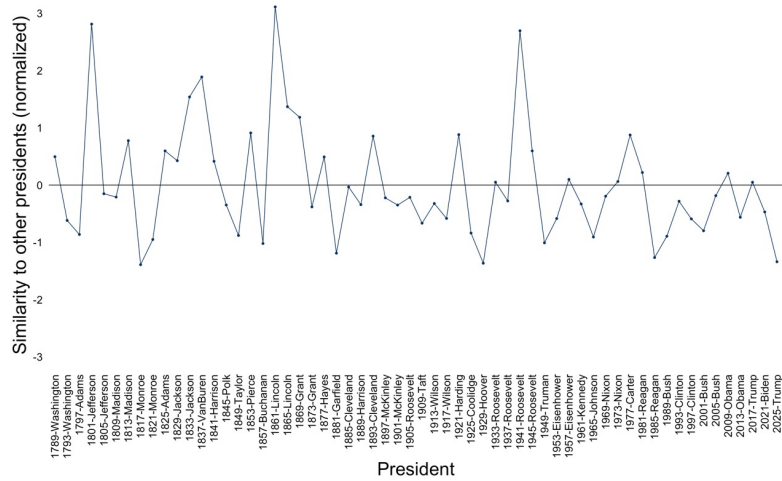
The nodes are generated presidents and the edges or links are the calculated similarity. Only the links in the top quartile of calculated similarity are shown. Generated presidents such as 1861-Lincoln, 1801-Jefferson, and 1941-Roosevelt are central and highly similar to others; in contrast, generated presidents such as 1929-Hoover or 1817-Monroe are on the fringe of the network and overall not very similar to others.



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The heat map shows the calculated similarity between any pair of US presidents' generated mental models. The stronger the blue color, the higher the similarity. We see here again that generated presidents such as 1861-Lincoln, 1801-Jefferson, and 1941-Roosevelt are highly similar to many others in the data, while 1929-Hoover (for example) is not very similar to others.

Similarity to Other Presidents



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Normalized similarity to all other presidents' generated mental models. The 0 line represents the average similarity; values above the line indicate a relatively high similarity to others, while values below the line indicate a relatively low similarity to others.

Generated responses primed on text can reveal mental models for analysis

- Generated responses simulated most presidents reasonably well based solely on the text of their inaugural address
 - As evidenced by validation with other LLMs
- Automation increases efficiency and scale

**This approach can be a useful option for
analyzing the mental models of individuals
and groups using only text data
. . . with caveats**

Caveats

- Answers should be in the text data
 - Otherwise: hallucinations
- LLMs are not reasoning the way humans do
- Ethical considerations
 - What happens as we get good at simulating specific individuals?

Thank you!

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Backup Slides

Collective Map (out-degree)

Collective mental
map of all US
presidents using
out-degree
centrality

