Computer Science > Computers and Society

arXiv:2409.01754 (cs)

[Submitted on 3 Sep 2024 (v1), last revised 30 Jun 2025 (this version, v2)]

Empirical evidence of Large Language Model's influence on human spoken communication

Hiromu Yakura, Ezequiel Lopez-Lopez, Levin Brinkmann, Ignacio Serna, Prateek Gupta, Ivan Soraperra, Iyad Rahwan

From the invention of writing and the printing press, to television and social media, human history is punctuated by major innovations in communication technology, which fundamentally altered how ideas spread and reshaped our culture. Recent chatbots powered by generative artificial intelligence constitute a novel medium that encodes cultural patterns in their neural representations and disseminates them in conversations with hundreds of millions of people. Understanding whether these patterns transmit into human language, and ultimately shape human culture, is a fundamental question. While fully quantifying the causal impact of a chatbot like ChatGPT on human culture is very challenging, lexicographic shift in human spoken communication may offer an early indicator of such broad phenomenon. Here, we apply econometric causal inference techniques to 740,249 hours of human discourse from 360,445 YouTube academic talks and 771,591 conversational podcast episodes across multiple disciplines. We detect a measurable and abrupt increase in the use of words preferentially generated by ChatGPT, such as delve, comprehend, boast, swift, and meticulous, after its release. These findings suggest a scenario where machines, originally trained on human data and subsequently exhibiting their own cultural traits, can, in turn, measurably reshape human culture. This marks the beginning of a closed cultural feedback loop in which cultural traits circulate bidirectionally between humans and machines. Our results motivate further research into the evolution of human-machine culture, and raise concerns over the erosion of linguistic and cultural diversity, and the risks of scalable manipulation.

Subjects: **Computers and Society (cs.CY)**; Artificial Intelligence (cs.AI); Computation and Language (cs.CL); Human-Computer Interaction (cs.HC)
Cite as: **arXiv:2409.01754 [cs.CY]**
(or **arXiv:2409.01754v2 [cs.CY]** for this version)
https://doi.org/10.48550/arXiv.2409.01754
Focus to learn more
arXiv-issued DOI via DataCite

Submission history

From: Hiromu Yakura [view email]
[v1] Tue, 3 Sep 2024 10:01:51 UTC (2,346 KB)
[v2] Mon, 30 Jun 2025 14:43:32 UTC (8,008 KB)

Links to Code Toggle
Papers with Code *(What is Papers with Code?)*
ScienceCast Toggle
ScienceCast *(What is ScienceCast?)*
Demos

Demos

Replicate Toggle
Replicate *(What is Replicate?)*
Spaces Toggle
Hugging Face Spaces *(What is Spaces?)*
Spaces Toggle
TXYZ.AI *(What is TXYZ.AI?)*
Related Papers

Recommenders and Search Tools

Link to Influence Flower
Influence Flower *(What are Influence Flowers?)*
Core recommender toggle
CORE Recommender *(What is CORE?)*
About arXivLabs

arXivLabs: experimental projects with community collaborators

arXivLabs is a framework that allows collaborators to develop and share new arXiv features directly on our website.

Both individuals and organizations that work with arXivLabs have embraced and accepted our values of openness, community, excellence, and user data privacy. arXiv is committed to these values and only works with partners that adhere to them.

Have an idea for a project that will add value for arXiv's community? **Learn more about arXivLabs**.