

How we trust the reliability of others' memories: Research examines difference between human and machine capabilities

September 9 2024



Credit: CC0 Public Domain

A police officer hears an eyewitness account of a car accident, a doctor diagnoses an illness based on symptoms listed by a patient, or a friend

recommends a restaurant. Others' memories are a source of information for us that influences the way we act. Cognitive and neuroscience researchers from Ben-Gurion University of the Negev have examined how humans assess the reliability of these memories and the difference between human and machine capabilities.

The findings were [published](#) recently in the journal *Proceedings of the National Academy of Sciences*.

Years of research indicate that our memories are subject to forgetting and distortion. People's memories are not accurate descriptions of the past, but are prone to error, even after short periods of time. The information from these memories is significant to us because much of our knowledge about the world relies on information from others' memories. So how can we base information on memory that is not always reliable?

Dr. Talya Sadeh of the Department of Cognitive and Brain Sciences at Ben-Gurion University of the Negev decided to examine this question and understand how humans can recognize and verify that others' memories are accurate.

"A lot of people's knowledge comes from sharing episodic memories with each other, knowledge that we use to make decisions, form opinions, and so on," she noted. "My research examined how we manage to base knowledge, sometimes really important knowledge, on the basis of memories that are not always reliable, and can natural language processing models, such as those we all know (e.g., ChatGPT and others), help us identify the truth of memory?"

For this purpose, she conducted a study that simulated situations from real life in which a person is required to judge whether memories told by another person are true or not. For example: "I remember that a woman

was at a party because I remembered that she arrived late and was wearing a really nice dress" or "I remember that the car didn't stop at the red light because I noticed the speed before it reached the intersection, while the traffic light changed from green to yellow."

Participants were asked to directly judge whether they thought the memories were truthful or not based on such descriptions. Next, they were asked to assess the quality of the other's memory by giving a quantitative score on questions such as how vivid and detailed the memory was, and how confident the speaker sounded about it.

The comparison to a machine learner was made based on the words from the memory descriptions that were most indicative of correct (or incorrect) memory, among humans and the machine learning model. Of the 20 words that best indicated the correctness of memory, 14 were shared by man and machine. Hence, the results indicate that humans have the ability to directly evaluate others' memories and determine whether they are true or false, and they do it based on much of the same information as a language model (and as well as the model).

However, the reliability of others' memories can be predicted even better (by a 10% gap) if--instead of relying on a direct assessment of memory reliability--we ask evaluators to judge the qualities of memory: how much they think it is associated with a rich, vivid and detailed sensory experience, and how confident the memory sharer sounds.

While a language model is based on the extraction of statistical rules, people's decisions rely on their sensitivity to information indicative of the qualities of the memory. This allows humans to evaluate the memories of others very well and perhaps even better than a language model that is trained to extract statistical rules from texts that describe people's memories.

Given that we use language to share [mental states](#), thoughts, and beliefs, this lifelong learning of language serves as a tool for us to validate the memories and experiences of others. This study is an important step in deciphering how humans think about [memory](#) sharing and its importance in creating social knowledge.

"Humans have the ability to take advantage of their being social creatures to learn quickly from others. Much of the knowledge of humans comes from the fact that we share real-life experiences with each other, and we have succeeded in showing that the machine cannot yet take our place when it comes to personal [memory](#)," concludes Dr. Sadeh.

The research group included Avi Gamran from the Psychology Department and Lilach Lieberman from the Department of Cognitive and Brain Sciences at Ben-Gurion University of the Negev, Prof. Ian Dobbins from the Washington University in Missouri, and Prof. Michael Gilead from Tel Aviv University.

More information: Avi Gamoran et al, Detecting recollection: Human evaluators can successfully assess the veracity of others' memories, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2310979121](#)

Provided by Ben-Gurion University of the Negev

Citation: How we trust the reliability of others' memories: Research examines difference between human and machine capabilities (2024, September 9) retrieved 9 September 2024 from <https://medicalxpress.com/news/2024-09-reliability-memories-difference-human-machine.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.