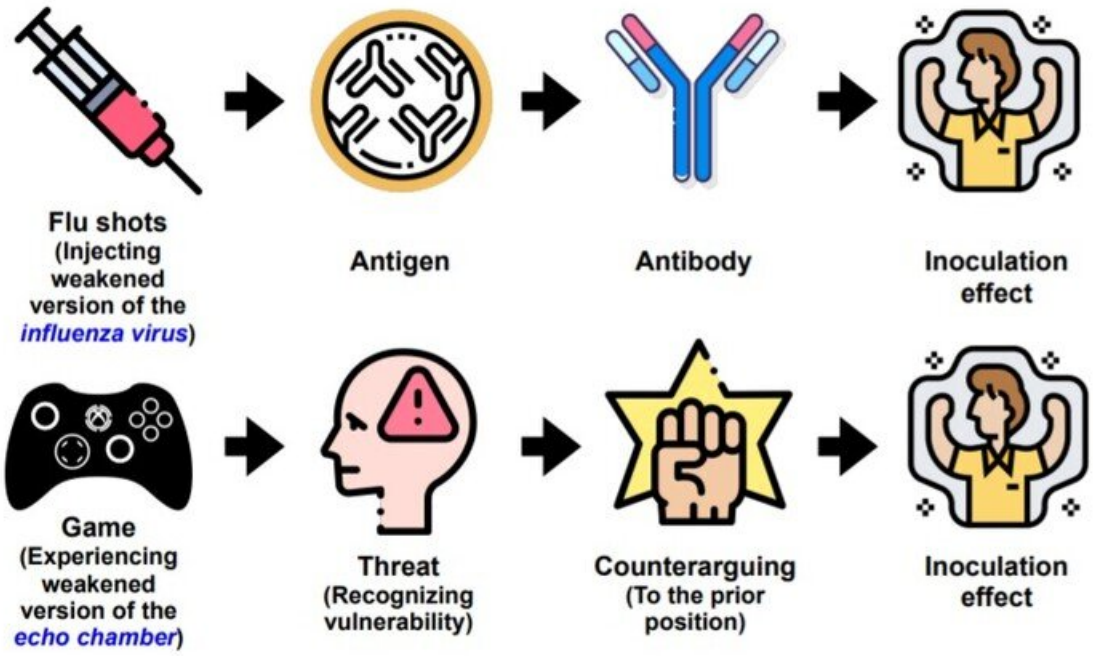
New game can help users identify, avoid online echo chambers

October 15 2021, by Jessica Hallman



The novel design of ChamberBreaker is based on three psychological theories including the concept of inoculation, through which the researchers suggest that the mental antibodies against misinformation (bottom) can be achieved in the same way as in biology, when a human body creates an antigen after being vaccinated with a weakened dose of a virus (top). Credit: Penn State

Every day, social media users are exposed to fake news and political polarization on social networks. What makes people vulnerable to

believing false information they find online?

According to researchers at the Penn State College of Information Sciences and Technology, users can easily fall into an echo chamber—a sort of online rabbit hole through which users consume only one-sided news and political arguments, eventually distrusting any opposing views. To combat this phenomenon, the researchers have developed a new tool that applies psychological concepts to help individuals become more aware of and responsive to an echo chamber effect.

The tool, a game named ChamberBreaker, is a theory-based game that enables a player to test their own awareness of content that could result in echo chambers and to observe how they are accelerated by the spread of fake news. Their goal is to help players resist echo chambers in the future and ultimately reduce the rate of fake news dissemination.

"Since people who fall into an echo chamber tend to consume the information they want to see, whether and how much the information is the same as their belief is usually more important than how credible the information is," said Kyungsik Han, associate professor at Hanyang University in Korea, who earned his doctorate at the Penn State College of IST and is the corresponding author of the research paper. "This indicates a necessity to conduct research on how to help people fundamentally understand an echo chamber and experience its negative consequences."

"We all tend to conform to and agree with the group opinion. Hence, people naturally get together with others who hold the same opinion," said Dongwon Lee, professor of information sciences and technology at Penn State and one of the paper's authors. "But if you're not careful and not thinking critically, there is a high risk for someone to fall into an echo chamber. Hopefully, in the future, this kind of tool helps people learn a sort of online hygiene—similar to washing your hands to protect

yourself from illness."

Added Lee, "Ultimately, the success of fake news research is based on how people will perceive information and how they will change their behavior accordingly. No matter how accurate AI-based fake news detectors are, ultimately, if users do not accept and change their behavior, then nothing is going to work."

In ChamberBreaker, a player is tasked with trying to misinform the audience in hopes of having community members fall into an echo chamber. To begin, the player is randomly assigned a scenario that focuses on a health, political or environmental issue, and are presented six tweets on that topic. Then, the player selects tweets that could cause the other members to fall into an echo chamber while simultaneously maintaining their trust.

The player can monitor their efforts through two gages on ChamberBreaker's interface—one that tracks the community's echo chamber effect and one that measures the player's reliability or credibility. The objective is for the player to keep both gages above a certain threshold. If successful, the community members will fall into an echo chamber and the player will witness the resulting negative effects on the community. The player then receives a score after each scenario.

The novel design of ChamberBreaker is based on three psychological theories. First, through the concept of inoculation, the researchers suggest that mental antibodies against misinformation can be achieved in the same way that a human body creates an antigen after being vaccinated with a weakened dose of a virus. That is, much like a virus, if left unchecked, misinformation can rapidly spread through networks from one person to the next. While the theory of inoculation has been applied in other social science issues, such as climate change and political topics, ChamberBreaker is the first awareness tool that uses it

against the echo chamber effect.

Second, the researchers study the impact of heuristics by judging—the process that humans go through to make a quick decision with limited information—and how it could result in a user falling into an echo chamber. In ChamberBreaker, a player can observe the negative effects of these quick and less informed decisions.

Lastly, ChamberBreaker applies gamification, which uses rewards such as scores and badges to encourage players to complete a task. This approach could improve users' self-awareness, increase participation and help users more easily recognize problem behaviors, the researchers said.

According to Aiping Xiong, assistant professor of information sciences and technology at Penn State and a co-author, many users enter an echo chamber without ever being aware of it.

"Fake news is not a new phenomenon," said Xiong. "In fact, as human beings, we've seen it again and again throughout history; it's an age-old problem. Therefore, it indicates that there are some fundamental cognitive mechanisms that play a role."

Once ChamberBreaker was developed, the researchers tested it to determine if the tool would help players become more aware of the echo chamber effect and change their news consumption behaviors after playing the game. Two groups of more than 800 participants each took a survey to indicate their current behaviors related to online news consumption. Then, one group was asked to play ChamberBreaker while the other was instead asked to read information about echo chambers and review samples of tweets and scenarios used in the game. Both groups then completed another survey to predict their future behaviors when reading online news.

The researchers found that those who played ChamberBreaker were significantly more likely to state their intention to observe online information from more diverse perspectives and showed an increased awareness of the echo chamber phenomenon. In particular, players over the age of 50 and those with a pro-liberal stance showed the most significant changes compared to other corresponding groups. These findings were all statistically significant.

"Our methodology has been proven to be useful in helping people realize the importance of information diversity and the characteristics of echo chambers, as well as educating people to become healthier news consumers," said Youngseung Jeon, first and lead author of the paper.

Ultimately, the researchers hope that their methodology can be applied to other research dealing with issues related to information consumption.

More information: Game: chamberbreaker.ngrok.io/

Conference: cscw.acm.org/2021/

Provided by Pennsylvania State University