

Tech-savvy people more likely to trust digital doctors

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Would you trust a robot to diagnose your cancer? According to researchers at Penn State, people with high confidence in machine performance and also in their own technological capabilities are more likely to accept and use digital healthcare services and providers.

"There is increasing use of automated systems in the medical field, where intake is now often conducted through a kiosk instead of by a receptionist," said S. Shyam Sundar, James P. Jimirro Professor of Media Effects. "We investigated user acceptance of these 'robot receptionists,' along with automated nurses and doctors. In addition, we tested whether the form that these roles took—human-like, avatar or robot—made a difference in user acceptance."

According to Sundar, the [healthcare](#) industry can benefit from increased reliance on automated systems.

"Doctors are limited by their human bandwidth, by

their experience, knowledge and even state of mind from minute to minute," he said. "In contrast, [machines](#) can be programmed to 'think' of all the possible conditions that a patient's symptoms could point to, and they never get tired. Some level of automation is clearly needed."

The researchers recruited participants from the online workforce, Amazon Mechanical Turk, to gain a better understanding of user psychology behind the acceptance of automation in clinics. The results will be presented today (May 8) at the ACM Conference on Human Factors in Computing Systems in Glasgow, Scotland.

First, the team gauged the participants' preconceived beliefs about and attitudes toward machines—what is called a "machine heuristic."

"A machine heuristic involves stereotypes people have about machines, including their beliefs in machines' infallibility, objectivity and efficiency," said Sundar.

The team measured participants' adherence to the machine heuristic by asking them to indicate their level of agreement with statements such as, "When machines, rather than humans, complete a task, the results are more accurate." The researchers also asked participants a variety of questions to rate their "power usage," or level of expertise and comfort in using machines.

Next, they exposed participants to various combinations of healthcare provider, such as receptionist, nurse and doctor; and agent type, such as human, avatar and machine. They initiated online chat interactions with the various types of avatars to test the participants' acceptance of those healthcare providers and their intentions to use those providers in the future.

"We found that the higher people's beliefs were in the machine heuristic, the more positive their

attitude was toward the agent and the greater their intention was to use the service in the future," said Sundar. "We also found that power usage predicted acceptance of digital healthcare providers. A power user (a person with advanced computer skills) is more likely to accept a robot doctor, for example, than a non-power user."

The team also noticed a double dose effect of machine heuristic and power usage.

"We found that if you're high on machine heuristic and you're high on power usage, you have the most [positive attitude](#) toward automated healthcare providers," said Sundar. "This combination seems to make people more accepting of these technologies."

This effect was similar across all experimental conditions. In other words, people who had high adherence to the machine heuristic and were also power users had almost equally positive attitudes toward all forms of digital healthcare provider, regardless of whether they were human-like, an avatar or a robot.

"Our results suggest that the key to implementing automation in healthcare facilities may be to design the interface so that it appeals to expert users who have a high belief in machine abilities," said Sundar. "Designers can direct resources toward improving features such as chat functionality instead of anthropomorphizing healthcare robots. In addition, increasing the number of power users and the general belief that machines are trustworthy may increase the adoption of automated services."

Provided by Pennsylvania State University

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