

New virtual reality research – and a new lab – at Stanford

Cutting down a virtual redwood with a virtual chainsaw may lead you to save trees by recycling more paper. That finding is an example of how real-world behavior can be changed by immersing people in virtual reality environments – a notion that is at the heart of work under way in Stanford's Virtual Human Interaction Lab.

BY ADAM GORLICK

If a tree falls in a virtual reality forest, will anyone hear an environmental message?

They will, as long as they were the ones who cut down the make-believe redwood.

New findings from Stanford researchers show that people who were immersed in a three-dimensional virtual forest and told to saw through a towering sequoia until it crashed in front of them later used less paper in the real world than people who only imagined what it's like to cut down a tree.

"We found that virtual reality can change how people behave," said [Sun Joo Ahn](#), whose doctoral dissertation outlines the [findings](#). "That's the big result. When people are in virtual reality and going through the motions of actually cutting down this tree, it might make them feel more personally accountable or responsible for the damage that occurred."

Ahn's work is among the latest batch of studies to come from Stanford's [Virtual Human Interaction Lab](#). Led by [Jeremy Bailenson](#), associate professor of communication, researchers in the lab are trying to better understand how advances in digital media like 3-D movies and interactive video games are affecting people's real-life experiences. And they want to know how those technologies can influence and change people's behavior.

"People want – and are becoming more used to – immersive media experiences," said Bailenson, co-author of the recently released book *Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution*. "You're going to need more than an instructional video or a pamphlet to explain something that requires a change in behavior. You need to make people feel like they're literally engaged."

In one of her studies, Ahn had about 50 people read some information about how the use of non-recycled paper leads to deforestation.

She then had one group of subjects read an account of what happens when a chainsaw buzzes through a tree. The piece was rich with detail, describing the chirping birds in the forest, the sound and vibration of the saw and the snapping of branches that comes with the crash of the mighty redwood.

A second group of subjects didn't read the description, but instead were plunged into the virtual forest. Outfitted with a helmet-like device that cut off their vision from the real world and surrounded them with the sights and sounds of a computerized woodland, they felt like they were there.

Using a special joystick called a haptic device, the subjects were able to control the back-and-forth motions of the chainsaw that their virtual selves used to cut down the tree. As they sawed for about three minutes, the haptic device vibrated in their hands to simulate the feeling of the real thing.

Regardless of which group they were in, all the participants said they had a stronger belief that their personal actions could improve the quality of the environment compared to how they felt before they either read about tree cutting or chopped down an evergreen in the fake forest.

But when it came time to put that belief into practice, only the tree choppers cut their paper use.

Before letting them leave the lab, Ahn had the subjects in both groups sit at a desk and fill out some forms. She placed a stack of paper napkins and a glass of water on the desk and pretended to accidentally knock the glass over. The subjects reflexively grabbed napkins to clean the spill, and Ahn later counted how many were used.

Those who only read about logging used an average of 20 percent more napkins than the virtual lumberjacks.

"This study isn't all about trees," said Ahn, who will receive her PhD this summer and begin teaching as an assistant professor at the University of Georgia's Grady College of Journalism and Mass Communication in the fall.

"It's about how we are able to use an immersive virtual environment to create a change in behavior in the physical world," she said. "We showed that just three minutes of an embodied experience could produce a behavioral result."

That implies that repeated or long-term exposure to virtual reality scenarios can produce even more dramatic results, she said.

And understanding that interplay between virtual and actual reality is at the heart of the work under way in Bailenson's lab. Long a proving ground for studies that show how interacting with an avatar can motivate someone to increase their retirement savings, exercise more or vote for a particular politician, the lab is going through a transformation of its own.

Expected to open by the end of April, a newly built space for virtual reality research will feature what Bailenson calls the

world's most technologically advanced "multi-sensory room" – an area that integrates sight, sound and touch into one immersive digital experience.

Test subjects will experience the virtual world with a head-mounted display that will give them complete peripheral vision and a 360-degree view of whatever landscape Bailenson and his researchers design. The room will have 24 speakers that mimic the movement of sound: Imagine watching a virtual bird flying by your eyes as the sound of its tweeting and chirping follows along.

"If you've seen a movie in a really state-of-the-art theater with great surround sound, this is like that – but on steroids," Bailenson said.

The new lab will also feature a floor that moves and shakes, allowing researchers to duplicate the feel of earthquakes, approaching footsteps and explosions.

"The next time a tree crashes," Bailenson said, "it will shake your boots."