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How Virtual Reality Is Used to Explore Empathy at Stanford, With Reflections from VHIL Director Jeremy Bailenson

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Virtual Reality (VR) may bring to mind advanced gaming possibilities and simulated, entertaining, sensory experiences. The team at Stanford University's Virtual Human Interaction Lab (VHIL) is using VR in an innovative way: to teach and explore human empathy. They create immersive experiences in which learners virtually become a different person or even a member of a different species, and they are discovering that VR can powerfully affect and formulate our world views and behavior.

Jeremy Bailenson is the founding director of Stanford's VHIL. He described VR this way in a 2014 interview with Intersect: The Stanford Journal of Science, Technology & Society:

"So, if you think of virtual reality, there's three components: it's tracking your physical movements with sensors, updating some digital scene which we call rendering, and then displaying new perceptual information to the eyes, the ears, and the skin."

These three components have a profound effect on the human psyche, allowing us to experience new ways of living and behaving in new environments. Bailenson also says in a San Francisco Chronicle video about the VHIL's VR work that we "cannot underestimate how radical this change is." The fact that people in violent virtual scenes have been found to be more aggressive in real life inspired the lab to use VR to explore and promote positive behaviors and traits like empathy. Two primary examples of their work using VR to teach empathy have focused on empathy for other people and empathy for other species and the natural environment.

Empathy for People

Learners who take part in the VHIL Empathy-At-Scale project get to virtually become someone who is different from them in some visually representable way. Differences have included skin color, abilities, genders, ages, and economic goals, among others. During a project relating to color blindness, learners experienced a red-green color blindness simulation.

Director Bailenson was kind enough to offer some insights with Not Impossible Now about these studies, and offered this reflection:

Lots of our research shows that you can indeed embody someone different from yourself in virtual reality and experience something from their perspective. We have conducted several research studies that have shown that VR can increase empathy and prosocial behavior. In a study where participants either became colorblind in VR or simply imagined that they were colorblind, those who experienced the actual visual impairment in VR were likely to spend more time helping someone with the same disability after the study.

In another study, we found that having someone become a superhero made them more helpful in a real life situation following the study. These results show that an immersive experience, where you actually feel as though you are in the body of someone else, or feel as if you've taken on a new ability, can especially impact your thoughts and behaviors in the real world. What's surprising to most is that even with fairly modest graphical realism and imperfect limb tracking, participants can still feel as though they have become the avatar they are embodying.

These VR studies can offer a variety of experiences to participants; challenging, enlightening, emotionally complex, rewarding, educational, etc. The superhero study mentioned above is an example of one of their positively-focused experiments. Bailenson shares that,

In that experiment, participants were tasked with finding a sick child and delivering medicine to save the child's life. We've also recently run an experiment in partnership with Sesame Workshop in which children interact with virtual characters, and then we ask them to engage in sharing exercises with the characters afterward.

Bailenson says that as the VHIL continues their empathy research, they will continue to "include experiences in which the user can positively affect the environment and/or the characters they interact with."

Empathy for Other Species and the Environment

VHIL's studies of VR as a tool for environmental empathy development have been diverse and powerful as well. They include cutting down a virtual tree and virtually entering marine environments. The tree cutting experiment resulted in VR learners consuming 20% less paper than learners who interacted with tree cutting through print and video media. Will Mason of Upload explains that this study affected participants' perceived locus of control: "the extent to which individuals believe they can control the events around them." The direct experience of being personally responsible for the felling of a tree connected learners to the source of their paper and their tangible ability to save trees.

VHIL is also taking on the urgent topic of ocean acidification. This occurs when the ocean soaks up the carbon dioxide that humans release into the atmosphere and becomes more acidic. The VHIL feels that it is an under-reported, misunderstood (people often confuse it with acid rain), and gravely serious environmental phenomenon. The learner in this VR project actually becomes coral, and Bailenson explains in the The San Francisco Chronicle that during this experience, for "the next 13 minutes, you become a pink coral among the dark purple sea urchins, sea bream and sea snails that swarm around you." The participants then watch as the ecosystem around them changes and erodes, creatures die, and their own skeleton disintegrates in the increasingly acidic water. The study found that subjects who underwent this VR experience demonstrated greater empathy for the environment than those who simply watched a film about ocean acidification. Also, after a week passed, the increased empathy only remained for the group of VR subjects. Bailenson writes in the same San Francisco Chronicle article that this use of VR "may be one of the best shots we have at saving the coral reefs for future generations."

What Now?

The VHIL is currently testing the effects of multiple VR sessions and exploring prejudice, bullying, and other topics with about 1,000 demographically diverse participants. Bailenson described the ongoing Empathy-At-Scale Project for us:

In our current Empathy-At-Scale project we are allowing users to take the perspective of someone other than themselves. What's special about this effort is that we are conducting this research at a large scale both in the lab and out in public. We have run hundreds of participants thus far both at Stanford and at events and locations across the Bay Area. As we create more empathy experiments we will continue to look at perspective taking as it pertains to particular out-group members and will continue to build modules that encourage empathy for the environment and for sustainable behaviors.

You can follow Director Jeremy Bailenson and the Stanford University Virtual Human Interaction Lab's ongoing work with empathy and VR at their site and on twitter (@StanfordVR).

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