Suggestible people feel more 'present' in virtual reality, study finds

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People with vivid imaginations are more likely than others to believe they truly inhabit the worlds they visit in virtual reality (VR) according to new research led by the University of Bath.

This finding, published at this year's CHI Conference on Human Factors in Computing Systems lays the foundation for software developers to improve VR applications by tailoring them to the personalities of individual players.

There has been a long-held assumption that the quality of a user's VR equipment directly improves the quality of their VR experience. In other words, the better and more expensive the VR headset and screen, the more convincing the experience.

However, the new Bath study suggests that when it comes to feeling present in a virtual world, the nature of an individual's imagination may be just as important as, if not more important than, the quality of equipment.

"We found imagination is an important component in the formation of presence: the better a person's imagination, the more able they are to find themselves in that world," said Dr. Christopher Clarke, researcher from the Department of Computer Science at Bath and study co-author.

Beyond gaming

The implications of this research extend beyond gaming: in the years ahead, VR is expected to play a significant role in many areas of life, from workplace training to medical rehabilitation programs.

"This is definitely an area that needs more exploration if people and organizations are to integrate VR into their lives," said Dr. Clarke.

This new research, which involved academics from the universities of Bath, Bristol and King's College London, set out to understand how differences in imaginative "suggestibility" mean some people get a lot more from VR than others. The study is believed to be the first to

examine the role of imagination in making a person feel truly present in a virtual world.

Presence

Imaginative suggestibility describes the ability to successfully experience an imaginary scenario as if it were real. This concept has been primarily investigated in the context of hypnosis, with those high in imaginative suggestibility also proving more susceptible to being placed in a hypnotic trance.

The researchers hypothesized that imaginative suggestibility played a significant role in the development of 'presence' in VR.

Elaborating, Dr. Crescent Jicol, Bath computer science researcher and lead author of the paper, said, "Different people imagine sensations, colors, images, sounds and smells at very different levels of vividness. So, if I say, 'Your hand is under a constant stream of water', you'll be able to imagine this very differently depending on your imaginative suggestibility. The easier you find it to imagine such a scenario, the more present you'll be in VR."

Presence—the feeling of being "in" the virtual world—is important for how we experience VR. It comes in three sub-types:

- Physical presence: the feeling that a virtual space is in fact real.
- Social presence: the feeling that the other characters in the virtual world are real.
- Self presence: the feeling that you are the avatar you embody in the virtual world.

Dr. Jicol said, "Presence is instrumental to a variety of VR applications, from those meant for entertainment such as games, to applications for

learning, training, and rehabilitation. Research into presence—how it works and how to increase it—is one of the leading areas of VR research. Yet much of this exploration has focused on the technology behind VR."

Dr. Jicol added, "What makes these findings particularly remarkable is that imaginative suggestibility affected presence across all three sub types. This could mean that regardless of what you are using VR for—from socializing to adventuring—your imagination is playing an important role."

Psychological factors

The researchers believe that by examining how psychological factors such as imaginative suggestibility can transform the effects of technology, developers will be in a position to design better virtual worlds for any application.

The VR market is one of the fastest growing sectors in technology. Technological challenges, such as the weight of the headset, are well-known and are being actively worked upon by hardware developers. However, until now, personality characteristics that might dissuade some people from using and engaging with the technology have been underexplored.

The Bath research into imaginative suggestibility takes an important step in addressing this.