

Spatial configuration can spark déjà vu, psychology study reveals

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(Medical Xpress) -- Déjà vu - that strange feeling of having experienced something before - is more likely to occur when a scene's spatial layout resembles one in memory, according to groundbreaking new research by a Colorado State University psychology professor.

The research, led by Anne Cleary, associate professor of [psychology](#), appears this month in the peer-reviewed scientific journal, *Consciousness and Cognition*. The study is the first ever to use virtual reality technology to model déjà vu in the laboratory.

Cleary, who researches familiarity-based recognition and is part of the Cognitive Psychology program, conducted the study with students using a 3-D virtual reality system to display scenes that had been created with the game, "The Sims."

"Survey research suggests that the feeling of déjà vu, of having experienced something before, most commonly occurs with places," Cleary said. "The virtual reality enabled us to get at that feeling of having been someplace before."

Déjà vu is generally defined as a feeling of recognition for something that is known to actually be new," she said. "We discovered that participants were most likely to report experiencing this – the feeling of familiarity and associated déjà vu alongside the simultaneous realization that the scene is actually new – for new scenes that contained the same spatial layout as previously experienced scenes."

Through a head-mounted display, research participants were shown different 3-D scenes (both indoor and outdoor) in which they could look around by turning their heads, which creates a more life-like experience of being “in” a scene. Cleary and her students used “The Sims” to build a village of structures that they called “Deja ville.” They created rooms and outdoor scenes in the virtual program that were very different and contained different objects – such as an aquarium and a doctor’s office reception area – but which had objects in the same places on a grid to create an identical spatial layout. In the study, research participants viewed multiple scenes and reported on their feelings of familiarity and experiences of *déjà vu* while in each scene, and they also reported on whether a scene was old or new within the context of the experiment or whether it reminded them of an earlier scene.

“We discovered that when a new scene has the same spatial layout as a previously viewed scene but that previously viewed scene fails to come to mind, that similarity in the layout can contribute to the *déjà vu* experience,” Cleary said. “People are more likely to report experiencing *déjà vu* if they are in a new scene that has the same spatial layout as a previous scene than if they are in a new scene that does not resemble a previously-viewed scene.”

For example, research participants who were immersed in a courtyard scene and then later in a museum scene weren’t specifically reminded of the earlier courtyard while in the museum scene, yet had a feeling of familiarity about the museum.

“That’s largely because the location of the central potted plant relative to the bushes and plants in the courtyard was exactly the same as the location of the central statue relative to the benches and rugs in the museum,” Cleary said. “The two scenes had the exact same configuration.”

Cleary added, “In some cases, the virtual reality test scene actually is identical to an earlier-experienced scene, but people fail to realize that that is an exact scene that they were in before. In those cases, when people mistakenly call such a scene ‘new,’ they’ve actually seen it before but fail to remember that. And in those cases, they are even more likely to report experiencing déjà vu than when the scene really is new, but just has the same configuration as a previous scene.”

“Undergraduate students in Introductory Psychology often eagerly sign up for the virtual reality experiments,” Cleary said. “Students have fun with this kind of research.”

Cleary, who joined Colorado State in 2006, has other lines of study including research into what’s going on in the brain when people have feelings of familiarity in the face of recall failure. She also works on other types of subjective memory experiences such as “tip of the tongue” experiences – when a word is “right there” but people can’t access it.

Provided by Colorado State University

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