Why the brain needs to get out and about

May 7 2020, by Marieke Epping

A virtual environment that Judith Schomaker gets her test participants to explore. Exploring a new environment improves the ability to remember and learn. Credit: Leiden University

We are all at home in familiar surroundings. Not only is this boring but it can also have a negative influence on our learning, explains cognitive neuropsychologist Judith Schomaker. "Discovering new environments gets our brain learning and remembering. We are now missing this stimulus."

You conduct research into the influence of new environments on our learning. What is this influence?

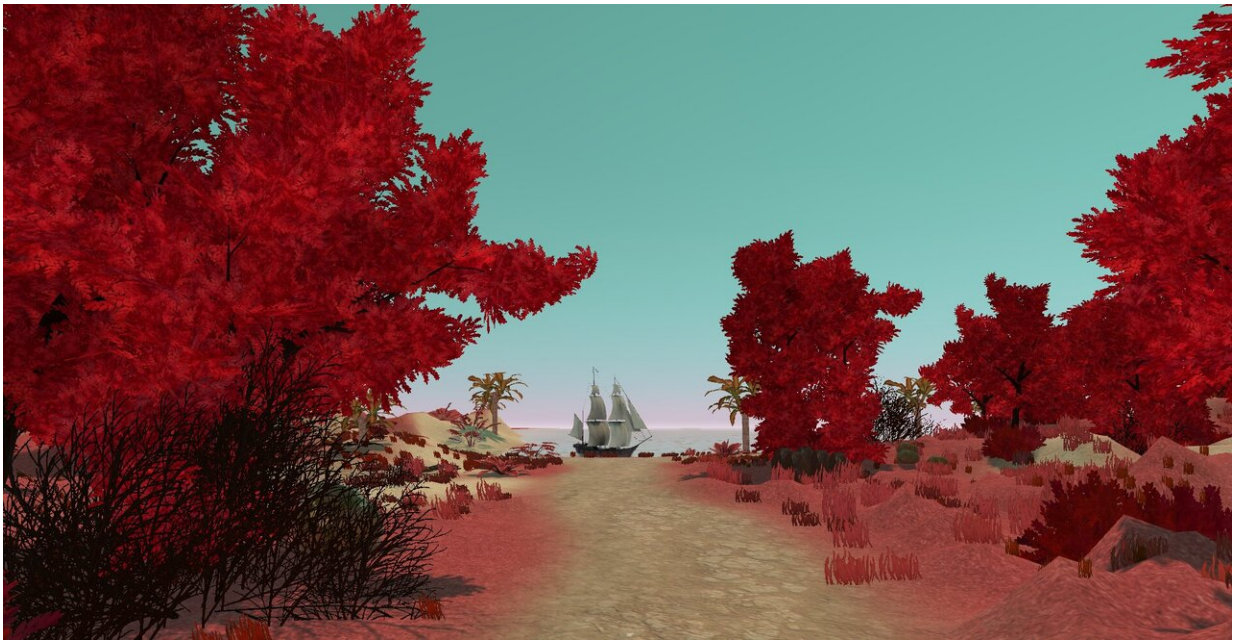
We know from research with animals that a new environment lowers the threshold to learning. Exploring a new environment makes animals better at learning and remembering. This is a generalizable effect: it's not about learning about the new environment but rather that the ability to learn in general improves. And the opposite is also true. Animals are better at remembering things that they learned just before exploring a new environment. From an evolutionary perspective, obviously it is useful for the brain to receive an extra stimulus to learn and remember when you enter a new environment.

I'm the first person who has researched this in humans, by getting them to explore a virtual world with a VR headset. The test participants then had to remember words before once again venturing into a virtual world. Those who explored a completely new world the second time had remembered more words than those who had ventured into familiar—virtual—grounds. A new environment therefore has a positive effect on learning in people too. What is also important is that this really is about the three-dimensional environment: we don't see this effect with pictures of new environments or new objects.

Why is that particularly relevant now?

We are all at home, in an environment that we know through and through. We only go outside for essential things and are limiting our social contacts. So we are no longer venturing into environments that are new to us—and are therefore missing this stimulus to learn. With animals we often talk about 'enriching' their environment. This could mean the design of zoo enclosures, for instance. We humans usually gain this enrichment by venturing out and about. And we can't do that during

the lockdown.



It's better to game than to watch Netflix: journeying through a game world activates the regions of the brain that control learning. Credit: Leiden University

Children are all being taught at home—which means they too aren't going into new environments. Is lockdown reducing children's ability to learn?

We know that if you expose young animals to a lot of new environments, they are better at learning for the rest of their lives than peers who have stayed in the same environment. If I look at my ten-month-old son, he practically only sees the interior of our house. Which is a real shame. By definition, a new environment gives children the chance to learn new things, and that is less in the current situation. And they are therefore also missing the positive effects of a new environment on the memory.

What should parents do to reduce the effect?

That's a question I ask myself too of course. In the lab we are replicating a new environment by getting people to explore a virtual world, a kind of fantasy island. If I think about how you could do that at home, what I come up with is video games. And not a quick round of Candy Crush but the more complex games where you as a persona have to traverse a 3-D world and complete challenges. Exploring this game world is a task that activates the hippocampus: the region of the brain that regulates learning and therefore what you use in a 'real' new environment. And I realize that I am probably not making myself popular with some people (laughs), but if you are stuck at home, it's better to let your child play video games than watch Netflix.

This period must be massively interesting for you as a researcher.

Definitely. A fantastic research situation has fallen into my lap. Normally you would never be able to say to test participants: stay at home for a whole month and we are going to look at whether you are less able to learn than someone who is allowed to go outside. That's ethically irresponsible. But that has now become our daily lives! So I have now designed an online study where I am now going to test this in people, and then again in a year or one-and-a-half year's time. I'm hoping the ethics committee will approve this quickly—then this situation will at least yield something good!

Provided by Leiden University