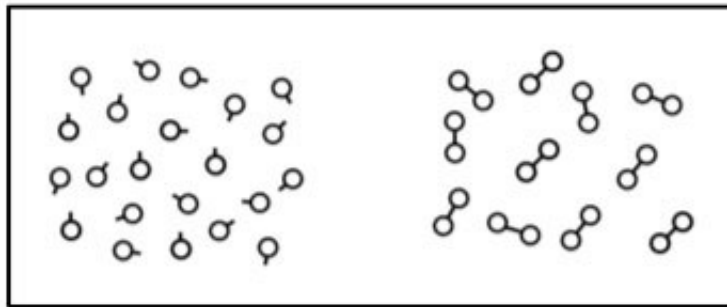


Brain can plan actions toward things the eye doesn't see

June 19 2013



Connecting the circles with short lines creates an illusion such that we perceive fewer circles on the right side of the display. But when our brain plans actions to these targets it computes the actual number of targets present. Credit: Jennifer Milne, Melvyn Goodale, et al. (2013). Connecting the Dots: Object Connectedness Deceives Perception but Not Movement Planning. *Psychological Science*. DOI: 10.1177/0956797612473485

People can plan strategic movements to several different targets at the same time, even when they see far fewer targets than are actually present, according to a new study published in *Psychological Science*, a journal of the Association for Psychological Science.

A team of researchers at the Brain and Mind Institute at the University of Western Ontario took advantage of a pictorial illusion—known as the "connectedness illusion"—that causes people to underestimate the number of targets they see.

When people act on these targets, however, they can rapidly plan accurate and strategic reaches that reflect the actual number of targets.

Using sophisticated [statistical techniques](#) to analyze participants' responses to multiple potential targets, the researchers found that participants' reaches to the targets were unaffected by the presence of the connecting lines.

Thus, the "connectedness illusion" seemed to influence the number of targets they perceived but did not impact their ability to plan actions related to the targets.

These findings indicate that the processes in the brain that plan visually guided actions are distinct from those that allow us to perceive the world.

"The design of the experiments allowed us to separate these two processes, even though they normally unfold at the same time," explained lead researcher Jennifer Milne, a [PhD student](#) at the University of Western Ontario.

"It's as though we have a semi-[autonomous robot](#) in our brain that plans and executes actions on our behalf with only the broadest of instructions from us!"

According to Mel Goodale, professor at the University of Western Ontario and senior author on the paper, these findings "not only reveal just how sophisticated the visuomotor systems in the brain are, but could

also have important implications for the design and implementation of [robotic systems](#) and efficient human-machine interfaces."

Provided by Association for Psychological Science

Citation: Brain can plan actions toward things the eye doesn't see (2013, June 19) retrieved 26 April 2024 from <https://medicalxpress.com/news/2013-06-brain-actions-eye-doesnt.html>

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