

Autism theory put to the test with new technology

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Next time you lose your car keys and enlist the family to help you search, try a little experiment. After your spouse searches an area, go and look in the same place. It will likely feel strange, even irritating to both of you - and that's because you may be fighting an ancient, hard-wired, human behaviour pattern.

The behavioural phenomenon is called 'inhibition of return' and for our ancient hunter-gatherer ancestors it made a lot of sense. As Dr. Tim Welsh explains, "This behaviour likely developed through evolution to increase search efficiency. Returning to search an area that someone else has already searched doesn't make a lot of sense from a survival point of view because they've either found the food and eaten it, or there's no food there."

Inhibition of return has been well-documented over the years, but Welsh is interested in measuring exactly how the actions of another individual affect our own, and whether people with autism react differently than the rest of the population. To test this Welsh, a professor in the Faculties of Kinesiology and Medicine, came up with a unique and elegant experiment that uses some cutting-edge technology.

In Welsh's set-up, two subjects sit across from each other wearing, liquid crystal goggles. They are told to reach for a lighted target in front of them.

Welsh's previous work has shown that if we see someone else touching an area, we are much slower to move there, but Welsh wanted to see how much of another person's actions we need to be aware of, to affect our own. Welsh's crystal goggles become opaque allowing the subject to see only a fraction of the other person's movement.

He discovered that as social beings, we are so sensitive to another's actions that just the

suggestion of a movement was enough to trigger the inhibition of return effect.

So what happens when the individual doesn't really recognize, or can't recognize the actions of another individual? Sadly this is often the case for people with autism, a complex neurological, developmental disability that affects over 50,000 Canadians. A current theory of autism is that individuals with the disorder have a problem with their mirror neuron system.

"In normal individuals if you see someone throwing a ball, your mind will 'mirror' those actions to make it seem as if you are throwing it yourself," Welsh explains. "The theory is that a person with autism may not be able to mirror the actions of other individuals. So in our experimental set-up you would expect them to be unaffected by the actions of another person and this is exactly what we have found to this point."

Welsh believes his research will advance our understanding of autism and the mirror neuron system - perhaps leading to more effective intervention and treatment of a condition that seems to be growing at an alarming rate.

"What I think is very interesting," says Welsh, "is that the same experimental set-up can effectively be used to test two theories, and in many ways the two groups we are working with - a typically-developing population and an autistic population - provide a control for the other group. I'm very excited about this research."

Source: University of Calgary

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