Getting the Brain and Body Working Together

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We study how the brain controls movement when you have to think at the same time. And by thinking, I don't just mean sitting around and thinking about what you had for breakfast or what your taxes were, but things like having to look off this way and move your hand this way in order to interact with something.

We do this in everyday life. We use computer mice, to move our hand here to move something we're looking at, when you're playing video games, when you're driving, things like that.

We've found that in certain folks, if they're thinking and moving at the same time, suddenly their movements become terrible - typically those who are recovering from concussion, or even have been deemed recovered by current standards but in fact have that history of concussion, and I'm also looking at folks who have family history of dementia. And it turns out both those groups, they're thinking just fine and feeling just fine, they're moving just fine, until you push the system. And it turns out brain parts talk to other brain parts, and when that happens, suddenly movements get a little less fabulous.

We're able to design games and activities that we can have those people do to improve how they move when they have to think at the same time.

How does your research work?

I use a technique called motor psychophysics, and basically what that is, is you have people make movements and then essentially you see how they

screw them up. So we have a number of ways of looking at them moving, and seeing, are you moving nice and straight and smooth, or are you wobbly, are you switching directions all the time. And so we measure the movements themselves. So that's one way we have of looking at things.

The other way I look at it is I am interested in how the brain controls all this, and what brain parts are not working, and so we also use brain imaging. So we stick people in a really big magnet and we look at how the brain parts are communicating, and we see what brain parts aren't communicating, and then that leads to ways that we can then train those brains to communicate better to then hopefully translate back into getting those people who are being affected by brain injury to be able to move better.