

Mouse tracking may reveal ability to resist temptation

July 7 2017, by Tom Fleischman

The devil on your right shoulder is telling you, "Go ahead, grab that candy bar! You know you want it!"

Meanwhile, the angel on your left is gently saying, "The apple is a much healthier option, isn't it?"

There you stand, conflicted. People make these types of choices every day, but what exactly is the process by which an individual reaches his or her decision?

Melissa J. Ferguson, professor and chair of the Department of Psychology, has studied [self-control](#) and the psychological factors that determine whether individuals stick to long-term goals, like good health, or succumb to short-term temptations such as candy. Her latest work employed an unusual tool – computer-mouse tracking – to capture the [real-time](#) conflict resolution that occurs during self-control decision-making.

"Resisting Temptation: Tracking How Self-control Conflicts Are Successfully Resolved in Real Time" is scheduled to be published in the journal *Psychological Science*. Collaborators are Paul E. Stillman '09, postdoctoral researcher at Ohio State University, and Danila Medvedev '16, who worked on the research as an undergraduate.

Psychologists have long explained self-control in a way that fits the good vs. evil analogy: A person's impulsive system gives rise to a potentially

unhealthy urge, which must be quelled by their better judgment. This implies that the process is sequential, but Ferguson and her group set out to prove that it is a dynamic, iterative journey.

The group conducted four separate studies, two regarding healthy eating choices and two regarding intertemporal decisions (smaller reward sooner versus larger reward later). In all four studies, participants' mouse movements – smooth rather than abrupt – during successful self-control choices indicated a dilemma playing out in real time.

For their studies, Ferguson and her group asked participants to use a computer mouse to make choices. Participants were asked to click on the "start" box at the bottom middle of the screen, and then onto one of two choices that appeared at the top corners of the screen.

Unbeknownst to the approximately 650 participants: Not only were the researchers documenting the choices made – participants overwhelmingly made the healthy [choice](#) – they were also tracking the "routes" participants took to reach their decisions. The paper references three previous studies, all claiming that continuous hand movement during a choice paradigm is indicative of dynamic conflict between competing options.

"Participants have no idea that we're measuring the x and y coordinates of their trajectory," Ferguson said. "We think of this as sort of a modern-day version of a Ouija board, in that where people move their mouse and how they do it can tell us something about their inner cognitive processes."

The results of all four studies, the group says, constitute the first behavioral evidence of real-time conflict resolution and dynamic competition between temptations and goals during self-control decisions. The paper revealed two important findings, Ferguson said.

"One is that when someone is making a movement with their mouse and making a so-called healthy decision," she said, "how closely they veer toward the temptation predicts in general how successful they're likely to be at resisting temptation. It makes sense."

The second, she said, is that while many studies suggest that people are battling an impulse to make an unhealthy choice, their results point to a dynamic process "over the course of milliseconds," Ferguson said.

"A lot of the literature suggests ... there's a temptation, an urge, an impulse, and the way that we succeed is by stamping it down," she said. "And that would suggest a certain type of mouse trajectory, going first toward the temptation and then correcting for it. But our hypothesis was that it's a much more gradual negotiation."

The group notes that people with good self-control tend to be those who are less likely to have bad impulses in the first place. For those more prone to succumbing to [temptation](#), it would be advantageous to avoid it altogether: By the time the devil appears, the angel might not stand a chance.

Provided by Cornell University

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