

Smartphone thumb skills alter our brains

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Credit: Peter Griffin/Public Domain

When people spend time interacting with their smartphones via touchscreen, it actually changes the way their thumbs and brains work together, according to a report in the Cell Press journal *Current Biology* on December 23. More touchscreen use in the recent past translates directly into greater brain activity when the thumbs and other fingertips are touched, the study shows.

"I was really surprised by the scale of the changes introduced by the use

of smartphones," says Arko Ghosh of the University of Zurich and ETH Zurich in Switzerland. "I was also struck by how much of the inter-individual variations in the fingertip-associated brain signals could be simply explained by evaluating the smartphone logs."

It all started when Ghosh and his colleagues realized that our newfound obsession with smartphones could be a grand opportunity to explore the everyday plasticity of the [human brain](#). Not only are people suddenly using their [fingertips](#), and especially their thumbs, in a new way, but many of us are also doing it an awful lot, day after day. Not only that, but our phones are also keeping track of our digital histories to provide a readymade source of data on those behaviors.

Ghosh explains it this way: "I think first we must appreciate how common personal digital devices are and how densely people use them. What this means for us neuroscientists is that the digital history we carry in our pockets has an enormous amount of information on how we use our fingertips (and more)."

While neuroscientists have long studied [brain plasticity](#) in expert groups—musicians or video gamers, for instance—smartphones present an opportunity to understand how regular life shapes the brains of regular people.

To link digital footprints to [brain activity](#) in the new study, Ghosh and his team used electroencephalography (EEG) to record the brain response to mechanical touch on the thumb, index, and middle fingertips of touchscreen phone users in comparison to people who still haven't given up their old-school mobile phones.

The researchers found that the electrical activity in the brains of [smartphone](#) users was enhanced when all three fingertips were touched. In fact, the amount of activity in the cortex of the brain associated with

the thumb and index fingertips was directly proportional to the intensity of phone use, as quantified by built-in battery logs. The thumb tip was even sensitive to day-to-day fluctuations: the shorter the time elapsed from an episode of intense phone use, the researchers report, the larger was the cortical potential associated with it.

The results suggest to the researchers that repetitive movements over the smooth touchscreen surface reshape sensory processing from the hand, with daily updates in the brain's representation of the fingertips. And that leads to a pretty remarkable idea: "We propose that cortical sensory processing in the contemporary [brain](#) is continuously shaped by personal digital technology," Ghosh and his colleagues write.

What exactly this influence of digital technology means for us in other areas of our lives is a question for another day. The news might not be so good, Ghosh and colleagues say, noting evidence linking excessive phone use with motor dysfunctions and pain.

More information: *Current Biology*, Anne-Dominique Gindrat, Magali Chytrir, Myriam Balerna, Eric Rouiller, Arko Ghosh "Use-dependent cortical processing from fingertips in touchscreen phone users" (2014) [www.cell.com/current-biology/a... 0960-9822\(14\)01487-0](http://www.cell.com/current-biology/a...0960-9822(14)01487-0)

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