

Practice, not loss of sight, improves sense of touch in the blind: study

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A photo of the device used in the fingertips experiments

New research from McMaster University may answer a controversial question: do the blind have a better sense of touch because the brain compensates for vision loss or because of heavy reliance on their fingertips?

The study, published in the most recent edition of the <u>Journal of</u> <u>Neuroscience</u>, suggests daily dependence on touch is the answer.



Twenty-eight profoundly blind participants—with varying degrees of Braille expertise—and 55 normally sighted adults were tested for touch sensitivity on six fingers and both sides of the lower lip.

Researchers reasoned that, if daily dependence on touch improves tactile sensitivity, then blind participants would outperform the sighted on all fingers, and blind Braille readers would show particular sensitivity on their reading fingers. But if vision loss alone improves tactile sensitivity, then blind participants would outperform the sighted on all body areas, even those that blind and sighted people use equally often, such as the lips.

"There have always been these two competing ideas about why blind people have a better sense of touch," explains Daniel Goldreich, corresponding author and a professor in the Department of Psychology, Neuroscience & Behaviour. "We found that dependence on touch is a driving force here. Proficient Braille readers—those who might spend hours a day reading with their <u>fingertips</u>—performed remarkably better. But blind and sighted participants performed equally when the lips were tested for sensitivity."

Researchers used a specially-designed machine which held the pad of the participant's fingertip perfectly still for the experiments. While the finger lay over a hole in the table, the machine pushed rods with textured surfaces through the opening until they met the fingertip. Researchers asked subjects to identify the patterns by touch. A similar test was performed on the lower lip.

Not only did blind participants do better than their sighted peers, but Braille readers, when tested on their readings hands, outperformed nonreaders who were also blind. For Braille-reading participants, their reading fingers were more sensitive than their non-reading fingers.



"These results may help us design further experiments to determine how to improve the <u>sense of touch</u>, which could have applications later in life," says Mike Wong, study author and a graduate student in the McMaster Integrative Neuroscience Discovery & Study program. "Braille is extraordinarily difficult to master, particularly as an adult. In future we may find new ways to teach <u>Braille</u> to people who have recently become blind."

More information: A pdf of the study can be found at: <u>dailynews.mcmaster.ca/images/Blindnesstouch.pdf</u>

Provided by McMaster University

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