

Looming sounds boost visual perception

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(PhysOrg.com) -- Whether it's the sound of a speeding car approaching from out of the blue, or the faint echo of footsteps following you along a dark street, such looming sounds not only make our ears prick up - but help us see better too.

Scientists at the Universities of Glasgow, UK, and Lausanne, Switzerland, have discovered that even before we are consciously aware of them, such looming sounds excite the low-level [visual cortex](#), boosting [visual perception](#).

By pinpointing exactly when and where in the brain multisensory interactions between the auditory and visual senses take place, the study dispels previous beliefs in the relative segregation of hearing and vision at the input stages.

Lead researcher Gregor Thut, senior lecturer at the Centre for Cognitive [Neuroimaging](#) within the Department of Psychology at the University of Glasgow, said: "This study has revealed the extent and dynamics of multisensory interactions in low-level sensory cortex and has shown how visual perception can be boosted by sounds even before we are aware of what the sound is. This fast perceptual ability has obvious survival benefits.

"The study shows how models of brain organisation and perception need to be changed to include multisensory interactions as a fundamental component."

The researchers were able to measure the

excitability of the visual cortex in healthy adults by artificially stimulating the back of the head (occipital pole) where the visual cortex is located through transcranial [magnetic stimulation](#) (TMS).

The stimulation results in the perception of light flashes- called phosphenes - such as those created when you rub your closed eyes. Phosphenes were dramatically and selectively enhanced by looming sounds (relative to a set of control stimuli) and this response occurred 35 milliseconds before participants were able to consciously discriminate the sound.

The findings not only challenge longstanding models of brain organisation, but also highlight alternative rehabilitation strategies for aged and clinical populations such as the sight-impaired and blind.

The study, entitled 'Pre-perceptual and stimulus-selective enhancement of low-level human visual cortex excitability by sounds' is published in the journal *Current Biology*, and was authored by Vincenzo Romei, Micah Murray, Celine Cappe and Gregor Thut.

Provided by University of Glasgow

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