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Finding the Mind's Eye

Tse studies where visual consciousness resides in the brain

Peter Tse, professor of [psychological and brain sciences](#), has published new results in his ongoing investigation of the brain and how it transforms visual stimuli into conscious experience. His paper, "Visibility, Visual Awareness, and Visual Masking of Simple Unattended Targets are Confined to Areas in the Occipital Cortex Beyond Human V1/V2," was published in the November 8 issue of the weekly journal, *The Proceedings of the National Academy of Sciences*. Tse's findings help to explain what part of the brain is at work in turning sight into understanding.

Tse, who is currently on sabbatical in Regensburg, Germany, as the recipient of the prestigious [Friedrich Wilhelm Bessel Research Award](#), conducted experiments using the phenomenon of "masking." Masking occurs when "a quickly flashed object seems to vanish because it is flanked by subsequently presented objects," says Tse. Using Functional Magnetic Resonance Imaging (fMRI), Tse says he and his team, "looked for areas of the brain where neuronal activity decreased when the object was made invisible. These areas are arguably the areas of the brain where the correlates of visual consciousness lie."

Tse's findings may advance the understanding of the brain's interaction with the eye by identifying the neural basis of conscious experience, a relationship important to the fields of medicine, neurology, and psychology.



Peter Tse

Tse and his coauthors, Susana Martinez-Conde, Alexander A. Schlegel, and Stephen L. Macknik of the [Barrow Neurological Institute](#), find that, "early areas in the visual processing hierarchy respond the same whether or not objects are visible to us or invisible in the context of visual masking." That is, some parts of the brain respond to visual stimuli regardless of whether the conscious mind "sees" them or not. However, Tse and his team found that, "neural activity in areas beyond visual area 2 appear to correlate with perception." They also found that the areas of the brain related to visual perception appear to reside exclusively in the occipital lobe (at the back of the head.) Tse's team concluded that, "the neural correlates of conscious visual visibility for masking stimuli lie in the occipital lobe, but after visual area 2."

By GENEVIEVE HAAS

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