

Neuroscientists demonstrate link between brainwave activity and visual perception

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Can we always see what is in front of us? According to Dr. Tony Ro, a Professor of Psychology and Cognitive Neuroscience at The City College of New York (CCNY), the answer is "no." New research published in "*The Journal of Neuroscience*" by Professor Ro and colleagues from the University of Illinois demonstrates that the brain cannot detect images when brainwave activity is in a trough.

"We may have our eyes open, but we sometimes miss seeing things," Professor Ro said. "When the brain is in a state of readiness, you see; when it is not, you don't see."

Brainwave activity has peaks and troughs that can occur around 10 times a second, he explained. In their research, Professor Ro and his colleagues demonstrated how the phase of the brainwave or alpha wave can reliably predict visual detection.

Subjects were shown a faint image of a dot on a computer screen and asked to indicate whether they saw the image by pushing a button. Subsequently, the dot was masked making it more difficult to see. "We tried to see whether there was variability in people's ability to see the image," he said. "When we presented the dots with masks sometimes people saw it and sometimes they didn't."

The research has potential applications in improving safety. For example, automobile accidents often occur because drivers miss seeing something, even if for a split second, he explained.

"With brain sensors we might be able to know when people will actually miss seeing something. By being able to predict whether or not someone will see something, we should be able to implement better ways of delivering information to people to ensure that they will detect it. This might then enhance safety, reduce errors, and prevent mishaps that frequently occur because people fail to see something that is right in front of them."

Professor Ro said future research will investigate what occurs when images are flashed by a strobe light at intervals to match these brainwave frequencies.

Source: City College of New York

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