

Blinking rate, not just pupil response, an important measure of alertness

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The speed and degree to which the pupil of the eye responds is a standard test for alertness. It has also been used to assess how sleepy or exhausted a person is. Now, research to be published in the *International Journal of Bioinformatics Research and Applications* suggests that measuring pupil response alone is not enough and that a person's rate of blinking should also be incorporated to obtain a more precise measure of alertness. The work could be important in the care of people with multiple sclerosis and other conditions. It might also be automated and ultimately used to automatically monitor patients, drivers, pilots, machine operators or others.

Minoru Nakayama of the Tokyo Institute of Technology and colleagues at Aichi Medical University point out that how the pupil of the eye dilates and contracts can be a useful way to measure alertness, but tests have demonstrated that the precise response of the pupil does not correlate well with the actual degree of sleepiness before any other signs become apparent. They point out that blinking subtly affects pupil response and have now developed a new approach that combines pupillography with blinking assessment.

The approach could side-step subjective assessment by [healthcare workers](#) in clinical situations. Moreover, it could be developed into an early-warning system to reduce workplace, road and other accidents by alerting operators and drivers to their level of [alertness](#) before sleepiness impinges on their behavior.

The team has successfully tested their approach with two groups of volunteers – sleepy and not sleepy as assessed by conventional sleepiness tests, including the Stanford Sleepiness Score and the Epworth Sleepiness Scale. The results allowed the team to produce a formula that links blink, pupillary indices and subjective [sleepiness](#).

More information: "Estimation of sleepiness using pupillary response and its frequency components" in *Int. J. Bioinformatics Research and Applications*, 2012, 8, 342-365.

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