University of Western Sydney

RESEARCH DIRECTIONS

High-rises putting people to sleep

Professor Kenny Kwok from the Institute for Infrastructure Engineering and Professor Vaughan Macefield from the School of Medicine, together with Dr Darren Walton from the University of Canterbury in New Zealand have teamed up to increase our understanding of the development of drowsiness of workers in tall buildings. This research is funded by the Australian Research Council though its Discovery Projects scheme.

As the population increases, people are turning to live and work in high-rise buildings. With more people occupying higher levels, the adverse effects of building motion-induced "sopite syndrome" on the community will increase.

'Sopite syndrome can be described as drowsiness caused by prolonged periods of motion, for example the motion-induced drowsy feeling babies get when they are rocked to sleep,' explains Professor Kwok. 'This syndrome has also been found to affect occupants of high-rise buildings due to the swaying of the structure caused by strong winds. Recent work has found that building motion can significantly impact the wellbeing of office workers and that sopite syndrome may be involved by reducing the rate of work – sleepiness – and the capacity for work – cognitive performance. Although there are no obvious visual cues of motion, structures in our ears sensitive to gravity and acceleration are capable of detecting subtle changes of our head position in space brought by the swaying of a tall building. This research will determine the amount of building motion that will induce sopite syndrome, uncover other potential causes of motion induced performance loss and identify the physiological changes in sopite syndrome.'

Participants of the research will complete several questionaries, giving the team enough information to correlate the amount of time spent in high-rise buildings to the development of sopite syndrome.

The team will also conduct measurements of the buildings' movements. To identify the cause and physiological changes of sopite syndrome, participants will be subjected to a range of motions, delivered at different frequencies to a motorised platform, and their physiological responses – specifically those related to the sympathetic nervous system and its interaction with the vestibular system – will be recorded.

This research will advance our understanding of the physiology of building motion-induced sopite syndrome and its effect on building occupants. The data from the research will also help identify ways to mitigate the effects of motion sickness, and strategies to design buildings that are less prone to sway in strong winds.

Project Title: Adverse effects of sopite syndrome on occupants in wind-excited buildings
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