Effects of light on human sleepiness and alertness: A simulated driving experiment

Research team contacts
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What is the purpose of the research?
The purpose of this project is to assess the impact of mild sleepiness on young drivers’ alertness and performance, and to assess the nature and magnitude of the alerting effects of light on drivers’ sleepiness and performance while driving.

Are you looking for people like me?
The research team is looking for people aged 18-24 years, who hold a driver’s licence with no physical restrictions to drive, and normal vision (including normal vision while using spectacles and or contact lenses).
You are not eligible for this study:
- If you are a professional driver, shift worker or have travelled overseas in the past month.
- If you usually go to sleep after 12am (midnight).
- If you have any significant health problems, particularly if you suffer from vestibular and/or psychiatric diseases.
- If you have any eye or optic nerve diseases affecting your normal vision, such as retinopathy, colour vision that is incompatible with driving, and diseases of the optic nerve or ocular media.
- If you take prescription medication or illicit drugs
- If you do not consume caffeine or are a heavy caffeine user (e.g. drink more than 3 caffeinated drinks per day).
- If you consume more than 2 standard alcoholic drinks per day (a standard drink contains 10 grams of alcohol).

What will you ask me to do?
If you are interested in this study please send an email to the researcher. The researcher will email you a Participant Information Package to let you know about the nature of this research and the inclusion criteria. If you are still interested in participating in this study after consideration of the information provided in the Participant Information Package, we request you contact the research team by email or phone to advise them of your interest. You will then be contacted by phone to confirm you meet the initial inclusion criteria (as mentioned above), and a time will be arranged for you to attend the screening session in a laboratory at the Institute of Health & Biomedical Innovation (IHBI), QUT, Kelvin Grove.

During this session the researcher will complete a battery of questionnaires. If you meet the eligibility criteria, you will be given an Actiwatch (a small wrist-watch device that records your activity levels and allows us to monitor your sleep) and advised of when you need to wear the Actiwatch, as well as when the subsequent testing sessions will take place. You will be required to wear the Actiwatch for two weeks prior to the commencement of your testing sessions. During the first week, you will be asked to sleep between 11pm and 7am each night. At the start of the second week, you will be asked to reduce your sleep by 15 minutes for 4 nights, resulting in sleep loss of an hour (thus sleeping between 11pm and 6am). In the final three days of the second week, you will be asked to attend three testing sessions in the laboratory at IHBI (one testing session per day). Each testing session will take about 3 hours (i.e. approximately 8:30am to 11:15am).

During the testing sessions sensors will be stuck on your scalp, using a non-toxic sticky gel, to measure your brain waves and on your chest to measure your heart rate. You will also be required to chew either caffeinated or decaffeinated chewing gum. Your eyes will also be exposed to either blue or red light through special light-emitting glasses. In addition, you will undertake computerised tests, including a simulated driving test and a reaction time test. In total, the 3 testing sessions will take up about 9 hours of your time across the 3 days.

Are there any risks for me in taking part?
There are some minor risks associated with your participation in this project. You might find the study tiring, feel sleepy or uncomfortable from the electrodes. You may experience minor eye strain, a headache, nausea or feel stimulated from exposure to low-level lights. Moreover, you may experience sleepiness symptoms such as poor concentration, head nodding during few days prior to testing, sleepiness during testing sessions, and potential increased sleep duration for 2-3 days after completion of the study. While the degree of sleepiness induced by the sleep time manipulation is likely to be mild, you may feel excessive sleepiness while working or studying. Therefore, you should not engage in safety-sensitive tasks such as driving. If you experience these symptoms please let us know.
If you feel stressed, very sleepy or very tired we will discuss some mitigation strategies with you. To minimize the risks of driving while sleepy, we will provide taxi vouchers for your transportation to and from the test sessions. It should be noted that if you do agree to participate, you can withdraw from participation at any time during the project without comment or penalty.

**Are there any benefits for me in taking part?**

It is not expected that this project will benefit you directly. However, it may benefit others in the future. We expect that the results of this study will lead to better understanding of the problem of sleepy driving, and potentiality for light as an effective countermeasure.

**Will I be compensated for my time?**

As you will be required to spend four sessions in the laboratory (one screening session and three test sessions), and to wear an Actiwatch for two weeks, we would like to compensate you for your time. If the screening session excludes you from the study, you will receive $20 to compensate you for your time. If you are recruited, you will receive $150 at the end of the study. Taxi vouchers for transportation to and from the laboratory will also be provided.

**I am interested – what should I do next?**

If you would like to participate in this study, please contact one of the research team members for details of the next step.

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<tr>
<th>Name</th>
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You will be provided with further information to ensure that your decision and consent to participate is fully informed.

**Thank You!**

QUT Ethics Approval Number: 1300000846