



***When the school bell rings:  
Sleep timing and circadian phase during the school year***

**INFORMATION SHEET**

**Introduction**

- My name is Lora Wu and I am a registered clinical psychologist and sleep researcher at the Sleep/Wake Research Centre at Massey University in Wellington.
- This project aims to increase our understanding of New Zealand secondary students' sleep and circadian (body clock) timing.
- Adolescents often have irregular sleep patterns, with changes in timing and amount on school vs weekend nights, leading to a condition called social jetlag. Adolescents who do not get enough sleep during the school week and those who report sleep problems tend to have more trouble with school, make riskier choices, and report poorer health.
- We hypothesise that adolescents who have later school start times are more likely to sleep at an appropriate circadian phase, experience less social jet lag, and have fewer behavioural health consequences than those with earlier school start times.

**Project Description and Invitation**

- This project will look at the relationship between sleep and circadian (body clock) timing of students during the school year.
- Secondary students will monitor sleep at home with diaries and actigraphy (small watch-like device to measure movement). During one night, participants will provide saliva samples in order to measure melatonin.
- The project will compare sleep and circadian timing between students who start school early or later in the morning in order to assess how school start times affect sleep.
- Secondary school students in the Wellington region are invited to participate in the project.

**Participant Recruitment**

- You may be invited to participate in the study after hearing about it from a teacher, school administrator, friend, parent, or community member. You may also learn about the study from adverts.
- Participation is voluntary and there are no disadvantages to not participating.
- The study involves 2 phases. Any interested secondary student in the Wellington region is invited to participate in Phase 1.
  - Phase 1 involves completing questionnaires online and/or on paper. You can skip any question you want without penalty.
  - During Phase 1 you will be asked to wear an actigraph on your wrist for 2 weeks while keeping a daily sleep diary.
  - Some people find wearing the actigraph uncomfortable (similar to wearing a sports watch). The sleep diary takes about 1 minute to complete each day.
- To participate in Phase 2, you cannot have had a traumatic brain injury during the past 12 months, have had a seizure in the past, or have a condition called mania. A researcher will ask you questions about these conditions to help identify if you have any.
  - During Phase 2 you will spend about 8 hours in the field (for example, at school) or laboratory in a group session. You will be asked to drool into a tube or keep a

cotton swab in your mouth to collect saliva every 30 minutes for a total of 14 times over 7 hours.

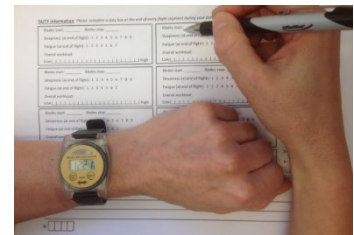
- Some may find this uncomfortable or boring. We will try to make the session fun by providing games, movies, and peers to spend time with.
- You will be given dinner and snacks during the session.
- If you complete Phase 2, you can enter the draw to earn a \$20 voucher.

## Project Procedures

- If you decide to participate, you will need to complete the consent form.
- All information you provide will be confidential and saved only with a participant identification number (not your name). We will use your name and your contact details (including phone and email) during data collection, but once we have finished data collection we will delete your contact information and only keep your participant ID number.

If you decide to participate, you will be asked to do the following:

- During Phase 1, you will complete questionnaires (either online or in person), which will take about 30 minutes of your time. The questionnaires collect demographic information (age, information on sleep, psychological experiences, and behaviours including substance use).
- You will meet with a researcher who will give you an actigraph and a sleep diary and explain how to use it (photo of actigraph shown below).
- You will wear an actigraph continuously (except when you are in contact with water for a long time, like during swimming or taking a bath/shower), and complete a sleep diary every day for 2 weeks.
  - The actigraph is the size of a watch and is worn on your non-dominant wrist. It measures movement, light intensity, the temperature of the actigraph case (to detect when it is on), and when you press a button (you're asked to press this when you get into and out of bed). The actigraph does not collect any other information and cannot tell the researchers what you are doing nor communicate data until it is handed back to the researchers. When you return the actigraph, data are analysed with a computer program to estimate when and for how long you have slept. The sleep diary asks when you try to sleep, how often you wake, and has space for you to rate your sleep quality and any important notes like when you took the watch off.
- About every 3 days you will receive a phone call, text, or email message from a researcher to check to see if you have any questions or need help with the study.
- Once Phase 1 data collection is complete, you will return your actigraph and sleep diary to the researcher.



### Phase 2

- If you complete Phase 1 of the study, you may be invited to take part in Phase 2. If we have enough volunteers already, you may not be asked to take part in Phase 2.
- Before taking part in Phase 2, you will complete a brief mental health questionnaire and answer a few questions from the researchers to make sure it is safe for you to take part.
- In Phase 2, you will come to either the Sleep/Wake Research Centre or a specified location at school at 6PM and stay until at least 2AM. You will need to arrange a ride home (you cannot drive yourself). You will be given dinner and snacks.
  - You are welcome to invite a support person to attend with you if you come to the Centre.

- You will be asked to drool into a tube or keep a cotton swab in your mouth to collect saliva every 30 minutes for a total of 14 times over 7 hours. The saliva will later be analysed for the hormone melatonin.
- The lights will be kept low, since bright light suppresses melatonin. Even though it is dim, there is enough light to read and watch movies.
- You may take part in a 20-minute group interview which asks about your opinions of behaviours which may improve sleep.
- You will complete questionnaires. Some of the questionnaires will ask about stress, depression, and anxiety. All participants will be given a handout of resources for what to do if you feel overly stressed, depressed, or anxious. If the researchers are concerned about some of your responses on the questionnaires, they may ask to have a private conversation with you where they will offer you support.
- You may opt to take part in cognitive or physical tests which highlight the effects of sleep deprivation.
- When you are not engaged in saliva collection, interviews, or questionnaires, you will be able to socialise, watch movies, play games, or read.
- Some schools may be conducting a project where students stay up all night. If that is the case, you will have the option of staying up until the school experiment is over (usually about 7AM). You will not need to provide further saliva samples after 2AM. You do not need to be taking part in this study to participate in the school study, and vice versa.

### **Data Management**

- Data will be analysed by researchers at the Sleep/Wake Research Centre.
- If you want, you are welcome to collect the unused portion of your saliva samples after the data has been analysed. The researchers will let you know when you can collect samples, and you will have up to 3 months to uplift them. Please indicate if you wish to be contacted to pick up your sample on the consent form.
- None of the data collected will have your name saved with it. Instead, it will be labelled with an identification number. No material that could personally identify you will be used in any reports on the study.
- A limited amount of deidentified group data may be provided to use in teaching at your school. School personnel will not be able to view any of your data with your name on it.
- The findings of the study will be published in peer-reviewed papers and presentations. You will receive a summary of the findings of the study and have access to this via hard copy or on the Centre website.
- De-identified data may subsequently be used in conjunction with data from other studies to improve our understanding of sleep and circadian processes in young people. You retain the right to remove your data from subsequent analyses.
- All data will be stored in secure facilities at the Sleep/Wake Research Centre, Massey University. The signed consent form will be kept for 5 years then shredded. Hard copy data will be kept for 10 years after the study has been completed then securely destroyed. Digital data (labelled with ID numbers only) will be kept indefinitely, or until you ask us to delete it. If you want us to delete your data, you will need to remember your participant ID number since it will not be labelled with your name.

### **Risks, Inconveniences, and Benefits**

*Risks.* There is the possibility of minor discomfort resulting from your participation. Wearing the actigraph may cause minor discomfort due to the wristband and/or due to not being used to wearing a wristwatch during sleep. If redness and itching occur, please notify the researcher and corrective measures can be taken, such as using a sports watch strap or applying tape to the underside of the actigraph where it comes in contact with your skin. Some questions ask

about uncomfortable psychological experiences including stress, depression, and anxiety. You can skip any questions you wish without penalty. At the end of Phase 2, you will be provided with a written list of resources in case any of the study procedures have made you realise you would like additional support. You may feel very sleepy or upset due to the sleep deprivation involved in the experiment. There are designated quiet zones where you can go to have a sleep if you want to stop the experiment, or a researcher can call someone to pick you up.

*Inconveniences.* Wearing the actigraph and the special care required to prevent exposing it to water during this study may be considered an inconvenience. The actigraph must be removed during water exposure such as swimming and bathing. Keeping the sleep diary will take about 1 minute per day for 2 weeks.

*Benefits.* By participating in this project, you will contribute to an improved understanding of the influence of school start times on sleep and circadian timing among New Zealand secondary students. Once your participation is complete, you may contact the researchers to receive feedback on your individual data (e.g., to see a chart of your sleep during the study). To identify your data, you will need to remember and provide the researchers with your participant identification number.

### **Participant's Rights**

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time and take your data;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used in reports (a participant ID number is used instead) unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded.

### **Project Contacts**

If you have any questions about this project, please do not hesitate to contact the researcher.

Dr. Lora Wu

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### **Compensation for Injury**

If physical injury results from your participation in this study, you should visit a treatment provider to make a claim to ACC as soon as possible. ACC cover and entitlements are not automatic and your claim will be assessed by ACC in accordance with the Accident Compensation Act 2001. If your claim is accepted, ACC must inform you of your entitlements, and must help you access those entitlements. Entitlements may include, but not be limited to, treatment costs, travel costs for rehabilitation, loss of earnings, and/or lump sum for permanent impairment. Compensation for mental trauma may also be included, but only if this is incurred as a result of physical injury.

If your ACC claim is not accepted you should immediately contact the researcher. The researcher will initiate processes to ensure you receive compensation equivalent to that to which you would have been entitled had ACC accepted your claim.

### **Committee Approval Statement**

*This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 17/56. If you have any concerns about the conduct of this research, please contact Dr Lesley Batten, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 356 9099 x 85094, email [humanethicsoutha@massey.ac.nz](mailto:humanethicsoutha@massey.ac.nz).*