Dunedin Concept Paper Template

Provisional Paper Title: Social jetlag and mental health disorders: Evidence from a cohort study

Proposing Author: Alice M. Gregory

Author's Email: a.gregory@gold.ac.uk

P.I. Sponsor: Avshalom Caspi and Terrie E. Moffitt
(if the proposing author is a student or colleague of an original PI)

Today's Date: 16/06/17

Objective of the study:

Sleep disruptions are closely intertwined with mental health (1). Suffering from a psychiatric disorder may involve abnormalities in sleep quality, architecture and timing. This is perhaps most clearly illustrated when considering depression. Indeed, experiencing insomnia or hypersomnia is listed among the diagnostic criteria for depression (2). It is further known that those suffering from depression may experience unusual sleep architecture, such as a disinhibition of Rapid Eye Movement (REM) sleep (3). A recently meta-analyses also highlighted a small link between evening preference and symptoms of depression (4). Other psychiatric disorders have also been associated with atypical sleep quality, architecture and timing (5).

Relatively recently there has been interest in 'social jetlag' (6). This refers to the discrepancy between sleep timing during days at work and free days. As with the type of jetlag experienced when crossing time-zones, there is a loss of synchrony between the different time-pieces within our bodies, and between our internal and external environments.

It has been proposed that social jetlag is associated with psychiatric difficulties (7) – although the mechanisms underlying such associations are currently unclear. Hypotheses include the possibility that social jetlag could result in changes to the stress/ axis and neurotransmitters which could lead to psychiatric difficulties. Social jetlag could also result in poor or short sleep, which could impact upon psychiatric problems. It's also possible that factors associated with social jetlag (such as smoking, caffeine and alcohol consumption) could impact upon psychiatric health.

Data supporting the link between social jetlag and mental health found the former to be associated with symptoms of depression in a sample of over 4000 participants (8). Of relevance to the current proposal which focuses on adults in their 30s, this association was particularly pronounced in those aged between 31 and 40 years. Social jetlag has also been associated with other difficulties including physical aggression (9) and ADHD symptoms (10). Despite these pioneering studies, research examining the links between social jetlag and psychiatric disorders is largely lacking. The purpose of this study is therefore to explore the links between social jetlag and a range of psychiatric disorders in a birth cohort.

In a previous paper focusing on this cohort, we reported links between insomnia and psychiatric disorders (11). At age 38 we focused on 7 psychiatric disorders. These same psychiatric disorders will be examined in relation to social jetlag in the current study.

Data analysis methods:

General approach.

A previous study of this cohort reported an association between social jetlag, obesity and metabolic disorder (12). We will use similar methodology as used in that paper.

Excluding shift workers.

In line with our previous work in this area, we shall focus on non-shift workers as is standard in work of this type (12).

Logistic regression analyses.

We shall use logistic regression analyses in order to predict, from social jetlag, 7 psychiatric disorders: major depression; generalized anxiety disorder; any fear or phobia (including panic disorder, social phobia, agoraphobia and simple phobias); posttraumatic stress disorder (PTSD); alcohol dependence; cannabis dependence; and hard drug dependence (including stimulants, sedatives, opiates, hallucinogens, inhalants, cocaine, crack or methadone).

For each psychiatric disorder we shall run separate regression analyses which do not control for covariants (unadjusted models). In further models, covariants will include sex, SES, chronotype (corrected for sleep debt), sleep duration, smoking, insomnia status and a history of the psychiatric disorder being predicted from the model.

Age range

The analyses will focus on data from age 38 years. We could also investigate whether associations hold when looking at psychiatric disorders from other time points.

Sensitivity analyses

As in our previous work on this topic, we will rerun the results excluding 6 people with extreme values for social jetlag (12). We will also rerun analyses excluding those taking sleep/ psychiatric medications. We will rerun the depression and GAD analyses excluding insomnia items from the diagnostic criteria as previously (11).

Variables needed at which ages:

Background information

Age, Sex, SES

Age 38 variables

Social jetlag (this is the measure used by Mike previously. This measure controls for sleep duration and timing. A recent report has suggested that there is a need to correct for sleep debt (13) so we might want to consider whether we need to make any adjustments to our measure. This may not be necessary because we adjust for sleep debt in our chronotype variable).

Psychiatric disorders (I am keen to use the same variables used in Goldman-Mellor et al., 2014). These are major depression, generalized anxiety disorder, any fear or phobia (including panic disorder, social phobia, agoraphobia and simple phobias), posttraumatic stress disorder (PTSD), alcohol dependence, cannabis dependence and hard drug dependence (including stimulants, sedatives, opiates, hallucinogens, inhalants, cocaine, crack or methadone). We would like GAD and depression scores both with and without insomnia items excluded.

Smoking status
Insomnia status
Sleep duration
Chronotype (adjusted for sleep debt)
Shift workers
Medication use (for sleep or psychiatric disorders)

Variables at other ages

History of each of the psychiatric disorders separately

Other variables that might be relevant (taken from Parsons Concept form)

Latitude
Young children in the house
Alcohol use
Caffeine consumption

Significance of the Study (for theory, research methods or clinical practice):

Work requirements can result in late bedtimes or early start times. We can catch up on sleep during the weekend – but a change in timing can result in a state of jetlag where there is desynchronisation between our body clock and the world in which we live. It has been proposed that this lack of synchronisation can result in a plethora of problems, including those with our mental health. More work is needed to investigate this. Finding that social jetlag predicts psychiatric difficulties might further support the growing idea that by improving aspects of our sleep, in this case the regularity of sleep timing, can be a route by which to reduce other difficulties.

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Data Security Agreement

A

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Proposing Author	Alice M. Gregory
Today's Date	16/06/17

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Please initial your agreement AMG

	I am current on Human Subjects Training (CITI (www.citiprogram.org) or equivalent)
X	My project is covered by Duke or Otago IRB OR I have /will obtain IRB approval from my home institution.
X	I will treat all data as "restricted" and store in a secure fashion.
X	I will not share the data with anyone, including students or other collaborators not specifically listed on this concept paper.
X	I will not post data online or submit the data file to a journal for them to post. *Some journals are now requesting the data file as part of the manuscript submission process. The Dunedin Study cannot be shared because the Study Members have not given informed consent for unrestricted open access. Speak to Terrie or Avshalom for strategies for dealing with data sharing requests from Journals.*
X	Before submitting my paper to a journal, I will submit my draft manuscript and scripts for data checking, and my draft manuscript for co-author mock review, allowing three weeks
X	I will submit analysis scripts and new variable documentation to project data manager after manuscript gets accepted for publication.
X	I will return all data files to the Data Manager after the project is complete. Collaborators and graduates of DPPP may not take a data file away from the DPPP office. The data remains the property of the Study and cannot be used for further analyses without express, written permission.

A Gregory

Signature: _____

CONCEPT PAPER RESPONSE FORM

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Proposing Author	Alice M Gregory
Other Contributors	As suggested by sponsors [I propose Michael J Parsons, Richie Poulton, Sidra Goldman-Mellor]
Potential Journals	
Today's Date	16/06/17
Intended Submission Date	16/06/18 (although, ideally, I would submit before the next academic year starting in October, 2018)

Please keep one copy for your records and return one to the proposing author

B. To be completed by potential co-authors:

	Approved
	Not Approved
	Let's discuss, I have concerns

Comments:

Please check your contribution(s) for authorship:

	Conceptualizing and designing the longitudinal study
	Conceptualizing and collecting one or more variables
	Data collection
	Conceptualizing and designing this specific paper project
	Statistical analyses
	Writing
	Reviewing manuscript drafts
	Final approval before submission for publication
	Acknowledgment only, I will not be a co-author

Signature:

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