

The Effects of Untreated and Treated Obstructive Sleep Apnoea on Subjective  
Sleepiness, Microsleeps, Simulated Driving Performance and Neurocognitive  
Functioning

Melissa Stephens

3592085

Thesis submitted in partial fulfilment of the requirements for

Doctor of Psychology (Clinical Neuropsychology)

Department of Psychology

Victoria University

Melbourne, Australia

February 2006

## Declaration

“I declare that this report is an original piece of research, conducted by myself and does not contain data or materials which have been previously submitted by myself or anyone for academic credit. I further declare that this report does not contain any materials previously presented by myself or another persons, except where due reference is made in the text. This study was conducted with the full approval of the ethics committee of the Department of Psychology, of Victoria University.”

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

## Acknowledgements

I gratefully acknowledge the assistance and support of my supervisor, Dr. Gerard Kennedy, as well as the help of Daniela DeFazio of Victoria University, particularly for her assistance with the assessment of participants. In addition, the contributions of Professor Robert Pierce and Dr. Mark Howard, of the Austin and Repatriation Medical Centre, are greatly appreciated. I would also like to express my appreciation to the individuals who volunteered their time as participants for the study.

I am appreciative of the comments of several friends and colleagues, particularly Marie Day, Natasha Panagiotopoulos and Stuart Lee, who all gave me excellent detailed and constructive advice when reviewing early and late drafts. To all of them and the many other colleagues, friends and family who put up with the throes of this process, thanks.

Last, but far from least, I would like to thank my husband, Andrew Stephens, for always being there for me when I needed a shoulder to cry on. I thank him with all of my heart for his infinite encouragement, his never-ending help and his wonderful support.

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## Abstract

Obstructive sleep apnoea (OSA) is a complex disorder of neural respiratory control and upper airway dysfunction that results in repeated complete and partial occlusion of the upper airway during sleep. Obstructive sleep apnoea has been linked to fatigue, increased rates of road and work-related accidents and deficits across a range of neurocognitive domains. The most widely used treatment for OSA is continuous positive airway pressure (CPAP). This study aimed to compare neurocognitive functioning, simulated driving performance, vigilance, objective and subjective sleepiness in patients with moderate to severe OSA with control participants before and after treatment with CPAP. It was hypothesised that patients with OSA would report higher levels of subjective sleepiness, perform poorer on a simulated driving task and neurocognitive tests, demonstrate reduced vigilance and reaction times, and show increased objective sleepiness in comparison to control participants. It was also hypothesised that performance in these tasks would improve in OSA patients following CPAP treatment. Fifteen patients (12 males and 3 females) with moderate to severe OSA between the ages of 40 and 71 were recruited from the Austin and Repatriation Medical Centre and 15 healthy controls (12 males and 3 females) aged between 37 and 70 matched for gender and closely matched for age and weight were recruited from the community. Participants were assessed on a driving simulator, psychomotor vigilance task and a battery of neurocognitive tests. The results showed that OSA patients displayed significant impairments related to daytime sleepiness and a novel finding of this study was that OSA patients demonstrated a lowered capacity for procedural learning. The current study also found that following CPAP treatment, OSA patients improved on measures of sustained attention, reaction time, simulated driving performance, memory and procedural learning. Findings of the present study

indicate the importance of detecting impairments relating to performance in OSA patients in order to minimise the risk of accidental injury to themselves or others. Increased sleepiness and deficits in simulated driving and neurocognitive tasks may be alleviated with CPAP treatment. Continued research into this area is warranted so that significant consequences for the quality of life of patients and for other road users can be identified.