

**Cognitive Impairment, Spontaneous Recovery and Environmental
Enrichment Post Stroke**

Presented by

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B.Sc (Hons) Psychology

*This thesis is submitted to the
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in fulfilment of the requirements of the degree of*

Doctorate of Clinical Psychology

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Declaration

1. *The thesis contains no material which has been accepted for award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available to this loan and photocopying subject to the provisions of the Copyright Act 1968.*
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3. *I hereby certify that the work embodied in this thesis contains a co-authored scholarly work, of which I am a joint author. I have included as part of the thesis a written statement, endorsed by my supervisor, attesting to my contribution to the joint scholarly work*
4. *The work in this thesis was carried out under the supervision of Associate Professor Frini Karayanidis, University of Newcastle and Dr. Karen Drysdale, University of Newcastle*
5. *The conduct of this research was approved by the Hunter New England Human Research Ethics Committee and the University of Newcastle Human Research Ethics Committee (approval number 09/09/16/5.08.)*

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Statement of Collaboration and Authorship

I hereby certify that I am joint author of the scholarly work embodied in this thesis "*Cognitive improvement during stroke rehabilitation: Spontaneous recovery or practice effects?*"

The following research was conducted in collaboration with the following researchers:-

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Structured Abstract

Background: Cognitive impairment post stroke is common yet few studies have investigated cognitive deficits in the early stages post stroke. Spontaneous recovery of post stroke cognitive deficits has been reported. Studies assessing this phenomenon require the use of repeated neuropsychological assessments, however, the majority of this research fails to account for practice effects. The effects of intervention for cognitive deficits have also been explored. Stroke animal models reveal significant improvements in cognition following environmental enrichment, although human stroke studies are limited. Aims: The current study aims to 1) assess cognitive impairment in the early stages of stroke 2) assess spontaneous recovery of cognitive deficits while accounting for practice effects 3) assess the effects of enrichment on cognitive functioning post stroke. Method: Forty one stroke patients were assessed on memory, attention and executive functioning tasks on admission to and on discharge from a rehabilitative ward. Results were compared to 15 aged matched health controls. Cognitive performance was also compared between stroke participants allocated to a control or intervention (enrichment) group. Enrichment took place during the patient's rehabilitative stay and consisted of individual enrichment (books, music magazines) and communal enrichment (Nintendo Wii games, board games). Results: Stroke participants were impaired on all neuropsychological tasks compared to healthy controls. Stroke patients improved at the same rate as healthy controls on tasks of memory and attention therefore suggesting improvement was a result of practice effects, not spontaneous recovery. Stroke patients improved at a significantly greater rate than healthy controls on the executive functioning task therefore suggesting evidence of spontaneous recovery in

this particular cognitive domain. Enrichment did not enhance any of the cognitive deficits experienced by stroke patients. Conclusion: Cognitive impairment and spontaneous recovery in the early stages of stroke requires further attention. In particular, practice effects need to be accounted for. Further research on environmental enrichment should include increasing the duration of the enrichment period, and providing satisfactory methods for documenting patients' engagement in enrichment activities.