

# CRE NEWSLETTER

## 2014/15





# WELCOME

## MOVING AHEAD

### Centre for Research Excellence in Brain Recovery

Dear Reader,

I am writing to you about MOVING AHEAD. MOVING AHEAD is an NHMRC Centre of Research Excellence in Traumatic Brain Injury which commenced in April 2012. The specific goal of the CRE is to improve psychosocial outcomes after TBI. This newsletter provides you with information about our activities over the last year or so.

Our team of Chief Investigators comprises some of the most well-known researchers in this field in Australia: Prof Skye McDonald (UNSW), Prof Vicki Anderson (MCRI), Prof Jennie Ponsford (Monash University), Prof Robyn Tate (SydUni), Prof Leanne Togher (SydUni), Dr Angela Morgan (MCRI), Dr Jenny Fleming (UQ), Prof Jacinta Douglas (La Trobe), Dr Tamara Ownsworth (Griffith University) and A/Prof Cathy Catroppa (MCRI).

We work with a team of wonderful Associate Investigators and Post-doctoral and PhD students. Together we are capable of really making a difference in the Australian and international landscape in terms of improving the lives of people with TBI and their families and in terms of making clinical research in this field a vibrant, interactive network of clinicians and researchers. We also have an expert advisory team of eminent international researchers to help guide directions of the CRE.

The CRE has four broad aims: (1) to pursue specific research projects to improve psychosocial outcomes; (2) to facilitate knowledge transfer between research and clinical practice and to foster research in practice; (3) to train the researchers of tomorrow and (4) to increase collaboration.

We have been working together over the past 3 years to address each of these aims and a short overview of what we have done towards these is detailed overpage.

In addition, the CRE represents a network of researchers across Melbourne, Sydney and Brisbane who are engaged in numerous studies to address psychosocial rehabilitation following TBI. In this newsletter we have detailed some of the individual projects of our students and CIs that have been conducted over the past 12 months or are currently in the planning stages, commencing from Page 12.

We hope you find this newsletter informative and interesting. Please give us your feedback at [movingahead@unsw.edu.au](mailto:movingahead@unsw.edu.au) and do visit our website for more information and for updates throughout the coming year. You can also find a fuller description of the CRE in the following journal article:

McDonald, S., Anderson, V., Ponsford, J., Tate, R., Togher, L., Morgan, A., Fleming, J., Ownsworth, T., Douglas, J. & Murdoch, B. (2012) Moving Ahead: A new centre of research excellence in brain recovery, focusing on psychosocial reintegration following traumatic brain injury. *Brain Impairment*, 13 (2), 256-270.

Best wishes,  
Skye McDonald

#### Our team of Chief Investigators

Bottom row, left to right:  
Dr Jenny Fleming (UQ), Prof Vicki Anderson (MCRI), Prof Skye McDonald (UNSW), Prof Jennie Ponsford (Monash University), Dr Angela Morgan (MCRI)



Top row, left to right:  
Prof Leanne Togher (USYD) Prof Robyn Tate (USYD), A/Prof Cathy Catroppa (Associate Investigator, MCRI), Dr Tamara Ownsworth (Griffith University), A/Prof Jacinta Douglas (La Trobe)



# 2014 achievements of CRE

## Aim 1: To pursue specific research projects to improve psychosocial outcomes

Ten projects representing collaborations across CRE members have commenced since 2012:

1. Speech production in adults: (MCRI: Angela Morgan)
2. Facilitating home-life: (MCRI: Vicki Anderson & Cathy Catroppa)
3. Facilitating friendships: (USYD/La Trobe: Leanne Togher & Jacinta Douglas)
4. Self-awareness: (UQ/Griffith: Jenny Fleming & Tamara Ownsworth)
5. Emotion regulation: (UNSW/USYD: Skye McDonald & Robyn Tate)
6. Addressing anxiety and depression: (Monash Uni: Jennie Ponsford)
7. CBT for fatigue and insomnia (Monash Uni: Jennie Ponsford)
8. Meaningful occupation (USYD: Robyn Tate)
9. Developing paediatric guidelines (MCRI: Angela Morgan & Vicki Anderson)
10. Social cognition (UNSW/USYD: Skye McDonald & Robyn Tate)

In 2014 the CRE presented papers/symposia on existing studies within these broad strands at (1) annual meeting of the annual meeting of the Australian Society for the Study of Brain Impairment (ASSBI: Fremantle, 2014) (2) annual meeting of the International Neuropsychological Society (INS: Seattle, 2014) (3) midyear meeting of the International Neuropsychological Society (INS: Jerusalem, 2014) (4) Neurorehab meeting (WFNR: Turkey, 2014) (5) College of Clinical Neuropsychologists Conference (CCN: Adelaide, 2014) and (6) 10th World Congress on Brain Injury (San Francisco, 2014).

## Aim 2: Knowledge transfer

In 2014 this objective was pursued by: (1) maintaining Moving Ahead's website providing a portal to (a) research activities of the CRE (b) PyscBITE and SpeechBITE (providing access to all published empirical research on remediation for problems associated with TBI) (c) evidence based resources for treating/assessing psychosocial disorders; (2) development of a webinar series (commencing in 2014) presented via ASSBI; (3) ongoing engagement with the NSW TBI evidence based practice group (McDonald).

## Aim 3: Research training

The CRE aims to support research training. There were several initiatives ongoing in 2014: (1) appointments of PDs and PhD students specifically to foster training (see Pages 49-56); (2) annual meetings (most recent, Perth 2014) involving PostDoctoral fellows and post-graduate research meetings, next to be held in Sydney in July 2015, (3) advertising of seed grants to foster research by clinicians with three successful grants awarded in December 2013 and 2014 (see Pages 5-7).

## Aim 4: Increase collaboration

The CRE also aims to increase collaboration within CRE members and between the CRE and the broader national and international community. This has commenced via (1) establishment of an international panel of experts as the CRE Advisory Board (2) new collaborations between CIs on CRE research projects (see Aim 1 above) (3) new collaborations between CIs on grants (e.g. new project grant awarded to Ownsworth, Fleming and Tate, 2012; new grant application by McDonald, Ownsworth, Togher and Ponsford, submitted 2014) (4) a collaborative research project involving all CRE members aimed at devising a standardized protocol for assessing psychosocial outcomes (5) development of a Clinical Advisory Board.

**MA Website**  
The Moving Ahead website provides up to date information on the activities of our CRE and its people.



## CRE Seed Grants

In 2014, the Moving Ahead CRE awarded three small seed grants to the value of \$2,000 each. The aim of these grants was to provide some assistance to outstanding individuals who were undertaking, or were about to embark on, promising research that was consistent with the overall goals of Moving Ahead. Applications for the grants were highly competitive. The lucky recipients included Nicholas Behn, Nicholas Ryan, and Claire Willis.

## Improving quality of life and communication skills for people with acquired brain injury (ABI) following project-based therapy.

**By Nicholas Behn, Madeline Cruice, Jane Marshall and Leanne Togher**

### What the study will be about:

Communication impairments are common following acquired brain injury (ABI) and have a significant impact on a person's quality of life post-injury. Therapy can involve conversational skills training and training the communication partner (i.e. family member, paid carer). While both approaches improve communication skills, quality of life is less amenable to change. An alternative therapy, called project-based therapy, has been proposed where a person with ABI works collaboratively towards a common goal (or project), providing a meaningful, engaging and motivating environment. This study will evaluate the effect of project-based therapy on improving the communication skills and quality of life for people with ABI.



**Nicholas Behn**

### What we have done:

Twenty-one people with ABI with communication impairments participated in this study (ten were allocated into a delayed treatment group). Following an initial assessment, therapy involved 10 sessions over 6 weeks (each session lasting 2 hours). The first therapy session involved setting individualised communication goals and useful strategies for the person with ABI and their communication partner. The next nine sessions involved group sessions (of two to three people) where participants worked towards achieving a meaningful project identified by the group. Each session provided a supportive environment for people with ABI to work on their communication goals and problem-solve, plan and organise a range of tasks to achieve the project. Regular text-messages were sent to people with ABI to remind them of their individualised goals and any tasks they need to do to complete the project.

### What we expect to find:

It is anticipated that people with ABI will have better conversations and report a higher quality of life following the therapy. The design of this study will also enable us to identify the most critical components of project-based therapy for people with ABI. Completed projects can be located on YouTube ("brain injury projects") at the following link:

[https://www.youtube.com/channel/UCL\\_KmMcSwrsl\\_HdwTddc0pA](https://www.youtube.com/channel/UCL_KmMcSwrsl_HdwTddc0pA)

# Structural Imaging Biomarkers and Predictors of Social Cognitive and Behavioral Functioning after Pediatric Traumatic Brain Injury (TBI): a Longitudinal Prospective Analysis.

By Nicholas Ryan, Cathy Catroppa, Timothy Silk and Vicki Anderson

## What the study is about:

Pediatric traumatic brain injury (TBI) is a common cause of childhood disability, and is associated with elevated risk for social, behavioural and cognitive-communicative difficulties. In addressing substantial gaps in current knowledge of the neurobiological and neurocognitive mechanisms that link TBI to socially maladaptive behaviour, this study aims to; (1) characterize the nature and prevalence of social cognitive, communication, and behavioural difficulties up to 24 months post-pediatric TBI, and (2) relate social cognitive and behavioural outcomes to both (i) the location and extent of microhaemorrhagic lesions detected using susceptibility weighted imaging (SWI) and (ii) alterations in structural network topology quantified via diffusion weighted imaging (DWI) and graph theoretical methods.



Nicholas Ryan

## What we have done so far:

Our research team has recruited 147 children and families: 104 children and adolescents with TBI, and 43 typically developing (TD) children and adolescents aged between 5 and 15 years. Participants have undergone research MR imaging at 2-8 weeks post-injury, and completed cognitive and behavioral assessments at 6, 12- and 24-months post injury. A subset of the sample has undergone structural imaging at 2-years post-TBI.

## What we expect to find:

We predict that paediatric TBI will be associated with elevated risk for impairments across domains of social cognition, pragmatic communication and social adjustment. Compared to typically developing children, we expect that paediatric TBI will be associated with both alterations in existing structural brain connections, as well as a decrease in the number of edges between brain areas across time. More specifically, we expect that TBI patients will show abnormal small-world organization, reduced network efficiency and altered nodal efficiency in white matter networks.

Furthermore, we expect a relation between the degree of network connectivity and social cognitive and behavioural function in children and adolescents with TBI, whereby decreased connectivity degree will be associated with impairments in social and behavioural functioning.

Results from the study will enable identification of potential 'critical developmental periods' for better and worse recovery of social cognitive and pragmatic-communicative abilities, as well as assist to identify neural correlates and acute structural imaging biomarkers to improve prediction of long-term social outcomes. The results will also extend current knowledge of risk factors for externalizing trajectories post-TBI, ensuring clinicians and policy makers are better equipped to identify and target children who may benefit from long-term follow up and/or psychological interventions.

# The *Participate Project*: Preparing children with acquired brain injury for integration into community recreation and leisure activity

By Claire Willis, Anna Gubbay, Siobhan Reid, Sonya Girdler, Astrid Nyquist, Reidun Jahnsen, Michael Rosenberg, Noula Gibson, Jane Valentine and Catherine Elliott.

## What the study will be about:

Participation is associated with a child's behavioural and emotional wellbeing, the development of psychosocial and physical competencies, and the development of sense of meaning and purpose in life. Although participation is considered a key component of rehabilitation, there is limited empirical evidence regarding approaches to improve this domain in the paediatric ABI population. Thus, this research aims to develop a rehabilitation model and intervention to help facilitate the community participation of children with an ABI.



Claire Willis

## What we have done:

A needs assessment has been used to develop the model, involving both a local environment analysis and an international model analysis. In Western Australia (WA), we have identified the most significant factors impacting upon a child's participation in the community following ABI. The second part of this analysis will identify services in WA that do and do not facilitate participation of children with ABI in community activities. The last component of the needs assessment is being undertaken at Beitostølen Healthsports Centre (BHC) in Norway. This rehabilitation centre successfully meets the needs of children and youth, adults and their families in Norway, providing them with the skills and confidence to participate in home, school and community settings following intervention. The analysis of this Norwegian model has identified key structures and elements that are required for successful intervention in preparing children for integration into community activities.

## What we expect to find:

Collating the findings of the needs assessment will provide the context and conceptual basis that will form the key pillars of our Australian rehabilitation model. The model will provide the framework that will guide the development of the participation-based intervention. The intervention will be designed to support children and families in gaining skills and confidence to move into community programs to promote empowerment, social inclusion and participation in children with an ABI. Importantly, the model developed in this research will outline key strategies to guide future program development and implementation, support replication into other rehabilitation frameworks, and assist in enhancing the participation opportunities and quality of life of children with ABI in Australia.

## ASSBI Webinar Series

ASSBI is currently offering 6 one-hour webinars which will run throughout 2015. Topics that are relevant to traumatic brain injury include:

- Improving first impressions: Social skills training for adults with brain injury. By Professor Skye McDonald, 10th March 2015
- Assessment of visuospatial memory in clinical practice. By Professor Roy Kessels, 9th June 2015
- Prospective memory. By Professor David Shum, 11th August 2015
- Understanding self-identity change after brain injury. By Associate Professor Tamara Ownsworth, 13th October 2015
- Cognitive Interventions for Mild Cognitive Impairment. By Dr Maurice Finn, 8th December 2015

For more information or to register go to: [www.assbi.com.au/webinars](http://www.assbi.com.au/webinars)

## 2014 Clinical Advisory Board Meeting

Darlington Centre, Sydney, 6th November 2014

**By Dr Heather Francis**

Clinicians with varying expertise in the field of traumatic brain injury were invited to take part in a one day meeting. Professor Skye McDonald opened the meeting with an introduction to the aims and goals of the Moving Ahead CRE. Chief investigators presented the latest research findings of the CRE, which included meaningful occupation (Robyn Tate), managing mental health issues (Jennie Ponsford), emotion dysregulation (Skye McDonald), management of cognitive communication disorders (Leanne Togher), a survey of multi-disciplinary clinicians (Tamara Ownsworth) and social outcomes in paediatric TBI (Vicki Anderson). Group discussions were held, with the aim of generating ideas for translating research into practice and bridging the gap between evidence and practice. Those who attended the meeting were invited to form a Clinical Advisory Board, with the aim of encouraging ongoing dialog between Moving Ahead researchers and the clinicians working with traumatic brain injury patients.

## Using CBT to treat anxiety and depression after brain injury

Adina Apartment Hotel, Melbourne, 15th May 2015

**By Professor Jennie Ponsford, Dr Dana Wong and Dr Adam McKay**

In this full-day workshop, three leading Australian clinical researchers explored the treatment of anxiety and depression after TBI with a modified form of CBT, designed for people with cognitive impairment. In the first part of the workshop, Professor Jennie Ponsford discussed the rationale and evidence for using CBT as a psychological intervention for people with TBI. Dr Dana Wong and Dr Adam McKay then discussed and demonstrated the use of the various components of modified CBT, with a particular focus on how to use cognitive restructuring methods with cognitively impaired clients, using case examples, videos of CBT in action, and role plays.

**We are always very keen to receive suggestions for future workshops and research training opportunities, so please don't hesitate to contact us with your ideas! Just drop us an email at [movingahead@unsw.edu.au](mailto:movingahead@unsw.edu.au)**

# Moving Ahead Clinician Survey

## Study in Progress

**Elizabeth Pagan, Tamara Ownsworth, Skye McDonald, Cynthia Honan and Jenny Fleming**

### What this study is about:

The Moving Ahead Clinician Survey was launched in May 2013.

This research aims to investigate the barriers to effective intervention for clinicians conducting neuro-rehabilitation with traumatic brain injury clients. Additionally it aims to identify professional development preferences of clinicians.

### What we are doing:

A total of 305 completed survey were received from clinicians (88% female) from a range of disciplines including psychology (28%), occupational therapy (27%), speech pathology (15%), physiotherapy (11%), social work (6%), rehabilitation medicine (3%) and nursing (3%).

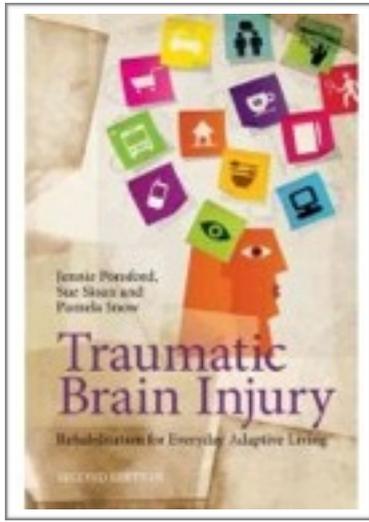
Survey results indicated that goal setting, client/family education, assessment for rehabilitation needs, and provision of assessment feedback were considered 'core' activities for all disciplines. The most frequently endorsed barriers to practice were client-related (e.g. poor attention and concentration – 96%; memory impairment – 95%). Client-related barriers, family-related barriers, and client-therapist relationship barriers were more frequently endorsed than workplace context barriers and professional skill barriers. However, there was a trend for clinicians to report greater confidence in overcoming client-related barriers than the other types of barriers.

The two main factors found to be related to the number of barriers endorsed and clinicians' confidence level included the clients' functional status and years of experience in the TBI field. Clinicians working with clients with mild TBI reported experiencing significantly fewer barriers than those working with clients with more severe TBI. However, they were less confident in overcoming barriers than clinicians working with clients with more severe TBI. Clinicians with fewer years of experience (i.e. <2 years) reported significantly lower levels of confidence than clinicians with 2-10 years and >10 years experience.

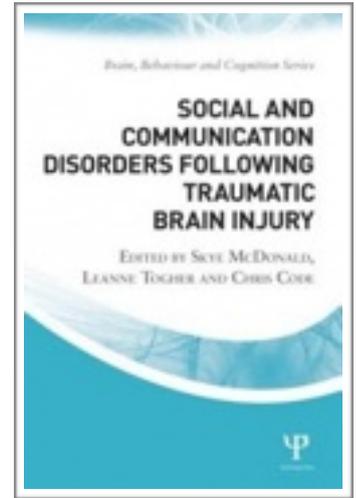
The most commonly endorsed items for professional development included: new interventions and therapies (76%), translating rehabilitation research into everyday practice (65%) and client specific topics (e.g. insight or self-awareness - 66%; attention, memory, executive function – 64%). The findings of this study provide a unique multidisciplinary perspective on clinicians working in TBI rehabilitation and improve understanding of barriers to practice and professional development needs within TBI in Australia.



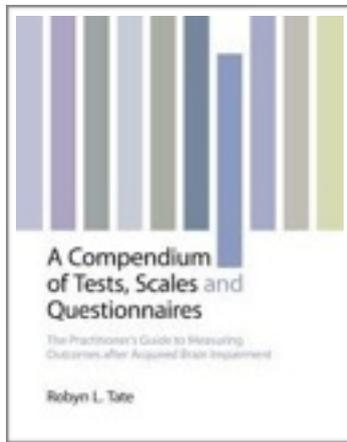
CRE PUBLICATION RESOURCES



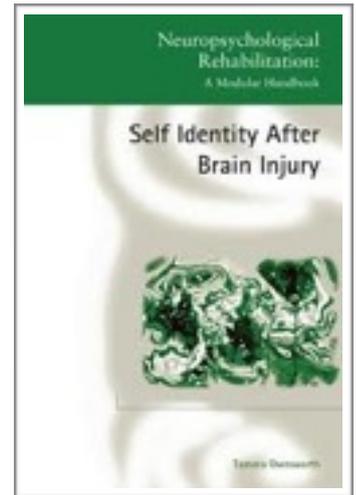
**Rehabilitation for Everyday Adaptive Living, 2nd Edition**  
by Jennie Ponsford, Sue Sloan and Pamela Snow



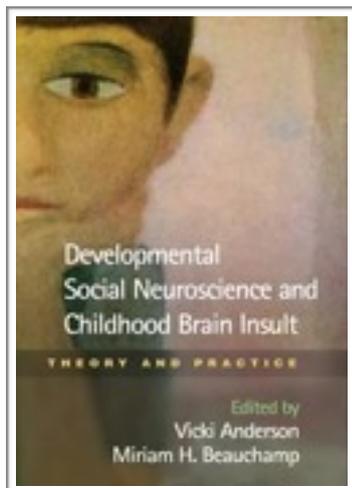
**Social Communication Disorders Following Traumatic Brain Injury, 2nd Edition**  
by Skye McDonald, Leanne Togher and Chris Code



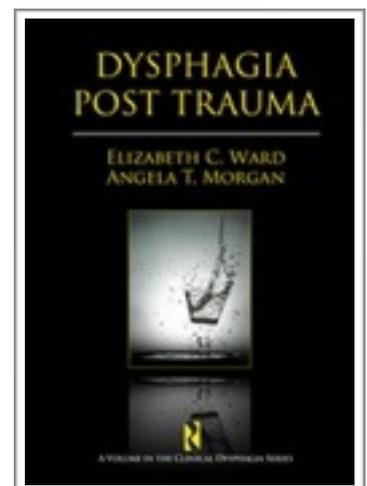
**A compendium of Tests, Scales and Questionnaires**  
by Robyn L Tate



**Self-Identity after Brain Injury**  
by Tamara Ownsworth

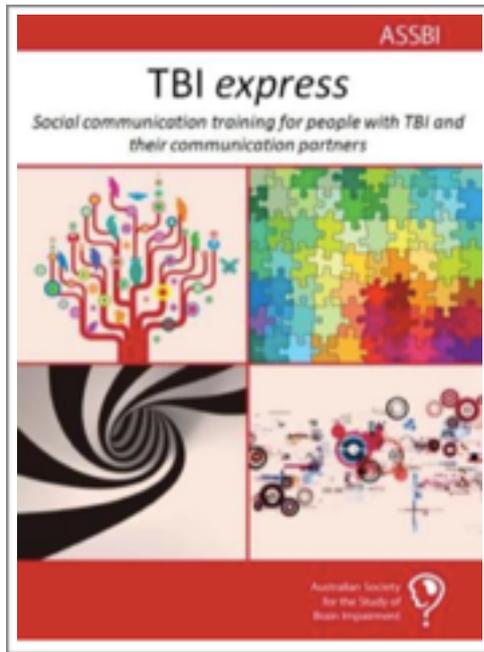


**Developmental Neuroscience and Childhood Brain Insult**  
by Vicki Anderson and Miriam H. Beauchamp

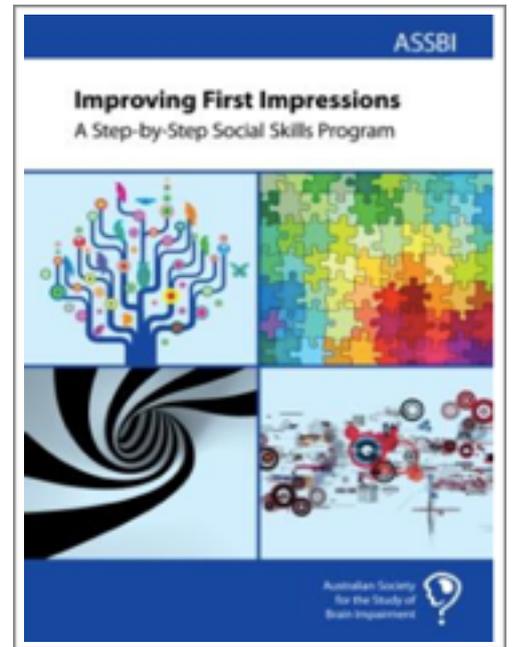


**Dysphagia Post Trauma**  
by Elizabeth C. Ward and Angela T. Morgan

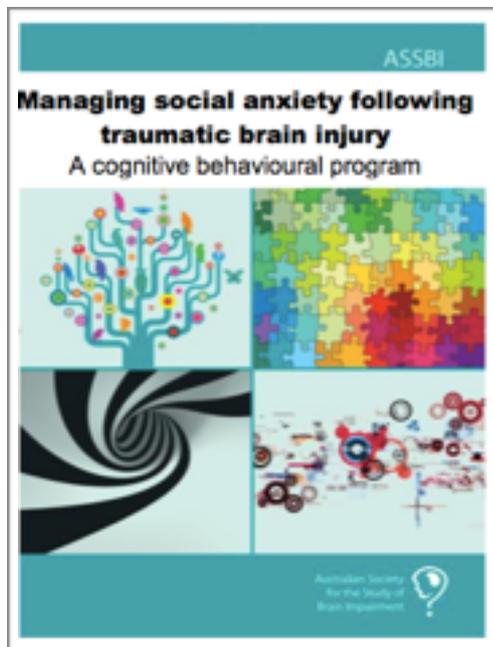
CRE TREATMENT RESOURCES



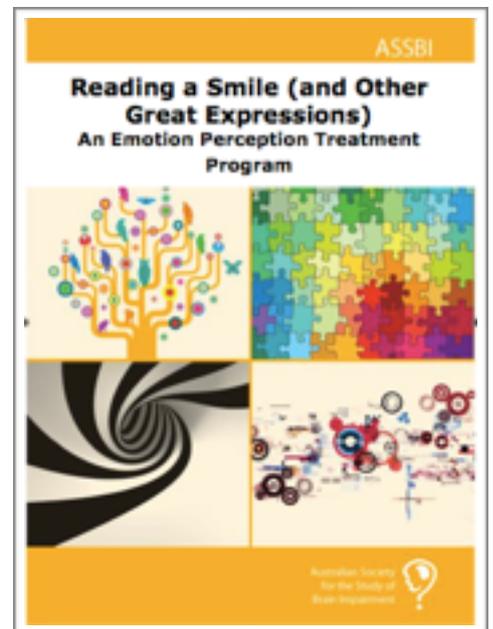
**TBI - Express: Social Communication training for people with TBI and their communication partners**  
by Togher, McDonald, Tate, Power, Ylvisaker & Rietdijk



**Improving First Impressions: A step-by-step Social Skills Program**  
by McDonald, Bornhofen, Togher, Flanagan, Gertler, & Bowen



**Managing Social Anxiety Following Traumatic Brain Injury**  
by Hodgkinson & McDonald



**Reading a Smile (and Other Great Expressions): An Emotion Perception Treatment Program**  
by Bornhofen & McDonald

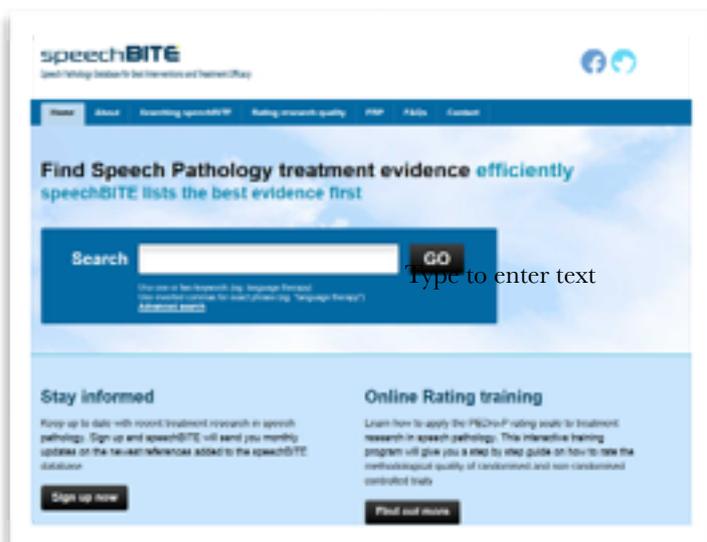
For more information on CRE's treatment, assessment and publication resources, please see our website: [moving-ahead.com.au](http://moving-ahead.com.au)

# PsycBITE and SpeechBITE

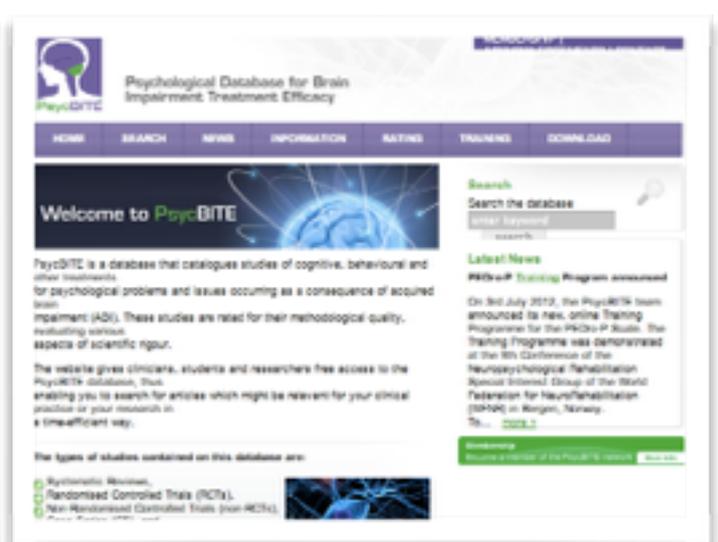
As part of its aim to support research in clinical practice, the Moving Ahead website provides links to both PsycBITE and SpeechBITE.

PsycBITE and its sister database SpeechBITE are readily-available, free web-resources developed by members of the CRE. These can be accessed directly in the internet or via the MA webpage. PsycBITE contains all published, empirical reports on the effectiveness of non-pharmacological interventions for the psychological consequences of acquired brain impairment (currently over 4500 records). SpeechBITE contains all published empirical reports attesting to the effectiveness of treatments for speech, language and swallowing disorders (currently over 4265 records). Using these databases, clinicians, consumers and researchers can, at the touch of a button, access all studies for a given treatment, which are rated for and ranked on the database by their methodological quality. This makes it easy to identify the best evidence. The databases are updated monthly.

Some of the facilities offered on PsycBITE				
Easy search for treatments	Summaries of remediation techniques	Ratings of methodological quality	On-line training in how to rate methodological quality	
Access to all papers that target a given problem (e.g. memory) at the press of a button	Access to a large selection of summaries of techniques used in good quality studies	Provision of a methodological rating by which to gauge the scientific validity of the study	Step by step training in how to evaluate RCTs (launched in July 2012)	Step by step training in evaluating n-of-1 trials (in preparation)



New **SpeechBITE** Home page - check it out!



**PsycBITE** Home page, currently being redeveloped - new website will be live soon!

## Longitudinal study of childhood traumatic brain injury

By Cathy Catroppa, Celia Godfrey and Vicki Anderson

Led by Assoc Prof Cathy Catroppa and Prof Vicki Anderson, our research team has systematically followed the progress of a sample of 172 children with traumatic brain injury, and a matched control group of 35 children, over a 20-year period. The project has an international reputation, and is unique in terms of length of follow-up, prospective design and representative well-maintained sample. We most recently completed the 16-year follow-up of the cohort and are now in the process of writing up results for publications. Recent papers on this sample include:



### Professor Vicki Anderson

Vicki Anderson is a child neuropsychologist at the Royal Children's Hospital and Murdoch Childrens Research Institute, Melbourne. Her expertise is in working with children with brain injuries and their families. Her clinical research team, the Australian Centre for Child Neuropsychology Studies (ACCNS) conducts research addressing the assessment, diagnosis and treatment of problems resulting from brain injury, including cognitive, behavioural and social difficulties. ACCNS has extensive local and international collaborations.

- Rosema, S., Muscara, F., Anderson, V., Hearps, S., Godfrey, C., Eren, S. & Catroppa, C. (accepted December 2014) The trajectory of long-term psychosocial development 16 years following childhood traumatic brain injury. *Journal of Neurotrauma*
- Ryan, N.P., Hughes, N., Godfrey, C., Rosema, S., Catroppa, C., Anderson, V.A. (2015). Prevalence and Predictors of Externalizing Behavior in Young Adult Survivors of Pediatric Traumatic Brain Injury. *Journal of Head Trauma Rehabilitation*, 30 (2), 1-11.
- Rosema, S., Muscara, F., Anderson, V., Godfrey, C., Eren, S. & Catroppa, C. (2014) Young adults' perspective on their psychosocial outcomes 16 years following childhood traumatic brain injury. *Social Care and Neurodisability* 5 (3) 135-144
- Rosema, S., Muscara, F., Anderson, V., Godfrey, C., Eren, S. & Catroppa, C. (2014) Agreement on and predictors of long-term psychosocial development 16 years post-childhood traumatic brain injury. *Journal Of Neurotrauma*, 31 (10), 899-905.
- Cooper, J.M., Catroppa, C., Beauchamp, M.H., Eren, S., Godfrey, C., Ditchfield, M. & Anderson, V.A., (2014) Attentional control ten years post-childhood traumatic brain injury: The impact of lesion presence, location, and severity in adolescence and early adulthood. *Journal Of Neurotrauma*, 31 (8), 713-21.
- Ryan, N.P., Anderson, V., Godfrey, C., Eren, S., Rosema, S., Taylor, K., & Catroppa, C. (2013) Social communication mediates the relationship between emotion perception and externalizing behaviors in young adult survivors of pediatric traumatic brain injury (TBI). *International Journal Of Developmental Neuroscience* 31 (8), 811-9.
- Ryan, N.P., Anderson, V., Godfrey, C., Beauchamp, M.H., Coleman, L., Eren, S., Rosema, S., Taylor, K., & Catroppa, C. (2014) Predictors of very-long-term sociocognitive function after pediatric traumatic brain injury: Evidence for the vulnerability of the immature "social brain". *Journal Of Neurotrauma*, 31 (7), 649-57.

In 2015 we intend to recontact the study cohort to invite participation in the 20-year follow-up of the longitudinal study. Participants are now adults aged between 20 and 32 years, an age where individuals are typically engaged in higher education, employment, financial independence, relationships, marriage, and having their own children. This is our 7th wave of data collection and this time the follow-up will take the form of an online survey only. Thus participation entails minimal inconvenience as participants will not need to physically attend the Hospital for Neuropsychological assessment and MRI brain scan as they have done previously. Questionnaires for the 20-year follow-up focus on functional outcomes and will include:

- Sydney Psychosocial Rehabilitation Scale (TBI only), Fatigue Severity Scale, Short-Form McGill Pain Questionnaire, Empowerment at Work Scale, Hospital Anxiety and Depression Scale (HADS), Social Performance Survey Schedule, Latrobe Communication Questionnaire, Rosenberg Self-esteem Scale, Nottingham Leisure questionnaire, Parenting Sense of Competence scale, and WHOQoL.

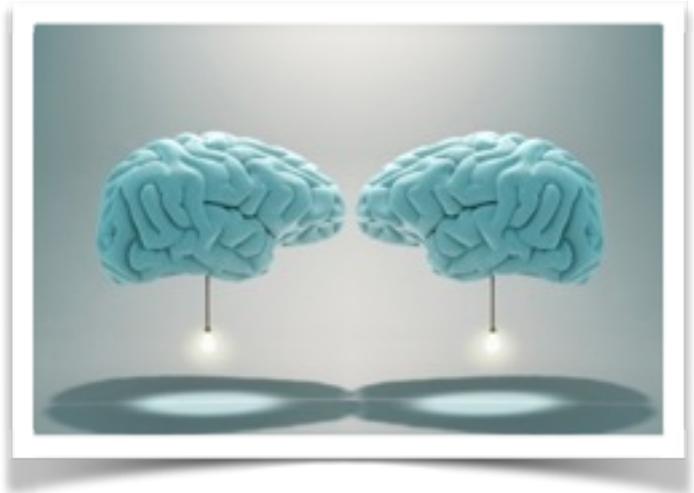
## The emergence of age-dependent social cognitive deficits after paediatric traumatic brain injury: A longitudinal prospective analysis using susceptibility-weighted imaging

By Nicholas Ryan, Cathy Catroppa, Miriam Beauchamp and Vicki Anderson

### What this study is about:

Childhood and adolescence are critical periods for maturation of neurobiological processes that underlie complex social and emotional behaviour including Theory of Mind (ToM). While structural correlates of ToM are well described in adults, less is known about the anatomical regions subsuming these skills in the developing brain or the impact of cerebral insult on the acquisition and establishment of high-level social cognitive skills.

This longitudinal prospective study examined the differential influence of age-at-insult and brain pathology on ToM outcomes after paediatric traumatic brain injury (TBI).



### What we did:

Children and adolescents with TBI ( $n = 112$ ) were categorised according to timing of brain insult: (i) middle childhood (5-9 years;  $n = 41$ ); (ii) late childhood (10-11 years;  $n = 39$ ); and (iii) adolescence (12-15 years;  $n = 32$ ) and group-matched for age, gender, and socioeconomic status to a typically developing (TD) control group ( $n = 43$ ). Participants underwent magnetic resonance imaging including a susceptibility-weighted imaging (SWI) sequence 2-8 weeks post-injury and were assessed on a battery of ToM tasks at 6- and 24-months after injury.

### What we found:

For adolescents with TBI, social cognitive dysfunction at 6- and 24-months post-injury was associated with diffuse neuropathology and a greater number of lesions detected using SWI. In the late childhood TBI group, we found a time-dependent emergence of social cognitive impairment, linked to diffuse neuropathology. The middle childhood TBI group demonstrated performance unrelated to SWI pathology and comparable to TD controls.

### What these findings mean:

This study suggests that the full extent of social cognitive deficits may not be realised until the associated skills reach maturity. Evidence for brain structure-function relationships suggests that the integrity of an anatomically distributed network of brain regions and their connections is necessary for the acquisition and establishment of high-level social cognitive skills.

## The effectiveness of the Take a Breath program (TAB) in improving the mental health of parents with children who have TBI: A Randomised Controlled Trial

By Frank Muscara and Vicki Anderson

### What this study is about:

A substantial proportion of parents whose child has suffered a significant TBI experiences debilitating stress and anxiety that endures into the post-hospital recovery period. Intrusive thoughts, excessive fear and heightened emotional arousal can make it difficult for these parents to provide an optimal recovery environment for their child. The current study will trial the newly developed Take a Breath program, delivered to parents in their homes via video-conferencing technology. Using an Acceptance Commitment Therapy (ACT) approach, the program assists parents to identify and manage their distressing thoughts and emotions. Building on promising pilot results, this randomised controlled trial will evaluate program impact up to 12 months later on parent psychological wellbeing, role functioning and quality of life, and the adjustment of the child with TBI.

### What we have done so far:

The trial is still underway, with some papers published outlining some outcomes of the project. Unfortunately, no papers have thusfar been published which specifically report on outcomes of parents and/or children with TBI. These will follow.

### What we expect to find:

We expect to find that TAB is an effective intervention, that assists in preventing mental health problems in parents, and secondarily helps to improve the psychosocial and behavioural outcomes in children with TBI.

## The development of a measure of social functioning in children and adolescents with TBI: The PEERS-Q

By Frank Muscara, Vicki Anderson and Cathy Catroppa

### What this study is about:

The current project involves the design and construction of a new and novel questionnaire that will specifically measure social functioning in children and adolescents. This questionnaire will be designed to measure the specific and often subtle social difficulties that children and adolescents experience after suffering a traumatic brain injury. We aim to collect information from parents of children without TBI, and from a clinical sample of parents with who have suffered TBI. This information will help us to determine the validity and reliability of this questionnaire.

### What we did:

The pilot study examining differences between a community sample and an ABI sample has been completed. Further, primary teacher and secondary teacher versions of the PEERS-Q have been developed, with there now being a total of 5 versions of the measure. Preliminary validity and reliability analyses are underway, and 2 papers are in preparation to disseminate the findings of this pilot and validation study. In addition, an online scoring app has been developed, so it can be scored instantly, rather than manually scored. Currently, it is being converted to an online format, so that clinicians and researchers can email the PEERS-Q to families.

### What we found:

We expect to find that the PEERS-Q is a valid, reliable and sensitive measure of social difficulties in children and adolescents with TBI.

# Predictors of Quality of Life in Adolescents and Young Adults with a History of Childhood Traumatic Brain Injury

By Kate Noone, Cathy Catroppa, Vicki Anderson

## What this study is about:

This study investigated quality of life (QoL) in survivors of childhood traumatic brain injury (CTBI) 16 years post-injury, as part of a prospective longitudinal study.

CTBI can be a lifelong problem, with sequelae persisting into adolescence and adulthood. Although ongoing deficits have been found to detrimentally affect QoL in survivors of CTBI (Anderson, Brown, & Newitt, 2010), little research has examined long-term QoL outcome. Inconsistencies in the existing literature mean current understanding of QoL many years post-CTBI remains uncertain. Despite the importance of identifying at risk survivors and developing effective intervention to improve QoL, few studies have investigated predictors of QoL following CTBI.

This study aimed to examine QoL across severity groups; investigate predictors of QoL; and explore the utility of a mediation model for predictors of QoL in survivors of CTBI.

## What we did:

Both general- and health related-QoL (HR-QoL) were assessed. The 52 participants (aged 16 to 30 years) were divided according to injury severity – mild (n=15), moderate (n=26) and severe (n=11) – and assessed using neuropsychological and psychiatric protocols as well as questionnaires.

## What we found:

No QoL differences were found between severity groups. Examination of predictors demonstrated that injury severity did not predict QoL. Socio-economic status predicted HR-QoL when mediated by IQ. IQ directly predicted HR- but not general-QoL and psychological problems predicted both general- and HR-QoL.

## What these findings mean:

The results indicate that injury factors do not pre-determine QoL outcome 16 years post-CTBI, rather environmental, cognitive and psychological factors have greater influence on long-term QoL. This suggests all survivors, regardless of injury severity, should be screened for low QoL. It also emphasises alternative factors which could identify survivors at risk of lower QoL. Moreover, this study proposed modifiable risk factors which, if targeted by interventions, may improve QoL.

### A/ Professor Cathy Catroppa

Cathy Catroppa is a research fellow of the Murdoch Children's Research Institute (MCR). For the last 15 years she has been coordinating a large scale research program examining long-term outcomes and predictors following traumatic brain injury (TBI), and given the research findings has placed an emphasis on developing and piloting intervention programs in this domain. She is on the Editorial Board of *Brain Injury*, *Journal of Pediatric Psychology*, *Journal of the International Neuropsychological Society* and *Neuropsychology*.



# Longitudinal communication outcomes following traumatic brain injury

By Leanne Togher, Robyn Tate, Skye McDonald, Lyn Turkstra, Audrey Holland and Brian MacWhinney

## What this was about:

Our research team is interested in learning more about factors that predict communication recovery after severe traumatic brain injury (TBI). This project will trace communication recovery in adults during the first 2 years after their injury. Changes in comprehension, expression, conversation and thinking skills will be measured at 3 month, 6 month, 9 month, 12 month and 2 year recovery time points. Findings will show how different communication skills are affected by TBI and when these skills may be expected to recover. This project will provide new information to support the planning and timing of speech pathology treatment for adults with TBI. The project will also contribute to future research in TBI by providing information to the TBI Bank research site.



## Professor Leanne Togher

Leanne Togher conducts innovative research in communication disorders and training for people with TBI, families, community agencies and health professionals in collaboration with colleagues in the USA and Canada (University of Wisconsin-Madison; Carnegie Mellon University, Pittsburgh, University of Montreal). She is the Past-President of ASSBI and is on the Editorial Board of a number of journals including the Journal of Rehabilitation Medicine and Brain Impairment.

## What we are doing:

Fifty eight people and their communication partners are participating in our study. Each participant completes a range of speech pathology and neuropsychology tests. Participants also complete audio or video recorded conversations and speaking tasks. Assessments for 3 month to 12 month recovery times are complete and 2 year assessments will be completed in April, 2015.

## What we found:

Our early findings have provided important information about communication recovery during the first 6 months

after TBI. Elise Elbourn, PhD student, found that many people with severe TBI experience speech and language impairments in the early stages of recovery. Over 50% of participants were diagnosed with language impairments 3 months after their injury. Problems with naming were their most frequent concern. Over 85% of participants presented with speech impairments at their 3 month assessment. Most speech difficulties were related to problems using the voice to create the right pitch or loudness for conversation.

Sophie Brassell and An An Chia, speech pathology honours students, found that people with severe TBI can take part in meaningful conversations in the early stages of recovery. However, they may need support to discuss important topics and share conversation time with their communication partners. Elin Persson, international speech pathology student, found people with severe TBI may have difficulties describing procedures e.g., making a sandwich. Some participants provided unnecessary details when giving instructions. These skills showed improvement between 3 and 6 months assessments.

Our early findings demonstrate the importance of providing communication therapy in the first 6 months after severe TBI. We now plan to identify key communication issues at later stages of recovery and to look closely at the factors that may help or hinder communication recovery.



# Review of the Literature on the Use of Social Media by People with Traumatic Brain Injury

By Melissa Brunner, Bronwyn Hemsley, Stuart Palmer, Stephen Dann and Leanne Togher

## What this study was about:

This study forms part of the literature review for the first author's PhD studies at the University of Newcastle, Australia, under the supervision of the co-authors. Social media use is rapidly becoming a usual part of everyday life for many people and connecting online is now considered an integral part of society regardless of a person's social status. People who have acquired communication disabilities related to traumatic brain injury (TBI) and who used social media before their injury may need or want to be able to maintain their current social media use, or to recover this ability. The study aimed to review the literature relating to use of social media by people with a TBI, specifically its use for communication of information, social interaction, or rehabilitation.

## What we did:

A systematic review with a qualitative meta-synthesis of content themes was conducted with 10 databases searched for relevant, peer-reviewed research studies in English that related to both TBI and social media.

## What we have found:

Sixteen studies met the inclusion criteria and content analysis identified three major categories of meaning in relation to social media and TBI: 1) risks and benefits; 2) barriers and facilitators; and 3) purposes of use of social media. Facebook and Twitter were identified as the most common social media represented in the included studies. A greater emphasis was apparent regarding risks and barriers to social media use, with little focus on facilitators of successful use by people with TBI. Identified facilitators for social media use in people with TBI included training the person with TBI and their communication partners in the use of social media.



## What's next:

With a growing body of evidence on social media use by people with TBI, there is as yet no research examining the strategies or outcomes of supporting people with TBI to continue or take up social media following TBI. Current studies suggest that integrating social media training and practice into TBI rehabilitation has the potential to increase social participation and support. Rigorous evaluation regarding the efficacy of providing interventions focusing on ways to remove the barriers and increase facilitators for the use of social media by people with TBI is required. Further research is also needed on the methods of investigating content relating to TBI found in social media platforms.

This research is funded by a PhD scholarship to the first author and Discovery Early Career Research Award (Australian Research Council) to the second author.

More information on this study and future research into the use of social media by people with TBI can be found at [www.melissabrunner.wordpress.com](http://www.melissabrunner.wordpress.com) or by contacting Melissa on Twitter (@LissBEE\_CPSP) or email ([melissa.brunner@uon.edu.au](mailto:melissa.brunner@uon.edu.au)).

# Investigations of friendships following traumatic brain injury (TBI)

By Tennille Thomasz, Leanne Togher, Emma Power and Jacinta Douglas

## What this study was about:

Social isolation is a significant and common affect following TBI. There are numerous factors that contribute to people with TBI becoming socially isolated. Some of which include changes to communication, difficulties participating in activities and changes to cognition and behaviour.

The study will investigate friendships following traumatic brain injury (TBI). It will consider the perspective of Australian Speech Pathologists surrounding their work within the area of friendships. Data collected will highlight current practices surrounding the area of friendship, barriers to working on friendships and possible ways to overcome these barriers, the reasons that Speech Pathologists conduct work surrounding friendships and factors that are perceived as contributing to successful friendships post TBI.

The perspective of friends of those who have sustained a TBI will also be considered. The findings from this data may provide insight into the experience of maintaining a friendship with a person with TBI, the changes that are recognised by friends and the way the friends are involved in a person's recovery.



## What we are doing:

A group of 68 Australian Speech Pathologists completed an online survey, using Survey Monkey. The survey consisted of 37 open ended and multiple choice questions. Responses have been analysed using descriptive statistics including frequencies, means and medians.

Semi structured interviews have been conducted with 9 friends that were nominated by 4 participants with TBI. Interviews were conducted without the person with TBI present. Interviews were audio and video recorded and transcribed verbatim. Data will be analysed using principles of grounded theory. Member checking has been conducted with participants.

Analysis of data for both components of the study is currently being completed and results will follow by the end of 2015.

# TBIconneCT: Using telehealth for improving the communication skills of people with traumatic brain injury and their carers

By Rachael Rietdijk, Leanne Togher, Melissa Brunner and Emma Power

## What this study is about:

Many families have little access to support regarding how to manage communication problems after TBI, particularly in rural and remote regions. A possible solution is the use of telehealth to provide communication training for families. The TBIconneCT project will focus on the potential use of Skype for managing social communication impairments after TBI. This will involve (a) determining whether Skype assessment is as reliable as in-person assessment, (b) determining whether Skype intervention is as effective as in-person intervention, and (c) exploring the perceptions of people with TBI and their carers regarding the use of telehealth for brain injury rehabilitation.

## What we are doing:

Our reliability study involved 20 participants with TBI and their carers. This study involved comparing Skype-based with in-person assessment for (a) questionnaires about communication completed by the person with TBI and their carer, and (b) independent ratings of the conversations between people with TBI and their communication partner. Participants also completed qualitative interviews regarding their perceptions of telehealth services. Our intervention study will compare Skype-based training to in-person training for social communication skills. 36 participants with TBI and their carers will be recruited in total. 24 participants will be recruited from the Sydney metropolitan area and randomly allocated to groups in a 1:3 ratio (6 Skype: 18 in-person). The remaining 12 participants will be recruited outside of Sydney and allocated directly to the Skype intervention. Recruitment for this intervention study is ongoing.

## What we have found:

Our reliability study found that Skype was usually feasible for meeting with families. For a small number of families (n=3), the quality of the Skype call was not adequate for observing the quality of conversations between people with TBI and their carers. Questionnaires about the communication skills of the person with TBI could be administered reliably over Skype and within the same amount of time as an in-person assessment. When the Skype call was of adequate quality, measures of the person with TBI's conversational participation were reliable. People with TBI and their carers perceived both potential benefits and potential risks regarding the use of telehealth for brain injury rehabilitation. A pilot study of the Skype-based intervention with two participants demonstrated positive outcomes in both self-report measures and ratings by blinded observers.



# The narrative skills of children treated for brain tumour: An exploration of the impact of tumour-related and treatment variables on microstructure and macrostructure

By Kimberley Docking, Natalie Munro, Tara Marshall and Leanne Togher

## What this study is about:

Improvements in survival rates in children diagnosed with brain tumour have highlighted long term effects impacting quality of life. Language competence, in particular, has been linked to educational outcomes and social connectedness, with narrative assessment considered a valid and useful measure of language, allowing for both naturalistic and structured communication.

## What we did:

The narrative skills of children treated for brain tumour were examined in relation to individually matched controls. The influence of tumour location, radiotherapy, time post-treatment and hydrocephalus on narrative performance was also investigated, as well as associations between the macrostructure and microstructure elements of children's narrative abilities and their performance on structural language and cognitive-communicative tasks.

## What we found:

Outcomes of this research highlighted the importance of investigating narrative abilities as part of a comprehensive language assessment and longitudinal monitoring of language skills in children treated for brain tumour. Findings included marginal differences in macrostructure elements related to tumour location and hydrocephalus, and increased use of mazes in children treatment other than radiotherapy. Examination of narrative was also found to be a valid cognitive communication assessment procedure for this population.



**Professor Robyn Tate**

Robyn Tate's expertise in outcome evaluation is reflected in her work on international committees within the World Health Organisation and the Cochrane Collaboration. She is Co-editor of Brain Impairment, Executive Editor of Neuropsychological Rehabilitation, and secretary of the Special Interest Group in Neuropsychological Rehabilitation of the World Federation of NeuroRehabilitation.



## Treating Depression following Traumatic Brain Injury

By Paul Gertler, Robyn Tate and Ian Cameron

### What this study is about:

Depression is common after traumatic brain injury (TBI) and is associated with poorer outcomes from rehabilitation. Therefore it is very important to have effective interventions for depression which can be applied to people with TBI. There are three stages to the research program which seeks to identify, evaluate and develop effective non-pharmacological interventions.

Stage 1 was the evaluation of the highest quality evidence that is available on this topic. To that end, a Cochrane Systematic Review is in the final stages of completion. This review was limited to randomized controlled trials (RCTs). Six RCTs were identified. All were published since 2004 with three published in the last eighteen months. The treatments identified included cognitive-behaviour therapy (CBT), mindfulness-based cognitive therapy, supportive psychotherapy, supervised exercise and repetitive transcranial magnetic stimulation. The review included a meta-analysis of three studies comparing CBT with a wait-list control condition. The findings were mixed and there were methodological limitations with all studies. The outcomes across the studies were highly variable and do not provide substantial support for the

effectiveness of any intervention for depression following TBI.

Stage 2 was the evaluation of a behavioural intervention for depression following TBI. Previous research identified behaviourally-based interventions as the most likely to succeed in a population that has cognitive impairments. This study investigated behaviour activation therapy (BAT) by way of a single-case experimental design (SCED). A multiple-baseline design was applied to three different behaviours that reflected participation in rehabilitation-related activities. BAT was found to lead to a significant difference in engagement in some activities (exercise and social participation) but not functional independence activities.

Stage 3 is the survey of interventions applied by practicing clinicians and researchers. The primary question is how is depression managed after TBI across a broad range of clinical settings?

If you are interested in participating in a future clinical survey please email the author Paul Gertler at [pger8510@uni.sydney.edu.au](mailto:pger8510@uni.sydney.edu.au).

# Evaluation of the Program for Engagement, Participation and Activities (PEPA) using single-case experimental methodology

By Robyn Tate, Donna Wakim, Linda Sigmundsdottir, Wendy Longley and Michelle Genders

## What this study is about:

This project addresses the problem that a large proportion of people with traumatic brain injury (TBI) who are not able to participate in the workforce also do not engage in any meaningful occupation in lieu of work. These people generally suffer major impairments of those neuropsychological functions that are essential for many activities, including engaging in a program of meaningful occupation – the skills to plan, initiate, monitor and/or sustain activities. Such people generally require structure and support if they are to develop a program of meaningful occupation.

To this end, we have drawn upon our previous NHMRC project grant and developed the Program for Engagement, Participation and Activities (PEPA). The PEPA is designed to be delivered to a client with TBI over approximately 12 to 16 sessions during a 3 to 4 month period, the number of sessions and time frame depending on the client's level of functioning. Working collaboratively, the clinician and client develop (a) a program of meaningful occupational activity and (b) strategies to implement and then sustain the program when formal contact with the clinician has concluded. Delivery of the program is embedded in principles of single-case methodology. We previously developed the Model for Assessing Treatment Effect (MATE), which provides a framework for implementing interventions using an evidence-based approach (Tate, Aird & Taylor, 2012; Tate, Taylor & Aird, 2013) and the MATE framework is used in the present study.

This study has two main aims: (i) to evaluate the effectiveness of the PEPA in a series of single-case experimental designs, and (ii) to conduct training workshops to educate clinicians and other service providers in using the PEPA approach.

## What we are doing:

As an initial step, we conducted a systematic review of the literature (Tate, Wakim & Genders, 2014).

To address the first aim, we are currently recruiting participants with TBI to the PEPA trial. To date, eight clients with TBI have commenced the PEPA which has been implemented using the multiple-baseline across behaviours design. Two participants have completed all post-assessment and follow-up evaluations.

To address the second aim, we have conducted six of the proposed seven full-day workshops (three in metropolitan Sydney and three in regional areas: Coffs Harbour, Orange and Tamworth). Each workshop has been fully subscribed with 98 people having attended to date and feedback has been very favourable.

## What we expect to find:

We expect that the PEPA will be effective for implementing and sustaining a program of meaningful occupation, particularly for people with TBI who are not able to work. The PEPA will provide clinicians and other service providers with a structured approach for implementing the program in an evidence-based manner. We expect that indirect benefits will also be generated from the project in that clinicians will find the PEPA approach useful in the application of other interventions that are unrelated to the PEPA.

## To read more about this study:

- Tate RL, Aird V, Taylor C. (2012). Bringing single-case methodology into the clinic to enhance evidence-based practices. *Brain Impairment*, 13(3), 347-359.
- Tate RL, Taylor C, Aird V. (2013). Applying empirical methods in clinical practice: Introducing the Model for Assessing Treatment Effect (MATE). *Journal of Head Trauma Rehabilitation*. 28(2): 77-88.
- Tate RL, Wakim D, Genders M. (2014). A systematic review of the efficacy of community-based, leisure/social activity programs for people with traumatic brain injury. *Brain Impairment*. 15(3), 157-176.



### Professor Skye McDonald

Skye McDonald conducts experimental research in emotion perception, sharing techniques and data collection with colleagues at McGill Uni, Montreal, Uni of Wisconsin, USA, Donders Institute, the Radboud University, Netherlands. She also serves as Consulting Editor of the Journal of the International Society (JINS) and was on the Board of Governors for the International Neuropsychological Society (retired 2013).

## When diplomacy fails. What cues can people with TBI use to understand hints?

By Skye McDonald, Alana Fisher and Sharon Flanagan

### What the study was about:

Despite having good language skills, many people with severe traumatic brain injuries (TBI) have difficulty with communication. In particular, they have difficulty understanding inferences in conversation, such as when someone says something indirectly rather than clearly stating what is on their mind. Many people with TBI also have problems understanding other social cues such as reading emotional expressions or guessing what someone else is thinking. So in this study we examined whether being able to recognise emotions helped in understanding hints in everyday conversation.

### What we did:

In this study we invited 31 adults with a TBI and 24 adults without any injuries from the community to take part. We showed them two sets of short videos of professional actors in everyday conversations. In each video one speaker starts off making a fairly indirect hint (e.g. "I need to go to the hospital to visit my mother") and then becomes progressively more explicit (e.g. "You go past the hospital on your way home, don't you?", "Can you give me a lift?"). In one version of the hints, the actor speaks in a neutral, deadpan voice. In the other, the actor is explicitly emotional. In both cases, the video was paused after the first most indirect hint and the participant was asked to explain what was meant. If they could not, the next more direct hint was played and so on. Everyone was also assessed on an independent measure of social cognition (TASIT).

### What we found:

The adults with TBI recognised neutral hints at a normal rate but, unlike the community controls, they did not improve their performance when watching overtly emotional hints. Improved performance on the emotional hints was not uniquely predicted by social cognition but, rather, by processing speed and possibly also stress in the group with TBI. From this we conclude that people with TBI appear to have difficulty using emotional cues to infer speaker meaning. This may reflect cognitive slowing and also anxiety and stress. This has implications for both remediation of such deficits and for educating others who interact with people with TBI.

# Can people with traumatic brain injury detect sincerity in others?

By Skye McDonald, Alana Fisher and Sharon Flanagan

## What the study was about:

Many people with severe traumatic brain injury (TBI) are perfectly able to understand straight-forward conversations. Unfortunately, conversations are not always straight forward and speakers often do not mean what they say. This is where problems can emerge for some people with TBI. Quite a lot of research has shown that some people with TBI have difficulty understanding sarcasm where the speaker means the opposite to what they say. But there are many shades of grey between being totally sincere (such as enthusiastically taking on additional work: “Yeah, always happy to help!”) and blatantly insincere (“Yeah, always happy to help!” as a sarcastic response). Speakers may choose to use the same words while communicating a lack of sincerity that falls somewhere between the two extremes.

This study aimed to explore whether people with TBI have difficulty detecting insincerity. We also wanted to know whether this is because they have poor cognitive abilities (attention, processing speed, etc) or poor ability to interpret social cues (emotional expression, mental states).

## What we did:

For our study, 30 adults with severe TBI and 30 matched controls watched short video-clips showing everyday scenarios in which people were asked to volunteer for additional duties (e.g., cat-sitting, covering shift at work, helping move house). In each vignette four actors responded that they were willing to take part. However,

each of the four actors differed in how sincerely they said this. After viewing each clip, participants rated how sincere they thought each actor was. We also tested participants on their basic emotion and social perception, attention, processing speed and abstract reasoning.

## What we found:

As others have found, we found that the TBI participants were as good as those without injuries in detecting the very sincere speakers. Also, as found before, they were not as sensitive to sarcasm as the controls, rating sarcastic comments as relatively sincere. We also found that TBI participants were relatively poor at differentiating between differing levels of sincerity. These difficulties were specifically associated with poor social perception.

## What our findings mean:

Communication is fundamental to interpersonal success. It is common for speakers to say something but to not be entirely sincere in doing so. This enables them to communicate, at another level, a different set of meanings. If people with TBI cannot detect these subtleties they are very disadvantaged in social situations. Our findings suggest that problems detecting these subtle differences are related to poor social cognition which is an important remediation target.



Figure 1: Example screen-shots of four responding actors with four verbal responses used.

# Assessment of social skills in individuals with traumatic brain injury

By Heather Francis and Skye McDonald

## What the study was about:

Reductions in social functioning are common following traumatic brain injury (TBI) and include violation of social customs, poor emotion recognition, irritability, poor communicative ability and repetition in conversations. These problems are often rated by relatives as the most difficult to come to terms with. They result in poor reintegration, difficulty returning to work and relationship stress. Finding a good measure of these social skills is important so deficits can be detected early and targeted for remediation. A good social skills measure is also important as a means to evaluate the success of social skills training programs.

One potential measure is the Social Performance Survey Schedule (SPSS). Unfortunately, two previous studies showed that it is not sensitive to TBI. Analysis of the items suggested that many were not suitable for a TBI population.

The aim of this project is to develop a new tool for measuring social skills, using some of the appropriate items from the SPSS, as well as some additional items.

## What we did:

We developed a shortened version of the SPSS consisting of 35 statements, which a relative or close other of an individual with TBI is asked to rate on a five point likert scale. We are analysing how well this questionnaire works in two different studies.

Firstly we re-analysed data we already had on the full SPSS and other social measures given to 40 people with TBI and their families. Secondly, we are in the process of distributing the questionnaire via online survey advertised via social media of Brain Injury Australia, as well as via participants in our laboratory. Family members/ significant others of an individual with TBI completed the questionnaire, in conjunction with behavioural measures and other questionnaires related to social functioning for comparison.



## What we found:

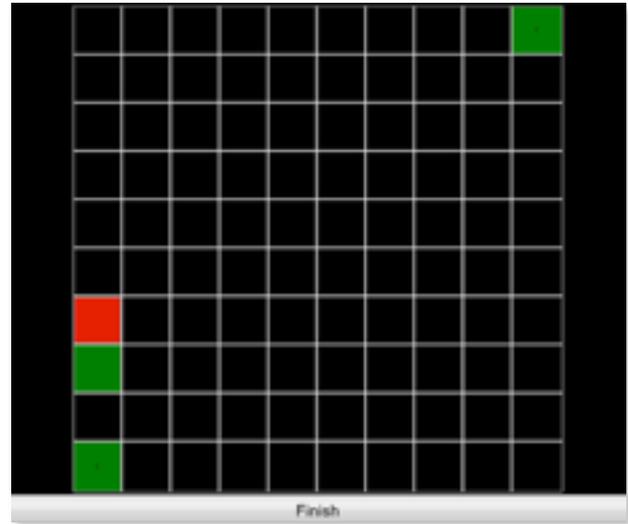
According to our retrospective analysis of from the 40 individuals with TBI, our questionnaire divides neatly into two subscales, negative and positive social skills. These are internally consistent ( $\alpha=.93$  and  $\alpha=.90$  respectively). Ratings on the scale correlated significantly with social perception (TASIT parts 1, 2 and 3:  $r=.360 - .449$ ). The scale also correlated with other measures of social performance; Katz Adjustment Schedule-R1 ( $r = .734$ ) and the Sydney Psychosocial Reintegration Scale ( $r = .501$ ). Twenty-three individuals completed the items on repeated occasions, demonstrating good test- retest reliability ( $r = .89$ ,  $p < .001$ ). Analysis of the online survey data is ongoing and we hope to publish the findings in early 2015.

# Visuospatial learning in traumatic brain injury: an examination of impairments using the computerised Austin Maze task

By Cynthia Honan, Skye McDonald and Alana Fisher

## What the study was about:

Traumatic brain injury (TBI) often leads to problems with visuospatial learning and memory. The Austin Maze task is a measure of visuospatial learning that has a long history in both clinical neuropsychological practice and research, particularly in individuals with TBI. The task requires a person to learn a hidden pathway across a 10 x 10 array of buttons. The task continues until the person has reached a criterion of three correct error-free trials. The conventional form of the task was a small electronic device with buttons and accompanying circuitry. It has never been widely available commercially leading to its declining use in research and clinical settings over the past 20 years. However, a new computerised adaptation of the Austin Maze task is now available making the task more accessible to both clinicians and researchers alike. The primary purpose of this study was to evaluate spatial learning deficits in an adult TBI sample using the recently developed computerised version of the Austin Maze task and to validate the measure with other cognitive tests.



## What we did:

A group of 28 people with severe TBI and 28 people with similar backgrounds but without a history of brain injury participated in the study. Participants were tested on the Computerised Austin Maze task as well as other cognitive tests assessing processing speed, working memory, verbal memory, cognitive flexibility, visuospatial copying and perceptual organisation and planning.

## What we found:

TBI individuals performed significantly more poorly on all Austin Maze task performance indicators (including total errors made, the number of errors made in the first 10 trials, number of trials taken to reach criterion, and total completion time) than control participants. They were also less likely to complete the task. Austin Maze task performance was moderately correlated with processing speed and working memory tasks, and highly correlated with flexibility and organisation and planning tasks. No Austin Maze task measure was related to verbal memory or a visuospatial copying task. Thus, the computerised version of the Austin Maze appears to be a sensitive measure that can detect visuospatial learning impairments in TBI individuals. It is also a measure that demonstrates good convergent and divergent validity.

## To read more about this study:

Honan, C. A., McDonald, S., & Fisher, A (2015). Visuospatial learning in traumatic brain injury: An examination of impairments using the computerised Austin Maze task. *Brain Impairment*, available online ahead of print.

# Facial emotion recognition deficits following severe traumatic brain injury (TBI): Re-examining the valence effect and the role of emotion intensity

By Hannah Rosenberg and Skye McDonald

## What the study is about:

A common difficulty with research investigating emotion recognition, is that negative emotions (such as sadness, disgust, fear and anger) are more difficult to recognise from the face than positive emotions (such as happiness and surprise). This is a confound in emotion recognition research since it limits the conclusions about specific impairments in recognition of some emotions in clinical populations.

## What we are doing:

To address this issue, we attempted to equate the six emotions on difficulty. This was done by equating the different emotions by selecting emotional videos that were correctly recognised by controls approximately 50-70% of the time. This resulted in a selection of emotional expressions that were more similar in terms of difficulty. The aims of this study were threefold. First, it aimed to compare the recognition of the equated videos to the recognition of 100% full blown expressions (that are most commonly used in emotion recognition research).

Second, it aimed to examine whether emotion recognition is associated with selected neuropsychological measures assessing working memory, processing speed and executive functioning. Third, it aimed to examine the hypotheses that the emotion recognition deficit in the TBI group is 1) a specific emotion recognition deficit due to injury or 2) the poorer performance in TBI is secondary to reduced working memory, processing speed and executive functioning.

## What we found:

On stimuli of full-blown 100% intensity: the TBI group was impaired in recognising anger, fear and disgust, but not happiness, surprise or sadness, and performed worse on negative than positive emotions. On stimuli of 'equated intensity': the TBI group was poorer than control overall, but not differentially poorer for negative emotions. Although processing speed and non-verbal reasoning were associated with emotion accuracy, injury severity by itself was a unique predictor. These results indicated that when task difficulty is taken into account, individuals with TBI show impairment in recognising all facial emotions. There was no evidence for a specific impairment for negative emotions or any particular emotion. Impairment was accounted for by injury severity, rather than being a secondary effect of reduced neuropsychological functioning.

## To read more about this study:

- Rosenberg, H., McDonald, S., Dethier, M., Kessels, R.P.C. & Westbrook, R.F. Facial emotion recognition deficits following a Traumatic Brain Injury: Re-examining the valence effect and the role of intensity *Journal of the International Neuropsychological Society*, 20 (10) 994-1003.
- Rosenberg, H., Dethier, M., Kessels, R.P.C., Westbrook, R.F. & McDonald, S. (In Press) Emotion Perception After Moderate-Severe Traumatic Brain Injury: The Valence Effect and the Role of Working Memory, Processing Speed, and Nonverbal Reasoning, *Neuropsychology*.



# CAVEAT, a new test for assessing recognition of complex emotion after traumatic brain injury

By Hannah Rosenberg

## What the study is about:

People who have sustained a traumatic brain injury (TBI) often experience difficulties interpreting social situations and understanding the emotions portrayed by others. The ability to accurately recognise how other people are feeling is very important in a variety of everyday social situations. Emotion research to date has mostly focussed on recognition of six emotions (termed 'basic'), namely happiness, surprise, sadness, anger, fear and disgust, and has revealed that recognition deficits are more robust for negative than positive emotions.

## What we are doing:

This study aims to investigate emotion recognition in adults with TBI using a new measure of emotion recognition, the Complex Audio-Visual Emotion Assessment Task (CAVEAT). This measure was developed as part of Hannah Rosenberg's PhD project and consists of video vignettes in which the observer is asked to judge what emotion is experienced by the person in the scene. It includes a wider array of emotions than are included in the conventional measures, such as contempt, amusement, pride, and relief. This allows the investigation of subtle emotion recognition deficits in clinical populations and reevaluation of the commonly reported findings that recognition of negative emotions is more impaired following a range of neurological conditions than positive emotions. Thirty two people with moderate-severe TBI and 32 demographically matched controls completed CAVEAT as well as some neuropsychological measures.

## What we found:

The TBI group performed more poorly in recognising all emotions, rather than displaying a selective impairment in recognising some emotions compared to others. Although processing speed, non-verbal reasoning, and working memory were associated with emotion recognition, injury severity and non-verbal reasoning were the sole predictors of CAVEAT performance. Emotion recognition performance in the TBI group was associated with self-reported disinhibition and self-reported number of friends. These findings reveal that emotion recognition deficits have a direct effect on the social dysfunction that is associated with TBI, strengthening the need for targeted remediation of these difficulties alongside carer training to reduce frustration.

## To find out more about this study:

Contact Hannah Rosenberg:  
[hannah.rosenberg@unsw.edu.au](mailto:hannah.rosenberg@unsw.edu.au)



CAVEAT - SCREEN SHOTS

# Adolescent performance on the Awareness of Social Inference Test: TASIT

By Skye McDonald, Alana Fisher, Leanne Togher and colleagues

### What the study was about:

The ability to understand social cues (e.g., facial expression, tone of voice, gestures, body language) is an important part of social interactions. Social cognition can be disrupted in numerous developmental and acquired brain disorders during childhood and adolescence. Despite this, there are few tools to assess social cognition clinically in this age group. This study examined adolescent performance on The Awareness of Social Inference Test (TASIT), which is known to be a valid measure of social cognition in adults.

### What we did:

We tested 665 school children from private and government schools on parts of TASIT. TASIT involved showing students a series of short video-clips involving actors in everyday social situations (see Figure 1). In these situations the characters are either genuine/sincere, sarcastic, or telling a lie. After viewing each of the clips, the students answered questions about what a particular character was thinking, feeling, wanting another character to do, or really meaning to say. Of all the participating students, 464 students aged 13-15 were selected to provide data on average performance. Scores from a further 97 students provided information on how lower levels of English familiarity impact on performance.

### What we found:

Adolescents did not perform as well on TASIT as adults although the differences were not large. Older adolescents were somewhat better than younger adolescents but there was a great deal of overlap. Female students performed better than male students overall. Adolescents who did not speak English at home had scores that were 6-13% lower than adolescents who spoken English as a first language.

### What these findings mean:

TASIT appears to be a suitable measure of social cognition for adolescents. When determining levels of average performance, the adolescent's age, gender, and English language familiarity needs to be considered.

### To read more about this study:

McDonald, S., Fisher, A., Togher, L., Tate, R., Rushby, J., English, T., Kelly, M., Mathersul, D., Foriech, F. & Francis, H. (2015) Adolescent performance on The Awareness of Social Inference Test: TASIT. *Brain Impairment* 16 (1) 3-18



Figure 1: Screen shots of example scenes from TASIT.

# The Awareness of Social Inference Test (TASIT) – A shortened version

By Cynthia Honan and Skye McDonald

## What the study is about:

It is becoming more and more apparent that people with all kinds of brain disorders have problems reading social cues and we need to be able to assess these. The Awareness of Social Inference Test (TASIT) is an ecologically valid and reliable tool that assesses higher-level social perception deficits. The measure is sensitive to deficits in various patient groups including traumatic brain injury, schizophrenia, frontotemporal dementia, Alzheimer's disease, and stroke. However, its administration time is lengthy (60-75 mins). As such, routine use of this tool in clinical settings is often difficult to achieve.

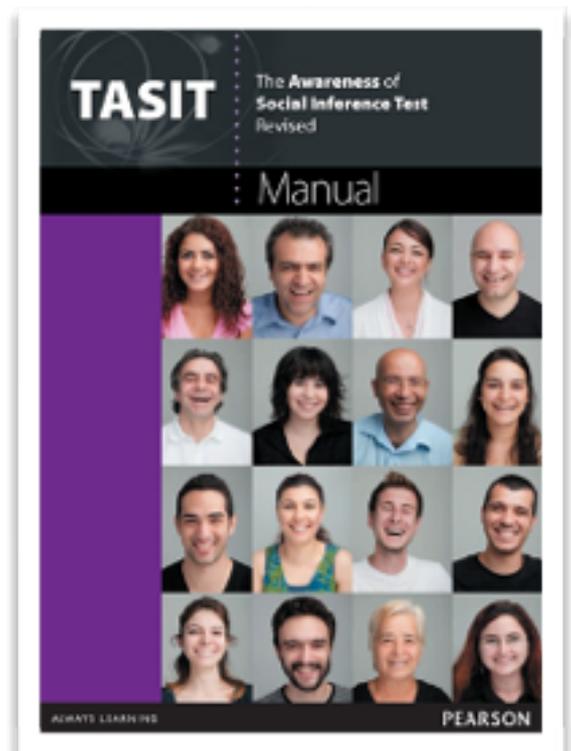
## What we are doing:

The aim of this study is to develop a shortened version of the TASIT to screen for higher-order social perception deficits. The shortened version will be created by sophisticated statistical techniques (confirmatory factor analysis and Rasch analysis methods) to look at each individual item in TASIT to see how much extra information it provides and whether it is necessary or useful. This study will also validate the new shortened version TASIT by seeing whether performance on the short version predicts performance on cognitive (processing speed, working memory, cognitive flexibility, etc) and social cognitive (facial recognition, theory of mind, and self-reported empathy) domains. Participants include 160 individuals with a history of acquired brain injury (e.g. traumatic brain injury, stroke, and tumour). Data is currently being analysed and an article is being prepared for publication.

## What we expect to find:

We expect that the shortened TASIT will be a useful screening tool for higher-order social cognition deficits in those with acquired brain injury which can easily be administered in clinical settings. We also expect that the TASIT will show moderate correlations with alternative social cognition measures and small to moderate correlations with most alternative cognitive tests.

For more information about the study: Please contact Cynthia on [c.honan@unsw.edu.au](mailto:c.honan@unsw.edu.au).



# Is recognising anger different to recognising surprise? If you can understand sincerity can you understand sarcasm? Factor structure of The Awareness of Social Inference Test (TASIT)

By Cynthia Honan, Skye McDonald, Christopher Sufani

## What the study is about:

The Awareness of Social Inference Test – Revised (TASIT-R) is sensitive and reliable tool that assesses social perception deficits. Unlike traditional emotion recognition measures that use static displays (such as photographs) of emotional expressions, TASIT assesses understanding of complex spontaneous displays of emotion encountered in everyday social interaction. TASIT contains three parts; Part 1 measures emotion perception focusing on speakers engaged in ambiguous conversation; Parts 2 and 3, on the other hand, measure the ability to identify the thoughts, intentions and feelings of speakers, and the ability to interpret conversational meanings as sincere, sarcastic, or deceptive. Despite its relevance as an assessment tool for people with brain injuries, we do not know whether the subtests are actually measuring separate abilities.

## What we are doing:

In this study we are examining the structure of TASIT using complex statistical techniques (such as confirmatory factor analysis and structural equation modelling) in a large group of people with acquired brain injury (from trauma, stroke etc). We are also looking at whether their performance on TASIT is similar to their performance on other cognitive tests (e.g. processing speed, working memory, cognitive flexibility) and social cognitive tests (e.g. face recognition, theory of mind, self-reported empathy). Data is currently being analysed and an article is being prepared for publication.

## What we will expect to find:

We expect that the subtests of TASIT will be generally valid measures of different types of abilities with some differences. For example, it may be that emotion recognition is better represented as recognition of positive versus negative rather recognition of individual emotions. In Part 2 we expect that ability to understand sincere exchanges will be different to ability to understand sarcasm, and in Part 2 we expect that ability to recognise lies will differ to recognition of sarcasm. We also expect that TASIT performance will correlate to other social cognition measures and (to a lesser extent) with other cognitive tests.

For more information about the study: Please contact Cynthia on [c.honan@unsw.edu.au](mailto:c.honan@unsw.edu.au).

# Impaired Emotional Prosody Processing in Severe Traumatic Brain Injury: An Event-Related Potential Study

By Katie Osborne-Crowley, Skye McDonald and Jacqueline Rushby

## What the study is about:

Many people with severe traumatic brain injury (TBI) have socially inappropriate behaviour. This is one of the most distressing outcomes of TBI for the individual, their family and the community. Yet exactly what causes this problem is unclear. One theory is that people with TBI cannot learn to change tack when their behaviour is no longer useful or appropriate. We know that this failure to learn to change tack is associated with damage to the frontal lobes of the brain.

Our study aimed to determine whether failure to learn to change tack in this way is associated with socially inappropriate behaviour in adults with severe TBI.

## What we are doing:

Twenty-one participants with a TBI and 21 participants from the general community completed a task in which they were shown two geometric shapes on a screen and were told “YOU WIN!” if they chose one of these and “YOU LOSE” if they chose the other. Half way through the rule swapped over so the “lose” shape became the “win” shape and vice versa. They were also given a “social” version of this task where they were shown two photographs of faces. If they chose the correct face a new photo of the same actor with a “happy” expression showed up. If they chose the incorrect face, the same actor with an “angry” expression showed up. Once again, half way through the rule swapped over so the “happy” actor became the “angry” actor and vice versa.

We measured performance in two ways. We looked at how many wrong choices people made on the two tasks. We also looked at brain activity (EEG). In particular we looked at a specialised part of the brain wave that shows a peak (ERP) when people are just learning that their response is incorrect.

We also interviewed participants and videotaped the conversation. We later asked two judges who did not know anything about the participants to rate how appropriate their conversation was.

## What we found:

The participants with TBI group made more errors on both tasks than the participants without brain injuries. Their brain waves also showed lower “peaks” when they were given feedback during the tasks. We also found that those participants with TBI who were rated as having highly inappropriate behaviour had more errors when learning to change tack than did the participants with TBI who were rated as having normal behaviour.

These results suggest that being unable to change tack may play a role in causing socially inappropriate behaviour after TBI. Further, the pattern of reduced brain wave activity when processing mistakes might be a marker of a problem with this kind of learning.

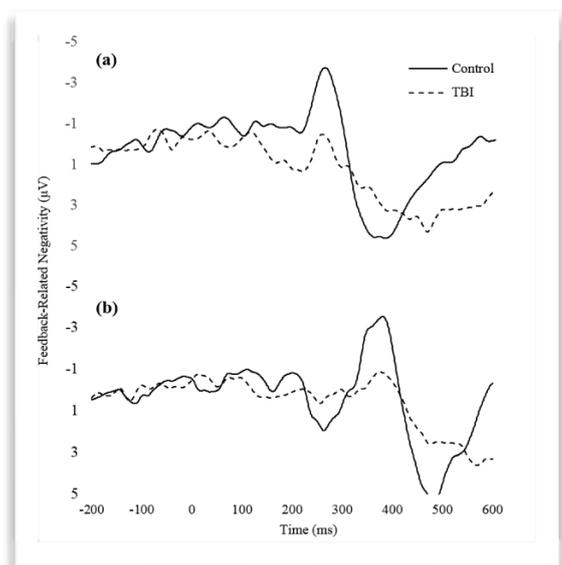


Figure. Average ERP (specifically the feedback-related negativity or FRN component) for TBI and control group for (a) the non-social and (b) the social reversal learning task.

# Could biofeedback be useful to improve emotion regulation after severe traumatic brain injury?

By Heather Francis, Alana Fisher, Jacqueline Rushby and Skye McDonald

## What the study was about:

Heart rate variability (HRV) is thought to reflect a person's capacity for functioning well in social situations. HRV can be improved by biofeedback. People with traumatic brain injury (TBI) can have both reduced HRV and poorer social functioning. The present study aimed to determine whether

- 1) lower HRV in TBI is associated with poor social functioning and
- 2) whether HRV biofeedback might be a useful remediation technique.



Figure. Screenshot: of the breathing pacer participants viewed during HRV biofeedback

## What we did:

HRV during a resting period and measures of social and emotional processing were collected in 30 individuals with severe TBI (3-34 years post-injury) and 30 controls. This was followed by a single session of HRV biofeedback where participants were asked to breath in time with a visual pacer (see Figure 1) timed at 6 breaths per minute.

## What we found:

Among TBI participants, higher (better) HRV was associated with better ability to understand social cues and empathise with another's thoughts and feelings. Higher (better) HRV was also associated with less difficulties identifying and describing one's own feelings and emotions in the TBI group. After one session of biofeedback both TBI and control groups showed significantly increased (better) HRV compared to the initial rest period.

## What our findings mean:

These results suggest that decreased HRV is linked to poorer social and emotional function following severe TBI. HRV biofeedback techniques may also be used to target problems with HRV and social functioning.

## To read more about this study:

Francis, H. M., Fisher, A., Rushby, J. A., & McDonald, S. (2015). Reduced heart rate variability in chronic severe traumatic brain injury: Association with impaired emotional and social functioning, and potential for treatment using biofeedback. *Neuropsychological Rehabilitation*, 1-23. doi:10.1080/09602011.2014.1003246

# Social disinhibition: A failure to inhibit and/or a failure to produce socially acceptable responses?

By Cynthia Honan, Skye McDonald, Alana Fisher and Katie Osborne-Crowley

## What the study is about:

Problems inhibiting inappropriate social behaviour are common to many neurological conditions involving frontal lobe dysfunction (e.g., TBI). Formal tests of inhibitory or interference control (e.g., Go No-Go tasks, Haylings Sentence Completion test) are often used in clinical practice to infer behaviour and emotion regulation difficulties in TBI populations. However, these tests may not be measuring the same type of inhibition difficulties that occur in social contexts.

It is unclear for instance, if a person with TBI has difficulty with adjusting their responding to be more socially acceptable or has difficulty with inhibiting automatic behaviours and verbal responses.

This study addressed two questions:

- (1) Are individuals with TBI impaired in inhibiting automatic verbal responses to complex social information?
- (2) Are they impaired in their ability to produce socially acceptable positive responses?

This study also aims to develop a new “Social Disinhibition Task” that is suitable to detect social disinhibition deficits in clinical (as opposed to laboratory) settings.

## What we are doing:

The new social disinhibition task requires people with TBI to view scenes of complex social situations, and then describe a character in them (Part A), describe a character while inhibiting inappropriate or negative remarks about them (Part B), and describe a character while not only inhibiting negative remarks, but also providing positive remarks (Part C). To date, 19 individuals with TBI and 14 healthy controls have participated.

## What we have found so far:

TBI participants and healthy control participants responded similarly to Part A. Individuals with TBI were significantly impaired on Part B with a trend towards impairment on Part C. However, further participants are required to confirm the significance of this effect. The data collected will be used to also assess the psychometric properties of the test items so that a clinical measure of social disinhibition can be constructed.

For more information about the study: Please contact Cynthia on [c.honan@unsw.edu.au](mailto:c.honan@unsw.edu.au).



# Are problems in empathy and arousal following severe traumatic brain injury linked to loss of specific brain structures?

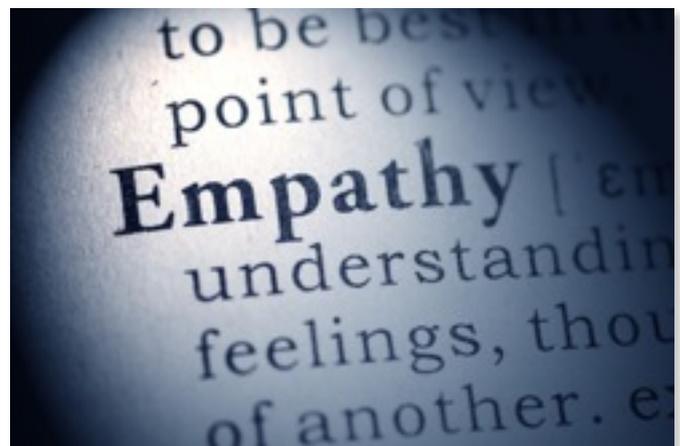
By Jacqueline Rushby, Alana Fisher, Skye McDonald, Nicklas Parks and Olivier Piguet

## What the study is about:

We know that severe traumatic brain injury (TBI) leads to problems in empathy and physiological arousal (or how reactive people are to other people and events around them), and these two things are thought to be linked. Certain “deeper” brain structures, which make up the limbic system, help to regulate arousal and emotion processing and are vulnerable to damage after a TBI. In this study we aimed to find out whether brain volume loss after TBI plays a role in these problems.

## What we did:

We tested 28 adults with a severe TBI and 28 Controls matched on age, gender and level of education. Participants had a magnetic resonance imaging (MRI) scan so we could measure grey and white matter volume in the brain structures we were interested in. We then used electroencephalography (EEG) to record participants’ brain wave activity while relaxed (a measure of resting physiological arousal), and used questionnaires to ask participants about their levels of empathy.



## What we found:

We found that people with a TBI had reduced brain volumes both across the overall brain and in the individual brain structures of interest. We also found that the people with a TBI reported lower emotional empathy compared to Controls, as well as a different pattern of brain wave activity in both sides of the brain and along the midline (from the front to the rear of the scalp). Both brain volume and brain wave activity were associated with people’s empathy levels.

## What our findings mean:

Our findings suggest that TBI can lead to reduced brain volume and abnormal patterns of brain wave activity. These injury-related changes to neurophysiology may then make it more difficult to empathise with another’s thoughts and feelings.

**Professor Jacinta Douglas.**

Jacinta Douglas has qualifications in the disciplines of speech pathology and clinical neuropsychology. She is recognised internationally for her development of the La Trobe Communication Questionnaire and her research focussing on the role of communication in shaping social participation following traumatic brain injury. Jacinta is founding co-editor of the journal *Brain Impairment* and a Fellow of the Australian Society for the Study of Brain Impairment and the Speech Pathology Association Australia. She collaborates with colleagues in Europe (University of Copenhagen, Gothenburg University, University of Oslo), North America (University of Montreal, University of Wisconsin, Texas Institute of Rehabilitation Research) and Singapore (Singapore General Hospital).



## Return to Work and Social Communication Ability following Severe Traumatic Brain Injury

By Jacinta Douglas, Christine Bracy and Pamela Snow

**What the study is about:**

Return to competitive employment presents a major challenge to adults who survive severe traumatic brain injury (TBI). Worldwide a substantial proportion of those who sustain moderate-severe TBI do not successfully re-enter the workforce. Employment rates rarely exceed 50% and remain in the order of 40-45% at 2 years postinjury in Australia, New Zealand, the United Kingdom and the United States of America. There are clear benefits for those who return to work including financial gains, improved motivation and capacity to participate in society, increased opportunities for social interaction, enhanced self-esteem and sense of purpose, improved social status, and reduced likelihood of secondary negative consequences (e.g., substance abuse). We completed this study to better understand the communication factors that shape employment outcome by comparing the communication profiles of adults with severe TBI who return to and maintain employment with those who do not.

**What we did:**

23 adults who had returned to work and 23 who had not participated in the study. The two groups did not differ in regard to sex, age, education, injury severity, or time postinjury. The La Trobe Communication Questionnaire (LCQ), self-report and close other versions, was used to measure communication. Group comparisons on LCQ total scores were analysed using mixed 2 x 2 ANOVA (between factor: employment status; within factor: source of perception).

**What we found:**

Our analysis found the 2 groups were significantly different from each other. The employed group reported significantly less frequent communication difficulties (self and close other report) than those who were unemployed. In addition, the unemployed participants also showed they were significantly less aware of their own difficulties. They perceived themselves to have significantly less frequent difficulties than their relatives perceived them to have. In contrast, employed participants reported significantly more frequent difficulties than their relatives reported them to have; this pattern of response is consistent with that shown by neurologically healthy adults in the general population. Our findings show that both communication outcome and awareness of communication deficits play an important role in reintegration to the workplace following severe TBI.

# Using Single Case Experimental Design to evaluate Communication-specific Coping Intervention for Adults with Traumatic Brain Injury

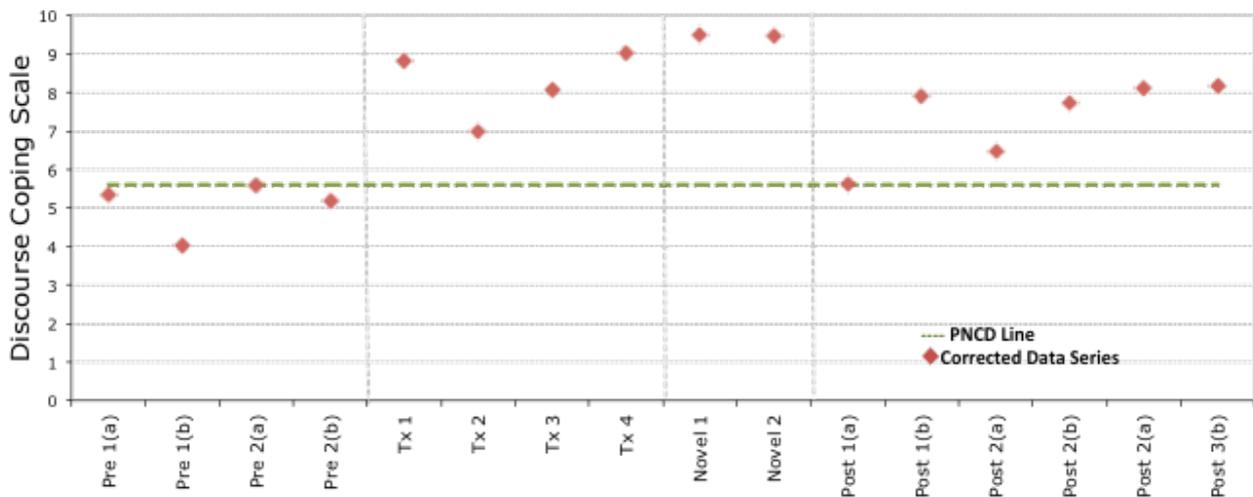
By Jacinta M. Douglas, Lucy Knox, Carren De Maio and Helen Bridge

## What the study is about:

Impaired communication is a well-documented and enduring consequence of traumatic brain injury (TBI). As a result of this impairment, people with TBI frequently experience communication breakdown and associated stress. Typically, we use communication-specific coping strategies in situations characterised by communication breakdown. Productive strategies enhance message transfer; non-productive strategies do little to resolve problems and frequently result in negative social interaction. We have developed a new treatment, Communication-specific Coping Intervention (CommCope-I), which specifically targets coping in the context of communication breakdown. We reported some of our first results in the previous CRE newsletter. This particular study aimed to evaluate the effectiveness of this new treatment (CommCope-I) with two clients using single case experimental design.

## What we did:

We chose an A–B–A single case design with follow-up using multiple probes across our two participants. Participants were Samantha, a 30-year-old woman who had sustained severe TBI 8 years previously, and Thomas, a 34-year-old man who had sustained severe TBI when he was 29 years old. CommCope-I is a 6-week programme which targets personally relevant productive coping strategies identified collaboratively with the client. Productive coping scripts are developed and practised through a series of graded scenarios that are evaluated by the client and the clinician together, with the aid of video recording. We used percentage of non-overlapping corrected data (PNCD) to analyse the results. PNCD is a conservative single case analysis technique that involves a data-correction procedure to remove baseline trend from the data series prior to calculating the change produced as a result of intervention.



Thomas: percentage of non-overlapping corrected data

**What we found:**

A large treatment effect was demonstrated in both participants (PNCD: end of treatment Samantha = 100%, Thomas = 100%, 3-month follow-up Samantha = 100%, Thomas = 100%). Positive changes in interpersonal communication were also evident in the participants' reports of their own functioning. Both participants reported reduced use of non-productive communication-specific coping strategies at the end of treatment and at 1 and 3 months following treatment. One participant also reported a reduction in general psychological distress at the end of treatment and this reduction was maintained at 1 and 3 months post treatment. Positive intervention-related changes were also perceived by close others who interacted regularly with the participants. Close others reported reduced functional communication problems at the end of treatment and at 1 and 3 months following treatment. They also reported an increase in the observed use of productive communication-specific coping strategies which was maintained 1 and 3 months following treatment. Qualitative feedback from clients and close others highlighted important strengths of the intervention including its focus on strategy development, use of video feedback, and community practice.

**To read more about this study:** To read more about this study: Douglas, J., Knox, L., De Maio, C. & Bridge, H. (2014). Improving communication-specific coping after traumatic brain injury: Evaluation of a new treatment using single case experimental design. *Brain Impairment*, 15(3), 190-201.

## The Invisible Problem: The Incidence of Olfactory Impairment following Traumatic Brain Injury

By Drummond, Jacinta Douglas and John Olver

**What the study is about:**

Although exact figures are difficult to ascertain, research to date indicates that as many as 50-60% of patients with traumatic brain injury (TBI) admitted to rehabilitation facilities may have olfactory impairments. Current incidence estimates have been derived from studies conducted internationally and there is no comparable data available in the Australian context. The primary aim of this study led by doctoral scholar Melanie Drummond was to identify the incidence of olfactory impairment following TBI in a consecutive sample of adults admitted to the Brain Injury Rehabilitation Program at Epworth Hospital in Victoria, Australia.

**What we did:**

Of the 134 total participants, 73 (54.47%) demonstrated an OI on the PST screening assessment whereas 90 participants (67.16%) demonstrated OI on the full version of the UPSIT. When severity of OI was categorised using UPSIT performance, 31 participants presented with mild impairment, 28 with moderate impairment, 8 with severe impairment and 23 participants presented as anosmic (no sense of smell). Our results show a substantial proportion of adults admitted for rehabilitation following TBI have olfactory impairment. Accurate assessment and appropriate management of posttraumatic olfactory dysfunction must be incorporated into rehabilitation programs in order to meet the needs of these patients and their families.

**To read more about this study:**

This work is currently under review for publication.

# “I won’t be around forever”: Understanding the decision-making experiences of adults with severe TBI and their parents.

By Lucy Knox, Jacinta Douglas and Christine Bigby

## What the study is about:

There is growing recognition of the right of all individuals, including those with cognitive impairment, to make decisions about their own lives. However, little is known about how the process of decision making is experienced after severe traumatic brain injury (TBI). This study is part of a larger project led by doctoral scholar Lucy Knox. The overall project seeks to build an understanding of the process of decision making for individuals with severe TBI and those who support them.

## What we did:

We used constructivist grounded theory to explore processes used by adults with severe TBI and their parents in making decisions about life after injury. Data consisted of 18 individual, in-depth interviews with four dyads (consisting of an individual with severe TBI and his or her parent).

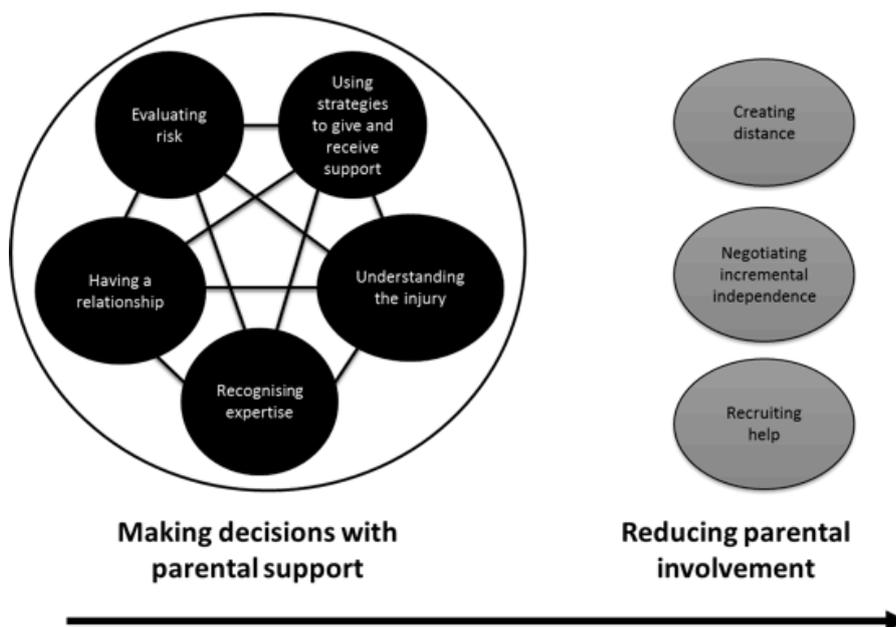


Figure 1. Decision making within parental relationships after severe TBI

## What we found:

The overlying construct emerging from the data was a process of reimagining the future, which influenced how participants approached and participated in making decisions. In line with this construct, two central themes described processes of joint decision making within parent–adult child relationships after severe TBI over time: (1) making decisions with parental support, and (2) reducing parental involvement. These findings emphasise the complexity of supporting decision making after injury, and illustrate that both parents and their adult children with TBI use explicit and implicit strategies to facilitate increased participation in making decisions.

## To read more about this area:

Knox, L., Douglas, J., & Bigby, C. (in press). “I won’t be around forever”: Understanding the decision-making experiences of adults with severe TBI and their parents. *Neuropsychological Rehabilitation*, Advance online publication. doi: 10.1080/09602011.2015.1019519

## Managing fatigue and sleep disturbance following Traumatic Brain Injury (Study in progress)

By Jennie Ponsford, Shantha Rajaratnam, John Olver, Meaghan O'Donnell, Adam McKay, Dana Wong, Gavin Williams and Sylvia Nguyen

### What the study is about:

Traumatic brain injury (TBI) frequently results in fatigue, daytime sleepiness and/or sleep problems which can interfere with the person's lifestyle, sometimes over many years. Evidence shows that Cognitive Behaviour Therapy (CBT) is more effective than medication in treating Chronic Fatigue Syndrome and Insomnia in the general population. There is also increasing evidence of CBT being successful in reducing fatigue related to cancer, stroke and Multiple Sclerosis. The current study aims to evaluate the effectiveness of Cognitive Behaviour Therapy (CBT) in reducing fatigue, daytime sleepiness and/or sleep disturbance following head injury. It is currently funded by the NHMRC Centre of Excellence in TBI Psychosocial Rehabilitation.



### What we did:

A manualized CBT treatment has been developed specifically for adult TBI and pilot data collected. We are currently conducting a controlled trial comparing participants who receive therapy with those receiving treatment as usual. The two groups are being compared across three time points on measures of fatigue, sleep, mood, quality of life and self-efficacy in managing symptoms.

### What we found:

Pilot participants reported improved sleep quality, reduced subjective fatigue and mood. Participants reported greater control over their symptoms and these gains were largely maintained over time. We expect these trends to continue in the controlled trial and for participants in therapy to report better outcomes relative to those not receiving treatment. Findings of this study may be used to inform future clinical services.



### Professor Jennie Ponsford

Jennie Ponsford leads an extensive program of research aimed at improving outcomes following traumatic brain injury, focused on assessment and treatment of problems including anxiety and depression, fatigue and cognitive dysfunction. She has collaborative grants with colleagues in the US, Canada and Europe. She is the President of the International Neuropsychological Society (INS), is a member of the Executive Committees of the International Brain Injury Association, the World Federation of NeuroRehabilitation, ASSBI and INS and serves on the editorial boards of five international journals. She is also the Immediate Past-President of the International Neuropsychological Society.

# Efficacy of Motivational Interviewing and Cognitive Behaviour Therapy for Anxiety and depression following traumatic brain Injury

By Jennie Ponsford, Meaghan O'Donnell, Nicole Lee, Ming-Yun Hsieh, Adam McKay, Dana Wong, Yvette Alway and Ming-Yun Hsieh

## What the study is about:

There is a high incidence of psychiatric disorders following traumatic brain injury (TBI), most commonly anxiety and depression. Consequently, there is a need for effective psychological treatments to enhance psychosocial outcomes for this group. This NHMRC – funded randomised controlled trial examined the efficacy of a 9-week cognitive behaviour therapy (CBT)-based treatment program adapted for a community sample with moderate-severe TBI. Motivational Interviewing (MI) was also evaluated as a preparatory intervention to increase motivation to change and engagement in treatment.

## What we did:

75 adult participants with mild to severe TBI were randomly assigned to one of three treatment conditions: (1) motivational interviewing plus cognitive behavioural therapy (MI+CBT), receiving MI for the first 3 weeks followed by CBT for 9 weeks, and 3 booster sessions of CBT between 21 and 30 weeks; (2) non-directive counselling for 3 weeks followed by CBT for 9 weeks and 3 booster sessions between 21 and 30 weeks (NDC+CBT); and, (3) treatment as usual (i.e., control group; TAU). Assessment included a semi-structured clinical interview to determine psychiatric diagnoses; and measures of anxiety, depression, psychosocial functioning, coping style and cognitive functioning. Assessments occurred at baseline, and then at weeks 3, 12, 21 and 30. The interventions were guided by manuals adapted for participants with TBI, with an emphasis on flexibility to tailor therapy to individual needs and cognitive difficulties.

## What we found:

Analyses revealed that both the CBT groups showed significantly greater reduction in anxiety (as measured by the Hospital Anxiety and Depression Scale) and depression (as measured by the Depression Anxiety and Stress Scale) compared to the TAU group over the 30-week period. It was also found that both CBT groups showed significantly greater gains in psychosocial functioning, as measured by the Sydney Psychosocial Reintegration Scale relative to the TAU group. We did not find that preceding CBT with 3 sessions of MI enhanced reduction in anxiety and depression symptoms.

A high comorbidity of depression and anxiety is evident, highlighting the challenges in assessing and treating psychiatric disorders following TBI. The development and distribution of the manualised intervention is also supported by the NHMRC Centre of Excellence in TBI Rehabilitation.

## To read more about this study:

- Hsieh, M., Ponsford, J. Wong, D. Schönberger, M., McKay, A., Haines, K. (2012). A cognitive behaviour therapy (CBT) programme for anxiety following moderate to severe traumatic brain injury (TBI): two case studies. *Brain Injury*, 26(2), 126-138.
- Hsieh, M., Ponsford, J. Wong, D. McKay, A., (2012) Exploring variables associated with change in Cognitive Behaviour Therapy for post-TBI Anxiety. *Disability and Rehabilitation*, 43(5), 408-415.
- Hsieh, M., Ponsford, J. Wong, D. Schönberger, M., McKay, A., Haines, K. (2012). Development of a Motivational Interviewing Programme as a Prelude to CBT for Anxiety & Depression Following Traumatic Brain Injury. *Neuropsychological Rehabilitation*; 22(4):563-84. doi: 10.1080/09602011.2012.676284.
- Hsieh, M., Ponsford, J. Wong, D. Schönberger, M., Taffe, J. McKay, A., (2012). Motivational Interviewing and Cognitive Behavior Therapy for Anxiety Following Traumatic Brain Injury: A Pilot Randomized Controlled Trial. *Neuropsychological Rehabilitation*; 22(4):585-608. doi:10.1080/09602011.2012.678860.

# Light therapy for sleepiness and fatigue following traumatic brain injury

By Kelly Sinclair, Jennie Ponsford, Shanta Rajaratnam and Steven Lockley

## What the study is about:

This novel study is the first randomised controlled trial of a non-pharmacological treatment for post-TBI sleepiness and fatigue. It builds on our existing work investigating the prevalence and nature of fatigue and sleepiness post-TBI, and demonstrating the efficacy of light to improve alertness in healthy volunteers. The primary aim of this study, which has been funded by the Victorian Neurotrauma Initiative (now TAC), is to evaluate, in a randomized controlled trial, the effect of blue light therapy (Philips Home Healthcare Solutions-Apollo) versus yellow light therapy (placebo) and 'treatment as usual' on subjective daytime sleepiness and fatigue. It is hypothesized that participants will show reduced daytime sleepiness and fatigue, improved sleep quality, attention, reaction time, and health-related quality of life, and reduced depression following blue light therapy, compared with those receiving yellow light therapy or treatment as usual.

## What we did:

30 individuals with ABI and current reports of fatigue and/or excessive sleepiness during the day were recruited and randomly allocated to receive 4 weeks of daily treatment (45 minutes each morning) with either blue light therapy, yellow light therapy or no light therapy. Assessments of subjective fatigue, as well as secondary outcomes (self-reported daytime sleepiness, depression, sleep quality, and sustained attention) were taken at baseline, during the 4-week intervention period, and 4 weeks post-intervention.

## What we found:

After controlling age, gender, and baseline depression, treatment with high-intensity blue light therapy resulted in reduced fatigue and daytime sleepiness during the treatment phase, with evidence of a trend toward baseline levels 4 weeks after treatment cessation. These changes were not observed with lower-intensity yellow light therapy or no treatment control conditions. There was also no significant treatment effect observed for self-reported depression or psychomotor vigilance performance. Therefore, blue light therapy appears to be effective in alleviating fatigue and daytime sleepiness following TBI and may offer a noninvasive, safe, and nonpharmacological alternative to current treatments.



A pilot study, published in the *Journal of NeuroRehabilitation and Neural Repair* in 2014, has shown that exposure to short wavelength or blue light resulted in a significant reduction in subjective fatigue and daytime sleepiness and a trend towards improved mood. The trial is continuing. If successful in alleviating fatigue and daytime sleepiness and/or their impact on individuals' lifestyles, blue light therapy could be readily implemented into clinical practice, as it is relatively unobtrusive and inexpensive to deliver.

## To read more about this study:

Sinclair, K., Ponsford, J., Taffe, J., Lockley, S.W., & Rajaratnam, S.W. (2014). Randomised controlled trial of blue light therapy for fatigue following traumatic brain injury. *NeuroRehabilitation and Neural Repair*, 28, 303-313.

# Psychiatric disorders following traumatic brain injury (Study ongoing)

By Jennie Ponsford, Kate Gould, Lisa Johnston, Yvette Alway, Celia Pais and Dana Wong

## What the study is about:

Psychiatric disorders are common following traumatic brain injury (TBI), and exacerbate disability and impede psychosocial and vocational reintegration. The aim of this project, which is now the focus of the doctoral thesis of Yvette Alway, is to prospectively examine the frequency, course, and predictors of psychiatric disorders over the first five years following TBI. Specifically, the pre-injury injury-related and post-injury factors associated with the development, course and remittance of psychiatric disorders are being examined. Further, as the impact of a TBI extends beyond the injured individual, a secondary aim is to examine the influence of family dynamics on both patient and family psychosocial adjustment following TBI. A recent addition to the project is an examination of factors influencing Positive Growth following TBI by doctoral student Celia Pais, supervised by Jennie Ponsford, Kate Gould and Dana Wong.

## What we did:

To date, 252 participants with predominately moderate to severe TBI and their nominated family members have been recruited. Participants with TBI are being invited to complete psychiatric interviews and questionnaires examining various aspects of psychological adjustment soon after their injury and again at 3, 6, and 12 months, and 2, 3, 4 and 5 years post-injury. Family members complete three interviews over the first 5 years post-injury examining their own and the injured individual's adjustment and the relational dynamics between them. Findings from these studies are currently being analysed.



## What we found:

Psychiatric disorders, particularly depressive and anxiety disorders are significant and persistent problems after TBI and are often comorbid. Whilst individuals with a psychiatric history prior to their head injury have a particularly high risk of ongoing psychiatric difficulties post-injury, others also have a significant risk of these disorders. Anxiety disorders are associated with cognitive impairments, particularly reduced speed of information processing. Nevertheless, a significant proportion of individuals also experience positive growth following injury. They tend to be individuals who have better functional outcomes and more family support.

## To read more about this study:

- Gould, K., & Ponsford, J. (2015). A longitudinal examination of positive changes in quality of life after traumatic brain injury. *Brain Injury*, 29 (3), 283-290.
- Gould, K.R., Ponsford, J.L., & Spitz, G. (2014). Association between cognitive impairments and anxiety disorders following traumatic brain injury. *Journal of Clinical and Experimental Neuropsychology*, 36 (1), 1-14.

## Longitudinal head injury outcome study (Study ongoing)

Jennie Ponsford, John Olver, Michael Ponsford, Meagan Carty, Marina Downing and Gershon Spitz

### What the study is about:

Traumatic brain injury is the leading cause of acquired disability in young people, resulting in a complex range of physical, cognitive, behavioural and emotional changes. The elucidation of the long-term problems experienced by those who sustain traumatic brain injury owes much to the Longitudinal Head Injury Outcome Study, which has been conducted at Epworth Hospital (formerly Bethesda) since 1995.

### What we did:

After recruitment as inpatients, all patients admitted to Epworth Hospital with head injuries are routinely invited to attend a follow-up clinic at 1, 2, 3, 5, 10 and 20 years post-injury. They are interviewed by a rehabilitation physician and complete questionnaires documenting their level of mobility, functional independence, living situation, relationship status, vocational activities, neurological, cognitive, behavioural and emotional problems experienced and drug and alcohol use.

### What we found so far:

The study has provided comprehensive information regarding the difficulties experienced by these individuals and their families over long periods of time after injury. Findings have been published in over 70 international peer-reviewed journal articles, in over 110 national and international conference presentations. This is one of the largest and most comprehensive databases worldwide.

### To read more about this study:

- Bryce, S., Spitz, G., & Ponsford, J. (2014). Screening for substance use disorders following traumatic brain injury: Examining the validity of the AUDIT and DAST. *Journal of Head Trauma Rehabilitation*. Published online October.
- Dahm, J., & Ponsford, J. (2015). Comparison of long-term outcomes following traumatic injury: What is the unique experience for those with brain injury compared with orthopaedic injury? *Injury*, 46 (1), 142-149.
- Ponsford, J.L., Downing, M., Olver, J., Ponsford, M., Acher, R., Carty, M., & Spitz, G. (2014). Longitudinal follow-up of patients with traumatic brain injury: Outcome at 2, 5, and 10-years post-injury. *Journal of Neurotrauma*, 31, 64-77.
- Ponsford, J., & Spitz, G. (in press). Stability of employment over the first three years following traumatic brain injury. *Journal of Head Trauma Rehabilitation*. Published online May 2014.
- Richardson, C., McKay, A., & Ponsford, J. (in press). The trajectory of awareness across the first year after traumatic brain injury: The role of biopsychosocial factors. *Brain Injury*, 28 (13-14), 1711-1720.
- Richardson, C., McKay, A. & Ponsford, J. (2014). Factors influencing self-awareness following traumatic brain injury. *Journal of Head Trauma Rehabilitation*. Published online April 2014.
- Richardson, C., McKay, A., & Ponsford, J. (2015). Does feedback influence awareness following traumatic brain injury? *Neuropsychological Rehabilitation*, 25 (2), 233-253.
- Schönberger, M., Ponsford, J., McKay, A., Wong, D., Spitz, G., Harrington, H., & Mealings, M. (2014). Development of psychological adjustment during the course of community-based rehabilitation of traumatic brain injury: A preliminary study. *Neuropsychological Rehabilitation*, 24, 202-219.
- Spitz, G., McKenzie, D., Attwood, D., & Ponsford, J.L. (in press). Cost prediction following traumatic brain injury: Model development and validation. *Journal of Neurology, Neurosurgery and Psychiatry*, Accepted 28 January 2015.
- Spitz, G., Downing, M., McKenzie, D., & Ponsford, J. (in press). Mortality following traumatic brain injury inpatient rehabilitation. *Journal of Neurotrauma*. Accepted February 2015
- Willmott, C., Ponsford, J., Downing, M., & Carty, M. (2014). Frequency and Quality of Return to Study following Traumatic Brain Injury. *Journal of Head Trauma Rehabilitation*, 29, 248-56.
- Willmott, C., Spitz, G., & Ponsford, J. (in press). Predictors of productivity outcomes for secondary and tertiary students following traumatic brain injury. *Brain Injury*. Accepted February 2015.
- Wolters Gregório, G., Gould, K., Spitz, G., van Heugten, C.M., & Ponsford, J.L. (2014). Changes in self-reported pre- to postinjury coping styles in the first 3 years after traumatic brain injury and the effects on psychosocial and emotional functioning and quality of life. *Journal of Head Trauma Rehabilitation*, 29 (3), E43-E53.

# Developing communication and swallowing guidelines for children following traumatic brain injury

By Angela Morgan, Cristina Mei, Vicki Anderson, Louise Cahill and Mary-Clare Waugh

## What the study is about:

We are working on developing guidelines to improve the clinical care of children following traumatic brain injury (TBI). The guidelines will provide recommendations regarding assessment and treatment of speech, language and swallowing disorders for the first year after injury. Once developed, we aim to implement the guidelines into practice to provide more efficient and effective management of these disorders.

## What we have done so far:

We have formed a guideline development group consisting of 38 members. The group includes health professionals from a range of fields, parents of children with a TBI, and individuals who have sustained a TBI. Members have completed a survey that will reveal key areas to include in the guidelines. We are currently analysing the survey responses.

We have also searched the literature to identify key research findings in the field. We will integrate our survey and literature review findings in order to develop our guideline recommendations.



## Dr. Angela Morgan

Angela Morgan uses neuroimaging techniques (e.g., fibre tractography, functional connectivity) in her work examining prognosis and propensity for recovery of speech disorder following brain injury. Angela has strong collaborative links to the University College London Institute for Child Health. She is Associate Editor for the International Journal of Speech-Language Pathology.

# Do people with severe traumatic brain injury benefit from making errors? A clinical trial of the efficacy of error-based learning and errorless learning training (2013-2015)

## New NHMRC Project

By Tamara Ownsworth, Jenny Fleming, Robyn Tate and Amanda Lane-Browne

Self-awareness and error self-regulation are key predictors of whether people return to work and live independently after TBI. Although metacognitive training has been found to improve self-awareness and self-regulation deficits after severe TBI, people's capacity to generalise skills beyond training has rarely been examined. Poor skills generalisation poses one of the biggest barriers to successful outcomes of rehabilitation because most interventions are delivered in a specific context and are cost and time limited. This project seeks to address the following key questions:

- Is making errors actually beneficial in the learning process or is it better to avoid errors when training skills in rehabilitation? Specifically, does an error-based learning approach promote greater self-awareness and skills generalisation than errorless learning?
- Is improvement in self-awareness and skills generalisation after error-based learning related to better long-term social outcomes (e.g., work, independence and relationships)?

The protocol for this study was published in *Trials* in 2013. This RCT commenced in 2013 in Brisbane with recruitment underway in July 2013. To date, 59 people with severe TBI have been screened for eligibility and 36 have commenced the intervention. We commenced recruitment in Sydney in August 2014 and will continue recruiting from both Brisbane and Sydney sites until the end of 2015.

### To read more about this study:

Ownsworth, T., Fleming, J., Tate, R., Shum, D., Griffin, J., Schmidt, J., Lane-brown, A., Kendall, M., & Chevignard, M. (2013). Comparison of error-based and errorless learning for people with severe traumatic brain injury: Study protocol for a randomized control trial. *Trials*, 14, 369.

### Dr. Tamara Ownsworth

Tamara Ownsworth is a clinical neuropsychologist who is internationally recognised for her research on self-awareness and self-regulation after brain injury. She is a representative of the World Federation for NeuroRehabilitation's Special Interest Group in Neuropsychological Rehabilitation, the incoming President of ASSBI and on the Editorial Boards of *Neuropsych Rehabilitation* and *Brain Impairment*.



# Meta-cognitive strategies to improve errors and achieve goals in meaningful occupations

By Emmah Doig, Jenny Fleming and Tamara Ownsworth



## Dr. Jennifer Fleming

Jennifer Fleming conducts a program of research on psychosocial functioning and cognitive rehabilitation following TBI in collaboration with Griffith University. She holds a conjoint research appointment in occupational therapy with the University of Queensland and Princess Alexandra Hospital, and is Associate Editor of Brain Impairment.

### What the study is about:

This study evaluated the effect of an occupation-based intervention for people with self-awareness deficits after severe traumatic brain injury. Impaired self-awareness manifests as varying degrees in difficulty recognising changes after injury and how the changes impact on performance of everyday tasks, which can result in performance errors and loss of independence in valued activities. It is important that therapy uses activities or occupations that are meaningful for the individual and considers the context where these activities are performed in real life. The hallmarks of the intervention were (a) targeted goals that were valuable and meaningful to the client (b) occupation-based intervention involving task practice and individualised strategy use to facilitate goal achievement and (c) metacognitive strategies to facilitate self-awareness and reduce errors.

### What we did:

We piloted the 10-week intensive occupational therapy intervention with 2 people with severe TBI. Client goals were independence in meal and drink preparation, engagement in leisure tasks, prospective memory performance, study skills and budgeting. A single-case ABA experimental design was utilised with error behaviour, executive function (Executive Function Performance Test [EFPT] modified for each task) and goal achievement monitored repeatedly during each phase. The 'A' phases involved repeated task practice of goal-specific tasks, with the therapist responding to errors using a graded prompting approach 'pause, prompt and praise'. Error correction was determined by counting the frequency of errors, categorised as self-corrected errors [SCEs] (errors corrected spontaneously during the 'pause' phase), and therapist-corrected errors (errors corrected after the 'prompt' phase where the therapist provided non-specific followed by specific prompting to facilitate self-monitoring and error

correction). During the 'B' treatment phase, the client was engaged in the same task practice, however a range of metacognitive treatment strategies were used in addition to 'pause, prompt, praise', including pre-task self-prediction and post-task self-reflection about performance, and therapist feedback to facilitate self-monitoring and self-correction of errors during performance. Furthermore, sessions focussed on targeting goal attainment in everyday life by applying the metacognitive strategies (predicting and reflecting on errors and successes in everyday performance), individualised strategy use and reflection on the success of strategy use between intervention sessions. This was facilitated by using information documented by significant others in individualised diaries. Mood was monitored regularly across the phases using the Depression, Anxiety and Stress Scale (DASS).

### What we found:

There was an overall improvement in EFPT scores and reduction in number of errors made, however there were no significant differences, using 2 standard deviation band width analysis, across phases in errors or EFPT scores. In these cases, the use of 'pause, prompt, praise' as a metacognitive treatment strategy facilitated error self-correction and improved executive function performance in meaningful tasks with no further significant gains when using additional metacognitive treatment strategies including feedback, reflection and prediction. However, all goals were achieved to or above expected level of performance during or at the end of the 'B' phase and maintained in the follow-up 'A' phase. Furthermore, there was a gradual and significant reduction in DASS scores for both participants across the course of the intervention.

# Rehabilitation goal planning with clients with acquired brain injury

By Emmah Doig, Sarah Prescott, Jenny Fleming, Petrea Cornwell and Pim Kuipers

## What the study is about:

Client-centred goal planning includes clients as participants in decision making to establish goals of importance and meaning to clients. Engaging people with brain injury in goal planning can be challenging, particularly when self-awareness, cognitive skills and motivation are impaired. Goal planning is a core rehabilitation practice however there are limited studies which have explored goal planning in clinical settings with people with brain injury. This study aims to explore goal planning practice in outpatient brain injury rehabilitation settings by investigating processes and factors which facilitate client-participation in goal planning.

## What we are doing:

We are using quantitative and qualitative methods to explore the goal planning practice of occupational therapists, physiotherapists, neuropsychologists, social workers and speech pathologists in specialist brain injury rehabilitation settings including an outpatient clinic in a major metropolitan hospital and in community-based private practices. We developed the 'Client-Centredness of Goal Setting (C-COGS) scale' to measure client's perceived participation in goal planning and importance and relevance of their goals. We are using quantitative methods to explore whether client-centred goal planning is mediated by self-awareness, motivation, and therapeutic alliance, and whether client-centred goal planning is related to improvement in rehabilitation goals. We are using qualitative methods including in-depth interviews to explore therapist opinions and experiences of goal planning practice as well as audio-taped goal planning sessions between therapists, participants with brain injury and their family members (if involved). By examining the audiotaped goal-planning sessions we hope to understand how therapists plan goals as well as the amount and nature of participation of people with brain injury in goal planning. It is anticipated that the therapist interviews will lend further insights into ingredients for successful goal planning with people with brain injury in outpatient rehabilitation.

## What we have found so far:

So far we have conducted preliminary reliability and validity testing on the C-COGS and the findings lend preliminary support for the validity and reliability of the C-COGS. The C-COGS is intended to be used in clinical settings to encourage therapist reflection on goal planning practice to promote client-centred goal planning. Data collection is ongoing.

## To read more about this study:

Doig, E., Prescott, S., Fleming, J., Cornwell, P., & Kuipers, P. (early online). Development and validation of the Client-Centredness of Goal Setting (C-COGS) scale. *Scandinavian Journal of Occupational Therapy*.





**Dr Elizabeth Beadle  
Griffith University**

**Research topic:**

Lizzie already has a Doctorate of Psychology (Clinical and Neuropsychology) and is the project coordinator of a new NHMRC project. She commenced her PhD at Griffith University in February 2013 and is investigating changes in identity (self-discrepancy) after severe TBI in adulthood. Specifically, she is interested in the nature and extent of identity changes after TBI, correlates of identity change, the relationship between self-discrepancy and emotional adjustment and impact of rehabilitation. She is exploring this through self-discrepancy theory: a theory of how perceptions of who we are, and who we feel we should be, can cause emotional discomfort.



To date, Lizzie has collected data for 40 people with severe TBI, with data collection ongoing until December 2015. She has recently published a systematic review on factors influencing self-discrepancy and self-concept following TBI. She will be presenting some preliminary findings at the ASSBI/INS conference in Sydney, and the World Federation of NeuroRehabilitation conference on Daydream Island, in July 2015.

Her supervisors are A/Prof Tamara Ownsworth, Prof David Shum (Griffith University) and A/Prof Jennifer Fleming (PA hospital/UQ).

To read more see:

Beadle, E., Ownsworth, T., Fleming, J., & Shum, D. (in press) The impact of TBI on self-identity: A systematic review of the evidence for self-concept changes. *Journal of Head Trauma Rehabilitation*

**Owen Lloyd  
Griffith University**

**Research topic:**

Self-awareness deficits following paediatric TBI: natural recovery and relationship to outcome

Owen is doing a part-time PhD at Griffith University and is the Neuropsychology Clinical Leader at the Queensland Paediatric Rehabilitation Service at the Royal Children's Hospital in Brisbane. Owen commenced his PhD in March 2013, and is investigating factors influencing awareness of deficits in children with TBI, changes in awareness of deficits between discharge and 12-months post-injury, and the impact of self-awareness on psychosocial outcomes after paediatric TBI.



To date, Owen has published a systematic review of awareness deficits following paediatric TBI and is in the process of applying for ethical clearance to commence data collection in June 2015.

Supervisors: A/Prof Tamara Ownsworth (Griffith University) and A/Prof Jennifer Fleming (PA hospital/UQ)

To read more see:

Lloyd, O., Ownsworth, T., Zimmer-Gembeck, M., & Fleming, J. (2015, early access online). Awareness deficits in children and adolescents following traumatic brain injury: a systematic review. *Journal of Head Trauma Rehabilitation*. DOI: 10.1097/HTR.000000000000113

**Joshua King  
Griffith University**

**Research topic:** Knowing me and knowing you: An investigation of meta-social cognition after traumatic brain injury

Josh commenced his PhD in Clinical Psychology at Griffith University in 2015. He is particularly interested in psychosocial outcomes following TBI. His research aims to investigate people’s self-awareness of their ability to relate to others and respond appropriately in a social context (i.e. ‘meta-social cognition’) and the functional implications of meta-social cognition deficits for people with TBI.

Josh’s research is supervised by A/Professor Tamara Ownsworth and Dr Harriet Bodimeade.



**Elizabeth Pagan  
Griffith University**

**Research topic:** Moving Ahead Clinician Survey

Liz commenced her Masters in Clinical Psychology at Griffith University in 2013. To support one of the key aims of the CRE, her research seeks to investigate clinicians’ perceptions of the barriers to providing effective neurorehabilitation for people with TBI and their professional development preferences.

Supervisor: A/Prof Tamara Ownsworth in collaboration with Professor Skye McDonald, Dr Cynthia Honan and A/Prof Jenny Fleming.



**Alannah Bailey  
La Trobe University**



Alanna Bailey is a newly enrolled PhD student La Trobe University. Alanna’s project will be focusing on friendships following TBI, supervised by Associate Professor Jacinta Douglas. Alanna completed her Masters of Speech Pathology at La Trobe University in 2005. She is currently working as a speech pathologist at Epworth Rehabilitation, Camberwell Campus in Melbourne. She previously worked in the TBI Unit at Royal Rehabilitation Centre in Sydney with TBI clients across both inpatient and community settings. Her supervisors are Professor Jacinta Douglas and Professor Leanne Togher.

**Melinda Hickey  
University of Wollongong**



Melinda Hickey is a PhD candidate at the University of Wollongong. She is currently investigating the feasibility and efficacy of a neurocognitive training (combined cognitive and neurofeedback training) program that aims to improve state control (attention and relaxation), impulse control and working memory in adults with a traumatic brain injury. She is interested in the cognitive, electrophysiological and behavioural outcomes of this training program.



**Dr Kelly Sinclair**  
Monash University

Kelly Sinclair is a Research Fellow at Monash University in the Monash Epworth Rehabilitation Research Centre (MERRC). She completed a Doctor of Psychology (Clinic Neuropsychology) at Monash University in 2012, focusing on the assessment of fatigue and sleep disturbance following Traumatic Brain Injury and examining the use of light therapy to reduce these symptoms following injury. Kelly continues to work on projects across the research centre examining fatigue and sleep complaints following Acquired Brain Injury.



**Dr Adam McKay**  
Monash University

Dr Adam McKay is employed as a lecturer in the School of Psychological Sciences at Monash University and as a Senior Clinical Neuropsychologist at Epworth. He has investigated factors associated with return to driving after TBI, specifically the influence of cognitive test performance. He supervises students on a number of projects, including a study of the influence of family interaction on emotional adjustment after TBI. He is a lead investigator on the evaluation of early rehabilitation following TBI as well as two psychological intervention studies, for which provides therapy, including the MI/CBT for anxiety and depression, and CBT for fatigue.



**Dr Dana Wong**  
Monash University

Dr. Dana Wong is employed as a lecturer in the School of Psychological Sciences at Monash and working in private practice as a clinical neuropsychologist. She supervises clinical neuropsychology students in a specialised rehabilitation clinic at the Monash Psychology Centre, supervises research and provides therapy in various clinical intervention studies including the MI/CBT for anxiety and depression, CBT for fatigue, and rehabilitation of memory studies. She also has a particular interest in the use of smartphones to support cognitive impairment in people with TBI and stroke.



**Sylvia Nguyen**  
Monash University

Sylvia Nguyen is a registered Clinical Psychologist and Doctor of Psychology (Clinical Neuropsychology) Candidate at Monash University. She is conducting a randomized controlled trial to investigate the effectiveness of Cognitive Behaviour Therapy in treating fatigue and sleep disturbance after TBI. This project is under the supervision of Prof Jennie Ponsford, Prof Shantha Rajaratnam, Dr Adam McKay and Dr Dana Wong. She is currently working as a research assistant at the Monash-Epworth Rehabilitation Research Centre.



**Nicholas Behn**  
**University of Sydney**

Nicholas Behn is a current PhD candidate at City University, London UK. He is a qualified speech pathologist with over 10 years experience in working with people with brain injury. He has just completed his research masters degree through The University of Sydney on communication partner training for paid carers of people with TBI. His PhD is on communication and quality of life outcomes for people with ABI following project-based therapy. This form of therapy focuses on people with ABI working on meaningful and motivating "projects". The study is taking place in the UK under the supervision of Dr Madeline Cruice, Prof Jane Marshall and Prof Leanne Togher.



**Dr Kimberley Docking**  
**University of Sydney**

Dr Kimberley Docking is a Research Fellow with the Moving Ahead: NHMRC Centre of Research Excellence in Brain Recovery, joining the team under the leadership of Professor Leanne Togher at the University of Sydney. Kimberley is also a Lecturer in Speech Pathology in the Faculty of Health Sciences at the University of Sydney. Her research activity to date has made contributions to the study of paediatric acquired language disorders in populations of children who are recovering from childhood brain tumours and traumatic brain injury, in identifying the potential for long-term communication deficits and recovery patterns in these populations



**Tennille Thomasz**  
**University of Sydney**

Part-time Masters student called Tennille Thomasz has enrolled at The University of Sydney to commence work on a project investigating the issue of friendships following TBI. Tennille Thomasz is a Senior Speech Pathologist who works at the Brain Injury Unit at Bathurst Base Hospital. Tennille's research will provide the foundations for our planned RCT with friends of people with TBI. Tennille has worked on her literature review, methodology and is now submitting her ethics application.

Tennille's supervisors are Prof Leanne Togher, Dr Emma Power and A/Prof Jacinta Douglas.



**Elise Elbourn**  
**University of Sydney**

Elise Bogart is a doctoral candidate at the University of Sydney. Her current research interests are investigating the recovery of spoken discourse following severe traumatic brain injury.



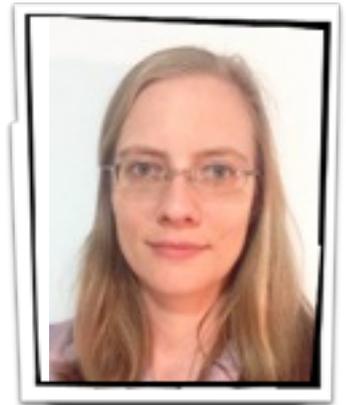
**Dr Belinda Kenny**  
**University of Sydney**

Belinda Kenny is working on a project that will trace communication recovery in people with severe TBI over a two year period following their injury. The study will be conducted by an international research team, led by Professor Leanne Togher from The University of Sydney, in collaboration with three major Brain Injury Rehabilitation Units in Sydney, NSW. The aims of the project are to determine predictive factors underlying recovery of communication deficits after TBI and identify the optimal period of recovery for communication skills.



**Dr Linda Sigmundsdottir**  
**University of Sydney**

Dr Linda Sigmundsdottir is a postdoctoral research fellow with the John Walsh Centre for Rehabilitation Research, University of Sydney. She has a Doctorate in Psychology (Clinical Neuropsychology) and works clinically part time in the area of cognitive rehabilitation following acquired brain injury at the Liverpool Brain Injury Rehabilitation Unit. As part of her research work with the CRE, she is an investigator on the PEPA program, which aims to evaluate an intervention approach to support persons with TBI to engage and sustain their involvement in meaningful avocational activities. She has recently completed a systematic review of the research literature evaluating use of computerised cognitive training programs for persons with acquired brain injury and is project manager for the PsycBITE online database ([www.psycbite.com](http://www.psycbite.com)) which catalogues published psychological and cognitive rehabilitation interventions for acquired brain injury.



Linda's mentor is Prof Robyn Tate.

**Rachael Rietdijk**  
**University of Sydney**

Rachael Rietdijk is working with Professor Leanne Togher and Dr Emma Power at The University of Sydney. Her project, entitled "Using telehealth for communication skills training for people with traumatic brain injury and their communication partners", aims to compare the outcomes of a Skype-based communication skills training program to a traditional face-to-face communication skills training program for people with TBI and their communication partners.



**Melissa Brunner**  
**University of Newcastle**

Melissa Brunner is a Certified Practicing Speech Pathologist and PhD candidate at The University of Newcastle investigating the use of social media, specifically Twitter, by people with Traumatic Brain Injury. Following a survey of how people with TBI use Twitter, Melissa will develop and test online Twitter training for use with people who have a TBI and communication disability. Her research will yield important insights into how people with TBI might be supported to use Twitter for communication, participation, and inclusion in online communities. The research is supervised by A/Professor Bronwyn Hemsley at the University of Newcastle, A/Professor Stuart Palmer at Deakin University, Dr Stephen Dann at the Australian National University, and Professor Leanne Togher at the University of Sydney. Melissa's research is supported in part by an APA PhD scholarship through the University of Newcastle.



**Dr Emmah Doig**  
**University of Queensland**

Emmah completed her PhD in 2010 and has been undertaking research since her commencement as a part-time post-doctoral research fellow with the NHMRC Moving Ahead CRE/University of Queensland in July 2012. Emmah's research has involved design and implementation of a series of single case experimental designs to evaluate a novel, intensive, occupation-based, metacognitive intervention (completed with 2 people with TBI to date) designed to improve performance in meaningful occupations and online awareness in conjunction with A/Professors Jenny Fleming and Tamara Ownsworth. Emmah has also been involved with a project in conjunction with A/Professors Pim Kuipers, Jenny Fleming and Melissa Kendall and Drs Ben Turner and Marion Mitchell which used qualitative interviews with people with brain injury and their family members to explore their experience of hospitalization for rehabilitation after brain injury, with the aim of informing how service providers can support family members and close friends during hospitalisation and rehabilitation. Emmah has also been co-ordinating a mixed methods study exploring goal planning with people with brain injury undergoing outpatient multidisciplinary rehabilitation, which commenced data collection in 2013. This project is being conducted in partnership with clinicians at the Princess Alexandra Hospital Brain Injury Rehabilitation Unit along with A/Professor Jenny Fleming and Dr Petrea Cornwell at the Griffith University.



**Sarah Prescott**  
**University of Queensland**

Sarah is an experienced Occupational Therapist who was awarded an APA scholarship in September 2013 and commenced her PhD at the University of Queensland in February 2014. Sarah's thesis will use quantitative and qualitative research methods to explore the goal planning process with people with brain injury in outpatient rehabilitation settings. Sarah has commenced a scoping review of the literature and data collection is currently underway. This study is capturing the goal planning process by analysing transcriptions of audiotaped goal planning sessions between therapists and people with brain injury. A range of other therapist, client and contextual factors are also being measured to explore the relationship between client participation in goal planning, contextual factors and outcomes.



Sarah's supervisors are A/Professor Jenny Fleming and Dr Emmah Doig.

**Freyr Patterson**  
**University of Queensland**

Freyr is an experienced Occupational Therapist who commenced her PhD at the University of Queensland in 2013. Freyr's PhD will explore the use of therapy groups in inpatient brain injury rehabilitation. Freyr has recently completed a scoping review of the literature to investigate the use of group therapy interventions in TBI rehabilitation. The findings of this review supported the need for further research into the efficacy of groups as well as research which includes patient and clinician perspectives about groups. Freyr has commenced data collection for a research project which will explore group processes and patient and clinician perspectives about their experience of involvement in a group therapy program at the Princess Alexandra Hospital Brain Injury Rehabilitation Unit using quantitative and qualitative methods (video-recording of group sessions, focus groups, interviews).

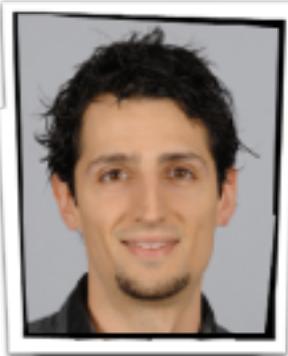


Freyr's supervisors are A/Professor Jenny Fleming and Dr Emmah Doig.



**Nicholas Ryan**  
**Murdoch Children Research Institute**

Nicholas Ryan is a PhD/Master of Psychology (Clinical Neuropsychology) Candidate at the University of Melbourne. In 2012 Nicholas completed his Honours project that examined predictors of emotion perception, and its relationship to social communication and externalizing behaviours in young adult survivors of paediatric TBI. Following on from this work, his PhD aims to investigate the neural bases of outcome and recovery of Theory of Mind in children and adolescents with TBI. He is supervised by Professor Vicki Anderson and Associate Professor Cathy Catroppa at the Murdoch Childrens Research Institute.



**Dr Frank Muscara**  
**Murdoch Children Research Institute**

Frank has been involved in the development and piloting of a new measure to assess social outcomes and functioning in children and adolescents with traumatic brain injury. The measure has already been tested in a non-clinical population, and is now being piloted in a clinical sample of children and adolescents with acquired brain injury. Frank is also coordinating a project investigating parent functioning, and its impact on child psychosocial outcomes and development, following acquired brain injury in childhood. Finally, Frank has been supervising Stefanie Rosema, PhD student, on her project investigating long-term psychosocial outcomes following traumatic brain injury in children.



**Stefanie Rosema**  
**Murdoch Children Research Institute**

Stefanie Rosema is a PhD student and research assistant at the Murdoch Childrens Research Institute. She is particularly interested in psychosocial outcomes after childhood traumatic brain injury and is currently setting up an intervention program for children with social and psychological difficulties. She is also involved as a research assistant in improving attention and memory in children with a brain injury and in training to analyse (f)MRI data.



**Dr Jacqueline Rushby**  
**University of New South Wales**

Jacqueline Rushby was awarded a NHMRC four year research fellowship, to investigate psychophysiological indices of recovery after severe Traumatic Brain Injury (TBI). Her research aims to examine psychophysiological processes underpinning arousal and activation, in order to inform our understanding about how and why arousal to emotional events is dysregulated after severe brain injury.

**Dr Cynthia Honan**  
**University of New South Wales**

Dr Cynthia Honan is a postdoctoral research fellow and clinical neuropsychologist for the Moving Ahead Centre for Research Excellence (CRE) in Brain Recovery ([www.moving-ahead.com.au](http://www.moving-ahead.com.au)). Cynthia coordinates many CRE-related projects including the development of common outcome measures and protocols for use across a variety of rehabilitation research projects within the CRE. Her research interests include test development and the measurement of Social Cognition, and disorders of control and drive, metacognition, and functional outcomes following acquired brain injury and multiple sclerosis.



**Hannah Rosenberg**  
**University of New South Wales**

Hannah is a PhD/Master of Psychology (Clinical) Candidate at UNSW. She has recently submitted her thesis and is awaiting marker comments. Her research area involves the study of emotion perception deficits in individuals with traumatic brain injury (TBI) and Parkinson's Disease. She is especially interested in the differences between recognition of negative and positive facial expressions and how this recognition improves as a function of emotion intensity.



**Dr Heather Francis**  
**University of New South Wales**

Dr Heather Francis is a part-time research fellow working at the University of New South Wales under the supervision of Skye McDonald. She completed a Combined PhD/Master of Clinical Neuropsychology in 2013 and her research and clinical interests lie in assessment and intervention of cognitive and emotional impairments following traumatic brain injury. She is also involved in coordination of CRE-related activities and projects, such as the outcome measures project.



**Katie Osborne-Crowley**  
**University of New South Wales**

Katie Osborne-Crowley is currently in her third year of her PhD studies. Her research interests include disorders of motivation and disorders of control following traumatic brain injury.



**Francesca Foreich**  
**University of New South Wales**

Francesca works as an Administrative Assistant supporting the day to day management of the CRE. Her research interests involve school-based bullying and disordered eating. She is also the designer of this newsletter so please direct any feedback to [f.foreich@unsw.edu.au](mailto:f.foreich@unsw.edu.au).



## List of Publications

### In Press

- Beadle, E., Ownsworth, T., Fleming, J., & Shum, D. (in-press). The impact of TBI on self-identity: a systematic review of the evidence for self-concept changes. *Journal of Head Trauma Rehabilitation*.
- Briggs, R., Brookes, N., Tate, R., Lah, S. (in-press). Duration of post-traumatic amnesia as a predictor of functional outcome in school-age children: a systematic review. *Developmental Medicine and Child Neurology*. DOI10.1111/dmcn.12674:
- Brunner, M., Hemsley, B., Palmer, S., Dann, S., & Togher, L. (2015). Review of the literature on the use of social media by people with traumatic brain injury (TBI). *Disability and rehabilitation*, (ahead-of-print), 1-11.
- Doig, E., Prescott, S., Cornwell, P., Fleming, J., & Kuipers, P. (in-press). Development and construct validation of the Client-Centredness of Goal Setting (C-COGS) scale. *Scandinavian Journal of Occupational Therapy*.
- Douglas, J. (in press). Placing Therapy in the Context of the Self and Social Connection. *International Journal of Speech-Language Pathology*.
- Francis, H., Fisher, A., Rushby, J. & McDonald, S. Reduced heart rate variability in chronic severe traumatic brain injury: association with impaired emotional and social functioning, and potential for treatment using biofeedback *Neuropsychological Rehabilitation* (Accepted 24/12/14)
- Gould, K., & Ponsford, J. (in press). A longitudinal examination of positive changes in quality of life after traumatic brain injury. *Brain Injury*, Accepted 7 October, 2014. IPP: 2.032; SJR: 0.795; SNIP: 1.024.
- Honan, C. A., McDonald, S., & Fisher, A (2015). Visuospatial learning in traumatic brain injury: An examination of impairments using the computerised Austin Maze task. *Brain Impairment*, available online ahead of print.
- Kilov, A., Togher, L. & Power, E. (in press). Reliability of a computer and Internet survey (Computer User Profile) used by adults with and without traumatic brain injury (TBI), *Brain Injury* (Accepted 12 April 2015).
- Knox, L., Douglas, J., & Bigby, C. (in press). ‘The biggest thing is trying to live for two people’: Spousal experiences of supporting decision-making participation for partners with TBI. *Brain Injury*, (Accepted 5 Jan 2015).
- Knox, L., Douglas, J., & Bigby, C. (in-press). “I won’t be around forever”: Understanding the decision-making experiences of adults with severe TBI and their parents. *Neuropsychological Rehabilitation*, (Accepted 10 Feb 2015).
- Liang, P., Gustafsson, L., Fleming, J., & Liddle, J. (in press). Family members’ needs and experiences of driving disruption due to health conditions or ageing. *Disability and Rehabilitation*.
- Lloyd, O., Ownsworth, T., Zimmer-Gembeck, M., & Fleming, J. (2015, early access online). Awareness deficits in children and adolescents following traumatic brain injury: a systematic review. *Journal of Head Trauma Rehabilitation*. doi: 10.1097/HTR.000000000000113
- Mbakile-Mahlanza, L., Manderson, L., & Ponsford, J. (in press) The experience of traumatic brain injury in Botswana. *Neuropsychological Rehabilitation*, (Accepted 10 Dec 2014).
- McDonald, S., Fisher, A., Togher, L., Tate, R., Rushby, J., English, T., Kelly, M., Mathersul, D., Foriech, F. & Francis, H. (in press) Adolescent performance on The Awareness of Social Inference Test: TASIT. *Brain Impairment* (Accepted 6 February 2015)
- McDonald, S., Togher, L. & Code, C. (Eds) (2013) *Social and communication disorders following traumatic brain injury* (2nd Edition). Hove, UK: Psychology Press. ISBN: 978-1-84872-129-6 (hbk)
- Nalder, E., Fleming, J., Cornwell, P., Foster, M., Skidmore, E, Bottari, C., & Dawson, D. (in press). Sentinel events and psychosocial status during the transition from hospital to home: a longitudinal study of women with a traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*.
- Ownsworth, T., & Haslam, C. (2014; ahead-of-print). The impact of brain injury rehabilitation on self-concept after traumatic brain injury: A systematic review. *Neuropsychological Rehabilitation*. doi: 10.1080/09602011.2014.977924
- Pell, M.D., Monetta, L., Rothermich, K., Kotz S.A., Cheang, H.S., and McDonald, S. (in press) Social perception in adults with Parkinson’s Disease, *Neuropsychology* (accepted 31 March, 2014)
- Roberts, C., Ponsford, J., Spitz, G. (2015; in press) Order of Item Recovery on the Westmead Post-Traumatic Amnesia Scale (WPTAS). *Neuropsychology*, Advance online publication. <http://dx.doi.org/10.1037/neu0000178>.
- Rosema, S., Muscara, F., Anderson, V., Hearps, S., Godfrey, C., Eren, S. & Catroppa, C. (in press) The trajectory of long-term psychosocial development 16 years following childhood traumatic brain injury. *Journal of Neurotrauma* (accepted December 2014)
- Rosenberg, H., Dethier, M., Kessels, R.P.C., & McDonald, S. (in press) Emotion perception after moderate-severe Traumatic Brain Injury: The valence effect and the role of working memory, processing speed and non-verbal reasoning *Neuropsychology* (Accepted 14/11/14)
- Ross, P., Ponsford, J., Di Stefano, M., & Spitz, G. (in press) Predictors of on Road Driver Assessment Performance after Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*. Accepted 16 September 2014.

- Schmidt, J., Fleming, J., Ownsworth, T., & Lannin, N. (in press). An occupation-based video feedback intervention for improving self-awareness: protocol and rationale. *Canadian Journal of Occupational Therapy*.
- Schmidt, J., Fleming, J., Ownsworth, T., & Lannin, N. (in press). Maintenance of treatment effects of an occupation-based intervention with video feedback for adults with TBI. *NeuroRehabilitation*.
- Soo, C., Tate, R., Anderson, V., Beauchamp, M., H., Brookes N, Catroppa C, Galvin J, Muscara F. (2015; in press). Assessing psychosocial functioning following childhood acquired brain injury: The Sydney Psychosocial reintegration Scale for children. *Developmental Neurorehabilitation*. doi: 10.3109/17518423.2014.1000504
- Spitz, G., Downing, M., McKenzie, D., Ponsford, J. (in press) Mortality following traumatic brain injury inpatient rehabilitation. *Journal of Neurotrauma*. (Accepted 12 February 2015)
- Spitz, G., McKenzie, D., Attwood, D., Ponsford, J.L. (in press) Cost prediction following traumatic brain injury: Model development and validation. *Journal of Neurology, Neurosurgery and Psychiatry*, (Accepted 28 January 2015).
- Tam, S., McKay, A., Sloan, S., & Ponsford, J. (in press). The Experience of Challenging Behaviours Following Severe TBI: A Family Perspective. *Brain Injury*. (Accepted 5 January 2015).
- Tate, R., Perdices, M., Rosenkoetter, U., McDonald, S., Togher, L., Shadish, W., Horner, R., Kratochwill, T., Barlow, D., Kazdin, A., Sampson, M., Shamseer, L. & Vohra, S. (in press) The Single-Case Reporting guideline In BEhavioural Interventions (SCRIBE): Explanation and Elaboration. *Archives of Scientific Psychology*. (Accepted 12 May 2015).
- Willmott, C., Spitz, G., & Ponsford, J. (in press). Predictors of productivity outcomes for secondary and tertiary students following traumatic brain injury. *Brain Injury*, Accepted 7 February 2015.

## Books and Book Chapters

- Doig, E. & Fleming, J. (2014). An occupation-based, client-centred approach to goal planning and measurement. In R. Seigert & W. Levack (Eds.). *Rehabilitation goal setting: Theory, Practice and Evidence* (pp. 181-211). Boca Raton, FL: Taylor & Francis.
- Douglas, J., Drummond, M., Knox, L., & Mealings, M. (2015). Rethinking Social-Relational Perspectives in Rehabilitation: Traumatic Brain Injury as a Case Study. In McPherson, K, Gibson BE, Leplege A, (eds), *Rethinking Rehabilitation Theory*, CRC Press: Boca Raton.
- Fleming, J. & Schmidt, J. (2015). Metacognitive occupation based training. In I. Soderback (Ed.). *International Handbook of Occupational Therapy Interventions* (pp.225-231). New York, NY: Springer.
- McDonald, S., Rushby, J., Kelly, M. & De Sousa, A. (2014) Disorders of emotion and social cognition in TBI. In Levin, H., Shum, D. & Chan, R. (Eds.) *Traumatic Brain Injury: A review of the research and future directions*, pp133-160, New York, Oxford University Press, ISBN 978-0-19-973752-9.
- Ownsworth, T. (2014). *Self-identity after brain injury*. Hove, UK: Psychology Press.
- Ownsworth, T. & Fleming, J. (2014) Community adjustment and re-engagement. (pp. 235-254). In H. Levin, D. Shum, & R. Chan (Eds.). *Understanding traumatic brain injury: current research and future directions*. New York NY: Oxford University Press.
- Sherer, M. & Fleming, J. (2014). Impaired self-awareness. In M. Sherer & A. Sandler (Eds.). *Handbook on the neuropsychology of traumatic brain injury* (pp.233-256). Switzerland: Springer.
- Tate R. L. (2014). Measuring outcomes using the International Classification of Functioning, Disability and Health (ICF) model, with special reference to participation and environmental factors. In: *Understanding traumatic brain injury: Current research and future directions*. H. Levin, D Shum and R Chan (Eds).Oxford: Oxford University Press, pp. 163-189.
- Tate, R. L., Aird, V., Taylor, C. (2014). Using single-case methodology to treat social-pragmatic communication disorders. In: S McDonald, L Togher & C Code (Eds.). *Social and communication disorders following traumatic brain injury*. 2nd ed. Hove, UK: Psychology Press. 361-388.
- Tate, R. L., & Perdices, M. (2015). Single-subject designs. In: FM Hamond, JF Malec, & N Todd (Eds.). *Handbook for Clinical Research. Design, statistics, and implementation*. New York: demosMEDICAL, pp. 13-17.
- Tate, R. L., Simpson, G., K., McRae, P. (2015). Traumatic brain injury. *Handbook of Vocational Rehabilitation and Disability Evaluation. Application and implementation of the ICF*. R Escorpizo, Brage S, Homa D, Stucki G. (Eds.). Switzerland: Springer, pp. 263-294.

## Publications in Refereed National and International Journals

- Attard, M.C. Lucette E. Lanyon, L.E., Togher, L. & Rose, M.L. (2015). Consumer perspectives on community aphasia groups: a narrative literature review in the context of psychological well-being *Aphasiology*, 29 (8), 983-1019.
- Bayley, M. Bragge, P. Douglas, J., Ponsford, J. Togher, L., Green, R. Tuskstra, L., Kua, A. (2014). INCOG guidelines for Cognitive Rehabilitation following Traumatic Brain Injury: Methods and Overview. *Journal of Head Trauma Rehabilitation*, 29(4), 290-306. doi: 10.1097/HTR.0000000000000070.

- Bayley, M., Tate, R. L., Douglas, J., Turkstra, L., Ponsford, J., Stergiou-Kita, M., Kua, A., Bragge, P, on behalf of the INCOG Expert Panel (2014). INCOG Guidelines for Cognitive Rehabilitation Following Traumatic Brain Injury: Methods and Overview. *Journal of Head Trauma Rehabilitation*, 29(4): 290-306. doi: 10.1097/HTR.0000000000000070
- Boosman, H., Visser-Meily, J. M. A., Ownsworth, T., Winkens, I., & Van Heugten, C.M. (2014). Validity of the Dynamic Wisconsin Card Sorting Test for assessing learning potential in brain Injury rehabilitation. *Journal of the International Neuropsychological Society*. 20, 1034–1044. doi:10.1017/S1355617714000897
- Bragge, P., Pattuwage, L., Marshall, S., Pitt, V., Piccenna, L., Stergiou-Kita, M., Tate, R. L., Teasell, R., Wiseman-Hakes, C., Kua, A., Ponsford, J., Velikonja, D., Bayley, M. (2014). Quality guidelines for cognitive rehabilitation following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 29(4), 277-289.
- Briggs R, Brookes N, Tate R, Lah S. (2015). Duration of post-traumatic amnesia as a predictor of functional outcome in school-age children: a systematic review. *Developmental Medicine and Child Neurology*. DOI: 10.1111/dmcn.12674
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- Canty, A., Shum, D., Fleming, J., Patterson, F., Green, H., & Man, D. (2014). Evaluation of a prospective memory virtual reality task for use with individuals with severe traumatic brain injury. *Neuropsychological Rehabilitation*, 24, 238-265.
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- Cooper, J.M., Catroppa, C., Beauchamp, M.H., Eren, S., Godfrey, C., Ditchfield, M. & Anderson, V.A., (2014) Attentional control ten years post-childhood traumatic brain injury: The impact of lesion presence, location, and severity in adolescence and early adulthood. *Journal Of Neurotrauma*, 31 (8), 713-21.
- Couchman, G., McMahon, G., Kelly, A., Ponsford, J., (2014) A new kind of normal: Qualitative Accounts of Multi-Family Group Therapy for Acquired Brain Injury. *Neuropsychological Rehabilitation*, 24 (6), 809-832. doi: 10.1080/09602011.2014.912957.
- Dahm, J., & Ponsford, J. (2015). Comparison of long-term outcomes following traumatic injury: What is the unique experience for those with brain injury compared with orthopaedic injury? *Injury*, 46(1), 142-149. doi:10.1016/j.injury.2014.07.012.
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- Fisher, A. C., Rushby, J. A., McDonald, S., Parks, N., & Piquet, O. (2015). Neurophysiological correlates of dysregulated emotional arousal in severe traumatic brain injury. *Clinical Neurophysiology*, 126(2), 314-324. doi: 10.1016/j.clinph.2014.05.033
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