CLINICAL NEUROPSYCHOLOGY

Newsletter

2015
10th Edition

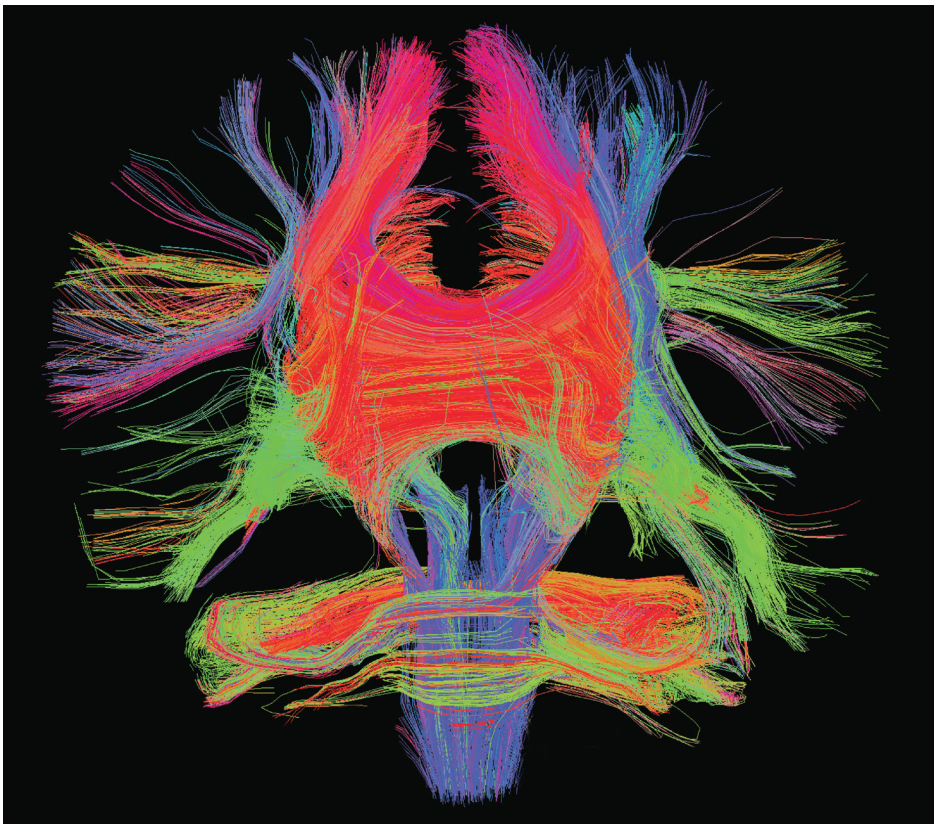

Image of the brain from our TBI research

Brain Sciences UNSW SYDNEY • AUSTRALIA

In this issue

I hope you are having a happy and healthy start to 2016! Here at the University of New South Wales (UNSW), our Clinical Neuropsychology Research Team is already off to a positive and busy commencement.

It is my pleasure to present you with our annual newsletter detailing our research activities in brain injuries and disorders over the past 12 months. The aim of our newsletter is to provide you with an overview of what has been happening - the kind of research we do, the people involved, the projects we conduct and who has assisted us. But more importantly, to inform you of how your involvement is contributing to our understanding of how the brain processes social and emotional information both before and after a brain injury, as well as what treatment techniques we are trialling.

We hope you find our newsletter informative. Any feedback that you wish to provide is most welcome.

Best wishes,

Skye McDonald.

Professor Skye McDonald
Clinical Neuropsychology Research Team Leader
School of Psychology, UNSW

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CONTENTS

THIS EDITION

In this 10th edition of our newsletter, you will read about successfully completed studies, ones that are currently in progress, and new research that will be conducted later this year. Each study is described in terms of *what it is about*, *what we did*, *what we found* and *what our findings mean*.

Where studies have been submitted for publication, the reference to the article and target journal has been provided, in case you are interested in reading more about the study. In most cases, it takes a long time for articles to be published; so most articles are not immediately available but will be in the next year or so. We have also detailed articles and conference presentations that are accepted for publication on page 28.

OUR LAB

A SNEAK PEAK

Clinical Groups

The research that our team conducts is essentially concerned with disorders that arise from brain dysfunction due to structural or developmental conditions. We are interested in disorders that arise from a variety of different kinds of brain impairment including acquired brain impairment due to trauma, degenerative conditions (e.g. Parkinson's disease) and mild cognitive impairment. We are also interested in developmental conditions such as Autism Spectrum Disorder and psychiatric conditions.

Our primary research interest is in discovering the underpinnings of problems that get in the way of everyday function and why problems occur in interpersonal interactions and everyday communication. This type of research is particularly important because many people who have a brain impairment find some aspects of social interaction difficult. These difficulties often impact self-esteem, mood, confidence in social situations, rehabilitation efforts, and quality of life. Our research aims to increase our understanding of how social and emotional functioning is disrupted by a brain injury to improve rehabilitation techniques and practical support to those with a brain injury or disorder. We believe that this type of research is important because social interaction is pivotal to being a friend, student, work mate or family member.

Type of Research

Our research has a number of streams looking at (1) social cognition and communication (2) emotional disorders and (3) remediation. In each case, we are interested in how these disorders impact upon everyday functioning. Over the past few years, we have had a particular interest in psychophysiology. This field provides us with techniques that allow us to measure bodily reactions to external events (like changes in heart rate and skin temperature). Through these measures, we have a clearer understanding of how people respond emotionally to significant events.

It is important to mention that people with acquired brain injuries experience a range of difficulties that makes them quite a varied group. Even though we know this is the case, we typically analyse the results of all the people with brain injuries together, due to the impossibility of recruiting participants with exactly the same types of injuries. Doing this allows for us to draw conclusions about the type of difficulties the group as a whole experience, but does not highlight unique difficulties experienced by any one individual. We recognise that it is a combination of the group and individual pictures that will best contribute towards our understanding of brain injury. For this reason, we are planning to begin several single-case studies this year, as well as continue with further group research.

Research Team

Our dedicated research team is led by renowned Professor Skye McDonald with the able assistance of Dr Jacqueline Rushby (NHMRC Clinical Research Fellow). Dr Rushby provides extensive expertise in psychophysiological techniques and is a sought after mentor for everyone in the lab.

There are four PhD students in the research team who have all been tremendous additions to the lab: Matt Gerathy, Katie Osborne-Crowley, Christopher Sufani and Emily Trimmer; and one honours student in Neuroscience starting in March 2016, Edward Ho, who will be measuring the effects of facial and body postures on arousal and mood for his thesis.

We are very fortunate to have Samantha Allen in our lab as our full-time research assistant. She works tirelessly to ensure the lab runs smoothly and efficiently, and is available to answer any queries about our research program (02 9385 3590). We also have four outstanding part-time research assistants in the lab: Katie Dalton, Frances De Blasio, Kelly Kershaw and Emma Kornfeld.

Our lab is very unique in that we partner with the Moving Ahead Centre of Research Excellence in Brain Recovery. Through this partnership, we work closely with many leading and well known academics in the field of brain injury, as well as our associate staff: Dr Anneli Cassel (Clinical Researcher), Melinda Drew (Administration Assistant), and Crystal Yau (Project Officer).

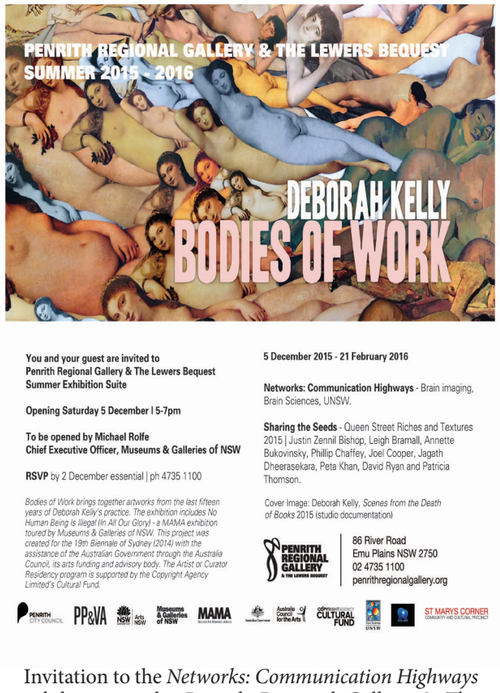
To hear more about the research we conduct and to meet our team members, please visit our website below.

http://www2.psy.unsw.edu.au/Users/smcdonald/people.html

Lab Successes

In 2015 our lab completed 10 studies, attended many conferences, and had the exciting opportunity to showcase a collection of our brain imaging work at the Penrith Regional Gallery & The Lewers Bequest Summer Exhibition Suite.

In our lab we conduct studies using magnetic resonance imaging (MRI) to examine brain structure changes after a traumatic brain injury, and how these may lead to changes in social cognition. The purpose of the imaging work we do is to extract data from the brains for analysis; however the images we produce are beautiful within themselves, which is why we were thrilled to be invited to show our work to the public. The exhibition, titled *Networks: Communication Highways*, consisted of 12 pieces (one of our images is featured on the front page of this newsletter!) which colorfully depicted the brain and its various white matter pathways. The pictures provide insight into the communication that takes place beneath the brain surface between brain regions, which cannot be seen without the techniques we use in our studies.



Invitation to the *Networks: Communication Highways* exhibition at the Penrith Regional Gallery & The Lewers Bequest Summer Exhibition Suite

Alumni Update - Life after the Lab

This past year, we bid adieu to our brilliant Postdoctoral Fellows, Dr Heather Francis and Dr Cynthia Honan. Not only were they apart of our lab conducting research, but both were also registered Clinical Neuropsychologists. Dr Francis provided our lab with her expertise from her clinical work in emotion regulation following acquired brain injury, while Dr Honan provided her expertise in test development and advanced statistical procedures. Dr Francis was recently selected to a postdoctoral fellowship at Macquarie University, and Dr Honan has been appointed to a lecturer position at the University of Tasmania. We are sorry to have said goodbye to both Heather and Cynthia; and we wish them all the best in their new positions.

Two of our honours students recently completed their studies, and we would like to take this opportunity to congratulate Shani Lauf and Katya Wang for their great efforts. Shani graduated with First Class Honours, and was awarded the Paxinos & Watson Neuroscience Honours Prize for the best performance in Neuroscience Honours in 2015. Her research centered on mild, non-invasive brain stimulation and its use as a tool to improve memory and cognition.

Hannah Rosenberg completed her PhD in Clinical Neuropsychology/Clinical Psychology last year. She works as a registered Clinical Psychologist at Eastern Suburbs Child Psychology Practice. On 30 October 2015, Dr Rosenberg gave birth to her second child - a beautiful and healthy baby girl, Lily.

Michelle Kelly completed her PhD/MPsychol in Clinical Psychology at UNSW in 2011. Upon graduating, Dr Kelly has worked as a Clinical Psychologist and was recently appointed to Senior Lecturer in Clinical Psychology at the University of Newcastle. Her research focus is psychosocial functioning in people with traumatic brain injury and people with a diagnosis of dementia.


Dr Heather Francis

Dr Cynthia Honan


Shani Lauf


Dr Hannah Rosenberg


Dr Michelle Kelly

COMPLETED STUDIES

@ UNSW

@ UNSW

When diplomacy fails: Some people with TBI don't pick up hints

By Skye McDonald, Alana Fisher and Sharon Flanagan

What the study is about:

Many people with severe traumatic brain injuries (TBI) have difficulty with everyday communication especially when people do not say what is on their mind directly. They can also have problems picking up on emotions in others. This study was designed to see whether a group of people with TBI could pick up hints at the same rate as people without injuries and also, whether they found it easier to pick up hints when the speaker was obviously emotional.

What we did:

We asked 31 adults with long-standing, severe traumatic brain injuries and 24 adults from the community without injuries to participate. They watched videos of two speakers talking, where one speaker made a hint to the other. Their hints became progressively more obvious. In half of the videos the "hinter" was matter-of-fact in their speech. In the other half, they were obviously emotional (cross, frightened, etc.). Research participants watched the videos and answered questions as to what they thought was on the "hinter's" mind.

What we found:

The adults with TBI recognised the matter-of-fact hints at a normal rate but, unlike the community controls, did not find the overtly emotional hints easier. Being able to use emotional hints seemed to be easier for those people with TBI who had better processing speed. It also seemed to be easier if the TBI participants were not stressed.

What our findings mean:

Understanding what kinds of conversations can be difficult for people with TBI is important in terms of thinking about new treatment approaches. It is also important for friends, family and other people who spend time in the company of a person with a TBI, to understand when things might not be clearly understood, so as to improve communication.

To read more about this study:

This study is currently in press: McDonald, S., Fisher, A., & Flanagan, S. (In press). When diplomacy fails: Difficulty understanding hints following severe traumatic brain injury. *Aphasiology* (Accepted 25 June 2015).

From brain communication to social communication: Examining the link between damage to white matter connections and impairments in social cognition

By Katie Dalton, Jacqueline Rushby, Nicklas Parks, Samantha Allen and Skye McDonald

What the study is about:

This study examined the differences in the brains white matter connections in the corpus callosum and performance on The Awareness of Social Inference Test (TASIT). White matter is involved in transmitting signals and information across different areas of the brain. Diffuse axonal injury is a common outcome following a traumatic brain injury, where white matter connections in the brain are damaged over a widespread area. This can occur within deep structures of the brain such as the corpus callosum. The corpus callosum is a bundle of white matter that connects the two hemispheres of the brain to facilitate a number of social, emotional and cognitive processes. Therefore, we wanted to see whether differences in white matter connectivity in the corpus callosum, for individuals with TBI and controls, related to their social cognition performance using the TASIT.

What we did:

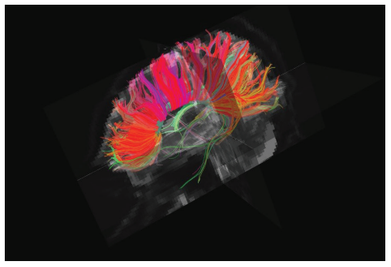
17 individuals with a traumatic brain injury and 17 control participants were involved in the study. Participants went to an hour MRI scanning session at NeuRA where brain images were taken. Participants also completed the TASIT and a comprehensive neuropsychological test battery that went for approximately 2 – 3 hours.

What we found:

Participants with a traumatic brain injury had poorer performance on the TASIT and had poorer white matter connectivity in the corpus callosum, compared to controls. There were strong relationships found in both groups where better white matter connectivity in the corpus callosum and its parts related to better performance on the TASIT.

What our findings mean:

This provides preliminary evidence that poor social cognition in individuals with a traumatic brain injury could be contributed by poorer communication between different brain regions and the two brain hemispheres.



Manipulation of heart rate variability can modify response to anger-inducing stimuli

By Heather Francis, Kathryn Penglis and Skye McDonald

What the study is about:

Emotions are a normal aspect of everyday life, but following a brain injury, an individual may lose the capacity to control their emotional behaviour or their emotions may be out of proportion to the situation. When an individual experiences emotions, they also experience changes in their heart rate. A more variable heart rate is thought to reflect flexibility in responses to emotional events. Heart rate variability biofeedback is a method that teaches individuals how to control their physiological functions with breathing techniques, by providing feedback as to the nature of their own physiological activity (heart rate). This study aimed to examine whether a single session of heart rate variability biofeedback can alter responses to angry events.

What we did:

We recruited 60 participants from the student (n = 39) and general (n = 21) community. 30 participants received HRV biofeedback in which they watched a screen which gave them feedback about their breathing, heart rate, etc., and were trained to match their breathing to a ball on-screen which helped them pace breathing to be slow and regular. The other 30 participants watched a screen but did not receive biofeedback. After 5 minutes, all participants were asked to do a stressful number counting exercise and then to watch a film about human rights injustice. We did this to induce feelings of anger.

What we found:

During the training session, the biofeedback group had a slower breathing rate and higher variability in their heart rate, suggesting the training was successful. When we then induced anger in the participants, the biofeedback group again had higher variability in their heart rate. And the higher the variability in their heart rate, the lower their anger ratings.

What our findings mean:

These findings show that variability in heart rate can be a good indicator of ability to regulate emotions, and that providing biofeedback might be a good method to improve ability to regulate emotions. But further studies are needed to explore how many sessions are required, and whether this is effective in individuals with traumatic brain injury.

To read more about this study:

Francis, H., Penglis, K. & McDonald, S. (2015). Manipulation of heart rate variability can modify response to anger inducing stimuli. *Social Neuroscience*, 22, 1-8.

Image above shows HRV biofeedback screen depicting the pacing stimulus (yellow ball; top right), respiration rate displayed in numerical form (top center), a green round light that provides feedback (top left) and the heart rate, breathing, and skin conductance waveforms

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 and Christopher Sufani

What the study is about:

The Awareness of Social Inference Test – Revised (TASIT-R) is a 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 did:

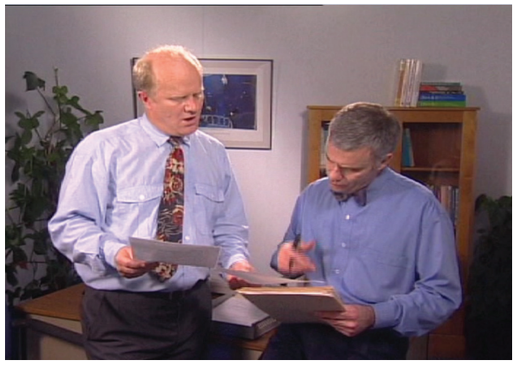
In this study we examined the structure of TASIT using complex statistical techniques (confirmatory factor analysis and structural equation modelling) in a large group of people with acquired brain injury (ABI; from trauma, stroke, etc.; n = 160). We also identified whether performance on TASIT differentiated ABI participants from healthy control participants (n = 43).

What we found:

Similar to prior studies, the TASIT differentiated ABI participants from healthy control participants on the Part 1 emotion recognition, and Parts 2 and 3 Sarcasm subtests. ABI participants performed similarly to control participants on the Part 2 Sincere and Part 3 Lies subtests. TASIT Parts 2 and 3 demonstrated sound structure according to both the Rasch and CFA models. This modelling also demonstrated that paradoxical and simple sarcasm were highly related, indicating that they are interpreted and understood very similarly by ABI participants. Understanding sarcasm, however, was not associated with a person's ability to understand sincere remarks. Likewise, understanding sarcasm was not associated with a person's ability to detect lies.

What our findings mean:

The results for Part 1 emotion perception indicated that performance is highly variable in ABI and very contextually dependent. This highlights the complexity in understanding emotions in everyday interactions.



Screen shots of example scenes from TASIT

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

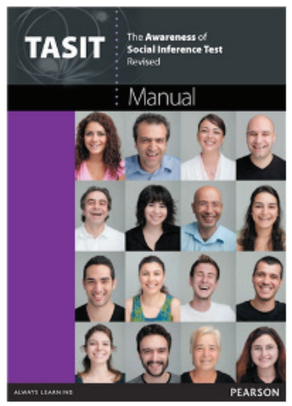
By Cynthia Honan, Skye McDonald, Christopher Sufani and Fiona Kumfor

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 did:

The aim of this study was to develop a shortened version of the TASIT to screen for higher-order social perception deficits. The shortened version was created using sophisticated statistical techniques (confirmatory factor analysis and Rasch analysis methods), which allowed us to identify whether the individual TASIT items provide necessary or useful information. Participants included 160 individuals with a history of acquired brain injury (ABI; e.g. traumatic brain injury, stroke, and tumour). To establish validity, scores on the shortened test were correlated with other tests, the original TASIT and compared to a group of healthy control participants (n = 43).



The Awareness of Social Inference Test (TASIT) manual

What we found:

The final TASIT-S comprised 10 items in Part 1 assessing emotion perception ability, 9 items in Part 2 (4 items assessing detection of sincere remarks and 5 items assessing detection of sarcasm in a minimally enriched environment), and 9 items in Part 3 (4 items assessing the detection of lies and 5 items assessing detection of sarcasm in an enriched environment). TASIT-S differentiated ABI participants from healthy control participants on the Part 1 emotion recognition, and Parts 2 and 3 Sarcasm subtests. ABI participants performed similarly to control participants on the Part 2 Sincere and Part 3 Lies subtests. Very high correlations were present between the TASIT-S and the original TASIT. The TASIT-S showed moderate correlations with alternative social cognition measures and small to moderate correlations with most alternative cognitive tests.

What our findings mean:

The TASIT-S is a useful screening tool for higher-order social cognition deficits in those with acquired brain injury which can easily be administered in clinical settings in 30 minutes.

To read more about this study:

This study is currently in press: Honan, C.A., McDonald, S., Sufani, C., Hine, D.W., & Kumfor, F. (In Press). The Awareness of Social Inference Test: Development of a shortened version for use in adults with acquired brain injury. *The Clinical Neuropsychologist* (Accepted 18 December 2015).

If you're interested in keeping in the loop about our progress, please contact Cynthia Honan at: **Cynthia.Honan@utas.edu.au**.

ERP correlates of impaired vocal emotion perception: New insights from principal component analysis

By Kelly Kershaw, Jacqueline Rushby, Skye McDonald, Frances De Blasio, Christopher Sufani, Alana Fisher and Jaimi Iredale

What the study is about:

Accurate interpersonal perception of emotions is imperative in forming and maintaining positive social relationships. Individuals who have sustained a severe traumatic brain injury (TBI) predominantly experience impairments in vocal and facial emotion recognition, which are reflected in changes to their socio-emotional functioning. Speech is the most frequently used mode of communication relied upon to express complex emotional intent. The semantic content of speech provides the literal cues that form the 'what' aspect of verbal communication. Conversely, prosody is the term given to the non-verbal features such as tone, duration, pitch, and intensity that provide the grammatical and emotional cues crucial in determining 'how' a sentence is expressed. In 2012 our lab conducted a pilot study to examine the different stages of vocal emotion processing in healthy adults and found partial support for a three-stage model (Stage 1: sensory processing, Stage 2: perceptual processing, Stage 3: cognitive processing). The current study aimed to examine whether TBI impairments in vocal emotion processing are due to perceptual or cognitive deficits in line with the three-stage model.

What we did:

Electroencephalography (EEG) was recorded from 19 adults with severe TBI and 19 demographically matched healthy controls while they completed a same-different emotional prosody word pair task. Participants were required to indicate with a button press if word 2 was spoken in the same (i.e., angry-angry, happy-happy, neutral-neutral) or different (i.e., angry-happy, happy-angry) emotional prosody as word 1. Accuracy and response times were recorded and event related potentials (ERPs) were derived from the averaged EEG data to enable observation of specific brain responses to individual words in relation to valence (positive/happy vs. negative/angry), tone (emotional vs. neutral), and word pair congruency (same vs. different).

What we found:

Analyses indicated that ERP outcomes in controls only partially matched the three-stage model. The proposed sensory N1 and perceptual P2 indices were found to be merged into a single N1/P2 complex in response to word 1. The N300 was not found; instead cognitive indices consisted of separate P3a and P3b components, and a late complex. Compared to controls, TBIs component ERP amplitudes were generally reduced and their distributions differed somewhat topographically. This was reflected in reduced accuracy and increased reaction times for the TBI group although their performance was only significantly poorer than controls in the word pair congruency analysis. Both groups showed increased difficulty processing happy compared to angry, emotional compared to neutral, and different compared to same word pairs (see Figure 1 below). Differences in N1/P2 peak amplitudes suggest that processing of vocal emotional cues may be occurring earlier than anticipated and that perceptual deficits at this stage could be having a knock-on affect for later cognitive processing.

What our findings mean:

The complex pattern of results has implications for the three-stage prosodic processing model and provides significant insight into the processing of vocal emotion.

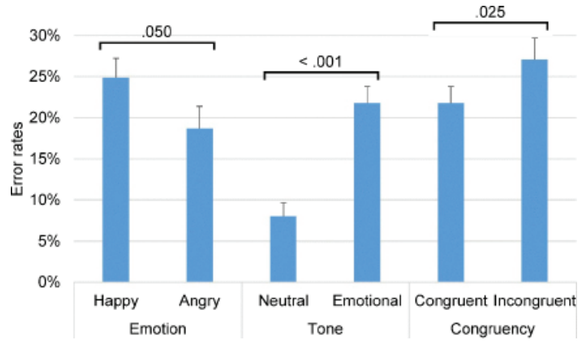


Figure 1: Mean accuracy percentages across groups for each condition, illustrating the shared difficulties for controls and TBIs in processing happy vs. angry, emotional vs. neutral, and different vs. same word pairs

Problems with smell and problems with social relationships after TBI

By Katie Osborne-Crowley and Skye McDonald

What the study is about:

Problems with sense of smell after a brain injury are often related to damage to frontal brain structures, specifically the orbitofrontal cortex. We also know that damage to this region of the brain is associated with socially inappropriate behaviour following TBI. We wanted to see whether scores on a formal smell test could predict someone's ability to behave in a socially appropriate manner in a conversation with a stranger. We also thought scores on the smell test would predict the degree of change in someone's social relationships since their injury (as rated by a close family member or friend).

What we did:

Twenty-three individuals with a severe TBI completed the brief smell identification test (BSIT). Each individual also participated in a structured conversation with the experimenter which was video recorded and later rated for inappropriate social behaviour. We also asked each participant with a TBI to take home some questionnaires for a family member or close friend to fill out. One of these questionnaires (the Neuropsychiatric Inventory) measured disinhibited behaviour, such as saying insensitive things or talking openly about very personal information. The other questionnaire measured how much change the individual with TBI has experienced in their social relationships since their injury.

What we found:

We found that the smell test scores did predict the degree of change in social relationships reported by a family member or close friend. This means that the lower a person's score on the smell test, the more likely their family or friend rated them as having had significant negative changes to their social relationships. However, the smell test scores did not predict socially inappropriate behaviour during the conversation with the experimenter, or as reported by the family member or friend.

What our findings mean:

These findings suggest that while the smell test may not be a specific indicator of damage to the orbitofrontal brain structure, it may be a good indicator of frontal damage more generally and thus it can predict problems with social relationships post-injury.

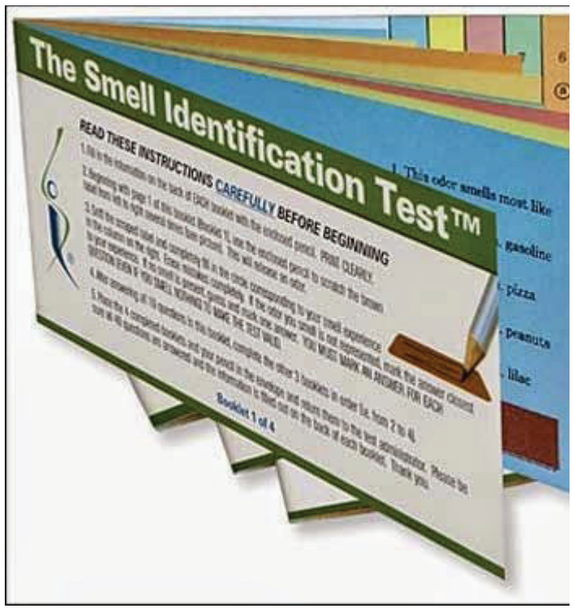


Image of the brief smell identification test (BSIT)

Do problems recognising emotions lead to inappropriate social behaviour following TBI?

By Katie Osborne-Crowley and Skye McDonald

What the study is about:

We know that many people with a TBI have problems in detecting how other people are feeling from their facial expressions. It has been widely suggested that this impairment may play an important role in the inappropriate social behaviour we often see after TBI. We wanted to find out whether problems in detecting emotions in facial expressions is related to predict someone's ability to behave in a socially appropriate manner in a conversation with a stranger. We also wanted to find out whether the ability to recognise others emotions would predict the degree of change in someone's social relationships since their injury (as rated by a close family member or friend).

What we did:

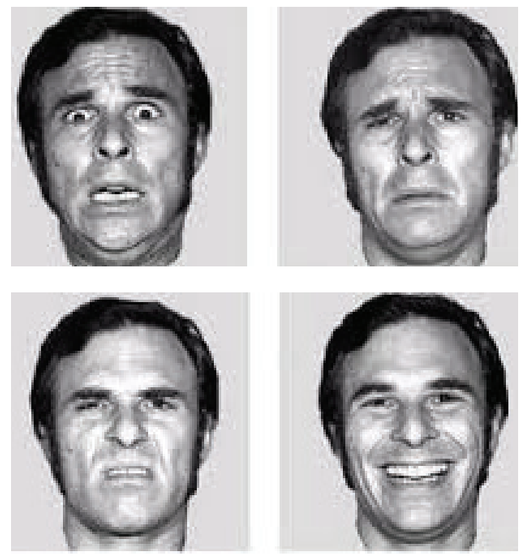
We had 23 participants with a severe TBI and 15 control participants. We showed all participants a series of facial expressions (like those portrayed in the images below) and asked them to rate how much happiness, surprise, sadness, anger and disgust they saw in those faces. Each individual also participated in a structured conversation with the experimenter which was video recorded and later rated for inappropriate social behaviour. We also asked each participant with a TBI to take home some questionnaires for a family member or close friend to fill out. One of these questionnaires (the Neuropsychiatric Inventory) measured disinhibited behaviour, such as saying insensitive things or talking openly about very personal information. The other questionnaire measured how much change the individual with TBI has experienced in their social relationships since their injury.

What we found:

We found that participants with TBI were more likely to rate an incorrect emotion as the highest intensity emotion in a facial expression. However, the actual intensity ratings provided for the various emotions did not differ significantly between the participants with TBI and the control participants.

What our findings mean:

This suggests that people with TBI are not actually impaired at detecting intensity of emotion but are less likely to perceive the correct emotion as the dominant one in an image. This result also suggests that standardised emotion perception tasks may not provide a full picture of the capabilities of people with TBI. We did not find any evidence for a relationship between level of impairment at detecting emotion in a face and socially inappropriate behaviour or level of change in social relationships since the injury. So it appears that emotion perception difficulties after TBI are not an important factor in social competency.



Impaired mirror neuron response to facial affect in traumatic brain injured patients

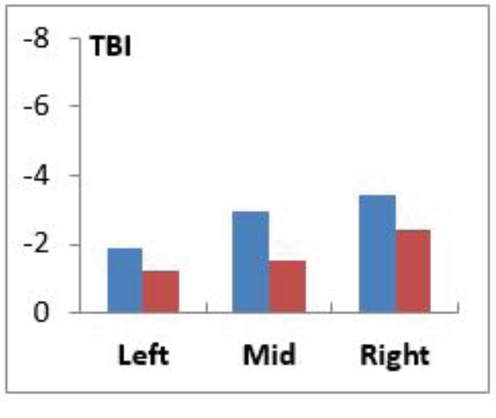
By Jacqueline Rushby, Skye McDonald, Frances De Blasio and Emma Kornfeld

What the study is about:

The disrupted capacity to understand, process and express emotional information found in people with severe traumatic brain injury (TBI) has a major impact on their social functioning. Around two thirds of patients with TBI experience deficits in arousal and emotional responsivity. The discovery of the mirror neuron system (MNS) in the human brain has provided a neurobiological substrate for understanding human social cognition directly relevant to the emotional processing deficits observed in TBI. To date, however no studies have examined MNS responsiveness in people with TBI. The current study aimed to determine whether a relationship is evident between MNS responsivity and loss of emotional responsiveness.

What we did:

Brain electrical activity, measured by Electroencephalography (EEG), was recorded while participants viewed repeated presentations of happy and angry facial expressions. Event-related Mu Power (an EEG analogue of the MNS) was derived for expression (happy vs. angry), and group (TBI vs. Controls). To date, 19 adults (15 male, age 44.9, SD = 13.7), who had sustained a TBI, and 19 age, gender and education matched healthy controls have participated.

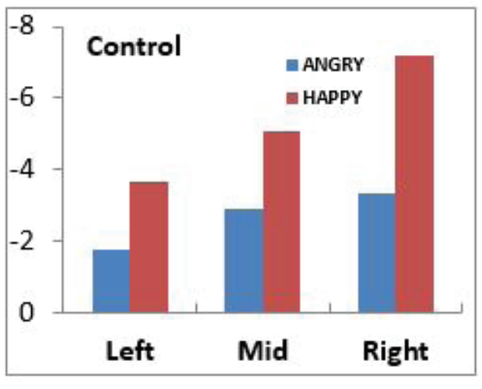


What we found:

MNS activity was found to both happy and angry facial expressions for both groups. Responses were significantly muted for the TBI group, and this was greater to the happy facial expressions (see graphs below).

What our findings mean:

Overall, the present study suggests disrupted neural networks that process emotional affect following TBI.



The graphs above and to the left show the average MNS responses found for controls compared with TBI participants to happy and angry facial expressions

The effects of ostracism in Autism Spectrum Disorder

By Emily Trimmer, Skye McDonald, Jacqueline Rushby, Michelle Kelly and Danielle Mathersul

What the study is about:

Little is known about how adults with Autism Spectrum Disorder (ASD) respond to social exclusion or being ostracized from a group. Yet, these individuals often find social interactions awkward and distressing which can lead to feelings of isolation and avoidance. This study examined the psychological and physiological effects of social exclusion or ostracism in individuals with ASD.

What we did:

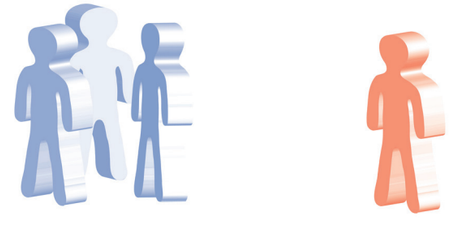
Individuals aged 16 or older with a diagnosis of ASD and matched controls participated in an online game of ball tossing in which they were either included equally or excluded after a few throws. Whilst playing, participants' arousal level was monitored via skin conductance. Participants were also required to complete a self-report questionnaire about their experience after both games.

What we found:

Results suggest that individuals with ASD were more engaged in the game than controls. They stayed focused and demonstrated higher level of arousal throughout the game than the controls. Furthermore, individuals with ASD experienced greater emotional response when excluded from the game than the controls. Individuals with ASD also appeared to have more difficulty regulating this emotional response. Conversely, those with ASD reported less emotional response than controls, suggesting that these individuals have difficulty interpreting and describing their own emotional responses.

What our findings mean:

Individuals with ASD experience significant levels of distress after being ostracised from a group. Furthermore, they seem to have more difficulty coping and reducing these negative feelings than individuals without ASD. However, individuals with ASD appear to have difficulty identifying and describing these feelings. This research highlights the need for awareness of feelings in these individuals given the difficulties they have in reporting how they feel.



Narratives and charisma in adults with a traumatic brain injury

By Sarah Kraning, Samantha Allen, Lyn Turkstra and Skye McDonald

What the study is about:

To successfully convey a narrative or story one must utilise language, communicative and cognitive skills. This then provides a comprehensive tool to assess social communicative skills. A previous study by Turkstra and Jones (2011) has found that gesture use and speech rate influenced how charismatic and attractive a conversation partner is perceived. We wanted to replicate these findings with a larger sample and see whether perceived charisma is related to narrative performance behaviours and desirability as a conversation partner. We also wanted to extend the work and see whether baseline arousal measures were an additional predictor of charisma.

What we did:

In this study, 33 individuals with a traumatic brain injury (5 females) shared their accident narratives with a female confederate. These videos were shortened to 1 minute clips and analysed for performative features. Then they were rated by unfamiliar undergraduate students using an online questionnaire via Qualtrics which included a measure of charisma. Participants were also asked whether they would have liked to engage with that person in the future and whether they thought they were an attractive conversation partner. All questions were rated on a seven-point Likert scale.

What are our next steps:

Currently the questionnaire data from undergraduates is being analysed by our colleagues at the University of Wisconsin-Madison, USA (Sarah and Lyn); and we will see whether arousal and charisma are associated.

For more information about this study:

If you would like to know more information about this study, please direct all correspondence to Skye McDonald at **s.mcdonald@unsw.edu.au**.

Sarah Kraning (above) is a Master's student in speech-language pathology at the University of Wisconsin-Madison, USA. Her thesis aims to investigate the correlation between physiological arousal and perceptions of charisma in individuals with traumatic brain injury.

Dr Lyn Turkstra (above) is a professor in the Department of Communicative Disorders and member of the Neuroscience Training Program at the University of Wisconsin-Madison, USA. Her research and clinical interests are in communication outcomes for adolescents and adults with acquired brain injury.

Reassessing habituation to emotional facial processing

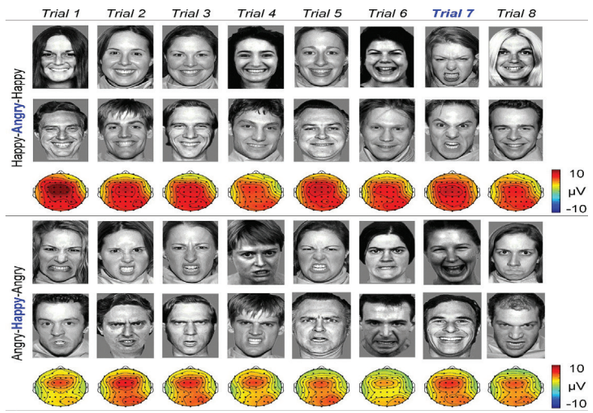
By Frances De Blasio, Emma Kornfeld, Jacqueline Rushby and Olivia Schollar-Root

What the study is about:

The brain processes happy and angry facial expressions differently, and when a person is presented with a sequence of similar expressions, less processing is expected as there is little change or new stimulus information that needs to be processed. In this study we were interested to see if the brain would show a similar or different processing pattern when people viewed a series of either happy or angry facial expressions. We also included one picture of the opposite expression to see how this would affect the processing patterns. The data for this study were actually collected in 2012 by Olivia Schollar-Root, and we are currently reanalysing the data using a technique that is more sensitive in identifying any processing differences.

What we did:

Brain waves (also known as EEG data) were recorded from 40 university students while they viewed a series of black and white pictures of faces with happy or angry expressions. Some of the students saw the Happy-Angry-Happy series and the others saw the Angry-Happy-Angry series.



Series of black and white pictures of faces with happy or angry expressions. Top 2 rows of faces are the Happy-Angry-Happy series. The bottom 2 rows of faces are the Angry-Happy-Angry series. The 3rd rows in the top and bottom sections show brain activity patterns in response to each picture. These patterns represent the electrical brain activity across the head if viewed from above, as in a top-down or birds-eye-view.

For each of these images, the black dots indicate where on the head the data was recorded, and there is a small nose indicated at the top, and small ears indicated at each side.

What we expect to find:

As expected, the figure below shows that the brain activity during the processing of the faces showed different patterns for the happy and angry expressions, and these patterns differed across the series of pictures shown. Although we are still analysing this data, the overall findings appear to suggest that the students paid more attention to the angry faces as these faces were processed faster and underwent more processing than the happy faces.

What our findings will mean:

The outcomes of this study will provide us with a better idea of what the brain processing patterns look like in this task, and will then help us to identify how traumatic brain injury changes these processing patterns. This is of interest to us as people with traumatic brain injury have some difficulty with this task, and show poorer performance particularly in relation to faces with negative emotions like anger.

The effect of visual masks on responses to emotional faces

By Emma Kornfeld, Samantha Allen, Jacqueline Rushby and Skye McDonald

What the study is about:

Faces are an integral part of communication, and as such, the processing of facial identities and expressions occurs quickly and efficiently. Exactly how fast such processing happens is unclear. In fact, we are interested to know whether it is possible that people can pick up someone's facial expression - for example, an angry look, even before they are conscious of it. In order to look at these "pre-conscious responses" we can show a photo of a facial expression really quickly and then cover it with a mask - which usually prevents the observer from being aware of what they saw. However, it turns out that the kind of mask we use is important. If the mask is another face - with a neutral expression, people seem more likely to be aware of the emotional face. This suggests that the target emotional faces may be 'priming' the neutral faces rather than the neutral face masking the emotional. So in this study, we decided to look at awareness of facial expressions with different kinds of masks.

What we did:

Thirty-five university students viewed a series of briefly presented emotional faces which were each followed by either a scrambled image or a neutral face. While they were watching these images we measured their brain activity (EEG), their facial muscle responses and their arousal (skin conductance). We are currently analysing the data, looking to see which mask disrupts the processing of emotional faces better (neutral face or scrambled image) and whether this processing is related to empathy.

What we expect to find:

We expected that the scrambled image mask would work better than the neutral face mask at disrupting face processing, and the results so far support this. We expect that the facial muscle and skin conductance responses will show similar results, and that low empathy will be related to smaller responses to the emotional faces, however we are still in the process of analysing our data. This study was conducted as a test to examine which image effectively masked the emotional face, and we are hoping to extend the findings in healthy controls to people who have had a traumatic brain injury.

For more information about this study:

For more information or if you're interested in participating in the next stage of the study, please contact Emma at: **e.kornfeld@unsw.edu.au**.

GET INVOLVED

IN OUR RESEARCH

Our research would not be possible without the generosity of all the people with traumatic brain injuries and their families, as well as our control participants who so kindly offer their time and energy to participate in our studies.

The Clinical Neuropsychology Research Team at UNSW in conjunction with Liverpool, Ryde and Westmead Hospitals are conducting research on emotion processing and social cognition following brain injury. We are looking for individuals who have suffered a brain injury, as well as healthy controls, to participate in our research projects.

If you are interested in getting involved in any of the following studies, please contact Samantha Allen, our Lab Research Assistant, on (02) 9385 3590 or at **s.k.allen@unsw.edu.au** and provide the following information: your name, date of birth, level of education, and nature of your brain injury (if applicable). We look forward to hearing from you!

Emotion and Social Communication Studies

These projects examine the ability of those who have sustained a brain injury to make judgements about the thoughts, feelings, and intentions of others. Testing sessions involve a variety of simple tasks, such as viewing pictures or videos on the computer, as well as pen-and-paper tasks. Whilst these tasks are completed, measures such as heart rate, brain activity, facial muscle activity and arousal may be taken. We are looking for individuals who have a brain injury, as well as healthy controls, to participate in these studies.

Sessions are conducted at the University of New South Wales, and require one visit lasting approximately three hours. Appointment times are flexible, to suit your schedule.

Transcranial Direct Current Stimulation (tDCS) Study

This study examines whether a brain stimulation technique (tDCS) can be used to help with problems regulating emotions, such as those that follow traumatic brain injury.

The study involves placing electrodes on the scalp and passing a weak direct electrical current through the brain that can increase or decrease neuronal excitability. The stimulation is non-invasive and painless with few reported side effects such as skin irritation or a mild headache. Participants will be fully awake and alert during the sessions. Individuals are assigned to a condition whereby they will receive tDCS or receive a sham/placebo condition. During this time they will also complete a computer-based task in which they will respond to symbols appearing on the computer monitor.

For this study, we are looking for individuals who have a brain injury, as well as healthy controls, to participate. This study will involves four testing sessions that take approximately 2 hours each. Sessions will take place at the UNSW, Kensington Campus. Appointment times are flexible, to suit your schedule.

Social Disinhibition Studies

These studies examine the ability of those who have sustained a brain injury to respond and behave in a socially appropriate way. Testing sessions involve a face-to-face interview, looking at and commenting on images of social situations, and an electroencephalogram (EEG). We are looking for individuals who have a brain injury, as well as healthy controls, to participate in these studies.

Sessions are conducted at the UNSW, Kensington Campus and require one visit lasting approximately three hours. Appointment times are flexible, to suit your schedule.

Speech Perception Study

This study examines the neural processes associated with speech perception. We hope to learn which neural processes are associated with the identification and comprehension of speech in various contexts (which are vital for effective social cognition), and how these processes may be impaired in people with brain injuries. In order to better understand the sorts of social difficulties experienced by people with brain injuries, we need individuals who have sustained a brain injury, as well as healthy control participants.

This study typically takes place across two testing sessions: the first involving an MRI scan, and the second involving electroencephalogram (EEG) testing; with each session lasting approximately one to two hours. The sessions will take place at the UNSW, Kensington Campus and Neuroscience Research Australia (NeuRA).

Self-Control Therapy

This study provides participants with self-control training, requiring them to use their non-dominant hand as frequently as possible between 8am and 6pm, every day for two weeks. Participants will be required to complete a paper diary every other day for the duration of the training, rating how often they used their non-dominant hand for a selection of tasks. Participants in the control condition will not be required to complete any tasks during the period other than answer a simple question via a text message.

Pre- and post-training, participants will be evaluated on a number of computer and pen-and-paper tasks which will help with assessing their cognitive, emotional and social competencies. This study will involve two testing sessions lasting from 2 – 3 hours each.

Emotions in Voices

In our daily interactions we rely heavily on accurate perception of emotions in voices. This study aims to (1) examine acoustic features of emotional speech, and (2) investigate how the brain processes acoustic features to interpret emotions in speech.

It is anticipated that the study will provide greater insight into the neural basis of underlying vocal emotion perception.

For this study, we are looking for individuals who have a brain injury, as well as healthy controls, to participate. If you are interested or know someone who may be suitable for this study, please contact Christopher Sufani at **christopher.sufani@student.unsw.edu.au** for more information.

Heart Rate Variability Biofeedback Study

This study will examine whether biofeedback can affect an individual's fluctuations in their heart rate (heart rate variability; HRV), and whether this can improve emotional and social dysregulation that often occurs after a traumatic brain injury.

HRV can be measured non-invasively by using a flexible respiration belt around the waist and three heart rate electrodes placed on the wrists. Individuals are assigned to one of two conditions, where they receive either; HRV biofeedback, and are trained to breathe in phase with heart rate changes, or an active control group, which are given no feedback.

This study also involves a pre- and a post-testing session, during the first and last treatment sessions. During these sessions, participants watch a few emotion-eliciting videos, and complete pen-and-paper tasks. These sessions involve measuring HRV, as well as other indices of emotion such as: skin conductance and facial muscle movement using electrodes on the finger tips and face, respectively. In total this study will involve 6 testing sessions over two weeks.

NEW RESEARCH

STARTING IN 2016

Reading Minds: Can we treat social cognitive deficits after traumatic brain injury?

By Anneli Cassel, Skye McDonald, Leanne Togher and Michelle Kelly

What the study is about:

Understanding emotions, understanding that other people think or feel things differently to ourselves, and thinking and feeling from another's perspective are all skills associated with social cognition. There are many reasons why some people find it more difficult to do these things, and having a traumatic brain injury is one of them: the regions in the brain that can be damaged through injury often affect the areas we know are important for social cognition. What is less well understood is whether it is possible to treat these social cognitive deficits after such an injury, in order to help people socialise more easily.

What we are doing:

We are currently looking at social cognition treatments that have been developed for other clinical populations, like for those with autism or schizophrenia, to get ideas about what works for others and could therefore be useful for those with a traumatic brain injury. Studies that have treated social cognitive deficits in other populations have generally found positive outcomes: difficulties in this area can improve with therapy. This is a good sign for those with a traumatic brain injury who may struggle with social cognition as it shows that, with support, these skills can get better. However, not everything that has been used to remedy social cognition in other populations is relevant for those with a brain injury. We have recently started to think about this issue: how can we make such a treatment relevant, fun, and linked to peoples' real-life experiences after a brain injury and, importantly, how can we make it work?

What are our next steps:

We hope to develop a social cognition treatment plan that meets all the previously discussed aims. In order to do this, we firstly need to continue to think of interesting ways to increase an individual's ability to think of others' perspectives and be able to put themselves 'in another person's shoes'. We will eventually need to pilot our ideas in a small group setting to see if these ideas work and take feedback on board, to make sure the people we are trying to help feel they have benefited from such a treatment. In the long run, it would be great to think about ways we could trial this on a larger scale so that we can see if this kind of treatment can make real changes to peoples' lives and help clinicians use this knowledge in rehabilitation settings.

For more information about this study:

If you're interested in getting involved or keeping in the loop about our progress, please contact: Anneli at **anneli.cassel@unsw.edu.au**.

Sensitivity of a brief measure of social skills for people with dementia

By Michelle Kelly, University of Newcastle and Skye McDonald, UNSW

What the study is about:

Many people with dementia have difficulty with social cognition, that is they have trouble reading facial expressions, and understanding the intentions behind other people's behaviour. They also fail to pick up innuendos, such as hints and sarcastic comments. This leads to misunderstandings, confusion and aggression, and can make it difficult for relationships with caregivers. Clinicians working with people with dementia do not routinely assess social cognition and this is likely due to the unavailability of an appropriate measurement tool. This study was designed to develop a brief screening test of social cognition and to see if it is sensitive to dementia.

What we are doing:

We developed the Brief Assessment of Social Skills (BASS) based on our understanding of different ways to assess social cognition. We are now giving this to people with a diagnosis of dementia and healthy controls of approximately the same age to see if it was sensitive to problems people with dementia experience. We are also giving our established test, The Awareness of Social Inference Test and the Balanced Emotional Empathy Scales.

What we found:

So far, we have tested 10 people with dementia and 26 adults of much the same age. We have found that the normal adults perform significantly better than those with dementia. We have also found that scores on certain parts of the BASS (emotion perception, empathy, social disinhibition and social reasoning) are associated with scores on established tests of social cognition suggesting that the BASS is measuring the same kinds of abilities.

What our findings will mean:

The results are encouraging thus far and suggest that a short test of social cognition may be useful to pick up everyday difficulties for dementia patients. We are currently collecting more data in order to publish these findings.

For more information about this study:

If you're interested in getting involved or keeping in the loop about our progress, please contact: Michelle at **michelle.kelly@newcastle.edu.au**.

Dr Michelle Kelly is a Clinical Psychologist and a Senior Lecturer in Clinical Psychology at the University of Newcastle. Her research focus is psychosocial functioning in people with traumatic brain injury and people with a diagnosis of dementia.

Survey of clinicians working in traumatic brain injury: Assessment of social cognition

By Michelle Kelly, University of Newcastle; Skye McDonald, UNSW; and Matt Frith, Hunter New England Health District

What the study is about:

It is increasingly well recognised that social cognition, that is the ability to read social cues and understand the behaviour of those that we interact with, is impaired in many different clinical disorders, including brain injury, Autism Spectrum Disorder, dementia and others. Despite this, it is not clear whether clinicians who work with these patient groups are familiar with, or use, tests of social cognition, or whether they treat disorders of social cognition. So this study examines the current assessment practices of clinicians working with children and adults with acquired brain injury (ABI).

What we did:

We conducted an online survey which we disseminated through professional networks. It was completed by 443 clinicians worldwide who were asked to comment on their approach to the assessment of social cognition impairments.

What we found:

84% of clinicians reported that more than half of their clients with severe brain injury have social cognition impairments. Despite this, 78% of respondents stated that they infrequently or never conducted routine assessment using a formal assessment tool. 33% said this was because there was a lack of reliable tests.

What our findings mean:

These findings suggest the need for researchers in this field to improve the development and norming of test instruments capable of detecting social cognition impairment in this population. Furthermore, these findings have implications for training and education in the use of social cognition assessment tools.

For more information about this study:

If you're interested in finding out more information about this study, please contact: Michelle at **michelle.kelly@newcastle.edu.au**.

Matt Frith is a certified Speech Pathologist with 15 years clinical experience in rehabilitation of children after acquired brain injury. He has been involved in the development of audit tools, which has been supported by the Clinical Excellence Commission to be utilised state-wide.

In his current role, as Network Manager, Matt provides strategic advice and coordination for Children, Young People and Families Services across the Hunter New England Health District.

The expanded manual for the Risk of Bias in N-of-1 Trials (RoBiNT) Scale has finally been published!

By Tate, R., Rosenkoetter, U., Wakim, D., Sigmundsdottir, L., Doubleday, J., Togher, L., McDonald, S., and Perdices, M.; University of Sydney and UNSW

What the study is about:

Conducting treatment research with groups of patients with brain disorders can be very difficult. It can be hard to find enough people suffering the same problem at the same time in the same place available for treatment. People may have the same problem but differ from each other in important ways making it hard to see group changes.

A flexible solution is to use a single-case experimental study. In this, only a very few patients are treated and each individual is carefully monitored to see how they change once treatment commences. While such single-case designs are flexible, they must be conducted rigorously, in order to prevent potential bias influencing results. Often-times, it is actually quite difficult to work out how well the study was conducted because there are so many approaches to single-case research.

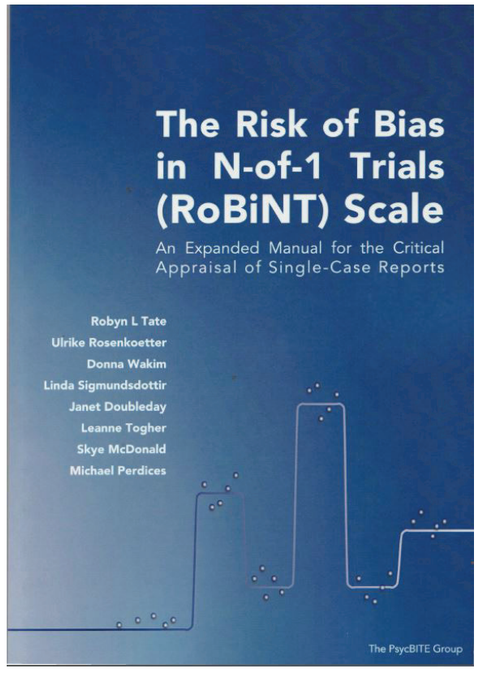
What we did:

For the past 10 years, the PsycBITE Group has worked on developing a scale that makes it possible to judge how well a single-case experimental study has been conducted. This scale not only helps readers judge how good a study is, but it also provides clear guidance in how to conduct a good study. The manual provides examples of good, mixed and poor studies, focusing on 15 different aspects of a study; for example, whether the study used an acceptable design, whether raw data was provided, whether assessments were conducted in a non-biased fashion and how data was analysed.

For more information about this study:

If you're interested in finding out more information about this study, or to purchase the RoBiNT manual, please contact: Robin Tate at **robyn.tate@sydney.edu.au**.

Dr Robyn Tate is a professor in the Sydney Medical School at the University of Sydney. She is the Program Director of PsycBITE, and is also a Clinical Psychologist and Neuropsychologist with 15 years of extensive clinical experience in rehabilitation after traumatic brain injury.



Dr Leanne Togher is the Professor of Communication Disorders following Traumatic Brain Injury (TBI) in the Faculty of Health Sciences at the University of Sydney. She also works as a Speech Pathologist with 25+ years of experience in the area of communication disorders following acquired brain injury.

Do different emotional expressions influence recognition of faces?

By Eli Vakil, Bar-Ilan University, Israel; and Skye McDonald and Samantha Allen, UNSW

What the study is about:

Eli Vakil and Bloch have previously established that the context in which we first encounter a face affects whether or not we remember this the next time. For example, if a person is wearing a strange hat, this will be an important cue when we see them again (Bloch and Vakil, 2015, Psychological Research).

As an extension of this, we are interested in whether a certain facial expression on a person's face makes it more or less likely we will recognise that face the second time we see it. In particular, we are interested in whether angry faces are more likely to be remembered than happy or neutral faces, given anger is very readily recognised.

What we are doing:

In Australia, we developed a large set of faces with different expressions (angry, happy and neutral) and sent these to Eli Vakil in Israel. He has now conducted the first of several studies where he has shown research participants 42 faces with neutral expressions. Following this, the participants see some of the same faces with neutral expressions (same as on the first occasion), some with changed expressions- either angry or happy, and some that are different faces altogether.

What we found:

So far, it seems that happy expressions reduce the recognition of (previously neutral) faces but angry expressions do not, but we need to get more data before we know for sure.

What are our next steps:

Eli Vakil will continue testing participants in Israel in order to complete the series of studies hopefully for publication. We will also use eye tracking to tell whether participants are paying attention to the facial expression and how that predicts recollection.

For more information about this study:

If you're interested in finding out more information about this study, please contact: Skye McDonald at **s.mcdonald@unsw.edu.au**.

Dr Eli Vakil has over 30 years experience in Clinical Neuropsychology. He is a professor in the Department of Psychology and the Head of the Memory and Amnesia Lab at the Gonda (Goldschmied) Multidisciplinary Brain Research Center at Bar-Ilan University in Israel.

PUBLICATIONS

OVER THE LAST 2 YEARS

BOOKS AND CHAPTERS

IN PRESS

- McDonald, S. & Cassel, A. (In Press). Rehabilitation of social cognition. In Wilson, B.A., Van Heugten, C., Winegardner, J. & Ownsworth, T. (Eds), *International Handbook of Neuropsychological Rehabilitation*. Psychology Press.

2014

- McDonald, S., Rushby, J., Kelly, M. & De Sousa, A. (2014). Disorders of emotion and social cognition in TBI. In Levin, H., Shum, D. and Chan, R. (Eds), *Traumatic Brain Injury: A review of the research and future directions*, (pp 133-160). New York: Oxford University Press, ISBN 978-0-19-973752-9.

PUBLICATIONS IN REFEREED NATIONAL AND INTERNATIONAL JOURNALS

SUBMITTED/IN PREP

- Trimmer, E., McDonald, S., & Rushby, J. (Submitted). Social Anxiety in Autism Spectrum Disorder: Implication for Empathic Understanding.

- Francis, H.M., Osborne-Crowley, K.L. & McDonald, S. (Submitted). Validity and reliability of a revised version of the Social Skills Performance Schedule for use in adults with traumatic brain injury.

- Stubbs, E., Togher, L., Kenny, B., Fromm, D., Forbes, M., MacWhinney, B., McDonald, S., Tate, R.L., Turkstra, L., Holland, A.& Power, E. (Submitted). Procedural discourse performance in adults with severe traumatic brain injury at 3 and 6 months post injury.

- Osborne-Crowley, K., & McDonald, S. (Submitted). Hyposmia, not emotion perception, predicts social disinhibition after severe traumatic brain injury.

- Rosenberg, H., McDonald, S., Westbrook, R.F., & Rosenberg, J. (Submitted). Measuring emotion perception following traumatic brain injury: The Complex Audio Visual Emotion Assessment Task (CAVEAT).

- Rosenberg, H., McDonald, S., Westbrook, R.F., & Rosenberg, J. (Submitted). Amused, flirting or simply baffled? Is recognition of all emotions affected by Traumatic Brain Injury (TBI)?

- Green, M.J., Singh, P., Sparks, A, Lino, B.J. McDonald, S., & Mitchell, P.B. (Submitted). Determining the relative contributions of neurocognition and social cognition to functional outcome in schizophrenia and bipolar disorder.

- Rushby, J.A., De Blasio, F.M., Kornfeld, E.J., Schollar-Root, O., & McDonald, S. (In Prep). Event-related potential habituation patterns differentiate happy vs. angry face processing.

- Sufani C, Rushby J.A., & McDonald, S. (In Prep). Attending to the Sound of Feelings: ERP Insights into the Perception of Emotional Prosody in Healthy Controls and Brain Injured Individuals.

- Rushby, J.A., Sufani, C., & McDonald, S. (In Prep). Perceptual versus cognitive processing in emotional prosody detection, which comes first?

- Rushby, J.A., Kershaw, K.A., McDonald, S., De Blasio, F.M., Sufani, C., Fisher, A.C., & Iredale, J.M. (In Prep). ERP correlates of emotional prosodic processing following severe traumatic brain injury: New insights from principal component analysis.

- Gerathy, M., Rushby, J.A., McDonald, S., & Dimoska, A. (In Prep). An ERP investigation into gender differences in affective prosody processing and its relationship to empathy.

- Rushby, J.A., McDonald, S., Fisher, A.C., Kornfeld, E.J., De Blasio, F.M., Trimmer, E., Parks, N., & Piguet, O. (In Prep). Amygdala volume predicts arousal and empathy deficits after severe traumatic brain injury.

IN PRESS

- Honan, C., McDonald, S., Sufani, C., Hine, D. & Kumfor, F. (In Press). The Awareness of Social Inference Test: Development of a shortened version for use in adults with acquired brain injury, *The Clinical Neuropsychologist* (Accepted 18 December 2015).

- Pagan, E., Ownsworth, T., McDonald, S., Fleming, J., Honan, C. & Togher, L. (In Press). A Survey of Multidisciplinary Clinicians Working in Rehabilitation for People with Traumatic Brain Injury. *Brain Impairment* (Accepted 4 December 2015).

- Osborne-Crowley, K., McDonald, S. & Rushby, J. (In Press). The role of reversal learning impairment in social disinhibition following severe traumatic brain injury. *Journal of the International Neuropsychological Society* (Accepted 26 November 2015).

- Tate, R.L., Perdices, M., Rosenkoetter, U., Shadish, W., Vohra, S., Barlow, D.H., Horner, D., Kazdin, A., Kratochwill, T., McDonald, S., Sampson, M., Shamseer, L., Togher, L., Albin, R., Backman, C., Douglas, J., Evans, J.J., Gast, D., Manolov, R., Mitchell, G., Nickels, L., Nikles, J., Ownsworth, T., Rose, M., Schmid, C., & Wilson, B., (In Press). The Single-Case Reporting guideline In BEhavioural interventions (SCRIBE) 2015 Statement. *Archives of Scientific Psychology* (Accepted 18 November 2015).

- Osborne-Crowley, K., McDonald, S. & Francis, H. (In Press). Development of an observational measure of social disinhibition after traumatic brain injury. *Journal of Clinical and Experimental Neuropsychology* (Accepted 31 October 2015).

- Honan, C.A., McDonald, S., Gowland, A, Fisher, A, & Randall, R. (In Press). Deficits in comprehension of speech acts after TBI: The role of Theory of Mind and Executive Function. *Brain and Language* (Accepted 1 September 2015).

- McDonald, S., Fisher, A., & Flanagan, S. (In Press). When diplomacy fails: Difficulty understanding hints following severe traumatic brain injury. *Aphasiology* (Accepted 25 June 2015).

- Tate, R.L., Perdices, M., Rosenkoetter, U., McDonald, S., Togher, L., Shadish, W., Horner, R., Kratochwill, T., Barlow, D.H., Kazdin, A., Sampson, M., Shamseer, L., & Vohra, S., for the SCRIBE Group: The Single-Case Reporting guideline In BEhavioural interventions (SCRIBE 2015): Explanation and Elaboration. *Archives of Scientific Psychology* (Accepted 12 May 2015).

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- Rosenberg, H., Dethier, M., Kessels, R.P.C., Westbrook, R.F. & McDonald, S. (2015). Emotion Perception After Moderate-Severe Traumatic Brain Injury: The Valence Effect and the Role of Working Memory, Processing Speed, and Nonverbal Reasoning. *Neuropsychology, 29*(4), 509-21. doi: 10.1037/neu0000171.

- Kangas ,M., McDonald, S., Williams, R.J. & Smee, R.I. (2015). Acceptance and Commitment Therapy Program for Distressed Adults with a Primary Brain Tumor: A Case-Series Study. *Supportive Care in Cancer, 23*(10), 2855-9. doi: 10.1007/s00520-015-2804-8.

- McDonald, S., Fisher, A., Flanagan, S. & Honan, C. (2015). Impaired perception of sincerity after severe traumatic brain injury. *Journal of Neuropsychology*. doi:10.1111/jnp.12086.

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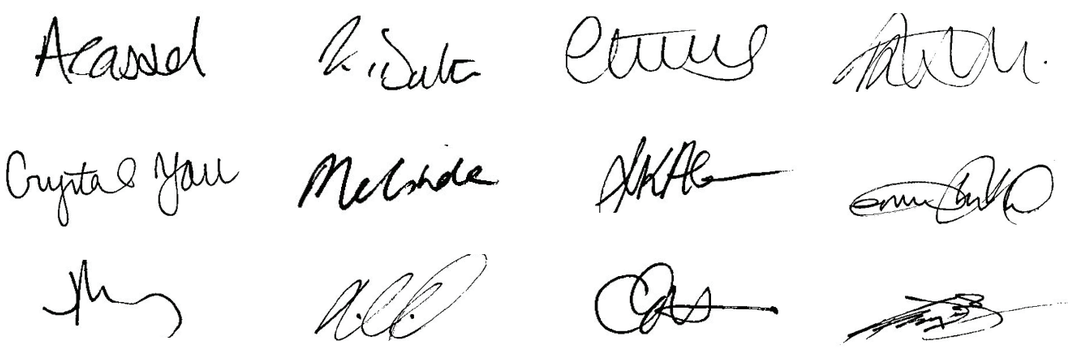
Until next year,



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