

June 2006

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work produced from the neuropsychology group at UNSW which is lead by Professor Skye McDonald and Dr Julie Henry – who joined UNSW from Aberdeen late in 2004.

We produce these newsletters to inform you about how your involvement is contributing to a better understanding of how the brain processes social and emotional information, both after a brain injury and without injury.

This type of research is important because many people who have acquired a brain injury can have difficulties with both the general and subtle aspects of social interaction. These difficulties can affect self-esteem, mood, confidence in social situations, overall rehabilitation and quality of life. By conducting this research and increasing our understanding of how social and emotional aspects are disrupted by brain injury, we anticipate that this knowledge will improve rehabilitation techniques and practical support to those with a brain injury.

The past year has been busy for us with a large number of research projects being commenced and several being completed. This newsletter outlines 12 different studies describing what we did, why we did it and what we found. It is important to mention that people with acquired brain injuries and neurological disorders are a very varied group, who experience a range of difficulties. Even though we know this is the case, we typically analyse the results of all the people with a certain condition together due to the impossibility of recruiting participants with exactly the same types of injuries. In addition, where studies have been submitted for publication, the reference to the article and target journal have been provided in case you are interested in reading more about the study. As it takes a long time for articles to be published, most articles are not immediately available but will be published in the next year or so.

Introduction

Welcome to our second research newsletter detailing our work in people with brain injuries and disorders. This year we are focusing on

Many people and agencies have been involved in coordinating and assisting in these research studies. We would especially like to acknowledge staff and students at Canterbury Boys High School and Leichardt High School, staff at the Liverpool Hospital Brain Injury Unit, especially Adeline Hodgkinson, Anne Pfaff, Diane Martin, Thelma Osoteo, Marcella Forman, Rebecca Bowen, Kim Ferry, Leisa Elliott, Irene Ko, Patty Loukas, Nicole Simon, Aruna Chand and Senerita Tua, Sarah Cotter, Lauren Gillett and Grahame Simpson; the staff at the Royal Rehabilitation Centre at Ryde, especially Clayton King, Carissa Coulston, Jane Turner, Michelle Lammi, Thea Hamieh, and Kate Martin; the staff at the Westmead Brain Injury Unit, especially Ian Baguley, Joe Gurka, Kath McCarthy, Alisa Green, and Alex Walker; the staff at the Rehabilitation Studies Unit, especially Cheryl Soo, Amanda Lane-Brown, and Regina Schultz; the staff at the Commonwealth Rehabilitation Service, especially Jennifer Rollins; the staff at Prince of Wales especially Drs Bernard Kwok and Marcus Stoodley in Neurological Sciences, Professors Tony Broe and Henry Brodarty and Drs Clement Loy and Simon Chalkey in the Departments of Geriatric Medicine and Psychogeriatrics; who have assisted in recruitment of participants. We would also like to say a sincere thank you to Bankstown Headway, and the Macquarie Centre for Cognitive Science (MACCS) at Macquarie University, for the use of their facilities and equipment during training and assessments.

Several of these projects also represent collaborations with researchers at UNSW and other institutions, in particular A/Prof Robyn Tate of the Rehabilitation Studies Unit at Sydney University, Dr Leanne Togher from the School of Communication Sciences, University of Sydney, Dr Melissa Green from MACCS at Macquarie University and Dr Karen Salmon and A/Prof Rick Richardson at UNSW.

Last, but certainly not least, our biggest thanks goes to all of the people with a brain injury and their families, as well as our control participants, who have willingly given of their time and energy to make all of this research possible. We sincerely appreciate your involvement and look forward to working with you all again in the future.

Many thanks!

Skye McDonald and Julie Henry



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Participants Needed

The Neuropsychology Research Team at UNSW is always looking for people with and without a neurological disorder affecting the brain to participate in our various studies and treatment groups.

We typically need males and females between the ages of 17 – 50 years.

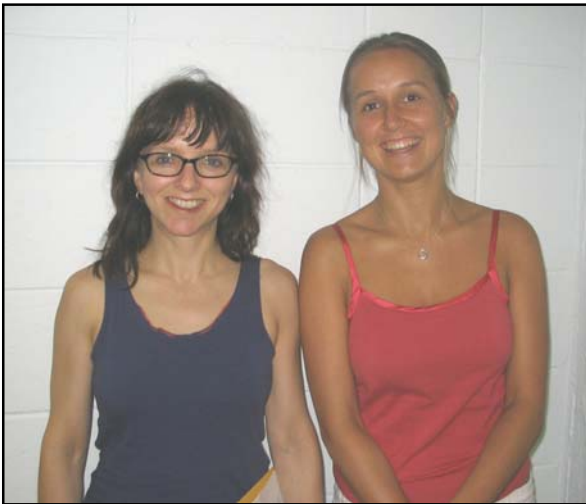
If you are interested in participating in our research, please contact one of the research assistants on: 9385 3310

1. Can we teach better social skills?

Investigators: Skye McDonald, Robyn Tate, Leanne Togher, Sharon Flanagan, Cristina Bornhofen, Paul Gertler, Esther Long, Rebecca Bowen

What the study is about

This is a very large study that we have been conducting for the past 3.5 years in conjunction with the Brain Injury Units at Liverpool, Ryde and Westmead. In this study we aimed to develop and evaluate a treatment program for reducing disorders in social skills following severe TBI. We aimed to enhance the TBI individual's ability to create a good "first impression" on meeting new acquaintances – e.g., potential employers, work colleagues and social acquaintances – and to engage in behaviour that is mutually rewarding, for themselves and their social partners.



Cristina & Esther – group leaders for the social skills study and therapists for the social skills groups.

What we did

We developed an integrated treatment approach that addresses cognitive, behavioural and emotional problems, each of which affect social skills in many people with TBI. We then evaluated its effectiveness using a randomised control trial over three successive waves, the first recruiting people with TBI from Liverpool Brain Injury Unit, the second recruiting people from Ryde Brain

Injury Unit and the third recruiting people from Westmead Brain Injury Unit. In each wave 15-20 people with TBI were randomly allocated to: (1) the treatment, (2) a social group that has no particular treatment focus or (3) a waitlist. The treatment group and the social group attended weekly group and individual sessions over a twelve-week period.

Before treatment commenced all participants were assessed on three occasions on a range of measures to evaluate their social skills. General social skills were evaluated via two questionnaires pre-treatment: the KATZ-R and the Social Skills Performance Survey (SPSS). Social perception was evaluated via The Awareness of Social Inference Test (TASIT) and improvements in levels of functioning were assessed via the Sydney Psychosocial Reintegration Scale (SPRS). Participants were also videoed while chatting to a stranger to assess actual social performance. Depression was assessed via the Depression, Anxiety and Stress Scale (DASS).

After treatment (or the social group) was over, all participants were again assessed. This assessment was repeated at 6 months post-treatment. People on the waitlist were asked to wait for treatment until assessments were over.



Rebecca Bowen, co-therapist for the Liverpool social skills group

Treatment of social skills including social perception occurred via 12 two-hour weekly group sessions supplemented by weekly individual sessions designed to support skills learning in groups and address individual issues in terms depression, anxiety etc.

42 participants were recruited for this study.

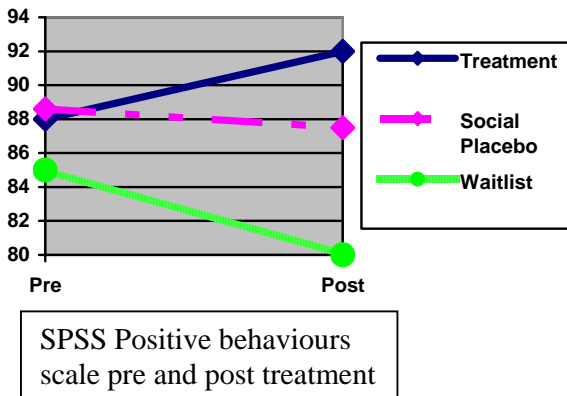
All participants had experienced severe traumatic brain injuries and were well past the acute phase of recovery (on average they were 7 years post injury). Thirteen were allocated to treatment, 14 to social group and 14 to waitlist control condition.



Amanda Baker and Regina Shultz, co-leaders (with Esther) for the Ryde social group

What we found

Feedback from clients who have attended the treatment groups has been very positive. People generally enjoyed the groups and have felt that their ability to participate socially has improved as a result. People who attended the social groups had a good time too!!



We have only analysed initial pre-post treatment data at this stage. We have found that, disappointingly, quite a few of the measures do not indicate any change in functioning as a result of the treatment, although, some such as scores on the Social Performance Survey Schedule (SPSS) Positive behaviour scale look close.



Paul Gertler: project leader for 2003 and individual therapist for all waves

We are currently in the process of rating the videos of social performance that we obtained (hours and hours of them). Two psychologists who have never met the participants or know anything about whether they were treated or not, are in the process of doing this. Once these videos have been rated we will be in a good position to look really closely at how well our measures of treatment pick up any improvements that occurred.



One of our raters, Chris Hunt, hard at work

To read more about this study:

The (very) preliminary findings for this study were presented at the 2006 ASSBI conference in Sydney.
 McDonald, S., Tate, R., Togher, L., Bornhofen, C., Long, E. Gertler, P. & Bowen, R. (In Press) Treating social skills deficits

following traumatic brain injury – preliminary results from a randomized controlled trial. (Abstract). 2006 Annual meeting of the Australian Society for the Study of Brain Impairment. [Brain Impairment](#)



Maureen Kong and Maria Haros – leaders for the Westmead social group.



2. Are problems with emotion processing after TBI caused by post-traumatic stress disorder?

Investigators: Julia Rosenfeld and Skye McDonald

What the study was about

We now know that many people with TBI have difficulties identifying facial expression of other people and also can report reduced feelings of emotion themselves. We also know that people with TBI can experience Post Traumatic Stress Disorder (PTSD) – which is a reaction to stress and which can also result in changed experience of emotion and poor emotion recognition. They can also experience a condition known as alexithymia, that is, impaired ability to experience and interpret their own emotional feelings. This study was designed to see if these problems were related.

What we did

We asked 20 people with TBI to come to the University of NSW for this study. Twenty university students without brain injuries also

took part. Participants sat in a comfortable chair and had metal electrodes taped to their face – one on their forehead and one close to their cheek. They also had a gauge placed on their finger (to measure skin temperature, also called skin conductance). Participants watched a series of slides of faces with different expressions after being given: 1) no specific instruction; 2) instruction to identify the age and gender of the individual; and 3) instruction to identify the individual's emotional state. They were also asked to identify emotions in photographs, to fill in a questionnaire about their own emotional experiences and a questionnaire asking them about symptoms of PTSD.

What we found

There was tremendous variability between participants in this study, in both people with brain injuries and those without. Consequently, as in our last experiment using the specialised equipment we did not find any significant differences between the two groups on our physiological measures.

Our measures of self-report and emotion recognition were more revealing. What we found was that more people with TBI reported symptoms of post-traumatic stress disorder than university students without such injuries. Half of our group with TBI reported clinically significant levels of symptoms consistent with PTSD. Almost as many people with TBI reported problems with alexithymia, that is, altered experience of emotions. PTSD and alexithymia were related. Those with greater PTSD symptoms also had greater alexithymia. But, PTSD symptoms were not related to poor recognition of emotions. One did not seem to cause the other. On the other hand, certain features of alexithymia, in particular, the tendency to think about physical events rather than feelings (externally oriented thinking) was related to poor capacity to recognise emotions.

To read more about this study:

A paper was presented at the 2006 conference of the Australian Society for the Study of Brain Impairment.

Rosenfeld, J & McDonald, S. (In Press) Emotion recognition, post-traumatic stress and alexithymia in adults with severe traumatic brain injury (Abstract). 2006 Annual meeting of the Australian Society for the Study of Brain Impairment. [Brain Impairment](#)

A full research paper is currently being prepared for publication.



3. Can we find a measure of social skills that is sensitive to both good and poor social behaviour in people with TBI?

Investigators: Esther Long. & Skye McDonald.

What the study was about

There is a lot of interest in finding out exactly what problems people with TBI have in social relationships. Relatives and carers are a good source of information about this but in order to get the most from them we need good questionnaires. One questionnaire that is potentially useful is the Social Performance Survey Schedule (SPSS) which has been used frequently in work with people with developmental disabilities. This scale measures not only antisocial but also prosocial behaviours. We wanted to know whether this was a good measure of social skills compared to existing measures (e.g. the KAZ-R) and that it didn't just pick up any problems people with TBI experienced (e.g. attention problems).

What we did

We asked the relatives and carers of 33 people with TBI to fill in the SPSS. We also asked 190 university students to fill in the SPSS about a relative of theirs. We asked them to also fill in another measure of social performance (the Katz-R) and we asked the people with TBI to complete a measure of attention (Digit Span).

What we found

According to their relatives, people with TBI had fewer "prosocial" behaviours than

Australians adults without brain injuries. But they did not have more "antisocial" or negative behaviours. People who scored poorly on the SPSS also scored poorly on the Katz-R suggesting the two measures were measuring similar things. Scores were independent of Digit Span (a measure of attention) suggesting that problems on the SPSS were not due to the extent of intellectual and cognitive impairment

To read more about this study:

A conference presentation on this study was given at the International Conference on Brain Injury held in Melbourne 2005. Long, E. & McDonald, S. (2005) Obtaining a Valid Estimate of Social Functioning in Individuals with Acquired Brain Injuries: The Social Performance Survey Schedule [Brain Injury](#), **19 (Suppl)** 51.

A research paper detailing the study has also been submitted for publication



4. Assessing social perception can be a reliable and valid exercise

Investigators: McDonald, S., Bornhofen, C. Shum, D., Long, E. and Saunders, J.C. , K. Neulinger.

What the study was about

The Awareness of Social Inference Test (TASIT) developed by Skye McDonald, Sharon Flanagan and Jennifer Rollins assesses how well people can "read" social cues such as emotional expressions, tone of voice and body gesture as well how well they can use these to infer thoughts, feelings and intentions of others, and how well they can discriminate between conversational remarks meant literally (e.g. sincere remarks or "white" lies) and those meant non-literally, i.e. sarcasm. It has alternate forms A and B for re-testing.



Figure 1: Still taken from TASIT (Angry video)

TASIT is very simple for most normal speakers but many people with severe traumatic brain injuries (TBI) have difficulties and these difficulties can predict problems in everyday social behaviour. In this study we wanted to know how reliable the test is when used repeatedly and also how similar it was to other tests of cognitive ability.

What we did

32 adults with severe, chronic TBI were administered Form A of TASIT twice, one week apart. 38 adults with TBI were administered Form A and then B (or visaversa) over a period of 5-26 weeks. Groups from a pool of 116 adults with TBI were given TASIT and also some other standard tests of neuropsychological function and specific social perception measures.

What we found

People who scored highly on TASIT on the first occasion tended to score similarly the next time suggesting that it is reliable for repeat administrations (Test-retest reliability ranged from 0.74 to 0.88. Alternate forms reliability ranged from 0.62-0.83). Performance was associated with other tests of face perception, information processing speed and working memory. Socially relevant tests of memory and reasoning were also associated but non-social tasks were not. Social perception tasks such as Ekman photos of faces with different expressions and stories that require understanding about what the story characters are thinking (theory of

mind) were also associated. Overall it appeared that TASIT is reliable as a clinical test of social perception and was not overly prone to practice effects. Although performance on TASIT was affected by impairments in thinking, attention and memory, the uniquely social nature of TASIT provides useful insights into the particular difficulties people with clinical conditions experience when interpreting complex social information.

To read more about this study

McDonald, S., Bornhofen, C., Shum, D., Long, E. Saunders, C., Neulinger, K. (In press) Reliability and validity of 'The Awareness of Social Inference Test' (TASIT): A clinical test of social perception. [Disability and Rehabilitation](#)

5. Is TASIT – a test that we have developed to assess emotion recognition in adults with TBI suitable for adolescents?

Investigators: Skye McDonald, Ingerith Martin, Cristina Bornhofen, Donna Pellarini

What the study was about

Previously we have developed a test (TASIT: The Awareness of Social Inference Test) that assesses emotion recognition by using videos of professional actors. The test also assesses how well people understand whether a speaker is being sincere or sarcastic based upon their facial expression and body language. The test is proving very useful for assessing adults with traumatic brain injuries (and other conditions) but because the actors are all adults and the scenarios involve adults only we did not know whether the test would also be suitable for adolescents. This study aimed to find out whether normal adolescents were able to interpret the actions and emotions of adults.

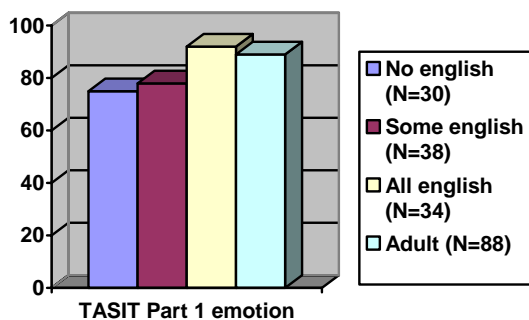
What we did

108 school students participated in this study, nine from Leichhardt High School (3 girls and 6 boys) and 99 from Canterbury Boys High

School. The majority of students were aged between 14 and 16. (We also had one 13 year old, one 18 year old and three 17 year olds). Students came from a range of cultural and language backgrounds including Asian, European and Island languages. For the purposes of our study we categorised students as (1) speaking English only at home (2) speaking English and another language at home (3) Speaking only another language at home.

What we found

14-16 year old adolescents are able to answer the questions in TASIT much the same as do adults, although not quite as well. The older students did better on Part 2 of TASIT but there was no correlation between age and either Part 1 (emotion recognition) or Part 3 (lies and sarcasm with extra context). In general, the adolescents did perform more poorly than adults, although the size of the difference was not great. Adolescents from non-english speaking backgrounds found TASIT a little more difficult than native English speakers (see graph below). This is extremely useful to know because it suggests that TASIT may be useful to use with adolescents with traumatic brain injury, provided we compare them to other adolescents, not simply adults' performance



To read more about this study

This study was presented at the 2006 International Traumatic Brain Injury Congress in Melbourne.

McDonald, S., Martin, I., Bornhofen, C., & Pellarini, D. (2005) Adolescent Performance on the Awareness of Social Inference Test (TASIT) *Brain Injury*, 19 (Suppl), 21



6. Making the most of conversation: What cues do people with TBI use when understanding others?

What the study was about

People with TBI often have normal language but, none-the-less, have difficulty following and interpreting normal conversational remarks, especially when such remarks are meant non-literally as in the case of sarcasm. What is not clear is to the extent to which they are able to use the different cues available in everyday conversational contexts.

In this study we examined how well people with TBI could interpret remarks meant to be taken literally versus non-literally when given different kinds of cues such as being able to see and hear the speaker (vs just hear) and having extra information about what the speaker actually believes.

What we did

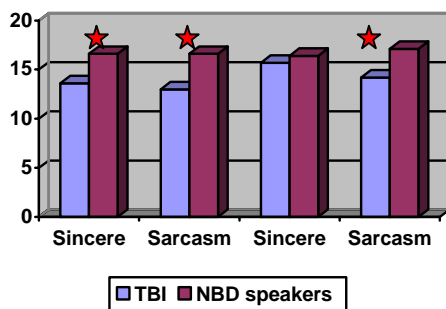
34 people with chronic severe TBI and 28 non-brain-injured control participants watched video segments from TASIT with and without extra cues. They watched sincere versus sarcastic remarks under two conditions (a) audiovisual and (2) audio only and the watched sarcastic remarks versus lies with (1) extra context about the speakers beliefs versus (2) no extra context.

What we found

The TBI speakers had difficulty understanding sarcasm but not lies. These problems are present both when provided with audiovisual cues and auditory cues alone. The presence of context did not appear to be of great benefit when interpreting such remarks, i.e. their problems appear to arise primarily from difficulties understanding the emotional state of the speaker, or from using this to guess speaker intention.

TASIT Part 2 Sincere vs Sarcasm

Audiovisual cues Audio only



★ Speakers with TBI had more trouble than those without brain injury

To read more about this study

This study was presented at the 2006 International Traumatic Brain Injury Congress in Melbourne.

McDonald, S. (2005) Making the Most of Conversation: What Cues do People with Severe TBI use when Understanding Others? *Brain Injury*, 19 (Suppl), 50.



7. Do people with TBI look at faces in the same way as others?

Investigators: Skye McDonald, Melissa Green and Fiona Taylor

What the study is about

Previous research has indicated that poor patterns of visual scanning are associated with poor ability to recognise emotions. Poor visual scanning patterns commonly occur in people with frontal lobe impairment. Many people who have had a TBI sustain damage to the frontal lobes; however, their ability to scan effectively has never been investigated. This study looks at whether there is a relationship between difficulties recognising emotion and deficits in visually scanning facial features in people with TBI. The results of this study will help us understand more about the kinds of difficulties people with TBI

experience in social situations, as well as the normal processes involved in recognising different emotions.

What we are doing**Fiona and the visual scanning headset.**

Located at Macquarie University, the visual scanning apparatus is placed on participants' heads and uses cameras and mirrors to track small eye movements whilst both upright and inverted pictures of different facial expressions are viewed on a computer screen. The movement of the eye across the picture is recorded and superimposed onto the picture so we can see where each person was looking at different points in time. In one task participants are asked to identify whether the face is male or female; and in the other 3 tasks they are asked to identify what emotion the person in the picture is expressing.

We reported on this project last year and are still collecting data. To date, 23 TBI participants have been involved and 15 control participants. We are looking for more participants with a TBI for this study. As Fiona is no longer working with us, Corrine Restuccia is looking for volunteers. If you are interested, contact Corrine on 9385 3310.



Corrine – our new eye scanner expert

Results for this study will be available in next year's newsletter.



8. Are some techniques more effective than others for treating problems with emotion perception?

Investigators: Cristina Bornhofen and Skye McDonald.

What this study was about

Numerous studies over the past few years have shown that significant proportion of individuals with traumatic brain injury (TBI) demonstrate problems with interpreting emotion-related information from facial expressions, vocal intonation and other nonverbal cues (e.g. body posture). Much less attention has been directed at developing appropriate techniques for remediating these deficits in a clinical setting. This study aimed to examine the effectiveness of two strategies, errorless learning and self-instruction training, for the specific purpose of remediating deficits in interpreting emotional cues. Both techniques have been shown to be effective with TBI clients for retraining in other cognitive domains.

What we did

Participants were 14 outpatient volunteers (NB: an additional 4 dropped out prior to completing assessment, leaving 13 male, 1 female) who had been referred by staff members of the Liverpool Hospital Brain Injury Unit. All had experienced a severe traumatic brain injury. Treatment comprised 25 hours (across 10 weeks) of one of two specifically designed programs, which incorporated either errorless learning or self-instruction training, to the exclusion of the other technique. The main focus of the programs was on mastery of basic emotion discrimination skills although treatment also encompassed the use of these skills in making social inferences such as sarcasm and lying in order to be kind to someone.

What we found

Initial analyses indicated that both treatment groups improved significantly in their ability to discriminate between basic emotional stimuli (i.e., photographs). In consideration of the very small group numbers, further analysis of individual performance was carried out using a procedure that took into account practice effects and the reliability of the measures used. The results suggested that, in particular, self instruction training may have been a powerful technique for emotion perception training in this study. These findings will assist in devising effective treatment plans for people with severe traumatic brain injuries who wish to improve their social skills.



9. Can we improve memory for personal experiences?

Investigators: Blanche Savage, Skye McDonald and Karen Salmon

What the study was about

Memory disorders are the most common complaint after TBI occurring in over 50% of cases. Finding ways for people with TBI to improve their recall of past events may also improve their functioning in social situations as many social interactions rely upon the ability to reminisce and chat about past experiences. In a previous study (reported in last year's newsletter) we found that reminders (photographs) improved subsequent recall of complex events. We wanted to repeat this study looking at a different group of people with TBI, using a shorter delay period and using each person as their own control, i.e. comparing their recall with reminders compared to their recall without reminders.

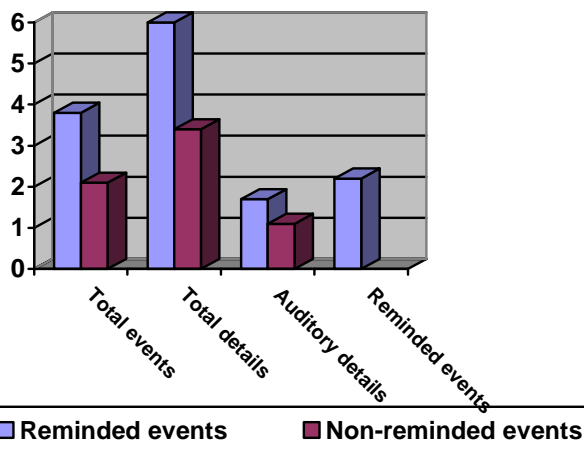
What we did

14 men and 4 women aged around 38 years who had experienced TBI around 12 years previously (with a large degree of variation in this) participated. All had suffered a severe TBI. The average length of post-traumatic

amnesia was 100 days. They participants watched two videotapes and then, 30 minutes later, were shown photos of some of the events in one of the videos. 30 minutes after that their memory for the videos was tested.

What we found

Looking at photographs improved the free recall of events in the videos, but did not affect their recognition memory. Reminders for some events can sometimes interfere with the ability to remember others not reminded. However, this did not occur in this study. Indeed there were some findings to suggest it enhanced non-reminded but related, memories. The findings of this study suggest that reminders improve recall through retrieval rehearsal. This study also has practical implications for rehabilitation.



To read more about this study

This paper was presented as a poster at the 2006 meeting of the Australian Society for the Study of Brain Impairment:

Savage, B. & McDonald, S. (In Press) The effectiveness of reminders on recall of complex events for people with severe traumatic brain injury: a within subject study. (Abstract). 2006 Annual meeting of the Australian Society for the Study of Brain Impairment. Brain Impairment (Accepted December, 2005)



10. Do people with TBI have reduced ability to think about and feel emotions?

Investigators: Julie Henry, Louise Phillips, John Crawford, Georgia Theodorou and Fiona Summers.

What the study is about

Alexithymia is a condition characterized by a reduction in the tendency to think about emotions, and to engage in fantasizing, as well as a deficit in the ability to consciously experience, describe and identify emotions. It has been thought that brain injury might lead to alexithymia because there is evidence of an association between head injury and alexithymia, but most of the evidence for this is anecdotal. This study was designed to assess whether there is an increased incidence of alexithymia in people who have sustained head injuries, and if so, whether alexithymia is associated with problems in peoples' day to day lives.

What we did

This study was conducted at the University of Aberdeen, in Scotland. We asked 28 people with TBI and 31 age, education and gender matched controls without brain injuries to take part. Participants were asked to complete a measure of alexithymia, as well as various other measures which assessed different facets of cognitive, psychological and social functioning.

What we found

Relative to controls, people who had sustained a TBI were found to have significantly higher levels of alexithymia, and in particular, reported more difficulty identifying their own emotions, and engaging in introspective thought. People who experienced greater difficulty identifying their own emotions also tended to self-report a lower quality of life. These results suggest that if we try and help people with TBI identify the emotions that they are experiencing, this may have broader implications and also help improve their quality of life.

To read more about this study

Henry, J. D., Phillips, L. H., Crawford, J. R., Theodorou, G., and Summers, F. (2006). Cognitive and psychosocial correlates of alexithymia following traumatic brain injury. *Neuropsychologia*, 44, 62-72.



11. When people with TBI have difficulty understanding what is on someone else's mind (theory of mind) is this because they don't understand emotions or because of problems with thinking flexibly?

Investigators: Julie Henry, Louise Phillips, John Crawford, Georgia Theodorou and Fiona Summers.

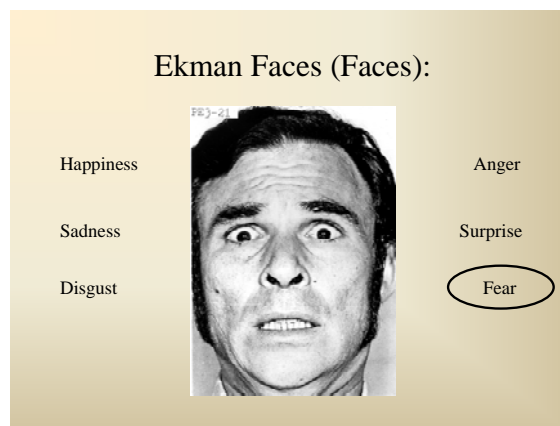
What the study is about

Many people with TBI have difficulties recognising basic emotions, inferring the mental states of others (theory of mind), as well as flexible and controlled thinking (executive functioning). But are these problems related? Specifically problems with theory of mind may be attributable to basic deficits in emotion recognition but could equally be due to problems with mental flexibility and response inhibition. This study was designed to determine which of these explanations was more likely.

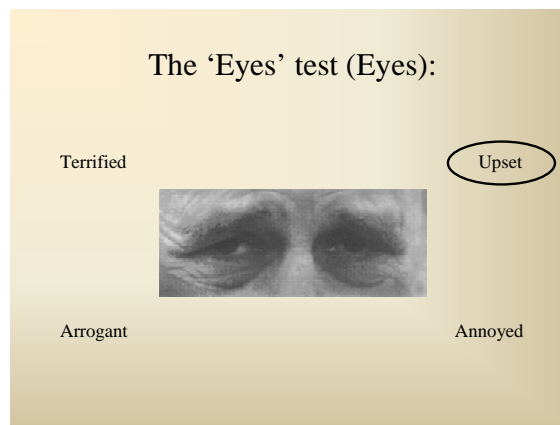
What we did

16 adults with TBI were compared with 17 healthy controls from similar social and educational backgrounds. They were asked to label basic emotional expressions (see next column). They were also required to infer what someone was thinking on a basis of a picture of their eyes (Eyes). As can be seen from the example below, the Eyes task differs from identifying basic facial expressions of emotion in that the distinctions made involve more complex emotions and often concern social factors (e.g., distinctions include attraction or repulsion, friendly or

hostile, noticing you or ignoring you). Finally, participants were also asked to complete a measure of flexibility (FAS).



Example from the 'Faces' measure (basic emotion recognition); correct answer circled.

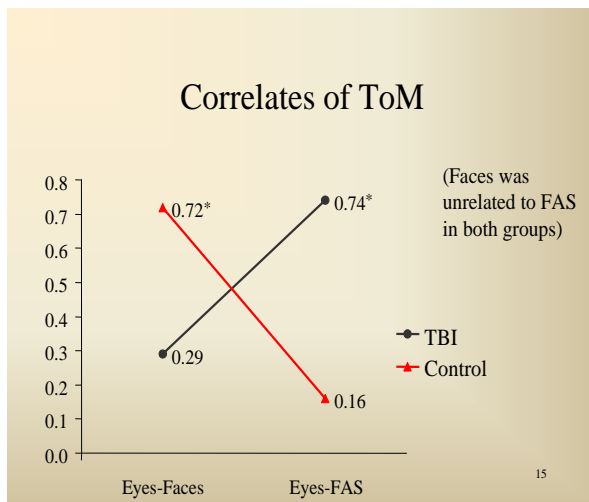


Example from the 'Eyes' measure (theory of mind); correct answer circled.

What we found

It was found that TBI participants' recognition of basic emotions, as well as their capacity for mental state attribution, was significantly reduced relative to controls. As can be seen in the Figure below, performance on both of these measures was strongly correlated in the healthy control, but not in the TBI sample. In contrast, in the TBI (but not the control) sample, theory of mind was correlated with performance on FAS.

These results suggest that deficits in flexibility and response control (FAS) may contribute to deficits in social cognition following TBI, and may help explain why so many people with TBI experience problems with social functioning.



Correlations between Theory of Mind (Eyes) emotion recognition (Faces) and flexibility (FAS)

To read more about this study

Henry, J. D., Phillips, L. H., Crawford, J. R., Iatswaart, M., & Summers, F. (in press). Theory of mind following traumatic brain injury: The role of emotion recognition and executive dysfunction. *Neuropsychologia*.



12. Do people with TBI have problems remembering to do things when the number of things to be remembered is increased?

Investigators: Julie Henry, Louise Phillips, John Crawford, Matthias Kliegel, Georgia Theodorou and Fiona Summers.

What the study is about

TBI often leads to problems with prospective memory. This type of memory refers to our

memory for future intentions – for instance, remembering to pick up bread on your way home from work, or remembering to attend a doctor's appointment. A common way of assessing prospective memory in the laboratory is to ask participants to make a particular response whenever they see a specific target event. For example, typical instructions would be: "Please press the star key whenever the word rake appears on the screen". In this example, there is only one target event (rake), however, it is possible to have more target events. For example: "Please press the star key whenever any of the words 'star', 'sun', 'show' and 'stop' appear". People typically have more difficulty in the four-target event relative to the one-target event condition.

This study aimed to find out whether if we increase the number of target events to be attended to people with TBI will have *greater* difficulty relative to people who do not have a TBI (i.e., is there any evidence of *disproportionate* impairment).

What we did

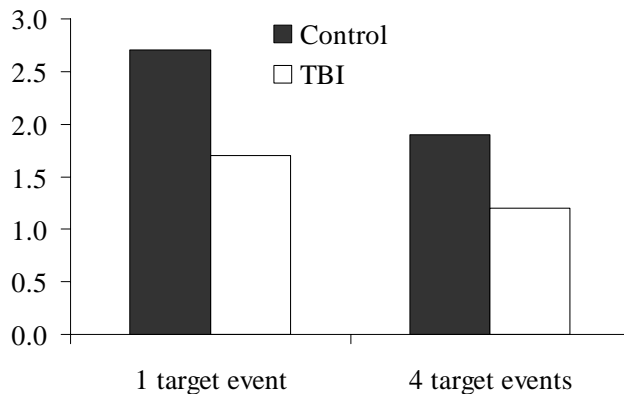
16 people with TBI and 17 age-education matched controls took part in this study. Participants were asked to complete a measure of prospective memory under two different conditions. The first condition involved participants having to make a response when one, specific target event occurred; in the second condition they were asked to make a response when any of four specific target events occurred. Participants were also asked to complete various measures of retrospective memory (memory for things that occurred in the past), and executive functioning (tasks that measure cognitive flexibility).

What we found

As can be seen in the Figure below, people with TBI had more difficulty remembering to perform the prospective memory task than did controls, and this was true for both the one- and the four-target event condition.

However TBI participants were not *differentially* impaired in their capacity to respond to four-target events, i.e. moving from one to a four target event condition

affected both groups equally. Clearly the problems people with TBI have with prospective memory are that they are poorer on all types of tasks not just complex ones. These findings are important in terms of theoretical notions of prospective memory and for planning rehabilitation.



Number of correct responses TBI and control participants made across the two conditions of the prospective memory task:

To read more about the study:

Henry, J. D., Phillips, L. H., Crawford, J. R., Kliegel, M., Theodorou, G. and Summers, F. (in press) Traumatic brain injury and prospective memory: Influence of task complexity. *Journal of Clinical and Experimental Neuropsychology*.



STOP PRESS:
Research underway

How is our ability to regulate our emotions affected by the presence of different disorders?

Investigators: Julie Henry, Skye McDonald, Phoebe Bailey, Melissa Green, Louise Phillips, Amber DeLucia, Corinne Restuccia, Marie-Andree Peek O'Leary, Scott Nash, Amy Joscelyne, Beth Williams, Ingerith Martin, Maryanne O'Donnell, William Beatty, Wendy Longley, Henry Brodaty, Chris Hunt

What the studies are about

Recent theoretical developments have challenged the notion that emotions come and go of their own accord, and it is increasingly accepted that individuals may exert considerable control over the emotions they experience by applying different regulatory strategies. In a series of studies currently underway, we want to investigate exactly how the ability to regulate emotions is affected by various types of disorders.



What we are doing

These studies are currently being conducted at the School of Psychology here at UNSW, but only with the help of various other organizations (in particular, the Departments of Neurosurgery and School of Psychiatry at the Prince of Wales Hospital, the Department of Aged Care at Royal North Shore Hospital and the Multiple Sclerosis Society of New South Wales) as well as with the assistance of various funding bodies (in particular, the *Australian Research Council* and *Alzheimer's Australia Research*). Each of the studies differ in design, but the central thing that we are investigating in each is exactly how the presence of the disorder in question affects our ability to control our emotional experience and ensuing behaviour. At present, we are investigating this in people who have been diagnosed with one of the following disorders; Multiple Sclerosis, Schizophrenia, Alzheimer's disease, TBI, as well as people who have sustained very localised brain damage, for instance as a consequence of a brain tumour.

What we will find

We don't know exactly what we will find yet, but we do know that the results will help us understand exactly how different types of brain damage affect our ability to regulate our emotions. This is really important, because emotion dysregulation has been linked to increased psychopathology and is an important predictor of mental health, well-being and our ability to interact with others. The current research will help extend our understanding of emotional regulation in a range of different diagnostic disorders, with important implications for the development of intervention-based treatments.



Phoebe Bailey, researcher on the emotion regulation project.



Needed

Control Participants

If you are a family member or friend of someone who has had a brain injury or other neurological condition you can be involved in research too!

The TBI Research Team at UNSW is always looking for people without a brain injury to participate as control subjects. We typically need males and females between the ages of 17 - 50 years who have NOT had extensive tertiary education.

If you are interested in participating, please contact one of the research assistants on: 9385 3310.