Australian Research Council Centre of Excellence in Cognition and its Disorders
Annual Report 2013
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Leading global efforts to solve fundamental and challenging puzzles about the inner workings of the human mind, based on a pioneering agenda of interdisciplinary and collaborative research.
the centre

at Macquarie University

at The University of Western Australia

at The University of New South Wales
Building upon Australia’s research and commercial strengths by serving as a point of interaction among higher education institutions, government, industry and stakeholders.
On behalf of the Advisory Board, let me begin by saying what a pleasure it has been this year to support Distinguished Professor Stephen Crain and all of the researchers, postdoctoral fellows, PhD students and administrative staff of the ARC Centre of Excellence in Cognition and its Disorders (CCD).

The Advisory Board met in February and November in 2013. Our first meeting focussed on providing guidance in the development and refinement of the Centre’s strategic plan and risk management assessment. The Advisory Board also reviewed and advised the Director on the proposed future directions and scientific expansion of the CCD, the processes that are being implemented for rewarding excellence at all levels of research, for mentoring and for succession planning. We are delighted that the Centre’s relocation to the Australia Hearing Hub has led to a new direction for the CCD in “hearing and cognition”, which the Board wholeheartedly supports.

At the second meeting of the Advisory Board we invited Dr Kevin Cullen from The University of New South Wales to share his insights on the meaning of “impact” for Centres of Excellence in Australia. The CCD Director took the opportunity to ask the Board to consider a draft of a new four page brochure entitled “Impact – How the CCD impacts the community” which outlines the many ways in which the CCD is engaged in translational research. The Board was enthusiastic in its endorsement of this brochure, and recommended that it be widely distributed to the ARC, to its stakeholders, and to the broader scientific community. In this same spirit, the Centre is planning a Stakeholders’ Workshop in early 2014, with the aim of further enhancing its impact on the community. The Board was pleased to learn of this important initiative, and offered its unanimous support. As the second Board meeting was held during the week of the Centre’s Annual Workshop we were afforded a unique opportunity to meet with members of the Scientific Committee and also with the four international Partner Investigators who presented keynote addresses at the workshop.

The 2013 Annual Report is a testament to the Centre’s many achievements in its first three years, not only in research excellence but also in outreach and in collaborations, both with industry and with prestigious international centres in cognitive science. I commend the Centre’s many ground breaking initiatives for cross program research collaborations, outreach, education and schemes to recognise the contributions of early career researchers and PhD students. These initiatives reinforce the confidence of the Advisory Board that there will continue to be significant returns from the investments that have been made to the CCD by the ARC and by its participating institutions in Australia and overseas.

The achievements of the CCD will be reviewed in 2014 as the ARC undertakes the mid-term performance review of several of its Centres of Excellence. The Advisory Board has every confidence that the CCD is well positioned to successfully complete this process. I would conclude by thanking the members of the Board, which was expanded in 2013, for their continued support and contributions.
I am pleased to present the third Annual Report of the ARC Centre of Excellence in Cognition and its Disorders (CCD). This year witnessed many exceptional accomplishments by both individual researchers and research teams. Centre personnel has grown to 280, including 100 PhD candidates, 17 Centre research fellows and 12 research support staff.

In addition to the five research programs, we established a new research direction this year in Hearing, Audition and Cognition, and appointed Associate Professor Blake Johnson as Director of Research in Hearing and Cognition. This was a natural extension for the Centre as the Macquarie University node of the CCD moved into its new home in the Australian Hearing Hub. The Australian Hearing Hub brings together many of the country’s finest researchers, educators and clinicians to help improve the quality of life for children and adults with hearing loss.

The year also saw exciting new additions to the KIT-Macquarie Brain Research Laboratory, including the installation of a third brain imaging system using magnetoencephalography (MEG). This is a first of its kind system for children and adults who have been fitted with Cochlear Implants (CI). The CI MEG represents innovative technology that opens up a brand new window for research into the effects of hearing loss – and into the effects of the restoration of hearing on the human brain – across the lifespan. This project was a collaboration between Macquarie University, Kanazawa Institute of Technology, Cochlear Ltd, The HEARing CRC and CSIRO. Another new addition to the laboratory was the installation of the state-of-the-art Liquid Helium Recovery System (LHRS) developed in collaboration with CSIRO, and partly funded by a grant from the New South Wales Science Leveraging Fund (NSW SLF). The LHRS recovers the helium gas that boils off during the operation of our MEG systems, and converts it back into liquid helium.

There were a number of changes to Partner Investigator personnel throughout the year. One was the departure of Dr Donna Rose Addis (The University of Auckland) who was a major contributor to the CCD. I would like to thank her for her dedication and commitment to the Memory Program. Another change in the Memory Program was the appointment of Professor Facundo Manes (INECO Foundation, Argentina). Professor Manes is a great asset to the CCD. His research interests are in the neurobiology of the mind, especially the role of the prefrontal cortex in human decision-making and in social cognition. Unfortunately, the last personnel change I must record was the tragic loss of Dr Andrew Calder, who passed away suddenly late in October. Andy was part of the MRC Cognition and Brain Science Unit at Cambridge in the United Kingdom and was an active and inspiring Partner Investigator in the Person Perception Program. He is a tremendous loss to the Centre.

Many outstanding researchers in the Centre received recognition throughout the year. There are too many to name here, but I would draw attention to the fact that Professor Katherine Demuth received a prestigious 2013 ARC Laureate Fellowship, one of only seventeen of Australia’s most outstanding researchers to receive this award.

We continue to try to find ways to promote and reward the significant contributions that CCD students make to the Centre. In 2013 we awarded five Excellence in Research Postgraduate Awards. We also introduced two new student awards: the Excellence in Research Student Award for a Publication, and the Excellence in Research Honours/MRes Student Award for a Poster. In addition, we introduced the Neural Markers Training Scheme to provide funding for collaborative research projects using MEG to investigate neural markers of cognition and its disorders.

It was a year full of events, including a record number of workshops, conferences, colloquia and celebratory launches of labs and programs. We were especially pleased that four of our Partner Investigators presented sensational keynote addresses at our two-day Annual Workshop in November.

To sum up, it will be apparent from this Annual Report that the CCD has reached a level of maturity, having significant impact on the community and continuing to meet the needs of its stakeholders.
ARC Centres of Excellence are prestigious research hubs in which experts from across the nation work in collaboration to extend Australia’s international standing in areas of national priority. The ARC Centre of Excellence in Cognition and its Disorders (CCD) offers unique opportunities for interdisciplinary and international collaborative research in the study of cognition, its disorders and their treatment.

The mission of the Centre is to coordinate research in five areas of cognition: belief formation, language, memory, person perception, and reading.

The five CCD research areas, belief formation, language, memory, person perception, and reading, were chosen because they are well understood from a theoretical point of view and because Australia has outstanding researchers in these areas. The five research programs will directly inform the assessment and interventions for a range of cognitive disorders, including dyslexia, specific language impairment, autism, dementia and schizophrenia.

structure

The ARC Centre of Excellence in Cognition and its Disorders brings together an extensive network of Australian and international research institutions. The central node of the CCD is Macquarie University, with additional nodes at The University of New South Wales and at The University of Western Australia. There are two other Australian institutions, University of New England and The University of Sydney, plus ten international partner institutions associated with the CCD during 2013: University of Oxford, UK; MRC Cognition and Brain Sciences Unit, Cambridge, UK; Cardiff University, UK; The University of Hong Kong, Hong Kong; Royal Holloway, University of London, UK; Institute of Education, University of London, UK; University of Kansas, USA; The University of York, UK; The University of Auckland, New Zealand (until July 2013); and INECO Foundation, Argentina (from July 2013).

governance | management

The Director, Distinguished Professor Stephen Crain, is responsible for scientific leadership and strategic direction. The Chief Operations Officer, Dr Lisa Yen, is responsible for the operational management of the CCD. Mr Andrew Hallman is acting in this role while Dr Yen is on parental leave (June 2013 – July 2014). The CCD Research Management Committee comprises the Director, the Chief Operations Officer and the Program Leaders. This Committee is responsible for the Centre’s goals, policies, and performance indicators. The progress, future directions and outreach activities of the CCD are reviewed by an international Scientific Committee composed of eminent scholars in cognitive science, and by an Advisory Board with representatives from academia and key community/advocacy organisations.
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2013 annual report
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1 casual
Enabling ground-breaking studies with international impact using custom-designed brain imaging systems as well as evidence-based intervention and remediation programs.
The Belief Formation Program aims to advance understanding of the disorders that are associated with higher-order cognition, i.e., delusions and other psychiatric symptoms. To meet this aim, we use a range of methodologies (e.g., hypnosis, cognitive neuropsychiatry, experimental psychology) and encourage cross-disciplinary perspectives that bring together cognitive scientists, philosophers and psychiatrists.

**The two-factor theory of delusional belief**

Robyn Langdon, Max Coltheart, Emily Connaughton, Jakob Howhy (Monash University), Philip Gerrans (The University of Adelaide), Dominic Murphy (The University of Sydney), Matthew Large (The University of New South Wales) and Olav Nielsen (The University of Sydney)

For the past 15 years, researchers in the Belief Formation Program have been developing a cognitive-neuropsychiatric theory intended to explain how various types of delusional belief arise. According to their theory, any delusion can be explained by discovering the answers to two questions. First: what caused the delusional idea to occur in the first place? Second: why does the patient nevertheless persist in believing that the delusional idea is true when the patient’s family, friends and clinicians insist that it is false? The two-factor theory has been applied successfully to the explanation of a number of delusions, including Capgras delusion, which is the delusional belief that a loved one, typically a spouse, has been replaced by a look-alike stranger; and mirrored-self misidentification, which is the belief that the person you see when you look in the mirror is not yourself, but some stranger who looks like you. These are monothematic delusions; that is, delusions concerning a single idea. However, many delusional patients are delusional about many different ideas: this condition is known as polythematic delusion, and this year we have begun work on whether our two-factor theory of delusional belief, hitherto applied only to monothematic delusions, might be used to explain how polythematic delusional conditions arise.

**Hypnosis research**

Rochelle Cox, Amanda Barnier, Michael Connors, Vince Polito, Robyn Langdon, Max Coltheart, Emily Connaughton, Martha Turner (University College London, UK), Nora Breen (Royal Prince Alfred Hospital) and Lisa Bortolotti (University of Birmingham, UK)

This research uses hypnosis to model pathological symptoms such as delusions and hallucinations. These symptoms occur in neuropsychological and psychiatric conditions, but they are difficult to investigate experimentally because they often occur with other impairments. To overcome this challenge, researchers at the CCD Hypnosis Laboratory have been developing hypnotic models of delusions and hallucinations. Hypnotic suggestions can create compelling, unusual experiences that are believed with conviction, similar to clinical cases. As such, hypnosis is a useful technique for producing temporary, reversible ‘virtual patients’.

This year we were interested in clinical reports suggesting that delusions may wax and wane under different circumstances. We used our hypnotic analogue of mirrored-self misidentification delusion to investigate whether we could switch this delusion on and off. The success of this study highlights the ability of hypnosis to model features of delusions that are otherwise difficult to investigate.

We also are investigating olfactory hallucinations, which involve smelling odours that are not present. We gave high and low hypnotisable individuals a hypnotic suggestion to experience a sniffing hallucination and tested whether they smelled any odours as a
consequence. We found that high hypnotisable subjects not only experienced sniffing hallucinations but many of them detected odours during these hallucinations. These findings confirm that hypnosis can be useful for studying less prevalent psychiatric symptoms.

**Prediction error processing and delusion formation**

Mike Le Pelley (The University of New South Wales), Melissa Green, Richard Morris (The University of Sydney) and Simon Killcross (The University of New South Wales)

Many of our beliefs regarding the world are formed as a result of learning about the relationships that we experience between events in our environment. For example, an illness incurred after eating watermelon might result in the belief that watermelon caused the illness, or a traumatic event experienced during driving might result in a belief that driving is dangerous. Given that associative learning is an important source of our beliefs about the world, it seems possible that a dysfunction of fundamental associative learning processes might contribute to the formation and maintenance of unusual beliefs (delusions) that are a characteristic feature of psychosis, most notably as a "positive" symptom of schizophrenia. This idea has a long history and, as a result of advances in techniques for studying associative learning processes, it has recently come under concerted empirical scrutiny. This year we used newly developed procedures to provide an empirical test of the relationship between delusional beliefs and prediction error signalling.

First we investigated individual differences in prediction errors by healthy people as a function of variations in levels of schizotypal traits (measured using self-report questionnaires). We also validated new tasks. Second we piloted these tasks with schizophrenia patient groups and healthy controls recruited via the Australian Schizophrenia Research Bank.

**Aberrant beliefs, including those involving unusual experiences of one’s own body**

Glenn Carruthers, Max Coltheart, Regine Zopf (Macquarie University), Xiaoping Gao (York University, Canada), Rachel Robbins (University of Western Sydney) and Kristina Musholt (London School of Economics and Political Science, UK)

This research focuses on beliefs about and experiences of one’s own body, and reports of spontaneous bizarre experiences such as out of body experiences. The study uses a well-known technique (the rubber hand illusion) in which an artificial hand is touched in synchrony with one’s own hand, such that people come to experience the artificial hand as if it were their own real hand. In recent work we have focussed on explaining the occurrence of this odd experience in terms of changes in the perception of similarity between the artificial hand and one’s real hand. This experience of something being a part of one’s body is also at play in a variety of cognitive disorders. For example, a delusion called somatoparaphrenia arises when stroke patients come to believe that a part of their body (e.g., their left arm), is not their own arm but, in fact, someone else’s. Our work on out of body experiences has highlighted difficulties in distinguishing subjects’ experience from confabulations (i.e., narratives told in an attempt to make sense of the bizarre experience). Although it seems as though it should be possible to distinguish experience and confabulation, it is impossible to do so. This surprising state of affairs, we argue, is predicted by a particular theory of consciousness known as ‘functionalism’.
A novel social cognitive training program for people with schizophrenia

Pamela Marsh, Robyn Langdon, Vince Polito, Max Coltheart, Melissa Green and Anthony Harris (Westmead Hospital)

This year saw continued development of ‘SoCog’, a novel psychosocial group treatment to help people with schizophrenia overcome their profound social difficulties. Social cognition refers to the abilities that sustain our understanding of the actions, intentions, thoughts and feelings of other people. These abilities underpin successful social interactions, which are reliant on social cognitive abilities to understand what others might be thinking or feeling. Social impairments are identified by people with schizophrenia, carers, and clinicians as a significant unmet treatment need. SoCog is comprised of two programs that use a suite of games and activities focusing on the specific social cognitive problems experienced by people with schizophrenia. One program is emotion recognition training, to improve the recognition of others’ facial expressions of emotion. The second is mental-state reasoning training, to encourage flexible thinking about others’ likely thoughts, the tolerance of ambiguity, and thoughtful consideration of other people’s perspectives. We also were awarded funding from Schizophrenia Fellowship NSW (2013-2014) to develop an internet version of SoCog (eSoCog) to supplement our original SoCog Program. This internet-administered treatment program has the potential to reach more people, including people in rural locations, with cheaper administration costs than face-to-face treatments, and to serve as an important bridge between early intervention services for young people, which typically last for 18-24 months, into standard care thus preventing loss of treatment benefits and increasing the likelihood of ongoing engagement with mental health services.
The Language Program investigates the development of language in normal children and adults, and in children and adults with language disorders (e.g., Specific Language Impairment (SLI), aphasia). Language is crucially used in making logical inferences, which is central to understanding how typically-developing children and children with SLI come to comprehend and use expressions that convey logical relations.

**How tense and negation interact in children with specific language impairment**

Rosalind Thornton, Stephen Crain, Kelly Rombough, Jasmine McKenzie and Linda Orton (Speech Pathology and Project Services)

English-speaking children, who have been identified as having SLI, often leave off word endings that express tense (past, present, future). Children with SLI might say ‘He walk to school’, whereas normally developing children at the same age would say ‘He walks to school’ or ‘He walked to school’. Typically-developing children produce the same kinds of ‘errors’ as children with SLI, but these errors occur at a much earlier age. Children with SLI do not reliably use tense endings until they are about 9 years old. We have conducted an experiment examining children’s use of tense in negative statements and in negative questions. Negation introduces additional complexities, beyond those introduced by tense. Logically speaking, if the affirmative sentence is ‘He walks to school’ you might think the negative equivalent would be ‘He not walks to school’. But it is not. Instead, the negative statement is ‘He doesn’t walk to school’, which requires us to use the special verb do, plus the present tense marker ‘s’, plus the negative ending ‘n’t’. Typically-developing children take considerable time to figure out how the word ‘doesn’t’ is composed. Before they figure it out, they often leave off the tense marker and say ‘He not walk to school’, and they also try out a range of alternative negative sentences including the logical ‘He not walks to school’, ‘He don’t walks to school’ as well as ‘He’s not walk to school’. Our study found that 5 year old children with SLI make exactly the same errors as typically-developing children, but they take much longer to acquire the adult form doesn’t. Most 5 year old children with SLI are still trying out all of the options, and even at 7 years old, the children have not perfected this difficult part of English grammar.

**The acquisition of morphological representations in typically-developing children and those with specific language impairment**

Katherine Demuth, Ekaterina Tomas, Kiri Mealings, Kelly Miles (Macquarie University), Ivan Yuen and Karen Smith-Lock

This project focuses on the development of morphosyntactic representations in typically-developing children and those with SLI, with special emphasis on inflectional morphemes such as plurals, possessives, third person singular, and the past tense. It examines some of the morphological skills that are acquired relatively late by typically-developing children, whether this is due to problems of articulation/motor control, or incomplete representations of phonemes and grammatical morphemes. By comparing the performance of children with SLI to that of both age-matched and language-matched controls, we gain a better understanding of the factors that contribute to the late acquisition of linguistic skills in both populations. Another series of studies explored children’s ability to use different types of grammatical morphemes. The results indicate that syllabic inflectional morphemes, such as ‘peach-es’, are much more challenging for children with SLI than segmental morphemes such as ‘cat-s’. These findings suggest that the late acquisition of these syllabic morphemes is due to various phonological and frequency factors. Other studies explored phonological context effects on both word-final consonants and inflectional morphemes. Once again the findings suggest that phonological/prosodic context effects play a major role in explaining the variability found in children’s use of these forms. These findings are important for clinicians who are evaluating children’s knowledge of grammar, and for developing more effective intervention protocols.
Treatment of aphasia

Lyndsey Nickels, Shiree Heath, Kati Renvall, Karen Croot, Belinda McDonald (St Joseph’s Hospital), Cathleen Taylor (War Memorial Hospital) and Catherine Mason

This research project aims to develop and evaluate effective treatments for aphasia, both when it is as a result of stroke or brain injury (non-progressive aphasia) and when it is as a result of a progressive brain disorder. We have had a longstanding interest in treatments that can improve the ability of people with aphasia to retrieve the words they need to communicate. Several specific projects are underway, including investigations of the mechanisms underlying effective treatment. While it is clear that treatment can improve the word retrieval abilities of people with aphasia, there is little research investigating precisely how improvement occurs. Two possible mechanisms have been put forward to account for positive treatment effects: (a) priming – behavioural performance is improved with a single prior exposure to a stimulus and (b) word learning – repeated exposure to a stimulus builds representations that are retained through learning. We are investigating this issue by testing a series of individuals with aphasia and a group of age-matched unimpaired controls. Each individual participates in a series of experiments, each focusing on a different possible mechanism, as well as a period of treatment. This will enable examination of how far priming and/or word learning abilities predict response to word retrieval treatment.

Effective grammar treatment for children with specific language impairment

Karen Smith-Lock, Suze Leitão, Lyndsey Nickels, Genevieve McArthur, Anne Castles and Polly Prior (West Coast Language Development Centre)

This project aimed to identify the key techniques in successful treatment of grammatical word endings (possessive ‘s, past tense -ed and present tense -s). The project tested the effectiveness of language treatment in a community setting, in order to answer a certain central question about SLI: Do SLI children learn better when the quantity of grammatical input is increased, or is learning facilitated more by providing explicit feedback when they commit errors? To answer this question, children received one of two treatment techniques: indirect or direct feedback. In indirect feedback, treatment involved modelling of the correct grammatical target, whereby the clinician repeated a child’s utterance and corrected any errors but did not explicitly draw attention to the error or require the child to correct himself (recasting). In contrast, the direct feedback procedure provided the child with structured feedback and opportunities to self-correct, including a forced choice of correct versus incorrect responses and direct requests for repetition. Results suggest that the direct feedback procedure, in which the child was encouraged to produce the correct response after an error, was more successful in improving performance. Transcription of treatment sessions is underway in order to plot learning curves of the children as well as to identify the key cues for eliciting correct grammatical responses.

Cognitive neuropsychology of language

Lyndsey Nickels, Britta Biedermann, Kati Renvall, Saskia Kohnen, Karen Smith-Lock, Shiree Heath, Karen Croot, Catherine Mason, Hana Burianová, Nora Fieder, Trudy Krajenbrink, Anastasiya Romanova, Vishnu Nair, Solène Hameau and Polly Barr

Language can be impaired as a result of stroke, traumatic brain injury, or dementia. These acquired language impairments are known as aphasia. Similarly, language and literacy may fail to develop normally. Cognitive neuropsychology uses these language impairments to inform theoretical models of language processing, and uses these models to increase our understanding of the nature of language impairments, and to enable more effective targeting of treatment. We combine cognitive neuropsychological methods to investigate many different aspects of language, including the way spoken and written words are learned, represented and processed in monolingual and bilingual speakers. One aspect of language is the representation and processing of lexical syntax. Our research in this area has examined how lexical syntactic information is stored in the mind. We have determined that whether a noun is a mass noun (e.g. water, butter) or a count noun (e.g. carrot, biscuit) is not something that can be ‘worked out’ online, but must be stored. Nevertheless, there can be influence from meaning and context which influences how fast or accurately mass nouns are produced. Similarly, we have discovered that plural nouns are represented differently depending on whether the word is most commonly used as a plural (e.g. beans) or as a singular (e.g. cat). This pattern is shown both by people without language impairments and people with aphasia, and helps us understand the errors that people with aphasia make with plurals.
Elucidating episodic memory circuits

Michael Hornberger, Glenda Halliday (The University of New South Wales), Rachel Tan (Neuroscience Research Australia), Stephanie Wong (Neuroscience Research Australia), Jillian Kril (The University of Sydney), Olivier Piguet and John Hodges

Episodic memory deficits are observed in the behavioural-variant of frontotemporal dementia, in Alzheimer's disease and, to a lesser degree, are also present in semantic dementia. This project combines structural neuroimaging and postmortem tissue investigations in these disorders of brain structures, which form part of the 'circuit of Papez' (hippocampus, mammillary bodies, fornix, thalamus, cingulate cortex), structures known to support memory functioning. This cutting edge approach has not only allowed us to identify the location and severity of pathological changes, but also the type of pathology affecting these structures in these different disorders. Our neuroimaging work indicates that the hippocampus and other medial temporal lobe structures crucial to optimal episodic memory functioning are affected in these disorders. While the posterior cingulate cortex appears critical for memory performance in Alzheimer's disease, damage to the frontal lobe and the thalamus contributes to poor memory performance in the behavioural variant of frontotemporal dementia. These changes have been confirmed with postmortem investigations. In semantic dementia, atrophy – but limited neuronal loss – was present in most memory relays, with the exception of the mammillary bodies. This pattern of change would explain the relative preservation of episodic memory in patients with semantic dementia.

Autobiographical past memories and imagining the future

Muireann Irish, Michael Hornberger, Michael Gascoigne, Suncica (Sunny) Lah, Laurie Miller, John Hodges and Olivier Piguet

The episodic memory system enables us to remember personal events from our recent and distant past. These memories are essential for our sense of self and continuity over time. We have conducted a number of studies investigating deficits in memory for the personal past (autobiographical memory) in a number of clinical populations known to present with damage to brain regions supporting memory processes, including temporal lobe epilepsy, transient epileptic amnesia, and subtypes of frontotemporal dementia. These studies have highlighted the different patterns of change in autobiographical memory ability across these clinical groups and their associated brain changes. The same memory system is instrumental in allowing us to imagine possible personal events in the future. Damage to the episodic memory system, therefore, prevents us from imagining the future as well as from remembering the past. Our recent work was instrumental in demonstrating that damage to the brain's semantic memory system also impacts on the ability to think about the future. Semantic memory represents our memory for facts and general knowledge and is essential for the ability to imagine the future, presumably by providing the scaffolding necessary for the construction of future events. We are collaborating in a series of studies designed to reveal the cognitive and neural underpinnings of future thinking.
Memory systems in paediatric clinical populations

Suncica (Sunny) Lah, Mary-Lou Smith, Michael Gascoigne, Louise Parry (Sydney Children’s Hospital Randwick), Robyn Tate (The University of Sydney), Naomi Brookes (Sydney Children’s Hospital Randwick), Rachel Briggs (Australian National University), Pamela Davis (The University of Sydney), Anna Mandalis (Sydney Children’s Hospital Randwick), Jasmin Grayson-Collins (The -), Belinda Barton (Children’s Hospital at Westmead), Richard Webster (Children’s Hospital at Westmead), Deepak Gill (Children’s Hospital at Westmead), Adrienne Epps (Sydney Children’s Hospital Randwick), Suzanne Benson (Children’s Hospital at Westmead), Angie Morrow (Children’s Hospital at Westmead), David Shum (Griffiths University), Lyndsey Nickels, Anne Castles and John Hodges

We are currently investigating four central questions related to memory functions in children: 1) How do semantic and episodic memory relate to each other and develop during childhood? 2) What are the functional implications of memory deficits in children and their impact on other cognitive skills such as reading, future thinking and social problem solving? 3) Are tools for assessing memory functions in children sensitive and developmentally appropriate? and 4) How can we enhance memory development and promote functional outcomes in children with memory deficits? Our investigations have uncovered a number of novel findings. We were the first to demonstrate a selective or combined deficit of semantic or episodic memory and a gradual impairment of autobiographical memory in children with temporal lobe epilepsy. We have further shown that semantic and episodic memory deficits have differential functional implications in these children: semantic memory deficits are strongly related to poor literacy skills compared to episodic memory deficits. We have also identified that children with epilepsy experience accelerated long-term forgetting. This memory deficit remains undetected by standardised memory tests. Further, we have devised a novel classification of skill recovery during post-traumatic amnesia following traumatic brain injury, based on skill acquisition during childhood. Finally, we are investigating the efficacy of computerised interventions for rehabilitation of working memory deficits in children following traumatic brain injury.

Interactions of memory and emotion

Fiona Kumfor, Muireann Irish, John Hodges and Olivier Piguet

Emotional events like weddings, funerals or accidents are typically remembered in greater detail and more vividly than other non-emotional events. This emotional enhancement of memory is thought to depend on regions in the frontal and temporal lobes. How emotional enhancement of memory is affected in neurodegenerative disorders has been unexplored to date, despite these same frontal and temporal lobe brain regions showing progressive atrophy in common younger-onset dementia syndromes. This project examines the intersection of emotion and memory in patients with Alzheimer’s disease and frontotemporal dementia. In patients with Alzheimer’s disease, episodic memory is profoundly impaired, yet emotional functioning remains intact. In contrast, in frontotemporal dementia, the reverse pattern is observed, with early impairments observed in emotional and social functioning. We have demonstrated for the first time, that emotional enhancement of memory is compromised in frontotemporal dementia, whereas the effect is present in Alzheimer’s disease. Using neuroimaging we found that this loss of emotional enhancement of memory was associated exclusively with atrophy in the orbitofrontal cortex.

Mechanisms of episodic memory

Michael Hornberger, Marshall Dalton, Sicong Tu, John Hodges and Olivier Piguet

Memories from our past are rich with different perceptual, emotional and conceptual information. Creating and remembering these episodes is crucially dependent upon the brain’s ability to integrate the different types of information that we perceive and to create meaningful associations among these elements. This binding process relies on brain structures within the medial temporal lobes such as the hippocampus and the perirhinal cortices depending on the type of information to be linked and remembered. The contribution of these different brain regions during the retrieval of these novel memories remains an area of intense research. In this project, young and older adults participate in various memory tasks during which brain activation is recorded using an Magnetic Resonance Imaging (MRI) scanner while they learn and remember different types of information. Observations from these structural and functional brain imaging experiments support the theory that specific regions within the medial temporal lobes contribute to different types of associative memory retrieval. Findings from these investigations further demonstrate specialisation within these brain regions during memory when processing of semantic (verbal) and non-semantic stimuli. We are also interested in establishing the age-related changes in memory performance and their related brain changes. Observations from this project have important implications for theoretical models of associative and episodic memory processing in the human brain.
Person perception in autism spectrum conditions

Louise Ewing, Eleni Avard, Andrew Calder, Frances Caulfield, Michael Ewbank (MRC Cognition and Brain Sciences Unit, UK), Chiara Fiorentini, Linda Jeffery, Daphne Maurer, Romina Palermo, Elizabeth Pellicano, Ainsley Read, Gillian Rhodes, Mel Rutherford, Raliza Stoyanova (MRC Cognition and Brain Sciences Unit, UK), Elizabeth Taylor, Mark Vida and Jennifer Walsh

Individuals with autism spectrum conditions often experience face-processing difficulties. Our overarching research goal is to understand the mechanisms that underlie the face- and person-processing atypicalities associated with autism. We are also investigating whether these person perception atypicalities might extend to “unaffected” individuals, who do not have a clinical diagnosis of autism but present with subtle traits of the disorder, e.g., family members of individuals with autism and other typical individuals with high levels of autism-like traits. Together, this research should provide an evidence base for researchers and clinicians to develop targeted interventions to enhance person perception, and ultimately, to enhance social functioning and quality of life in individuals with autism. One focus of our work has been adaptive processes in autistic person perception: whether atypical coding and updating of face representations might contribute to the observed difficulties recognising and discriminating between identities. Studies in this area are being conducted with both behavioural and neuroimaging data collection techniques. Results from children and adults with autism have revealed that face identity and expression aftereffects are indeed significantly reduced in these groups, relative to typical individuals. Furthermore, typical undergraduate men with high levels of autism-like traits also show diminished adaptive coding of identity, relative to those with fewer characteristics associated with autism.

The development of person perception mechanisms

Linda Jeffery, Romina Palermo, Anita Smith, Amber King, Samantha Bank, Nichola Burton, Ainsley Read, Gillian Rhodes and Elizabeth Taylor

Faces convey rich social information that guides our social interactions. Adults have little difficulty reading this information from thousands of faces, despite their apparent similarity as visual patterns. This exquisite expertise with faces emerges slowly during development, with performance on many face perception tasks improving throughout childhood. However, the source of improvement is controversial. We are investigating whether children’s difficulties could be caused by their use of different visual processing mechanisms as compared to those used by adults. One such mechanism is adaptive, norm-based coding, a process in which identity is coded relative to an average or “norm” face. We have used face aftereffects, in which perception of a face is biased by the characteristics of previously seen faces, to determine whether children, like adults, use norm-based coding for identity and emotional expression. We have now established that children use norm-based coding for face identity by at least age four. Adult face mechanisms are tuned to upright faces and this orientation-selectivity is central to adult expertise with upright faces. It has been argued that children’s face mechanisms are less orientation-selective than those of adults. We have used face aftereffects to test this hypothesis and found that 8 year-old children’s face mechanisms are just as orientation-selective as those of adults. Overall our findings are consistent with an emerging view that many of the key attributes of specialised face perception emerge much earlier in development than previously thought.
Insights into face processing mechanisms from congenital prosopagnosia
Romina Palermo, Linda Jeffery, Markus Neumann, Nichola Burton, Shahd Al-Janabi, Eleni Avard, Laura McLaughlin-Engfors, Christopher Benton, Andy Skinner, Elinor McKone, Fiona Kumfor, Olivier Piguet, Muireann Irish and Gillian Rhodes

People with congenital prosopagnosia have failed to develop adequate face identity recognition mechanisms, and as such often report severe, recurring, everyday face recognition difficulties, such as failing to recognise their child at day care or having difficulty following the plot of movies because they cannot differentiate the actors. Our recent work has focussed on discovering the perceptual mechanisms that may be disrupted in this developmental form of prosopagnosia. Holistic coding, in which information is integrated across a face, is a key face-specific mechanism. We found that a group of adults with congenital prosopagnosia showed reduced holistic coding of facial identity, suggesting that this perceptual mechanism is compromised. Adaptive face coding is another key face-specific perceptual mechanism, in which identity is coded relative to an average or ‘norm’ face, and is reflected by face aftereffects. We found that a group of adults with prosopagnosia displayed a significant face identity aftereffect. However, their impression of the identity of the neutral average face was not significantly shifted by adaptation, suggesting that adaptive coding of identity is abnormal in prosopagnosia. There are many different types of face aftereffects, which code different face attributes, such as eye gaze, expression or head direction. We are currently investigating the specific types of face aftereffects that are impaired in people with congenital prosopagnosia. We also plan to investigate whether the perceptual mechanism of ensemble coding, where an average of simultaneously presented faces is formed, is disrupted in congenital prosopagnosia. This will help us to understand how the perceptual mechanisms involved in face processing are organised.

Determinants of ensemble representations for face identity
Markus Neumann, Romina Palermo, Ryan Ng, Rachel Emiechel, Francesca de Bonis (The University of Western Australia), Mike Burton, Stefan Schweinberger (Friedrich Schiller University of Jena, Germany) and Gillian Rhodes

A face conveys an abundance of information about a person, such as his or her gender, current emotional state, and identity. Such information can be efficiently extracted in a glance, and apparently without much effort, when viewing a single face. However, humans are often confronted with multiple faces at once. These situations may require a different style of information processing. Specifically, one might be interested in gaining information about characteristics for an entire group of people at once, for example the average emotion in the crowd at a given moment (the current “vibe”). Depending on the context, information about the group could be more relevant than a single individual’s state. Ensemble representations can be derived from groups of similar objects, e.g., faces, via a cognitive mechanism that promotes extraction of average information, often at the expense of accurate memory for individual faces in the group. We tested the assumption that ensemble representation could serve as a quick and efficient way to extract information from groups of faces in situations that do not allow for a close examination of the entire scene. We found that ensemble representations were closely linked to the memory for individual faces, with no evidence that ensemble representations were encoded in the absence of memory for individual faces, e.g., at short presentation durations. In contrast to previous research that has mostly focussed on facial expressions, these findings suggest that observers do not encode the mean identity of any group of faces at a glance, but that ensemble representations for facial identity might be formed during a later stage of face processing, which requires accurate individual representation for each face in a group.
How does race affect face processing?

Kate Crookes, William Hayward, Gillian Rhodes, Elinor McKone, Nadine Kloth, Louise Ewing, Jillian Richards, Judith Gildenhuys, Stephen Pond (The University of Western Australia) and Samantha Bank

People are generally better at recognising faces from their own ethnic group than faces from other groups with which they have less experience. This “other-race effect” is well established and has been widely replicated across different countries and ethnicities. However the processes that underlie this effect are still much debated. An understanding of this phenomenon and how it might be overcome will inform theories of face recognition more generally and may have practical implications in our increasingly global society. This year we investigated differences between own- and other-race faces in experience, attention allocation, motivation and social categorisation. Previous evidence in the literature that social factors can influence the other-race effect has mostly come from one specific ethnic group and location – White Americans. In contrast, we have repeatedly found across a number of studies that social, motivational and attentional manipulations do not reduce the other-race effect in the groups we test (i.e., Caucasian and Asian participants in Australia and Hong Kong). Our findings are consistent with a perceptual basis of race effects in face recognition resulting from a lack of experience with other-race faces.
Computational modelling of reading
Max Coltheart, Serje Robidoux, Stephen Pritchard, Anne Castles, Eva Marinus, Ami Sambai, Derek Besner (University of Waterloo, Canada), Kathleen Rastle, Claudio Mulatti, Steven Saunders and Lisa Ceccherini

This project has been devoted, in part, to programming the second version of the Dual Route Cascaded (DRC) computational model of reading, DRC 2.0. Programming has been completed and testing of the DRC 2.0 model involving new experimental studies of reading aloud and visual word recognition was begun in 2012 and has continued in 2013. This empirical work is being carried out in three overseas laboratories. Work is also underway on a second project, aimed at developing a DRC-style computational model of reading aloud and visual word recognition in Japanese. Japanese represents a unique challenge for modelling because it uses three different writing systems, rather than the single, alphabetic, writing system used by languages that were previously modelled using the DRC computational model of reading. A DRC-style computational model of reading aloud and visual word recognition in Greek has also been constructed. Finally, we have worked on developing a version of the DRC that learns. Until now, DRC has not explicitly modelled the process of acquiring reading skill, despite its success in offering an account of skilled reading. A new DRC model, titled “learning-DRC”, or L-DRC, has been created that models reading acquisition within the DRC framework. L-DRC will be used to investigate theories of reading acquisition, and offer a demonstration of how learning of various word types such as regular words, irregular words, and homographs can be acquired by a beginning reader without constant instruction from a teacher on every item.

Orthographic learning in dyslexia and the hearing-impaired
Anne Castles, Eva Marinus, Hua-Chen Wang, Lyndsey Nickels, Kate Nation, Malin Wass, Teresa Ching (National Acoustic Laboratories) and Linda Cupples

This ongoing research project explores how children acquire representations of individual written words, and how this may be impaired in children with different developmental disorders. Although it is known that learning alphabetic decoding skills is a key foundation of learning to read, children must ultimately move beyond this to recognising individual words fluently and automatically. Much less is known about how this advanced stage of word reading is acquired. In a new project on this theme, we have begun to explore orthographic learning in two groups of children who often experience phonological problems, namely profoundly deaf children with Cochlear Implants and children with phonological dyslexia. A special focus is to find differences and similarities between the two groups in: a) orthographic learning and orthographic representations, b) the cognitive skills that affect orthographic learning and reading in general, and c) the possible effects that semantic context may have on orthographic learning in these children. The performance of children with dyslexia and children with Cochlear Implants (CI) will also be compared with that of peers with normal hearing and typical reading development. This project is in collaboration with the National Acoustic Laboratories (NAL).

Reading Program

The Reading Program uses theoretical models of reading as the basis for investigating how children learn to read, why some children have so much difficulty (developmental dyslexia), and how such difficulties are best treated. These models are applied to the understanding and treatment of the different kinds of reading disorders that are seen in formerly skilled readers after brain damage (acquired dyslexia). The neural basis of both normal and impaired reading can be investigated using brain-imaging techniques such as Event-Related Potentials (ERP).
Letter processing in typical reading and dyslexia

Serje Robidoux, Saskia Kohnen, Max Coltheart, Sachiko Kinoshita, Derek Besner (University of Waterloo, Canada), Nicholas Badcock, Yvette Kezilas and Anne Castles

This project is focussed on early letter and character string processing in dyslexia, with an eye towards developing and implementing a computational model of different dyslexias. While skilled readers can effortlessly identify letters and order them, letter-position coding is not a trivial problem. Letter-position dyslexics find the task very difficult. For example, they might read ‘wrap’ and ‘pirates’ as ‘warp’ and ‘parties’. Letter-by-letter reading is another form of dyslexia that is characterised by a strong sensitivity to letter-confusability, which results in very slow “one letter at a time” reading of words (which skilled readers do not do). Results like these show that letter identification and letter-position coding are not bullet-proof. In the first part of this project, we conducted experiments designed to test whether or not visual similarity between two adjacent letters influences processing. For example, is LCOAL easier to identify as local than LOACL (where the OC pair is visually similar, but the CA pair is not)? In another project, we have explored the question of whether increasing letter spacing improves reading in children with dyslexia. There are several research studies suggesting that increasing the spacing between letters can help poor readers increase reading accuracy and speed. In this research study, we want to find out if these spacing manipulations improve reading performance both in single words and texts.

Attentional deficits in dyslexia

Nicholas Badcock, Genevieve McArthur, Anne Castles, Saskia Kohnen, Naama Friedmann, Hanli Uys, David Badcock (The University of Western Australia), Kathryn Preece, Kate Glenn, Yvette Kezilas, Linda Larsen, Kristy Jones and Joanna Kidd

We have been examining temporal attention in dyslexia as measured using the “foreperiod” paradigm. In 2013 we extended the foreperiod effect to visual stimuli over shorter intervals to examine speed of processing. Our findings suggest that the preparation of visual attention is slower in some children with dyslexia but that auditory deficits may be confounded with dual target confusions. We have also been conducting a meta-analysis of research on the “attentional blink” paradigm and dyslexia. This has uncovered a number of variables related to the general difficulties associated with dyslexia in this paradigm. The variables strongly correlated with between-group differences were fixation duration, temporal variability of targets, and the exposure duration of stimuli. We are in the process of planning follow-up experiments to directly manipulate these variables. Finally, we have studied the phenomenon of attentional dyslexia. People with attentional dyslexia swap letters between words. For example, dark part may be read as “park dart” or “dart park”.

Reading and spelling training studies


This year, we have carried out a range of training studies focussed on informing the development of effective treatment for reading disorders. We have carried out a reading fluency training study to determine whether children with dyslexia can be helped to read more fluently by making them aware of the syllabic structure of words. We are also in the process of conducting a randomised control trial in which we train oral vocabulary skills, to determine whether this can assist children with specific comprehension difficulties. We have written up the findings of our large training study examining the effects of phonics and sight word training, and their order, on remediating poor reading. We have also continued a spelling training study. In the first phase of this study we recruited 14 primary school aged children with developmental spelling difficulties. These children were “phonetic spellers” and tended to spell words the way they sound, for example, ‘said’ as ‘sed’. We tested children twice before the training and once after the training. All participants showed significant improvements in spelling their trained words. Eight of the children also showed generalisation for a small number of words that were not specifically trained. These words tended to have the following characteristics: they shared letters with the trained words (for example, tough and though), they occurred more often in written texts and were shorter. These results show that sight word training can improve spelling beyond just the words that are the focus of training.
Enculturated cognition and its disorders

Richard Menary, John Sutton, Max Coltheart, Nicolas Bullot, Greg Downey (Macquarie University), Doris Mcllwain (Macquarie University), Evelyn Tribble (University of Otago, NZ), Regina Fabry (Johannes Gutenberg University of Mainz, Germany), Mirko Farina, Jan (Richard) Heersmink and Kellie Williamson

The main goal of this research is to theoretically and empirically examine the affects that cultural practices, tools and systems of representation on cognitive mechanisms, encompassing four sub-projects:

Narrative, Belief and Theory of Mind: this research relates to the Belief Formation and Memory Programs, and here the main goal is to distinguish the role that narratives play in social cognition, especially theory of mind and disorders of the self. Research questions include: What is the role of narrative in confabulation? How do narratives influence the sense of self? What are the mechanisms responsible for narratives in these cognitive contexts? Is there a narrative route in the dual factor theory of delusion?

Cognitive Practices: this research broadly relates to the Reading Program and explores the notion that humans have shown a remarkable capacity to invent cognitive tools that capitalise on the environment. The main research question is: What are the various ways in which such tools transform our fundamental cognitive mechanisms and cognitive skills? Humans have only very recently (in evolutionary terms) developed writing systems for language and mathematics. The abilities to read and write and perform complex mathematical calculations are not evolutionary endowments. There are no neural circuits that have evolved specifically for reading and writing and there is no neural module for algebra; yet humans are capable of learning to read and write and solve algebraic equations. How is this possible? The project will develop a theoretical model of how the enculturation of the brain gives rise to a transformed set of cognitive systems that make reading, writing and mathematical cognition possible.

Mindful Bodies in Action: Skilled experts in sport or dance perform extraordinary actions in perfect time, with exquisite control, and display resilient coping under pressure: their mindful bodies blend cognition and emotion in action. This research project integrates disconnected research on skilled movement in a new, multidisciplinary, mixed method account of embodied intelligence. Our studies focus on three sets of issues, concerning a) timing and anticipation; b) control and agency; c) resilience, personality, and pressure.

Cognitive History: this research builds a detailed framework for the historical study of cognition, incorporating cognitive approaches to cultural history and to literature, performance and the arts. One strand addresses ecologies of skill and memory in early modern England, integrating the theory of distributed cognition with detailed case studies of practices of memory, education, action, and religion in the 16th and 17th centuries. Another strand develops a psycho-historical theory of art history and aesthetics.

Belief in memory

Amanda Barnier, Donna Rose Addis, Greg Savage, Rochelle Cox, John Sutton, Nicolas Bullot, Celia Harris, Muireann Irish, Emily Connaughton, Aline Cordonnier, Amanda Selwood, Marie (Misia) Temler, Kellie Williamson, Paul Keil and Aleea Devitt

The project brought together investigators from the Belief Formation and Memory programs to consolidate individual cross-program links into broader, long-lasting collaborations on belief in memory. We conducted a conceptual review of the relationship between belief and memory; conducted new experiments on the transmission of beliefs and memories via collaboration; and adapted memory-coding methods from Donna Addis and the Collective Memory team to examine the nature of remembering within clinical cases of delusional beliefs. We also are underway on a new sequence of collaborative recall experiments funded by recently awarded ARC Future Fellowship and Discovery grants. We found that beliefs, not just memories, can be transmitted when people collaborate together on tasks, developing new beliefs that they carry away from the group with them. And we found that people with clinical delusions use a lot of “memory talk” in service of their delusion but that the qualities of these memories look quite different from the memories of healthy people in autobiographical memory studies. The project also provided an avenue for high quality supervision and mentoring to postgraduates and postdoctoral fellows across the programs.

Face perception, trust and paranoia

Ryan McKay, Max Coltheart, Robyn Langdon, Emily Connaughton and Gillian Rhodes

The present study combined techniques from behavioural economics and experimental psychology, with the symptom-focussed approach of cognitive neuropsychiatry, to explore the attentional concomitants and financial consequences of paranoia. 150 participants played a series of financially incentivised, computerised bargaining games (“trust games”). A subset of participants with high and low levels of non-clinical paranoid ideation later took part in a second series of games while we concurrently recorded eye-movements. Paranoid trustors transferred significantly less money to trustees than non-paranoid trustors. Moreover, paranoid trustors earned less money from the games and were more sensitive to different trustee poses, transferring less money to trustees posing with ‘neutral’ or ‘untrustworthy’ expressions than ‘natural’ or ‘trustworthy’ expressions. In the eye-tracking phase of the study we found that paranoid trustors spent less time looking at trustee faces on each trial. Finally, there was a trend for dwell time to mediate the effect of paranoia on trustor transfers. Our results validate the trust game as a useful paradigm for evaluating non-clinical paranoia, and indicate that paranoid individuals are relatively averse to looking at the faces of interaction partners in a context of risk, defaulting to a more cautious (and ultimately costly) interaction strategy.
Powering up the right hemisphere when words fail: Augmenting Melodic Intonation Therapy (MIT) with non-invasive brain stimulation to treat impaired left-hemisphere function

William (Bill) Thompson, Paul Sowman, Greg Savage, Lyndsey Nickels and John Hodges

We investigated whether the right hemisphere can be engaged using Melodic Intonation Therapy (MIT) and excitatory repetitive Transcranial Magnetic Stimulation (rTMS) to improve language function in aphasic patients. Two participants (GOE and AMC) had chronic non-fluent aphasia. The treatment included an rTMS phase, which consisted of 3 treatment sessions that used an excitatory stimulation method known as intermittent theta burst stimulation, and a sham-rTMS phase, which consisted of 3 treatment sessions that used a sham coil. Each treatment session was followed by 40 minutes of MIT. A linguistic battery was administered after each session. After MIT and TMS treatment, one participant (GOE) improved in verbal fluency and phrase repetition. However, the other participant (AMC) showed no evidence of behavioural benefit from this treatment. Post-treatment changes in neural activity were observed in both participants, in Broca’s area in the left hemisphere and in the homologue to Broca’s area in the right hemisphere. These case studies indicate that a combination of MIT and rTMS applied to the right Broca’s homologue has the potential to improve speech and language outcomes for some people with post-stroke aphasia.
neural markers

Influence of language experience on the cortical representation of pitch: Comparison of MEG and EEG data

Ravi Krishnan (Purdue University, USA), Graciela Tesan and Blake Johnson

Neural representation of pitch at the brainstem level has shown that native speakers of Mandarin (compared to native speakers of English) show more accurate pitch tracking and stronger pitch representation of sounds with native pitch contours presented in either a speech or a non-speech context. These results suggest long-term language-experience-dependent reorganisation in the brainstem to enhance behaviourally relevant pitch contours in Chinese listeners. Here we examine whether this enhanced representation of pitch is also observed at the early sensory level processing in the auditory cortex using the cortical pitch response (recorded using concurrent MEG and EEG recordings) which presumably reflects pitch relevant neural activity localised to the lateral Heschl’s Gyrus. The overall objective is to understand how language experience shapes pitch mechanisms in the brainstem and auditory cortex, and also the nature of the interplay between cortical and subcortical pitch mechanisms.

MEG study of auditory change detection

Fabrice Bardy (The HEARing CRC), Shu Hui Yau and Blake Johnson

EEG and MEG studies of auditory perception in disorders such as autism, schizophrenia, language impairment, and dyslexia typically focus on the mismatch negativity response. Participants hear a sequence of identical “standard” sounds containing occasional “deviant” sounds. The mismatch negativity is calculated by subtracting the brain response to standard sounds from responses to the deviant. Unfortunately, the mismatch response is not particularly reliable, so it is not suitable for measuring differences between individuals. EEG has been used to measure a brain response, known as the Acoustic Change Complex, to subtle changes within rapidly presented sounds. This is more reliable than the mismatch response and provides a more direct measure of auditory change detection. We have conducted an equivalent MEG study. Preliminary results indicate that the rapid Acoustic Change Complex can also be detected using MEG. In comparison to EEG, MEG provides much clearer differentiation of responses originating in the left and right hemispheres of the brain.

MEG studies of auditory processing in autism

Jon Brock, Shu Hui Yau, Yatin Mahajan and Blake Johnson

Atypical auditory processing is a common feature of autism. Many individuals show hypersensitivity to auditory stimuli and some have exceptional pitch discrimination skills. There is also evidence, both from first-hand accounts and from experimental studies, that autistic individuals often have difficulty processing sounds in complex acoustic environments, particularly with regard to following speech against a noisy background. None of these features are incorporated in diagnostic criteria, but the fact they are nevertheless associated with autism indicates that there is, at some level, a causal relationship between atypical auditory perception and the “core” diagnostic symptoms of the disorder. Understanding the underlying neurocognitive mechanisms of atypical auditory perception should therefore provide important insights into the origins of autism. In one study, MEG was used to investigate auditory brain responses in a group of 10 autistic children, aged between 8 and 12 years. The stimuli used were noise bursts presented to both ears. On some trials, a timing difference was introduced between the two ears, leading to the illusory perception of a tone. For typically-developing children, the brain responses to the illusory tone began around 250 milliseconds after its onset. We predicted that autistic children would not respond to the tone at all, but in fact they showed an early response, at around 50 milliseconds, which has not previously been found in any other group.

Neural mechanisms of inhibitory control of vocalisation in aging and dysfluency

Andrew Etchell, Paul Sowman and Blake Johnson

As human beings we rely on speech as the most effective and flexible means of communicating our ideas and sharing our experiences and knowledge. During conversation the speech control system precisely coordinates nearly 100 muscles to produce 6 syllables per second. To achieve this, a delicate balance must be struck between excitatory impetus and inhibitory suppression so that the onsets and offsets of speech are both rapid and flexibly controlled. A significant role is played by mechanisms of executive control that allow the speaker to decide on one course of verbal action rather than another and rapidly select between competing speech motor plans. A central component is the capacity to inhibit initiated speech at almost any point in the production process. A clear understanding of the neural mechanisms of response inhibition in general is yet to be established. Furthermore, the underpinnings of response inhibition in the vocal domain are virtually unknown. This project is using MEG to elucidate the neural mechanisms that support vocal response inhibition and is examining how these mechanisms are affected in aging and by disorders of fluency such as stuttering.
Auditory processing in dyslexia
Blake Johnson, Genevieve McArthur, Michael Hautus (The University of Auckland, NZ), Melanie Reid, Jon Brock, Anne Castles and Stephen Crain

This project examined central auditory processing in typically-developing readers, and in children with dyslexia. The main finding was that children with dyslexia showed less brain lateralisation of auditory cortical function as compared to typically-developing readers. The study recorded brain responses by both groups of children using EEG and MEG concurrently. There were 16 children with dyslexia aged 8-12 years, and an age-matched group of 16 children with normal reading ability. Auditory brain responses were elicited using sounds that were designed to engage binaural auditory mechanisms. We found that cortical processing of binaural information was associated with an auditory brain response at a latency of about 250 to 500ms. Typically-developing children and children with dyslexia showed no significant difference in the binaural response. However, the children with dyslexia showed less lateralisation of auditory cortical functioning, and a different pattern of development of auditory lateralisation with age.

Speech in the brain in developmental stuttering
Paul Sowman, Blake Johnson, Elisabeth Harrison and Stephen Crain

Deviations from the normal brain asymmetry of language function have been proposed to underlie speech/language dysfunctions, one of which is stuttering. In the 1920s Orton developed the concept of stuttering as a manifestation of incomplete cerebral dominance for speech. His theory was that in the presence of incomplete hemispheric dominance, the initiation of speech proceeds concurrently in both hemispheres causing the resultant motor output to be incoherent or stalled by interhemispheric inhibitory processes. However, until recently, the ability to non-invasively measure the lateralisation of speech function in children has not been possible and therefore direct examination of this hypothesis had not been tested. We are currently measuring brain activations during speech production in children who stutter around the time of stuttering onset (2-5 years) using MEG.

Development of face perception
Blake Johnson, Jon Brock and Wei He

Some investigators maintain that full maturation of the abilities to perceive faces occurs as late as adolescence, while others suggest that it happens much earlier in the preschool years. In support of the late development hypothesis, recent neuroimaging studies have reported that an adult face-specific brain response is absent in children. However these researchers used adult sized brain imaging systems, which are not optimal for measuring brain activity from the much smaller heads of young children. This project has examined the question of when face perception attains adult capacities by measuring face-specific responses in pre-schoolers aged 3-5 years, using the unique child MEG brain imaging system at the CCD, which has been custom-built for use with pre-school aged children. The results of this project show that the face-specific brain response is present and functional in children aged 3-5 years. However, the functional interactions of the components of the brain network that underlie the face-specific brain response in children have not yet reached adult patterns of organisation and functionality.
Making sense of the world: How does the brain process task-relevant information?

Alexandra Woolgar, Anina Rich, Mark Williams and John Duncan (MRC Cognition and Brain Sciences Unit, UK)

In everyday life, we are constantly bombarded with information from our senses. To make use of the information we receive, we must partial out irrelevant information, and integrate the relevant information with our memories, goals, and the tasks at hand. Non-invasive neuroimaging techniques (e.g., functional Magnetic Resonance Imaging - fMRI; magnetoencephalography - MEG) afford a unique opportunity to investigate the processes adopted by human brains to sort sensory information. New brain imaging methodologies allow us to investigate not only which brain areas respond to particular tasks but also what information is coded in different brain regions. This project aims to extend current fMRI analysis techniques, so that we can examine more precisely how information is represented in the brain, using more fine-grained units of analysis (patterns across voxels). A second aim is to develop similar methods for analysing MEG data. The third aim is to implement these techniques in new experimental studies that address fundamental questions about how sensory information is represented and integrated in the human brain. More specifically, we propose to investigate the cognitive processes that occur in the frontoparietal brain regions, which have proven to be critical for the modulation and cognitive control of information processed in the visual cortex.

The brain that adapts itself: Flexible processing in an ever-changing world

Alexandra Woolgar, Soheil Afshar, Jade Jackson, Sehr Javed (Macquarie University), Anina Rich, Mark Williams and John Duncan (MRC Cognition and Brain Sciences Unit, UK)

How do humans – characterised above all animals for the diversity and flexibility of their behaviour – cope so effortlessly in the ever-changing world around us? How does the brain achieve such flexible control? What are the neural mechanisms that drive dynamic focus on the most important information? Novel methods for neuroimaging analysis enable new insights into how the brain processes information from the world and integrates it with internal representations of task rules and our current cognitive focus. This research uses multi-voxel pattern analysis with fMRI data to examine these processes as participants perform tasks in the scanner. This research focuses on the contribution of a key network of frontal and parietal “multiple-demand” (MD) brain regions which are important for a wide range of tasks. These regions are thought to behave flexibly: adjusting to process the most important information at each moment; and biasing processing elsewhere in the brain to drive a goal-directed response across the system. Current projects focus on the flexibility of processing in the MD system, the relationship between processing in these regions and more specialised brain regions such as the visual and somatosensory cortices, and what happens when the system fails and we make mistakes.

perception in action

Research in Perception in Action is conducted by an extremely productive team of cognitive scientists in the Department of Cognitive Science at Macquarie University. This team does not receive funding from the ARC Centre of Excellence in Cognition and its Disorders (CCD), however, their research complements that of the CCD research programs, so we include representative project summaries in this Annual Report.
Gaze following: Automatic or top-down?
Shahd Al-Janabi and Matthew Finkbeiner

Eye gaze following is vital for smooth social interactions as it can indicate sources of threat, underlying attitudes, points of interest and so on. As such, it’s not so surprising that infants begin to follow another person’s gaze from 4 months of age. Given the early development of this gaze following ability, many researchers have concluded that gaze following is automatic (effortless and unavoidable). But our research suggest otherwise. We present our participants with masked (subliminal) averted eye-gaze cues in a central location and then ask our participants to respond to a peripheral target. If gaze following is effortless and unavoidable, then our participants should shift their attention in the direction of the averted eye-gaze cue. While our participants demonstrate a clear ability to process masked gaze cues in tasks that tap learned stimulus-response mappings, we find that the same gaze cues do not produce shifts of spatial attention unless they are highly visible. These results suggest that gaze following is not as effortless and unavoidable as previously believed.

Towards understanding visual perception of the body: Neuroimaging and behavioural studies
Regine Zopf (Macquarie University) and Mark Williams

A central question in cognitive neuroscience is how embodiment (i.e., having the kinds of bodies we have) influences our physical actions and how this shapes our perception of the world. This project aims to enhance our understanding of the influences of the body on perception, and its neural underpinnings. More specifically, the project investigates how information from the hands influences how healthy observers, as well as amputees, perceive external objects. In order to understand the neural mechanisms that underlie the use of our hands to manipulate objects, we use neuroimaging techniques to demarcate the neural representations of hand form and hand orientation, paying special attention to brain areas that have been found to be recruited in planning and controlling actions.

Seeing clearly: Examining the consequences of glaucoma for the human brain
Mark Williams, Anina Rich and Stuart Graham (Australian School of Advanced Medicine)

Glaucoma is a progressive optic neuropathy characterised by a specific pattern of optic disc damage and ganglion cell loss. If untreated it leads to blindness, and it remains one of the three major causes of blind registrations in Australia. Despite considerable deficits on objective testing, glaucoma patients are often unaware of their scotoma (blind spot). In the early stages of the disease, the cortex somehow fills in the gaps, so patients do not see black regions associated with their loss of vision. There is the possibility that adjacent striate or higher cortical areas recruit unused neurons corresponding to the scotoma as a form of neural plasticity. The broad aim of this project is to investigate the way the brain adapts to changes in visual input due to a scotoma. The ability of the brain to ‘fill in’ missing visual information has been well documented using ‘artificial scotomas’, the physiological blind spot. This study will compare brain adaptations resulting from scotomas to those of the physiological blind spot (artificial scotoma) using both functional MRI to examine plasticity in the brain after retinal damage and behavioural studies examining the behavioural consequences of such plasticity. The findings of this research will help us understand the glaucoma process and how to possibly detect visual loss at an earlier stage of the disease.

Multiple object tracking
Kiley Seymour, Anina Rich and Todd Horowitz (Harvard University, USA)

In daily life, our visual system is bombarded with information - some of which must be ignored in order for us to achieve the task at hand. Furthermore, to navigate in a dynamic world, we must often track multiple objects moving simultaneously about the environment. This research examines the types of events that cause the most distraction when we are performing tasks involving motion. Specifically, we are interested in understanding how distracting events affect one’s ability to track moving objects. Using the Multiple Object Tracking (MOT) paradigm, we are building on classical experiments that have used stationary displays, to examine attention capture in a more real-world scenario.
research training
Attracting and providing high-quality training and unparalleled research opportunities for the most promising postgraduate students.
The ARC Centre of Excellence in Cognition and its Disorders (CCD) takes pride in its Higher Degree Research (HDR) Program. Resulting from the unique composition of our Centre, the CCD allows HDR students to complete a PhD which crosses various disciplines including Psychology, Linguistics, Speech Pathology, Psychiatry, Clinical Psychology, Philosophy, Audiology, Artificial Intelligence and Experimental Phonetics/Laboratory Phonology.

Most PhD candidates complete their thesis in the journal article format. This allows HDR students to submit articles ready for publication prior to thesis submission, and provides the means through which to build a research track record during their PhD candidature. This places them in a strong position for future academic employment or future grant applications such as an Australian Research Council Discovery Early Career Researcher Award (DECRA).

To support the intellectual development of our HDR candidates, the CCD regularly hosts seminars, workshops, and conferences for both postgraduates and researchers with national and international distinguished academics. These academic meetings are discussion-oriented and focus on topics relevant to the work of the Centre, with local and overseas researchers presenting papers for discussion and allowing Centre students to interact with experts in their respective fields of research. Throughout 2013, the CCD held grant training seminars, MATLAB workshops and career path seminars. Students were also able to attend a nine week writing course to assist with completing their PhD.

Each of the three CCD nodes, Macquarie University, The University of New South Wales and The University of Western Australia, have scholarships available to fund postgraduate PhD candidates of exceptional research promise as they undertake their research project at the CCD.

Congratulations to our 2013 PhD graduates: Dr Nobuaki Akagi, Questions and disjunction in child language; Dr Michael Connors, Modelling the mirrored-self misidentification delusion with hypnosis; Dr Peter de Lissa, Using fixation-related potentials to investigate cognitive processes; Dr Aijun Huang, Acquisition of polarity-sensitive items in Mandarin Chinese; Dr Loes Koelewijn, Balancing stimulus and goal-driven attentional demands: Investigating the role of gamma oscillations in human early visual cortex using magnetoencephalography; Dr Jonathan McGuire, Moral primacy, actions and omissions; Dr Amanda Miller Amberber, Language switching, language selection and intervention in bilingual aphasia; Dr Hock Beng (Tommy) Ng, Neuromagnetic brain activity associated with the coordination of movement and anticipatory postural adjustments in bimanual load lifting; Dr Stephen Pritchard, Incorporating learning mechanisms into the Dual Route Cascaded (DRC) model of reading aloud and word recognition; Dr Melanie Rosen, Philosophy of dreams; Dr Stephane Savanah, The threshold of self-consciousness and Dr Neralie Wise, The Capgras delusion an integrated approach. Also to our combined PhD/Masters graduates: Dr Tania Malouf, Lack of insight after traumatic brain injury and Dr Tracey Williams, Social processing in Fragile X syndrome.

We also extend congratulations to our DPsych graduates: Dr Georgina Avery, Autobiographical memory and emotion in patients with frontal lobe lesions; Dr Deepa Bapat, Whole figure rotations in the Rey Complex Figure; Dr Jamie Campbell, Age and sex effects of typographical memory; Dr Donna McCabe, Social cognition and mild cognitive impairment; Dr Didier (Vince) Oxenham, Eye movement abnormalities and dementia in motor neurone disease and Dr Robyn Petersen, Social cognitive abilities of people with borderline personality disorder; and to our Masters graduates: Jillian Attewell, Predictors of behavioural symptoms in Huntington’s disease; Vanessa Leung, Masked priming of associate-recognition and Jordan Taylor, Emotions across three phases: A theory of a dynamic emotion system.

This year our Centre recruited 43 new students across our three nodes from Australia and overseas.
Rebekah Ahmed  
PhD, The University of New South Wales  
Associate Professor Olivier Piguet,  
Professor Matthew Kiernan (Neuroscience Research Australia) and Professor John Hodges  
Eating, autonomic and sexual dysfunction in frontotemporal demential motor neurone disease.

Nobuaki Akagi  
PhD, Macquarie University  
Distinguished Professor Stephen Crain and  
Associate Professor Rosalind Thornton  
Questions and disjunction in child language.

Shahd Al-Janabi  
PhD, Macquarie University  
Associate Professor Matthew Finkbeiner and  
Dr Anthony Lambert (Macquarie University)  
Neuronal global workspace theory.

Shasha An  
PhD, Macquarie University  
Associate Professor Rosalind Thornton,  
Distinguished Professor Stephen Crain and Dr Peng Zhou  
Mandarin Chinese children’s acquisition of constraints on interpretation.

Erin Banales  
PhD, Macquarie University  
Associate Professor Genevieve McArthur and Dr Saskia Kohnen  
Working memory training in children with dyslexia.

Fabrice Bardy  
PhD, Macquarie University  
Associate Professor Catherine McMahon,  
Dr Bram Van Dun (National Acoustic Laboratories),  
Dr Harvey Dillon (National Acoustic Laboratories) and Associate Professor Blake Johnson  
Cortical auditory evoked responses to rapidly occurring acoustic stimuli.

Polly Barr  
PhD, Macquarie University  
Dr Britta Biedermann and Professor Lyndsey Nickels  
Speech production in language-impaired speakers.

Cory Bill  
PhD, Macquarie University  
Distinguished Professor Stephen Crain and  
Associate Professor Rosalind Thornton  
What’s in an inference: Exploring the nature of scalar implicatures and presuppositions.

Benjamin Börschinger  
PhD, Macquarie University  
Professor Mark Johnson, Professor Anette Frank (Heidelberg University, Germany) and  
Dr Diego Molla-Aloid (Macquarie University)  
Computational models of human language acquisition.

Nichola Burton  
PhD, The University of Western Australia  
Professor Gillian Rhodes and Dr Linda Jeffery  
The structure of expression-space: How do we visually represent facial expressions?

Nathan Caruana  
PhD, Macquarie University  
Dr Jon Brock, Associate Professor Blake Johnson,  
Dr Alexandra Woolgar and Associate Professor Genevieve McArthur  
Brain mechanisms of attention and social cognition in autism.

Leidy Janeth Castro-Meneses  
PhD, Macquarie University  
Dr Paul Sowman and Associate Professor Blake Johnson  
Temporal cortical dynamics in two disorders of childhood development: Specific language impairment (SLI) and developmental stuttering (DS).

Lisa Ceccherini  
PhD, Macquarie University  
Emeritus Professor Max Coltheart, Professor Anne Castles and Dr Claudio Mulatti  
The effects of a concomitant distractor on word reading aloud and picture naming tasks.

Leone Chare  
PhD, The University of New South Wales  
Professor Glenda Halliday (The University of New South Wales), Professor John Hodges and Professor Jillian Krill (The University of Sydney)  
Clinical predictors for underlying pathology in frontotemporal dementia.

Hui Chen  
PhD, Macquarie University  
Professor Katherine Demuth and Associate Professor Felicity Cox  
Examining the acquisition of vowel length contrasts.

Yao-Ching (Rocco) Chiu  
PhD, Macquarie University  
Associate Professor Anina Rich and  
Associate Professor Matthew Finkbeiner  
The influence of language experience on synaesthesia: Evidence from psychophysics and cross-language comparison.

Danielle Colenbrander  
PhD, Macquarie University  
Dr Saskia Kohnen, Professor Lyndsey Nickels and Dr Karen Smith-Lock  
Understanding and treating the causes of reading comprehension difficulties.

Michael Connors  
PhD, Macquarie University  
Associate Professor Amanda Barnier, Emeritus Professor Max Coltheart and  
Associate Professor Robyn Langdon  
Modelling the mirrored-self misidentification delusion with hypnosis.
Aline Cordonnier
PhD, Macquarie University
Associate Professor Amanda Barnier
and Professor John Sutton
From past to future and future to past: How we collaborate to remember, imagine and plan.

Vania Marisa Correia de Aguiar
PhD, Macquarie University
Professor Lyndsey Nickels and Dr Paul Sowman
Non-fluent aphasia rehabilitation from a linguistic perspective and the role of tDCS.

Marshall Dalton
PhD, The University of New South Wales
Associate Professor Olivier Piguet and Dr Michael Hornberger
Characterisation of episodic memory deficits in frontotemporal dementia.

Peter de Lissa
PhD, Macquarie University
Associate Professor Genevieve McArthur, Dr Jon Brock and Professor Anne Castles
Using fixation-related potentials to investigate cognitive processes.

Bianca de Wit
PhD, Macquarie University
Associate Professor Sachiko Kinoshita, Associate Professor Genevieve McArthur and Dr Nicholas Badcock
A fresh look on semantic priming effects.

Sithembinkosi Dube
PhD, Macquarie University
Professor Katherine Demuth, Dr Jon Brock, Dr Mridula Sharma (Macquarie University) and Dr Varghese Peter (University of Western Sydney)
The link between prosodic sensitivity and grammatical morpheme acquisitions: A comparative ERP study of children with SU and children acquiring English as an L2.

Andrew Etchell
PhD, Macquarie University
Dr Paul Sowman and Associate Professor Blake Johnson
Brain dynamics and sensorimotor integration associated with speech.

Mirko Farina
PhD, Macquarie University
Professor John Sutton and Emeritus Professor Max Coltheart
Extended mind, DST, neuro constructivism, complementarity.

Nora Fieder
PhD, Macquarie University
Professor Lyndsey Nickels and Dr Britta Biedermann
Neurological disorders.

Yong Zhi Foo
PhD, The University of Western Australia
Professor Gillian Rhodes and Professor Leigh Simmons
Do facial sexual dimorphism and skin colour signal good health in humans?

Vasfiye Geçkin
PhD, Macquarie University
Associate Professor Rosalind Thornton, Distinguished Professor Stephen Crain and Professor Barbara Höhle (University of Potsdam, Germany)
Second language acquisition in early childhood: Evidence from typically and atypically developing Turkish-English bilingual children.

Rebecca Gelding
PhD, Macquarie University
Associate Professor Blake Johnson and Professor William (Bill) Thompson
Mental imagery of musical pitch and rhythm.

Rimke Groenewold
PhD, Macquarie University
Professor Lyndsey Nickels, Professor Roelien Bastiaanse (University of Groningen, The Netherlands) and Dr Mike Huiskes (University of Groningen, The Netherlands)
Fictive interaction in aphasic conversation.

Sana-E-Zehra Haidry
PhD, Macquarie University
Professor Anne Castles, Professor Lyndsey Nickels and Professor Ben Maassen (University of Groningen, The Netherlands)
Early assessment of developmental dyslexia in Urdu language.

Solène Hameau
PhD, Macquarie University
Dr Britta Biedermann and Professor Lyndsey Nickels
Neighbour density effects in spoken word production.

Aijun Huang
PhD, Macquarie University
Distinguished Professor Stephen Crain and Associate Professor Rosalind Thornton
Acquisition of polarity-sensitive items in Mandarin Chinese.

Wei He
PhD, Macquarie University
Associate Professor Blake Johnson, Dr Jon Brock and Professor Wei Wang (Zhejiang University, China)
Development of early face processing in the human brain.

Jan (Richard) Heersmink
PhD, Macquarie University
Professor John Sutton and Emeritus Professor Max Coltheart
The varieties of situated cognitive systems: Embodied agents, cognitive artifacts and scientific practice.

Qandeel Hussain
PhD, Macquarie University
Professor Katherine Demuth, Associate Professor Felicity Cox and Dr Mark Harvey (The University of Newcastle)
Retroflexion in Punjabi loanword phonology.

Anne Jäeger
PhD, Macquarie University
Associate Professor Robyn Langdon and Emeritus Professor Max Coltheart
Meta-cognitive features associated with schizophrenic delusion in obsessive compulsive disorders with and without delusional ideation.
Vishnu Kaleeckal Krishnankutty Nair  
PhD, Macquarie University  
Professor Lyndsey Nickels and Dr Britta Biedermann  
Effect of bilingualism on cognitive-linguistic abilities.

Yvette Kezilas  
PhD, Macquarie University  
Professor Anne Castles and Dr Saskia Kohnen  

Neha Khetrapal  
PhD, Macquarie University  
Associate Professor Rosalind Thornton and Dr Jon Brock  
Language acquisition in autistic and typically developing children.

Loes Koelewijn  
PhD, Macquarie University  
Associate Professor Anina Rich and Professor Krish Singh (Cardiff University, UK)  
Balancing stimulus and goal-driven attentional demands: Investigating the role of gamma oscillations in human early visual cortex using magnetoencephalography.

Janna (Trudy) Krajenbrink  
PhD, Macquarie University  
Professor Lyndsey Nickels and Dr Saskia Kohnen  
Generalisation effects in treatment of acquired language disorders.

Linda Larsen  
PhD, Macquarie University  
Associate Professor Genevieve McArthur, Dr Saskia Kohnen, Professor Lyndsey Nickels and Professor Anne Castles  
Grapheme-phoneme correspondence knowledge in typical and atypical reading development.

Samantha Leivers  
PhD, The University of Western Australia  
Professor Leigh Simmons and Professor Gillian Rhodes  
How do men judge and respond to perceived female infidelity?

Min (Maggie) Liao  
PhD, Macquarie University  
Associate Professor Rosalind Thornton and Distinguished Professor Stephen Crain  
Children’s acquisition of “shenme” in Chinese.

Xuejing Lu  
PhD, Macquarie University  
Professor William (Bill) Thompson and Associate Professor Blake Johnson  
Visual information affects auditory experience in amusics.

Cassandra Lyne  
PhD, Macquarie University  
Associate Professor Sachiko Kinoshita  
Visual word recognition: An in-depth consideration of orthography in silent reading process models.

Pragati Rao Mandikal Vasuki  
PhD, Macquarie University  
Dr Mridula Sharma (Macquarie University), Professor Katherine Demuth and Dr Joanne Arciuli (The University of Sydney)  
Role of statistical learning and auditory processing in understanding reading and speech perception in noise.

Shaun Markovic  
PhD, The University of Western Australia  
Associate Professor Romina Palermo  
Disturbance in positive emotion as an underlying mechanism of bipolar disorder.

Lars Marstaller  
PhD, Macquarie University  
Associate Professor Blake Johnson and Dr Paul Sowman  
Gestures and cognition.

Tina Marusch  
PhD, Macquarie University  
Professor Lyndsey Nickels and Dr Frank Burchert (University of Potsdam, Germany)  
Language production of verbal inflectional morphology in healthy and impaired adult speakers of German and English.

Christopher McCarroll  
PhD, Macquarie University  
Professor John Sutton and Dr Richard Menary  
Memory and the self.

Jonathan McGuire  
PhD, Macquarie University  
Associate Professor Robyn Langdon, Associate Professor Amanda Barnier and Professor Catriona Mackenzie (Macquarie University)  
Moral primacy, actions and omissions.

Laura McLaughlin Engfors  
PhD, The University of Western Australia  
Associate Professor Romina Palermo and Dr Linda Jeffery  
Individual differences in children’s face recognition ability.

Kiri Mealings  
PhD, Macquarie University  
Professor Katherine Demuth, Dr Jorg Buchholz (Macquarie University), Dr Robert Mannell and Dr Harvey Dillon (National Acoustic Laboratories)  
An investigation into the effects of open plan and enclosed classroom acoustics on speech perception in kindergarten children with and without hearing impairments.

Amanda Miller Amberber  
PhD, Macquarie University  
Professor Lyndsey Nickels, Associate Professor Rosalind Thornton and Emeritus Professor Max Coltheart  
Language switching, language selection and intervention in bilingual aphasia.

Colleen Murphy  
PhD, Macquarie University  
Associate Professor Robyn Langdon  
Poor social functioning in schizophrenia: Understanding the role of automatic facets of social cognition.

Hock Beng (Tommy) Ng  
PhD, Macquarie University  
Associate Professor Blake Johnson and Dr Jon Brock  
Neuromagnetic brain activity associated with the coordination of movement and anticipatory postural adjustments in bimanual load lifting.
Collaborative facilitation in aging populations as a function of familiarity.

Mehdi Parviz
PhD, Macquarie University
Professor Mark Johnson and Dr Diego Molla Aliod (Macquarie University)
Using machine learning to understand the causes of neural responses.

Stephen Pritchard
PhD, Macquarie University
Emeritus Professor Max Coltheart, Professor Anne Castles and Dr Eva Marinus
Incorporating learning mechanisms into the dual route cascaded (DRC) model of reading aloud and word recognition.

Hans Receveur
PhD, Macquarie University
Associate Professor Greg Savage
The sole of semantic function in the transition from mild cognitive impairment to Alzheimer’s Disease.

Monica Ricci
PhD, Macquarie University
Associate Professor Greg Savage, Associate Professor Genevieve McArthur and Dr Laurie Miller
Episodic memory: Normal and pathological rates of forgetting.

Adria Rofes Sanchez
PhD, Macquarie University
Professor Lyndsey Nickels, Professor Gabriele Miceli (University of Trento, Italy) and Professor Roelien Bastiaanse (University of Groningen, The Netherlands)
Neural correlates of verb production and their relevance in awake surgery.

Anastasiia Romanova
PhD, Macquarie University
Professor Lyndsey Nickels and Dr Kati Renvall
Word class effects on representation and processing in non-brain-damaged speakers and people with aphasia.

Melanie Rosen
PhD, Macquarie University
Professor John Sutton and Professor Peter Menzies
Philosophy of dreams.

Robert Ross
PhD, Macquarie University
Associate Professor Robyn Langdon and Emeritus Professor Max Coltheart
Cognitive theory of delusion.

Sharon Savage
PhD, The University of New South Wales
Professor John Hodges, Associate Professor Oliver Piguet and Dr Michael Hornberger
Cognitive retraining in frontotemporal dementia (FTD) and related disorders.

The threshold of self-consciousness.

Tamara Schembri
PhD, Macquarie University
Professor Katherine Demuth and Professor Mark Johnson
Exploring the learning of Arabic stress.

Xenia Schmalz
PhD, Macquarie University
Professor Anne Castles, Dr Eva Marinus and Emeritus Professor Max Coltheart

Amanda Selwood
PhD, Macquarie University
Associate Professor Amanda Barnier, Professor John Sutton and Dr Celia Harris
Collaborative and autobiographical memory in siblings and twins.

Usha Sivaranjani Sista
PhD, Macquarie University
Associate Professor Mark Williams and Dr Jason Friedman
The involvement of mirror systems in mimicking learning.

Yanan Sun
PhD, Macquarie University
Professor William (Bill) Thompson and Associate Professor Blake Johnson
Music and specific language impairment: From music processing to music intervention.

Huizhen (Joann) Tang
PhD, Macquarie University
Distinguished Professor Stephen Crain and Dr Jon Brock
Rhythmic patterning of speech comprehension and production: Role in language acquisition.

Marie (Misia) Temler
PhD, Macquarie University
Associate Professor Amanda Barnier, Professor John Sutton and Associate Professor Doris McIlwain (Macquarie University)
Social contagion of autobiographical memory.

Ekaterina Tomas
PhD, Macquarie University
Professor Katherine Demuth and Associate Professor Rosalind Thornton
The acquisition of grammatical morphology: Cross-linguistic and cross-population considerations.

Marina Trakas
PhD, Macquarie University
Professor John Sutton and Professor Jerome Dokic (École des Hautes Études en Sciences Sociales, France)
Theories of memory implications for metacognition.
Sicong Tu  
PhD, The University of New South Wales  
Dr Michael Hornberger and  
Associate Professor Olivier Piguet  
*Brain connectivity biomarkers predict specific memory consolidation deficits across dementia subtypes.*

Leslie van der Leer  
PhD, Royal Holloway, University of London, UK  
Dr Ryan McKay  
*The causes and consequences of systematic deviations from rational belief formation.*

Mark Vida  
PhD, McMaster University, Canada  
Professor Daphne Maurer  
*The development of sensitivity to the direction of gaze.*

Jennifer Walsh  
PhD, McMaster University, Canada  
Professor Mel Rutherford  
*Examining face processing mechanisms in autism spectrum disorder.*

Vana Webster  
PhD, Macquarie University  
Associate Professor Amanda Barnier and  
Dr Penny Van Bergen (Macquarie University)  
*Collective memory: The social context of remembering together.*

Kimberly Weldon  
PhD, Macquarie University  
Associate Professor Mark Williams,  
Associate Professor Anna Rich and Dr Alexandra Woolgar  
*Functional consequences of glaucoma for the human brain.*

Kellie Williamson  
PhD, Macquarie University  
Professor John Sutton and  
Associate Professor Amanda Barnier  
*On the nature of procedural memory.*

Neralie Wise  
PhD, Macquarie University  
Professor Peter Menzies, Professor Jeanette Kennett (Macquarie University) and Dr Mitch Farsell (Macquarie University)  
*The Capgras delusion: An integrated approach.*

Shu Hui Yau  
PhD, Macquarie University  
Dr Jon Brock, Associate Professor Blake Johnson and  
Associate Professor Genevieve McArthur  
*Cognitive and brain mechanisms of autism.*

Astrid Zeman  
PhD, Macquarie University  
Dr Kevin Brooks (Macquarie University),  
Emeritus Professor Max Coltheart and Dr Olivier Obst (CSIRO ICT Centre)  
*Computer models of human visual object perception.*

Likan Zhan  
PhD, Macquarie University  
Distinguished Professor Stephen Crain, Dr Peng Zhou and  
Associate Professor Drew Khlentzos  
*Are we logic? An experimental study of if-conditional.*

Combined Masters | PhD

Adam Bentvelzen  
PhD/MClinNeuro, Macquarie University  
Associate Professor Greg Savage,  
Associate Professor Genevieve McArthur,  
Professor William (Bill) Thompson and Dr Nicholas Badcock  
*Hemispheric specialisation for nonverbal memory processing.*

Emily Connaughton  
PhD/MClinNeuro, Macquarie University  
Associate Professor Robyn Langdon,  
Emeritus Professor Max Coltheart and Dr Nora Breen  
(Royal Prince Alfred Hospital)  
*Delusions in traumatic brain injury.*

Erika Contini  
PhD/MClinNeuro, Macquarie University  
Associate Professor Mark Williams and Dr Thomas Carlson  
*Preventing depression and cognitive decline in the elderly: The effects of novel pharmacotherapies on white matter connectivity.*

Michael Gascoigne  
PhD/DClinPsych, The University of Sydney  
Dr Suncica (Sunny) Lah and Dr Belinda Barton  
(The University of Sydney)  
*Long term memory in children with epilepsy.*

Tania Malouf  
PhD/MClinNeuro, Macquarie University  
Associate Professor Robyn Langdon,  
Professor Edwin (Arthur) Shores, (Macquarie University),  
Emeritus Professor Max Coltheart and Dr Kasey Metcalf (Liverpool Hospital)  
*Lack of insight after traumatic brain injury.*

Michelle Marneweck  
PhD/Masters, The University of Western Australia  
Associate Professor Romina Palermo and  
Emeritus Professor Geoff Hammond (The University of Western Australia)  
*Emotion perception in Parkinson’s disease.*

Genevieve Quek  
PhD/MClinNeuro, Macquarie University  
Associate Professor Matthew Finkbeiner and Dr Paul Sowman  
*The role of attention in nonconscious processing: Comparing faces and non-faces.*

Jasmina Vrankovic  
PhD/MClinNeuro, Macquarie University  
Associate Professor Veronika Coltheart and Dr Nicholas Badcock  
*Selection by semantic category: Towards a model of iconic memory.*

Tracey Williams  
PhD/MClinNeuro, Macquarie University  
Dr Melanie Porter, Associate Professor Robyn Langdon and Emeritus Professor Max Coltheart  
*Social processing in Fragile X syndrome.*

Stephanie Wong  
PhD/MClinNPsych, Macquarie University  
Associate Professor Greg Savage and Dr Michael Hornberger  
*Episodic memory deficits in behavioural variant frontotemporal dementia: Investigating the role of the prefrontal cortex.*
Doctoral

Georgina Avery  
DClinPsych/MSc, The University of Sydney  
Dr Suncica (Sunny) Lah and Dr Laurie Miller  
Autobiographical memory and emotion in patients with frontal lobe lesions.

Deepa Bapat  
DClinPsych, Macquarie University  
Dr Jennifer Batchelor (Macquarie University) and Dr Melanie Porter  
Whole figure rotations in the Rey Complex Figure.

Jamie Campbell  
DClinPsych, Macquarie University  
Dr Jennifer Batchelor (Macquarie University), Dr Melanie Porter, Dr Ilana Hepner and Dr Laurie Miller  
Age and sex effects of typographical memory.

Frances Caufield  
DClinPsych, The University of Western Australia  
Professor Gillian Rhodes and Dr Louise Ewing  
Facial trustworthiness judgments in typical adults, typically developing children and children with autism.

Cliff Deyo  
DClinNeuro, Macquarie University  
Professor Robyn Langdon and Professor Edwin (Arthur) Shores (Macquarie University)  
Semantic memory deficits in pre-prodromal psychosis.

Sally Finnie  
MPhil/DClinNeuro, Macquarie University  
Associate Professor Greg Savage, Associate Professor Peter Schofield (The University of Newcastle) and Professor Dick Stevenson (Macquarie University)  
Specificity of an olfactory stress test performance in several neurological disorders.

Katie Leach  
DClinPsych, The University of Western Australia  
Professor Gillian Rhodes, Dr Linda Jeffery and Dr Elizabeth (Liz) Pellicano  
Does attention modulate face aftereffects in children with autism?

Meryn Lechowicz  
DClinPsych/MSc, The University of Sydney  
Dr Suncica (Sunny) Lah and Dr Laurie Miller  
Remembering the past and constructing the future in patients with temporal lobe epilepsy.

Donna McCade  
DClinNeuro, Macquarie University  
Associate Professor Greg Savage, Dr Jennifer Batchelor (Macquarie University) and Associate Professor Sharon Nasmith (The University of Sydney)  
Social cognition and mild cognitive impairment.

Didier (Vince) Oxenham  
DClinPsych, Macquarie University  
Associate Professor Greg Savage, Dr Jon Brock and Professor Dominic Rowe (Macquarie University)  
Eye movement abnormalities and dementia in motor neurone disease.

ARC centre of excellence in cognition and its disorders

Robyn Petersen  
DClinNeuro, Macquarie University  
Associate Professor Robyn Langdon and Associate Professor Romina Palermo  
Social cognitive abilities of people with borderline personality disorder.

Shelley Simpson  
DClinNeuro, Macquarie University  
Associate Professor Robyn Langdon and Dr Jennifer Batchelor (Macquarie University)  
Neuropsychological profile of very late-onset schizophrenia versus late-onset psychotic depression versus chronic schizophrenia.

Masters

Thushara Anandakumar  
MClinNeuro, Macquarie University  
Associate Professor Robyn Langdon  
Belief bias reasoning in the maintenance of delusional beliefs.

Jillian Attewell  
MClinNeuro, Macquarie University  
Associate Professor Robyn Langdon  
Predictors of behavioural symptoms in Huntington’s disease.

David Foxe  
MClinNeuro, Macquarie University  
Associate Professor Greg Savage and Dr Muireann Irish  
Verbal and visuospatial span in LPA & AD.

Luke Freeman  
MClinNeuro, Macquarie University  
Associate Professor Greg Savage  
Cognitive reserve and MCI.

Kelly Jeng  
MClinNeuro, Macquarie University  
Associate Professor Greg Savage  
Distilling the essence of associative memory in healthy ageing, MCI and AD.

Andrew Jones  
MClinNeuro, Macquarie University  
Associate Professor Greg Savage  
Memory profiling in the early detection of Alzheimer’s disease.

Vanessa Leung  
MClinNeuro, Macquarie University  
Associate Professor Greg Savage  
Masked priming of associate-recognition.

Lois MacCullagh  
Masters, Macquarie University  
Dr Agnes Bosanquet (Macquarie University) and Dr Nicholas Badcock  
Learning experiences of university students with dyslexia.
Fleur Le Marne
MClinNeuro, Macquarie University
Associate Professor Greg Savage
The diagnostic utility and prognostic value of semantic memory measures in prodromal Alzheimer’s dementia.

Katherine O’Lone
Masters, Royal Holloway, University of London, UK
Dr Ryan McKay
Understanding scrupulosity.

Alena Rahmanovic
MClinNeuro, Macquarie University
Associate Professor Greg Savage
Memory training for older adults with subjective memory complaints – a pilot study.

David Rodwell
MClinNeuro, Macquarie University
Associate Professor Greg Savage
Memory in temporal lobe epilepsy – the impact of aetiology.

Jordan Taylor
MPhil, Macquarie University
Professor John Sutton and Dr Nicolas Bullot
Emotions across three phases: A theory of a dynamic emotion system.

Damith Woods
MClinNeuro, Macquarie University
Associate Professor Greg Savage
Intellectual functioning and memory performance: Its correlation with beta-amyloid deposition in dementia.

Vanessa Zeleny
MClinNeuro, Macquarie University
Associate Professor Greg Savage
The ‘Fluency Flip’: Verbal fluency as a predictor of progression from MCI to AD.

Honours

Rachel Emiechel
Honours, The University of Western Australia
Associate Professor Romina Palermo and Dr Markus Neumann
Individual differences in ensemble coding of facial identity.

Judith Gildenhuys
Honours, The University of Western Australia
Dr Louise Ewing and Professor Gillian Rhodes
Own-race bias on computer generated faces.

Amber King
Honours, The University of Western Australia
Dr Linda Jeffery
Individual differences in face recognition.

Rui Xiang (Ryan) Ng
Honours, The University of Western Australia
Associate Professor Romina Palermo and Dr Markus Neumann
Influencing factors of ensemble coding for faces.

Julia Pagnozzi
Honours, The University of Western Australia
Dr Nadine Kloth
Age and gender categorisation in unfamiliar faces.

Jillian Richards
Honours, The University of Western Australia
Dr Kate Crookes and Professor Gillian Rhodes
Facial expression and the other-race effect.

Jessica Sailah
Honours, Macquarie University
Dr Nicholas Badcock
Reading ability and perceptual anchoring.

Susannah Shields
Honours, The University of Western Australia
Professor Gillian Rhodes
Under what conditions does the cross race effect disappear? The influence of multi-stimuli presentation paradigm on social categorisation and attention.

Anita Smith
Honours, The University of Western Australia
Dr Linda Jeffery
Face identification ability and psychosocial function in children.

Maree Tyson
Honours, Macquarie University
Dr Nicholas Badcock
Reading efficiency and the attentional blink.
community
Engaging with the greater community though outreach and education programs, sponsored events, media, public talks, and presentations to community organisations.
The aim of this workshop was twofold. First, it was intended to enable reading researchers to keep abreast of the widening array of ongoing research using the DRC model. Second, it was intended to inform researchers from the wider community, including members of the CCD Reading Program, about current developments in the DRC model. The following topics were covered:

- How the DRC model implements the dual-route theory of visual word recognition and reading aloud
- The DRC and the masked onset priming effect: A problem with how the Interactive Activation and Competition (IAC) model encodes visual feature information
- How the DRC learns its non-lexical route
- How is letter position encoded when non-words are read aloud?
- How the DRC learns its lexical route
- How the DRC names colours and pictures
- How the DRC simulates pure alexia
- DRC approaches to Japanese
- DRC approaches to Hindi
- The problem with the calculation of unsupported phoneme decay in DRC

Workshop
Research Methods and Applications in Auditory Physiology: Measuring Auditory Processing from Brainstem to Auditory Cortex and Beyond

6 May | Macquarie University

Keynote speakers

Distinguished Professor Stephen Crain  
Macquarie University  
Associate Professor Blake Johnson  
Macquarie University  
Professor Ravi Krishnan  
Purdue University, USA  
Associate Professor Catherine McMahon  
Macquarie University  
Dr Graciela Tesan  
Macquarie University  
Dr Bram van Dun  
National Acoustic Laboratories

Auditory researchers and clinicians have traditionally focussed on one of two rather distinct aspects of auditory information processing in the brain. On the one hand “hearing” scientists have concentrated on sensory and perceptual aspects of information processing in the lower reaches of the central auditory system, with relatively little consideration of the eventual destinations for this information in the linguistic and cognitive centres of the brain. On the other hand cognitive scientists and linguists have focussed on fairly abstract representations and transformations of acoustic information, but have paid little attention to the neural processes that give rise to these abstractions. Theoretical and empirical advances are now eroding some of the distinctions between hearing and language/cognition. Consequently, there is an increasing need for researchers in each camp to understand and utilise the methods and concepts of the other. This free workshop introduced participants, including auditory researchers and clinicians, to the major non-invasive methods for measuring and studying human auditory brain function from brainstem to primary auditory cortex to brain centres for language and cognition. Methods discussed included the Auditory Brainstem Response (ABR), Frequency Following Response (FFR), auditory cortical responses and electrophysiological markers of psycholinguistic processes.
Workshop
Point of View in Memory and Imagery: Philosophical and Psychological Perspectives on Perspective

9-11 May | Macquarie University

Keynote speaker
Associate Professor Lisa Libby
Ohio State University, USA

This workshop addressed perspective-taking in remembering and imagining. Papers were invited from philosophers and psychologists, and from related disciplines. Of particular interest were proposals that focussed on relations between a visual or visuo-spatial perspective and other kinds of perspective, as well as proposals that addressed the possible interactions between internal and external perspectives on one’s past, future, or possible actions and experiences.

Workshop
MathWorks

5 June | Macquarie University

Every day and worldwide, thousands of engineers, mathematicians, scientists, and researchers in academic institutions rely on MATLAB® and other MathWorks tools to improve workflow and to accelerate the pace of engineering and science. This workshop was attended by over 120 lecturers, researchers and postgraduate students who wanted to enhance their teaching and research, update their MATLAB skills and learn from the experts on how to get started using MathWorks software. In this workshop, MathWorks engineers demonstrated how to build mathematical models for forecasting and optimising the behaviour of complex systems.

Workshop
Visual Word Recognition (ForsterFest ‘13)

11 June | Macquarie University

Keynote speaker
Professor Ken Forster
University of Arizona, USA

A one day workshop on visual word recognition was organised by the Reading Program to coincide with a visit by Professor Ken Forster to the Macquarie node of the CCD. The focus of the workshop was on the study of visual word recognition and on the nature of the information retrieval mechanisms that enable effortless but accurate retrieval of the properties of words at such rapid rates.
30 July | Macquarie University

Keynote speakers

**Distinguished Professor Stephen Crain**
Macquarie University

**Dr Cathy Foley**
CSIRO

**Professor Sakkie Pretorius**
Macquarie University

This launch marked the opening of a state-of-the-art Liquid Helium Recovery System (LHRS) which is part of the KIT-Macquarie Brain Research Laboratory. The system was developed in conjunction with CSIRO, and was partly funded by a New South Wales Science Leveraging Fund (NSW SLF) grant. The system recovers the helium gas that boils off during the operation of our MEG brain imaging systems, and converts it back into liquid helium. This innovative project brought together an interdisciplinary team of researchers from the CCD and scientists from the CSIRO, including experts in cryogenics, superconductivity and magnetism. The LHRS will benefit cognitive neuroscience and the study of cognitive disorders, by making cutting edge MEG brain imaging technology less expensive and more accessible for academics, students and the broader community. The LHRS will assist our use of MEG to yield insights into typical and disordered brain processing and, at the same time, promote the efficient and sustainable use of our natural resources by recovering the helium that is expended during the use of these systems.

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Flicking the switch

Left to right: Dr Alex Katsaros (CSIRO), Dr Emma Mitchell (CSIRO), Dr Cathy Foley (CSIRO), Professor Sakkie Pretorius (Macquarie University) and Distinguished Professor Stephen Crain
Launch
CI MEG System for Patients with Cochlear Implants

30 October | Macquarie University

Keynote speakers

**Associate Professor Robert (Bob) Cowan**
The HEARing CRC

**Distinguished Professor Stephen Crain**
Macquarie University

**Professor S Bruce Dowton**
Macquarie University

**Professor Ken-ichi Ishikawa**
Kanazawa Institute of Technology, Japan

**Associate Professor Jim Patrick**
Cochlear Ltd

**Professor Ovid Tzeng**
Academia Sinica, Taiwan

**Professor Gen Uehara**
Kanazawa Institute of Technology, Japan

This ceremony marked the opening of a world first brain imaging device to measure brain function in the auditory cortex of children and adults who have received a Cochlear Implant (CI). We call this innovative brain imaging system the CI MEG system, where MEG is short for magnetoencephalography, a brain imaging device that measure the minute magnetic fields that are generated in the brain as people process information. The development of the CI MEG system brought together a international, interdisciplinary team of researchers in Cochlear Implant technology, in hearing disorders, in the cognitive and language sciences, and in brain imaging. The CI MEG system will enable researchers at the CCD, and its collaborating partners in the Australian Hearing Hub, to measure brain function for the first time in children and adults with Cochlear Implants. The research plan is to investigate the effects of deafness in the brain, and the effectiveness of intervention using Cochlear implantation, across the life span. Primary funding for the CI MEG was provided by Macquarie University and The HEARing CRC, and collaborating partners included Cochlear Ltd, CSIRO and the Kanazawa Institute of Technology.
Symposium
Memory Program

31 October | Neuroscience Research Australia

Keynote speakers

Professor Rick Richardson
The University of New South Wales

Associate Professor Elise van den Hoven
University of Technology, Sydney

Associate Professor Sarah Wilson
The University of Melbourne

This inaugural Memory Program symposium provided an opportunity to hear eminent researchers, postdoctoral fellows and PhD students present their work on various aspects of memory. The day included presentations that reported on research using animal models, neuroimaging and clinical approaches, to examine theories of memory and its disorders, and avenues for remediation.

Workshop
Person Perception Program

18 November | The University of Western Australia

In this half day workshop 12 members of The University of Western Australia (UWA) node of the Person Perception Program presented their current research in a series of brief presentations. This workshop was also attended by visiting scholar, Professor Stefan Schweinberger (Friedrich Schiller University of Jena, Germany), as well as other interested researchers at the UWA School of Psychology.

Workshop
Dyslexia

19 November | Macquarie University

Keynote speakers

Professor Kate Nation
University of Oxford, UK

Dr Nenagh Kemp
University of Tasmania

This one day workshop was devoted to considering models for a dedicated Australian dyslexia conference. No such conference currently exists, which is a significant gap, especially considering Australia’s research strengths in this area. We took advantage of visits from two leading reading researchers, Professor Kate Nation and Dr Nenagh Kemp, to discuss what we see as the key questions to be answered in the field of dyslexia, and to consider how a conference might be structured to best foster consideration of these questions. Eight key questions were identified, and these will form the basis of the inaugural program. We also discussed the structure and content of an associated one day outreach workshop, designed for teachers, parents and professionals.
Workshop
Rhythm and Timing in
Music and in Language

22 November | Macquarie University

This half day workshop was devoted to bringing together researchers and students at the CCD and from the broader scientific community to discuss the perception and production mechanisms involved in music and in language, as well as the neural mechanisms of rhythm and timing information involved in music and in language. The workshop commenced with a networking lunch and was followed by short presentations of current research projects.

Forum
7th Australian Cognitive Neuropsychology and
Cognitive Neuropsychiatry Research

25-26 November | Macquarie University

Keynote speakers
Professor Martin Brüne
Ruhr-University Bochum, Germany
Dr Karen Croot
The University of Sydney

This research forum was hosted by the CCD at Macquarie University and was organised with the assistance of a team of young postgraduate and postdoctoral researchers. The theme of the forum was to promote cognitive neuropsychology and cognitive neuropsychiatry. That is, to promote research that uses data from cognitive disorders to develop and test cognitive models of normal and abnormal function. These models, in turn, lead to better understanding and treatment programs for individuals with cognitive disorders. The forum provided an opportunity for researchers from different disciplines, including neuropsychology, psychiatry, linguistics, psychology, philosophy and speech pathology to present research that relates neuropsychological or psychiatric impairment to theories of cognitive function.

Annual Workshop
ARC Centre of Excellence in Cognition and its Disorders

27-28 November | Macquarie University

Keynote speakers
Professor Facundo Manes
INECO Foundation, Argentina
Dr Ryan McKay
Royal Holloway, University of London, UK
Professor Kate Nation
University of Oxford, UK
Professor Mabel Rice
The University of Kansas, USA

This annual workshop was held at the Australian Hearing Hub, at the Macquarie University node of the CCD, and was a forum to learn about and discuss research developed by each of the five programs - Belief Formation, Language, Memory, Person Perception and Reading. Four keynote presentations were given by international Partner Investigators of the Centre along with 10 research talks by postdoctoral researchers and Associate Investigators. This year’s workshop saw four of the five winners of the “CCD Excellence in Research Postgraduate Awards for 2012”, Nichola Burton, Michael Gascoigne, Stephen Pritchard and Sharon Savage, give speed presentations on their winning papers. The first day concluded with a student poster session which facilitated feedback and comments to the students on their research projects. The annual workshop was well attended over the two days and served to provide a conducive environment for research collaboration.
Launch SoCog

27 November | Macquarie University

Keynote speakers

Professor Martin Brüne
Ruhr-University Bochum, Germany
Dr Pamela Marsh
Macquarie University

A new training program, SoCog, has been devised by Dr Pamela Marsh for people with schizophrenia and was launched as part of the CCD Annual Workshop.

SoCog is a novel remediation program that targets the characteristic social impairments found in schizophrenia. Social impairments are identified by people with schizophrenia, their carers, and clinicians as one the greatest unmet treatment needs. These impairments cause great difficulties with communicating and understanding one’s own and other people’s perspectives and they cause severe social isolation for many individuals with schizophrenia. As these impairments are not usually improved by medications commonly used to treat schizophrenia, SoCog offers an alternative treatment plan. SoCog is comprised of two training programs: Emotion Recognition Training (SoCog-ERT) and Mental-State Reasoning Training (SoCog-MSRT). SoCog-ERT training aims to improve the ability to accurately recognise other people’s facial expressions of emotion, an ability that is essential for effective social interaction and an ability that is profoundly impaired in schizophrenia. SoCog-MSRT training encourages flexible thinking about the likely thoughts of others, the tolerance of ambiguity, and thoughtful consideration of other people’s perspectives within social contexts. Each of these training programs is made up of a suite of games that are presented within a social atmosphere with small groups of participants.
Keynote speakers

Dr Marc Buehner
Cardiff University, UK

Associate Professor Flavie Waters
The University of Western Australia

Dr James Moore
University of London, UK

Sense of agency, the subjective feeling of controlling one’s actions, is an area of increasing interest in cognitive science, psychology and psychiatry. This one day interdisciplinary workshop brought together researchers, philosophers and clinicians to explore ideas and practical applications related to sense of agency research. The morning keynote session addressed clinical aspects of sense of agency and featured a presentation from Associate Professor Flavie Waters. The afternoon keynote session addressed methodological issues in sense of agency research, with a particular focus on the intentional binding technique. This session featured presentations from Drs James Moore and Marc Buehner, discussing alternate interpretations of experimental data related to the connection between time perception and sense of agency. This inclusive and collegial workshop was an opportunity for researchers to present and discuss experimental, clinical or philosophical work within the broad domain of sense of agency.
Workshop
The Evolution of Language

6 December | Macquarie University

Keynote speakers

Professor Robert (Bob) Berwick
Massachusetts Institute of Technology, USA
Emeritus Professor Brian Byrne
University of New England
Associate Professor Drew Khlentzos
University of New England
Dr Richard Menary
Macquarie University
Professor Kim Sterelny
Australian National University

This one day workshop was co-sponsored by the CCD, Centre for Language Sciences (CLaS) and Centre for Agency, Values and Ethics (CAVE) – three research centres across three faculties of Macquarie University. The workshop was devoted to in-depth discussions on the origins of human language with healthy discussions on the two alternative approaches – Continuity versus Discontinuity. Among the questions that were debated were:

- What is language?
- What aspects of language are unique to humans?
- What can language acquisition tell us about language evolution?
- How is language represented in the brain?
- What function, if any, does language serve?
- Were there proto-languages?
- Did language evolve gradually or was its evolution a ‘sudden emergent event’?
- Is there a gestural origin to language?
- What is the relationship between logic and language?
Workshop
Innovative Methods in Neuroimaging

8-9 December | Macquarie University

Keynote speakers
Dr Stefan Bode
The University of Melbourne
Associate Professor Scott Brown
The University of Newcastle
Dr Thomas Carlson
Macquarie University
Dr Paul Dux
The University of Queensland
Professor Polina Golland
Massachusetts Institute of Technology, USA
Dr Kiley Seymour
Macquarie University
Dr Alex Woolgar
Macquarie University

This two day workshop brought together a diverse group of researchers from across a number of Australian universities to engage in lively discussions on advanced neuroimaging techniques currently utilised in cognitive neuroscience. The interactive workshop, which included an informal and impromptu morning brainstorming session, gave researchers the opportunity to present their ideas and experiences using the latest methodologies in the field and promoted future cross disciplinary collaboration.

Workshop
Memory Days

11-12 December | Macquarie University

Keynote speakers
Professor David Balota
Washington University in St Louis, USA
Associate Professor Jan Duchek
Washington University in St Louis, USA
Associate Professor Michelle Meade
Montana State University, USA
Associate Professor Amanda Barnier
Macquarie University
Professor Michael Fine
Macquarie University
Professor Elaine Reese
University of Otago, NZ

Held over two days at the Macquarie University node of the CCD, this highly successful workshop was the sixth in a series produced by the Collective Cognition Team, and funded by ARC Discovery Projects and supported by the CCD. The focus of this workshop was on understanding the role of collaboratively remembering the past with others, including how such shared remembering affects healthy aging. The workshop showcased researchers, projects and new collaborations that examined themes of memory, aging and intervention research. It brought together acclaimed local, national and international researchers allowing thought provoking discussions on memory, cognition and collaboration in aging, translating laboratory based memory paradigms into intervention programs, as well as broader themes in social and autobiographical memory research, to synthesize our distinct backgrounds and to consolidate plans for ongoing collaborative research. On the first evening a public lecture was given by Professor David Balota, entitled “Healthy aging and early stage Alzheimer’s disease: A paradigm shift in research”. This public lecture was moderated by Lynne Malcolm from ABC’s radio program “All in the Mind” and was attended by over 50 members of the general public.
January 2013 saw the Macquarie node of the Centre move into its new home - the Australian Hearing Hub (AHH). The AHH was an initiative of the Australian Government as part of the Higher Education Investment Fund. This was an important step as it has brought all CCD researchers at Macquarie University together.

The Australian Hearing Hub is a state-of-the-art facility that has attracted a number of industry-leading partners to drive innovation and collaboration including Australian Hearing, National Acoustic Laboratories (NAL), Cochlear Ltd, The Royal Institute for Deaf and Blind Children, The Shepherd Centre and the Sydney Cochlear Implant Centre.

The AHH researchers, educators, clinicians and innovators with expertise in audiology, speech pathology, cognitive and language sciences, psychology, nanofabrication and engineering sciences have been brought together under one roof with a common purpose - to conduct research that will enhance the lives of people with hearing impairment.

The AHH will enable ground-breaking advances in:

- mapping brain/hearing function
- understanding auditory processing
- assessing auditory system disorders
- developing hearing aid and implant technologies
- improving strategies for rehabilitation
- learning to hear

A well-attended inaugural conference that was held 17-19 April provided outstanding opportunities for Australian and international researchers to exchange current knowledge and findings on the broad themes of language, literacy and cognition in children with hearing impairment. The conference also encompassed themes of emotional health, social competency, tele-health, auditory processing abilities and disorders, speech perception, diagnosis of hearing loss in children and epidemiology.

The AHH was officially opened by the Vice Chancellor, Professor S Bruce Dowton and Senator John Faulkner as part of the inaugural conference.
Researchers from The HEARing CRC, NAL and the CCD at Macquarie University visited Beijing Language and Culture University (BLCU) for a workshop on Language Acquisition and Language Impairment for researchers and students. This workshop was funded by the Commonwealth of Australia through the Australia-China Science Research Fund.

As part of the visit, Macquarie University Vice-Chancellor Professor S Bruce Dowton joined a round table discussion with Professor Xiliang Cui, President of BLCU. The discussion by the University Presidents focussed on the longstanding relationship between the universities, the importance of the linguistic and hearing research being carried out at both universities, and the value for society of working with children with hearing impairments and language disorders. During the discussion that followed, Distinguished Professor Stephen Crain expressed his desire for a tri-partite relationship between Macquarie University, Beijing Language and Culture University and Kanazawa University to allow students and researchers to conduct joint research using MEG brain imaging systems at the three universities (with BLCU’s Child MEG lab scheduled to be built in 2014).

As part of the workshop, researchers had the opportunity to visit the Beijing Disabled Persons Rehabilitation Service and Guidance Centre to see first hand the individualised intervention programs designed for children with autism spectrum disorder between the ages of 4-7. The goal is to rehabilitate the children into mainstream schooling by age 7. Another highlight of the visit was a training workshop for over 150 special education teachers from across Beijing, hosted by the Beijing Haidian Special Education School.

These workshops were the first of a series of planned workshops that are intended to foster long-term research collaborations between the stakeholders at the Australian Hearing Hub (The HEARing CRC, NAL and the CCD) and our research partners in China (BLCU, Chinese Academy of Science and the Beijing Tongren Hospital, Capital Medical University) and Japan (Kanazawa Institute of Technology). The aim of these workshops is to translate research findings from Australian University research teams into treatment programs that will improve outcomes for children with hearing and/or language impairments.
Nerd Nite Sydney
6 March | Surry Hills, Sydney

Associate Professor Amanda Barnier and Professor John Sutton, members of the Belief Formation Program, participated in one of Nerd Nite Sydney’s popular café events, which was attended by over 70 people. Nerd Nite Sydney is a monthly night for intellectuals to meet informally over pizza and beer to enjoy presentations by experts.

Workshop - Neuroimaging for Clinicians
6 June | Neuroscience Research Australia (NeuRA)

This workshop was organised by Memory Program members Associate Professor Olivier Piguet and Dr Michael Hornberger in collaboration with the NSW division of the Australian Psychological Society College of Clinical Neuropsychologists and provided an introductory course in structural and functional brain neuroimaging. Clinical (neuro) psychologists, medical practitioners and other allied health professionals were introduced to principles of neuroimaging and different imaging modalities. In addition, the application of these techniques to research questions and clinical investigations was discussed.

Meeting - Young-Onset Dementia Carers
12 June | Neuroscience Research Australia

This meeting for carers of patients diagnosed with young-onset dementia was the third of its kind. It provided opportunities for carers to share their experiences of looking after someone with dementia in a safe environment. Members of the CCD Memory program (Professor John Hodges, Dr Fiona Kumfor, Dr James Burrell and Associate Professor Olivier Piguet) presented their findings, and issues such as driving ability, mental capacity, emotion processing deficits, and the genetics of dementia were discussed.

Workshop - Training Younger-Onset Dementia Key Workers
24 July | Neuroscience Research Australia

Associate Professor Olivier Piguet and Dr James Burrell welcomed a group of younger-onset dementia key worker trainees at NeuRA for a morning workshop discussing cognition, behaviour and genetics of dementia. This was part of a training program organised in collaboration with Alzheimer’s Australia NSW for their staff.

Tour - CCD and National Acoustics Laboratories Research and Facilities
1 August | Macquarie University

In the spirit of collaboration, the CCD and NAL held a morning get together to learn more about the activities and facilities of each Centre. The day opened with a guided tour of CCD research facilities for NAL staff. This was followed by a tour by CCD staff of the extensive NAL research facilities. A joint morning tea provided an opportunity for researchers from both Centres to discuss their research interests in an informal context.

Public Talk - Café Scientifique
2 September | Hong Kong Maritime Museum, Hong Kong

Professor William Hayward of the Person Perception Program gave a public talk at the Hong Kong Maritime Museum’s Café Scientifique on “How we see the world”. Café Scientifique is a forum for discussion where anyone can come to explore the latest ideas in science and technology outside of the traditional academic context.

Inaugural Learning Differences Convention
1–2 November | Darling Harbour, Sydney

Researchers in the Reading Program, along with the CCD’s Neuronauts Brain Science Club, attended the Inaugural Learning Differences Convention in Sydney. At this event, Dr Nicholas Badcock gave a presentation on the subtypes of dyslexia and invited people with and without dyslexia to get involved in research. Parents, teachers, clinicians, and individuals with dyslexia were given the opportunity to ask questions and interact with CCD researchers. They expressed appreciation for the opportunity to learn about the scientific approach to understanding and treating dyslexia.

Literacy Tutoring
June - December | Macquarie University

Dr Saskia Kohnen from the Reading Program collaborated on a project that provided literacy tutoring to children who are in part- or full-time care of their grandparents. Some of the grandchildren have backgrounds of exposure to abuse, neglect and relationship breakdown and often have additional needs, including learning difficulties. The children were assessed prior to and following five months of intervention, and post-test results revealed improvements in the targeted areas for most children.

Reading and Spelling Treatments

The CCD Reading Program is host to a large Reading Training Study led by Associate Professor Genevieve McArthur, which provides treatment to all eligible children with reading difficulties, as well as free assessments, written reports, and ongoing advice.

The Spelling Training Study, led by Dr Saskia Kohnen, assessed children with spelling difficulties and provided free training to eligible poor spellers. All children received free assessments, written reports and advice about further training.
Sydney Kids Intellectual Development Study (SKIDS)

23 September - 4 October | Macquarie University

Over the September-October school holidays, a total of 117 kids aged 7 through 12 (with and without reading difficulties) visited the Australian Hearing Hub and completed a series of games and puzzles with the theme of space exploration as part of a project led by Reading Program member Dr Nicholas Badcock entitled ‘Cognitive and Social-Emotional Development in Learning Difficulties’. The project was popular with both kids and parents and resulted in the collection of well over 500 hours of data that will be used to address questions from 12 different projects, involving over 30 researchers.

SoCog Training and Social Cognition Education

In 2013, Dr Pamela Marsh of the Belief Formation Program provided two top-up training workshops for the SoCog remediation program for clinicians at Concord Hospital. Dr Marsh has also given presentations to clinical audiences at Cumberland Hospital and Westmead Hospital and continues to promote the needs of patients to receive better treatment for their social functioning difficulties.

Dr Marsh also contributed to psycho-education on social cognition and poor social functioning in schizophrenia by speaking to many consumer/carer audiences such as the Family and Carer Support Group at Cumberland Hospital. She also actively promotes rehabilitation and has coordinated and supervised two Macquarie University interns who have run computer skills classes for people with severe mental illness at Cumberland Hospital.

Answering Questions of the Meditation Community

In 2013, Dr Britta Biedermann and members of the Reading Program team hosted two meetings at the CCD with a Tibetan Buddhist nun and Buddhist apprentice from the Vajrayana Institute in order to discuss collaboration and to capture what research questions the meditation community wants answers for from the research community.
International Doctorate in Experimental Approaches to Language and Brain (IDEALAB)

The IDEALAB PhD is an exchange program that is funded by the European Commission’s Education, Audiovisual and Culture Executive Agency. As part of this program, Macquarie University partners with four European universities (University of Potsdam, Germany; University of Groningen, The Netherlands; University of Trento, Italy; Newcastle University, UK).

At Macquarie University, IDEALAB is directed by Professor Lyndsey Nickels, with supervisors drawn from the CCD Language Program and more widely across the university. The first cohort of eight Erasmus-Mundus funded students enrolled in October 2012, and the second nine students enrolled in October 2013, with five students spending time at Macquarie University in 2013. Further details about the programme are available on the IDEALAB website: em-idealab.com

Collaboration with Regional Universities

This year the CCD continued to maintain contact with the University of New England’s Language and Cognition Research Centre (LCRC). The LCRC includes one CCD Chief Investigator, Emeritus Professor Brian Byrne and two CCD Associate Investigators, Associate Professor Drew Khlentzos and Dr Inés Antón-Méndez. The Macquarie University node of the CCD hosted Emeritus Professor Byrne and Associate Professor Khlentzos on various occasions throughout the year and they were invited to present their work at a special workshop entitled The Evolution of Language, held in December 2013.

Careers Day

7 June | North Sydney Girls High School

For the third time, North Sydney Girls High School requested that women from the CCD present at its annual careers day and provide information about pathways to a career in cognitive science. Dr Britta Biedermann, of the Reading Program, and Dr Kiley Seymour, from the Perception in Action group, attended to talk about what qualifications are needed to enter the field of cognitive science, opportunities/challenges for women in the field, and relevant scholarship opportunities and potential assistance available.

Tour - National Youth Science Forum - Next Step Program

5 July | Macquarie University

The National Youth Science Forum, sponsored by Rotary International, is a program for Year 12 students who have been selected to participate based on their demonstrated aptitude for and interest in science. The aim of the program is to inspire young Australians to consider a future in science.

In conjunction with Cochlear Ltd, a partner of the Forum, the CCD hosted 50 Year 12 students as part of the Next Step Program. The students were given an overview of the Centre, lab demonstrations and tours, and information about pathways to a PhD in cognitive science.
Summer Institute for Speech Pathologists

7-23 July | Beijing Haidian Special Education School

Distinguished Professor Stephen Crain along with Dr Peng Zhou, Associate Professor Blake Johnson, and Professor Liqun Gao (BLCU) set up a professional training program for speech pathologists in China through the International Centre for Child Language Health (ICCLH). The program kicked off this year with a two-week summer institute in Beijing, at which Language Program members Distinguished Professor Crain, Dr Elisabeth Harrison and Dr Zhou offered course content.

The International Centre for Child Language Health was initially conceived between the CCD and the Centre for Studies of Chinese as a Second Language at the BLCU and brings together researchers, teachers, clinicians and medical practitioners from China and Australia to address the needs of Mandarin-speaking children who suffer from language impairments.

Macquarie University Open Day

14 September | Macquarie University

Open Day is an opportunity for prospective Macquarie University students and the broader community to attend mini lectures, talk to academics and discover what life is like on campus. As part of the mini lecture series, Dr Nicholas Badcock, from the Reading Program, gave a presentation on Auditory Event-Related Potentials (ERPs) and The Emotiv System. The Emotiv System, which is based on electroencephalography (EEG) technology, is an unobtrusive and portable headset used to measure electrical brain activity that has been converted by CCD researchers from video gaming equipment.

Student Mentoring

1-2 July | The University of Western Australia

Year 10 student Joshua Page visited the FaceLab to learn some of the practical aspects that are involved in face research under the supervision of Person Perception Program members Dr Linda Jeffery, Stephen Pond, Eleni Avard and Elizabeth Taylor.

Year 10 Work Experience Week

16-20 September | The University of Western Australia

The FaceLab hosted two year 10 students as part of their work experience week. The students, with guidance from Person Perception researchers Dr Linda Jeffery, Elizabeth Taylor and Stephen Pond took on the role of Research Assistants for the week and performed a number of tasks from all stages of conducting a research project. During their time at the lab, the students were also introduced to the research fields and interest areas of a number of Centre members to get an idea of the context and application of the work that they were conducting.
Cracking the Enigma: An Autism Research Blog

Dr Jon Brock, of the Person Perception Program, maintains and regularly updates a blog about autism research. This blog, titled Cracking the Enigma, can be found at crackingtheenigma.blogspot.com.au

MOTIf

The Macquarie Online Test Interface is an online facility designed to automatically administer, score, and provide reports for cognitive tests developed by researchers in the CCD Reading Program, including Associate Professor Genevieve McArthur, Professor Anne Castles, Dr Saskia Kohnen and Professor Lyndsey Nickels, in collaboration with Pip Jones (Deepend). MOTIf tests are available online at no charge to registered teachers, clinicians and researchers. The test results of each MOTIf user are stored in a secure and private database. MOTIf includes nine cognitive tests (two of these are new), available in a range of fully automated and PDF forms, with automatically generated standardised scores (age norms). As of October 2013, there were over 2800 registrants from all around the world, with 20-40 new registrants every week. (motif.org.au)

Standardised Reading Tests for Teachers and Clinicians

Researchers in the Reading Program have developed two new evidence-based reading tests that can be used by teachers and professionals. These include the Test of Everyday Reading Comprehension for children (TERC; supervised by Associated Professor Genevieve McArthur and Dr Saskia Kohnen), and the Test of Letter-Sound Knowledge (LeST; supervised by Dr Saskia Kohnen and Associate Professor Genevieve McArthur). Both tests have been normed on Australian school children and have been made available on the MOTIf website.

LiteracyPlanet

Researchers in the CCD Reading Training Study are involved in an online reading training program called LiteracyPlanet. LiteracyPlanet includes dozens of exercises that train students’ letter-sound reading and sight-word reading. CCD researchers have provided content and advice to the site, and continue to use it as a research tool. (literacyplanet.com)

Neuronauts Brain Science Club

The Neuronauts Brain Science Club (ccd.edu.au/neuronauts) is a register of young people (0 to 17 years) who are interested in taking part in research. When research projects are advertised through Neuronauts, children on the register can be signed up for studies that they are eligible for. Parents are reimbursed for their time and travel costs, and children receive certificates and other rewards.

Newsletters

Both the Reading and Person Perception Programs distributed annual newsletters to stakeholders including schools, teachers, clinicians, professionals and parents of study participants.

Prosopagnosia Register

Associate Professor Romina Palermo, from the Person Perception Program, engages with the community through the Prosopagnosia Register (maccs.mq.edu.au/research/projects/prosopagnosia). This is an online register for people with prosopagnosia, which is a term for when a person experiences difficulty in recognising faces. This web-based resource enables people who suffer from prosopagnosia to make contact with leading experts in the field and to participate in research. In turn, research updates are provided and queries are answered.

Social Media

The Person Perception team connects to the community and fellow researchers via Twitter (@PersonPercept) and Facebook (CCD Person Perception). Social media is used to share interesting articles on person perception and inform about the latest news from the CCD Person Perception team, including recent publications, prizes and events.

Western Australia Register for Autism Spectrum Disorders

The Person Perception Program provides ongoing support to the WA Autism Register (autismwa.org.au). The WA Autism Register collects information on newly diagnosed cases of autism spectrum disorders in Western Australia. This information is used to help understand how many people receive a diagnosis, what features they have in common and trends over time. The WA Autism Register also provides interested families with opportunities to participate in current research projects.
Members of all five programs regularly engage in a range of community outreach activities including providing talks to stakeholders and community organisations, consulting with clinicians and accepting appointments to external organisations.

Dr Nicholas Badcock (Reading): Conducted symposium for practitioners at the International Workshop on Reading and Developmental Dyslexia in Spain.

Professor Anne Castles (Reading): Chair, Steering Committee for the NSW Centre for Effective Reading.

Professor Anne Castles and Professor Lyndsey Nickels (Reading): Members, Council for Learning Difficulties Australia (LDA).

Professor Linda Cupples (Language): Presented to practitioners and clinicians at the Speech Pathology Australia National Conference.

Distinguished Professor Stephen Crain (Language): Invited talks on language to the Australian Association of Audiologists in Private Practice (Excellence in Education Program) and the Schizophrenia Fellowship of NSW (Annual Symposium). Invited presentations at Wu Ta-You Science Camp, Taiwan and at the training workshop for special education teachers at Beijing Haidian Special Education School, China.

Associate Professor Melissa Green (Belief Formation): Invited talks on schizophrenia research to the Australian Rotary Health Sydney City Club and the NSW Health Acute Inpatient Benchmarking Forum.

Professor John Hodges (Memory): Member, International Scientific Committee of Cognitive Neurology.

Dr Saskia Kohnen (Reading): Presented to practitioners at the International Workshop on Reading and Developmental Dyslexia in Spain.

Associate Professor Robyn Langdon (Belief Formation): Member, Schizophrenia Research Unit; treasurer, Australasian Society for Psychiatric Research; presented to family and carer support group Cumberland Hospital Sydney.

Associate Professor Genevieve McArthur (Reading): Invited by three forums to speak on evidence-based assessments and treatments of dyslexia and presented to teachers and practitioners at the Children’s Hospital Education Research Institute Conference in Sydney.

Dr Simon McCarthy-Jones (Belief Formation): Advisor to the Hearing Voices Network NSW; invited talks on hearing voices at the 36th National Conference of the Australian Association for Cognitive Behaviour Therapy (Adelaide), the XVIII Annual Course of Schizophrenia (Madrid, Spain), the 2013 Hearing Voices World Congress (Melbourne), the Bloomfield Mental Health Forum (Orange) and at St Vincent’s Hospital (Sydney); monthly blog (“This Month in Voices”) summarising monthly voice-hearing research.

Dr Jonathan McGuire (Belief Formation): Presented to family and carer support groups at Cumberland Hospital Sydney.

Professor Lyndsey Nickels (Language): Academic member, NSW Speech Pathology Australia Evidence Based practice group; collaboration with clinicians at St Joseph’s Hospital, War Memorial Hospital and the Speech Pathology Service at the Royal Rehabilitation Centre in Sydney; professional development workshops for several of the NSW health regions and for Speech Pathology Australia; presented at the Speech Pathology Australia National Conference; presented about reading and spelling assessment to practitioners at Aphasia Days in Norway.

Professor Lyndsey Nickels and Dr Scott Barnes (Language): advisors on development of research in the clinical environment for Western Sydney Local Health District Speech Pathology Services.

Dr Vince Polito (Belief Formation): Lecture on delusions as part of the “Uni in a Day” program at Macquarie University.

Dr Vince Polito and Dr Pamela Marsh (Belief Formation): Talk on social cognition and early psychosis at the Early Psychosis Forum at Westmead Hospital.

Associate Professor Olivier Piguet (Memory): Board Director, Australian Fronto-Temporal Dementia Association.

Dr Karen Smith-Lock (Language): Mentors speech pathologists in clinical practice; assists speech pathologists from the Department of Education Western Australia to develop measurement tools to assess the success of school programs; works with the principals and speech pathologists of the Department of Education Western Australia in the Evidence-Based Practice in Education Collaboration.

Associate Professor Rosalind Thornton (Language): Presented to practitioners and clinicians at the Speech Pathology Australia National Conference.

Dr Peng Zhou (Language): Presented at training workshop for special education teachers at Beijing Haidian Special Education School, China.
collaborations

Our researchers have strong links with international and national researchers beyond the five national collaborating institutions and nine international partner institutions of the CCD. Our researchers have developed and maintained collaborations with research partners from over 100 institutions in 17 countries. This collaboration section highlights links between CCD researchers and leading international and national researchers.

Dr Donna Rose Addis
Dr Adam Brown (New York University, USA), on future thinking in post-traumatic stress disorder (PTSD).

Dr Kelly Giovanello (University of North Carolina at Chapel Hill, USA), on functional Magnetic Resonance Imaging (fMRI) studies of autobiographical and episodic memory.

Professor Cheryl Grady (University of Toronto, Canada), on neural networks supporting future thinking.

Professor Daniel Schacter (Harvard University, USA), on fMRI studies of future thinking in young and older adults.

Associate Professor Lynette Tippett (The University of Auckland, NZ), on autobiographical memory and identity in aging, dementia and depression.

Associate Professor Amanda Barnier
Professor David Balota (University of Washington, USA), Dr Roger Dixon (University of Alberta, Canada), Associate Professor Janet Duchek (University of Washington, USA), Professor Suparna Rajaram (Stony Brook University, USA) and Professor William Hirst (The New School, USA) with Dr Celia Harris, Associate Professor Greg Savage and Professor John Sutton, on individual, collaborative, social and collective memory.

Dr Nora Breen (Royal Prince Alfred Hospital), Dr Lisa Bortolotti (University of Birmingham, UK) and Dr Martha Turner (University College London, UK) with Dr Rochelle Cox, Emeritus Professor Max Coltheart and Associate Professor Greg Savage and Professor John Sutton, on hypnotic analyses of clinical delusions.

Professor Erik Woody (University of Waterloo, Canada), on conceptualising and measuring individual differences in hypnotic ability.

Dr Jon Brock
Dr Joe Mc Cleery (University of Birmingham, UK) with Professor Ian Apperly on a magnetoencephalography (MEG) study of social perspective taking.

Dr Michael Hautus (The University of Auckland, NZ) with Associate Professor Blake Johnson, on MEG and electroencephalography (EEG) studies of auditory processing in autism.

engagement

CCD’s hosted events and outreach activities have provided numerous opportunities for our Centre members to develop and enhance links with stakeholders and the community. Representatives from the following industry, community and peak body organisations have been involved in CCD activities and events in 2013.

- AD Instruments
- Advanced Bionics
- AEIOU Foundation
- Alzheimer’s Australia NSW
- Amaze (Autism Victoria)
- Autism Queensland
- Autism Spectrum Australia (Aspect)
- Australasian Cognitive Neuroscience Society (ACNS)
- Australasian Society for Autism Research (ASfAR)
- Australasian Society for Psychophysiology, Inc.
- Australian Cricketer’s Association
- Australian Hearing
- BESA
- Cochlear Limited
- College of Educational and Developmental Psychologists
- Cricket Australia
- CSIRO
- Daughterty Care
- Department of Families, Housing, Community Services, and Indigenous Affairs
- Department of Health and Ageing
- Elekta
- Hear and Say
- Hearing Voices Network NSW
- HCSNet
- InsideOut Associates
- Intervention Services for Autism and Developmental Delay
- LEARN Foundation for Autism
- Learning Difficulties Australia
- LiteracyPlanet
- Mental Health Council of Australia
- National Acoustic Laboratories
- North Sydney Local Health District
- Northern Sydney Home Nursing Service
- NSW Centre for Effective Reading
- NSW Government Health
- Oticon
- Phonak
- Respite Day Centres
- Richmond PRA
- Royal Institute for Deaf and Blind Children
- Schizophrenia Research Institute
- Schizophrenia Fellowship NSW Inc
- SDN Children’s Services
- SR Research Eyelink
- Sydney Cochlear Implant Centre
- Sydney Kids Holiday Research Program
- Symbiotic Devices
- The Art Gallery of New South Wales
- The HEARingCRC
- The Lawrence Wilson Art Gallery
- Therapy Focus
- The Shepherd Centre
- Western Australian Department of Education, School Psychology Service
- Western Australian Register for Autism Spectrum Disorders
- The Art Gallery of New South Wales
- The HEARingCRC
- The Lawrence Wilson Art Gallery
- Therapy Focus
- The Shepherd Centre
- Western Australian Department of Education, School Psychology Service
- Western Australian Register for Autism Spectrum Disorders
Professor Rhoshei Lenroot (The University of New South Wales) and Dr Jim Lagopoulos (The University of Sydney) with Associate Professor Blake Johnson, on the relationship between gamma-aminobutyric acid (GABA) levels and neural oscillations in autism.

Dr Caroline Witton (Aston University, UK), on MEG studies of auditory processing in autism.

Emeritus Professor Brian Byrne
Dr Erik Wilcutt and Dr Richard Olson (University of Colorado Boulder, USA), Dr Bruce Pennington and Dr Janice Keenan (University of Denver, USA) and Dr Stefan Samuelsson (Linköping University, Sweden), on studies of genetic and environmental influences on mathematics, literacy and attention in elementary and high school twins.

Professor Anne Castles
Dr Helene Deacon (Dalhousie University, Canada), on longitudinal studies of orthographic learning.

Professor Gareth Gaskell (The University of York, UK) and Dr Anna Weighall (University of Leeds, UK) with Professor Kate Nation, on lexical consolidation effects in written word learning.

Dr Meredith McKague (The University of Melbourne) with Dr Saskia Kohnen and Ms Yvette Kezilas, on letter position processing in normal reading and dyslexia.

Professor Sheena Reilly, Professor Margot Prior, Associate Professor Melissa Wake, Professor John Carlin and Dr Lesley Bretherton (The University of Melbourne and the Murdoch Children’s Research Institute), on an NHMRC project: The Early Language in Victoria (ELVS) study.

Emeritus Professor Max Coltheart
Professor Derek Besner (University of Waterloo, Canada) with Professor Kathy Rastle, Dr Betty Mousikou and Dr Claudio Mulatti, on computational modelling of reading aloud.

Dr Anika Fiebich (Ruhr-University Bochum, Germany), on theories of theory of mind.

Dr Nenagh Kemp (University of Tasmania), on hypocoristics in Australian English.

Dr Rachel Robbins (University of Western Sydney), on body cues to person recognition.

Dr Alessio Toraldo (University of Pavia, Italy), on the phonetics/phonology of the speech of children with hearing disorders.

Professor Katherine Demuth
Dr Teresa Ching (National Acoustic Laboratories), on the phonetics/phonology of the speech of children with hearing loss.

Dr Jan Edwards (University of Wisconsin, USA), on children’s phonological development, include non-standard dialects.

Dr Michael Frank (Stanford University, USA), on looking at modelling word learning as a function of social interactions.

Dr Mark Harvey (The University of Newcastle), on the articulatory phonology of coronal consonants in English and Arandic languages.

Dr Barbara Höhle (University of Potsdam, Germany), on phonological, morphological and syntactic development in typically developing children and those with hearing loss/language delay; and on eye-tracking methods.

Dr Colleen Holt (The University of Melbourne), on prosodic development in children with Cochlear Implants.

Dr Caroline Jones (University of Western Sydney), on indigenous child speech.

Dr Takuya Goro (Ibaraki University, Japan), on the acquisition of logical words in Japanese and in English.

Ms Wendy Haigh (The Benevolent Society), Associate Professor Jim Patrick (Cochlear Ltd) and Dr Cathy Foley (CSIRO) with Associate Professor Blake Johnson, on measuring brain function in disadvantaged children.

The HEARing CRC, Sydney Cochlear Implant Centre, National Acoustic Laboratories, Cochlear Ltd with Associate Professor Blake Johnson, on the cortical evaluation of implant performance and on cognitive development in children with hearing disorders.

Dr Mitsuru Kikuchi (Kanazawa University, Japan), Professor Liqun Gao (Beijing Language and Culture University, China) with Associate Professor Blake Johnson, on a collaborative project to study children with autism spectrum disorders using child MEG systems to measure functional brain connectivity.

Professor Gen Uehara (Kanazawa Institute of Technology, Japan) with Associate Professor Blake Johnson, on developing the world’s first MEG brain imaging system for measuring brain responses in people with Cochlear Implants.

Professor Gen Uehara (Kanazawa Institute of Technology, Japan), Associate Professor Yoshiashi Adachi (Kanazawa Institute of Technology, Japan) with Associate Professor Blake Johnson, on the development of a Real Time Head-Position Monitoring (ReTHM) system for the child MEG system.

Professor Emeritus Rosalind Thornton, on the acquisition of logical words in Japanese and in English.

Professor Liqun Gao (Beijing Language and Culture University, China), Dr Wen Yu (The Special Educational School of Haidian District, China) with Associate Professor Rosalind Thornton and Dr Peng Zhou, on establishing the International Center for Child Language Health (ICCLH) where studies are being conducted on language acquisition and assessing children with language disorders in China.

Dr Caroline Witton (Aston University, UK), on MEG studies of auditory processing in autism.

Professor Liqun Gao (Beijing Language and Culture University, China), Dr Wen Yu (The Special Educational School of Haidian District, China) with Associate Professor Rosalind Thornton and Dr Peng Zhou, on establishing the International Center for Child Language Health (ICCLH) where studies are being conducted on language acquisition and assessing children with language disorders in China.
Professor Matthew Kiernan (The University of Sydney), on the phonology of Arandic languages.

Dr Samrah Ahmed (University of Oxford, UK), on the neuroscience of hypnosis.

Dr Quinton Deeley (King's College London, UK), on suggested limb paralysis.

Dr Vaughan Bell (King's College London, UK), on hystera and hypnosis.

Dr Victor Villemagne (The University of Melbourne) with Associate Professor Olivier Piguet, on PET imaging in the dementias.

Dr Karsten Steinhauer (McGill University, Canada), on syntactic processing using EEG.

Dr Megha Sundara (University of California Los Angeles, USA), on the acoustics and articulatory organisation of adult and child speech.

Dr Dr Janetto Zhou (Sun Yat-sen University, China), on the other-race effect in face perception.

Professor Peter Halligan
Professor Paolo Bartolomeo (Salpêtrière Hospital, France and Università Cattolica del Sacro Cuore, Italy), on neglect.

Dr Ya Ana Tzeng (Academia Sinica, Taiwan), on the relationship between motor control and rhythm in language comprehension.

Dr Karsten Steinhauer (McGill University, Canada), on syntactic processing using EEG.

Dr Megha Sundara (University of California Los Angeles, USA), on infant speech perception and grammatical morphology across typical, bilingual, SLI and hearing loss populations.

Dr Rachel Theodore (University of Connecticut, USA), on phonological and morphological development, and effects of phonotactic probability.

Dr Myfany Turpin (The University of Queensland), on the phonology of Arandic languages.

Professor William Hayward
Professor Roberto Caldara (University of Fribourg, Switzerland), on differences in eye-movements between ethnic groups during face perception.

Professor Isabel Gauthier (Vanderbilt University, USA), on holistic face perception.

Professor Paolo Bartolomeo (Salpêtrière Hospital, France and Università Cattolica del Sacro Cuore, Italy), on neglect.

Professor Peter Halligan
Professor Paolo Bartolomeo (Salpêtrière Hospital, France and Università Cattolica del Sacro Cuore, Italy), on neglect.

Dr Janet Hsiao (University of Hong Kong, Hong Kong), on differences in eye-movements between ethnic groups during face perception.

Dr lan Thornton (University of Malta, Malta), on extraction of face information during perception.

Dr Holger Wiese (Friedrich Schiller University of Jena, Germany), on recollection and familiarity of objects and faces.

Dr Guomei Zhou (Sun Yat-sen University, China), on the other-race effect in face perception.

Professor John Hodges
Dr Samrah Ahmed (University of Oxford, UK), on autobiographical memory in the dementias.

Associate Professor Kirnie Ballard (The University of Sydney), on language studies in dementia.

Professor Matthew Kiernan (The University of Sydney), on cognition in motor neurone disease.

Professor Jillian Kriil (The University of Sydney) and Professor Glenda Halliday (The University of New South Wales) with Associate Professor Olivier Piguet, on pathology and anatomy of memory.

Professor Facundo Manes (INECO Foundation, Argentina), on collaborative studies of cognition in frontotemporal dementia.

Dr Rupert Noad (Plymouth University, UK), on development of tests of cognition.

Professor Karalyn Patterson (University of Cambridge, UK), on semantic memory.

Professor Chris Rowe (The University of Melbourne) with Associate Professor Olivier Piguet, on Positron Emission Tomography (PET) imaging in the dementias.

Professor Adam Zeman (University of Exeter, UK), on forgetting and memory in epilepsy.

**Associate Professor Blake Johnson**
Associate Professor Douglas Cheyne (University of Toronto and Toronto Hospital for Sick Children, Canada) with Distinguished Professor Stephen Crain and Professor Maria Teresa Guasti, on the relationship between motor control and rhythm in language comprehension.

Associate Professor Dimity Dorman (Hear and Say) and Dr Chris Roberts (Cochlear Ltd) with Distinguished Professor Stephen Crain, on effects of early intervention on auditory brain development in a child with a cochlear implant: A MEG pilot study.

Dr Michael Hautus (The University of Auckland, NZ), on brain mechanisms of auditory scene analysis.

Professor Andrew Heathcote and Dr Scott Brown (The University of Newcastle), on acquisition of expertise in spatial imagery.

Professor Jennifer Hudson (Macquarie University), on neural mechanisms of anxiety in children.

Associate Professor Frini Karayanidis (The University of Newcastle), on spatio-temporal components of preparation in task-switching.

Professor Ovid Tzeng (Academia Sinica, Taiwan), Professor Thomas Lee (The Chinese University of Hong Kong, Hong Kong) and Professor Liquan Gao (Beijing Language and Culture University, China) with Distinguished Professor Stephen Crain, Associate Professor Drew Khlentzos and Associate Professor Rosalind Thornton, on the emergence of logic in child language.

Professor Ravi Krishan (Purdue University, USA), on brainstem and cortical representation of native and non-native contours in speech sounds.

Professor Rhoshel Lenroot (The University of New South Wales), on the relationship between gamma-aminobutyric acid (GABA) levels and neural oscillations in autism.

Dr Penelope McNulty and Professor Caroline Rae (The University of New South Wales), on imaging of brain recovery after stroke.
**Associate Professor Robyn Langdon**

Dr Adam Guastella (The University of Sydney) and Associate Professor Philip Ward (The University of New South Wales), on examining the effect of oxytocin on social cognitive abilities in people with schizophrenia.

Associate Professor Ulrich Schall, Professor Patricia Michie and Dr Juanita Todd (The University of Newcastle), Assistant Professor Philip Ward (The University of New South Wales) and Dr Helen Stain (The University of Sydney), on identifying predictors of transition to psychotic illness in at-risk young people.

Associate Professor Brian Scholl and Dr Tao Gao (Yale University, USA), on piloting paradigms to investigate the detection of signals of agency and intent in people with schizophrenia.

Dr Olav Nielsen and Dr Matthew Large (The University of New South Wales), on shared delusional beliefs leading to homicide.

**Professor Facundo Manes**

Dr Tristan Bekinschtein (University of Cambridge, UK), on disorders of consciousness.

Professor John Cacioppo, Assistant Professor Stephanie Cacioppo and Professor Jean Decety (University of Chicago, USA), on aspects of social and affective neuroscience.

Professor John Duncan (University of Cambridge, UK), on intelligence and the role of BA10.

**Dr Genevieve McArthur**

Dr Florian Hutzler and Dr Stefan Howelka (University of Salzburg, Austria) with Associate Professor Romina Palermo and Dr Peter de Lissa, on a project using fixation-related potentials to investigate the brain responses to eyes in faces.

Dr Lena Quinto (Macquarie University) with Dr Britta Biedermann, Dr Yatin Mahajan, Dr Vince Polito, Dr Michael Connors, Dr Peter De Lissa, and Dr Nicholas Badcock, on using event-related potentials (ERPs) to examine the effect of meditation of neural correlates of auditory attention.

Dr Johnson Thie (The University of Sydney) with Dr Nicholas Badcock, Dr Peter de Lissa, Dr Betty Mousikou and Dr Yatin Mahajan, on a project converting and validating the EMOTIV gaming EEG system into an ERP system.

Dr Hannah Nash, Professor Charles Hulme (University College London, UK) and Professor Maggie Snowling (University of Oxford, UK) with Dr Yatin Mahajan, on a project using ERPs to investigate the learning of phonemes in the brain.

**Dr Ryan McKay**

Professor Peter Brugger (University Hospital Zurich, Switzerland), on unrealistic optimism and caloric vestibular stimulation.

Professor Daniel Dennett (Tufts University, USA), on evolution and religion.

Professor Ernst Fehr and Dr Charles Efferson (University of Zurich, Switzerland), on religion and prosocial behaviour and on shared delusions.

Dr Petter Johansson (University College London, UK), on religion and choice blindness.

**Professor Ara Norenzayan, Professor Joe Henrich,**

**Dr Jon Lanman and Dr Miriam Mathews (The University of British Columbia, Canada), on ritual and group cohesion.**

**Professor Bill Swann (The University of Texas at Austin, USA), on identity fusion and ritual.**

**Professor Harvey Whitehouse (University of Oxford, UK), on religion and morality; and on ritual and group cohesion.**

**Dr Laurie Miller**

Professor Skye MacDonald (The University of New South Wales), on the effects of focal frontal lobe lesions on communication.

Dr Eneida Mioshi (The University of New South Wales), on carer burden in dementia.

Dr Anna Mitchell (University of Oxford, UK), on the role of the thalamus in memory (comparing human and nonhuman primates).

Associate Professor Armin Mohamed (The University of Sydney and Royal Prince Alfred Hospital), on epilepsy and its relationship to cognition and mood.

Professor Louise Sharpe (The University of Sydney), on studies of mood in patients with epilepsy.

Professor Richard Stevenson (Macquarie University), on olfaction, gustation and synaesthesia in patients with focal brain lesions.

Dr Ysbrand van der Werf (VU University Medical Center and Netherlands Institute for Brain Research, The Netherlands), on sleep and cognition in epilepsy.

**Professor Kate Nation**

Dr Victoria Murphy and Professor Stephen Pulman (University of Oxford, UK), on exploring children's reading via a corpus of reading experience.

Professor Kim Plunkett (University of Oxford, UK), on predicting reading outcomes in school-age children from measures of vocabulary in infancy.

Dr Emily Transcianko (St John's College, Oxford, UK) and Dr Karin Kukkonen (University of Turku, Finland), on eye movements in literary reading.

**Professor Lyndsey Nickels**

Associate Professor Kerrie Ballard and Ms Dominique Scholl (The University of Sydney), on intervention in aphasia and apraxia of speech.

Dr Wendy Best (University College London, UK) and Professor David Howard (Newcastle University, UK), on common methodological failings in single case study treatment research.

Associate Professor David Copland, Dr Tony Angwin, Dr Katie McMahon and Dr Anna Holmes (The University of Queensland), on using functional Magnetic Resonance Imaging (fMRI) to evaluate different treatments for word retrieval impairments following brain damage.

Professor Barbara Höhle (University of Potsdam, Germany), Professor Roelien Bastiaanse (University of Groningen, The Netherlands), Professor David Howard (Newcastle University, UK), Professor Gabriele Miceli (University of Trento, Italy), on the International Doctorate in Experimental Approaches to Language and Brain (IDEALAB) program.
Professor David Howard (Newcastle University, UK), on persistence of activation in the language system.

NHMRC Centre for Clinical Research Excellence in Aphasia Rehabilitation: A large network of national and international aphasia researchers, on developing evidence for better pathways for aphasia rehabilitation.

Professor Brenda Rapp (Johns Hopkins University, USA) with Dr Saskia Kohnen, on the jointly edited special issue of Cognitive Neuropsychology on using intervention to inform cognitive theory.

Professor Niels Schiller (Leiden University, The Netherlands), Dr Antje Lorenz (University of Münster, Germany), Dr Elisabeth Beyersmann (Aix-Marseille University, France) with Dr Britta Biedermann, on the representation and processing of plural information.

Dr Samantha Siyambalapitya (Griffith University) with Dr Britta Biedermann, on bilingual language representation.

Cathleen Taylor (War Memorial Hospital) with Dr Karen Croot, on intervention for individuals for progressive language disorders.

Dr Elizabeth (Liz) Pellicano
Dr Geoff Bird (King’s College London, UK), on susceptibility to social influence in autism.

Professor David Burr (University of Florence, Italy), on number perception in autism, perceptual adaptation, motion processing and Bayesian decision theory.

Professor Tony Charman (King’s College London, UK), on re-mapping autism research and a feasibility study into an early intervention program for parents of children with autism.

Professor Anthony Costello (University College London, UK), on intervention in autism.

Professor Steven Dakin (University College London, UK), on visual perception in autism.

Dr Kristine Krug (University of Oxford, UK), on social conformity in monkeys, typical children and children with autism.

Mr Ari Ne’eman (Autistic Self Advocacy Network, USA), on adaptation to face gender.

Dr Marc Sollberger (University Hospital of Basel, Switzerland), on social cognition in major depressive disorders.

Dr Gabrielle Todd (University of South Australia), on cognition in Parkinson’s disease.

Professor Gillian Rhodes
Dr Christopher Benton (University of Bristol, UK), on norm-based coding of facial expression.

Dr Michael Ewbank (University of Cambridge, UK), on neural adaptation and autistic traits.

Dr Andy Skinner (University of Bristol, UK), on norm-based coding of facial expression.

Professor Michael Webster (University of Nevada, USA), on adaptation to face gender.

Dr Jeremy Wilmer (Wellesley College, USA), on heritability of face preferences: A twin study.

Associate Professor Greg Savage
Professor David Ames and the Australian Imaging, Biomarkers and Lifestyle Study of Ageing Research Group, Melbourne and Perth, on understanding the development of Alzheimer’s disease.

Dr Chris Baker (National Institute of Mental Health, USA), on neuroimaging of brain plasticity.

Professor David Balota (University of Washington, USA) and Professor Suparna Rajaram (Stony Brook University, USA) with Associate Professor Amanda Barnier and Dr Celia Harris, on collaborative memory.

Dr Christopher Butler (University of Oxford, UK) and Professor Adam Zeman (University of Exeter, UK), on accelerated forgetting and remote memory impairment in cases of epileptic amnesic syndrome.

Professor Paul Fitzgerald, Dr Kate Hoy and Dr Jerome Maller (Monash Alfred Psychiatry Research Centre), on neurocognition in treatment-resistant depression.

Professor Stuart Graham, Dr Mojtaba Golzan and Dr Carolyn Orr (Macquarie University), on retinal biomarkers of early Alzheimer’s disease.

Dr Nicole Kochan (The University of New South Wales), on early detection of Alzheimer’s disease.

Professor Michael Morgan (Macquarie University), on neuroimaging of brain plasticity.

Associate Professor Sharon Naismith (Brain and Mind Research Institute), on emotion recognition in mild cognitive impairment.

Professor Dominic Rowe (Macquarie University), on memory functioning in Parkinson’s disease and prediction of dementia in motor neuron disease.

Associate Professor Peter Schofield (The University of Newcastle), on olfaction and the early detection of Alzheimer’s disease.

Associate Professor Rosalind Thornton
Dr Hirohsa Kiguchi (Miyagi Gakuin Women’s College, Japan), on children’s interpretation of cleft structures in English.
visitors

Professor David Burr  
Department of Psychology  
University of Florence, Italy  
7-11 January, 10-24 December,  
The University of Western Australia

Associate Professor  
Cristina Schmitt  
College of Arts and Letters  
Michigan State University, USA  
13-15 January, Macquarie University

Dr Naoki Furutani  
Department of Psychiatry and Neurobiology  
Kanazawa University, Japan  
23-25 January, Macquarie University

Mr Wang Gang  
International Students Office  
East China Normal University, China  
23 January, Macquarie University

Dr Hirotoshi Hiraishi  
Department of Psychiatry and Neurobiology  
Kanazawa University, Japan  
23-25 January, Macquarie University

Dr Yuki Kunioka  
Hokuriku Innovation Cluster for Health Science, Japan  
23-25 January, Macquarie University

Professor Robert Seckler  
Institute of Biochemistry and Biology  
University of Potsdam, Germany  
23 January, Macquarie University

Associate Professor  
Polina Golland  
Computer Science and Artificial Intelligence Laboratory  
Massachusetts Institute of Technology, USA  
1 February-30 August, Macquarie University

Professor Akira Uno  
Graduate School of Comprehensive Human Sciences  
University of Tsukuba, Japan  
1 February, 29-31 October, Macquarie University

Associate Professor  
Drew Khlentzos  
School of Behavioural, Cognitive and Social Sciences  
University of New England  
4 February-1 May, 5 July, 6 December, Macquarie University

Professor Peter Gärdenfors  
Department of Philosophy  
Lund University, Sweden  
12 February, Macquarie University

Dr Stefan Bode  
Melbourne School of Psychological Sciences  
The University of Melbourne  
20-22 February, Macquarie University

Professor Maria Teresa Guasti  
Department of Psychology  
University of Milano-Bicocca, Italy  
20 February-2 March, Macquarie University

Professor Marios Fourakis  
Department of Communication Sciences and Disorders  
University of Wisconsin-Madison, USA  
27 February, Macquarie University

Ms Devon Barnes  
Lindfield Speech Pathology and Learning Centre  
1 March, Macquarie University

Professor David Badcock  
School of Psychology  
The University of Western Australia  
5-6 March, Macquarie University

Mr Jun-ichi Fujihira  
Fujihira, Japan  
5-6 March, 2-11 April, 8-25 May, Macquarie University

Mr Noriyuki Muramatsu  
Fujihira, Japan  
5-6 March, 2-8 April, 8-25 May, Macquarie University

Mr Mitsunori Endo  
Ohtama Group, Japan  
6-20 March, Macquarie University

Mr Koichi Hino  
Ohtama Group, Japan  
6-20 March, Macquarie University

Mr Naoki Mashiyama  
Ohtama Group, Japan  
6-20 March, Macquarie University

Mr Yoshiyuki Matsuda  
Ohtama Group, Japan  
6-27 March, Macquarie University

Mr Kazuya Yamashita  
Ohtama Group, Japan  
6-20 March, Macquarie University

Professor David Howard  
School of Education, Communication and Language Sciences  
Newcastle University, UK  
11 March-11 April, Macquarie University

Associate Professor Colin Klein  
Department of Philosophy  
University of Illinois at Chicago, USA  
13 March, Macquarie University

Professor Michael Wibral  
Brain Imaging Center  
Johann Wolfgang Goethe University of Frankfurt am Main, Germany  
15 March, Macquarie University

Dr Helen Fraser  
Independent Consultant  
18 March, Macquarie University

Mr Daisuke Fujita  
Ohtama Group, Japan  
18-27 March, Macquarie University

Mr Koji Kadokura  
Ohtama Group, Japan  
18-20 March, Macquarie University

With Ohtama MSR Installation Team from Japan
Mr Sigeaki Takahashi
Ohtama Group, Japan
18-27 March, Macquarie University

Professor Richard Kayne
Department of Linguistics
New York University, USA
19 March, Macquarie University

Mr Satoru Muto
Ohtama Group, Japan
20-21 March, Macquarie University

Mr Manabu Okuda
Ohtama Group, Japan
20-21 March, Macquarie University

Associate Professor
Yoshiaki Adachi
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, 17-19 April, 29-30 October, Macquarie University

Professor Masanori Higuchi
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, 29-30 October, Macquarie University

Ms Miki Kawabata
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, Macquarie University

Professor Jun Kawai
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, Macquarie University

Mr Masakazu Miyamoto
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, Macquarie University

Associate Professor
Daisuke Oyama
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
25 March-9 April, Macquarie University

Dr Kenji Ohyama
Tohoku Rosai Hospital, Japan
27 March, Macquarie University

Dr Kazuma Sugawara
Yamaguchi University Hospital, Japan
27 March, Macquarie University

Professor Eiji Yumoto
Kumamoto University, Japan
27 March, Macquarie University

Associate Professor
Hirohisa Kiguchi
Miyagi Gakuin Women’s University, Japan
28 March-2 April, 5-6 December, Macquarie University

Mr Akio Inada
Fujihira, Japan
2-8 April, 8-25 May, Macquarie University

Mr Kazuma Ishiyama
Fujihira, Japan
2-8 April, Macquarie University

Mr Kazunori Watanabe
Fujihira, Japan
2-11 April, 2-25 May, Macquarie University

Professor Ravi Krishnan
Department of Speech, Language, and Hearing Sciences
Purdue University, USA
8 April-15 May, Macquarie University

Dr Jason Bell
Research School of Psychology
Australian National University
17 April, The University of Western Australia

Emeritus Professor Brian Byrne
School of Behavioural, Cognitive and Social Sciences
University of New England
17 April, 27-28 November, 6 December, Macquarie University

ARC centre of excellence in cognition and its disorders
Professor Gen Uehara
Applied Electronics Laboratory
Kanazawa Institute of Technology, Japan
17-19 April, 29-30 October, Macquarie University

Professor Jan Wouters
Division of Experimental Otorhinolaryngology
University of Leuven, Belgium
18 April, Macquarie University

Dr Michael Buschermöhle
Center of Competence for Hearing Aid System Technology, Germany
19 April, Macquarie University

Dr Sabine Haumann
Hörzentrum Hannover, Germany
19 April, Macquarie University

Dr Rainer Huber
Center of Competence for Hearing Aid System Technology, Germany
19 April, Macquarie University

Dr Nils Prenzler
Hannover Medical School, Germany
19 April, Macquarie University

Dr Michael Schulte
Hörzentrum Oldenburg, Germany
19 April, Macquarie University

Professor James Enns
Department of Psychology
The University of British Columbia, Canada
22 April, The University of Western Australia

Dr Hock Beng (Tommy) Ng
School of Humanities and Social Sciences
Nanyang Technological University, Singapore
22 April-3 May, Macquarie University

Dr Dennis Norris
MRC Cognition and Brain Sciences Unit
University of Cambridge, UK
1-15 May, Macquarie University

Dr Dorothea Debus
Department of Philosophy
University of York, UK
6-17 May, Macquarie University

Associate Professor Lisa Libby
Department of Psychology
Ohio State University, USA
6-13 May, Macquarie University

Mr Midori Fujihira
Fujihira, Japan
8-25 May, 3 December, Macquarie University

Mr Motoyoshi Sato
Fujihira, Japan
8-25 May, Macquarie University

Mr Akira Uchida
Fujihira, Japan
8-25 May, Macquarie University

Professor Mary O’Kane
Office of Chief Scientist and Scientific Engineer
NSW Government
23 May, Macquarie University

Dr Antonio Penna
Office for Health and Medical Research
NSW Government
23 May, Macquarie University

Professor Ken Forster
Department of Psychology
University of Arizona, USA
3-20 June, Macquarie University

Professor Aidan Byrne
Australian Research Council
6 June, Macquarie University

Dr Lucia Pozzan
The Institute for Research in Cognitive Science
University of Pennsylvania, USA
12 June, Macquarie University

Distinguished Professor Stephen Crain
Department of Linguistics
Macquarie University
17-18 June, The University of Western Australia

Professor Manfred Krifka
Centre for General Linguistics
Humboldt University of Berlin, Germany
5 July, Macquarie University
Professor Franck Ramus
Institute of Cognitive Studies
École Normale Supérieure, France
6-9 August, Macquarie University

Professor Jeremy Wolfe
Harvard Medical School
Harvard University, USA
7 August, Macquarie University

Dr Elise Mansfield
School of Psychology
The University of Newcastle
7-8 August, Macquarie University

Dr Renate Thienel
Priority Research Centre for Translational Neuroscience and Mental Health
The University of Newcastle
7-8 August, Macquarie University

Senator, The Honourable Kim Carr
Minister for Innovation, Industry, Science and Research
Parliament of Australia
12 August, Macquarie University

Mr Jason Yat-sen Li
Australian Labor Party Candidate for Bennelong, Eastwood
12 August, Macquarie University

The Honourable Kevin Rudd MP
Prime Minister of Australia
Parliament of Australia
12 August, Macquarie University

Professor Edward de Haan
Faculty of Social and Behavioural Sciences
University of Amsterdam, The Netherlands
12-16 August, Macquarie University

Dr Noam Sagiv
Centre for Cognition and Neuroimaging
Brunel University, UK
16 August, Macquarie University

Professor Han Zhuo
Beijing Normal University, China
27 August, Macquarie University

Professor Renlai Zhou
School of Psychology
Beijing Normal University, China
27 August, Macquarie University

Associate Professor Michelle Meade
Department of Psychology
Montana State University, USA
2 September 2013-29 August 2014, Macquarie University

Dr Annelies Vredeveldt
Department of Psychology
University of Cape Town, South Africa
16-20 September, Macquarie University

Professor Thomas Lunner
Linnaeus Centre HEAD
Linköping University, Sweden
23 September, Macquarie University

Distinguished Professor Stephen Davies
Department of Philosophy
The University of Auckland, NZ
7-11 October, Macquarie University

Distinguished Professor Stephen Crain
Department of Linguistics
Macquarie University
21-22 October, The University of Western Australia

Associate Professor Genevieve McArthur
Department of Cognitive Science
Macquarie University
21-25 October, The University of Western Australia

Associate Professor Robert Cowan
The HEARing Cooperative Research Centre (CRC)
The University of Melbourne
30 October, Macquarie University

Professor Jun Fudano
Office of International Programs
Kanazawa Institute of Technology, Japan
30 October, Macquarie University
Mr Kenji Fukuda  
Office of the Secretary General  
Kanazawa Institute of Technology, Japan  
30 October, Macquarie University

Professor Ken-ichi Ishikawa  
Office of the President  
Kanazawa Institute of Technology, Japan  
30 October, Macquarie University

Ms Rose Lee  
Institute of Linguistics  
Academia Sinica, Taiwan  
30 October, Macquarie University

Mr Yoshiriko Murai  
Office of Collaboration and Innovation  
Kanazawa Institute of Technology, Japan  
30 October, Macquarie University

Associate Professor Jim Patrick  
Design and Development  
Cochlear Ltd  
30 October, Macquarie University

Professor Ovid Tzeng  
Institute of Linguistics  
Academia Sinica, Taiwan  
30 October, 27-29 November, Macquarie University

Associate Professor Denise Wu  
Institute of Cognitive Neuroscience  
National Central University, Taiwan  
30 October, Macquarie University

Associate Professor Amanda Barnier  
Department of Cognitive Science  
Macquarie University  
31 October, Neuroscience Research Australia

Dr Adam Congleton  
Department of Cognitive Science  
Macquarie University  
31 October, Neuroscience Research Australia

Distinguished Professor Stephen Crain  
Department of Linguistics  
Macquarie University  
31 October, Neuroscience Research Australia

Dr Celia Harris  
Department of Cognitive Science  
Macquarie University  
31 October, Neuroscience Research Australia

Associate Professor Greg Savage  
Department of Psychology  
Macquarie University  
31 October, Neuroscience Research Australia

Professor John Sutton  
Department of Cognitive Science  
Macquarie University  
31 October, Neuroscience Research Australia

Professor Kate Nation  
Department of Experimental Psychology  
University of Oxford, UK  
1-30 November, Macquarie University

Professor Björn Lyxell  
Department of Behavioural Sciences and Learning  
Linköping University, Sweden  
8-13 November, Macquarie University

Professor Stefan Schweinberger  
Department of General Psychology  
Friedrich Schiller University of Jena, Germany  
11-22 November, The University of Western Australia

Professor Lynn Robertson  
Department of Psychology  
University of California, Berkeley, USA  
12-15 November, Macquarie University

Dr Nenagh Kemp  
School of Psychology  
University of Tasmania  
18-22 November, Macquarie University

Dr Fiona Kumfor  
Neuroscience Research Australia  
The University of New South Wales  
21 November, Macquarie University

Associate Professor Olivier Piguet  
Neuroscience Research Australia  
The University of New South Wales  
21 November, Macquarie University

Professor Martin Brüne  
Department of Psychiatry  
Ruhr-University Bochum, Germany  
25-29 November, Macquarie University

Dr Ryan McKay  
Department of Psychology  
Royal Holloway, University of London, UK  
25-28 November, Macquarie University

Professor Joan Maling  
National Science Foundation, USA  
25 November, Macquarie University

Professor Facundo Manes  
Institute of Cognitive Neurology (INECO)  
Institute of Neuroscience-Favaloro University, Argentina  
25-29 November, Macquarie University

Professor Mabel Rice  
Department of Speech, Language & Hearing  
University of Kansas, USA  
25-29 November, Macquarie University

Professor William Hayward  
Department of Psychology  
University of Hong Kong, Hong Kong  
27-28 November, Macquarie University

Professor Gillian Rhodes  
School of Psychology  
The University of Western Australia  
27-28 November, Macquarie University
Professor Mary Lou Smith  
Department of Psychology  
University of Toronto Mississauga, Canada  
27-28 November, Macquarie University

Dr Kay (Louise) Mercer  
Faculty of Education, Learning and Professional Studies Discipline  
Queensland University of Technology  
29 November, Macquarie University

Professor Richard Larson  
Department of Linguistics  
Stony Brook University, USA  
3-6 December, Macquarie University

Professor Mark Steedman  
School of Informatics  
University of Edinburgh, UK  
3-6 December, Macquarie University

Mr Seiichi Fujihira  
Fujihira, Japan  
4 December, Macquarie University

Professor Robert (Bob) Berwick  
Department of Electrical Engineering and Computer Science  
Massachusetts Institute of Technology, USA  
5-6 December, Macquarie University

Professor Kim Sterelny  
College of Arts & Social Sciences  
Australian National University  
6 December, Macquarie University

Associate Professor Elaine Reese  
Department of Psychology  
University of Otago, NZ  
9-13 December, Macquarie University

Professor David Balota  
Department of Psychology  
University of Washington, USA  
9-13 December, Macquarie University

Mr Craig Roy  
Science, Strategy and People  
CSIRO  
16 December, Macquarie University

Dr David Williams  
Information Sciences Group  
CSIRO  
16 December, Macquarie University

Ms Regina Fabry  
Johannes Gutenberg University of Mainz, Germany  
16 January-15 July, Macquarie University

Ms Noriko Akashi  
University of Tsukuba, Japan  
1-15 February, 28 October-27 November, Macquarie University

Mr Geoffrey Gonzalez  
Université Toulouse Ill-Paul Sabatier, France  
14 February-5 July, Macquarie University

Ms Francesca De Bonis  
University of Florence, Italy  
15 March-26 September, The University of Western Australia

Ms Leonie Geigis  
University of Potsdam, Germany  
8 April-17 May, Macquarie University

Ms Amy Dawel  
Australian National University  
24 April, The University of Western Australia

Ms Lyn Tieu  
University of Connecticut, USA  
1 May-31 July, Macquarie University

Ms Billie Steele  
Orange High School  
20-21 June, Macquarie University

Ms Ashleigh Broad  
31 July-29 November, Macquarie University

Ms Pernille Brondum  
Aalborg University, Denmark  
26 August 2013-15 January 2014, Macquarie University

Mr Michael Holt  
Aalborg University, Denmark  
26 August 2013-15 January 2014, Macquarie University

Ms Wang Chen  
Beijing Normal University, China  
27 August, Macquarie University

Ms Zhuang Dan-qi  
Beijing Normal University, China  
27 August, Macquarie University

Ms Ma Hong  
Beijing Normal University, China  
27 August, Macquarie University

Ms Gao Meng-yu  
Beijing Normal University, China  
27 August, Macquarie University

Ms Xia Ymn  
Beijing Normal University, China  
27 August, Macquarie University

Ms Li Ye  
Beijing Normal University, China  
27 August, Macquarie University

Ms Jiang Yi-han  
Beijing Normal University, China  
27 August, Macquarie University

Ms Shen Yu-chen  
Beijing Normal University, China  
27 August, Macquarie University

Mr Ma Zi-qi  
Beijing Normal University, China  
27 August, Macquarie University

Ms Elena Pagliarini  
University of Milano-Bicocca, Italy  
1 September 2013-31 August 2014, Macquarie University

Ms Mareike Moormann  
Rheinisch-Westfälischen Technischen Hochschule  
Aachen University, Germany  
1 October-31 December, Macquarie University

Ms Julia Misersky  
1 November 2013-31 October 2014, Macquarie University

Ms Amelia Dani  
Green Point Christian College  
18-22 November, Macquarie University
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Associate Professor Amanda Barnier
Thinking their way clear to HSC success
The Age, Avon Valley Advocate, Illawarra Mercury, Maitland Mercury, Port Macquarie News, 25 August

Rebooting your memory: After millions of years of remembering what matters, is technology changing the way memory works?
Canberra Times, Sydney Morning Herald, 3 November

Dr Jon Brock
Researchers calculate sibling autism spectrum disorder risk
The Conversation, 20 August

Does psychology belong in the science club?
The Conversation, 17 September

Dr Nicolas Bullot
Art appreciation is measureable
Science Daily, 28 May

What makes people appreciate good works of art?
New Track India, 29 May

Emeritus Professor Brian Byrne
Genes aren’t destiny but teaching isn’t everything either
The Conversation, 1 May

Genes have a big impact on exam results: UK research
The Conversation, 12 December

Professor Anne Castles
Pre-school computers boost ABC knowledge
Early Learning Review, 30 April

Emeritus Professor Max Coltheart
Brain gym claims challenged
Sydney Morning Herald, 13 January

Rowe inquiry spelled out how children can be taught to excel in reading
Weekend Australian, 19 January

Associate Professor Felicity Cox
Samsung expands smart TV content and functionality
Cnet Australia, 17 April

Bigger, smarter Samsung S9 Ultra HD 4K TV is only $40k
Current Online, 17 April

Samsung launches smart TV with Aussie accent
Sun Herald, 17 April

Samsung unveils 85 inch TV ultra-high definition TV
The Australian, 18 April

Samsung proves “bigger is better” with Smart TV range
ConnectedAustralia.com, 18 April

Samsung gets sneaky at launch event for 2013 TV range
Current.com.au, 18 April

Samsung launches its 2013 TV lineup with 4K, smarts, and plenty of style
Gadget Guy, 18 April

Samsung’s 2013 TV lineup is big on interaction and content
Good Gear Guide, PC World, 18 April

Samsung’s new 2013 Smart TV platform part 1
SmartHouse, 18 April

The ever-evolving Aussie accent
Australian Geographic, May/June

Distinguished Professor Stephen Crain
Portrait of amateur hour dressed up as an art prize
Sydney Morning Herald, 13 March

The Emergence of Meaning
New Book Network, 30 May

Australian experts to help Mandarin-speaking kids struggling with speech
China Weekly English News, 4 July
ShanghaiDaily.com, 5 July

The end of medical diagnostics and space exploration? Why helium recycling matters
Australian Life Scientist, 31 July

AUSTRALIAN SCIENCE MEDIA CENTRE ON HELO RESERVES
The Register, 30 July

We’re wasting all our precious helium. A call for recycling
Before it’s News, ZME Science, 30 July

Recycling helium
Australian Life Scientist, 31 July

Solving the world’s helium problem Forbes, 31 July

No balloons for you! Helium prices set to skyrocket
Lifehacker, 31 July

Helium balloons may soon be out of reach
Larvatus Prodeo, 2 August

Uni inflates helium supply
Northern District Times, 7 August

Election 2013: Rudd v Abbott debate sparks notes row - politics live - as it happened
The Guardian, 12 August

New imaging device gives insights into hearing
Time Health & Family, 30 October

MEG to offer new insight into Cochlear implants
The Hearing Review, 30 October

Children’s brain-imaging device has built-in entertainment
Sydney Morning Herald, 30 October

Brain-imaging with entertainment
Stuff.co.nz, 31 October

Scientists acquire world’s first child-friendly brain-imaging machine
The Age, 31 October

Cochlear uses new imaging device
Hospital & Aged care, 4 November

World-first device offers new insight into life with a Cochlear implant
Medical Xpress, 30 October

World-first imaging system for Cochlear implants
Labonline.com.au, 11 November
Get Better Health, 14 November

Dr Kate Crookes
Weaker holistic processing explains why Caucasians struggle to tell Asian faces apart
ScienceNetwork WA, 14 March

Caucasians struggle to distinguish Asian faces
Australasian Science, 1 May

Dr Karen Croot
Rare disorder leaves sufferers speaking with a foreign accent
Newcastle Herald, Sydney Morning Herald, 17 June
Your ears aren’t fooling you: Listen to the Australian woman who woke up from an accident with a French Accent
The Blaze, 18 June
Australian crash victim develops French accent
Reuters UK, 18 June

Professor Katherine Demuth
Women urged to climb career ladder
The Australian, 10 July

Professor S Bruce Dowton
Just what the doctor ordered
Sydney Morning Herald, 5 January

Election wrap: August 12, 2013
Sydney Morning Herald, 12 August

Prime Minister Kevin Rudd announces tech hubs to boost job numbers in Sydney
The Telegraph, 12 August

Dr Louise Ewing
Significance of facial processing in autism re-evaluated
ScienceNetwork WA, 5 May

Dr Muireann Irish
Daydream believer: Why your brain is wired to wander
The Conversation, SBS News Online, 21 October

Is daydreaming necessary
Being Human, 23 October

Daydreaming is hard work says neuroscience research
ABC Melbourne, ABC Sydney, ABC Online, 23 October

Daydream stress reliever
The Irish Sun, October

Don’t forget the milk! Memory lapses in ageing and dementia
Ageless Magazine, December

Dr Linda Jeffery
Kids solve face code
The West Australian, 10 July

Four-year-olds recognise how to catch a thief
University World News, 20 July

Associate Professor Blake Johnson
World-first machine bypasses Cochlear ‘distortions’
The Australian, 31 October

Australian Computer Society,
1 November

Dr Fiona Kumfor
Dementia patients’ emotional link lost
The Age, WA Today, 8 July

FTD patients struggle with emotional memories
Neurology Update, 9 July

Brain region implicated in emotional disturbance in dementia patients
AphaGalileo, Science News, 12 July

Emotional memories lost in FTD
Medical Observer, 16 July

Making a mark on the brain – how emotion colours memories
The Conversation, 23 July

Frontotemporal dementia and emotional memories
News Medical, 23 July

Dr Simon McCarthy-Jones
Working with voices given a fair hearing
Central Western Daily, 10 May

Dr Ryan McKay
Social evolution: The ritual animal
Nature, 23 January

Human rites
Aoen Magazine, January

Dr Catherine McMahon
Mosquito devices may be used to disperse Australian delinquents - but how do they work?
The Conversation, 3 June

Bone conduction: The new front in guerilla advertising
Canberra Times, 1 May

Famous faces to help spot early dementia
ABC Science, 13 August

Professor Gillian Rhodes
Is sexual infidelity written on your face?
Psychology Today, 2 February

Robert Ross
The evolution of little red riding hood
Science Now, 14 November

Professor William (Bill) Thompson
Love of music is learned, study finds
Australian Geographic, 25 February

Dr Lisa Yen
Our people .... women in research
Equity and Diversity Unit, Macquarie University, June

Ms Astrid Zeman
Optical illusions can trick computers, too
Science on NBC News, 20 March

Radio | Podcast

Associate Professor Amanda Barnier
Memory recall techniques
Breakfast, 6PR Perth, 22 April

Associate Professor Felicity Cox
Australian accents
Afternoons, ABC Radio, 2 April

Australian voices project
ABC Adelaide, 21 May
ABC Drive, ABC Brisbane, 22 May
ABC Sydney, ABC Central Coast, 27 May

Distinguished Professor Stephen Crain
Australian facility to tackle global helium decline
ABC National Radio - AM Program, 30 July
Helium gas running out
ABC National Radio - PM Program, 30 July

The world’s dwindling supply of helium
ABC North Queensland, 30 July

Dr Karen Croot
Foreign accent syndrome interview
Radio Australia, 16 June
ABC Radio Queensland, Radio 6PR Perth, 20 June

Talk the talk: Foreign accent syndrome
Radio RTRfm 92.1 Perth, 30 July

Professor Janet Greeley
Australian ‘Hearing Hub’ opens
SBS, 17 April

A new national centre bringing together hearing-related researchers and educators from across Australia
World News Australia, SBS Ethnic Radio, 19 April

Dr Muireann Irish
Libbi Gorr is dreaming
774 ABC Melbourne, Breakfast with Libbi Gorr, 22 October

Daydreaming in dementia research
ABC Radio Cairns, ABC Radio Perth, Radio 2SE, Radio 4BC, 22 October

Memory and imagination
Alzheimer’s Australia Dementia News, October

Dr Fiona Kumfor
Study reveals why dementia sufferers lose memory of significant life events
ABC National Radio - AM Program, 8 July

Dementia’s emotional link
The AFTRS, 9 July
ABC Adelaide, ABC Riverlands, 12 July
2SER, 13 July

Professor Lyndsey Nickels
Medical segment on foreign accent syndrome
774 ABC Melbourne, 24 June

Foreign accent syndrome
ABC North West WA, Statewide Drive, 25 June

Associate Professor Anina Rich
Synaesthesia
774 ABC Melbourne, 23 September

Professor William (Bill) Thompson
Music as therapy
ABC South East NSW, South East Mornings, 14 February

Television

Dr Hua-Chen Wang talking with Prime Minister Kevin Rudd and Mr Jason Yat-sen Li

Distinguished Professor Stephen Crain
World-first device offers new insight into life with a Cochlear implant
Channel 9 News (syndicated nationally), 30 October

Dr Karen Croot
Foreign accent syndrome interview with Lucy Shannon
ABC TV News Tasmania, 16 June

Car crash leaves Australian woman with foreign accent
CNN Hong Kong, 21 June

Foreign accent syndrome interview
Today Tonight Melbourne, 21 June

Professor S Bruce Dowton
Prime Minister visits campus to announce new Medical Technologies Innovation Partnership
7 News, Sky News, 12 August

Professor Janet Greeley
Hear hear
ABC News, 17 April

Associate Professor Romina Palermo
Face blindness
Today Tonight, 17 April

Dr Paul Sowman
Redesign my brain - Episode 1
ABC Television, 10 October

Redesign my brain - Episode 2
ABC Television, 17 October

Redesign my brain - Episode 3
ABC Television, 24 October

PUTTING BRAIN TRAINING TO THE TEST

Redesign My Brain
Shahrood Sammon
Thinking speed
Divergent thinking
Visualisation
Emotional intelligence
Innovation
Body intelligence
Memory
Attention
Lateral thinking
Producing outputs that tackle significant conceptual issues and shed new light on current research mysteries.
outputs

hosted seminars

* From the jointly supported CLaS-CCD Research Colloquium Series

Acquisition of number morphology: Effects of sociolinguistic variation and parametric variation.
**Associate Professor Cristina Schmitt**
College of Arts and Letters, Michigan State University, USA
15 January, Macquarie University

Hemispheric specialisation for symmetry processing is complexity dependent.
**Dr Jason Bell**
Research School of Psychology, Australian National University
17 January, The University of Western Australia

Introduction of the mission and program of Hokuriku Innovation Cluster for Health Science (HICHS).
**Dr Yuki Kunioka, Dr Hiroshi Hiraishi, & Dr Naoki Furutani**
The Hokuriku Industrial Advancement Center, Japan
24 January, Macquarie University

The geometry of meaning: Semantics based on conceptual spaces.
**Professor Peter Gärdenfors**
Department of Philosophy, Lund University, Sweden
12 February, Macquarie University

Phonological development: The acquisition of a (really) complex system.
**Professor Edwards**
Department of Communication Sciences and Disorders, University of Wisconsin, USA
13 February, Macquarie University

Predicting decisions and post-decision errors from multivariate patterns of fMRI and EEG activity.
**Dr Stefan Bode**
Melbourne School of Psychological Sciences, The University of Melbourne
21 February, Macquarie University

Language and reading in Italian-speaking children with cochlear implants.
**Professor Maria Teresa Guasti**
Department of Psychology, University of Milan-Bicocca, Italy
26 February, Macquarie University

Effect of frequency boundary assignment on speech recognition in newly implanted cochlear implant recipients.
**Professor Marios Fourakis**
Department of Communication Sciences and Disorders, University of Wisconsin, USA
27 February, Macquarie University

Brain imaging, the vegetative state, and cryptic consciousness.
**Associate Professor Colin Klein**
Philosophy Department, University of Illinois at Chicago, USA
12 March, Macquarie University

Information transfer and storage in neural systems.
**Professor Michael Wibral**
Brain Imaging Center, Johann Wolfgang Goethe University of Frankfurt am Main, Germany
15 March, Macquarie University

Risks involved in the transcription of hard-to-hear covert recordings used as evidence in criminal cases.
**Dr Helen Fraser**
Independent Consultant
18 March, Macquarie University

Comparative syntax.
**Professor Richard Kayne**
Department of Linguistics, New York University, USA
19 March, Macquarie University

Computationalism, consciousness and some no-go arguments.
**Associate Professor Drew Khentzos**
School of Behavioural, Cognitive and Social Sciences, University of New England
12 April, Macquarie University

What we see in paintings: Exercises in experimental aesthetics.
**Dr Johannes Zanker**
Department of Psychology, Royal Holloway, University of London, UK
3 May, Macquarie University

Multistream real-time event detection.
**Dr Miles Osborne**
School of Informatics, University of Edinburgh, UK
6 May, Macquarie University

Finding information in disfluencies.
**Professor Mari Ostendorf**
College of Engineering, University of Washington, USA
8 May, Macquarie University

Autobiographical memory, self-identity and emotion regulation in prolonged grief.
**Dr Fiona Macculum**
School of Psychology, The University of New South Wales
21 May, Macquarie University

Anticipatory expertise in sport: Progress and challenges in understanding and application.
**Professor Damian Farrow**
Australian Institute of Sport, Victoria University
24 May, Macquarie University

The predictive brain.
**Professor James Enns**
Department of Psychology, University of British Columbia, Canada
22 April, The University of Western Australia

Integration of dangerous context and fearful expressions in children and adults: Gaze-cueing and threat bias effects.
**Ms Amy Dawel**
Research School of Psychology, Australian National University
24 April, The University of Western Australia

What we see in paintings: Exercises in experimental aesthetics.
**Dr Johannes Zanker**
Department of Psychology, Royal Holloway, University of London, UK
3 May, Macquarie University

Multistream real-time event detection.
**Dr Miles Osborne**
School of Informatics, University of Edinburgh, UK
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Finding information in disfluencies.
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Autobiographical memory, self-identity and emotion regulation in prolonged grief.
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School of Psychology, The University of New South Wales
21 May, Macquarie University

Anticipatory expertise in sport: Progress and challenges in understanding and application.
**Professor Damian Farrow**
Australian Institute of Sport, Victoria University
24 May, Macquarie University
The relationship between prenatal testosterone and language development
Ms Lauren Hollier
School of Psychology,
The University of Western Australia
24 May, Macquarie University

The effort (cognitive and attentional resources) that older adults deploy when processing speech in noise. * Professor Jean-Pierre Gagné
The Centre for Research in Human Development,
University of Montreal, Canada
27 May, Macquarie University

Towards a functional architecture for gaze perception.
Professor Colin Clifford
Faculty of Science,
The University of Sydney
31 May, Macquarie University

Using explicit semantic analysis for classifying sentiments. * Dr Michael Rosner
Department of Intelligent Computer Systems,
University of Malta, Malta
3 June, Macquarie University

The ghosts of syllables parsed: Textsetting in an Aboriginal singing genre. * Dr Myfanwy Turpin
School of Languages and Comparative Cultural Studies,
The University of Queensland
14 June, Macquarie University

Investigating phonological representation using real-time MRI. * Dr Michael Proctor
The MARCS Institute,
University of Western Sydney
25 June, Macquarie University

Object representations in the human brain: How they emerge, and their connection to language and perceptual decision-making.
Dr Thomas Carlson
Department of Cognitive Science,
Macquarie University
28 June, Macquarie University

Negation and focus in polarity questions.
Professor Manfred Krifka
Centre for General Linguistics,
Humboldt University of Berlin, Germany
5 July, Macquarie University

Electrophysiological markers of musical entrainment and interpersonal coordination.
Associate Professor Peter Keller
The MARCS Institute,
University of Western Sydney
9 July, Macquarie University

A noisy channel approach to error correction in spoken referring expressions. * Professor Ingrid Zukerman
Faculty of Information Technology,
Monash University
15 July, Macquarie University

What we don’t know about phonology? * Associate Professor Paul de Lacy
Linguistics Department,
Rutgers University, USA
29 July, Macquarie University

If I can see so much, why do I miss so much?
Professor Jeremy Wolfe
Division of Sleep Medicine,
Harvard Medical School, USA
7 August, Macquarie University

Eyetracking investigations of social cognition in schizophrenia.
Professor Franck Ramus
Laboratoire de Sciences Cognitives et Psycholinguistique, École Normale Supérieure, France
9 August, Macquarie University

Are we victims of our unconscious minds?
Professor Edward de Haan
Faculty of Social and Behavioural Sciences, University of Amsterdam, The Netherlands
15 August, Macquarie University

Synaesthesia: A window into human consciousness and social cognition.
Dr Noam Sagiv
Centre for Cognition and Neuroimaging, Brunel University, UK
16 August, Macquarie University

On the usefulness of ‘what’ and ‘where’ pathways in vision.
Professor Edward de Haan
Faculty of Social and Behavioural Sciences, University of Amsterdam, The Netherlands
23 August, Macquarie University

The malleability of memory in social contexts.
Associate Professor Michelle Meade
Department of Psychology, Montana State University, USA
20 September, Macquarie University

Resolving visual conflict.
Professor Randolph Blake
Department of Psychology, Vanderbilt University, USA
1 October, Macquarie University

The aesthetics of human adornment.
Professor Stephen Davies
Department of Philosophy,
The University of Auckland, NZ
11 October, Macquarie University

Spatial deficits after brain injury with a focus on visual perception and attention.
Professor Lynn Robertson
Department of Psychology,
University of California, USA
15 November, Macquarie University

Better NLP with topic models and better topic models with NLP. * Associate Professor Timothy Baldwin
Department of Computing and Information Systems,
The University of Melbourne
18 November, Macquarie University

Do you want a cuppa this arvo?
Professor Martin Davies
Department of Experimental Psychology, University of Oxford, UK
22 November, Macquarie University

The role of shape and texture in face recognition: Implications for the configural processing hypothesis.
Professor Stefan Schweinberger
Department of General Psychology, Friedrich Schiller University of Jena, Germany
21 November, The University of Western Australia

Universality in eye movements and reading: A trilingual investigation.
Professor Simon Liversedge
Department of Psychology, University of Southampton, UK
22 November, Macquarie University

Eye movements in Autism Spectrum Disorder (ASD).
Dr Val Benson
Department of Psychology,
University of Southampton, UK
25 November, Macquarie University

Syntactic change in progress: The new impersonal construction in Icelandic. * Associate Professor Joan Maling
Department of Psychology, Brandeis University, USA
25 November, Macquarie University

From soup to nuts: Language and computation. * Professor Robert (Bob) Berwick
Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, USA
30 November, Macquarie University

Robust computational semantics for open domain question answering and text entailment. * Professor Mark Steedman
School of Informatics,
University of Edinburgh, UK
2 December, Macquarie University

Thoughts on distributed thinking in dementia.
Professor Nicole Muller
Department of Communication Disorders, University of Louisiana at Lafayette, USA
6 December, Macquarie University

The structure and projection of DP. * Professor Richard Larson
Department of Linguistics, Stony Brook University, USA
9 December, Macquarie University

Transitions of consciousness: When wakefulness modulates cognition.
Dr Tristan Bekinschtein
MRC Cognition and Brain Sciences Unit, University of Cambridge, UK
13 December, Macquarie University

Modeling ‘bootstrapping’ in language acquisition: A probabilistic approach. * Dr Sharon Goldwater
School of Informatics,
University of Edinburgh, UK
16 December, Macquarie University

2013 annual report
Belief Formation Program

Books

Book Chapters


Periodicals


delusions in early psychosis. Cognitive Neuropsychiatry.


Shepherd, A., Laurens, K.R., Matheson, S., Carr, V.J., & Green, M.J. (2013). Systematic meta-analysis of insula volume in schizophrenia. Biological Psychiatry, 72(9), 775-784.


Language Program

Books


Book Chapters


**Periodicals**


Published Conference Proceedings


Shaffer & M.J. Dorahy (Eds.), Cognitive perspectives on dissociation and trauma and dissociation: Emerging perspectives on severe psychopathology. Hoboken: Wiley-Blackwell.


Kumfor, F., & Piguet, O. (2013). Journal watch: Our panel of experts highlight the most important research articles across the spectrum of topics relevant to the field of neurodegenerative disease management. Neurodegenerative Disease Management, 3(5), 409.

Kumfor, F., Irish, M., Hodges, J.R, & Piguet, O. (2013). The orbitofrontal cortex is involved in emotional enhancement of


Perception in Action

Periodicals


Other Programs

Book Chapters


Periodicals


Quinto, L., & Thompson, W.F. (2013). Composers and performers have different capacities to manipulate arousal and valence. Psychomusicology: Music, Mind, and Brain, 23(3), 137-150.


Published Conference Proceedings


Keynote | Invited Presentations


McKay, R. (2013, October). Delusions are radically different from normal beliefs (Debate). Invited paper presented at the Power and Pitfalls of Psychopathology: Marking 100 years since the publication of Karl Jaspers’ General Psychopathology, London, UK.


Piquet, O. (2013, November). Frontotemporal dementia as disease model of episodic memory: Invited
symposium conducted at the 4th Australasian Cognitive Neuroscience Conference (ACNC), Melbourne.


Conference Papers | Symposia


2013 annual report


and its Disorders Annual Workshop, Sydney.


presented at the 19th APS Clinical Neuropsychology Conference, Brisbane.


Thayer, Z., & Miller, L. (2013, June). Does polytherapy or cortical resection influence the ability of people with epilepsy to benefit from a memory rehabilitation program? Paper presented at the 30th International Epilepsy Congress, Montreal, Canada.

Thayer, Z., & Miller, L. (2013, November). Examining relationships between memory scores and depression in epilepsy patients who undergo memory training. Paper presented at the Point of View in Memory and Imagination: "Philosophical and Psychological Perspectives on Perspective" Workshop, Macquarie University, Sydney.


presented at the 27th Epilepsy Society of Australia Annual Scientific Meeting, Sydney.


Posters


presented at the XXIII International Evoked Response Audiometry Study Group Biennial Symposium, New Orleans, USA.


Quek, G. (2013, November). Does the upper visual field advantage in face-processing relate to participant bias in attentional allocation? Poster session presented at the 4th Australasian Cognitive Neuroscience Conference (ACNC), Melbourne.


Other Invited Presentations

Badcock, N.A. (2013, November). The Emotv EPOC EEG system for research. Invited colloquium at the National Health and Medical Research Council Centre for Integrated Research and Understanding of Sleep (NHMRC CRUIS) Sleep and Circadian Research Group, Woolcock Institute of Medical Research, The University of Sydney, Sydney.


Crain, S. (2013, April). Language, logic and learnability. Invited colloquium at the Department of Linguistics Psychobabble Meeting, University of California, Los Angeles, USA.

Crain, S. (2013, April). Focus and scope in child language. Invited colloquium at the Department of Linguistics Semantic Babbble Meeting, University of California, San Diego, USA.

Crain, S. (2013, August). Investigations in child language. Invited presentation given at the Wu Ta-You Science Camp, National Taiwan University, The Experimental Forest, Taiwan.


Crain, S. (2013, September). How to derive the basic meanings of logical expressions. Invited presentation given at the Concept, Composition and Experimental Semantics/Pragmatics Workshop, Utrecht University, The Netherlands.


Crookes, K. (2013, May). Childhood development of face recognition: Recent evidence suggests early maturity - specific processing. Invited colloquium at the Department of Psychology, University of Hong Kong, Hong Kong.

Crook, K. (2013, January). The whole picture is the whole person: Clinical management pathways for primary progressive aphasia. Invited colloquium at the Centre for Advanced Studies, Ludwig-Maximilians University of Munich, Germany.


Demuth, K. (2013, October). Effects of phonological context on children’s perception and production of grammatical morphemes. Invited colloquium at the Linguistics Department, University of Tours, Tours, France.


Kemp, N. (2013, September). Dgtf communc8n: Does it spell the ruin or the enhancement of literacy skill? Invited colloquium at the Division of Psychology and Language Sciences, University College London, London, UK.


Kemp, N. (2013, November). txtn: Spoiling our spelling, or aiding our expression? Invited colloquium at the MARCS Institute, University of Western Sydney, Sydney.


Liao, M. (2013, June). Acquisition of disjunction in Mandarin comparatives. Invited colloquium at the Beijing Language and Culture University, Beijing, China.
When the world becomes too real: A new explanation of autistic perception. Invited colloquium at the Department of Psychology, University of Kent, Kent, UK.

Pellicano, E. (2013, March). When the world becomes too real: A new explanation of autistic perception. Invited colloquium at the Institute of Neuroscience, University of Newcastle, Newcastle, UK.

Pellicano, E. (2013, April). When the world becomes too real: A new explanation of autistic perception. Invited colloquium at the School of Public Health and the Department of Psychology, The University of Western Australia, Perth.


Other Colloquia | Presentations


Bell, J. (2013, January). Hemispheric specialization for symmetry processing is complexity dependent. Colloquium at the Department of Psychology, The University of Western Australia, Perth.


Crain, S. (2013, November). The logic of child language. Presentation given at the Australia-China Science Research Fund Hearing Impairment and Language Acquisition Workshop, Beijing Language and Culture University, Beijing, China.


de Wit, B., & Kinoshita, S. (2013, November). RT distribution analyses of ‘automatic’ semantic priming effects in a semantic categorisation task. Colloquium at the 7th Lexical processing Colloquium, Department of Psychology, The University of Western Australia, Perth.

Duchaine, B. (2013, November). Developmental prosopagnosia. Colloquium at the Institute of Child Development, University of Minnesota, Minnesota, USA.

Duchaine, B. (2013, December). Investigating social perception via prosopagnosia. Colloquium at the McGovern Institute, Peking University, Beijing, China.

Duchaine, B. (2013, December). Investigating social perception via prosopagnosia. Colloquium at the Imaging Center for Brain Research, Beijing Normal University, Beijing, China.


Johnson, B.W. (2013, November). Child MEG for the study of pitch and language processing in children acquiring tonal languages. Presentation given at the Australia-China Science Research Fund Hearing Impairment and Language Acquisition Workshop, Beijing Language and Culture University, Beijing, China.

Kloth, N., Pond, S., Jeffery, L., McKone, E., Irons, J., & Rhodes, G. (2013, April). It’s a girl Opponent versus multichannel neural coding underlying the perception of face gender. Colloquium at the School of Psychology, The University of Western Australia, Perth.


Marsh, P.J. (2013, May). The case for social cognitive remediation in schizophrenia. Presentation given at the Family and Carer Support Group, Cumberland Hospital, Sydney.


Rutherford, M.D. (2013, March). Evidence of functional specialization in social cognition. Colloquium at the Department of Child & Youth Studies, Brock University, St Catharines, Canada.


Savage, S., Piguet, O., & Hodges, J.R. (2013, August). Word retraining in semantic dementia: Giving forgotten words new life. Colloquium at the Speech Pathology Department, Prince of Wales Hospital, Sydney.

Savage, S., Piguet, O., & Hodges, J.R. (2013, October). When language goes wrong: Diagnosis and treatment of language disorders in young onset dementia. Presentation given at the Prince Charles Hospital Internal Medicine & Dementia Research Unit, Brisbane.


Tang, J. (2013, November). The role of brain rhythms in perception of speech rhythms. Presentation given at the Australia-China Science Research Fund Hearing Impairment and Language Acquisition Workshop, Beijing Language and Culture University, Beijing, China.


Yau, S., & Brock, J. (2013, June). Auditory processing and language impairment in autism: A summary. Colloquium at the Summer Lecture Series at the Graduate Center, City University of New York, New York, USA.


Awards

Dr Nicholas Badcock
Macquarie University Research Excellence Awards: Highly Commended for Excellence in Research - Social Sciences, Business & Humanities for “A video-gaming system to measure event related brain activity in research”
Macquarie University Faculty of Human Sciences Red Balloon Award for “Exemplary effort, team work, productivity & public service”
Dr Nicholas Badcock, Associate Professor Genevieve McArthur, Dr Peter de Lissa, Dr Petroula (Betty) Mousikou, Dr Yatin Mahajan and Dr Johnson Thie
Macquarie University Faculty of Human Sciences Innovation Award: Highly Commended for “A video-gaming system to measure event-related brain activity in research”
Dr Samantha Baggott
Macquarie University Faculty of Human Sciences Red Balloon Award for “Exemplary effort, team work, productivity & project completion”
Associate Professor Amanda Barnier
Society for Clinical and Experimental Hypnosis Bernard B Ragnski Award for Leadership and Achievement in Hypnosis
American Psychological Association Division of Psychological Hypnosis Award for Distinguished Contributions to Scientific Hypnosis
Nichola Burton
CCD Excellence in Research Postgraduate Award “Outstanding Student Publication in 2012”
Australian Cognitive Neuroscience Society Student Travel Award
Danielle Colenbrander
Macquarie University Postgraduate Research Fund (PGRF) Deputy Vice Chancellor’s Commendation

Dr Michael Connors,
Associate Professor Amanda Barnier, Emeritus Professor Max Coltheart, Dr Rochelle Cox and
Associate Professor Robyn Langdon
Society for Clinical and Experimental Hypnosis Henry Guze Award - Best Research Paper on Hypnosis
Dr Michael Connors
American Psychological Association Division of Psychological Hypnosis E.R. Hilgard Best Graduate Level Academic Thesis Award
Associate Professor Felicity Cox
Macquarie University Faculty of Human Sciences Executive Dean’s Awards for Learning and Teaching, for Teaching Excellence
Dr Rochelle Cox
American Psychological Association Division of Psychological Hypnosis Award for Early Career Contributions to Hypnosis
Distinguished Professor Stephen Crain
Macquarie University Faculty of Human Sciences Publication Award for Senior Researchers
Marshall Dalton
Runner Up, Brain Sciences, The University of New South Wales Symposium Poster Prize
Professor Katherine Demuth
Australian Research Council (ARC) Australian Laureate Fellowship
Associate Professor Bradley Duchaine
C. Troy Shaver Class of 1969 Fellowship, Dartmouth College
Dr Louise Ewing
CCD Excellence in Research Postgraduate Award “Outstanding Student Publication in 2012”
Mirko Farina
Macquarie University Faculty of Human Sciences Higher Degree Research Excellence Award

Professor Naama Friedmann
Michael Bruno Memorial Award
Michael Gascoigne
CCD Excellence in Research Postgraduate Award “Outstanding Student Publication in 2012”
Epilepsy Society of Australia Travel Scholarship Award
The University of Sydney Faculty of Science Award for Outstanding Academic Achievement
Neurosurgery Network Allied Health Travel Scholarship, NSW Agency for Clinical Innovation (ACI)
Judith Gildenhuys
Best Presentation at The University of Western Australia School of Psychology Honours Conference
Jan (Richard) Heersmink
Macquarie University Faculty of Human Sciences Higher Degree Research Excellence Award
Aijun Huang
Macquarie University Vice-Chancellor’s Commendation for a PhD Thesis of Exceptional Merit
Dr Muireann Irish
Paxinos Prize for Best Paper Published by a NeuRA Postdoctoral Researcher in 2012 for the paper “Considering the role of semantic memory in episodic future thinking: Evidence from semantic dementia” (Brain, 135, 2178-2191)
Laird Cermak Award for Outstanding Research in Memory, 41st Annual Meeting of the International Neuropsychological Society (Hawaii, USA)
Young Investigator award for an Outstanding Presentation, 41st Annual Meeting of the International Neuropsychological Society (Hawaii, USA)
Shortlisted Finalist, L’Oreal Women in Science Fellowship

Left to right: Student Award winners: Michael Gascoigne, Sharon Savage, Nichola Burton and Stephen Pritchard
Dr Muireann Irish receiving her award from the Governor of New South Wales, Her Excellency Professor The Honourable Marie Bashir AC CVO
Promotions

Dr Nicholas Badcock
Promotion to Lecturer (Level B)

Associate Professor Matthew Finkbeiner
Promotion to Associate Professor (Level D)

Dr Paul Sowman
Promotion to Senior Lecturer (Level C)

Dr Alexandra Woolgar
Promotion to Lecturer (Level B)

Dr Peng Zhou
Promotion to Lecturer (Level B)

New External Appointments

Professor Katherine Demuth
Visiting Researcher, Laboratoire de Science Cognitive et Psycholinguistique, École Normale Supérieure, Paris. (2013 continuing)

Associate Professor Bradley Duchaine
Graduate Program Chair, Psychological and Brain Sciences (PBS), Dartmouth College. (2013 continuing)

Member, Social Neuroscience Faculty Search Committee, Psychological and Brain Sciences (PBS), Dartmouth College. (2013 - 2014)

Professor John Hodges
Member, International Advisory Committee 2014 International Conference on FTD. (2013 continuing)

Member, International Scientific Committee for the Institute of Cognitive Neurology (INECO). (2013 continuing)

Professor Lyndsey Nickels
Academic Advisor, Western Sydney Local Health District Speech Pathology Services. (2013 continuing)

Associate Professor Olivier Piguet
Board Director, Australian Fronto-Temporal Dementia Association. (2013 continuing)

Board-approved Supervisor (Area of practice: Clinical neuropsychology), Psychology Board of Australia. (2013 continuing)

Professor Gillian Rhodes
Fellow, Academy of the Social Sciences in Australia. (2013 continuing)

Associate Professor Greg Savage
Honorary University Fellow, University of Exeter Medical School. (2013)
Editorial Appointments

Associate Professor Amanda Barnier
Editor, Memory Studies. (2006 continuing)
Associate Editor, Australian Journal of Clinical and Experimental Hypnosis. (2004 continuing)

Professor A Michael (Mike) Burton
Associate Editor, Perception. (2009 continuing)

Professor Anne Castles
Editorial Board, Scientific Studies of Reading. (2002 continuing)
Editorial Board, Cortex. (2011 continuing)
Associate Editor, Cognitive Neuropsychology. (2010 continuing)

Associate Professor Felicity Cox

Distinguished Professor Stephen Crain
Editorial Board, Journal of Child Language. (2005 continuing)
Editorial Board, Bio linguistics. (2006 continuing)
Advisory Board, Language Acquisition. (2003 continuing)
Editorial Board, Semantics and Pragmatics. (2008 continuing)
Editorial Advisory Board, English Linguistics, English Linguistics Society of Japan. (2010 continuing)

Dr Celia Harris
Editorial Assistant, Memory Studies. (2007 continuing)

Professor William Hayward
Associate Editor, Visual Cognition. (2009 continuing)
Associate Editor, British Journal of Psychology. (2013 continuing)

Professor John Hodges
Editorial Board, Cognitive Neuropsychiatry. (1997 continuing)
Editorial Board, Aphasiology. (2000 continuing)
Editorial Board, Cognitive Neuropsychology. (2002 continuing)
Associate Editor, Journal of Alzheimer’s Disease. (2010 continuing)
Editorial Advisory Board, Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration. (2011 continuing)

Associate Professor Blake Johnson
Dr Nenagh Kemp
Associate Editor, Reading and Writing. (2013 continuing)
Associate Editor, Journal of Research in Reading. (2011 continuing)
Editorial Board Member, Scientific Studies of Reading. (2010 continuing)

Associate Professor Sachiko Kinoshita
Associate Editor, Quarterly Journal of Experimental Psychology. (2005 continuing)
Editorial Board, Journal of Memory and Language. (2009 continuing)
Associate Editor, Journal of Experimental Psychology: Learning, Memory and Cognition. (2012 continuing)

Dr Saskia Kohnen
Guest Editor, Cognitive Neuropsychology. (2013)

Associate Professor Robyn Langdon
Associate Editor, British Journal of Clinical Psychology. (2011 continuing)
Editorial Board Member, Cognitive Neuropsychiatry. (2012 continuing)
Guest Editor, Cognitive Neuropsychiatry. (2010 continuing)

Associate Professor Genevieve McArthur
Editorial Board, Scientific Studies of Reading. (2009 continuing)
Academic Editor, PLoS-One. (2011 continuing)
Academic Editor, PeerJ. (2012 continuing)

Mr Christopher McCarron
Editorial Assistant, Memory Studies. (2012 continuing)

Dr Ryan McKay
Book Reviews Editor for Cognitive Neuropsychiatry. (2009 continuing)
Editorial Board of Topoi: An International Review of Philosophy. (2012 continuing)

Professor Cathy Mondloch
Associate Editor, Journal of Experimental Child Psychology. (2011 continuing)

Professor Lyndsey Nickels
Associate Editor, Aphasiology. (2003 continuing)
Editorial Board, Cognitive Neuropsychology. (2010 continuing)
Editorial Board, Brain Impairment. (2009 continuing)

Associate Professor Romina Palermo
Associate Editor, British Journal of Psychology. (2013 continuing)

Dr Elizabeth (Liz) Pellicano
Editor, Autism. (2011 continuing)

Associate Professor Olivier Piguet
Editorial Board, Frontiers in Dementia Research. (2010 continuing)
Publication Committee Member, Brain Impairment. (2005 continuing)

Professor Kathleen Rastle

Professor Gillian Rhodes
Editorial Board, Perception. (2006 continuing)

Professor Leigh Simmons
Associate Editor, Proceedings of the Royal Society of London, Biological Sciences. (2008 continuing)
Editor, Advances in the Study of Behavior. (2008 continuing)
Editor-in-Chief, Behavioural Ecology. (2012 continuing)

Dr Karen Smith-Lock
Associate Editor, Language Speech and Hearing Services in the Schools. (2013 continuing)

Professor John Sutton
Co-Editor, Memory Studies (Sage). (2006 continuing)
Editorial Board, Philosophical Psychology. (2006 continuing)
Editorial Board, Neuroethics. (2008 continuing)
Editorial Board, Scan: journal of media arts culture. (2004 continuing)
Co-Editor, Memory Studies (Palgrave Macmillan book series). (2009 continuing)

Ms Marina Trakas
Editorial Assistant, Memory Studies. (2012 continuing)

Assistant Editor, Philpapers. (2012 continuing)

Associate Professor Mark Williams
Academic Editor, PLoS-One. (2008 continuing)

Dr Peng Zhou
Associate Editor, International Journal of English Linguistics. (2012 continuing)

Grants
Alfred Kordelin Foundation via the Foundations’ Postdoc Pool (2010 - 2013)
“Treatment of anomia in people with aphasia: Theoretically motivated, clinically possible, and functionally relevant intervention programs. Grant for post-doctoral research abroad.” (€119,000). Renwall, K. ($182,692)
ARC Centre of Excellence [CE110001021]
ARC Discovery Early Career Research Award [DE120100814] (2012 - 2014) “Hypnotic illusions and clinical delusions: How closely and usefully can hypnosis model delusional beliefs.” Cox, R.E. ($375,000)
ARC Laureate Fellow Professor Katherine Demuth


ARC Discovery Project and Australian Post-Doctoral Fellowship (APD) Award (2011 - 2015) "Decoding the process of holistic shape encoding in the human visual system." Bell, J. ($524,138)


ARC Discovery Project (2010 - 2013) "How does the brain process facial expressions?" Williams, M.A. ($609,610)

ARC Discovery Project Grant (2011 - 2013) "Integrating holistic processing and face-space approaches to the perception of facial identity." McKeone, E., Edwards, M., & Aimola Davies, A.M. ($475,000)

ARC Discovery Project Grant (2011 - 2013) "Computational models of synergies in human language acquisition." Johnson, M., Demuth, K., & Frank, M. ($368,000)

ARC Discovery Project Grant (2010 - 2014) "Understanding bilingual language acquisition in northern indigenous Australia: Phonological, lexical, orthographic, and family factors." Jones, C., Smolensky, J., & Montrul, S. ($629,101)

ARC Discovery Project Grant (2010 - 2013) "Is it better to remember with others or to remember alone, especially as we age?" Barnier, A.J., Harris, C.B., Savage, G.R., Rajaram, S., & Balota, D. ($297,759)

ARC Discovery Project Grant (2010 - 2013) "Moral bodies in action: a philosophical study of skilled movement." Sutton, J., & McIlwan, D. ($325,000)

ARC Discovery Project Grant (2010 - 2013) "Music and language: psychological commonalities revealed." Thompson, W., & Schellenberg, G. ($330,000)

ARC Discovery Project Grant (2010 - 2013) "How does the brain process task-relevant information?" Woolgar, A., Rich, A.N., Williams, M.A., & Duncan, J. ($246,000)

ARC Discovery Project Grant (2012 - 2014) "Making sense of the world: how does the brain process task-relevant information?" Woolgar, A., Rich, A.N., Williams, M.A., & Duncan, J. ($284,000)

ARC Discovery Project Grant (2012 - 2014) "Improving genetic tests for children’s learning of grammatical morphology." Demuth, K. ($2,865,815)
Canada Research Chair Tier II - Canada Research Chair in Social Perceptual Development (2012 - 2017) Rutherford, M.D. ($500,000)


Canadian Institutes for Health Research (CIHR) (2013 - 2016) "Developmental relationships among social perceptual and social cognitive measures in infants at risk for autism spectrum disorders and in control infants." Rutherford, M.D. ($211,737)


Department of Health, Western Australia, Medical and Health Research Infrastructure Fund (2013) Rhodes, G. ($31,903)

Department of Industry, Innovation, Science, Research and Tertiary Education (DISRTE) Endeavour Postgraduate Award (2012 - 2016) Hussain, Q. ($228,000)

Department of Industry, Innovation, Science, Research and Tertiary Education (DISRTE) National eResearch Collaboration Tools and Resources (NeCTAR) Project Virtual Laboratory Program Grant (2012 - 2013) "Above and beyond speech, language, and music: A virtual lab for human communication science." Burnham, D. et al., including Kemp, N. ($1,408,829)

Economic and Social Research Council (ESRC) Grant (2011 - 2013) "Discourse processing in poor comprehenders: An eye movement study." Nation, K., & Joseph, H.

Economic and Social Research Council (ESRC) Large Grant (2011 - 2013) "Ritual, community, and conflict." (£4 million grant at the University of Oxford to cover research time at Royal Holloway, University of London, £230,562). McKay, R. ($428,790)

Economic and Social Research Council (ESRC) Professional Fellowship (2012 - 2015) "Variability as a route to understanding face recognition." (£460,000) Burton, A.M. ($351,000)

Economic and Social Research Council (ESRC) Quota Award (2010 - 2013) "Probing the sensory atypicalities in autism." (£56,500). Pellicano, E. ($105,077)

Economic and Social Research Council (ESRC) Research Grant (ES/K002457/1) (2013 - 2016) "Face perception in acquired prosopagnosia." (£379,354,533) Eimer, M., & Duchaine, B. ($694,819)

Economic and Social Research Council (ESRC) Research Grant (RES-062-23-2130) (2010 - 2013) "The architecture of human face processing in typical and atypical populations: Combining behavioural and electrophysiological measures." (£352,596,43) Eimer, M., Duchaine, B., & Driver, J. ($645,810)


European Research Council (ERC) Advanced Grant (2013 - 2017) "Face recognition: Understanding the role of within-person variability." (£1,230,000) Burton, A.M. ($2,275,000)

European Union Education, Audiovisual and Culture Executive Agency (EACEA) Erasmus Mundus Joint Doctorate (Action 1B) (2012 - 2017) "International Doctorate in Experimental Approaches to Language and Brain (IDEALAB)." De Bieser, R., Bastaanne, R., Howard, D., Miceli, G., & Nicksel, L. ($68,000)


Hong Kong Research Grants Council (2012 - 2014) "Recollection and familiarity for rotated objects." Hayward, W. ($540,456)

Hong Kong Research Grants Council (2011 - 2014) "Understanding the basis for the own-race advantage in face recognition." Hayward, W. ($903,660)
practice using the iPad.” Tsukada, K., Xu, tone pronunciation via native listener
Research - Scientific Research Category C
Science (JSPS) Grant-in-Aid for Scientific
systems.” Guasti, M.T. ($87,190)
the Italian language: Documents,
on Basic Research (FIRB) Project Grant
Charles Wolfson
Institute of Education (IOE), University
 submariners.” Johnson, B., & Crain, S. ($10,000)
Chin and forehead supports for TMS
Sciences Equipment Grant Scheme
Margaret Brown (GBF) Start-Up Grant
enhancing students’ learning experience
Scholarship Program
Funding to support a Faculty of Human
Scholarship Program 2013 - 2014
Multimodal functional
“The role of preparation time in the attentional blink” (Vision Research).
Badcock, N.A. ($1,959)
Funding to support a Faculty of Human
Macquarie University Faculty of Human
Science (JSPS) Grant-in-Aid for Scientific
systems.” Guasti, M.T. ($87,190)
in specific locations” (Cortex). Rich, A.N.
chiroptera” (Cognitive Neuropsychology). Rich, A.
reduce the auditory N1 and P2” (Experimental Brain Research). Sowman, P. ($3,365)
“Funding to support the visit of Dr Joana Cholin, University of Bielefeld, Germany.” Biedermann, B. ($6,000)
understanding the basis for the own-race advantage in face recognition.” Hayward, W., Calfada, R., & Rhodes, G. ($123,977)
Visual processing deficit markers in schizophrenia.” (HKD95,000). Hayward, W. ($13,755)
Travel funding to attend the International Neuropsychological Society Annual Meeting, Hawaii.” Irsh, M. ($1,130)
Inge Wakehurst Trust. Charles Wolfson
Foundation, and Waterloo Foundation
Research Autism. ($131,227)
Institute of Education (IOE), University
London Higher Education Innovation
Funding (HEIF) Next Generation Fund
Institute of Education University of
London and University College London
Italy Ministry of Education, University
Research and University (MIUR) Fund for Investments on Basic Research (FRB) Project Grant (2009 – 2013) “The basic research on the Italian language: Documents, acquisition mono-, bilingual and L2 and the project for the creation of multimedia systems.” Guasti, M.T. ($87,190)
Japan Society for the Promotion of
Institute of Education University of
London and University College London
Italy Ministry of Education, University
Research and University (MIUR) Fund for Investments on Basic Research (FRB) Project Grant (2009 – 2013) “The basic research on the Italian language: Documents, acquisition mono-, bilingual and L2 and the project for the creation of multimedia systems.” Guasti, M.T. ($87,190)
Japan Society for the Promotion of
Macquarie University Faculty of Arts
Learning and Teaching Research Grant Scheme. (2013 “Assessment of Mandarin tone pronunciation via native listener judgement before and after listening practice using the iPAD.” Tsukada, K., Xu, HL., Xu Rattanasone, N., Argent, L, & Arthur, C. ($5,000)
Macquarie University Faculty of Human
Macquarie University Faculty of Human
Macquarie University Faculty of Human
Sciences Equipment Grant Scheme (2013) “Portable, six line, high definition audio recording equipment for research involving interviews off and on campus.” Banner, A., Harris, C., Van Bergen, P., McIlwain, D., Sutton, J., & Congleton, A. ($5,360)
Macquarie University Faculty of Human
Macquarie University Faculty of Human
Macquarie University Faculty of Human
Macquarie University Faculty of Human
Badcock, N.A. ($1,959)
Macquarie University Faculty of Human
Sciences Open Access Journal Assistance Scheme (2013) “Why remembering together is crucial as we age.” Banner, A. ($149,212)
Macquarie University Faculty of Human
Sciences Open Access Journal Assistance Scheme (2013) “Decoding the neural representation of objects in the human brain.” Carlson, T. ($100,000)
Macquarie University Innovation and Scholarship Program 2013 - 2014 “Mobile Language Lab (MLL) for enhancing students’ learning experience and communicative efficiency in Italian and Japanese.” Tsukada, K., Alimeni, G., Lomonaco, E., & Cox, F. ($19,880)
Macquarie University New Staff Grant (2013) “Sense of agency across contexts: A multimethod approach to understanding how we control our actions.” Polito, V. ($19,879)
Macquarie University New Staff Grant (2013) “Investigating coarticulation in connected speech using real-time MRL.” Proctor, M. ($17,555)
Macquarie University Research Development Grant (2012 - 2014) "Using hypnosis to model olfactory hallucinations." Cox, R., & Langdon, R. ($48,985)


Macquarie University Research Development Grant (2012 - 2014) "Using magnetoencephalography (MEG) to examine neurological activation during emotion processing in anxious children." Hudson, J., Broeren, S., Johnson, B., & Dodd, H. ($44,840)

Macquarie University Research Development Grant (2012 - 2014) "Towards understanding body representations and their influences on perception, cognition and behaviour: The role of visual information and awareness." Zopf, R., & Williams, M. ($40,532)


Macquarie University Research Development Grant (2011 - 2013) "Boring’ or ‘interesting’: How do we process adjectives after brain damage?" Renwalt, K., Burianova, H., & Nickels, L. ($45,998)

Macquarie University Research Development Grant (2011 - 2013) "Eye tracking for ecologically rich environments: Integrating anthropology and philosophy in cognitive ethnography of sports." Downey, G., & Sutton, J. ($34,000)


Macquarie University Research Fellowship (2012 - 2015) "Shared remembering and memory compensation in older couples." Harris, C. ($259,917)


Macquarie University Research Infrastructure Block Grant (2012 - 2013) "Tobi eye-tracker for testing infants and young children." Demuth, K., Grant, K.-A, McMahan, C., Crain, S., Thornton, R., Sharma, M., Cox, F., Tsukada, K., Zhou, P., & Moscati, V. ($49,150)


Macquarie University Research Infrastructure Block Grant (2012 - 2013) "Processing of sounds, words and sentences: An ERP study." Sharma, M., Demuth, K., Kinoshita, S., Cox, F., Peter, V., & Johnson, B. ($43,062)


Macquarie University Restart Grant (2013) "Cognitive, motor and brain function in Down syndrome." Porter, MA. ($18,750)


Michael J. Fox Foundation (2012 - 2016) "The Parkinson's Progression Markers Initiative." Marek, K. (site investigators: Rowe, D., Savage, G., & Magnusson, J.) ($1,200,000)

Motor Neurone Disease Research Institute of Australia Grant in Aid (2013) Burrell, J. R. ($97,009)

National Institute of Child Health and Human Development (NICHD) [R01HD057606] (2008 - 2013) "Constraints on phonological and morphological development." Demuth, K., & Shattuck-Hufnagel, S. ($1,595,024)

National Science Foundation (NSF) Partnerships for International Research and Education (PRIER) International Training Program in Computational Linguistics (2009 - 2014) "Collaborative investigation of meaning representation in language processing." Johnson, M. & Charniak, E. ($1,064,990)

National Sciences and Engineering Research Council of Canada (NSERC) (2009 - 2014) "Care knowledge and development in infants and young children: Evidence from visual perception." Rutherford, M.D. ($110,000)


NHMRC Project Grant (2009 - 2013) "Understanding emerging severe mental illness in young people." Schall U., Miche, P., Stain, H., Ward, P., Langdon, R., & Todd, J. ($1,540,000)


NHMRC Project Grant [1003139] (2011 - 2013) "Eating disturbances and hypothalamic function in frontotemporal dementia." Piguet, O., Samaras, K., & Hodges, J. ($475,000)


NHMRC Project Grant [APP1630471] (2010 - 2014) "Imaging genetics in schizophrenia and bipolar disorder: Adjudicating neurocognitive endophenotypes." Green, M.J., Cairns, M.J., Laurens, K.L., & Carr, V.J. ($540,000)


Ontario Brain Institute (2011 - 2013) "Long-term outcomes of pediatric epilepsy surgery - A sub project in Integrated discovery system for epilepsy (New 2013 annual report}
approaches to intractable seizures).”


Schizophrenia Fellowship of NSW (2013 - 2014) “The development of an Internet-based social cognitive remediation for people with schizophrenia (eSoCog).”

Marsh, P.J., Langdon, R., & Coltheart, M. ($50,000)


Green, M.J., Cairns, M.J., Laurens, K.L., & Carr, V.J. ($39,000)


Green, M.J., McCarthy-Jones, S., & Shepherd, A. ($31,000)


Social Sciences and Humanities Research Council (SSHRC) (2011 - 2014) “Face processing strategies in those with and without autism spectrum disorders.”

Rutherford, M.D. ($90,950)


Sollberger, M., Monsch, A.U., & Piguet, O. ($168,393)

Vice-Chancellor’s Early Career Postdoctoral Research Fellowship (Flinders University) (2013 - 2015) “Maximising the effectiveness of psychological treatment for delusions in schizophrenia: Combining metacognitive and cognitive-behavioural therapy.” Balzan, R.P. ($250,000)


Charman, T., & Pellicano, E.

Wellcome Trust Medical Humanities Strategic Award (098455/Z/12/Z) (2012 - 2015) “Hearing the Voice.” (£1,000,708).


Velux Stiftung, Switzerland (2013 - 2015) “Differentiation of patients with behavioural variant frontotemporal dementia from patients with major depressive disorder.” (CHF135,000).

Sollberger, M., Monsch, A.U., & Piguet, O. ($168,393)

Vice-Chancellor’s Early Career Postdoctoral Research Fellowship (Flinders University) (2013 - 2015) “Maximising the effectiveness of psychological treatment for delusions in schizophrenia: Combining metacognitive and cognitive-behavioural therapy.” Balzan, R.P. ($250,000)


Charman, T., & Pellicano, E.

Wellcome Trust Medical Humanities Strategic Award (098455/Z/12/Z) (2012 - 2015) “Hearing the Voice.” (£1,000,708).


Enhancing the Centre’s national and international standing through highly innovative transformational research outputs in the five core areas of cognition.
## income

<table>
<thead>
<tr>
<th>source</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014 projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC Centre of Excellence Grant</td>
<td>$3,047,251</td>
<td>$3,164,494</td>
<td>$3,286,244</td>
<td>$3,385,555</td>
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<tr>
<td>Cash Contributions by Node</td>
<td>$1,098,116</td>
<td>$1,824,287</td>
<td>$996,487</td>
<td>$1,345,785</td>
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<tr>
<td>Macquarie University</td>
<td>$750,535</td>
<td>$1,473,899</td>
<td>$646,099</td>
<td>$995,397</td>
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<tr>
<td>The University of New South Wales</td>
<td>$150,000</td>
<td>$150,000</td>
<td>$150,000</td>
<td>$150,000</td>
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<tr>
<td>The University of Western Australia</td>
<td>$197,581</td>
<td>$200,388</td>
<td>$200,388</td>
<td>$200,388</td>
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<tr>
<td>Other Income</td>
<td>–</td>
<td>$11,060</td>
<td>–</td>
<td>–</td>
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<tr>
<td>NSW Science Leveraging Fund</td>
<td>$511,579</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>TOTAL INCOME</strong></td>
<td><strong>$4,656,946</strong></td>
<td><strong>$4,999,841</strong></td>
<td><strong>$4,282,731</strong></td>
<td><strong>$4,731,340</strong></td>
</tr>
</tbody>
</table>

Accumulated funds from previous year: $2,062,637

## expenditure

<table>
<thead>
<tr>
<th>description</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014 projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries/Contractors</td>
<td>$1,830,699</td>
<td>$3,148,550</td>
<td>$3,230,798</td>
<td>$4,110,116</td>
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<tr>
<td>Scholarships</td>
<td>–</td>
<td>$258,369</td>
<td>$348,185</td>
<td>$478,863</td>
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<tr>
<td>Equipment</td>
<td>$295,387</td>
<td>$408,456</td>
<td>$471,986</td>
<td>$153,600</td>
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<tr>
<td>Travel/Professional Development</td>
<td>$190,836</td>
<td>$267,494</td>
<td>$167,891</td>
<td>$435,460</td>
</tr>
<tr>
<td>Maintenance/Consumables</td>
<td>$165,195</td>
<td>$212,482</td>
<td>$235,848</td>
<td>$311,002</td>
</tr>
<tr>
<td>Other Expenditure 4</td>
<td>$112,192</td>
<td>$132,977</td>
<td>$95,198</td>
<td>$271,804</td>
</tr>
<tr>
<td><strong>TOTAL EXPENDITURE</strong></td>
<td><strong>$2,594,309</strong></td>
<td><strong>$4,428,828</strong></td>
<td><strong>$4,549,906</strong></td>
<td><strong>$5,760,845</strong></td>
</tr>
</tbody>
</table>

Accumulated funds to next year: $2,062,637

## NOTES

1. Includes $500,000 brought forward from 2016/2017 to contribute to NSW Science Leverage Fund Helium Recovery System project
2. Includes $180,000 of 2013 commitment received in 2012
3. Includes $26,500 PhD Fees which were not included in the 2012 Annual Report
4. Includes $428,988 in research salaries contracted to the Centre in an arrangement between The University of New South Wales and Neuroscience Research Australia (NeuRA). This amount was included in Other Expenditure in 2012 Annual Report and has been transferred to Salaries/Contractors in this report for comparative purposes
5. Includes $26,500 in PhD Fees paid which was not previously included in the 2012 Annual Report
## Research Findings

<table>
<thead>
<tr>
<th>Performance Indicators</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research outputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Book chapters</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>Journal articles</td>
<td>85</td>
<td>293</td>
</tr>
<tr>
<td>Quality of journal articles (IF &gt; 2)</td>
<td>30</td>
<td>175</td>
</tr>
<tr>
<td>Keynote and invited presentations at major meetings</td>
<td>23</td>
<td>34</td>
</tr>
<tr>
<td>Commentaries about Centre achievements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media releases &amp; articles</td>
<td>15</td>
<td>123</td>
</tr>
<tr>
<td>Web of Science citations for: CIs (2013 outcome includes all Centre CIs)</td>
<td>400</td>
<td>~4400</td>
</tr>
</tbody>
</table>

## Research Training | Professional Education

<table>
<thead>
<tr>
<th>Performance Indicators</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training sessions organised by the Centre</td>
<td>15</td>
<td>28</td>
</tr>
<tr>
<td>Number of attendees at Centre training sessions</td>
<td>57</td>
<td>~250</td>
</tr>
<tr>
<td>New postgraduate students</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>New postdoctoral researchers</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>New honours students</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Postgraduate completions, completion times</td>
<td>8, 3yr 6mth</td>
<td>22, 3yr 11mth</td>
</tr>
<tr>
<td>Number of Early Career Researchers (within 5 years of PhD)</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>Mentored high school and visiting students</td>
<td>7</td>
<td>20</td>
</tr>
</tbody>
</table>

## International, National and Regional Links | Networks

<table>
<thead>
<tr>
<th>Performance Indicators</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>International visitors</td>
<td>18</td>
<td>118</td>
</tr>
<tr>
<td>National and international workshops organised by the Centre</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Visits to overseas laboratories</td>
<td>30</td>
<td>53</td>
</tr>
<tr>
<td>Interdisciplinary research supported by the Centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-program experiments/papers</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Interdisciplinary PhD supervision</td>
<td>20%</td>
<td>19%</td>
</tr>
</tbody>
</table>

## End-user Links

<table>
<thead>
<tr>
<th>Performance Indicators</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government, industry and business briefings</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>Public awareness programs</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3: High School visits, student mentoring and year 10 work experience: Outreach program with regional universities: Website, hosted events/seminars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events</td>
<td>12</td>
<td>&gt; 12</td>
</tr>
<tr>
<td>Research outcomes</td>
<td>4</td>
<td>&gt; 4</td>
</tr>
<tr>
<td>Website hits</td>
<td>15,000</td>
<td>33,457</td>
</tr>
<tr>
<td>Public talks given by the Centre</td>
<td>10-15</td>
<td>15</td>
</tr>
</tbody>
</table>
## Organisational Support

<table>
<thead>
<tr>
<th>Description</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total annual cash contributions from Collaborating Organisations</td>
<td>$1,133,747</td>
<td>$971,229</td>
</tr>
<tr>
<td>($180,000 of target commitment received in 2012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total annual in-kind contributions from Collaborating Organisations</td>
<td>$2,167,837</td>
<td>$3,017,153</td>
</tr>
<tr>
<td>Total annual cash contributions from Partner Organisations</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total annual in-kind contributions from Partner Organisations</td>
<td>$96,131</td>
<td>$96,131</td>
</tr>
<tr>
<td>Total annual other research income</td>
<td>$5,534,000</td>
<td>$13,669,397</td>
</tr>
<tr>
<td>New collaborations with institutions/industry</td>
<td>3</td>
<td>4: Hear and Say for Deaf Children Ltd, Beijing Language &amp; Culture University, China, National Acoustic Laboratories, Kanazawa Institute of Technology, Japan</td>
</tr>
</tbody>
</table>

## Governance

<table>
<thead>
<tr>
<th>Description</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadth, balance and experience of advisory committees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific Committee</td>
<td>4</td>
<td>6: see Governance</td>
</tr>
<tr>
<td>Advisory Board</td>
<td>10</td>
<td>10: see Governance</td>
</tr>
<tr>
<td>Advisory Board meetings</td>
<td>2</td>
<td>2: 1 Feb/29 Nov</td>
</tr>
<tr>
<td>Bringing researchers together to form an interactive and effective research team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruit (or retain) new staff and students across the five research programs</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td>Research Management Committee meetings</td>
<td>1</td>
<td>4 meetings; plus Director and COO visits to UWA/UNSW nodes</td>
</tr>
</tbody>
</table>

## National Benefit

<table>
<thead>
<tr>
<th>Description</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to the National Research Priorities and the National Innovation Priorities</td>
<td>6</td>
<td>Contributed to National Research Priorities: A healthy start to life: Reading, Language and Person Perception Programs; Ageing well, ageing productively: Memory, Belief Formation and Language Programs Contributed to National Innovation Priorities: 1, 2, 6 &amp; 7.</td>
</tr>
</tbody>
</table>

## Centre-specific Performance Indicators

<table>
<thead>
<tr>
<th>Description</th>
<th>TARGET</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation at peak body meetings and information sessions Cognitive science in the public interest program</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Educational outreach program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Centre continued its association with the IDEALAB PhD exchange program hosting five international students and providing them with the opportunity to work closely with CCD members and to see first hand our state of the art facilities (see Outreach</td>
<td>Impact).</td>
<td></td>
</tr>
<tr>
<td>This year the Centre hosted Year 10 students as part of their work experience week, provided mentoring to another Year 10 student who visited our FaceLab within the Person Perception program at our UWA node and hosted 50 Year 12 students as part of the National Youth Science Forum (see Outreach</td>
<td>Impact).</td>
<td></td>
</tr>
<tr>
<td>Rural outreach program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In 2013 our regional collaborations continued to be maintained with UNE, with the CCD hosting CI Byrne and AI Kilentzos on various occasions. In particular they were invited to present their work at a special workshop entitled The Evolution of Language, held in December (see Outreach</td>
<td>Impact).</td>
<td></td>
</tr>
</tbody>
</table>
The CCD is an Australian Research Council Centre of Excellence. The administering node of the CCD is Macquarie University, with additional nodes at The University of New South Wales and at The University of Western Australia. The CCD is supported by two collaborating universities and nine partner organisations.