



Te Kāhui Roro Reo • New Zealand Institute of
Language Brain & Behaviour

Annual Report



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“The NZILBB is now a very vibrant, busy team, doing amazing research. We have been awarded more than \$3 million dollars in external grants.”



Director's Report

Welcome to the 2011 New Zealand Institute of Language, Brain and Behaviour Annual Report.

Despite having existed now for 2 years, this is our first report.

NZILBB was formed at the beginning of 2010, with a \$3,250,000 investment by the University of Canterbury. 2010 was a very busy 'building' year. We literally built labs and refurbished offices and research spaces. We built human resources – hiring Post-docs, advertising scholarships, and putting administrative and technical support in place. And we built links – establishing partnerships with a lot of external organizations, both within Christchurch and further afield. And also links between ourselves, forging novel interdisciplinary projects at the intersections of our respective fields.

Having done so much construction, we were finally hitting our stride when forces of destruction set us back. The February earthquake hit mere weeks after several of our long-awaited Post-docs had finally arrived. The earthquakes closed the university for a considerable time, and our own building for even longer. The Post-docs were forced to face crisis in a city they hardly knew, and without a regular workplace to visit. We are extremely grateful to the New Zealand Brain Research Institute, who lent desk space and community to several of them during this time. A number of our national and international partners also hosted PhD students during the months following February. We are very grateful to them, and of course, to the Post-docs and students for sticking with us throughout it all.

Luckily, despite the long building closure, and the difficult year that many of our members faced, the NZILBB came through the events relatively unscathed. Once we were finally reunited back on campus, NZILBB began to really thrive. The NZILBB is now a very vibrant, busy team, doing amazing research. We have been awarded more than \$3 million dollars in external grants. We have held two international workshops, and hosted many external visitors. We have developed many connections with industry, research partners and community.

2011, despite all, was a great year for NZILBB. This report details just some of the projects, events, and people that helped make it great.

Jen Hay

New Zealand Institute of Language Brain and Behaviour - *Connecting mouths, minds and movement*

The New Zealand Institute of Language, Brain and Behaviour (NZILBB) is a multi-disciplinary centre dedicated to the study of human language. It was founded in January 2010 as a result of a multi-year, multi-million dollar investment by the University. The researchers come from a wide range of disciplines, forging connections across linguistics, speech production and perception, language acquisition, language disorders, social cognition, memory, brain imaging, cognitive science, bilingual education, and interface technologies.

NZILBB collects audio, visual, articulatory, neural and behavioural data on how individuals speak, listen, interact, and otherwise use language in their day-to-day lives. With this data, we study the foundations of language as an integrated, multimodal, statistical system operating in a social, physical and physiological context. We study the relationship between language and other modes of cognition and behaviour, including memory, gesture, facial expression and gait. We are interested in language development throughout the lifespan, and in how non-language information (social, physical, contextual, visual) affects individuals' speaking and listening behaviours.

Our highly interdisciplinary team is working together toward a truly unified understanding of how language is acquired, produced and understood in its social and physical contexts.



Our People

Our highly interdisciplinary team is working together toward a truly unified understanding of how language is acquired, produced and understood.

NZILBB Research Faculty

NZILBB is a highly interdisciplinary group of over 30 researchers, who are distributed across University of Canterbury's Colleges of Arts, Science, Engineering and Education. The affiliated researchers are listed below.

Dharamvir Ahluwalia, *Department of Physics and Astronomy, UC*

Christoph Bartneck, *Human Interface Technology Lab (HitLab), UC*

Mark Billinghurst, *Human Interface Technology Lab (HitLab), UC*

Anne van Bysterveldt, *Health Sciences Centre, UC*

Lynn Clark, *Department of Linguistics, UC*

Andy Cockburn, *Department of Computer Science and Software Engineering, UC*

Jack Copeland, *Department of Philosophy, UC*

John Dalrymple-Alford, *Department of Psychology, UC*

Andreas Duenser, *Human Interface Technology Lab (HitLab), UC*

John Everatt, *School of Literacies and Arts in Education, UC*

Susan Foster-Cohen, *Director, The Champion Centre*

Gail Gillon, *College of Education, UC*

Jen Hay, *Department of Linguistics, UC*

Tami Howe, *Department of Communication Disorders, UC*

Beth Hume, *Department of Linguistics, UC*

Lucy Johnston, *Department of Psychology, UC*

Jeanette King, *Aotahi: School of Māori and Indigenous Studies, UC*

Thomas Klee, *Department of Communication Disorders, UC*

Kon Kuiper, *Department of Linguistics, UC*

Margaret Maclagan, *Department of Communication Disorders, UC*

Megan McAuliffe, *Department of Communication Disorders, UC*

Brigid McNeill, *School of Literacies and Arts in Education, UC*

Catherine Moran, *Department of Communication Disorders, UC*

Ewald Neumann, *Department of Psychology, UC*

Greg O'Beirne, *Department of Communication Disorders, UC*

Diane Proudfoot, *Department of Philosophy, UC*

Mike Robb, *Department of Communication Disorders, UC*

Heidi Quinn, *Department of Linguistics, UC*

Stephanie Stokes, *Department of Communication Disorders, UC*

Dean Sutherland, *Health Sciences Centre, UC*

Kevin Watson, *Department of Linguistics, UC*

Ondene van Dulm, *Department of Communication Disorders, UC*



Management Team

A group of 6 faculty play a management role within the Institute



Professor Jen Hay – Director NZILBB

Jen Hay is Director of the institute, and leader of the Language Variation and Change theme. She is a Professor in the Linguistics Department, and has wide-ranging interests in speech sounds and words, and how they are perceived and produced. She currently holds a prestigious Rutherford Fellowship, and has additional funding from the Marsden Fund, and from funding agencies in Australia and the US. She is Associate Editor of Language, and of the Journal of Phonetics. She has published 4 books and many journal articles, and regularly appears on Saturday Morning with Kim Hill, on Radio New Zealand, National.



Professor Thomas Klee – Deputy Director NZILBB

Thomas Klee is Professor in the Department of Communication Disorders and Co-Director of the Child Language Centre. He was twice Associate Editor of the *Journal of Speech, Language, and Hearing Research* and conducts research on children's early language development and disorders. His research is currently funded by the Marsden Fund of the Royal Society of New Zealand and focuses on improving the way in which children with language difficulties are identified. In addition to being deputy director, he leads the NZILBB Language Acquisition Theme.



Associate Professor Megan McAuliffe

Megan McAuliffe leads the Language and Ageing Theme and is an Associate Professor in the Department of Communication Disorders. Her research focuses on speech production and perception in neurological disorders and ageing, with particular interest in how listeners comprehend disordered speech. Megan's research is funded by the Health Research Council of New Zealand and the Neurological Foundation of New Zealand. She is the Associate Editor (motor speech disorders) for *Folia Phoniatica et Logopaedica* and a member of the Editorial Board for Evidence-Based Communication Assessment & Intervention.



Associate Professor Jeanette King

Jeanette King leads the Bilingualism theme. She was one of the first students of Māori language at the University of Canterbury in the late 1970s. She began teaching Māori language at Canterbury in the late 1980s and introduced immersion teaching into the Māori language programme in the early 1990s. Her research interests include changes in the phrasal lexicon of Māori, Māori English, and aspects of Māori language revitalisation, including motivation and ideology. She is a member of the MAONZE (Māori and New Zealand English) project team which, with the aid of two Marsden grants, has been investigating sound change in the Māori language. Recent collaborations with other members of the Institute focus on the production and perception of non-verbal cues Māori/English bilinguals.



Professor Lucy Johnston

Lucy Johnston leads the NZILBB Language and Social Cognition theme. Her research expertise is in social psychology, especially social perception and the impact of nonverbal communication (e.g., gesture; facial expressions; behavioural mimicry) within social interactions. Lucy also has a practical and research interest in sport psychology, and recently completed a specialist MSc in Sport and Exercise Psychology from the University of Staffordshire, UK. Lucy received a University Teaching Award in 2008 and in 2004 she held a Distinguished Visiting Professor position at the University of Connecticut. Lucy was appointed to the Psychosocial Recovery Advisory Group for the Joint Centre for Disaster Research (JCDR; a joint Massey University-Geological and Nuclear Science collaboration) following the Christchurch earthquakes of 2011.



Associate Professor Catherine Moran

Catherine Moran is the NZILBB industry liaison officer. Her research has focused primarily on the influence of working memory on language function in children and adolescents with traumatic brain injury (TBI). In order to achieve this she has examined language functioning at a discourse level. There have been a number of aspects of discourse investigated including: inference generation, narrative discourse, expository discourse and persuasive discourse with adolescents. The other area of research Catherine has pursued which is relevant across a number of clinical populations is that of intervention efficacy using single-subject design research. She has supervised intervention research in children with language difficulties due to hearing impairment, late talkers, and adolescents with TBI.

Post-Doctoral Fellows

NZILBB's Post-Doctoral Fellows are an integral part of our research and our team. Each Post-Doctoral Fellow was chosen for a unique quality and expertise in a certain area and for their ability to be inter-disciplinary.

Where possible the Post-Doctoral Fellows are encouraged to teach into programmes and supervise their own research assistants.

Dr Kota Hattori

Mentor: Jeanette King

Dates of employment: October 2010-March 2013

Kota's current project examines how ESL teachers acoustically modify their speech when they interact with L2 speakers. Two groups of English speakers are recruited; one group consists of ESL teachers, and the other consists of university students. Each participant engages in a task called DiapixUK (see Baker and Hazan, 2011), in which he/she and a conversation partner (either a New Zealand English speaker or a Mandarin speaker) talk and spot differences in shared pictures. Kota is currently collecting data for this project. He will examine whether the ESL teacher group and student group acoustically modify their speech depending on their conversation partners (i.e., comparing their speech addressed to a NZ English speaker and a Mandarin speaker), and whether the ESL teachers and students modify their speech differently for the L2 speaker. Kota will also examine whether there is a relationship between the degree of acoustic modification and lexical frequency.

In addition to the teacher speech project, he is preparing a project which will examine how listeners accommodate ambiguous pronunciations in across-language settings. We have cognitive flexibility to accommodate ambiguous speech sounds and categorize them into L1 phonetic categories. This project will allow Kota to think how we store phonetic information in mental representations. If English listeners demonstrate perceptual adjustment in both English and German, it may be the case that we access L1 phonetic categories in our mental representations to accommodate ambiguous sounds in the two languages. If English listeners do not demonstrate the perceptual adjustment in German, it may be the case that we have two separate mental representations (one for English, and the other for German) and accommodate ambiguous speech sounds in language-specific ways.

Dr Shira Katseff

Mentor: Megan McAuliffe

Dates of employment: January 2011-April 2012

Intelligibility in dysarthric speech

Individuals with dysarthria resulting from Parkinson's disease often find that their speech is difficult for others to understand. The degradation in intelligibility has been linked to a number of acoustic factors, including speech rhythm, vowel formants, and consonant closures. But listeners can frequently understand a sequence of words even if every phoneme isn't accurate because they have a good sense of the statistical structure of English (in terms of biphone probabilities, phonotactics, stress patterns, etc). In this study, we ask whether one syllable of clear speech embedded in an otherwise unintelligible sentence can increase its intelligibility. We expect that sentence processing changes caused by improvement, or degradation, of one syllable will affect the intelligibility of the entire sentence.

Feedback alteration

Speakers compensate for changes to their auditory environment: they speak louder on crowded streets and adjust their articulation to accommodate a retainer or piece of gum. Similarly, experiments in which speakers wear headphones that replace their natural auditory feedback with a subtly modified copy show that altering a speaker's vowel perception induces systematic adjustments to vowel articulation. Two studies are underway to investigate the time course and variation in compensation for altered auditory feedback.

Cross-dialectal responses to altered auditory feedback

The second study compares responses to altered auditory feedback in two varieties of English. Although we are certain that young native speakers of American English compensate for altered auditory feedback, their responses are influenced by the particular vowels that they are accustomed to saying. If this influence is strong, then English speakers should respond to altered feedback differently when they have different native vowels. Due to New Zealand's recent front vowel shift, we expect that speakers of NZ English will be less willing to compensate for altered front vowel feedback than their American counterparts. Testing is underway to compare compensation in speakers of these two Englishes.

Dr Kauyumari Sanchez

Mentor: Lucy Johnston

Dates of employment: January 2011-July 2013

Speech is not only something that you hear; it is also something that you see. Mari's research interests involve the audio and visual nature of speech perception, speech memory, and speech production (alignment/convergence and divergence). She is also interested in how one's unique speaking style (e.g. talker-specific characteristics) and social factors can affect these processes

Mari is currently conducting follow-up research on the findings obtained in her dissertation and the Miller, Sanchez, and Rosenblum (2010) study. These investigations involved speech alignment, the unconscious tendency for people to subtly shift their speech toward the speech of their conversational partner. These studies were unique, in that they are the first and only evidence for visual speech alignment. Alignment to visual speech was obtained via a modified shadowing task. First, participants were recorded reading words aloud to establish a baseline for how they normally speak. In the shadowing task, they were first presented with two words on a monitor (e.g. Tennis Table). They then were presented with a model silently saying one of those words (Table). Participants were asked to say the word they lip-read aloud (Table) and were recorded. These recordings were then presented to naïve raters who judged the similarity of the baseline and shadowed recording to the original model's voice. Participants judged the shadowed words as sounding more like the model than the baseline recordings. This suggests that people can sound like a person whose voice was never heard, but whose face was lip-read. This also suggests that a person's unique speaking style can be perceived by viewing the person talking (articulations). Alternatively, it is possible that viewing a person's face may activate pre-conceptions of how the person should sound. Mari's current project seeks to disambiguate the driving force behind visual speech alignment: articulations or pre-conceptions.

Dr Viktoria Papp

Mentor: Jen Hay

Dates of employment: July 2011 – December 2013

Vica's dissertation work investigated how physiology and performance separately feed into the production of speaker gender. To tease these two apart she documented the speech of both transitioning and transitioned female-to-male transgender / transsexual speakers. Also related to physiological issues, one of my forensic speech science research topics centres around mining large databases to estimate speaker biometric information, primarily speaker height, from the acoustic signal. In her other research project of forensic relevance, she is in the process of building a corpus of speakers under the influence of intoxicants that will hopefully serve as a reference corpus in forensic casework and yield insight into the effects of intoxicants on speech. Currently the database contains heroin speech Vica collected and analyzed for her MSc at the University of York, and Vica along with colleagues at the Maastricht Forensic Institute are starting collecting samples of amphetamine speech in July 2011. Finally, after investigating rhythmicity measures in production and simulation, Vica is planning to integrate the results with future experiments on the perception of speech rhythm.

Dr Donald Derrick

Mentor: Jen Hay (NZILBB) and Cathi Best (MARCS, UWS)

Dates of employment: October 2011 – October 2014

Donald studies speech production and perception in order to identify the phonetic constraints on low-level speech production, and the low-level percepts that can enhance or interfere with speech perception. One of his goals is to develop a theory of phonetic constraints on speech production that allows us to understand when and how low-level speech variability can systematize into sounds with different meanings in a language or dialect. Currently, Donald believes that when listeners can perceive low-level speech variability, it has a chance to become meaningful in that listener's idiolect.

So far, Donald's research has implications for speech planning, constraints on speech production, and multi-modal speech perception, including the possibility of enhancing speech perception among the hard of hearing.

Donald holds a unique position within NZILBB. He is a joint Post-Doctoral Fellow with NZILBB and with the MARCS Auditory Laboratory, University of Western Sydney. He divides his time between the two Institutes and is working on joint projects.

Dr Karolina Alichniewicz

Karolina was employed as a joint Post-Doctoral Fellow shared equally between NZILBB and The New Zealand Brain Institute. Karolina worked with us for nearly 8 months but moved to Australia to escape the aftershocks.

General Staff

NZILBB employs three staff who assist in the day to day running of the Institute:



Emma Parnell
NZILBB Manager



Robert Fromont
NZILBB Software Developer



Scott Lloyd
NZILBB Research Technician

Scholarship Students

There are a large number of thesis students who are affiliated with NZILBB, and involved in many NZILBB collaborations and activities. Many of these are funded by University of Canterbury scholarships. In addition, NZILBB directly offers a small number of scholarships.

The following students currently hold NZILBB scholarships:

Andrew MacFarlane

Andrew funded by a full NZILBB PhD Scholarship. He is supervised by Jen Hay and Lucy Johnston. Andrew's current research involves the interaction between an individual's speech (style, accent and tone) and observable behavioural differences in their listener. More broadly, Andrew is interested in sociophonetic variation, how we create and manage identities through this variation, and how others respond to these linguistic identities; this often takes ideas from persuasion and influence research.

Maryam Ghaleh

Maryam is on a joint CMRF and NZILBB PhD Scholarship. She is supervised by Megan McAuliffe, Ewald Neumann and Catherine Moran. Maryam's PhD research examines discourse comprehension abilities in healthy older adults. Ageing is believed to be accompanied by cognitive declines that may affect communication abilities. Maryam investigates whether an age-related decline in working memory contributes to a concomitant comprehension decline. More broadly, she is interested in the roles of working memory in high-level language processing in monolinguals as well as bilinguals.

Jessie Miller

Jessie is funded by a NZILBB MA Scholarship for her part time studies toward a Masters of Speech and Language Therapy. She is supervised by Catherine Moran (NZILBB and CMDS) and Susan Foster-Cohen from the Champion Centre. Jessie is examining the relationship between nonverbal and verbal aspects of development.

Associated Postgraduate Students

Although these students are not funded by NZILBB, they are supervised by at least one NZILBB researcher and their thesis is on a topic which is of interest to NZILBB. Some of these postgraduates are also working at NZILBB as research assistants.

- Jacqueline Nokes (Linguistics)
- Pauliina Saarinen (Linguistics)
- Keyi Sun (Linguistics)
- Romain Fiasson (Linguistics)
- Daniel Buerkle (Linguistics)
- Kate Naitoro (Linguistics)
- Hasliza Abd Halm (Linguistics)
- Martina Schaefer (Communication Disorders)
- Jayne Moyle (Communication Disorders)
- Penny Harris (Communication Disorders)
- Tze Peng Wong (Communication Disorders)
- Sharimila Adaikkalassamy (Communication Disorders)
- Asifa Sultana (Communication Disorders)
- Llyween Cooper (Health Sciences)

NZILBB Research Assistants

NZILBB currently employs about 40 Research Assistants who work on projects within the various research themes.

Research Assistants have a variety of tasks from designing and running experiments to data analysis or even watching episodes of Shortland Street. Each project usually has one or two research assistants attached to it. We try and support current students and place them in projects which they are interested in working on. Research Assistants are an invaluable resource to NZILBB and without them our research would certainly take a lot longer.

NZILBB Interns

NZILBB accepts students from the University of Bath who are required, as part of their Postgraduate degree, to complete a 9 month placement at a University outside of England. They are encouraged to be active members of the research group they belong to and share their ideas.

In 2012 NZILBB has accepted interns from Cornell University, The University of Osnabrueck, Ludwig-Maximilians University of Munich, and The University of York. They will be working on various projects and gaining an insight into our research for the months they are here.

NZILBB Domestic and International Partners

The Champion Centre , Christchurch, New Zealand

We work closely with the Champion Centre, which is an early intervention centre for children with severe developmental delay. The Director, Susan Foster-Cohen, has an adjunct appointment in Communication Disorders at the University of Canterbury, and teaches in the Linguistics Department. A NZILBB Masters student is based at the Champion Centre, and NZILBB has funded the equipment for an observation lab based at the Centre.

New Zealand Brain Research Institute, Christchurch, New Zealand

NZBRI focuses on brain research with clinical outcomes, and is particularly interested in Parkinson's and movement disorders. NZBRI and NZILBB have co-funded a Post-Doctoral Fellow, although the person who filled that role left Christchurch following the earthquakes. Several current projects with the Ageing Theme involve collaboration between the two Institutes.

Te Kura Whakapūmau i te Reo Tūturu ki Waitaha, Christchurch, New Zealand

The Whakapūmau is a kura kaupapa which is a Māori language immersion school, with whom we are working on issues relating to Māori/English bilingualism.

MARCS Institute, University of Western Sydney, Australia

We have a particularly close working relationship with MARCS Auditory Laboratories – A world-class research facility based at the University of Western Sydney. We have a joint postdoc, who spends half his time in NZ and half his time in Australia. NZILBB and MARCS have also recently purchased identical ultrasound equipment in a coordinated manner, in order to share technical resources, and to enable exacting cross-Tasman comparative work. We have a number of joint projects, and collaborate on a current Australian Research Council Grant.

Linguistics and Applied Language Studies, Victoria University of Wellington, New Zealand

The Department of Electrical and Computer Engineering, The University of Auckland, New Zealand

Callier Center for Communication Disorders, UT Dallas, USA

Carolina Conversation Collection, Medical University of South Carolina, USA

Motor Speech Disorders Laboratory, Arizona State University, USA

Neurolinguistic-Neurocognitive Research Center, Florida State University, USA

Northwestern Institute on Complex Systems: Language, Music and Communication, Chicago, USA

The Sociolinguistics Laboratory, University of Hawai'i at Manoa, USA

Spoken Syntax Laboratory, Stanford University, USA

Interdisciplinary Speech Research Laboratory, University of British Columbia, Canada

Centre for Research in Linguistics and Language Sciences, University of Newcastle upon Tyne, UK

Department of Languages and Linguistic Science, University of York, UK

Institute of Phonetics and Speech Processing (IPS), Ludwig-Maximilians University of Munich, Germany

NZILBB Adjunct Professor

We are very pleased that the University of Canterbury has invited Professor Janet Pierrehumbert (from Northwestern University) as an NZILBB Adjunct Professor.

Pierrehumbert's research uses experimental and computational methods to study the sound structure of language. Her current research, funded by the Studying Complex Systems Program of the James S. McDonnell Foundation, uses agent-based modeling of speaker populations to model the formation of language sound systems in individuals and populations. She has received a Guggenheim Fellowship, and is a fellow of the American Academy of Arts and Sciences. As part of the formation of our institutional partnership, Northwestern Institute of Complex Systems and NZILBB each committed USD\$10,000 toward seeding a joint project on the dynamics of the lexicon. This has resulted in a recent joint grant application between Pierrehumbert, Hay (Linguistics), Stokes (CMDS) and Bartneck (HITLab NZ). Pierrehumbert plans to visit NZILBB on an annual basis.

NZILBB Advisory Board

The Advisory Board has been established to discuss and clarify the strategies and direction of the Institute and to provide invaluable guidance. The first meeting of the Advisory Board will be in April 2012.

- **Board Chair – Professor Anne Cutler**
Director, Max Plank Institute for Psycholinguistics, The Netherlands
- **Professor Jonathan Harrington**
Director, Institute of Phonetics, University of Munich, Germany
- **Dr Stefanie Shattuck Hufnagel**
Principal Research Scientist, Research Laboratory of Electronics, MIT, USA
- **Professor Bruce Murdoch**
Director, Centre for Neurogenic Communication Disorders Research, The University of Queensland, Australia

Jen Hay and **Thomas Klee** are the NZILBB representatives and **Ian Town** and **Ed Adelson** represent the University of Canterbury.

Te Kāhui Kaihautū – The Māori Reference Group

Te Kāhui Kaihautū is the Māori steering committee. Its role is to support and guide the Institute in its research relationship with the Māori community.

- **Angus Macfarlane**, Professor of Māori Research (University of Canterbury)
- **Christine Brown**, Resource Teacher of Māori (Education representative)
- **Hector Matthews**, Executive Director of Māori and Pacific Health, Christchurch District Health Board (Health representative)
- **Alamein Connell**, teacher (community representative)
- **Charisma Rangipunga**, Manager Toitu te Kura at Te Runanga o Ngai Tahu (Ngai Tahu representative)
- **Terina Tahau**, Principal, Te Kura Whakapūmau it e reo Tūturu ki Waitaha

NZILBB Visitors

NZILBB welcomes collaborators from external Institutions. We happily provide office space and access to LaBBCAT and our facilities. Some recent visitors in 2011 were;

- **Janet Pierrehumbert** (Northwestern University, USA).
- **Anita Szakay** (University of British Columbia, Canada).
- **Abby Walker** (Ohio State University, USA)
- **Joan Bresnan** (Stanford University, USA)
- **Paul Foulkes** (University of York, UK)
- **Gerry Docherty** (Newcastle University, UK)
- **Cathi Best** (University of Western Sydney)
- **Jason Shaw** (University of Western Sydney)
- **Ingo Plag** (Universität Siegen)



Research

At the New Zealand Institute of Language Brain and Behaviour our work is loosely organized into a number of themes, although there are many projects which cross-cut these themes.



THEME

Language Variation and Change

Theme Leader : Jen Hay

This theme concentrates on how the production of language varies across speakers, and changes over time, and how listeners deal with this variation. These questions are approached via a combination of experimental work and analysis of corpora (large collections of recordings)

The corpus work builds on the success of the Origins of New Zealand English Project (ONZE). The ONZE project contains almost 1000 hours of recorded New Zealand English, spanning the entire history of the dialect. These are annotated and analysed in LaBB-Cat (Language, Brain and Behaviour, Corpus Analysis Tool), which allows for sophisticated searching and analysis of large, time-aligned, multiply annotated corpora. In collaboration with the other themes, the existing ONZE corpora are being radically expanded to include audiovisual data, to cover bilingual speakers, and to include the entire lifespan. With the recent arrival of Kevin Watson and Lynn Clark, another large, important corpus has recently been imported into LaBB-Cat at NZILBB: OLIVE (Origins of Liverpool English).

Featured Projects:

Can we really believe our ears?

Jen Hay, with in collaboration with NZILBB partners in Wellington and Hawaii, has conducted a series of studies looking at how listeners recognize words and sounds, with a particular focus on the effects of factors which are independent of the acoustic signal. How does what we can see, for example, affect what we think we hear? Across a series of experiments, Hay and colleagues have shown that what we think we hear is consistently subtly affected by factors that have nothing to do with the speech signal. These include things like our beliefs or expectations about the speaker. Young NZ listeners, for example, struggle to hear the difference between the vowels in words like 'bear' and 'beer'. But they are better at it if they are looking at a photo of an older speaker than if they are looking at a photo of a younger speaker. The environment matters too. A soft kangaroo toy sitting in the corner of the room prompted listeners to process vowels as more Australian-like than a soft koala bear. Other researchers within the LVC

theme are also look at the integration of information which is extra to the speech signal. Mari Sanchez, for example, is focussed on the information that listeners can take from looking at the movements on the face of a speaker. And Donald Derrick is investigating the very fine airpuffs associated with certain speech sounds. He has shown, for example, that listeners 'hear' some sounds differently if air is puffed at their ankle at the same time as the listener hears the sound.

How and why do languages change?

All languages change over time. What is the process through which this change happens? How do sound changes spread across words and speakers? What can this teach us about the nature of language, and the ways in which sounds and words are stored in the mind? These are the types of questions that underpin many ongoing NZILBB projects which look at how New Zealand English, Māori – and most recently – Liverpool English – have evolved over time. Our time-aligned corpora enable us to automatically extract large amounts of data very efficiently, and identify changing patterns over time. For example, a recent publication looked at the rhythm of speech in New Zealand, and how this has changed over the course of its history. Work in progress with NZILBB Adjunct Professor Janet Pierrehumbert, is investigating the details of the development of the NZ front short vowels – the vowels in the words hid, head and had. These investigations are some of the largest-scale studies of patterns of sound change that are currently being undertaken anywhere in the world.



THEME

Language Acquisition

Theme Leader: Thomas Klee

The language acquisition theme focuses on language and literacy development in children with and without developmental difficulties. The aim of this research group is advancing basic knowledge and improving clinical and educational practice.

Featured Project:

Statistical learning in emerging lexicons

Programme leader: Stephanie Stokes

While most children learn to talk effortlessly in the first two years of life, about 13% of children can be described as 'late talkers' when they are two. These are children who have not yet started to say words, or who say few words, or who are not yet putting words together in two-word utterances. Late talkers are defined by a *quantitative* measure (number of spoken words). Our research programme asks whether there are also *qualitative* differences in the words that these children can say compared with the words said by children who know many words. We take as our starting point the knowledge that as literate adults we know that spoken language is comprised of sequences of words, with boundaries. But there are no actual 'spaces' between words in running speech. The input that infants hear is a continuous string of language, without word boundaries (thedogischasingthecat). To overcome this challenge, infants take advantage of statistical (probabilistic) cues in input to identify words, and 'crack the code' of language learning. These cues include exaggerated pitch peaks, cross-syllable transitional (sequential) probabilities of sound sequences, and recurring clusters of syllables.

Our recent publications show that children who are late talkers may not be using these cues as effectively as other children. We have found that the words that late talkers have learned sound like a lot of other words that they hear spoken around them. We know that when most toddlers start to talk, their first spoken words are those that sound similar to many other words in the input (e.g. cat has 35 similar words, or 'neighbours', such as mat, pat, cap, kit). Such words have 'high phonological neighbourhood density'. Words that have few phonological neighbours are called 'sparse' words (e.g. mouth has only 5 phonological neighbours). It seems that late talkers learn dense words, but not sparse words. This is a very new finding, and one that we are continuing to explore in an effort to understand the learning mechanisms that underpin this finding.

The research involves interdisciplinary and international collaborators: Stephanie Stokes, Jen Hay (University of Canterbury), Martin Takáč (Cormenius University), Alistair Knott (University of Otago), Dorthe Bleses, Hans Basbøll, Claus Lambertsen (University of Southern Denmark), Sophie Kern (Dynamique du Langage, Lyon), Christophe dos Santos (Université François Rabelais), Elise de Bree, Annemarie Kerkhoff (Utrecht University), Tania Zamuner (University of Ottawa).



THEME

Language and Ageing

Theme Leader: Megan McAuliffe

The Language and Ageing theme focuses on language processing in healthy older adults and those with neurological problems such as Parkinson's disease, Alzheimer's disease and stroke. Researchers involved in this theme come from a variety of backgrounds including psychology, audiology, linguistics, and speech and language therapy.

Featured Projects:

Dysarthric speech

Associate Professor Megan McAuliffe, in conjunction with colleagues at the New Zealand Brain Research Institute and Arizona State University is conducting a series of studies examining older listeners' perceptions of dysarthric speech. The studies, funded by the Health Research Council of NZ, examine the cognitive-perceptual strategies older and younger listeners employ in their attempts to understand dysarthric speech. Our recent work has demonstrated that listeners' strategies vary depending on the type of exposure to dysarthric speech they receive. Upcoming work indicates that strategies employed by younger and older listeners may be quantifiably different. This programme of research has significant implications for our understanding of listener processing of disordered speech. Furthermore, it may provide a platform for the development of new rehabilitation paradigms to assist those with speech and hearing disorders.

Narrative in people with Dementia of the Alzheimer's type

Margaret Maclagan (CMDS, University of Canterbury) and Boyd Davis (English, University of North Carolina, Charlotte) are analysing narratives told by people with dementia of the Alzheimer's type (DAT). At present, we are focusing on participants who have been recorded speaking to different interviewers. This demonstrates the way that different interviewers affects speakers with DAT, who can appear more or less competent depending on the person to whom they are speaking. One person with DAT uses more general extenders (*or something like that*) when she thinks the person to whom she is speaking is sufficiently affiliated with her and able to complete her train of thought. If she does not think her conversation partner is interested in what she is talking about, she asks a lot of questions (*things OK with you?*) to get the other person talking.



THEME

Bilingualism

Theme Leader: Jeanette King

Most people in the world speak more than one language. The bilingualism theme focuses on aspects of the speech of bilinguals, from how knowledge of one language might influence the production of another, to the role of non-verbal cues in the production and perception of speakers.

Featured Projects:

Te Whakahuatanga a te tamaiti nohinohi – Phoneme acquisition in Māori/English bilingual children

This project will gather elicited and language sample data from 25 Māori/English bilingual children aged between 2-6 years. The recordings, in both Māori and English, will capture both audio and visual data. The phonetic data will allow us to determine which phonemes are produced at which age levels in both languages. There will be a focus of phonemes which have some contrastive quality between Māori and English, namely the pronunciation of /r/ and the word initial use of / / in Māori. Analysis will also indicate whether the children are acquiring the distinction between short and long pairs of Māori vowels.

Story telling in the New Zealand context – investigating the role of body language in oral performance

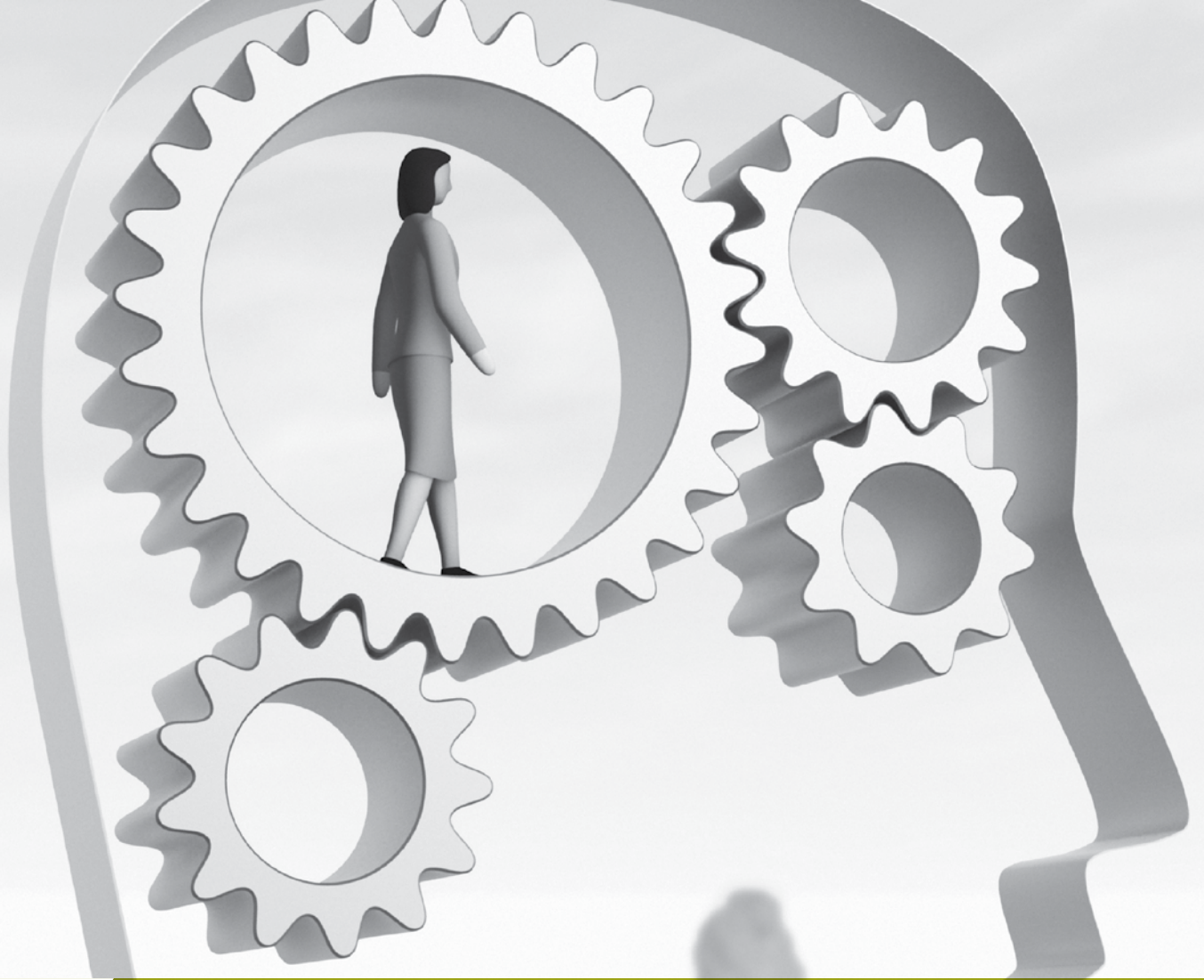
This is the data collection phase for a proposed larger research project investigating differences in verbal and non-verbal behaviour (especially gesture) by monolinguals and bilinguals speaking English and Māori. We are currently making audio/visual recordings of twelve young male New Zealanders in our recording studio. Six participants are monolingual in English and six are Māori /English bilinguals. In separate recordings, the participants will engage with a Pakeha and a Māori interviewer in a number of tasks including the retelling of

stories and telling about positive and negative incidents that occurred in their past and also in the previous week. Bilingual participants will be involved in a third interview with the Māori interviewer in the Māori language. The tasks performed in all sessions will be similar. Non-verbal cues will be coded to see whether there are differences in the rate and type of gesture used by the monolingual and bilingual participants and when the bilingual participants are using different languages. This data will form the basis of a number of perception experiments to examine whether such things as ethnicity or language being spoken can be reliably determined from the visual signal alone.

Moving and Speaking – investigating the link between movement and speech

Conducted in the HIT lab's Vision Space, the aim of this project is to investigate whether there is

synchrony between movement and speech among Māori/English bilinguals and whether this differs to that of monolingual New Zealand English speakers.



THEME

Language and Social Cognition

Theme Leader: Lucy Johnston

Language and Social Cognition works with the other themes to investigate the relationship between language and social cognition. Speech, gait, gesture, facial expression and emotion tend to be studied as isolated systems; we are working on developing an understanding of, and an integrative model of, this full system.

Featured Projects:

Ethnic and Sex Bias in Televised Non-Verbal Behaviours?

This research is investigating the transmission of subtle ethnic- and sex-bias in a popular long-running television soap-opera in New Zealand. The nonverbal behaviours of Pakeha (NZ-European) characters are compared when the characters are interacting with others of the same and different sex and with individuals of Pakeha and Māori /Pasifika origin. Further, Pakeha viewers were shown silent video-clips of the Pakeha character. After viewing each clip perceivers were asked to rate (i) how much they thought the visible character liked the (off-screen) person they were interacting with and (ii) how positive they thought the interaction was. Preliminary results indicate differing perceptions of the interactions as a function of the ethnicity and sex of the interaction partner. When interactions were between a male and female, the interactions were rated more positively, and the character judged as being more liked, when of the same ethnic group. When interactions were between same sex pairs, ratings were higher when the partner was of the other ethnic group. The non-verbal behaviours of Pakeha (ethnic majority) targets were judged to be more positive toward own ethnicity interaction partners of the opposite sex but more positive toward other ethnicity interaction partners of the same sex. Further analysis will be conducted to identify specific nonverbal behaviours that specific liking or positive interactions. Evaluations of the target video-clips from Māori /Pasifika viewers are also been collected to compare whether perceptions of interactions differ as a function of the ethnicity of the perceivers as well as the ethnicity of the actors. The results have implications for understanding ethnic and sex biases in social interactions.

It's not what you say, but the way that you say it.

“He didn’t say so, but I could tell he was angry”; “She said she was, but she just didn’t sound happy”

It's often not *what* but *how* somebody says something that guides judgments and behaviour in social interactions. Even without relevant words being spoken we will likely, for example, act in a different way toward somebody who sounds angry than somebody who does not. Voice quality is an important means by which physical, psychological and social characteristics of speakers are conveyed. Even when the words spoken are neutral, or are in a foreign language, individuals are able to identify, for example, a speaker's emotional state. Effective social interaction further requires perceivers to differentiate genuine from faked signals (e.g., between genuine specification of happiness and a simulation of such). Previous research in our laboratories has demonstrated that perceivers are sensitive to differences in genuine and posed facial expressions of emotion and that this sensitivity guides future interactions. The current research extends this research to auditory specification of emotion since voice quality is often subject to intentional control – talkers try to convey or disguise specific attributes in order to create a particular impression with others. This research consists of 3 phases:

- Recordings of genuine and posed vocal expressions – using mood induction methods, individuals are recorded reading specific words and phrases and in spontaneous speech.
- Acoustic analysis is conducted to investigate differences in voice quality (e.g. voice pitch and intensity) between genuine and posed expressions
- Perceiver sensitivity to differences between posed and genuine expressions are examined by having perceivers listen to auditory clips and judge the mood state of the speaker.

This research has implications for the unfolding of social interaction.



Team Tamariki

Team Tamariki is run by the University of Canterbury and the New Zealand Institute of Language Brain and Behaviour. It is led by Stephanie Stokes.

Team Tamariki is a database of families who are willing to be contacted when their child is the right age for a research project that is about to start at the University. The research projects will be on some aspect of child development or learning. For example, we might want to know what kinds of words children learn in their first two years, so we would contact a family and invite them into our child language centre to play some games and do some child development tests. Currently the database consists of approximately 200 children and we hope this will grow considerably in 2012.

Industry Connections

As part of the NZILBB's mission to Connect Mouths, Minds and Movement, the Institute is committed to building relationships with industry so that the research being developed is contributing to growth and capacity development in the broader NZ context. Researchers at NZILBB are working with NZ industry to optimise communication.

One example of this work is an ongoing collaboration with Tait Communication. NZILBB and Tait are working together with the New Zealand Fire Service to improve communication in challenging environments. Drawing on perceptual learning, non-linguistic communication behaviours, and speech and language production research, NZILBB has been involved in providing on-site assessments and evaluations of emergency communications. The relationship between Tait Radio Communications and NZILBB continues to strengthen with plans in 2012 to develop a product for enhancing radio communications in complex environments.



UC QuakeBox

The UC QuakeBox is a mobile recording studio in which members of the public can create video recordings of their stories of the Canterbury earthquakes. This is one of the community engagement projects being carried out as part of UC CEISMIC. A joint venture with the New Zealand Institute for Language Brain and Behaviour (NZILBB), the aim of the UC QuakeBox project is to connect with a broad variety of Canterbury communities and proactively gather people's earthquake experience stories. Recordings have thus far been conducted in English, Māori, Mandarin, Japanese, Russian and German.

The recordings will form part of UC QuakeStudies, the University of Canterbury node of the UC CEISMIC Digital Archive. Professor Jen Hay, Director of NZILBB, worked with the UC Human Ethics Committee and UC CEISMIC Research Committee to ensure the project has appropriate research and consent protocols.

The UC QuakeBox itself is a shipping container, donated by Tourism NZ, which once used it to travel around the country recording the views of tourists. It has a small recording booth which has been completely refurbished. The amount of support for the re-fit of the container from individuals and businesses in the community, and staff in the University's Facilities Management group has been very gratifying.

The UC QuakeBox was deployed for several weeks as part of the Re:Start project in Cashel Mall (CBD). It is currently located at Eastgate Mall and we hope to deploy it to other sites around the Canterbury region during 2012, including a residential home for the elderly.

UC QUAKE BOX

**Kōrero mai
Tell us your story**



UC *Whare Wānanga o Waitaha* • New Zealand Institute of
Brain & Behaviour

UC *Whare Wānanga o Waitaha* • **SMIC**
Earthquake Digital Archive

The aim of the UC QuakeBox project is to connect with a broad variety of Canterbury communities and proactively gather people's earthquake experience stories.



Workshops (2010 & 2011)

NZILBB has held two very successful workshops. The first in 2010 coincided with the official launch of the Institute.

Held over three days at Rydges, all of our domestic and international partners were represented, with over 80 delegates attending. The workshop was a mix of conference style presentations, demonstrations of equipment/software and also a poster session. The aim of this workshop was to provide researchers from different fields a platform to network and ultimately collaborate. Near the conclusion of the workshop a brainstorming session was held to discuss the direction of NZILBB and their thoughts on the workshop.

In November 2011 NZILBB held a smaller workshop over 3 days. We invited our domestic and Australian partners only. Since we had our full complement of Post-Doctoral Fellows we gave them all an opportunity to present their current research to the group which was well received.



External grants

Many of our faculty are conducting research which is funded by external grants. Some of these grants were awarded before the formation of NZILBB, and are hosted by the faculty members' home departments. One of the many advantages of NZILBB is that it can provide a central hub for the management of resources, funding and contracts, and so the more recently awarded grants are therefore administered centrally by NZILBB. The following is a list of the current external grants which are hosted by NZILBB

Rutherford Discovery Grant

Episodic word memory

Jen Hay

\$1,000,000NZD over 5 years

Individuals know many hundreds of thousands of words. Recent results indicate that what we know about each word is shaped in a dynamic ongoing way with our own experience with that word. Hay's research programme explores this episodic word memory – asking what the range of environments (social, physical and contextual) in which we encounter a word does to the way we hear, use and pronounce that word.

Marsden Fund

Early factors in childhood communication disorders

Thomas Klee, Stephanie Stokes, Catherine Moran

\$735,000 over 3 years

The ability to communicate is one of the most basic human traits. Successful communication involves learning to understand and produce an abstract, complex linguistic code and provides the foundation for social interaction, learning and personal well-being. Up to 12% of children experience speech and language difficulties by the time they enter school with 7% having specific language difficulties not due to hearing loss, developmental learning difficulties or other known aetiologies. Adolescents and adults who continue to have problems with language face reduced educational attainment, employment opportunities and social interactions, and have an increased risk of psychiatric and anxiety disorders and substance abuse.

Early identification of children with communication difficulties that are not transient is the key to getting children the help they need before negative consequences take hold. Typically, children suspected of having communication problems surface only when someone in their environment notices that something is amiss and registers their concern with a professional. Attempts to screen young children for early signs of language disorder have had mixed results. While screening is reasonably accurate in predicting a child's current developmental status, success in predicting longer-term outcomes is either modest or unknown. Moreover, research on the natural history of children with early language delay indicates that while most late talkers appear to catch-up by school age, as many as one-third fail to do so. Predicting which ones do and which ones don't has so far proved elusive, partly due to the variable path of development in the case of individual children and partly due to the factors that have been examined to date.

Our research examines several new areas of children's early development in the search for risk factors. Jayne Moyle, a Speech-Language Therapist who graduated from the University of Canterbury, is working on the project as part of her PhD. The project aims to assess 200 children at three points in time over the course of the project; it is being conducted through in the University's new Child Language Centre.



Marsden Fund

Enhancing Communication Intervention for Children with Autism

Dean Sutherland, Jeff Sigafoos (Victoria University of Wellington)

\$885,000NZD of which \$282,454 is awarded to NZILBB over 3 years.

Approximately 25% of children with autism and other developmental disabilities fail to develop sufficient speech to meet their communication needs. These children are candidates for the use of Augmentative and Alternative Communication (AAC). There are three major types of AAC systems that have been taught to children with autism and other developmental disabilities. These are: (1) Manual Signs; (2) Picture Exchange; and (3) Speech-Generating Devices such as iPads.

The aim of this project is to compare these three systems to see which one is learnt the quickest and which one is most preferred by children. To achieve this aim, we will teach the participating children to use all three of these communication systems. As the child is learning each system, we will also set up assessments that will let us know which one of the three systems the child prefers to use. The results of this project will lead to a greater understanding of the impact of children's preferred communication methods on communication development.

Lotteries Health Research Fund

Neurophysiological correlates of human behaviour

Stephanie Stokes, Thomas Klee, Catherine Moran Megan McAuliffe

\$94,000 for 2012

ERP data has been used internationally in a wide range of research exploring typical and atypical human behavior across diverse areas, for example, memory, attention, language processing, autism, specific language impairment, dementia, schizophrenia, ADHD and Alzheimer's, as well as many other conditions. ERP has also been used to measure the effects of substances or intervention on the brain, including drug therapy in attention disorders and social anxiety disorder, and the effects of alcohol on driving.

Little work has been done using EEG/ERP systems in New Zealand. To our knowledge, no work has been done with children or on human development except for the pilot study conducted recently in our Child Language Lab.

The equipment will allow us to measure children's and adult's brain responses (a completely harmless, safe, and even fun activity) to visual and auditory stimuli to increase our understanding of brain processes underlying typical and atypical development in infants and children and those associated with both typical and atypical language processing in adults and the elderly. Pilot studies on various aspects of human development and age-related language processing will be conducted once the equipment purchase is secured and proposals will be submitted to various funding agencies (including those for which the current team of researchers have a track record of success – Marsden, NIH, HRC, and Neurological Foundation) to fund larger-scale projects. We expect the equipment to be used by many research groups, especially as we build expertise across New Zealand, particularly in the South Island initially. The goal is to enable us to better understand human information processing and behaviour, and the effects of intervention on human behaviour, performance and well-being.



Australian Research Council

You came TO DIE?! Perceptual adaptation to regional accents as a new lens on the puzzle of spoken word recognition

Jen Hay, Cathi Best & Jason Shaw (University of Western Sydney), Gerry Docherty (Newcastle University, UK), Paul Foulkes (University of York, UK), Bronwen Evans (University College, London)

\$501,000AUD over 3 years of which \$91,000AUD is awarded to NZILBB

Investigating Australian, New Zealand and UK listeners adaptation to each others accents will reveal how we achieve stable word recognition via flexible adjustment to pronunciation differences. Results will inform word recognition theory and illuminate why unfamiliar accents are difficult for language learners and automatic speech recognisers.

National Science Foundation (USA)

The Development of Syntactic Alternations

Joan Bresnan (Stanford University) and a number of collaborators, including Jen Hay

\$275,000USD of which NZILBB is awarded \$15,000NZD over 3 years.

Ever had the feeling that you know exactly what someone's going to say? This project aims to test a probabilistic model of grammar which can predict the grammatical choices we unconsciously make in everyday situations. In addition, parallel experiments in several other countries may expose fine-grained differences between the cognitive processes associated with the variety of English spoken in New Zealand and that spoken elsewhere.

NZILBB has also been successful in gaining funding from the CEISMIC Research Grants and from the College of Arts funding round.



Facilities

NZILBB Researchers have access to an excellent range of research equipment, which is distributed across our associated departments and local partners. In addition to these, NZILBB itself has its own centralised research facilities. These include a number of pieces of equipment which are not available anywhere else in NZ.

As part of our new initiatives programme in 2012 a Post Doctoral Fellow will embark on a large project using the EEG system which was funded by Lotteries Health Research.





The NDI WAVE machine is a useful tool when investigating speech production.

Observation Room

NZILBB installed a sound-treated Observation Lab, which forms a comfortable environment, while synching five video cameras, with multiple audio feeds, all controlled from a separate control room.

This room is heavily utilised and all of the recordings are added to our growing audio visual corpus. This facility was recently used to record earthquake stories from Christchurch residents. Academic staff from Victoria University of Wellington have also made use of the Observation Room to video members of Christchurch's deaf community telling their earthquake stories.

Northern Digital Waves System

The WAVES electromagnetic tracking system is an exciting no-line-of-sight motion capture system specifically designed for tracking speech related articulatory to orofacial movements (such as tongue movements). It provides a non-invasive measurement system in which the subject is free to move naturally during the experiment.

Ultrasound

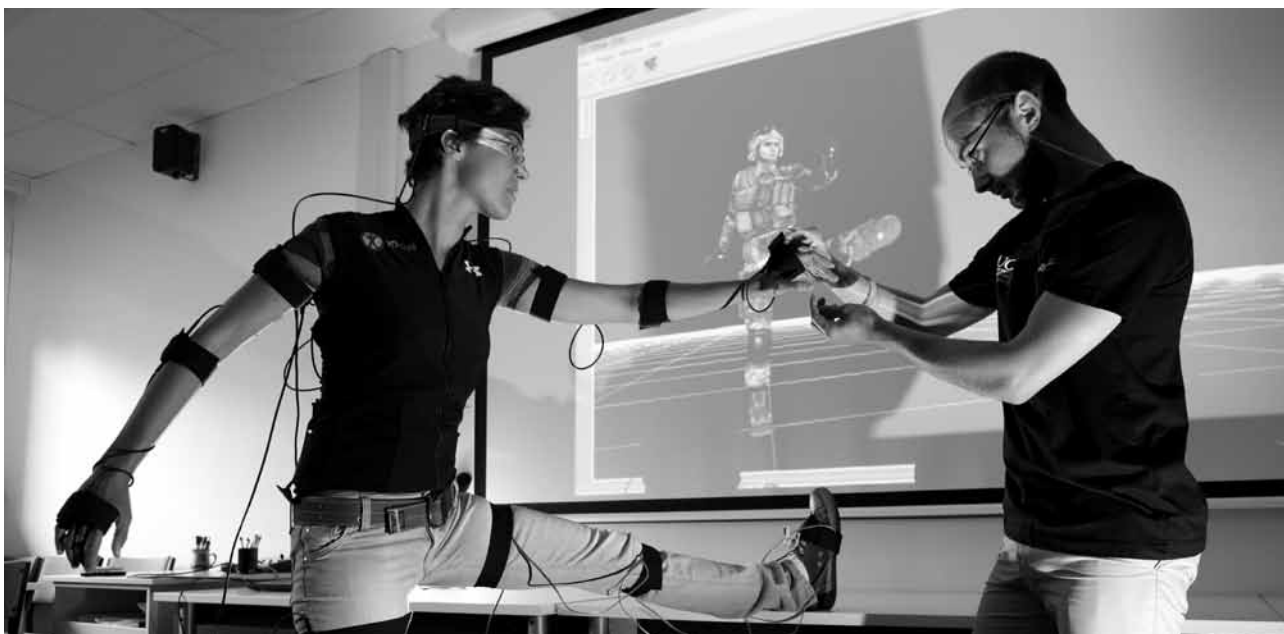
We purchased a GE Healthcare ultrasound machine at the end of 2011. This machine can be used to track the movements of the tongue. We are the only group in New Zealand currently using ultrasound for speech research

3D Suit

The 3D Suit is an invaluable tool for our movement and gait projects. It is a strap based system which is un-tethered allowing the subject full movement and freedom to roam, whilst coordinates relating to their movements are being captured onto a laptop.

Sound Booth

The Sound Booth is used to record speech in a sound proofed room. Currently this room is catered for with portable equipment, but we endeavour to have a more permanent set up this year.



Participants in our movement and language projects wear the 3D Suit which produces accurate measurements.

EEG system

The BioSemi system collects a continuous EEG recording of brain activity in response to visual or auditory stimuli, hence the nomenclature Event Related Potentials, as we are looking for specific neurological responses following a stimulus.

The ERP system is the BioSemi ERP Active Two Mark II System, 32 channels, DC amplifier, 24-bit resolution, Biopotential Measurement System with Active Electrodes, Analog Input Box, USB2 Receiver (16-Bit In + 15-Bit Out Triggers), Electrodes, LabView Software, and 3 laptops. The stimulus presentation is by E-Prime, and data analysis by BrainAnalyzer-2.

Perception Lab

The Perception Lab is equipped with dual boot computers. This lab is used for running our perception experiments. All of the machines have experimental design software installed.

Computer Lab

NZILBB has a 10 pc lab which our Research Assistants, interns and summer scholarship students use daily. These computers are equipped with experimental design software and speech analysis software.

Portable recording equipment

We have a wide variety of portable audio recording equipment and microphones and also a good stock of portable camcorders

Touch Screen laptops and iPads

NZILBB has two touchscreen laptops which are used with children and the elderly. We are hoping to purchase some iPads in 2012 to aid our portable data collection.

New Initiatives

NZILBB recently held a strategy meeting where it was decided to invest more in specific aspects of our research where there are excellent possibilities for future external funding and solid research which can lead to the development of products for Industry.

In 2012 the Lotteries Health Research Fund awarded NZILBB close to \$100,000 for the purchase of an electroencephalography (EEG) machine. To support this achievement NZILBB has committed funding for a Post-Doctoral Fellow to work on EEG projects. To complement this post we have committed to funding a postgraduate student on a full scholarship to work alongside the Post-Doctoral fellow. This is an excellent opportunity for a student who has good knowledge in this area and who would like to specialise in this field.

NZILBB has also set aside funding for another Post-Doctoral Fellow to specialise in the area of gait, movement and gesture. NZILBB has purchased a 3D suit which allows the subject to walk freely un-tethered and unconfined to a set space. With this freedom of movement comes a new path of research. One path we would like to focus on is gait and fall avoidance in the ageing community.

Other areas we have committed to funding is relationships with current and potential collaborators. We have established a Strategic Fellows initiative where nominated fellows can come and work with members of the NZILBB for up to 4 weeks and we will contribute to the cost of airfare and accommodation.

Appendices

Summer Scholarships

Summer scholarships are excellent opportunities for advanced undergraduates or beginning graduate students to work on a research project with a faculty member over the summer months. The influx of summer scholarship students makes the NZILBB corridor particularly busy and productive over the summer. Many of these are funded or part-funded by a University of Canterbury central fund, many were part-funded by NZILBB, and some have been part-funded by Tait communications.

2011-2012 Summer Projects

Project Title	Investigator	Summer Scholarship student
Perception of sound change in Māori	Margaret Maclagan & Jeanette King	Alia Hope-Wilson
Manual verification of spoken corpus segmentation boundaries	Viktoria Papp	Amber Keeley
Speech adaption in aphasia	Shira Katseff	Annalise Fletcher
The influence of social factors on speech alignment and divergence	Kauyumari Sanchez	Georgina Murphy
Christchurch earthquake stories - Māori interviewer	Jeanette King	Kerrie-Anna Anderson
Christchurch earthquake stories	Jen Hay	Kris Vavsour
Christchurch earthquake stories - Bilingual interviewer	Jen Hay	Yena Wei
Shortland Street: An examination of race bias via televised non verbal behaviour	Jeanette King	Kirsty Newman
Family members rehabilitation goals for their relatives with aphasia	Tami Howe	Lucy Schmacher

Project Title	Investigator	Summer Scholarship student
Linguistics change in Northern England: exploring a phonological merger with a new corpus of conversation	Kevin Watson	Mark Darbyshire
Improving radio intelligibility for public safety responders: The effect of clear speech strategies on speech intelligibility and response time in noise	Megan McAuliffe, Catherine Moran & Alan Murray (Tait Radio Communications)	Megan Chinnery
Improving radio intelligibility for public safety responders: Investigating speech characteristics, and compensatory changes, in high noise environments	Megan McAuliffe, Jen Hay & Alan Murray (Tait Radio Communications)	Zuzana Undesserova
Improving radio intelligibility for public safety responders: How do people use radios paired with various accessories in the field?	Catherine Moran, Lucy Johnston & Alan Murray (Tait Radio Communications)	Sarah Anderson
Improving radio intelligibility for public safety responders: Using auditory feedback to investigate new ways of enhancing speech intelligibility in noise	Megan McAuliffe, Jen Hay & Alan Murray (Tait Radio Communications)	Annika de Ruiter
Auditory specification of emotion	Megan McAuliffe & Lucy Johnston	Sarah Davies
Building an audio-visual corpus of New Zealand English	Jen Hay & Margaret Maclagan	Elizabeth Youard
Language and mild cognitive impairment	Megan McAuliffe, Margaret Maclagan & John Dalrymple-Alford	Matthew Bishop
Non-verbal cues used by Māori and Pakeha	Jeanette King, Jen Hay & Lucy Johnston	Kate Naitoro
Mapping environmental factors that influence the community participation of adults with aphasia onto the International Classification of Functioning, Disability and Health	Tami Howe	Eleanor Barclay
Rhythmic movement and rhythmic speech	Lucy Johnston, Jeanette King, Jen Hay & Margaret Maclagan	David Rockwell

NZILBB Seminars 2011

- Kota Hattori (NZILBB, UC) Independence of speech production and perception: Training Japanese speakers to produce English /r/-/l/. 24 May 2011
- Shira Katseff (NZILBB, UC) Talkers compensate for subphonemic feedback alterations. 31 May 2011.
- Anita Szakay (University of British Columbia) Exploring the perceptual and conceptual relationship between L1 ethnolectal variants and L2. 7 June 2011.
- Patti Davis and William Gavin Brain development from childhood to adulthood: Understanding individual differences using EEG and ERP measures. 28 June 2011.
- Cathi Best (University of Western Sydney) Devil or Angel in the details? Complementary principles of phonetic variation may provide the key to phonological structure. 19 July 2011.
- Viktoria Papp (NZILBB, UC) Where is gender? Studies on the source and filter in the speech production of female-to-male transsexuals. 2 August 2011.
- Karolina Alichniewicz (NZILBB, UC and Van der Veer Institute) Eternal sunshine of the spotless mind and introduction to brain imaging. 8 September 2011.
- Jakob Jon Mohamadi (University of Otago) Electroencephalography (EEG). 16 August 2011.
- Tracy Meltzer (University of Otago and Van der Veer Institute) 23 August 2011.
- Lisa Shorey (UC) 30 August 2011.
- Christoph Bartneck (Hitlab, UC) Robert interaction language (ROLA). 4 October 2011.
- Viktoria Papp (NZILBB, UC) Discussion of PVI issues. 18 October 2011.
- Kevin Watson (UC) (th)-fronting and regional dialect levelling in Northern England: new data from an old friend. 25 October 2011.
- Sasha Calhoun (Victoria University of Wellington) Intonation entrenches too: evidence for lexicalised storage of prosody. 29 November 2011.

NZILBB Publications

Book 2011

- Stedman, A., Sutherland, D. and Bartneck, C (2011) *Learning RIOLA*. Charleston: CreateSpace. 222pp.

Edited Book 2011

- Hornby, G. and Everatt, J. (Ed.) (2011) Support for Learning 26(3). *Special Issue: Special Educational Needs and Inclusion: Perspectives from New Zealand*. Chichester: Wiley. 53pp.
- Kuiper, K. (2011) *Yearbook of Phraseology 2010*. Berlin: De Gruyter Mouton. 194pp.
- Kuiper, K. (2011) *Teaching Linguistics: Reflections on Practice*. London: Equinox. 256pp.

Chapter in Book 2011

- Car stairs-McCarthy, A. (2011) Learning Phonology as a way to learn how theories are improved. In K. Kuiper (Ed.), *Teaching Linguistics: Reflections on Practice*. (13-26). London: Equinox.
- Clopper, C., Hay, J. and Plichta, B. (2011) Experimental speech perception and perceptual dialectology. In M. Di Paolo and M. Yaeger-Dror (Ed.), *Sociophonetics: A Students' Guide*. (149-162). New York: Routledge.
- Foster-Cohen, S. (2011) Developmental psycholinguistics. In K. Kuiper (Ed.), *Teaching Linguistics: Reflections on Practice*. (137-144). London: Equinox.
- Hay, J. (2011) A toolbox for teaching phonetics. In K. Kuiper (Ed.), *Teaching Linguistics: Reflections on Practice*. (4-12). London: Equinox.
- Hay, J. (2011) Statistical analysis. In M. Di Paolo and M. Yaeger-Dror (Ed.), *Sociophonetics: A students' Guide*. (198-214). New York: Routledge.
- Klee, T. and Stokes, S.F. (2011) Language development. In D. Skuse, H. Bruce, L. Dowdney, D. Mrazek (Ed.), *Child Psychology and Psychiatry: Frameworks for Practice*. (2nd ed.) (45-50). Chichester: Wiley-Blackwell.
- Kuiper, K. (2011) Introduction. In K. Kuiper (Ed.), *Teaching Linguistics: Reflections on Practice*. (1-3). London: Equinox.
- Kuiper, K. (2011) Teaching LING101. In K. Kuiper (Ed.), *Teaching Linguistics: Reflections on Practice*. (182-188). London: Equinox.
- Maclagan, M. and Hay, J. (2011) Transcription. In M. Di Paolo and M. Yaeger-Dror (Ed.), *Sociophonetics: A Student's Guide*. (36-45). New York: Routledge.
- Proudfoot, D. and Copeland, B.J. (2011) Artificial Intelligence. In E. Margolis, R. Samuels, S.P. Stich (Ed.), *Oxford Handbook of Philosophy of Cognitive Science*. (147-182). New York: Oxford University Press.

Journal Articles 2011

- Baldo, J.V., Katseff, S. and Dronkers, N.F. (2011) Brain regions underlying repetition and auditory-verbal short-term memory deficits in aphasia: Evidence from vowel-based lesion system mapping. *Aphasiology*.
- Borrie, S.A., McAuliffe, M.J., Liss, J.M., Kirk, C., O'Beirne, G.A., & Anderson, T. (accepted, 9th June 2011). Familiarization conditions and the mechanisms that underlie improved recognition of dysarthric speech. *Language & Cognitive Processes*.
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- Caroll, J. and Gillon, G. (2010) *Phonological awareness: Do educators need professional development?* Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics – Global Literacy: The role of

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- Carson, K., Gillon, G. and Boustead, T. (2010) Computer-based phonological awareness assessment at school-entry: a pilot study. Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics – Global Literacy: The role of phonological awareness in striving for early reading success for all children, 22-26 Aug 2010.
 - Drager, K. and Hay, J. (2010) A Novice's Guide to Understanding Mixed Effects Models. San Antonio: NWAV 39, November 4-6 2010.
 - Doell, E. and Moyle J., (2010) **Dynamic Assessment**. New Zealand Speech Language Therapists Association Biennial Conference, Wellington, New Zealand. April 2010.
 - Gillon, G., Wolter, J., Ehren, B., Proly, J., Nelson, N., Apel, K., Scott, C., Malani, M. and Murza, K. (2010) Perspectives on Disciplinary Literacy: A Discussion Forum. Philadelphia, PA, USA: ASHA Convention 2010: Leadership into New Frontiers, 18-20 Nov, 2010.
 - Gillon, G. (2010) The Globally Literacy Challenge. Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics – Global Literacy: The role of phonological awareness in striving for early reading success for all children, 22-26 Aug 2010.
 - Good, V.P., Gillon, G. and Socklingham, R. (2010) Enhancing phonological awareness within the classroom context. Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics – Global Literacy: The role of phonological awareness in striving for early reading success for all children, 22-26 Aug 2010.
 - Gregory, G.A. and King, J. (2010) Different cultures, different metaphors: intra-group differences in the experiences of Māori. University of New Mexico, Albuquerque, NM, USA: High Desert Linguistics Society (HDLS) 9th biennial conference, 4-6 Nov 2010.
 - Harlow, R., Maclagan, M., Watson, C., Keegan, P. and King, J. (2010) Stylistic variation and sound change in Māori. Auckland, New Zealand: 8th International Conference on Oceanic Linguistics, 4-9 Jan 2010.
 - Heidtke UJ, Rickard NA, O'Beirne GA, 2010. Diagnosis of Auditory Processing Disorder in children using an adaptive filtered speech test. New Zealand Audiological Society Conference, Blenheim, New Zealand, 3 July 2010.
 - Johnston, L., Porter, R.J., MacKenzie, A. and Miles, B. (2010) Is that a woman? Impact of testosterone levels on person construal. Fremantle, Australia: Society of Australasian Social Psychology Annual Conference April 2010.
 - Kaefer, S., King, J., Watson, C., Maclagan, M., Harlow, R. and Keegan, P. (2010) Evidence for the development of a centralised vowel in Māori and its effect on rhythm. 12th New Zealand Language & Society Conference: 12th New Zealand Language & Society Conference, 22-23 Nov 2010.
 - Keegan, P.J., Maclagan, M., Watson, C., King, J. and Harlow, R. (2010) Two languages in contact: further insights on the influence of English on Māori over time. University of Southampton, Southampton, UK: Sociolinguistics Symposium 18 (SS18), 1-4 Sep 2010.
 - King, J., Hay, J. and Johnston, L. (2010) Analysing gestural cues in young Māori bilinguals. AUT University, Auckland, New Zealand: 12th New Zealand Language & Society Conference, 22-23 Nov 2010.
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 - Klee, T. (2010) Evidence-based assessment of child language disorders. Wellington, New Zealand: New Zealand Speech Therapy Association Conference 2010, 22-23 Apr 2010.
 - Klee, T. (2010) Preschool language impairment: challenges in identifying children early and accurately. Wellington, New Zealand: New Zealand Speech Therapy Association Conference 2010, 22-23 Apr 2010.
 - Kuiper, K. (2010) The reports of medical specialists as a formulaic genre. Granada, Spain: Europhras, June 30-July 2 2010.
 - MacFarlane, A.E. and Stuart-Smith, J. (2010) One of them sounds Glasgow Uni'ish – Social judgements and fine phonetic variation in Glasgow. Experimental approaches to perception and production of language variation: University of Groningen: The Netherlands, 11-12 November 2010.
 - Maclagan, M., Watson, C., King, J., Bier, S., Harlow, R. and Keegan, P. (2010) Identification of Māori and English from Minimal Pitch/Rhythm Cues. San Antonio, TX, USA: NWAV 39, 4-6 Nov 2010.
 - Mathis, H., Sutherland, D. and McAuliffe, M. (2010) The effect of pause time upon the communication interactions of young people who use AAC. Barcelona, Spain: ISAAC, 24-29 July 2010.
 - McAuliffe, M.J. (2010) Motor speech disorders: Time to refuel. Wellington, New Zealand: New Zealand Speech-Language Therapists' Association Biennial Conference, 22-23 April, 2010.
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 - McAuliffe, M.J., Hughes, L., Schafer, M. and O'Beirne, G. (2010) The effects of listener age and background noise upon speech intelligibility in dysarthria. Oslo, Norway: 13th International Clinical Linguistics and Phonetics Conference, June 23-26, 2010.
 - McNeill, B.C., Gillon, G. and Dodd, B. (2010) Phonological Awareness Intervention Maintenance for Children with Childhood Apraxia of Speech. Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics, 22-26 Aug 2010.
 - Sadeghi, A., Everatt, J., Tehrani, L.G., Al-Menaye, N., Elbeheri, G., Mahfoudhi, A. and McNeill, B. (2010) Text reading across languages: the influence of underlying cognitive-linguistic abilities. University of Canterbury, Christchurch, New Zealand: 3rd Educational Psychology Forum, 1-2 Nov 2010.
 - Schäfer, M., McAuliffe, M., Liss, J., O'Beirne, G., & Cai, S. Responses of older individuals to manipulations in auditory feedback: Preliminary findings. Paper presented at the 8th Asia Pacific Conference on Speech, Language and Hearing, Christchurch, New Zealand. Jan 13th, 2010.
 - Stokes, S. F., Kern, S., and dos Santos, C. (2010). Extended statistical learning as an account for slow vocabulary growth. Paper presented at the Symposium for Research in Child Language Disorders, Madison Wisconsin, June 2010.
 - Thompson, L., Watson, C., Charters, H., Maclagan, M., Harlow, R., Keegan, P. and King, J. (2010) Investigating Agreement on Location of Rhythmic Prominences in Māori. AUT University, Auckland, New Zealand: 12th New Zealand Language & Society Conference, 22-23 Nov 2010.

- van Bysterveldt, A.K., Gillon, G. and Foster-Cohen, S. (2010) A home literacy strategy to support young children with Down Syndrome. Athens, Greece: 28th World Congress of the International Association of Logopedics and Phoniatrics, 22-26 Aug 2010.
- Walker, A. And Hay, J. (2010) Congruence between 'word age' and 'voice age' facilitates lexical access. University of New Mexico, Albuquerque, USA: 12th Conference on Laboratory Phonology, 8-10 July 2010.
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Conference Proceedings 2010

- Everatt, J., Elbeheri, G., Ocampo, D., Veii, K. and Al-Menaye, N. (2010) Dyslexia in different languages. School of Oriental and African Studies, University of London, London, UK: Language Learning and Dyslexia Symposium, 15 Feb 2008. In *Language Learning and Dyslexia Symposium Proceedings*, 17-29.
- Mbun, O., Shahid, S., Sande, E. v. d., Krahmer, E., Swerts, M., Bartneck, C., et al (2010) Using child-robot interaction to investigate the user acceptance of constrained and artificial languages. *Proceedings of the 19th IEEE International Symposium of Robot and Human Interactive Communication*. Viareggio, Italy. pp. 558-593.
- Thompson, L., Watson, C., Charters, H., Harlow, R., Keegan, P., King, J. and MacLagan, M. (2010) An experiment in mīta-reading: investigating perception of rhythmic prominence in the Māori language. Melbourne, Australia: 13th Australasian International Conference on Speech Science and Technology (SST 2010), 14-16 Dec 2010. In *Proceedings of the 13th Australasian International Conference on Speech Science and Technology*, 150-154.

Conference Posters 2010

- Borrie, S.A., McAuliffe, M.J., Liss, J.M., Kirk, C., O'Beirne, G.A. and Anderson, T. (2010) comparison of familiarisation modes on perceptual learning and speech intelligibility of hypokinetic dysarthria. Savannah, Georgia, USA: 15th Biennial Conference on Motor Speech Disorders: Motor Speech Disorders and Speech Motor Control, 4-7 March, 2010.
- Brittain, R. and Klee, T. (2010) Changes in

communicative behaviours of parents and children with language delay over the course of a Parent Child Interaction intervention. Madison, WI, USA: Symposium on Research in Child Language Disorders 2010, 3-5 June 2010.

- Clendon, S., Westerveld, M. and Gillon, G. (2010) Comparing spoken and written vocabulary use in typically developing New Zealand children. Wellington, New Zealand: New Zealand Speech Therapy Association Conference 2010, 22-23 Apr 2010.
- Drager, K., and Hay, J. (2010) Visual subliminal primes affect vowel perception. University of New Mexico, Albuquerque, USA: 12th Conference on Laboratory Phonology, 8-10 July 2010.
- Everatt, J., Tehrani, L.G., Al-Menaye, N., McNeill, B., Elbeheri, G. and Sadeghi, A. (2010) Predictors of reading comprehension across languages. Auckland, New Zealand: 23rd World Congress on Reading, 12-15 Jul 2010.
- Klee, T. and Gavin, W.J. (2010) Reference data for the LARSP profile chart for 2 and 3 year old children. Madison, WI, USA: Symposium on Research in Child Language Disorders, 3-5 June 2010.
- Kirk, C., Gillon, G. and Hide, M. (2010) The effect of two different types of intervention on the production of consonant clusters in onsets and codas. Madison, WI, USA: Symposium on Research in Child Language Disorders 2010, 3-5 Jun 2010.
- Moore, B. and Moran, C. (2010) Effect of vocabulary intervention on expressive language in young children. Madison, WI, USA: Symposium on Research in Child Language Disorders, 3-5 June, 2010.
- Wong, A., Everatt, J. and McNeill, B. (2010) Second language writing process: How do ESL students write? University of Melbourne, Melbourne, Australia: Australian Association for Research in Education (AARE) Conference 2010, 28 Nov-2 Dec 2010. .
- Wong, T.P., Moran, C. and Foster-Cohen, S. (2010) Conversational exchange and topic development of a caregiver-child following a family-focused intervention programme. Madison, WI, USA: Symposium on Research in Child Language Disorders 2010, 3-5 June 2010.

Other 2010

- Klee, T. and Gavin, W.J. (2010) LARSP reference data for 2- and 3-year-old children. (Working Paper)
- Davis, N., Fletcher, J., Brooker, B., Everatt, J., Gillon, G., Mackey, J. and Morrow, D. (2010) E-learning for adult literacy, language and numeracy: A review of the literature. Ministry of Education. 94pp.
- Elbeheri, G., Everatt, J. and Al-Sharhan, A. (2010) Dyslexia in Arabic: Identification & Intervention. Kuwait University: Invited symposium for the College for Women, Kuwait University, May 2010.
- Everatt, J. (2010) Profiles of children with learning disabilities. Kuwait: Invited public lecture at the Centre for Child Evaluation and Teaching, Apr 2010.
- Everatt, J. (2010) What is dyslexia? – Dyslexia theories – Dyslexia assessment. Christchurch, New Zealand: Invited all-day workshop given to Resource Teachers (Literacy) staff, May 2010.
- Gillon, G. (2010) Phonological Awareness: Motivating literary success. Adelaide, Australia: Speech Pathology Australia – SA Continuing Professional Development Workshop, 30 Mar 2010.
- Gillon, G. (2010) Phonological Awareness: Motivating literary success. Adelaide, Australia: Department of Education & Children's Services Workshop, 31 Mar 2010.
- Gillon, G. (2010) Phonological Awareness: Motivating literary success. Perth, Australia: WA Speech Pathology Workshop, 8-9 Apr 2010.
- McKean, C., Stringer, H. and Klee, T. (2010) A missed opportunity. *Bulletin of the Royal College of Speech & Language Therapists*, 695, 5.
- van Bysterveldt, A., Gillon, G. and Foster-Cohen, S. (2010) Integrated speech and phonological awareness intervention for young children with Down syndrome. London, UK: Child Language Seminar, 23-25 Jun 2010.

NZILBB Internal Grants

NZILBB has two grant rounds per year where we call for applications to fund research projects or conference/collaboration travel. Funding is offered at \$5000 per Research Grant and up to \$4000 per travel grant.

2011 Research Grants

Project Title	Principle Investigator	Associate Investigator(s)
Sub-lexical speech episodes and generalization to new words (aka “say it out loud: Words and voices”)	Kauyumari Sanchez	Jen Hay & Lucy Johnston
A cross-sectional investigation of the effects of ageing and mild cognitive impairment on speech production	Megan McAuliffe	Margaret MacLagan, John Dalrymple-Alford & Jen Hay
Compensation for feedback perturbation in speakers of New Zealand English	Shira Katseff	Jen Hay
Spoken persuasive discourse in children and adolescents	Catherine Moran	Marleen Westerveld & Ondene van Dulm
Does expansion of the vowel space facilitate recognition of dysarthric speech?	Shira Katseff	Megan McAuliffe & Stephanie Borrie
The development of a self-report measure of environmental factors that influence the community participation of adults with aphasia	Tami Howe	
Examination of non-native directed speech: An examination of teach speech in the classroom	Kota Hattori	Jeanette King
Teaching ROILA	Christoph Bartneck	Dean Sutherland
Feedback alteration for substantial and lasting vowel change	Shira Katseff	Thomas Klee, Megan McAuliffe, Kota Hattori & John Houde

2011 Travel Grants

Event	Traveller	Location
Meeting of the Auditory Cognitive Neuroscience Society	Megan McAuliffe	Tuscan, USA
Acoustical Society of America Conference	Shira Katseff	San Diego, USA
Biennial Symposium of the World Professional Association for Transgender Health and the Southern Comfort Conference	Viktoria Papp	Atlanta, USA
ResComm	Shira Katseff	UWS, Sydney, Australia
ResComm	Kota Hattori	UWS, Sydney, Australia
ResComm	Kauyumari Sanchez	UWS, Sydney, Australia
ResComm	Viktoria Papp	UWS, Sydney, Australia
Australasian Experimental Psychology Conference	Karolina Alichniewicz	Auckland, New Zealand
Australasian Experimental Psychology Conference	Kauyumari Sanchez	Auckland, New Zealand
International Symposium on Bilingualism	Jeanette King	Oslo, Norway
Collaboration visit to UCSD	Stephanie Stokes	San Diego, USA
Speech Motor Control Conference	Shira Katseff	Groningen, The Netherlands

2010 Research Grants

Project Title	Principle Investigator	Associate Investigator(s)
Phoneme Acquisition in Māori/English bilingual children	Jeanette King	Thomas Klee, Stephanie Stokes, Mike Robb & Margaret Maclagan
Moving and Speaking	Lucy Johnston, Jen Hay & Jeanette King	Margaret Maclagan
Talking while you walk: A preliminary study	Margaret Maclagan	Boyd Davis & Tasos Karakostas
Sensorimotor adaptation to feedback perturbations in dysarthria	Megan McAuliffe	Julie Liss, Greg O'Beirne & Martina Schaefer
Variation in NZE: A science citizen project	Jen Hay	Margaret Maclagan, Paul Warren & Catherine Watson
Statistical Learning in emerging lexicons	Stephanie Stokes	Jen Hay
Development of a virtual localisation training tool for children with binaural processing deficits	Natalie Rickard	Andreas Duenser & Andy Cockburn

Event	Traveller	Location
ICLASP 2010	Ewald Neumann	Brisbane, Australia
ICLASP 2010	Lucy Johnston	Brisbane, Australia
ICLASP 2010	Megan McAuliffe	Brisbane, Australia
Collaboration meetings with Child Language Labs	Stephanie Stokes	France, Denmark & The Netherlands





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