



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

# 2012 Annual Report

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“It has been particularly heartening, this year, to see a number of interdisciplinary projects launched or funded that would never have existed pre-NZILBB.”

# Director's Report

I am delighted to report that 2012 was a bumper year for NZILBB. I am constantly amazed and impressed by the variety and calibre of projects that are going on in the Institute, and by the inspiring people that occupy our corridors and who visit us on a regular basis.

It has been particularly heartening, this year, to see a number of interdisciplinary projects launched or funded that would never have existed pre-NZILBB. One example is the Ministry of Business, Innovation and Employment grant that began at the end of 2012. This innovative project examines the potential of aero-tactile enhancement of speech perception. It involves researchers from both Linguistics and Communication Disorders, as well as our own NZILBB Post Doc (Donald Derrick), and the NZILBB Technician. Also beginning in 2012 was the John Templeton Foundation grant which launched the 'Wordovators' Project. This project is a collaboration between NZILBB, and our partner organization Northwestern University (the home institution of NZILBB Adjunct Fellow Janet Pierrehumbert). The UC researchers involved span three different departments: Communication Disorders, Linguistics, and the Human Interfaces Technologies Lab.

These projects, and others like them, are examples of how NZILBB is truly succeeding in fostering links between disciplines. Neither of these grants would have existed without the formation of NZILBB. We can very proudly point to such successes as clear evidence that our researchers are not simply proceeding with 'business as usual'. The formation of NZILBB has encouraged them to engage deeply with one another on issues of mutual importance.

This 2012 Annual Report introduces the people that have comprised NZILBB during 2012, and highlights some of the work they have been doing. I hope these pages convey a sense of the depth and breadth of research currently being undertaken. The NZILBB crew is an amazing team, and I feel very privileged to be a part of it.

***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

The Research Faculty are academic members of staff internal to the University of Canterbury, currently spanning four Colleges. NZILBB encourages inter-disciplinary interaction and collaboration between these members of different Departments within UC and also with our international and domestic partners.

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## **Research Faculty from the Department of Communication Disorders**

- Tami Howe
- Margaret Maclagan
- Greg O'Beirne
- Mike Robb
- Don Sinex
- Stephanie Stokes
- Ondene Van Dulm

## **Research Faculty from the Department of Linguistics**

- Lynn Clark
- Susan Foster-Cohen
- Beth Hume
- Heidi Quinn
- Kevin Watson

## **Research Faculty from the Deputy Vice Chancellor's Office**

- Lucy Johnston

## **Research Faculty from the Human Interface Technology Lab**

- Christoph Bartneck
- Mark Billinghurst

## **Research Faculty from the Health Sciences Centre**

- Dean Sutherland
- Anne van Bysterveldt

## **Research Faculty from the Department of Psychology**

- John Dalrymple-Alford
- Ewald Neumann

## **Research Faculty from the School of Literacies and Arts in Education**

- John Everatt
- Brigid McNeill

## **Research Faculty from the School of Humanities**

- Jack Copeland
- Dianne Proudfoot

## **Research Faculty from the Department of Computer Science and Software Engineering**

- Andy Cockburn

## **Research Faculty from the College of Education**

- Gail Gillon





# Management Team

## **Professor Jen Hay (Director)**

- Department of Linguistics
- Leader of the Language Variation and Change theme

## **Professor Thomas Klee (Deputy Director)**

- Communication Disorders
- Leader of the Language Acquisition Theme

## **Associate Professor Megan McAuliffe**

- Communication Disorders
- Leader of the Language and Ageing Theme

## **Associate Professor Jeanette King**

- Aotahi – School of Māori and Indigenous Studies
- Leader of the Bilingual Theme

## **Associate Professor Catherine Moran**

- Communication Disorders
- Industry Liaison Officer

# General Staff

**Emma Parnell – NZILBB Manager**

**Robert Fromont – NZILBB Software Developer**

**Scott Lloyd – NZILBB Research Technician**

**Pat LaShell – Statistical Consultant**

# Post-Doctoral Fellows

## Dr Donald Derrick

Mentors: Jen Hay – NZILBB and Cathi Best – MARCS, UWS

Dates of employment: October 2011 – October 2014

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 a joint project. He investigates how subtle things like gravity, muscle elasticity, speech rate and tactile stimuli influence speech production and perception.

Donald has been very successful in obtaining two external grants, one with The Ministry of Business, Innovation and Employment and another with The Royal Society of New Zealand Marsden fund which begins in 2013.

### **Saving energy vs. making yourself understood during speech production**

- Royal Society of New Zealand Marsden Funded grant
- March 2013 – February 2016

Speakers sometimes move their tongues in completely different directions for different repetitions of exactly the same phrase. The cause of this variability is examined by comparing speech energy efficiency vs. producing clear speech. The first experiment records audio and tongue motion of New Zealand English (NZE) speakers induced to speak at progressively faster speeds, and the second uses the audio recordings to test whether easier to produce sequences are harder to understand. This is the first articulatory phonetics study of NZE, and will radically change speech research by expanding on speech ecology, leading to better speech recognition systems.





## Dr Kauyumari Sanchez

Dates of employment: January 2011 - July 2013

Mari's work concerns the idea of phonetic convergence, which is the tendency people have to subtly shift their speech toward their conversational partner. This shifting of behaviours can be found in the matching of bodily gestures (e.g. body posture, foot tapping) to the words we use and even how we say them. It is the shift in how we pronounce our words that Mari has primarily investigated.

Mari's work has shown that speakers shift their speech toward that of a speaker that they have seen speaking, even when they were not able to hear them. In 2012, Mari ran a series of experiments designed to establish whether such visual speech convergence effects are due to perceiving talker-specific speech articulations or due to activating a pre-conception of how the talker might sound, due to how she looks

(without necessarily activating a socially-relevant category). The Convergence to a Face (via lip-reading) project was aided by a UC Summer Scholarship award under the name 'Can seeing a face change how you speak?' With this award a UC student, Nicole Mehrrens, was provided with the opportunity to get a first hand experience in research. She became familiar with the literature concerning the topic, was able to run participants in the experiment, and measure acoustical properties of sound files. This unique experience not only provided her with a better understanding about the research process, but also gave her an insight to her own future career plans in pursuing a higher degree. This project was of interest to the media, and several news articles were published.



## Dr Viktoria Papp

Dates of employment: July 2011 – August 2013

Vica's work focuses on voice characteristics of female-to-male transgender individuals, and on Forensic Phonetics.

With Bethany Townsend (Rice University), Vica worked on a quantitative and qualitative description of pitch characteristics of female-to-male transgender individuals in varying social environments. The results were presented at New Ways of Analysing Variation (NWAV 41, 'Inhabiting acoustic spaces: Fundamental frequency and the gender/sexuality divide in male-identified transgender individuals') and at the Annual Meeting of the American Anthropological Association (AAA 2012, 'Disclosure and (In)Visibility: Acoustic navigation of the gender/sexuality border In Houston transmen').

With Richard Adler (Minnesota State University), Shelagh Davis (Vancouver, BC), Jennifer Oates (La Trobe), Georgia Dacakis (La Trobe) and Christella Antoni (London, UK), Vica also worked on establishing the Standing Committee on Speech and Voice under the aegis of the World Professional Association of Transgender Health (WPATH). The committee was approved in early 2013. Besides co-authoring the Missions and Goals documentation for the committee, she co-authored with Shelagh Davis and Cristella Antoni the Speech and Voice Companion Document for the WPATH Standards of Care, as well as the Speech and Voice Companion Document of the Vancouver, BC Standards of Care.

Vica is also involved in collaborative work with NZILBB partner Catherine Watson (University of Auckland) on modelling the vocal tract with acoustic reflectometry. In 2012 they tested the effects of posture on the reliability of reflectometry results, and presented the results at the International Association for Phonetics and Acoustics 2012 with the title 'Modeling Vocal Tract Dimensions In Speaker Profiling.'

## Dr James Gruber

Dates of employment: August 2012 – August 2014

James worked on three interlinked projects during 2012.

### Parallel Speech and Gesture in Bilinguals

When people talk, they move. They move their eyes, head, hands, arms, body, and they often do so in a manner that transparently represents the content of their speech (pointing, illustrating shapes or trajectories, imitating characters in the narrative). But speakers also rhythmically tap, beat, and nod in a way that carries no clear semantic content, but is intimately tied to intonation and emphasis in their speech. James is researching the linguistic and social factors that influence these different types of speech-accompanying gesture used by bilingual Māori and English speakers. Bilinguals offer a unique opportunity to investigate cross-linguistic variation while controlling for culturally-grounded and individual speaker differences.

### Does Gesturing Help You or Your Listener?

It is an unsettled question whether gestures function to assist the speaker formulate speech content or to help the listener interpret that content. Prior studies considering this question have either examined the gestures of speakers addressing controlled listeners or the ability of listeners to recall controlled speaker stimuli. This project offers a new perspective on this debate by testing the collective ability of unscripted subject dyads to exchange information with and without gesture. Pilot studies are underway to devise the series of tasks that measure the communicative effectiveness of each dyad across different conditions limiting their ability to gesture and/or see each other.



### Laryngeally-complex Tone

This project looks at the production and perception of lexical tone in the Burmese language. The complex nature of Burmese tone necessitates noteworthy or innovative acoustic measures to differentiate the complex set of distinctions found between the tones in pitch, voice quality, vowel quality, duration, and intensity. The complex has confounded prior acoustic study and been best described by non-acoustic instrumental articulatory investigation - namely EGG and pneumotachography.

## Dr Kota Hattori

Dates of employment: October 2010 - April 2013

In our daily lives, we listen to many talkers with a wide range of variability in speech signals (e.g., gender, age, regional accents, and impaired speech). It is sometimes difficult to understand speech because of this variability. However, listeners are able to adjust their phonetic knowledge and accommodate ambiguous or difficult speech productions. This phenomenon is called perceptual learning. Kota's current research program examines some of the unknown mechanisms behind perceptual learning.

### Perceptual learning and visual information

Listeners accommodate ambiguous speech productions by activating lexical items. They also do so by employing articulatory visual information. For example, when listeners watch videos of someone saying /aba/ paired with ambiguous stops between /b/ and /d/, they subsequently identify the ambiguous stops as /b/ more, suggesting that articulatory visual information is integrated into perceptual learning. However, it is little known whether visual information related to talker identity is integrated into the learning. Imagine you first hear ambiguous stops as /t/ in words like frontier, lunatic, and overtime with Nathan's voice and picture. You then identify /b/ and /d/ with Nathan's voice and Joel's picture. That is, the voice is not matched with the right visual information. Do listeners demonstrate perceptual learning despite the audiovisual mismatch? The answer was yes in Kota's experiment. Although articulatory visual information is integrated into perceptual learning, visual information related to talker identity seems not to be involved in the mechanisms of perceptual learning.

### Perceptual learning in multiple-talker conditions

A large body of research has demonstrated that perceptual learning occurs in single-talker conditions, but, listeners frequently face multiple talkers in conversations as well. They need to learn various speech characteristics of different talkers and adjust phonetic representations for various phonetic cues. Imagine you are surrounded by five friends. One of them produces ambiguous fricatives between /s/ and /ʃ/, and the other talkers produce normal



fricatives. Do listeners learn such a peculiar speech characteristic of the specific talker in the circumstance? In this experiment, English listeners first heard words produced by five talkers. One male talker produced ambiguous fricatives and the rest produced normal fricatives. The listeners subsequently categorized the /s/ and /ʃ/ produced by two of the five talkers. The results demonstrated that listeners still learn the speech characteristics of the specific talker and adjust phonetic representations although they face substantial talker variability of the five talkers. The listeners also generalized perceptual learning across talkers. This study suggests that perceptual learning occurs with talker-independent phonetic information, and that talker generalization entails some phonetic similarity among talkers.

# Adjunct Professor

## **Janet Pierrehumbert**

Professor Pierrehumbert is involved with NICO (Northwestern Institute on Complex Systems: Language, Music and Communication) and is Professor of Linguistics at Northwestern. Her research uses experimental and computational methods to study the sound structure of language. Current research, which is 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. Professor Pierrehumbert has recently been elected a Fellow of the Cognitive Science Society.

The John Templeton Foundation has awarded a USD \$2.7 million grant to Janet Pierrehumbert, Jen Hay (NZILBB), Stephanie Stokes (Communication Disorders) and Christoph Bartneck (HITLab NZ).

# Scholarship Students

## **Andrew MacFarlane**

*Voice and behaviour: automatic priming effects of voice on judgements and responses*

Andrew is funded by a full NZILBB PhD Scholarship for towards his PhD in Psychology. He is supervised by Jen Hay, Lucy Johnston and Ewald Neumann. Andrew's current research involves the interaction between an individual's speech (style, accent and tone) and observable behavioural differences in their listener. He integrates research from social psychology (automaticity, stereotyping, persuasion, and cognitive bias) to try to understand how speaker differences affect listener behaviour, and how these are mediated by social factors.

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**

*Discourse comprehension abilities in ageing; correlation of working memory with high-level reference resolution.*

Maryam is on a joint CMRF and NZILBB PhD Scholarship. She is on the third year of her PhD studies supervised by Associate Professor Megan McAuliffe, Associate Professor Catherine Moran, and Dr Ewald Neumann. Maryam's PhD research evaluates the high-level language processing abilities of older adults. Ageing is accompanied by decline in cognitive functions such as working memory and inhibitory abilities. Age-related cognitive decline may affect communication abilities. Maryam investigates whether an age-related decline in working memory processing and/or storage contributes to a concomitant comprehension decline.

# Associated Postgraduate Students

**Sharimila Adaikkalasamy** (PhD, Communication Disorders)  
*Cross cultural comparison of parent-child interactions and its association with children's language performance.*

**Daniel Buerkle** (PhD Linguistics)  
*The acquisition of sentence alternations*

**Llyween Cooper** (PhD Health Sciences)  
*Communication Choices for Non-verbal Children with Autism.*

**Romain Fiasson** (PhD Linguistics)  
*Allophonic imitation within and across word positions.*

**Penny Harris** (Master of Audiology, Communication Disorders)  
*Does speaker age affect speech perception in noise in older adults?*

**Kate Naitoro** (Master of Arts, Linguistics)  
*A sketch grammar of 'Are'are: the sound system and morpho-syntax.*

**Jayne Newbury** (PhD, Communication Disorders)  
*Early identification of specific language impairment: The role of working memory in language acquisition.*

**Jacqueline Nokes** (PhD, Linguistics)  
*The emergence of sociophonetic variation amongst preschoolers.*

**Pauliina Saarinen** (PhD, Linguistics) Title to be advised.

**Martina Schaefer** (PhD, Communication Disorders)  
*The interaction between speech perception and speech production: Implications for speakers with dysarthria.*

**Asifa Sultana** (PhD, Communication Disorders)  
*Morphological development of typically and atypically developing Bangla-speaking preschool children.*

**Keyi Sun** (PhD, Linguistics)  
*Language embodiment and language in body movement: testing temporal metaphor across different language speakers*



## Research Assistants NZILBB Interns

The NZILBB Research Assistants undertake a variety of tasks from designing and running experiments to data analysis. We support current University of Canterbury students by offering Research Assistant contracts to some students who are studying in the area of research the project is focused on. Research Assistants are an invaluable resource to the Institute.

In 2012 NZILBB accepted interns from Cornell University, The University of Osnabrueck and The University of York. Each intern was assigned to a Theme Leader and undertook research in associated projects. As in previous years NZILBB also worked with a student from the University of Bath, who was on a placement researching in the Language and Social Cognition theme for nine months. We will welcome another University of Bath student in 2013.

# Domestic and International Partners

The NZILBB Management Team has close connections with our partners. We share a joint Post-Doctoral Fellow with The MARCS Institute at the University of Western Sydney and NZILBB holds collectively \$3 million dollars worth of grants with The University of Western Sydney, Northwestern and Stanford.

- **The Champion Centre** (New Zealand)
- **New Zealand Brain Research Institute** (New Zealand)
- **Te Kura Whakapūmau i te Reo Tūturu ki Waitaha** (New Zealand)
- Linguistics and Applied Language Studies, **Victoria University of Wellington** (New Zealand)
- The Department of Electrical and Computer Engineering, **The University of Auckland** (New Zealand)
- MARCS Institute, **University of Western Sydney** (Australia)
- Callier Center for Communication Disorders, **UT Dallas** (USA)
- Carolina Conversation Collection, **Medical University of South Carolina** (USA)
- Neurolinguistic-Neurocognitive Research Center, **Florida State University** (USA)
- Motor Speech Disorders Laboratory, **Arizona State University** (USA)
- Northwestern Institute on Complex Systems: Language, Music and Communication, **Northwestern University** (USA)
- The Sociolinguistics Laboratory, **University of Hawai'i at Manoa** (USA)
- Spoken Syntax Laboratory, **Stanford University** (USA)
- Institute of Phonetics and Speech Processing, **Ludwig-Maximilians University of Munich** (Germany)
- Department of Languages and Linguistic Science, **University of York** (UK)
- Centre for Research in Linguistics and Language Sciences, **University of Newcastle upon Tyne** (UK)
- Interdisciplinary Speech Research Laboratory, **University of British Columbia** (Canada)

# 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 was in April 2012.

- **Board Chair – Professor Anne Cutler** (MARCS Institute, University of Western Sydney)
- **Professor Jonathan Harrington** (Director of the Institute of Phonetics, University of Munich)
- **Dr Steffie Shattuck Hufnagel** (Principal Research Scientist, Research Laboratory of Electronics, MIT)
- **Professor Bruce Murdoch** (Director of the Centre for Neurogenic Communication Disorders Research, The University of Queensland)

Jen Hay and Thomas Klee are the NZILBB representatives and the Deputy Vice Chancellor and Pro-Vice Chancellor, College of Arts represent the University of Canterbury.

The first meeting of the Board discussed external revenue, national and international visibility of NZILBB and the strengths of the Institute and where improvements could be made.

Our second Advisory Board meeting will be at the end of 2013.

# Te Kāhui Kaihautū - The Māori Reference Group

The role of this group is to support and guide Institute in its research relationship with the Māori community.

- Angus Macfarlane, Professor of Māori Research at the University of Canterbury
- Christine Brown, Resource teacher of Māori
- Hector Matthews, Executive Director of Māori and Pacific Health at the Christchurch District Health Board
- Alamein Connell, Teacher and Community Representative
- Charisma Rangipunga, Manager Toitu te Kura at Te Runanga o Ngai Tahu
- Terina Tahau, Principal at Te Kura Whakapūmau i e reo Tūturu ki Waitaha
- Jeanette King, Associate Professor at Aotahi-School of Māori and Indigenous Studies and Bilingual Theme Leader at NZILBB

The first meeting of Te Kāhui Kaihautū was held in June 2012. Terms of reference for Māori research were agreed upon as were protocols.



# 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

The Language Variation and Change Theme uses corpus analysis, experimental work and computational modelling in order to understand the causes and consequences of language variation, across speakers, contexts and lexical items.

A significant component involves the construction and analysis of corpora. This aspect builds on the success of the Origins of New Zealand English Project (ONZE). 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.

Our Corpus Analysis Tool – Labb-Cat – was recently upgraded (c.f. Fromont and Hay 2012), and continues to be used by increasing numbers of labs around the world. As part of our own corpus building, we have in 2012 transcribed, processed and uploaded data from preschoolers (in collaboration with the Language Acquisition Theme), older New Zealanders (in collaboration with the Language and Ageing Theme), and bilingual speakers of Maori (in collaboration with the Bilingualism Theme).

We have also collected a valuable archive of Earthquake Stories as part of the UC QuakeBox project, and transcription of these stories is ongoing. This collection will form a large, publically accessible, carefully annotated archive, which will be of value to linguists, but also of more widespread interest.

Ongoing work using these corpora aims to understand processes of Language Variation and Change, modelling how variants spread through the lexicon and across speakers. Particular topics under current or recent investigation include changes in the short front vowels, variation in medial /t/, rhythmic variation, and effects of lexical frequency and conversational topic.

A particular recent focus has looked at how skewed lexical distributions can affect speech production and speech perception patterns. Some words are used more by older speakers than younger speakers for example; and some are used more by men than women. Work from corpus analysis and speech perception experiments is showing that these skewed distributions affect speaking and listening, and can influence the course of language change.



**THEME**

# Language Acquisition

Theme Leader: Thomas Klee

The language acquisition group 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:**

## Prospective evaluation of the validity and nature of childhood apraxia of speech

This research project, lead by Brigid McNeill, aims to examine potential diagnostic symptoms of childhood apraxia of speech, a rare and severe form of developmental speech disorder. The study is following the speech, language and literacy development of 55 children with severe speech disorder over two years, 48 of whom exhibited inconsistent speech errors at the outset of the study. This is the largest cohort of children with inconsistent speech errors that has been examined in the literature. The results will give insight into impairment/s that underlie the use of inconsistent speech errors and the risk and protective factors that affect longer term literacy outcomes for children with speech disorder.

In 2012, the third and fourth (of five) assessment points were completed for the cohort. The results from the first year of the study were presented at the 2012 American Speech-Language-Hearing Association Convention.





**THEME**

# Language and Ageing

Theme Leader: Megan McAuliffe

The Language and Ageing theme examines the effect of age upon language processes and communication, both in normal ageing and disorders of ageing. We are interested in changes in communication with age and in speech and language difficulties associated with Parkinson's disease, Alzheimer's disease, and stroke.

**Featured Projects:**

### Factors influencing listeners' perception of dysarthric speech

Associate Professor Megan McAuliffe and colleagues at the NZILBB (Dr Patrick LaShell, Sarah Kerr and Elizabeth Gibson) and NZBRI (Professor Tim Anderson) have recently published work investigating how linguistic knowledge, memory and hearing interact to affect younger and older listeners comprehension of dysarthric speech. The study, funded by the Neurological Foundation of NZ and Health Research Council of NZ, found that vocabulary knowledge was the sole predictor of comprehension of dysarthric speech in younger adults, and that a similar effect existed for older adults—but was moderated by hearing acuity. It appeared that vocabulary knowledge may play a key role in perception in adverse listening conditions. Follow-up investigations related to this exciting finding are the subject of current funding application to the 2nd round of the Marsden project grants (McAuliffe & Sinex).

### Cross-cultural differences in communicative participation in Parkinson's disease

An international collaboration between the NZILBB and University of Washington, Seattle (Dr Carolyn Baylor and Professor Kathryn Yorkston) has led to the availability of the first short-form measure of communicative participation specifically validated on respondents from New Zealand. Communicative participation relates to the ability to be involved in life situations. For people with speech disorders associated with neurological disease, reduced speech intelligibility significantly hinders their life participation. The study, to appear in the *Journal of Speech, Language & Hearing Research*, showed no cultural bias in the use of the Communicative Participation Item Bank across over 400 respondents with Parkinson's disease from NZ and the US, paving the way for the use of this validated measurement tool here in NZ.



**THEME**

# Bilingualism

Theme Leader: Jeanette King

Most people in the work 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:**

### Story telling in the New Zealand context – investigating non-verbal behaviour in Māori and English narratives

This project investigates the speech-accompanying gesture and other non-verbal behaviour employed by monolingual and bilingual speakers of English and Māori. It seeks to identify socially meaningful variation in non-verbal behaviour by considering whether certain types of movement are attributable to the ethnicity of the speaker or the ethnicity of the listener, as well as to the language being spoken. Early evidence suggests that each of these factors play a role in the form, frequency, and timing of non-verbal behaviours and that the eyebrows were a particularly strong locus of variation between Pākehā, Māori, and Māori-language narratives.

In two separate interviews, six English monolinguals engaged with a Māori and a Pākehā interviewer. Six bilingual participants performed the same two interviews in addition to a third interview conducted in Te Reo Māori. James Gruber, an NZILBB post-doc, and Kylie Fitzgerald, an Honours student in Linguistics, coded portions of the interviews for an array of non-verbal behaviours: representational or depictive gestures, rhythmic beats of the hands and head, the frequency of certain handshapes, movement of the eyebrows, and orientation of the eyes, head, and torso.

In addition to careful frame-by-frame analysis of the video data, we also tested whether untrained observers could extract socially meaningful information from just the non-verbal cues. Another group of participants were shown clips of the coded interviews with the audio removed and the interviewer off-camera and were asked to identify whether the unseen interviewer was Māori or Pākehā. Observers from New Zealand were able to identify the interviewer's ethnicity at a rate better than chance while observers from the U.S.A. were not. Thus, behavioural differences were perceivable to an extent and cultural experience provided sensitivity to the social factors involved.



**THEME**

# Language and Social Cognition

Theme Leader: Lucy Johnston

Research conducted within the Language and Social Cognition theme investigates the relationship between spoken language and behaviour. On-going research projects are looking at the relationship between speech and impressions formed of the speakers, speech and gait, speech and gesture (including facial expression) and speech and emotion.

**Featured Project:**

## Does how you speak influence the likelihood of getting a job interview?

Organizational psychologists have long attempted to eliminate biases in occupational selection processes. One factor that has received very little attention is the impact of the voice on selection decisions. There is often the opportunity for an applicant's voice to have an impact on the impression formed of them – for example, through telephone (pre)interviews.

A lower pitch voice has been associated with leadership and dominance, characteristics that are frequently required in managerial positions. Accordingly, one would predict that individuals with lower pitch voices would be considered to be more suitable for leadership positions than those with higher pitch voices. Such biases may be especially detrimental to women who typically have higher pitched voices than males, and for whom higher pitched voices are considered more attractive (in contrast to males for whom lower pitch is considered more attractive).

In ongoing research we are considering whether the judgement of the suitability a female job applicant is influenced by the pitch of the voice. We are looking at whether the evaluation of identical CVs from job applicants differs as a function of a recording of the applicant's voice that has had her pitch digitally lowered or raised.

# NZILBB Featured Grants

## Aero-tactile enhancement of speech perception

- Ministry of Business, Innovation and Employment – Smart Ideas Grant
- \$481,000NZD 2012 – 2014

### Researchers

- Jen Hay (NZILBB)
- Donald Derrick (NZILBB)
- Greg O’Beirne (Communication Disorders)
- Scott Lloyd (NZILBB)

The ability to communicate successfully is vitally important. Often successful communication relies on devices such as hearing aids, emergency radios, smartphones and headphones. This project aims to optimize the efficacy of such devices by researching the potential of air-flow as a carrier of supplementary speech information. Recent scientific advances have revealed listeners don’t just listen with their ears, they also listen with their skin. The puffs of air from speech landing on our skin can help us understand what we are hearing.

This project will conduct the foundational research necessary to investigate the full potential of air-flow information for enhancing communication across different circumstances and in different listeners. The research will lay a firm foundation from which to concretely explore the integration of air-puff information into existing audio technologies.

A first prototype of an aero-tactile enhancement device currently exists, and initial tests of the effectiveness of this device are underway. The patent application process is also underway.





## Creativity and Co-Operation in the Dynamics of the Lexicon: from Lexis to Logos

- John Templeton Foundation, USA
- \$2.7million USD 2012 – 2015

### Researchers

- Janet Pierrehumbert (Northwestern University, Chicago)
- Jen Hay (NZILBB)
- Stephanie Stokes (Communication Disorders)
- Christoph Bartneck (HitLab NZ)

The Wordovators project aims to understand how children, teens and adults create new words. They want to understand why some new words are taken up by people while others fade. The Wordovators

project has the goal of discovering the fundamental mechanisms that support the complexity of the lexicon in human languages. It combines mathematical modeling with large-scale experiments in the form of computer word games. Hosted on the web, the games will recruit players from all over the world. Single-player games will explore cognitive factors in the creation and processing of novel words. Multiplayer games using a futuristic space-exploration scenario will investigate the interaction of cognitive and social factors in the development of shared vocabularies. At the end of 2012 a call went out for a Post-Doctoral Fellow to join the NZILBB Wordovators team and also for a PhD Scholarship to be housed in the HitLab NZ. In 2013 applications for a further Post-Doctoral Fellow to join the Wordovators team at Northwestern will be accepted.



# NZILBB Electroencephalography (EEG) Lab

One of the Institute's aims is to explore how language and speech are processed by the brain. A strand of research in this exciting new area concerns identifying neurophysiological correlates of children's language development. By investigating how children's brains process linguistic stimuli of various kinds, new insights into the process of language acquisition will be gained and new light will be shed on children who have difficulty developing language.

In mid-2011, Institute members Stephanie Stokes and Thomas Klee, in collaboration with William Gavin and Patti Davies, Directors of Colorado State University's Brainwaves Research Laboratory, conducted an initial pilot investigation of young children's auditory event related potentials (ERP) in the University's Child Language Lab. Drs Gavin and Davies brought their lab's EEG equipment with them for that project, with their travel being funded by a grant from the Royal Society of New Zealand's International Mobility Fund. Later that year, the Lottery Health Research Committee of the New Zealand Lottery Grants Board awarded a generous grant of NZ\$94k to Stokes, Klee, and Institute members Megan McAuliffe and Catherine Moran. Those funds enabled the purchase of our own equipment, a BioSemi Active Two Mark II 32 + 8 + 2 channel EEG/ERP/EMG/EKG system and Brain Products' Professional Analyzer 2 software.



In 2012, Dr Gavin returned to the University of Canterbury as an NZILBB Post-Doctoral Fellow. During his stay, he developed the NZILBB EEG Lab and mentored other NZILBB researchers, whose research using EEG is currently underway. Dr Catherine Theys also joined the EEG team as an NZILBB Post-Doctoral Fellow in December 2012. Dr Theys will conduct EEG experiments on neurophysiological correlates of overt speech production in 2013.

The NZILBB EEG lab is housed in the University's Child Language Centre.

# Small Research Grants

In 2012 NZILBB funded seven small research grants up to a maximum of \$5,000. These funds are usually released as seeding money to encourage pilot data to be collected with the hope these will turn into grant applications with external funding agencies.

## Featured Small Grant Project:

Normative performance on therapy material developed to treat later developing language structures on skills in language impaired children

### Project Leader

- Ondene van Dulm (University of Canterbury)

### Associate Investigators

- Catherine Moran (University of Canterbury)
- Thomas Roeper (University of Massachusetts)
- Frenette Southwood (Stellenbosch University)

This research project aimed to gather normative data for a set of 361 picture-based items devised to target certain later-developing language structures and skills in intervention for children with delayed and/or disordered language. Therapy material of this kind is of benefit to both language-impaired and otherwise language-challenged children (e.g. foreign language learners of English), who may benefit from focused language stimulation in order to develop those language skills which contribute toward the acquisition of literacy skills, and those which enable adequate functioning in the classroom context.



The data gathered in the project informed a number of issues in the finalisation of the therapy material kit published in November 2012 as the *Receptive and Expressive Activities for Language Therapy (REALt)*, namely (i) the order of presentation of items within each subset, (ii) tweaking of item wording to elicit the target response, and (iii) minor changes to pictures for optimal clarity. The data were reported in the user manual which accompanies the kit, in conjunction with data gathered by Associate Investigator Frenette Southwood in South Africa. The development of the REALt is thus in line with the aims of evidence-based practice, in that current research findings were applied in the development of a practical language intervention tool.

### The project led to the following outputs:



- Van Dulm, O. (2012) *Normative performance on therapy material developed to target later-developing language structures in children*. Auckland, New Zealand: Beyond Boundaries, Biennial Conference of the New Zealand Speech-Language Therapists' Association, 23-25 May 2012.
  - Southwood, F. and Van Dulm, O. (2012) *Later developing language skills: Fostering school language in 4-9yr old Afrikaans and English speaking children*. Sun City, South Africa: South African Speech-Language-Hearing Association Congress (SASLHA), 3-6 Nov 2012.
  - Van Dulm, O and Southwood, F. (2012) *Targeting later-developing language skills in children 4 years and older: Culturally appropriate material for the South African context*. Workshop presented at the Department of Speech-Language Therapy, Stellenbosch University, 9 November 2012.
  - Southwood, F. and Van Dulm, O. (2012) *Receptive and expressive activities for language therapy*. Johannesburg: Jopie van Rooyen. (<http://www.jvrcatalogue.com/?p=2551>)
- Research with the material is ongoing. Data are currently being collected among children aged 5-8 years at a low decile school in Christchurch, in order to ascertain whether there are differences in language skills between these children and the participants of the study reported here, who were from a high decile school. Research in other countries suggests that socio-economic background can have a negative impact on language development due to a number of factors which are difficult to tease apart, such as multilingualism, lower parental education level, and lower levels of language stimulation and literacy in the environment. Research on this issue in New Zealand is sparse, and information on such differences and how they may be addressed is essential if children from lower socio-economic backgrounds are to be helped to realise their full academic potential.

# Industry Connection

NZILBB continued its work in expanding the connection between research and industry throughout 2012. One of the prime achievements in 2012 was a joint project between Tait Radio Communications and NZILBB to develop a product for enhancing radio communications in complex environments.

The key outcomes for 2012 in that area were:

- Funding of three summer studentships for initial research into complex communication for summer 2012. These were completed in February 2012 and they provided initial impetus for a set of experiments carried out later in the year;
- NZILBB engaged in a number of experiments around complex communication in 2012. The experiments resulted in a “content” package of activities designed to enhance communication in complex environments. The package was delivered to Tait in August 2012 with plans to further develop the package for online work.
- As a result of the development of a research-based portfolio of activities to Tait Radio Communications, NZILBB with the assistance of the University of Canterbury R& developed a preliminary IP agreement and plan for commercialisation.
- As a result of the IP agreement, NZILBB staff moved to paid consultancy work with Tait Radio Communications in September 2012.
- At the end of 2012, discussions were ongoing regarding marketing, commercialisation, and further development of the activities into a training package.



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

# Community Engagement

## UC QuakeBox

In 2012 the UC QuakeBox travelled around Christchurch, collecting stories of people's experiences in the Canterbury earthquakes. Over the course of the year, eight community locations in the city and surrounds hosted the UC QuakeBox. Members of the public came in their hundreds, sharing their stories with the UC QuakeBox team at Re:Start Cashel Mall, Eastgate Mall, New Brighton Public Library, the suburb of Brooklands, Lyttelton township, Sumner village, the Canterbury A&P Show, and Westfield Mall in Riccarton. Recordings forming part of UC QuakeStudies and the UC CEISMIC Digital Archive were also conducted in the NZILBB's observation lab.

As of December 2012 the UC QuakeBox project had recorded a total of 722 stories, with thirteen different languages represented in the corpus. Stories were told in English, Maori, Japanese, Mandarin, German, Cantonese, Hungarian, Russian, Arabic, Punjabi, Portuguese, French and Dutch. The complete corpus contains over 100 hours of recordings, with an average length of ten minutes per interview.

Participants were offered a broad range of consent options. This approach enabled people to be very specific as to how their story will be made available, in terms of both research and public use. In total, 576 stories received consent from participants to be made publicly available on the UC CEISMIC Canterbury Earthquake Digital Archive website. Most of the remaining stories will be held solely for research purposes. So far 150 of these stories have been fully processed and are now available for viewing on the UC CEISMIC website as part of UC QuakeStudies.

The UC QuakeBox transcription team has been engaged in creating comprehensive transcripts of the stories since shortly after the project was launched. The team continues to make steady progress, with transcription now completed for 600 interviews.

Processing of the transcribed stories is ongoing, and soon we hope to have all interviews from consenting participants available to view on the UC CEISMIC Digital Archive website.

New Brighton Library  
Te Kele Wānanga o Karoro

# UC QUAKE BOX

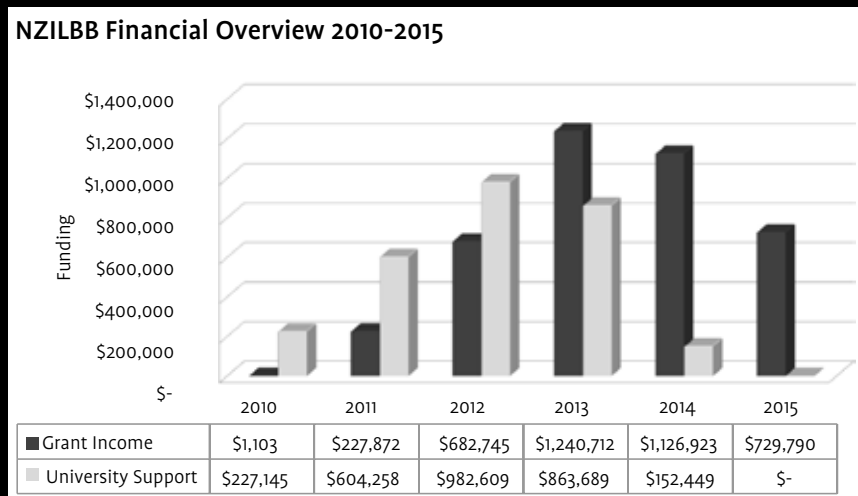
Kōrero mai  
Tell us your story



# NZILBB Financials

NZILBB was originally awarded a three million dollar start up fund from the University of Canterbury, with an additional \$250k for major items of equipment. By 2013 NZILBB's income from external grant funding will be more than the University contribution. By 2015 NZILBB will be self sufficient. In mid 2013 NZILBB will submit a business case to the University Senior Management Team requesting the Institute Manager and Institute Technician positions are made permanent.

This figure shows the already-secured external grant funding awarded to NZILBB. The figures for 2014-2015 are likely to increase.



# Appendices

Grant Title	Investigators	Funding Agency	Amount and Dates
<i>Creativity and Co-Operation in the Dynamics of the Lexicon</i>	Janet Pierrehumbert, Jen Hay, Stephanie Stokes & Christoph Bartneck	John Templeton Foundation (USA)	\$2.7 millionUSD from 2012-2015
<i>Aero-tactile Enhancements in Speech Production</i>	Donald Derrick, Jen Hay, Greg O'Beirne & Scott Lloyd	Ministry of Business Innovation and Employment (Science and Innovation Group)	\$481,170NZD from 2012-2014
<i>Episodic Word Memory</i>	Jen Hay	Rutherford Discovery Fellowship	\$1,000,000NZD from 2011-2016
<i>You came TO DIE?! Perceptual adaptation to regional accents as a new lens on the puzzle of spoken word recognition</i>	Cathi Best, Jason Shaw, Jen Hay, Paul Foulkes, Gerry Docherty & Bronwen Evans	Australian Research Council	\$509,000AUD from 2012-2014
<i>Communication Intervention for Children with Autism</i>	Dean Sutherland and Jeff Sigafoos	Royal Society of New Zealand Marsden Fund	\$885,000NZD from 2011-2014
<i>Early Factors in Childhood Communication Disorders</i>	Thomas Klee, Stephanie Stokes & Catherine Moran	Royal Society of New Zealand Marsden Fund	\$730,000NZD from 2011-2014
<i>Neurophysiological Correlates of Human Behaviour</i>	Stephanie Stokes, Megan McAuliffe, Thomas Klee & Catherine Moran	Lotteries Health Research Fund	\$94,000NZD for 2012
<i>The Development of Syntactic Alternations</i>	Joan Bresnan, Marilyn Ford, Benedikt Szmrecsányi, Jen Hay & Sali Tagliamonte.	National Science Foundation (USA)	\$275,000USD for 2010-2013



## 2011-2012 Summer Scholarships

Project Title	Investigators	Scholarship student
<i>Perception of sound change in Maori</i>	Margaret Maclagan & Jeanette King	Alia Hope-Wilson
<i>Manual verification of spoken corpus segmentation boundaries</i>	Viktoria Papp	Amber Keeley
<i>Speech adaption in aphasia</i>	Shira Katseff	Annalise Fletcher
<i>The influence of social factors on speech alignment and divergence</i>	Kauyumari Sanchez	Georgina Murphy
<i>Christchurch earthquake stories- Maori interviewer</i>	Jeanette King	Kerrie-Anna Anderson
<i>Christchurch earthquake stories</i>	Jen Hay	Kris Vavasour
<i>Christchurch earthquake stories- Bilingual interviewer</i>	Jen Hay	Yena Wei
<i>Shortland Street: An examination of race bias via televised non verbal behaviour</i>	Jeanette King	Kristy Newman
<i>Family members rehabilitation goals for their relatives with aphasia</i>	Tami Howe	Lucy Schmacer
<i>Linguistics change in Northern England: exploring a phonological merger with a new corpus of conversation</i>	Kevin Watson	Mark Darbyshire

## Internal Research Grants 2012

Title	Investigators	Amount
<i>Relationships between non-linguistics development and vocabulary in preschool children with multi-system development delay</i>	Catherine Moran, Thomas Klee, Susan Foster-Cohen & Jessie Miller	\$4905
<i>An investigation of phonological and phonetic recency effects in spoken conversation</i>	Lynn Clark	\$3890
<i>Developing a web-based methodology for investigating language attitudes to Māori and English in real time</i>	Kevin Watson & Lynn Clark	\$3500
<i>Speech production energetic at varying speech rates</i>	Donald Derrick	\$15,000
<i>Gesture Capture Tool</i>	Mark Billingham	\$5000
<i>Effects of audiovisual mismatch in perceptual adjustment</i>	Kota Hattori	\$5000
<i>Testing traditional assumptions of talker-specific characteristics</i>	Kauyumari Sanchez	\$5000
<i>Normative performance on therapy material developed to treat later developing language structures and skills in language impaired children</i>	Ondene van Dulm, Catherine Moran, Thomas Roeper & Frenette Southwood	\$5000

## Internal Travel Grants 2012

Name	Conference	Location
Kota Hattori	Speech Science and Technology	Macquarie University, Australia
Donald Derrick	Speech Science and Technology	Macquarie University, Australia
Megan McAuliffe	Collaborative research	University of Washington, USA
Ondene van Dulm	Language Congress	Sun City, South Africa
Ewald Neumann	Federation of European Neuroscience Societies	Barcelona, Spain
Megan McAuliffe	NZ Speech Language Therapists	Auckland, New Zealand
Kauyumari Sanchez	International Symposium on Imitation and Convergence in Speech	Aix-en-Provence, France
Viktorija Papp	Perspectives on Rhythm & Timing	Glasgow, UK
Viktorija Papp	LabPhon	Stuttgart, Germany
Viktorija Papp	International Association for Forensic Phonetics and Acoustics	Santander, Spain
Jeanette King	Language and Social Psychology	Leeuwarden, The Netherlands
Lucy Johnston	Language and Social Psychology	Leeuwarden, The Netherlands
Stephanie Stokes	Collaborative Research	University of San Diego, USA
Catherine Moran	Beyond Newborn Hearing Screening	Cernobbio, Italy
Beth Hume	Collaborative Research	Ohio State University, USA
Beth Hume	Collaborative Research	University of Arizona, USA

## NZILBB Seminars 2012

Speaker and affiliation	Seminar Title	Date
Maria Levlin (Umea University)	<i>Literacy difficulties and oral language skills in grade 2 and 3 - a study of 43 students in Northern Sweden</i>	24.01.2012
Cathi Best (University of Western Sydney)	<i>I can see what you just said! Infant sensitivity to articulator congruency between audio-only and silent-video presentations of native and nonnative consonants</i>	31.01.2012
Ingo Plag (Universität Siegen)	<i>Are creoles typologically distinct from non-creole languages? Evidence from statistical and computational modeling</i>	7.02.2012
Bryan Gick (University of British Columbia)	<i>Getting at whole speech events: How sphincters change everything</i>	24.02.2012
Donald Derrick (University of Canterbury & University of Western Sydney)	<i>Aero-tactile Integration in Speech Perception.</i>	10.05.2012
Andy Wedel (University of Arizona)	<i>The role of lexical contrast in the evolution of phonemic distinctions: Three complementary methodological approaches</i>	17.05.2012
Karsten Koch (University of Calgary)	<i>Syntactic focus marking and consequences for other areas of the grammar.</i>	24.05.2012
Adam Ussishkin (University of Arizona)	<i>Subliminal speech priming and Maltese lexical access.</i>	31.05.2012
Agata Daleszyska (University of Edinburgh)	<i>Variation in past tense marking in Bequia Creole: apparent time change and dialect levelling</i>	21.06.2012
Victor Kupperman (McMaster University)	<i>Individual differences in the visual processing of simplex and complex words</i>	28.06.2012
Mary Boyce (University of Hawaii at Manoa)	<i>Using corpora of Māori to explore the lexicon</i>	05.07.2012
W. Trammell Neill (University at Albany)	<i>False Memory for Semantic and Phonological Associates</i>	12.07.2012
Stephanie Stokes (University of Canterbury)	<i>Statistical learning in emerging lexicons</i>	19 July 2012
Barry Hughes (University of Auckland)	<i>When text meets texture: What finger movements reveal about reading Braille</i>	26.07.2012

Speaker and affiliation	Seminar Title	Date
Susan Foster-Cohen (Champion Centre & University of Canterbury)	<i>Building a database of language development in children with multi-system developmental disabilities</i>	02.08.2012
Kate Naitoro (University of Canterbury)	<i>The glottal catch: Writing 'Are'are in the era of modern technology</i>	06.09.2012
Megan McAuliffe (University of Canterbury)	<i>The perceptual challenge of dysarthric speech: From confusion to comprehension'</i>	13.09.2012
Ghil'ad Zuckermann (University of Adelaide)	<i>Sleeping Beauties Awake: Towards the Establishment of Revival Linguistics</i>	17.09.2012
Janet Pierrehumbert (Northwestern University)	<i>On the role of linguistic heterogeneity in language dynamics</i>	20.09.2012
James Gruber (University of Canterbury)	<i>Complex Tones and Tonogenesis in Burmese</i>	04.10.12
Lisa Matthewson (University of British Columbia)	<i>Hypothesis-driven semantic typology: Case studies from the Pacific Northwest</i>	11.10.2012
Kon Kuiper (University of Canterbury)	<i>Medical reports as expert evidence in legal judgements</i>	18.10.2012
William Gavin (University of Canterbury)	<i>Why Do We Hear What We Are Expecting to Hear? - Selective Attention Does Mediates Early Cortical Processing of Auditory Stimuli</i>	25.10.2012
Henry Davis (University of British Columbia)	<i>Hypothesis-driven syntactic typology: Case studies from the Pacific Northwest II</i>	01.11.2012
Stephanie Stokes (University of Canterbury)	<i>Learning in emerging lexicons: the impact of word form</i>	15.12.2012

## 2012 Visitors to NZILBB

- Janet Pierrehumbert (Northwestern University)
- Cathi Best (University of Western Sydney)
- Jason Shaw (University of Western Sydney)
- Bryan Gick (University of British Columbia)
- Ingo Plag (Universität Siegen)
- Victor Kuperman (McMaster University)
- Andy Wedel (University of Arizona)
- Adam Ussishkin (University of Arizona)

## NZILBB Publications

### CHAPTER IN BOOK

- Clark, L. (2012) Dialect data, lexical frequency and the usage-based approach. In G. De Vogeleer and G. Sieler (Ed.), *Dialects as a Testing Ground for Theories of Language Change*: 53-72. Amsterdam/Philadelphia: John Benjamins.
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  - Hay, J. and Clendon, A. (2012) (Non-)rhoticity: lessons from New Zealand English. In T. Nevalainen and E.C. Traugott (Ed.), *The Oxford Handbook of the History of English*: 761-772. Oxford: Oxford University Press.
  - Hay, J. (2012) Analyzing the ONZE data as evidence for sound change. In T. Nevalainen and E.C. Traugott (Ed.), *The Oxford Handbook of the History of English*: 94-97. Oxford: Oxford University Press.
  - Warren, P. and Hay, J. (2012) Methods and experimental design for studying sociophonetic variation. In A.C. Cohn, C. Fougerson and M. Huffman (Ed.), *The Oxford Handbook of Laboratory Phonology*: 634-642. Oxford: Oxford University Press.
  - Watson, K. (2012) Patterns of accent variation in British English. In D. Clayton (Ed.), *Language. A Student Handbook on Key Topics and Theories*: 44-59. London: English and Media Centre.
- ### JOURNAL ARTICLE
- Achmadi, D., Kagohara, D.M., van der Meer, L., O'Reilly, M.F., Lancioni, G.E., Sutherland, D., Lang, R., Marschik, P.B., Green, V.A. and Sigafoos, J. (2012) Teaching advanced operation of an iPod-based speech-generating device to two students with autism spectrum disorders. *Research in Autism Spectrum Disorders* 6(4):1258-1264.
  - Borrie, S.A., McAuliffe, M.J., Liss, J.M., O'Beirne, G.A. and Anderson, T. (2012) A follow-up investigation into the mechanisms that underlie improved recognition of dysarthric speech. *Journal of the Acoustical Society of America* 132(2): EL102-EL108.
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  - Ciccone, N., Hennessey, N. and Stokes, S.F. (2012) Community based early intervention for language delay: A preliminary investigation. *International Journal of Language & Communication Disorders* 47(4): 467-470.
  - Derrick, D. and Gick, B. (2012) Speech rate influences categorical variation of English flaps and taps during normal speech. *Journal of the Acoustical Society of America* 131(4): PAGE NUMBER???
  - Drager, K. and Hay, J. (2012) Exploiting random intercepts: Two case studies in sociophonetics. *Language Variation and Change* 24(1): 59-78.
  - Douglas, K.D., Porter, R.J. and Johnston, L. (2012) Sensitivity to posed and genuine facial expressions of emotion in severe depression. *Psychiatry Research* 196(1): 72-78.
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- Stokes, S.F., Kern, S. and dos Santos, C. (2012) Extended statistical learning as an account for slow vocabulary growth. *Journal of Child Language* 39(1): 105-129.
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- Hay, J. (2012) *The social side of words.* Sydney, Australia: The Social Side of Speech, 11 April 2012.
- Hay, J. (2012) *Using a large annotated historical corpus to study word-specific effects in sound change.* Dunedin, New Zealand: Australasian Language Technology Workshop (ALTA), 4-6 Dec 2012.
- Hay, J. and Kuperman, V. (2012) *Spoken Morphology: Investigating the implementation of plural /s/ in a large corpus of historical New Zealand English.* Wellington, New Zealand: Data-Rich Approaches to English Morphology: From corpora and experiments to theory and back, 4-6 July 2012.
- Hay, J., Kuperman, V. and Saarinen, P. (2012) *Paradigmatic structure in plural duration: A cross dialectal study.* Auckland, New Zealand: 13<sup>th</sup> Language and Society Conference, 28-29 Nov 2012.
- Howe, T., Davison, B., Worrall, L., Hersh, D., Sherratt, S. and Schumacher, L. (2012) *Family members' rehabilitation goals for their relative with aphasia: "What he requires is mixing with people".* Melbourne, Australia: 15<sup>th</sup> International Aphasia Rehabilitation Conference, 7-10 Oct 2012.

## CONFERENCE PRESENTATIONS

- Brown, K., Worrall, L., Davidson, B. and Howe, T. (2012) *"Making a good time: The role of friendship in living successfully with aphasia.* Melbourne: Australia: 15<sup>th</sup> International Aphasia Rehabilitation Conference, 7-10 Oct 2012.

- Hume, E. and Wedel, A. (2012) *Uncertainty as an organizing principle of phonology*. Auckland, New Zealand: 13<sup>th</sup> Language and Society Conference, 28-29 Nov 2012.
- Johnston, L., King, J. and Hay, J. (2012) *Ethnic and sex bias in televised non-verbal behaviours?* Leeuwarden, The Netherlands: 13<sup>th</sup> International Conference on Language and Social Psychology (ICLASP 13), 20-23 Jun 2012.
- Johnston, L., King, J. and Hay, J. (2012) *Forming impressions of others from the non-verbal gestures they use while speaking different languages*. Leeuwarden, The Netherlands: 13<sup>th</sup> International Conference on Language and Social Psychology (ICLASP 13), 20-23 Jun 2012.
- Katseff, S., McAuliffe, M.J., Klee, T. and Houde, J. (2012) *Compensation and adaptation following auditory feedback perturbation in L2 learners of English*. Santa Rosa, USA: Motor Speech Conference, 29 Feb – 4 Mar 2012.
- McAuliffe, M.J. (2012) *Comprehending running speech: Applying speech perception theory to the practice of speech-language therapy*. Auckland, New Zealand: New Zealand Speech-language Therapists' Association Conference (NZSTA), 23-35 May 2012.
- Moore, B., Moran, C. and Ramsay, R. (2012) *Early intervention for pre-schoolers with expressive language delay: Promoting broad gains*. Auckland, New Zealand: New Zealand Speech-language Therapists' Association Conference (NZSTA), 23-35 May 2012.
- Moran, C. and Morgan, K. (2012) *Effect of vocabulary intervention on verb production and syntax in two children with severe sensorineural hearing loss*. Cernobbio, Italy: Beyond Newborn Hearing Screening (NHS), Infant and Childhood Hearing in Science and Clinical Practice, 5-7 Jun 2012.
- O'Beirne, G.A., Rickard, N.A., Heidtke, U.J., McGaffin, A.J., Abu-Hijleh, A. and McAuliffe, M.J. (2012) *The UCAST-FW: An adaptive low-pass filtered speech test for the diagnosis of APD*. Adelaide, Australia: Audiological Society of Australia, 1-4 Jun 2012.
- Papp, V. (2012) *Modelling vocal tract dimensions in speaker profiling*. Santander, Spain: International Association for Forensic Phonetics and Acoustics Annual Conference (IAFPA), 5-8 Aug 2012.
- Papp, V. (2012) *A phonetic-phonotactic approach to rhythm: Rhythmic jitter*. Auckland, New Zealand: ASSTA Workshop on the Phonetic Analysis of Rhythm in Indigenous Languages, 30 Nov 2012.
- Papp, V. and Townsend, B. (2012) *Inhabiting acoustic spaces: The interaction of fundamental frequency and the gender/sexuality divide in female-to-male transsexuals*. Indiana, USA: New Ways of Analyzing Variation (NWAY), 25-28 Oct 2012.
- Southwood, F. and Van Dulm, O. (2012) *Later developing language skills: Fostering school language in 4-9 year old Afrikaans and English speaking children*. Sun City, South Africa: South African Speech-Language-Hearing Association Congress (SASLHA), 3-6 Nov 2012.
- Townsend, B. and Papp, V. (2012) *Disclosure and (In) Visibility: Acoustic navigation of the gender/sexuality border in Houston Transmen*. San Francisco, USA: 11<sup>th</sup> Annual Meeting of the American Anthropological Association (AAA), 14-18 Nov 2012.
- Van Bysterveldt, A. and McNeill, B.C. (2012) *Reading comprehension development in children with speech disorder*. Christchurch, New Zealand: International Reading Comprehension Symposium, 4-5 Oct 2012.
- Van Dulm, O. (2012) *Normative performance on therapy material developed to target later-developing language structures in children*. Auckland, New Zealand: New Zealand Speech-language Therapists' Association Conference (NZSTA), 23-35 May 2012.
- Watson, K. (2012) *Where does the New Zealand accent come from? And where is it going?* Christchurch, New Zealand: Platform Arts Festival, 5 Oct 2012.
- Watson, K., Clark, L. and Gold, E. (2012) *Phonological convergence and divergence in North-West England: the case of /t/ lenition*. Auckland, New Zealand: 13<sup>th</sup> Language and Society Conference, 28-29 Nov 2012.
- Watson, K. and Clark, L. (2012) *Sociolinguistic salience and the NURSE/SQUARE merger*. Auckland, New Zealand: 13<sup>th</sup> Language and Society Conference, 28-29 Nov 2012.
- Westerveld, M., van Bysterveldt, A., Gillion, G. and Boyd, L. (2012) *The emergent literacy skills of 4 year old children attending kindergarten in New Zealand*. Christchurch, New Zealand: International Reading Comprehension Symposium, 4-5 Oct 2012.
- Weston-Webber, N., Liberty, K. and Sutherland, D. (2012) *The effect of a tailored parenting programme with parents of young children with autism on children's play and behaviour*. Auckland, New Zealand: 5<sup>th</sup> Educational Psychology Forum, 20-21 Nov 2012.

## CONFERENCE POSTER

- Davidson, B., Howe, T., Worrall, L., Hersh, D., Sherratt, S., Schumacher, L. and Gilbert, J. (2012) *'You needed to rehab...families as well': Rehabilitation goals of family members' of people with aphasia*. Sydney, Australia: Stroke 2012 Conference, 29-31 Aug 2012.
- Davies, P.L., Gavin, W.J., Stokes, S.F. and Klee, T. (2012) *Auditory sensory memory and language development in 2 to 5 year olds*. New York, USA: 6<sup>th</sup> Conference on Mismatch Negativity and its Clinical and Scientific Application (MMN), 1-4 May 2012.
- Ellis, E.M., Evans, J.L., Thal, D., Elman, J. and Stokes, S.F. (2012) *Implicit word learning and verb knowledge in infants with typical and delayed language*. Lyon, France: 3<sup>rd</sup> Early Language Acquisition Conference (ELA), 4-7 Dec 2012.
- Grawburg, M., Howe, T., Worrall, L. and Scarinci, N. (2012) *Use of qualitative interviews with family members to describe third party disability in aphasia*. Melbourne, Australia: 15<sup>th</sup> International Aphasia Rehabilitation Conference, 7-10 Oct 2012.
- Hattori, K., Derrick, D. and Hay, J. (2012) *Examination of spontaneous non-native directed speech*. Sydney, Australia: 14<sup>th</sup> Australasian International Conference on Speech Science and Technology, 6 Dec 2012.
- Kazemi, Y., Nockerts, A., Klee, T., Stringer, H. and Miller, J.F. (2012) *Challenges in transcribing and analysing Persian child language samples*. Madison, USA: Symposium on Research in Child Language Disorders, 7-9 Jun 2012.
- Kazemi, Y., Klee, T. and Stringer, H. (2012) *Clinical assessment of Persian-speaking children with language impairment in Iran*. Madison, USA: Symposium on Research in Child Language Disorders, 7-9 Jun 2012.
- Neumann, E. (2012) *Reassessing the role of working memory in visual selective attention: Converging evidence from interference and negative priming*. Barcelona, Spain: 8<sup>th</sup> Federation of European Neuroscience Societies, 14-18 Jun 2012.

- Papp, V. (2012) *Rhythmic jitter: Accounting for low nPVI in languages with quantity contrast*. Glasgow, UK: Perspectives on Rhythm and Timing (PoRT), 19-21 Jul 2012.
- Papp, V. (2012) *Rhythmic typology of three languages with vowel harmony and quantitative contrast*. Glasgow, UK: Perspectives on Rhythm and Timing (PoRT), 19-21 Jul 2012.
- Ramsay, R.M.A., Moran, C. and McAuliffe, M.J. (2012) *Working memory constraints on listening comprehension in adolescents with traumatic brain injury*. Auckland, New Zealand: New Zealand Speech-language Therapists' Association National Conference (NZSTA), 23-25 May 2012.
- Rotheram, A., Howe, T. and Gillard, G. (2012) *The benefits of aphasia groups: "We thought it was Christmas"*. Melbourne, Australia: The International Aphasia Rehabilitation Conference, 7-10 Oct 2012.
- Rotheram, A., Howe, T. and Gillard, G. (2012) *The benefits of groups for people with aphasia: The insider's perspective*. Melbourne, Australia: The International Aphasia Rehabilitation Conference, 7-10 Oct 2012.
- Schaefer, M., McAuliffe, M.J., Liss, J., Katseff, S.E., O'Beirne, G.A. and Cai, S. (2012) *Responses to manipulations in auditory feedback: The effect of aging*. Santa Rosa, USA: Motor Speech Conference, 29 Feb-4 Mar 2012.
- Stenning, S., Howe, T. and Siyambalapatiya, S. (2012) *Aphasia assessment with bilingual Samoan-English speaking individuals: A literature review*. Auckland, New Zealand: New Zealand Speech-language Therapists' Association National Conference (NZSTA), 23-25 May 2012.
- Stokes, S.F. (2012) *Toddlers' receptive and expressive lexicons differ on lexical statistical characteristics*. Madison, USA: Symposium on Research in Child Language Disorders (SRCLD), 7-9 Jun 2012.





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