

Poster Session – Student Competition

Presenter	Presentation Title
Adrienne Harrison	Effect of stimulus level and carrier on speech-evoked envelope following responses (EFRs)
Andrew Lauzon	Intuition and algorithms: Cognitive errors in clinical reasoning
David Sindrey	Hear On: Parent video intervention to Increase hearing aid use in infants with hearing loss
Ekanayake WEMML	Development of a sinhala dichotic digits test to assess binaural integration and separation abilities in normal hearing young adults
Eunjung Na	Parents' preferences for services for children with mild bilateral and unilateral hearing loss: A conjoint analysis
Eunjung Na	Cochlear implantation in children with residual hearing
Jonathan Vaisberg	Electroacoustic correlates of subjective sound quality for hearing aid processed music
Kendra Di Bacco	Exploring the self-regulatory behaviors of elementary students with hearing loss in inclusive classrooms
Leticia Vicente	Cortical auditory responses in children with sequential bilateral cochlear implants
Maxime Maheu	Test-retest characteristics of cVEMP and oVEMP measures
Maxime Maheu	Vestibular and postural evaluations to reduce risk of falls following cochlear implant surgery
P.G.S. Madushani	Auditory effects among 18-45 year old workers of a textile plant in Sri Lanka
Sangamanatha Ankmnal Veeranna	Analysis of auditory brainstem responses in children with auditory processing disorder
Stephanie Monette	Acoustics of French-English Bilingual Infant-Directed Speech (IDS)
R.A.I.A. Subasinghe	Hearing status and noise exposure levels of workers at a washing plant in Dankotuwa, Sri Lanka
Matthew Urichuk	Effect of electrode montage on speech-evoked envelope following responses
Viviane Grandpierre	Barriers and facilitators to cultural competence in early hearing loss services: A qualitative analysis

Effect of stimulus level and carrier on speech-evoked envelope following responses (EFRs)

Adrienne L. Harrison¹, Vijayalakshmi Easwar^{1, 2}, Susan Scollie^{1, 2}, David W. Purcell^{1, 2}

¹ Faculties of Health & Rehabilitation Sciences, and Communication Sciences & Disorders,
Western University, London, ON

² National Centre for Audiology, Western University, London, ON

Objectives: Outcome measures are an essential part of the hearing aid fitting process. Infants with hearing loss are identified and fit with hearing aids at younger ages due to newborn screening programs. Behavioural outcome measures that are typically used to verify audibility in hearing aid users cannot be applied to young infants; therefore, objective outcome measures are utilized.

Background: Previous studies propose objective test paradigms based on speech-evoked envelope-following responses (EFRs) elicited by the naturally spoken stimulus /susafi/. The stimulus contains low, mid and high frequency information that is essential for speech processing. /Susafi/ elicits EFRs across eight carriers: modified /u/, /a/, and /i/ vowels record two simultaneous EFRs from the spectral F1 and F2+ formant regions; and amplitude-modulated fricatives /f/ and /s/. Results indicate EFR is sensitive to stimulus level changes.

Methods: The current study aims to determine the lowest sound pressure level that can elicit EFRs, and to determine which carriers provide the most significant and distinct responses. Single-channel electroencephalograms were recorded in normal hearing adults during the repeated presentation of /susafi/. EFRs were recorded at 20, 35, 50, and 65dB SPL, across the carriers. Behavioural thresholds of the eight carrier stimuli were also recorded.

Results: A significant effect of stimulus level on number of EFR detections exists, as well as a positive relationship with response amplitude. /f/ and /s/ carriers elicited the most significant responses, followed by /a/ F2 and /u/ F1.

Conclusion: The purpose of the experiment was to determine the validity of the EFR paradigm as an objective outcome measure of audibility. The EFR paradigm is sensitive to changes in audibility, in terms of the number of EFR detections and response amplitude, and is in general agreement with behavioural thresholds. The EFR paradigm needs to be tested further on hearing impaired and infant target populations.

Intuition and algorithms: Cognitive errors in clinical reasoning

Andrew P. Lauzon¹ & Lia M. Dell'Orletta¹

¹School of Communication Sciences and Disorders, Western University, London, ON

In this short scoping review, we investigated factors that commonly underlie poor clinical reasoning within the context of a dual-process model of cognition. The vast majority of misdiagnoses do not spring from ineptitude or a dearth of knowledge, but rather are a result of one or more cognitive errors, over 100 of which have been identified and associated with clinical decision making. We highlight and describe a few of the more common cognitive errors providing examples, as well as strategies and interventions which have been demonstrated as being effective in mitigating such errors and thus improving clinical reasoning. Much of the literature we reviewed examined clinical reasoning as pertaining to physicians and nurses, and we have made several suggestions for ways to apply this knowledge to the field of audiology.

Hear On: Parent Video Intervention to Increase Hearing Aid Use in Infants with Hearing Loss

David Sindrey, PhD Candidate, Sheila Moodie, PhD

Western University, Faculty of Health Sciences, Health & Rehabilitation Sciences Program

Western University, National Centre for Audiology, Family-Centred Early Intervention

Laboratory, London, ON

Objective(s): To develop an evidence based intervention designed to persuade, educate, and train both carers to increase hearing aid wear time for infants with hearing loss.

Background: To maximize benefit, hearing aids need to be worn “all waking hours”, which remains a goal for most parents of children with permanent hearing loss under the age of 2. A need was identified for an intervention which would increase malleable factors in parents contributing to hearing aid use.

Methods: 1. Scoping review of the literature regarding parent use of hearing aids for their young children with hearing loss (birth to age 2). 2. Scoping review of literature regarding behaviour change theories. 3. Choice of most appropriate behaviour change model and use of this model with stakeholder input and feedback to generate an evidence based intervention.

Results: Facilitators and Barriers to hearing aid use were identified and an intervention plan was developed, guided by the Behaviour Change Wheel, the Theoretical Domains Framework and the Behaviour Change Techniques Taxonomy. Twelve videos are planned to be used, one per week, from initial ABR diagnosis throughout hearing aid fitting and two months beyond.

Conclusions: Theory based behaviour change approaches help comprehensive planning in intervention design.

References: Michie, S., Atkins, L., & West, R. (2014). The behaviour change wheel: A guide to designing interventions. London: Silverback Publishing.

Development of a Sinhala Dichotic Digits Test to assess Binaural Integration and Separation Abilities in Normal Hearing Young Adults.

Ekanayake WEML¹ and Jayasena BN¹

¹Department of disability studies, Faculty of Medicine, University of Kelaniya, Sri Lanka.

Objectives

1. To develop a Dichotic Digit Test (DDT) in Sinhala language.
2. To establish cut-off scores for Sinhala speaking young adults.
3. To determine inter-aural dichotic performance difference within the normative data.
4. To compare scores between males and females.

Background: DDT is a test of dichotic listening and it is made up of several digits presented to both ears simultaneously. The DDT assess binaural integration and binaural separation abilities when performed in free recall and directed recall test conditions.

Methods: Three sets of 25 single pair digits were recorded using 6 bisyllabic Sinhala digits. The DDT was performed under free recall, directed right and directed left listening conditions. A sample of 148 right-handed normal hearing young adults aged 20 to 28 years were tested to establish cut-off scores, ear differences, gender differences and differences in listening conditions in performances. 20 participants were used for the pilot study and 128 were included in the main study.

Results: The cut-off scores for the DDT were 91.64% in the right and 85.96% in the left for free recall and 69.15% in the right ear and 68.75% in the left ear for directed recall listening condition. The right ear scores were significantly higher than the left ear scores ($p < .05$) in the free recall listening condition, re-establishing the phenomena of right ear advantage. Interestingly, ear differences were not significant ($p > .05$) in the directed recall. Gender differences were not noted for either of the listening conditions. Free recall scores were significantly higher than the directed recall scores ($p < .05$) bilaterally.

Conclusion: Normative cut-offs were obtained for Sinhala DDT. The test appears to be a feasible assessment tool in assessing binaural integration and separation abilities of Sri Lankan young adults.

Parents' Preferences for Services for Children with Mild Bilateral and Unilateral Hearing Loss: A Conjoint Analysis

Eunjung Na ^{1,2}, Viviane Grandpierre ^{1,2}, Mina Salamatmanesh ^{1,2}, Elizabeth M. Fitzpatrick ^{1,2}, JoAnne Whittingham ², Flora Nassrallah ^{1,2}, Isabelle Gaboury ^{1,3}, Doug Coyle ¹, Andrée Durieux-Smith ^{1,2},

¹ University of Ottawa, ² Children's Hospital of Eastern Ontario Research Institute, ³ University of Sherbrooke

Objective: The objective of this paper was to examine parents' preferences for various attributes of service following diagnosis of mild bilateral/unilateral hearing loss.

Background: Newborn hearing screening permits early diagnosis and intervention for children with hearing loss. Children with mild hearing loss, who were typically identified by school age, are now early identified. While literature exists on parents' experiences, and clinical outcomes of children with mild hearing loss, uncertainty remains about how to deliver services to this population.

Methods: A cross-sectional conjoint analysis was conducted with parents of children with mild bilateral/unilateral loss to determine their preferences related to service models. Participants were drawn from an ongoing project investigating communication outcomes in early-identified children with mild bilateral/unilateral loss. Families were recruited in three Ontario regions who met the following inclusion criteria: (a) chronological age under five years at enrolment, (b) permanent mild bilateral/unilateral loss identified by age three. Parents completed a questionnaire in which they selected their preferred service from eight clinical scenarios with various service options.

Results: A total of 51 questionnaires were returned. All eight scenarios were completed for each questionnaire. The coefficient for all attributes in the regression model were significant at the $p < .01$ level, except for the type of support for speech-language development. Specifically, the results for each attribute showed that these parents preferred a service model that included: 1) regular visits to the clinic for support with amplification, 2) therapy sessions at clinic or at home, 3) emotional support at the clinic, and 4) warm and supportive professional communication.

Conclusions: Conjoint analysis is an effective technique to qualify parents' perspectives of clinical services for children with mild bilateral/unilateral hearing loss. Parents' preferences provided insights into the components of a service model that are valued and that providers should consider when providing services for these children.

Cochlear Implantation in Children with Residual Hearing

Eunjung Na^{1,2}, Elizabeth Fitzpatrick^{1,2}, JoAnne Whittingham², Janet Olds^{1,2,3}, Rosemary Somerville³

¹ University of Ottawa, ² Children's Hospital of Eastern Ontario Research Institute, ³ Children's Hospital of Eastern Ontario

Objective: The purpose of this study was to examine the characteristics of children with CI whose hearing was better than audiometric criteria.

Background: The benefits of CIs for children with residual hearing in the severe range result in a better prognosis for spoken language than for those who continue to use HAs. However, decision-making can be challenging for parents who are confronted with a CI decision. Therefore, an understanding of parents' needs for decisional support of this children is necessary. As a first step to support parents, we undertook a study to better understand the characteristics of children who received CI outside audiometric candidacy criteria.

Methods: This study involved a retrospective analysis of clinical data at the CHEO CI program for all children implanted from 1993 to 2016. Inclusion criteria were pre-operative PTA ≤ 90 dB HL in at least one ear. Audiological information, and documented reasons affecting CI were extracted.

Results: A total of 364 children underwent surgery. Of these, 76 (20.9%) had residual hearing in at least one ear. The median age of CI was 4.3 years, and the median preoperative PTA was 88.0 dB HL. Of 76, 72.4% had documented progressive hearing loss, 46.1% showed sloping in at least one ear, 34.2% had asymmetrical, and 14.5% had fluctuating thresholds. The major reason of delayed CI candidacy assessment was insufficient hearing levels for CI (38.2%). Decisions to proceed with CI were primarily related to deterioration in hearing levels (53.9%) and to limited benefit from hearing aids (18.4%) and speech/ language delays (18.4%).

Conclusions: In this population-based study, 20.9% of implanted children had usable residual hearing in at least one ear. The primary reason for delaying CI candidacy assessment was degree of hearing loss at diagnosis. The major reasons for proceeding with later CI intervention was related to progressive hearing loss.

Electroacoustic correlates of subjective sound quality for hearing aid processed music

Jonathan Vaisberg^{1,2}, Paula Folkeard¹, Ewan Macpherson^{1,3}, Vijay Parsa^{1,3}, and Susan Scollie^{1,3}

¹ Western University, National Centre for Audiology, London, ON

² Western University, Graduate Program in Health & Rehabilitation Sciences, London, ON

³ Western University, School of Communication Sciences & Disorders, London, ON

Objective(s): This study compares hearing impaired listeners' sound quality ratings of hearing aid processed music between several premier hearing aids and the hearing aids' universal and music programs. This study also strives to identify electroacoustic parameters associated with changes in subjective sound quality.

Background: Listening to music is an enjoyable aspect of many people's lives. However, facilitating music listening in hearing aid wearers is not fully understood, and making music enjoyable through hearing aids can be challenging. Hearing aids are often thought of as devices which improve speech perception rather than other complex sounds such as music. Music can be broader and more variable than speech in the intensity and frequency domains. As a result, hearing aids optimized for speech may not amplify music as effectively. Manufacturers often include dedicated music programs in their products. However, a music program's electroacoustic behaviour is not always transparent, and its efficacy improving music sound quality is often left unmeasured. Sound quality differences between hearing aids and programs, and electroacoustic correlates which drive those differences, are therefore of interest to academics, clinicians, and manufacturers.

Methods: Hearing impaired listeners rated the sound quality of music samples recorded via the universal and music programs of five hearing aids. Recordings were individualized using each hearing aid's proprietary fitting formula. Recordings were analyzed using various electroacoustic measurements.

Results: Sound quality differences were most apparent between hearing aids. A music program improved ratings for two hearing aids, although the magnitude of improvement was less than the difference between a high- versus low-rated hearing aid. Electroacoustic correlates are currently being analyzed.

Conclusions: Optimal music sound quality appears to be a question of hearing aid selection, rather than music program selection. However, it is possible that measurable electroacoustic adjustments may be related to music sound quality, which may inform clinical fine-tuning.

Exploring the Self-Regulatory Behaviors of Elementary Students with Hearing Loss in Inclusive Classrooms

Kendra R. Di Bacco¹, Sheila Moodie ^{1,2} and Lynda Hutchinson³

¹ Western University, Faculty of Communication Sciences and Disorders, London, ON

² Western University, National Centre for Audiology, London, ON

³ Western University, Faculty of Education, London, ON

Objective(s): To explore the relationship relationships among students' hearing loss, academic achievement and self-regulation (SR), classroom background noise levels, teachers' perceptions of inclusion of students who are hard of hearing (HH) and features of classroom instruction that support SR.

Background : To date, very little research has attended to studying SR in children with hearing loss, yet research indicates that strong self-regulatory skills are needed for success in and outside of the classroom.

Methods: An exploratory, mixed-method and multi level research design was employed using data from 10 teachers on 131 students, 8 of who had a hearing loss.

Results: Results indicated that a) hearing status predicted SR, b) SR predicted academic achievement for normal hearing (NH) and hard of hearing (HH) students, c) HH students' received lower SR ratings than NH peers, and d) classroom background noise levels were negatively related to the use of features of instruction to support SR and to teachers' knowledge and understanding of hearing loss.

Conclusions: These results highlight the importance for further teacher education to emphasize a) the effects of hearing loss on learning and SR, b) the influence of classroom background noise levels on HH and NH students' success, and c) effective strategies for creating an inclusive classroom.

Cortical auditory responses in children with sequential bilateral cochlear implants

Vicente LC.¹, Gordon KA.^{2,3}, Polonenko MJ.^{2,3}, Costa OA.^{1,4}, and Alvarenga KF.^{1,4}

¹ University of São Paulo, Bauru School of Dentistry, Bauru, SP

² Neurosciences & Mental Health, The Hospital for Sick Children, Toronto, ON

³ Institute of Medical Sciences, Faculty of Medicine, University of Toronto, Toronto, ON

⁴ Cochlear Implant Program, Hospital for Rehabilitation of Craniofacial Anomalies, University of São Paulo, Bauru, SP

Objective: To evaluate cortical auditory asymmetries within the first year of sequential bilateral cochlear implantation.

Background: Multi-channel evoked potential recordings have shown that the lack of appropriate stimulation in the opposite ear of unilateral cochlear implant users leads to abnormal cortical development which may not be reversed by adding a second cochlear implant.

Methods: Cortical responses were recorded in 19 children who were first implanted by 3 years of age and received a second implant in their opposite ear 4.95 ± 2.56 years later. Responses were evoked by the speech stimulus /da/ presented in free field in both the unilateral and bilateral conditions at the time of the second implant activation and then after 3, 6 and 12 months of bilateral implant use. The active electrode was placed at Cz and referenced to the opposite mastoid of the stimulated implant and at Oz for the bilateral condition. Eye-blinks were monitored in a second channel. Individual cortical responses obtained for the three conditions (first, second and bilateral cochlear implants) were plotted against each other. Areas of difference between the waveforms were calculated from 45-200ms and 200-350ms latency for each recording time point.

Results: Large differences were initially present between the two unilaterally evoked responses. Over time, no changes were found at 45-200ms and significant decreases at 200-350ms latency were restricted to the first 3 months, leaving a significant difference at 1 year. The bilateral response was initially more similar to the response to the first implant as shown by a significant area differences at 45-200ms latency. This difference decreased slightly over time but remained significant at 1 year.

Conclusions: Limited effects of the second cochlear implant in children receiving bilateral cochlear implants sequentially were revealed in a one-channel montage by persistent cortical asymmetries over one year of bilateral implant use.

Test-retest characteristics of cVEMP and oVEMP measures

Behtani, Lydia¹, Maheu, Maxime, and Champoux François

¹ School of Speech Language Pathology and Audiology, University of Montreal, Montreal, Quebec, Canada.

² Center of interdisciplinary research in rehabilitation of Greater Montreal (CRIR), Raymond-Dewar Institut (IRD), Montreal, Quebec, Canada.

Objective(s): Evaluate test-retest reliability of cVEMP and oVEMP in adults between 20 to 60 years old.

Background: The use of cVEMP and oVEMP to assess the saccule and the utricle is increasing in audiology practice. However, up to now, data is sparse as to test-retest reliability, which could be crucial when it comes to monitoring pathologies in patients. Moreover, aging has been suggested to influence cVEMP and oVEMP amplitude, which could also influence data.

Methods: We evaluated 15 participants between 20 and 60 years old using cVEMP and oVEMP at baseline and 5 days later. We retrieved amplitude (P1-N1), asymmetry ratio, P1 and N1 latencies for both cVEMP and oVEMP. cVEMP was performed using EMG control device and amplitude and asymmetry ratio were assessed both with or without pre-stimulus rectification. Inter-class correlation using a two-way random model with absolute agreement and average measures was used to analyze test-retest reliability.

Results: The test re-test reliability of both raw and rectified P1-N1 amplitudes of the cervical VEMP are excellent (respectively ICC: 0.936 and ICC: 0.932). The asymmetry ratio both raw and rectified showed a poor reliability (respectively ICC: -0.08 and ICC: 0.095). The test-retest reliability of N1-P1 amplitude and asymmetry ratio of the ocular VEMP are excellent (respectively ICC: 0.973 and 0.892). No significant correlation has been found between age and cVEMP or oVEMP characteristics.

Conclusions: The results from our study suggest that both rectified and raw amplitudes from cVEMP recordings and amplitude and asymmetry ratio for oVEMP recordings could be use for test-retest analysis in this population. However, caution is needed when it comes to cVEMP raw and rectified asymmetry ratios. Finally, our results suggest no significant effect of age on cVEMP and oVEMP between 20 and 60 years of age.

Vestibular and postural evaluations to reduce risk of falls following cochlear implant surgery

Maheu Maxime^{1,2}, Pagé Sara^{1,2}, Sharp Andréanne^{1,2}, Delcenserie Audrey^{1,2}, Champoux François^{1,2}

¹ School of Speech Language Pathology and Audiology, University of Montreal, Montreal, Quebec, Canada.

² Center of interdisciplinary research in rehabilitation of Greater Montreal (CRIR), Raymond-Dewar Institut (IRD), Montreal, Quebec, Canada.

Objective: The goal of the present study was to investigate the impact of unilateral cochlear implantation on postural control in relation to the vestibular status before CI surgery.

Background : Cochlear implant is a device that can partially restore hearing in severe hearing impaired patients. Unfortunately, it also represents a relevant risk for structural damage to the vestibular receptors of the implanted ear and risk of falls post-surgery. To our knowledge, very few studies investigated the complete vestibular function and postural control longitudinally in relation to cochlear implant surgery.

Methods: We recruited 17 participants (four CI candidates and 13 hearing controls) and performed complete vestibular evaluation (cVEMP, oVEMP, vHIT) and postural evaluation using a force platform, prior and following unilateral cochlear implant surgery.

Results: Our study suggests that an increase in postural sway following cochlear implant was present only for the participants that received the implant in the ear with the better vestibular function. cVEMP and oVEMP measures in the implanted ear prior to unilateral cochlear implantation may help to predict postural control performance following surgery.

Conclusion: A thorough evaluation of the vestibular function, as described in the present study, could not only be helpful to make a more accurate prognosis of the risks of fall following cochlear implantation, but also to provide proper vestibular rehabilitation for at-risk patients.

Auditory effects among 18-45 year old workers of a textile plant in Sri Lanka.

Madushani P.G.S¹, Ileperuma L.D. ¹

¹ Department of Disability Studies , Faculty of Medicine, University of Kelaniya , Sri Lanka.

Objectives: To determine auditory effects among textile workers and to establish associations between the degree of hearing loss and exposure duration, degree of hearing loss and noise level and the proportion of hearing related complaints.

Background: Noise is one of the most common physical hazards in industrial settings. The prevalence of NIHL is on the rise with the increase in duration of exposure and the increase in the severity of hearing loss.

Methods: A cross sectional descriptive study using purposive sampling method was carried out. An interviewer administered questionnaire and DPOAE hearing screening on 127 (72 female and 55 male) textile workers of the selected textile plant in Seeduwa, Sri Lanka was done (Age: $M=31.16$, $SD=7.75$). Noise measurements were done in six sections of the factory and average noise levels were obtained. Diagnostic hearing evaluations were done for 60 (57.75%) subjects, who referred from the DPOAE hearing screening test.

Results: The degree of hearing loss and the exposure duration has a significant association in the high frequency region of 4 kHz to 8 kHz ($p < 0.05$). Noise levels fluctuate between 90.3 ± 0.8 dBA and 50.6 ± 0.52 dBA. 30.83% of workers having NIHL. Most of the workers (33.9%) complained difficulty in conversation in noisy backgrounds. Other complaints as tinnitus, dizziness, ear fullness and headache were reported in less than 30%.

Conclusion: Textile workers who were exposed to noise for more than 15 years were affected with NIHL (Permanent Threshold Shift) in the high frequency region. Administrative controls and engineering controls need to be implemented to manage hazardous noise levels in industrial settings. Hearing Conservation Programs should be initiated and implemented for textile workers.

ANALYSIS OF AUDITORY BRAINSTEM RESPONSES IN CHILDREN WITH AUDITORY PROCESSING DISORDER

Sangamanatha Ankmnal Veeranna¹, Chris Allan^{1,2} and Prudence Allen^{1,2}

¹National Centre for Audiology, Western University, London, ON

²School of Communication Science and Disorder, Western University, London, ON

Objective: To investigate the auditory brainstem neural integrity in children suspected of having auditory processing disorder (sAPD).

Background: ASHA recommends including electrophysiological measures in an APD assessment battery but few audiologists do so, possibly because of limited published evidence for its utility. This study expands on previous work showing that some children with sAPD have measurable physiologic deficits at lower levels of the auditory system.

Methods: ABRs were recorded at 80 dB nHL (13.3 and 57.7 clicks/sec) from 20 adults, 22 typically developing children and 108 children sAPD. The ABRs were analyzed using traditional clinical measures [absolute latencies (I, III and V), interwave intervals (I-III and III-V) and a shift in wave V latency with an increase in stimulation rate] and using a model proposed by Ponton et al (1996) that offered a more detailed analysis of axonal conduction time (I-II and III-IV interwave intervals) and synaptic transmission (II-III and IV-V interwave intervals).

Results: There were no significant differences between TD children and adults. Some children sAPD showed clinically significant delays in absolute latencies, interwave intervals and significant rate dependent shifts. Examination of responses delineating axonal vs synaptic transmission showed frequent delays in synaptic factors and fewer instances of delays in axonal conduction for children sAPD.

Conclusion: The ABR analysis examining responses for axonal and synaptic delays revealed more children with brainstem anomalies and offered greater insight into underlying mechanisms. This study provided evidence of a synaptic pattern of abnormalities in a significant portion of children sAPD. Synaptic delays may originate in the first auditory synapse (wave I) suggesting abnormal cochlear functioning in these children. Such observations could provide objective evidence of factors potentially contributing to listening difficulties that are frequently reported in these children. Results provide supportive evidence for the value of click-evoked ABRs in comprehensive APD assessment batteries.

Acoustics of French-English Bilingual Infant-Directed Speech (IDS)

Stephanie Monette¹, and Christopher T. Fennell²

¹ University of Ottawa, Department of Linguistics, Ottawa, ON

² University of Ottawa, School of Psychology, University of Ottawa, ON

Background: Early bilinguals strive to maintain language-specific phonemic categories, but may also merge categories to decrease processing load (MacLeod & Stoel-Gammon, 2005). Infant-directed speech is the type of speech infants hear most. Do early Canadian French-English bilinguals produce monolingual-like vowels and consonants, in the context of IDS?

Objective(s): The present study focused on the comparison of read IDS produced by French-English bilingual and English monolingual parents of 5 to 10 month-old infants. We also investigated the interaction between L1 and L2, when L1 is acquired simultaneously or before the age of five.

Methods: English monolingual (n=7) and early French-English bilingual (n=7) mothers were asked to read a picture book containing target phonemes /b/, /p/, /a/, /i/ and /u/ to their infants (M_{Age} = 8.2 months). Vowel formants and Voice Onset Time were analyzed using PRAAT (Boersma & Weenink, 2002).

Results: French-English bilinguals produced native-like sounds for all but French voiced bilabial stop. In addition, there were no significant differences in bilinguals' French and English productions. Bilinguals produced the second formant of /i/ with more variability when speaking English than when speaking French.

Conclusions: Our results are in line with Flege's Speech Learning Model (Flege, 1995): bilinguals cannot completely separate their two phonetic systems. Furthermore, age of acquisition, environment and language use may consist of contributing factors in producing monolingual-like speech.

References:

- Boersma, P., & Weenink, D. (2002). Praat v. 4.0. 8. A system for doing phonetics by computer. *Institute of Phonetic Sciences of the University of Amsterdam*, 218.
- Flege, J.E. 1995. Second language speech learning. In Strange, W. (Ed.) *Speech perception and linguistic experience*. Timonium MD: York Press.
- MacLeod, A. A., & Stoel-Gammon, C. (2005). Are bilinguals different? What VOT tells us about simultaneous bilinguals. *Journal of Multilingual Communication Disorders*, 3(2), 118-127.

Hearing status & noise exposure levels of workers at a washing plant in Dankotuwa, Sri Lanka.

Subasinghe R.A.I.A¹, Illeperuma L.D.¹

Department of Disability studies, Faculty of Medicine, University of Kelaniya, Sri Lanka.

Objectives: To determine the noise levels the workers are exposed to during their shifts, to evaluate hearing related complaints and audiometric measures of the workers, determine the association between the job category and the hearing status and determine the association between the exposure duration and hearing status.

Background: Among the worldwide adult population with disabling hearing loss, 16% were found to be associated with occupational noise (Nelson, Nelson, Concha-Barrientos, & Fingerhut, 2005).

Methods: The study included 107 male and female workers between 20 and 50 years engaged in different job categories. Purposive sampling method was used to recruit participants. Study tools were Sound Level Meter, Interviewer-administered questionnaire, the hearing screening test and the diagnostic hearing tests (Pure Tone Audiometry, Speech Audiometry, Immittance Audiometry otoacoustic emission testing).

Results: Noise levels within the plant were found to be between 69.9 and 100.3 dB (A). Among washing plant workers, 43 (40.18%) were found with abnormal audiograms. Among those who had abnormal audiograms, 34 (31.77%) had NIHL in right ear and 30 (28.03%) in the left ear. 37 (34.57%) workers were suggestive of noise-induced hearing loss.

Conclusions: The washing plant is a hazardous place for hearing health, thus preventive measures, such as hearing conservation programs must be adopted.

Effect of electrode montage on speech-evoked envelope following responses

Matthew J. Urichuk¹, Vijayalakshmi Easwar¹, Susan D. Scollie¹, David W. Purcell¹

¹Western University, National Center for Audiology, London, ON

Objective(s): This study aimed to investigate the effect of electrode montage choice on speech-evoked Envelope Following Responses (EFRs).

Background: Evoked potentials in infants are commonly recorded using a non-inverting forehead midline electrode, an inverting ipsilateral mastoid electrode, and a contralateral forehead ground electrode (infant montage). Whereas EFRs in adults are often recorded using a non-inverting Cz electrode, an inverting inion electrode, and a ground collarbone electrode (adult montage). A difference in electrode montage may affect response and noise amplitudes, and have clinical implications for EFR detection. A suboptimal electrode montage may decrease efficacy and accuracy of EFR responses while an optimal montage may enhance detection.

Methods: Twenty normal hearing adults participated in this study after passing a hearing screening at 15 dB HL. The stimulus used to evoke the EFRs was a male-spoken token /susashi/. Phonemes were modified to elicit 8 individual EFRs – six from the vowels and two from the fricatives. The vowels were altered to elicit two EFRs simultaneously by lowering the fundamental frequency (f₀) of the vowels' first formant relative to the f₀ of the second formant. The /susashi/ stimulus was presented in opposite polarities for 450 sweeps (30 minutes) in each montage. The order of electrode montage and test ear was randomly selected.

Results: Response amplitude did not vary by montage used, however, noise amplitude was higher in the infant montage than in the adult montage by a mean difference of +4.29nV (SD = 9.80nV). Response amplitude and noise varied significantly by carrier but the interaction with electrode montage was non-significant. The infant montage had 1-3 fewer detected responses across all carriers except in /u/ F2 where response detection was the same across montages.

Conclusions: Electrode montage choice could affect noise amplitude marginally. Further analysis will explore possible causes for change in detection rates by montage.

Barriers and facilitators to cultural competence in early hearing loss services: A qualitative analysis

Viviane Grandpierre*^{1,2} 613-562-5800 ext: 4564; vgran048@uottawa.ca

Elizabeth M. Fitzpatrick^{1,2} 613-562-5800 ext: 4545; elizabeth.fitzpatrick@uottawa.ca

Roanne Thomas² 613-562-5800 ext: 4564; roanne.thomas@uottawa.ca

Oreen Mendonca² 613-562-5800 ext: 4564; omend005@uottawa.ca

Lindsey Sikora² 613-562-5800 ext: 8959; lindsey.sikora@uottawa.ca

Beth K. Potter² 613-562-5800 ext: 8718; beth.potter@uottawa.ca

¹ Children's Hospital of Eastern Ontario Research Institute, ² University of Ottawa

Background: Increasing diversity in Canada has direct implications for early hearing loss services (EHLS). Efforts to improve cultural competence in EHLS should be informed by evidence on how cultural differences can affect services, however there is limited empirical research in this area.

Objective: The objective of this study was to explore practitioners' experiences with providing services to minority culture families.

Method: A qualitative research design with the use of semi-structured interviews was used to gain insight into practitioner perceptions of barriers and facilitators to the provision of culturally competent care.

Results: A total of 19 practitioners participated in this study. Three themes emerged from the interview data: characteristics of a culturally competent practitioner, barriers to service provision, and facilitators to service provision.

Conclusion: This is the first study to contribute to research on culturally competent care in early hearing loss services. Practitioners encountered barriers throughout the process of service delivery with language barriers affecting every stage however, they were also able to mitigate many of these challenges. The findings will hopefully inspire future investigators to contribute to a research field that has received little attention.