Australian Hearing Hub

AUSTRALIAN HEARING HUB INAUGURAL CONFERENCE2013

MACQUARIE UNIVERSITY
17–19 APRIL 2013

PLENARY SESSION ABSTRACTS

PRINCIPAL SPONSOR

MACQUARIE UNIVERSITY
SYDNEY ~ AUSTRALIA

ORGANISATIONAL SPONSOR

THE HEARING CRC

TABLE OF CONTENTS

AUSTRALIAN HEARING HUB **PLENARY SESSION ABSTRACTS**

In presentation order

WEDNESDAY, 17 APRIL 2013

PLENARY SESSION 1

Closing the gap: progress from preschool to elementary grades and high school in children with early cochlear implantation

Ann Geers [1]

1 University of Texas at Dallas, USA

Children with prelingual severe-profound deafness typically exhibit a verbal gap compared to hearing age mates that increases with age and is reflected in their speech, language and academic achievement. However over the past 20 years this expectation has been changing for children who receive a cochlear implant at a young age. These studies address the question: Can we expect children who receive a cochlear implant as infants to catch up with their normal hearing peers by elementary grades and to remain caught up when they graduate high school? One study examines development between elementary grades and high school in 112 children from across North America who received a cochlear implant between two and five years of age. A second study includes 60 children who were implanted even younger, at one or two years of age, and followed from preschool to 4th grade. These studies assess progress in speech production, language and literacy and document auditory, cognitive and social skills associated with early cochlear implantation. Finally, we identify factors that predicted which children would achieve age-appropriate outcomes in both elementary grades and high school.

THURSDAY, 18 APRIL 2013

PLENARY SESSION 2

Temporal auditory processing in children and the development of speech perception, language and reading

Jan Wouters [1]

1 Katholieke Universiteit Leuven, Belgium

Auditory processing is important for the development of speech and language. Research also indicates relations with the development of reading in people with dyslexia. In this contribution capita selecta of aspects of auditory neural processing and hearing screening, speech perception, language and reading will be reviewed. These reports will be illustrated with data obtained in children of different ages (neonates, 2, 5 and 10 year), using behavioral and objective measures, and quantifying neural responses from brainstem to cortex. These outcomes have become possible using recently developed methodologies for testing children.

PLENARY SESSION 3

Variable morpheme realization in early speech: implications for children with hearing loss

Katherine Demuth [1]

1 Macquarie University, Australia

Researchers have long observed that children variably omit grammatical morphemes (e.g., *the, wants*). This is generally assumed to be due to incomplete syntactic or semantic representations. However, recent research with typically developing children and those with language delay (SLI) has found that children's variable omission of grammatical morphemes is phonologically conditioned. Thus, children are more likely to produce grammatical morphemes in simple/'easy' phonological/prosodic contexts than in those that are more complex. These findings raise many questions regarding the nature of morphological development in children with hearing loss, where inflectional morphemes realized as a fricative (plurals –s, 3rd person singular –s, possessives –s) and prosodically weak morphemes (articles, pronouns, auxiliary verbs) may present perceptual challenges for children with hearing loss. The implications for designing more targeted interventions are discussed.

Mechanisms of selective attention: implications for children with language learning impairments

Phillip M. Gilley [1]

1 University of Colorado, Boulder, USA

Successful diagnoses for children with a language learning impairment (LLI) are primarily limited to behavioral assessments that may not reveal a deficit until well into the school-age years; long after the initial onset of language learning. The underlying mechanisms that give rise to LLI behaviors are not well understood, further complicating the differentiation of modality specific (e.g., auditory processing) and domain-general (e.g., attention) deficits. Current models of sensory processing, including language, suggest a dynamical interaction of endogenous

and exogenous processes, which optimizes feature extraction for behaviorally relevant inputs. We provide evidence that such processes can be differentiated by various oscillatory frequencies of the human EEG, which correspond with hierarchical processing of sensory inputs. The experimental manipulation of stimulus features (e.g. stimulus saliency, predictability) and attention demands (e.g., divided attention) reveals that these processes are both co-modulatory and coincident, which may reflect a probabilistic learning mechanism subserving language learning. Further, these results suggest that the extra-lemniscal pathways serving the limbic system are active in the modulation of these processes, which may underlie common behaviors in children with LLI.

FRIDAY, 19 APRIL 2013

PLENARY SESSION 4

Do children with hearing loss who receive early intervention catch up with their normal-hearing peers by elementary grades?

Teresa Ching [1,2,3]

1 Australian Hearing, 2 The HEARing CRC, 3 National Acoustic Laboratories

Congenital bilateral hearing loss greatly reduces children's language skills, academic attainment and life chances. Over the past 10 years, universal newborn hearing screening (UNHS) has been implemented across Australia, now reaching a national coverage of 95%. UNHS allows early detection and amplification, and its ultimate goal is to improve long-term outcomes at a population level. Can we expect children who received early intervention to catch up with their normal-hearing peers by elementary grades? In 2005, we conmmenced the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study to examine development of children with hearing loss over the first 10 years of life. This is a population-based, prospective study that evaluates outcomes in speech, language, literacy and psychosocial skills of children in NSW, Victoria and Queensland. Children were first tested at 6 or 12 months after initial intervention, and then at 3, 5 and 9 years of age. We assessed development of speech production, language and literacy, and psychosocial development. We identify factors that predicted which children would achieve more age-appropriate outcomes, and examine the extent to which early measures can predict later outcomes.

PLENARY SESSION 5

Breaking and entering the language faculty

Stephen Crain [1]

1 Macquarie University, Australia

When children gain entry to the language faculty, they are able to convey their wishes, beliefs, desires and personal experiences to others. In return, they gain access to what others wish for, believe, desire, and have learned from experience. This talk is about how language fosters communication. We will look inside the language faculty to see precisely how this is done.

Responding to diverse outcomes: implications for assessment, intervention and pedagogical approaches with deaf children

Greg Leigh [1,2,3]

1 RIDBC Renwick Centre, 2 Royal Institute for Deaf and Blind Children, 3 The University of Newcastle

The availability of newborn hearing screening (UNHS), the accessibility of cochlear implants, and the use of intensive aural practices in early intervention have served to heighten expectations about linguistic and educational outcomes for deaf children. The emerging evidence of positive outcomes associated with earlier cochlear implantation has led to an increasing nexus between early identification and earlier implantation.

This presentation considers the evidence from a range of sources (including the Long-term Outcomes for Children with Hearing Impairment study) that there remains diversity among the outcomes achieved by children with congenital hearing loss—associated with a number of factors including, inter alia, age of at cochlear implantation and presence of additional disabilities. The associated issues for professionals who are delivering early intervention and educational services to this group will be considered.

While age-appropriate outcomes are increasingly becoming the expectation for this population, there continues to be a need for a range of intervention/educational responses to be available for use with the full range of children with hearing impairment and their families. Effective intervention requires the development of assessment protocols, instruments, and intervention practices that are designed to identify departures from expected outcomes at the earliest possible time and to address those needs accordingly. The presentation will canvass a range of issues including current research into the development of assessment instruments for monitoring development in very young children.