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Centre of Research Excellence in Child Language

Submission to the Senate Community Affairs Inquiry into the prevalence of different types of speech, language and communication disorders and speech pathology services in Australia.

About us

The Centre of Research Excellence in Child Language is a collaboration of some of the world's leading child language experts. It is funded by the Australian National Health and Medical Research Council and is the only research group in the world that has built a wealth of data on speech, language, literacy and stuttering.

The Centre uses the latest approaches in epidemiology, neuro-imaging, molecular genetics, biostatistics and health economics to investigate:

- how language develops
- what can go wrong, when and why
- how to best deliver services to children with Language Impairment.

About our submission

This submission focuses on the development of language and Language Impairment in children from birth until eight years of age. A more detailed discussion of other communication disorders in other age groups will be addressed by other submissions, such as those by Speech Pathology Australia, The Royal Children's Hospital (concerning cleft lip and palate) the Murdoch Childrens Research Institute (concerning speech development), the University of Melbourne (concerning research funding) and the Australian Stuttering Research Centre (concerning stuttering).

Terminology

Language is defined as the ability to understand and use both spoken and written language (for example, the ability to put words together to form phrases and sentences). Language skills are critical for literacy and numeracy development.

Language Impairment is a difficulty understanding or using oral language when compared to developmental peers. This is different to a speech problem (which refers to difficulty coordinating the lungs, vocal cords and/or mouth to make speech sounds) or problems reading and writing (traditionally and narrowly described as literacy). Someone's language is considered 'impaired' when their use of language has lasting adverse effects on their ability to function effectively in social, employment and educational domains.

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Language is a critical skill for both individual health and national prosperity and health. Language underpins an individual's literacy and numeracy as well as their ability to lead a productive life and be a full participant in society. Language is also the key to Australia's future success and prosperity as a service economy.

Key points of the submission

- The way language develops is complex and can accelerate, plateau and sometimes go backwards.
- These fluctuating developmental pathways make it hard to accurately predict persistent Language Impairment.
- Language Impairment is common. The paediatric prevalence is equivalent to that of obesity.
- Language Impairment has costly, persistent and far-reaching consequences, including poor school performance and completion rates, reduced employment opportunities and increased risk of criminality.
- Early detection and intervention programs have economic and social benefits at the individual, familial, community and national level.
- The current service system does not meet the language needs of preschool and early school-aged children. It is based on a specialist health care model that is not equitable, efficient or effective.

Recommendations

1. Language Impairment should be a new National Health Priority area.
2. The federal Department of Health should conduct an audit of the state of children's speech, language and communication needs in Australia.
3. A national reporting system should be established to monitor prevalence of Language Impairment across the population.
4. Alternative service models should be tested to meet demand in a way that is both evidence-based and equitable.
5. It should be a priority to develop practical tools that zero in on young children destined for lasting Language Impairment.

Nature of language development

- The first five years of life are critically important for the development of language.
- Language pathways are complex and variable.
- For a number of children, there is no one time between birth and age seven when a single assessment of language can be confidently used to predict lasting Language Impairment.
- Language development and impairments are informed by both genetics and the environment.

In the first five years of life, children's language and communication skills develop very rapidly. By the time they start school, they have developed sophisticated language skills that enable them to form relationships and to negotiate the considerable variety of new experiences and situations that are at the heart of every child's development.

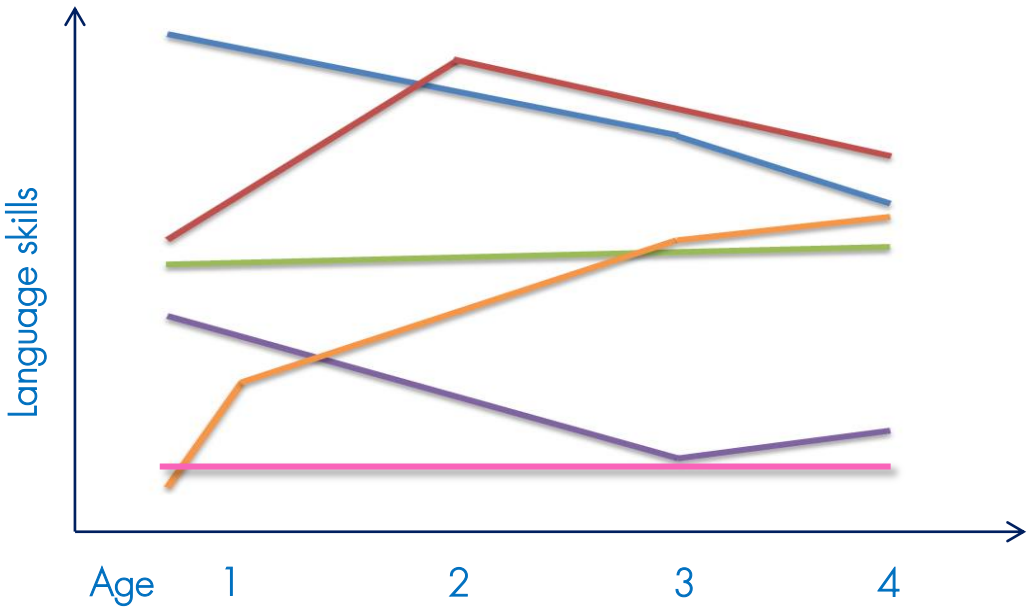
Critically, language does not develop in a predictable or consistent way – even in children with typical language abilities. It was previously thought that the development of language followed a relatively stable, upwards trajectory. However, our studies have shown that language development in many children under five can accelerate, plateau or even go backwards within the space of a year. For example, while children who are late to start talking are often presumed to be at greater risk of Language Impairment, many late-talking two-year olds catch up by the time they are four. Meanwhile, a number of children who have typical development in their talking at two years of age go on to show impairment in their language by age four.

These fluctuations make it very hard to accurately identify and predict which children will have sustained Language Impairment. The natural fluctuations that occur can be so great that a single point of assessment (e.g. age four) will be a poor predictor of future Language Impairment. For a number of children, there is no one time between birth and age seven when a single assessment of language can be confidently used to predict lasting Language Impairment. What would otherwise be considered developmental 'red flags' for Language Impairment can coincide with natural points of fluctuation.

Language Impairment arises from a complex interplay of genetic, neurological and environmental factors. There is no single or simple cause, and the nature of 'impairment' varies. A number of studies have demonstrated that language development and Language Impairment are shaped by genetics, but little is definitively known about the specific genes involved. We will be exploring these areas in our Centre over the next few years. The way in which environments influence the development of language and Language Impairment is more clearly understood. For example, we know that experiences in the first few years of life literally shape the anatomy of a child's highly 'elastic' or malleable

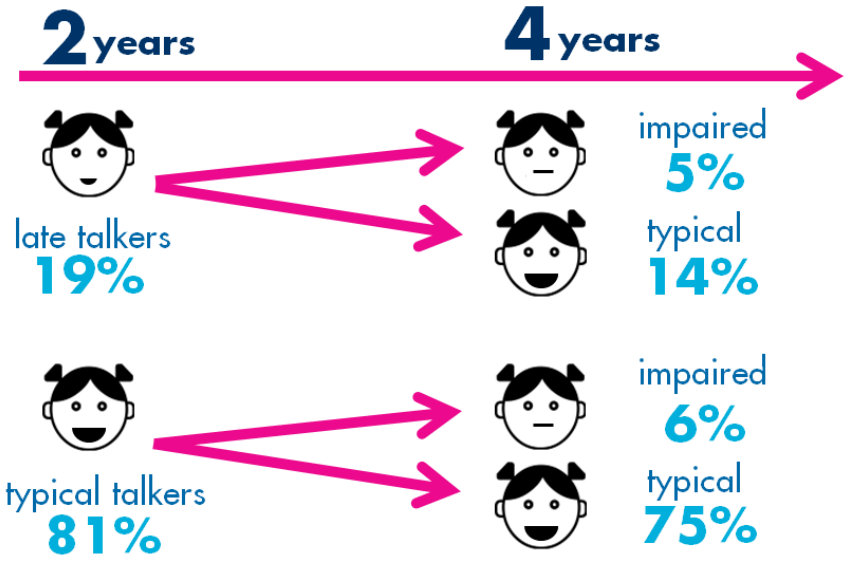
developing brain. This is why therapies and interventions focus on the environmental determinants.

The variable pathways between one and four years of age



Adapted from Ukoumunne, O.C., Wake, M., Carlin, J., Bavin, E.L., Lum, J., Skeat, J., Williams, J., Conway, L., Cini, E., Reilly, S. (2012) Profiles of language development in pre-school children: a longitudinal latent class analysis of data from the Early Language in Victoria Study. *Child: Care, Health and Development*, 38(3): 341-349.

Trajectories of two-year old late talkers



'Girl' graphic courtesy of Peacock Dream, The Noun Project

Prevalence and demographics

- Language Impairment is as common as childhood obesity.
- One in five children under five have difficulties understanding what is said to them and/or expressing themselves.
- Language Impairment is more common in disadvantaged populations, and in children who have other developmental impairments or a family member with a Language Impairment.

One in twenty (or five per cent) of Victorian children under the age of 14 have Language Impairment. Among four year olds, this can be as high as one in five (20 per cent), which equates to 50,000 Victorian children – the same number of obese children. These figures are thought to be nationally representative, equating to some 220,000 language-impaired Australian children. While obesity has been a National Health Priority area since 2007, Language Impairment is often not viewed as a disability of consequence, despite costly, persistent and far-reaching consequences.

Language Impairment involves a variety of elements and different levels of severity at different ages. Of those four year olds with Language Impairment, around 2 per cent also have general learning disabilities while 7.5 per cent have a specific Language Impairment. Although children with Language Impairment come from all socio-economic backgrounds, Language Impairment is more common in children who live in a vulnerable or disadvantaged community. In the most socially disadvantaged populations, up to 50 per cent of children can have Language Impairment. For Aboriginal and Torres Strait Islander children, the figure may be higher still. We also know that more and more Australian children are being raised in culturally and linguistically diverse environments and that the wide heterogeneity in bilingual children's communication skills may also represent a subset of children with unique language needs.

Language Impairment is also more common in children who:

- have a family member with a history of language or literacy difficulties
- have other developmental impairments such as behavioural problems.

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Comparison of condition prevalence in Victoria

Condition	Cases per 100,000
Type 1 diabetes	100
Obesity	5,000
Congenital heart disease	500
Cerebral palsy	200
Asthma	13,000
Language Impairment	5,000

Consequences of Language Impairment

- Language Impairment is a barrier to full participation in society.
- Language Impairment has a major role in predicting poor long-term educational, employment and economic outcomes.
- Language Impairment is associated with poor mental health, antisocial behaviour and criminality.

Learning to communicate is a critically important skill. At its most basic, it enables us to make and keep friends, regulate our behaviour and negotiate new experiences. We know that four year olds with Language Impairment are more likely to have:

- other communication problems
- motor delays
- behaviour problems
- a need for specialist health care services.

Language skills provide the foundation for other forms of learning. Language Impairment triples the chances of poor attainment in reading, spelling and mathematics with consequent high rates of school non-completion and restricted work opportunities.

There is increasing evidence that Language Impairment translates into serious co-morbidities and burdens. It is estimated that two-thirds of people with communication disorders are unemployed or in the lowest income brackets. For example, for hose unable to speak intelligibly, unemployment is an astonishing 75.6 per cent. As Australia increasingly makes the shift from a blue collar, manual labour economy towards a white collar, communication-focused one, Language Impairment is becoming more of a barrier to full participation in society. The difficulties associated with Language Impairment are further exacerbated in times of economic downturn.

The correlation between Language Impairment and antisocial behaviour is also well established. Language Impairment affects the mediation of interpersonal exchanges, limits the ability to adopt another perspective and creates a sense of detachment from school. Recent studies in Victoria have suggested that around half of young male offenders within the juvenile justice system have a significant Language Impairment and similar prevalence rates have been identified in community and custodial settings. These figures are comparable with those identified in studies in the US and the UK.

Costs of Language Impairment

- Language Impairment represents a 'double' financial burden to individuals and families through high lifetime therapy costs and reduced lifetime earnings.
- Language Impairment represents a significant cost to governments through an increased welfare burden and criminality as well as lower productivity and reduced tax revenue.
- Language Impairment receives around one fifth of the funding that the NHMRC allocates to obesity despite similar rates and significant, enduring consequences.

Once language problems are established, they are difficult and costly to treat. The median cost per year for remedial language services for Australian children in 2009 was estimated at $1061 (range $34 to $16,546) per child. Given the intractability of many language problems, a number of children will require therapy for many years, resulting in substantial lifetime costs. Language Impairment represents a 'double' burden as not only does it involve substantial expense in the form of therapy costs, but also lost income from reduced employment due to poor educational attainment and/or associated social conditions such as poor mental health. Economic modelling of UK data has estimated that every UK pound invested in speech and language therapy yields a six-fold increase in lifetime earnings. On face value, this may represent a cost borne only by individuals or families, but this cost is borne by the whole nation through an increased welfare burden, lower productivity and lost tax revenue, reduced social cohesion, and higher criminality.

It is harder to pinpoint the exact cost of Language Impairment to the nation as the costs are borne by a range of sectors and departments, including education, welfare and justice. However, we know that Language Impairment not only prevents individuals from achieving their maximum potential, but limits national prosperity and advancement. As a National Health Priority, obesity has for many years now received more government attention and National Health and Medical Research Council funding. In the 2011-12 financial year alone, obesity research was awarded more than seven times the amount allocated to speech and language disorders research ($37 million compared to $5 million).

Therapy services

- Therapy services are generally not located in areas with the greatest treatment needs.
- The current approach to identifying Language Impairment results in both under and over servicing.
- Speech impairments and stuttering are more recognisable than Language Impairment and so are more likely to be treated.

In Australia the match between needs and services is poor, and there is evidence of both under-servicing and over-servicing. This is due in part to the distribution of speech therapy services. For example, in Victoria the greatest concentration of these services is found in the least disadvantaged areas with few or sometimes no services in areas with the highest risks for Language Impairment. This reflects and reinforces the fact that therapy services are more readily accessed by wealthier families, entrenching social inequities.

The current approach to treating Language Impairment contributes to this imbalance in services; children often receive treatment on the basis of a single assessment. Given the fluidity of language development and the often transitory nature of Language Impairment, this leads to a system where those who perhaps no longer need help are still receiving services while those who would now benefit from treatment miss out.

Parents are also more likely to seek help if their child has obvious speech problems, which means that certain kinds of communication disorders receive more attention. Although Language Impairment may be harder to pick up, it is just as critical to address.

One of the key issues in understanding language development will be to examine the extent to which interventions may alter the course of these pathways. Our Centre of Research Excellence plans to conduct more studies examining the effectiveness of 'best practice' interventions on children's language pathways. We will also use effectiveness data from Cochrane reviews to estimate the threshold for change that may be achieved by implementing those interventions that have shown the most potential.

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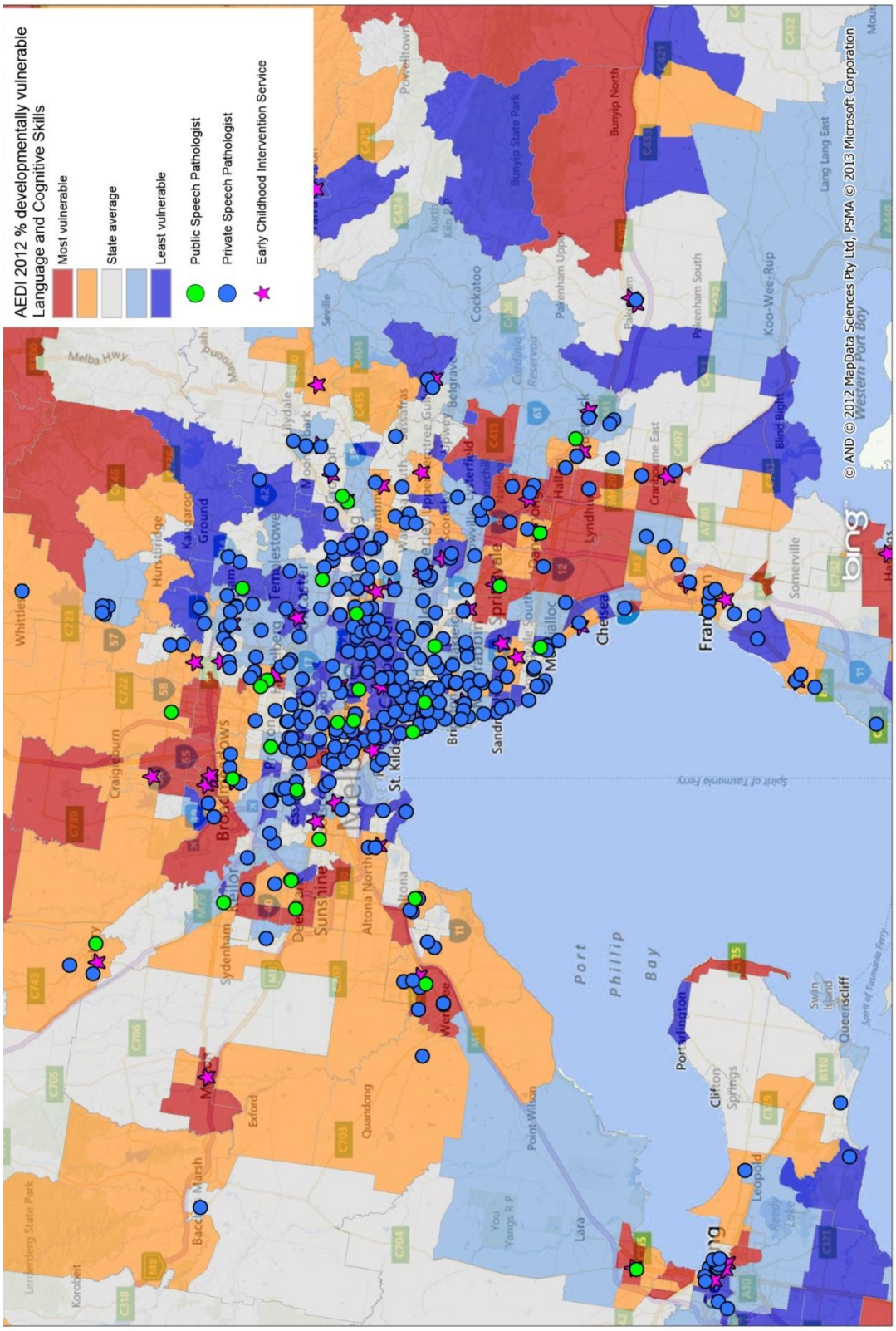
Example of therapy service distribution

Location of public and private speech pathologists in Victoria mapped against areas of language and cognitive skill vulnerability



Source: Australian Early Development Index 2012
Megan Harper, Department of Education and Early Childhood Development

Recommendations

Recommendation 1: Language Impairment should be a new National Health Priority area.

Addressing Language Impairment should be a new National Health Priority given its prevalence, significant and enduring consequences, and enduring costs for individuals, families and the nation. Without a high profile and an increase in funding, more effective and efficient diagnostic tools and intervention programs will not be developed. Making Language Impairment a National Health Priority area will increase community understanding and recognition of Language Impairment. Promoting the importance of language development and what can go wrong and when, will enable a range of education and health professionals to ensure that children who need treatment will receive it early. Existing health promotion channels could be leveraged for this purpose, such as the *Raising Children Network*, a leading Australian parenting website supported by the Department of Social Services.

Recommendation 2: The federal Department of Health should conduct an audit of the state of children's speech, language and communication needs in Australia.

Such an audit would provide a comprehensive analysis of the adequacy, strengths and limitations of existing services. This audit could be similar to the review the UK government commissioned in 2007, which resulted in the detailed Bercow Report and subsequent initiatives such as Better Communication. The audit would be a logical extension of the current Senate Inquiry and would involve:

- Consulting extensively with individuals, families and communities from a variety of demographic subsets that are directly affected by speech, language and communication needs, including but not limited to culturally and linguistically diverse and Aboriginal and Torres Strait Islander communities.
- Consulting extensively with a range of children's health and education providers, including but not limited to early childhood education and care centres, primary schools, secondary schools, speech and language therapists and special needs coordinators.
- Commissioning research by leading academics in the field of speech, language and communication needs into specific areas of interest to ensure that policies, programs and services are evidence-based and as equitable, effective and efficient as possible.

Recommendation 3: A national reporting system should be established to monitor prevalence of language impairment across the population.

Developing a set of national language reporting indicators would assist policymakers to evaluate both policies and services. This could be built on existing Commonwealth and State administrative survey data (including the Australian Early Development Index). This reporting system could also be embedded into existing mechanisms such as the federal government's 'Headline Indicators for Australia's Children' to maintain a focus on Language Impairment.

Recommendation 4: Alternative service models should be tested to meet demand in a way that is both evidence-based and equitable.

Despite the efforts of professionals in health and education, the needs of children and families are not being met. The current model, which consists largely of 'targeted specialist interventions' delivered by speech pathologists, is not sustainable or equitable. A shift is needed in emphasis, analogous to that in other areas of healthcare, from a specialist clinical focus to one grounded in public health principles. Testing alternative service models would ensure the use of the most equitable, efficient and effective approaches to language promotion and early intervention.

In the first instance, such an approach could involve harnessing the increasing interest from Medicare Locals as place-based advocates of child health and development. The Australian Early Development Index could also be used to identify geographic areas with higher rates of developmental vulnerability in which to test alternative service approaches and programs. This would enable the generation of new evidence about what works in areas of high need and would complement the Federal Government's already considerable investment through Communities for Children. Our Centre is developing an accessible, short form method for detecting children at higher risk for Language Impairment, which may prove useful in identifying specific children that could participate in this different service paradigm.

Recommendation 5: It should be a priority to develop practical tools that zero in on young children destined for lasting Language Impairment.

Language development is very fluid in the early years. Even if it were feasible to offer a language screen to 100% of young children, many would then receive services needlessly, as their Language Impairment would have resolved anyway. More concerning, others would miss out, as their high degree of long-term risk would 'fly under the radar'.

Clinicians need simple-to-use tools that help them to pinpoint a child's risk of future poor language and/or academic outcomes. We draw parallels with the Cardiovascular Risk Prediction charts now widely used by general practitioners. These colour-coded charts tell individuals their risk of a cardiac event over the next five years, drawing on a combination of straightforward factors such as age, sex, blood pressure, body mass index, smoking and family history.

A similar predictive tool for children's language could be based on the large-scale datasets held by our Centre. The Centre's rigorous population cohorts include detailed information across the first decade of life, both on risk (eg toddler vocabulary, language screens, family history, other risk factors) and outcomes (lasting language and academic achievement in the school years). With a time-limited analytic input, a Language Risk Prediction Chart could be fast-tracked, without the need to mount expensive new studies and wait for children to mature.

We recommend prioritising a Language Risk Prediction Chart to help understand a young child's risk of 5-year adverse language or academic outcomes. This would let professionals and parents really focus in on those children with most to gain from preventive or treatment interventions. It would also represent a practical and important step towards better language and literacy skills for Australia's children.

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Guide to further reading

Centre of Research Excellence in Childhood Language

Murdoch Children's Research Institute (MCRI) was successful in being awarded $2.5 million funding for a Centre of Research Excellence in Child Language (CRE-CL). This will link a number of Australian and international studies with the aim of advancing the science of how language develops, what goes wrong and when and how to intervene. The CRE-CL will bring together some of the best research, and leading researchers in the world incorporating the following organisations - MCRI, Deakin University and the Parenting Research Centre (all Melbourne based) – and international collaborators at the University of Newcastle (UK), and Universitiy of Iowa (USA).

Background

Spoken language is a characteristic that defines the human species. How this ability develops underpins the health, productivity, and social well-being of individuals. Language is critical to achieving ones full potential in life. Although most children acquire speech and language skills with relative ease, many do not. Importantly, this sizeable group accounts for disproportionate subsequent population health, social and economic burden. Yet research in the field has been chronically underfunded and fragmented, resulting in evidence gaps, limited research capacity, and uncoordinated, poorly-informed and often contradictory advice for policy-makers and practitioners.

Approach

This CRE-CL will address these issues. As a result of the data resources established over the last 10 years, we are uniquely well-positioned internationally to advance understandings in this field. The investigators administer or have access to several highly-harmonised cohort studies incorporating over 37,000 children, which include hearing and deaf populations and those with and without exposure to early interventions. The main approach of the CRE-CL will be to further harmonise these studies and enrich them with further follow up, genetic information, brain imaging, educational outcomes and health service utilisation. From this, we will be able to build a repository of information linking genes, brain and language behaviours in population studies. Further, we can enhance knowledge about the stability and fluidity of language pathways and factors that predict variation.

With our strength in 'real-world' population-based randomised trials and our close networks to service-providers and policy makers, we will be able to put the information thus generated into new approaches that can be tested and rapidly integrated into service platforms. This will help to ensure effective translation of research into health policy and practice and implement a sustainable cycle of knowledge exchange.

Murdoch Childrens Research Institute

Murdoch Childrens Research Institute is the largest and most prestigious child health research organisation in Australia.

Our team is dedicated to finding innovative ways to treat and prevent conditions affecting the health of babies, children and adolescents.

Because every discovery we make will help children live healthier happier lives.

Murdoch Childrens Research Institute is the largest and most prestigious child health research organisation in Australia.

Our team of 1,400 passionate researchers is driven by the excitement of discovery and the ambition to conduct innovative, world class research to make a real difference to the health and wellbeing of children.

As governments and other grant making bodies tend to support established research, philanthropic and corporate funds are vital to providing the seed funding we need to bring bold, daring and innovative research ideas to life.

We are currently focussed on conditions such as diabetes, allergies, asthma, premature birth and mental health problems which are on the rise in our children, and conditions such as cancer and genetic disorders that remain unsolved.

Biographies of submission contributors

Professor Sheena Reilly PhD FASSA

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Professor Sheena Reilly is Associate Director of Clinical and Public Health (Murdoch Childrens Research Institute), Professor of Paediatric Speech Pathology (University of Melbourne) and Honorary Speech Pathologist (Royal Children's Hospital). She has held an NHMRC Practitioner Fellowship since 2008; is a Fellow of the Australian Academy of Social Sciences, the UK Royal College of Speech and Language Therapists and Speech Pathology Australia. She is an Honorary Professor with the Australian Stuttering Research Centre, University of Sydney, Visiting Professor, Neurosciences Unit, Institute of Child Health, University of London and Visiting Fellow University of Newcastle upon Tyne, UK.

Sheena's research programme focuses on speech and language difficulties in children. She leads a series of cross-disciplinary studies, focusing on understanding the epidemiology of common problems that have long-lasting effects and the social, demographic and/or family factors that explain these.

Sheena has attracted competitive research funds from the NHMRC, ARC as well as international sources such as the NIH (over $14 million). She has more than 150 publications including over 110 peer reviewed original works in highly ranked journals such as Pediatrics, British Medical Journal and Brain. . In 2012 she was awarded an NHMRC Centre of Research Excellence grant to establish the Centre of Research Excellence in Child Language.

Professor Melissa Wake

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Professor Melissa Wake is a consultant paediatrician, Associate Director of the Centre for Community Child Health and co-leads the MCRI's Community Health Services Research Group. Her research focus is on 'population paediatrics' - how can universal and secondary care providers make a difference to children's health and development, and what systems are needed

to achieve this? To this end, she has established Australia's leading community child health randomised trials group, informed by her epidemiological studies in focus areas of language and literacy, hearing loss, overweight and obesity, and early mental health. In 2013-17, she is leading Growing Up in Australia's Child Health CheckPoint, a cutting-edge physical and biomarkers module for the Longitudinal Study of Australian Children.

Her landmark work to solve common child health problems was celebrated in the 2009 Australian Health Minister's Prize for Excellence in Health & Medical Research; other awards include the 2013 Elizabeth Blackburn Fellowship and consecutive national Excellence Awards (2008, 2012) for top-ranked NHMRC fellowship spanning all three biomedical, clinical and population health pillars.

She holds joint appointments with the Royal Children's Hospital, Murdoch Childrens Research Institute, and the Department of Paediatrics at the University of Melbourne.

Professor Jan Nicholson

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Professor Jan Nicholson is Research Director at the Parenting Research Centre, Honorary Principal Research Fellow at the Murdoch Childrens Research Institute, and Adjunct Professor in the School of Early Childhood, Queensland University of Technology. She has a background in child and family psychology with post-doctoral training in public health. Jan's research examines the influence of contemporary family, social and organisational environments on children's healthy development, with a particular focus on vulnerable families.

Jan is Design Team Leader for parenting and family functioning in the Longitudinal Study of Australian Children (LSAC), a national study tracking the health and development of two cohorts of 5000 children each. She leads a program of independent LSAC research examining: the trajectories and effects of mothers' and fathers' parenting and mental health; the effects of mothers' and fathers' work on parents and children; socioeconomic inequalities in health and development; and the determinants, trajectories and health care costs of common childhood disorders including child mental health, language, literacy, obesity and oral health.

Jan heads an NHMRC-funded cohort study of children with Attention Deficit Hyperactivity Disorder, and is co-investigator on studies promoting effective parenting, early literacy and healthy early life nutrition. In her role as Research Director at the PRC, Jan has overseen a state-government funded cluster-randomised controlled trial of an intervention to assist disadvantaged

parents provide their young children with an enhanced early home learning environment, the results of which have led to the state-wide implementation of the program.

Professor James Law PhD FRCSLT

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Professor James Law is Professor of Speech & Language Sciences at Newcastle University, England. With a background in linguistics and speech and language science he practised as a speech and language therapist in Hackney East London before receiving his PhD "Two and half year olds in Hackney, London - The early identification of language impairment and a description of related factors" in 1993. Since then he worked in the Department of Language and Communication Sciences at City University and as Director of the Centre for Integrated Healthcare Research in Queen Margaret University, Edinburgh before moving to the School of Education, Communication and Language Sciences at Newcastle University, UK. James' main research interests are intervention and evidence based practice in the field of speech and language science and examining the long term outcomes of children with language impairment. He has been investigator on grants of over £4m in total, the most recent in the UK being the Better Communication Research Programme (UK £1.5) and the NHMRC funded Centre for Research Excellence in Child Language.

Associate Professor Lisa Gold

W www.deakin.edu.au

Associate Professor Lisa Gold leads research in the economics of maternal and child health at Deakin Health Economics, Deakin University. Lisa is a health economist with particular expertise in the economic evaluation of health and social interventions that aim to improve population health and reduce health inequalities. Over the last fifteen years, Lisa has designed and successfully conducted a large number of economic evaluations in public health related issues as well as systematic reviews of evidence and methodological development in economic evaluation in the UK and Australia. Lisa is currently providing the economic input to evaluations of a range of public health interventions in maternal and child health, including trials of enhanced

midwifery care and peer support for pregnancy and breastfeeding outcomes, family oral health promotion, early language development support, and support for sleep problems and for low working memory in primary school-aged children. The economic research in these studies involves assessing both the investment required by the intervention (in terms of time and resources devoted by participants, health/education providers and communities) and the values held by children, parents, providers and the general public for the outcomes of the intervention.

Associate Professor Sharon Goldfeld

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Associate Professor Sharon Goldfeld is a paediatrician and public health physician at The Royal Children's Hospital Centre for Community Child Health (CCCH) and a Research Fellow at the Murdoch Childrens Research Institute. Associate Professor Goldfeld has a fundamental understanding of the Victorian health and education system, child health and development. She has worked in state government for 10 years and until recently was the Principal Medical Advisor for the Victorian Department of Education and Early Childhood Development. She has been the recipient of the prestigious international Harkness Fellowship in Health Care Policy and the Aileen Plant Medal in Public Health Research. Associate Professor Goldfeld has established a child health equity and policy research group including the Australian Early Development Index Research Program at CCCH with a focus on children with additional health and developmental needs, mental health and children with diverse language backgrounds. She is heading the research stream of the right@home Australian national nurse home visiting trial planned for implementation in 2013 in Victoria and Tasmania. Overall the research program brings together a number of secondary analysis studies and intervention trials that highlight and address issues of equity, particularly those most relevant to the child health and education policy environments. She is also a chief investigator on the NHMRC Centre of Research Excellence in Child Language where she focuses particularly on the translational elements of the research.

Dr Fiona Mensah

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Dr Fiona Mensah is an NHMRC Postdoctoral Fellow at the Murdoch Children's Research Institute and Royal Children's Hospital. Her research interests are in child health inequalities; children's development in the context of social disadvantage and family adversity; and the relationships with access to health and developmental services.

Fiona contributes expertise in Biostatistics and Social Policy within the Centre for Research Excellence in Childhood Language, particularly supporting longitudinal data analyses of The Early Language in Victoria Study.

Her work also focuses on epidemiological studies of families and children's development and health including The Longitudinal Studies of Australian Children, The Maternal Health Study and The Childhood Resilience Study. She also supports community based trials of early interventions to improve children's health and development including right@home, a trial of intensive nurse home visiting for vulnerable families beginning in pregnancy and working with families through the child's infancy; and Bridging the Gap, a quasi-experimental project to address inequities in maternal and child health care for refugee families through building organisational and system capacity. Her previous research has been based in the UK using The Millennium Cohort Study where she studied the relationships between the family environment, parenting behaviours and children's health and development.

Dr Angela Morgan

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Dr. Angela Morgan is Co-leader of the Hearing, Language and Literacy research group at MCRI and Senior Lecturer at the University of Melbourne. Angela is a Speech Pathologist who completed postdoctoral training in neuroscience and neuroimaging methods at the University College London Institute of Child Health. Angela has an impressive track record, having amassed over 80 publications, represented in quality high impact journals such as Brain and Neurology. She is currently Associate Editor of the International Journal of Speech-Language Pathology. Angela has attracted over $7.2M of research funding in the past 8 years post-PhD. She has received a number of awards recognising the quality of her research including an NH&MRC Achievement Award 2010; Elizabeth Usher Memorial Award for Speech Pathology in 2012; and a Young Tall Poppy Science Award in 2010. Her current NH&MRC and ARC funded research consists of two streams. The first is discovery focused and examines the neurobiological bases of childhood communication disorders. Angela's team uses structural and functional imaging techniques to explore neural markers for outcome associated with childhood speech and language disorders. She also leads a program of work on speech and language phenotyping in collaboration with leading Australian geneticists who have been highly successful using 'family-based' approaches to gene discovery in epilepsy. Angela and colleagues are using similar 'family-based' approaches to discover novel genes for childhood communication disorder. The

second stream is focused on direct clinical translation. Angela's clinical-research team is focused on improving diagnosis, prognosis and treatment for children with speech, language and swallowing disorders. Her research is cited in international guideline and policy documents, including the influential UK government commissioned Bercow Review of Speech Therapy Services for Children and Young People.

Dr Nathan Hughes

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Dr Nathan Hughes is Senior Lecturer in Social Policy at the University of Birmingham, and Marie Curie Research Fellow at the Murdoch Childrens Research Institute. He has extensive experience of working with local services, policy think tanks and central government departments in undertaking research, evaluation and knowledge transfer, including most recently with the UK Cabinet Office, the Transition to Adulthood Alliance and the Children's Commissioner for England. His current research focuses on offending amongst young people with neurodevelopmental difficulties, examining the implications of emerging understandings from neuroscience for policy and practice.

Dr Patricia Eadie is a Senior Lecturer in Speech Pathology at the University of Melbourne; a Senior Research Collaborator, Language and Learning Projects with the Norwegian Institute of Public Health and holds an Honorary Research position with the Murdoch Childrens Research Institute. Her research focuses on the developmental pathways to language development & language disorder and associated risk and protective factors (i.e., the Early Language in Victoria Study & the Norwegian Mother & Child Cohort Study – MoBa). She has published in the area of differential diagnosis of language delay and specific language impairment, as well as access to speech pathology services.

Dr Patricia Eadie

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Dr Ruth Nicholls is a Certified Practicing Speech Pathologist and Lecturer at The University of Melbourne. Prior to her current role, Dr Nicholls has worked as a paediatric speech pathologist across both public and private sectors, including early intervention, education, health and private practice. Dr Nicholls has particular experience working with young children with speech, language and communication disorders. Her research expertise is in the area of multilingualism,

with her doctoral research investigating how Australian children acquire English as well as their home languages during early childhood.

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Speech Pathology Australia terminology

Taken from the Speech Pathology Australia submission to the Senate Community Affairs References Committee

What is a Speech Pathologist?

A speech pathologist has been trained to assess and treat people who have a communication disability or swallowing problem. Speech pathologists complete a tertiary degree that encompasses all aspects of communication including speech, language, voice, and fluency multimodal communication (use of augmentative and alternative communication methods), as well as swallowing.

What is a Communication Disability?

Communication includes being understood as well as understanding others, in speaking, listening, reading, writing and body language.

There are five areas of communication:

1. Speech the physical production of sounds
2. Language understanding what words mean, putting sentences together, writing clearly, understanding written language
3. Fluency the smooth rhythm and pattern of talking
4. Voice the production of sound by vibrating the vocal cords
5. Pragmatics the verbal and non-verbal conventions for how we effectively interact socially with each other.

Speech pathologists work across all of these areas, promoting the functional development and/or recovery of communication skills. For clients with severe problems with communication, speech pathologists support the use of augmentative and alternative approaches to communication (for example, communication systems and electronic devices).

What do we mean by a disability?

According to the World Health Organisation, disability is "any restriction or lack of ability (resulting from an impairment) to perform an activity in the manner or range considered normal for a human being."

Communication – the process of being able to understand and to be understood – is something most of us take for granted. Communication disability occurs when one or more of the areas of communication are ineffective. A communication disability can be temporary or permanent. It can be mild, moderate or severe, and be present from birth or acquired later in life. Communication disabilities can arise from impairments of speech, using and understanding language, voice, fluency, or pragmatics.

People may experience difficulty producing speech sounds in words and sentences or experience a total inability to make the mouth movements required to say words. Other problems include reading and writing difficulties, inability to understand and use appropriate body language and difficulty understanding the cause and effect of social actions.

Children born with conditions such as Cerebral Palsy or Down syndrome may have a communication or swallowing disability. Catastrophic events such as motor accidents or stroke can give rise to the acquisition of a communication or swallowing disability, as can conditions such as Parkinson's disease, Multiple Sclerosis, and dementia. Hearing impairment may also impact on communication. Communication disabilities can also be developmental, with no known underlying cause.

The Raising Children Network

The Raising Children website offers up-to-date, research-based material on more than 800 topics spanning child development, behaviour, health, nutrition and fitness, play and learning, connecting and communicating, school and education, entertainment and technology, sleep and safety.

It covers grown-ups, newborns (0-3 months), babies (3-12 months), toddlers (1-3 years), preschoolers (3-5 years), school-age children (5-9 years), pre-teens (9-11 years), and early teens (12-15 years).

Use the website to print step-by-step guides o essential baby care skills such as breastfeeding, bathing and changing nappies.

RCN works with peak organisations and incorporates the advice and input of more than 180 experts. It researches and commissions original content, forms partnerships to incorporate quality content produced elsewhere and draws on existing parenting information from many sources.

All material has been developed to be engaging and relevant, with a focus on accessibility and reliability.

For further information see http://raisingchildren.net.au

Murdoch Childrens Research Institute
Healthier Kids. Healthier Future.

Further reading guide

Theme	Paper/Report
Nature of language development	1. Bishop, D.V.M. (2014) Ten questions about terminology for children with unexplained language problems, *International Journal of Language and Communication Disorders,* Special Issue In press 2. Reilly, S., Tomblin, B., Law, J., McKean, C., Mensah, F., Morgan, A., Goldfeld, S., Nicholson, J., & Wake, M. (2014). Specific Language Impairment: a convenient label for whom? *International Journal of Language and Communication Disorders,* Special Issue In press 3. Ukoumunne, O.C., Wake, M., Carlin, J., Bavin, E.L., Lum, J., Skeat, J., Williams, J., Conway, L., Cini, E., Reilly, S. (2012) Profiles of language development in pre-school children: a longitudinal latent class analysis of data from the Early Language in Victoria Study. *Child: Care, Health and Development*, 38(3): 341-349. 4. Zambrana, I.M., Pons, F., Eadie, P., Eivind, Y., (2013) Trajectories of language delay from age 3 to 5: persistence, recovery and late onset, *International Journal of Language and Communication Disorders* 2013 Dec 31. doi: 10.1111/1460-6984.12073
Prevalence and demographics	5. Reilly, S., Wake, M., Bavin, E.L., Prior, M., Williams, J., Bretherton, L., Eadie, P., Barrett, Y., Ukoumunne, O.C. (2007) Predicting language at 2 years of age: A prospective community study. *Pediatrics*, 120(6): E1441-E1449. doi:10.1542/peds.2007-0045 6. Reilly, S., Wake, M., Ukoumunne, O., Bavin, E., Prior, M., Cini, E., Conway, L., Eadie, P., Bretherton, L. (2010) Predicting language outcomes at 4 years of age: Findings from Early Language in Victoria Study. *Pediatrics*, 126(6): E1530-E1537. doi: 10.1542/peds.2010-0254. 7. Tomblin, J. B., Records, N. L., Buckwalter, P., Zhang, X., Smith, E., O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children. *Journal of Speech, Language, and Hearing Research*, 40(6), 1245.

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Costs of Language Impairment	10. ICAN The cost to the nation of children's poor communication – ICAN Talk Series Issue 2 UK 11. Marsh, K., Bertranou, E., Suominen, H., Venkatachalam, M.,(2010) An economic evaluation of speech and language therapy Matrix Evidence Final Report prepared for Royal College Speech and Language Therapists UK 12. Sciberras, E., Westrupp, E.M., Wake, M., Nicholson, J.M., Lucas, N., Mensah, F., Gold, L., Reilly, S. (2014) Healthcare costs associated with language difficulties up to 9 years of age: Australian population-based study. International *Journal of Speech-Language Pathology*. In Press 13. Skeat, J., Gold, L., Wake, M., Ukoumunne, O., Reilly, S. (19/9/2011) Letter to the Editor: The costs of preschool communication problems: Population study. *Medical Journal of Australia*, 195(6): 322-323. 14. Skeat, J., Wake, M., Ukoumunne, O., Eadie, P., Bretherton, L., Reilly, S. (2013) Who gets help for preschool communication problems? Data from a prospective community study *Child: Care, Health & Development* 22 MAR 2013, doi: 10.1111/cch.12032.
Therapy services	15. Bercow, J., MP (2008) The Bercow Report: A Review of Services for Children and Young People (0-19) with Speech, Language and Communication Needs. Nottingham: SCSF Publications 16. Bercow, J., MP (2008) The Bercow Report: A Review of Services for Children and Young People (0-19) with Speech, language and Communication Needs Executive Summary. Nottingham: SCSF Publications. 17. Centre of Research Excellence in Child Language (2013)

	Help vs Need. Centre of Research Excellence in Child Language Research Snapshots Number 1. 18. Law, J., Reilly, S., Snow, P., (2013) Child speech, language and communication need in the context of public health; a new direction for the speech and language therapy profession. *International Journal of Language and Communication Disorders*, 48 (5), 486-496. DOI: 10.1111/1460-6984.12027 19. Lindsay, G., Dockrell, J., Law, J. Roulstone, S. (2012) The Better Communication Research Programme: Improving provision for children and young people with speech, language and communication needs. UK Department of Education Research Report
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