

ICPLA 2023 in Salzburg 4th July - 7th July 2023		
Tuesday, 4th July 14:00 – 17:00 Registration		
15:00 – 16:00 Paris Lodron University of Salzburg Welcome Address: Hendrik Lehnert, Rector		
ICPLA Presidential Address: Vesna Stoijanovik		
Departmental Welcome: Ralph Poole, PLUS		
16:00 – 17:15 Opening Talk: Lars Bülow & Philip Vergeiner: The Sound(s) of Austria: Dialect Variation and Recent Changes.		
17:30 – 19:30 Welcome Reception, Unipark Roof Top Terrace		
Wednesday, 5th July 9:00 – 17:00 Registration		
9:00 – 10:30 Keynote: Lisa Bartha--Doering: Pathways to Language: From Fetus to Adolescent		
10:30 – 11:00 Coffee Break		
11:00 – 12:40 Parallel Sessions (Talks)		
Session: early linguistic development	<a href="#">Panel: Advances in dynamic assessment for diagnosing language disorders in diverse populations</a>	Session: instrumental analyses of speech sound disorders
<a href="#">1 Ellinor Strandberg, Marion Lieberman and Anette Lohmander: Babbling in extremely premature infants at 12 months corrected age</a>	1 Bernard Camilleri: Dynamic assessment of word learning – considering different options	<a href="#">1 Tim Bressmann: Effects of changed auditory feedback on oral-nasal balance in speech: The story so far</a>
<a href="#">2 Veronika Harmati-Pap, Noémi Vadász, Ildikó Tóth and Bence Kas: Links between lexical and syntactic reduction in infant-directed speech and early language development</a>	2 Amy Glaspey & Andre MacLeod: Dynamic Assessment of Multilingual Children: Applying language transfer, fast mapping and socially embedded language to word learning	<a href="#">2 Amy Smith, Maria Dokovova, Eleanor Lawson, Anja Kuschmann and Joanne Cleland: An ultrasound study of variability in children with and without speech sound disorder.</a>
<a href="#">3 Gertraud Erlacher: Clinical feasibility of a German adaptation of the Language-Neutral Assessment of Motor Speech in Young Children (LAMS)</a>	3 Salomé Schwob & Katrin Skoruppa: Comparison of autonomous and interactive learning situations for the detection of developmental language disorder in mono- and bilingual children	<a href="#">3 Stefanie Hahn, Maren Eikerling and Stephan Sallat: Concept and evaluation of a digital tool for interprofessional exchange of information in the assessment of language development of four- to six-year-old children</a>

<p><a href="#">4 Yvonne Wren, Sam Harding, Sharon Baker and Rhonwen Lewis: Early language surveillance in children growing up in bilingual environments</a></p>	<p>4 H��l��ne Delage, Margaret Kehoe, Olivia Hadjhadj &amp; M��lodie Matrat: Dynamic assessment of lexical and narrative skills in mono- and bilingual French-speaking children with and without developmental language disorder</p>	<p><a href="#">4 Cymie Wing Yee Ng, Herman Si loi Ng, Kathy Yuet Sheung Lee, Tan Lee and Michael Chi Fai Tong: Exploring the use of speech recognition technology in detecting children speech sound disorders: A cross-disciplinary collaboration</a></p>
<p><a href="#">5 Anna-Lena Scherger and Isabel Neitzel: Pupillometry in bilingual language assessment – preliminary results from early second language acquisition of German</a></p>	<p>Roundup &amp; Discussion: Katrin Skoruppa</p>	<p><a href="#">5 Sam Burr, Joanne Cleland, Sam Harding, Helen Stringer and Yvonne Wren: Which clinical speech metrics are used to measure outcomes of interventions for children with speech sound disorder of unknown origin?</a></p>
<p>12:40 – 13:30 Lunch</p>		
<p>13:30 – 15:10 Parallel Sessions (Talks)</p>		
<p><a href="#">Panel: Children’s speech development in 70+ languages and dialects.</a></p>	<p>Session: Developmental Speech Sound Disorders</p>	<p>Session: Hearing Impairment &amp; deafness</p>
<p>Sharynne McLeod, Helen Blake, Kathryn Crowe, Marit Clausen, Ellen Gerrits, Yvonne Wren, Jill Titterington, Joanne Cleland, Andrea MacLeod, Margaret Kehoe, Annette Fox-Boyer, Elena Babatsouli, Kakia Petinou, Krisztina Zajd��, Karla Washington, Marjan Larimian, Helen Grech; Kristian Kristoffersen; Maria Jo��o Freitas, Marisa Lousada &amp; Ana Margarida Ramalho; Sofia Str��mbergsson and Inger Lundeborg Hammarstr��m</p>	<p><a href="#">1 Carlo Hernandez-Morales, Daniela Lopez-Palma and Aline Herrera-Rangel: Phonetic features of stop consonants in children with Speech Sounds Disorders who speak Spanish from Central Mexico.</a></p>	<p><a href="#">1 Marcel Schlechtweg, Mark Gibson, Judit Ayala, Xianhui Wang and Li Xu: Vowel perception in noise: A comparison of children with cochlear implants and their peers with typical hearing.</a></p>
	<p><a href="#">2 Anouk Scheffer, Brigitta Keij, Britt Hakvoort, Esther Ottow-Henning, Ellen Gerrits and Frank Wijnen: Speech sound development of young Dutch children with DLD: A complex matter.</a></p>	<p><a href="#">2 Huina Gong, Ling Jia, Qin Peng, Ran Xiao, Jialu Fan, Jianghua Lei and Liang Chen: The role of two slave-systems of working memory in speechreading for students with hearing impairment in China.</a></p>

	<a href="#">3 Vanessa Giacchini: Generalization from the treatment by different therapeutic models.</a>	<a href="#">3 Sylvia Lia Grespan Neves and Felipe Venâncio Barbosa: Clinical linguistics and sign language: a study on age of acquisition and brain injury in deaf adults.</a>
	<a href="#">4 Wiebke Freese, Sarah Masso and Annette Fox-Boyer: Non-lexical speech measures in typical developing children and children with speech sound disorders aged 3;0 to 5;11 years.</a>	<a href="#">4 Christina Samuelsson, Ulrika Marklund, Charlotta Plejert, Henrik Danielsson and Björn Lyxell: On the use of Gestures in Young Children with Cochlear Implants -a comparison of everyday interaction and test situations.</a>
	<a href="#">5 Jéssica Gomes, Ana Margarida Ramalho and Maria João Freitas: On the acquisition of the alveolar lateral by Portuguese children with atypical development.</a>	<a href="#">5 Jiawei Huang, Qun Li and Guo Li: Research on the production of tone sandhi in Mandarin children with cochlear implants.</a>
<b>15:10 – 15:40 Coffee</b>		
<b>15:40 – 17:00 Parallel Sessions (Talks)</b>		
<a href="#">Panel: Children’s speech development in 70+ languages and dialects.</a>	Session: Developmental Language Disorders	Session: Assessment & Intervention
Sharynne McLeod, Helen Blake, Kathryn Crowe, Marit Clausen, Ellen Gerrits, Yvonne Wren, Jill Titterington, Joanne Cleland, Andrea MacLeod, Margaret Kehoe, Annette Fox-Boyer, Elena Babatsouli, Kasia Petinou, Krisztina Zajdó, Karla Washington, Marjan Larimian, Helen Grech, Kristian Kristoffersen, Maria João Freitas, Sofia Strömbergsson and Inger Lundeborg Hammarström	<a href="#">1 Olivia Hadjadj, Margaret Kehoe and H��l��ne Delage: Narrative training enables generalization between narrative tasks in children with Developmental Language Disorder.</a>	<a href="#">1 Susanne Seifert, Lisa Palecek and Martin Sch��fl: The Graz Vocabulary Test in kindergarten and Grade 1: differences in print and digital modes.</a>

	<a href="#">2 Yue Ji, Li Sheng and Li Zheng: Cognitive Control and Comprehending Passives in Mandarin Preschoolers with and without Risk for DLD</a>	<a href="#">2 Karin Myrberg and Inger Lundeberg-Hammarström: Evaluation of a caregiver-led book reading intervention with an interactional focus for children with speech, language and communication needs</a>
	<a href="#">3 Deya Alharbi, Judy Clegg and Ozge Ozturk : A Profile of Receptive and Expressive Verb Morphology in Arabic-Speaking Children with Developmental Language Disorder</a>	<a href="#">3 Naomi Leafe, Jill Titterington, Emma Pagnamenta, Laurence Taggart, Mark Donnelly and Angela Hassiotis: Evaluating effective, intensive, digital parent-implemented interventions for children with speech sound disorder using realist methodology: what works, how and for whom?</a>
	<a href="#">4 Theodora Papastefanou and Elena Theodorou: Narrative skills of Cypriot-Greek children with and without developmental language disorder</a>	<a href="#">4 Theresa Bloder, Maren Eikerling, Sofia Castro, Tanja Rinker and Maria Luisa Lorusso: International perspectives and attitudes towards speech and language therapy and multilingualism</a>
<b>17:00 – 18:00 Parallel Sessions (Talks)</b>		
<a href="#">Panel: Children’s speech development in 70+ languages and dialects.</a>	Session: Childhood Apraxias of Speech	Session: Acquired Language Disorders
Sharynne McLeod, Helen Blake, Kathryn Crowe, Marit Clausen, Ellen Gerrits, Yvonne Wren, Jill Titterington, Joanne Cleland, Andrea MacLeod, Margaret Kehoe, Annette Fox-Boyer, Elena Babatsouli, Kakia Petinou, Krisztina Zajdó, Karla Washington, Marjan Larimian,	<a href="#">1 Ann Malmenholt and Anita McAllister: Dynamic Temporal and Tactile Cuing (DTTC) for school aged children with Childhood Apraxia of Speech (CAS) plus comorbid language and neurodevelopmental disorders</a>	<a href="#">1 Mile Vuković and Liang Chen: Language and Executive Functions in Patients with Transcortical Motor Aphasia and Broca’s Aphasia</a>

<p>Helen Grech, Kristian Kristoffersen, Maria João Freitas, Sofia Strömbergsson and Inger Lundeborg Hammarström</p>	<p><a href="#">2 Dora Knežević and Ben Maassen: Phonological and phonetic difficulties in children with Childhood Apraxia of Speech.</a></p>	<p><a href="#">2 Lorraine Baqué and María Jesús Machuca: Assessing dysfluency in Primary Progressive Aphasia: speech-related vs pause-related parameters</a></p>
	<p><a href="#">3 Helen Ching Chung, Eddy Chun Ho Wong, Min Ney Wong, Shelley L. Velleman and Jess Loh: Performance on syllable repetition tasks by Cantonese-speaking preschool children with childhood apraxia of speech and typical development.</a></p>	<p><a href="#">3 Megan Thomas: Disfluencies and Cognitive Decline: An Investigative Study.</a></p>
<p>Thursday, 6th July 9:00 - 17:00 Registration</p>		
<p><a href="#">9:00 – 10:30 Keynote: Simone Pfenninger: Lifelong Language Learning and Significant Life Events: Re-Examining Threshold Hypotheses</a></p>		
<p>10:30 – 11:00 Coffee Break</p>		
<p>11:00 – 12:40 Parallel Sessions (Talks)</p>		
<p><a href="#">Panel: What’s in a name: How should we describe and define speech sound disorder and why does it matter?</a></p>	<p>Session: Grammatical development</p>	<p>Session: Genetic Language disorders</p>
<p>Yvonne Wren, Helen Stringer, Kakia Petinou, Marit Clausen, Lucy Southby and Yolanda Holt</p>	<p><a href="#">1 Christina Kauschke, Anne Tenhagen and Kim Lawatsch: Development of a Novel Instrument for Assessing Children's Grammatical Skills Using Elicited Production</a></p>	<p><a href="#">1 Vesna Stojanovik, Emma Pagnamenta, Sarah Sampson, Rachel Sutton, Benjamin Jones, Victoria Joffe, Kate Harvey and Elena Pizzi: Early social communication intervention for young children with Down syndrome: Results from a feasibility randomised controlled trial</a></p>

	<p><a href="#">2 Eugen Zaretsky, Benjamin P. Lange and Christiane Hey: Deterioration in nonword repetition performance of German children between 2008 and 2019: Growing deficits in phonological short-term memory or weaker German language skills?</a></p>	<p><a href="#">2 Pauline Frizelle, Eva McMullan, Eibhlín Looney, Ciara O'Toole and Nicola Hart: The feasibility of an online language through music programme and the impact of dosage on vocabulary outcomes in young children with Down Syndrome</a></p>
	<p><a href="#">3 Rob Zwitserlood, Annemarie Kerkhoff, Ingrid Singer and Ellen Gerrits: Effectiveness of a serious game for grammatical therapy in Dutch school-aged children with DLD</a></p>	<p><a href="#">3 Kristian Emil Kristoffersen and Hanne Gram Simonsen: The relationship between vocabulary and grammar in two children with 5p deletion syndrome</a></p>
	<p><a href="#">4 Pauline Frizelle, Ana Buckley, Tricia Biancone, Anna Ceroni, Darren Dahly, Paul Fletcher, Dorothy Bishop and Cristina McKean How reliable is assessment of children's sentence comprehension using a self-directed app? A comparison of supported versus independent use.</a></p>	<p><a href="#">4 Lluís Barceló-Coblijn and Elga Cremades: A first look into the capability of Catalan and Spanish-speaking individuals with Williams syndrome for syntactically combining words</a></p>
	<p><a href="#">5 H��l��ne Delage, Eleonore Morin and Emily Stanford: The efficiency of an explicit approach to improve complex syntax in French-speaking children with developmental language disorder: A pilot study</a></p>	<p><a href="#">5 Ana Vidovi�� Zori�� and Sara Bla��ekovi��: Speech disfluencies in individuals with Asperger syndrome in Croatian</a></p>
12:40 – 13:30 Lunch		
13:30 – 14:50 Parallel Sessions (Talks)		
<p><a href="#">Panel: Can we add depth to the systematic evaluation of speech and language therapy interventions? A comparison of realist and systematic approaches to literature reviews</a></p>	<p>Session: Acquired Speech Disorders</p>	<p>Session: Instrumental Therapy Approaches</p>

Jill Titterington	<a href="#">1 Elena Babatsouli: Cajun French Today: Research for the Clinic</a>	<a href="#">1 Marit C. Clausen, Maja Bjerrum Larsen and Stine Blicher Christensen: Screening for speech sound disorders: The impact of the elicitation method on assessment time and diagnostic accuracy.</a>
Naomi Leafe	<a href="#">2: Mridhula Murali, Joan Ma and Robin Lickley: Acoustic speech markers for tracking changes in hypokinetic dysarthria associated with Parkinson's Disease</a>	<a href="#">2 Lovisa Elm, Inger Lundeborg Hammarström, Christina Samuelsson and Charlotta Plejert: The use of Video in Speech and Language Intervention for Children with Developmental Language Disorder – a Survey Study</a>
Vesna Stojanovik	<a href="#">3 Thea Knowles, Nathaniel Cline and Meghan Clayards: Manipulation of voiced VOT in prominence and Parkinson's disease: Effects on intelligibility</a>	<a href="#">3 Tai-Ying Lee: Exploring the effect of Vocabulary Acquisition and Usage for Late Talkers Treatment approach for Cantonese-English bilingual late talkers.</a>
Emma Pagnamenta		<a href="#">4 Philip Combiths: System-Wide Generalization in Intervention for Phonological Disorder</a>
From 14:50: Meet The Editors! Tim Bressman & Vesna Stojanovik, editors of Clinical Linguistics and Phonetics will be available for Q&A on how to publish in ClinLingPhon		
15:10 – 17:00 Poster Session 1 (including Coffeebreak)		
<a href="#">Poster #1: Joanne Cleland, Eleanor Lawson and Jane Stuart-Smith</a> Title : <a href="#">A Speech Therapy Animation and imaging Resource (STAR)</a>	<a href="#">Poster #2: Nicola Bessell, Alice Lee and Aoife Hennessy: An ultrasound investigation of Irish English /ɹ/</a>	<a href="#">Poster #3: Pauline Frizelle, Sean O'Donovan, Mary Jolley, Lisa Martin and Nicola Hart: The co-construction of a reading assessment checklist with adults with Down syndrome: a meaningful literacy approach.</a>

<p><a href="#"><u>Poster #4: Inge van Dijke, Iris Duinmeijer, Lisanne Geurts, Luisa de Heer and Anouk Scheffer: Training morphosyntactic skills in pre-schoolers with DLD</u></a></p>	<p><a href="#"><u>Poster #5: Iris Duinmeijer, Margo Zwitterlood, Britt Hakvoort, Annette Scheper, Marijke Zoons, Sanne Peet, Wendy Blikendaal and Lonneke Janssen: Well-being in a large sample of young children with DLD</u></a></p>	<p><a href="#"><u>Poster #6: Aline Herrera-Rangel: Phonological description of Speech Sounds Disorder of Spanish speaking children from Central Mexico.</u></a></p>
<p><a href="#"><u>Poster #7: Maria Cromnow, Christina Samuelsson, Henrik Danielsson and Charlotta Plejert: When do communication facilitators intervene in people with communication impairment's phone calls?</u></a></p>	<p><a href="#"><u>Poster #8 Amy Glaspey, Andrea MacLeod, Pyper Trumble and Megan Andersen: Capturing Teaching Moments via Dynamic Assessment Methods during Speech Sound Disorder Intervention</u></a></p>	<p><a href="#"><u>Poster #9: Eddy C. H. Wong, Min Ney Wong, Shelley Velleman, Edwin M. C. Lai and Twinkie Y. K. Cheung: Structural and functional oral-motor abilities in typically developing Cantonese-speaking preschool children and children with childhood apraxia of speech</u></a></p>
<p><a href="#"><u>Poster #10: Annette Fox-Boyer, Antonia Mörtstedt and Clara Wolf: Prevalence of SSD in German-speaking primary school children</u></a></p>	<p><a href="#"><u>Poster #11: Léonor Piron, Andrea MacLeod and Christelle Maillart: Identification of Speech Sound Disorders in French-speaking preschoolers: the utility of parent and teacher concerns and their correspondence to standardized assessment</u></a></p>	<p><a href="#"><u>Poster #12: Bénédicte Grandon, Marcel Schlechtweg and Esther Ruigendijk: Plural processing in German-speaking children with a cochlear implant: an eye-tracking study.</u></a></p>
<p><a href="#"><u>Poster #13: Tim Bressmann and Blanche Hei Yung Tang: Differences in nasalance scores obtained with different Nasometer headsets</u></a></p>	<p><a href="#"><u>Poster #14: Carolin Schmid and Genti Zhitia: L2 German articulation skills of successive bilingual children</u></a></p>	<p><a href="#"><u>Poster #15: Paola Calabrese, Nicholas Hedger, Katherine Pritchard, Vesna Stojanovik and Emma Pagnamenta: Word learning in children with developmental language disorder: a meta- analysis testing the encoding hypothesis and the contribution of working memory.</u></a></p>
<p><a href="#"><u>Poster #16: Margaret Kehoe: The effects of phonological complexity on word production in French-speaking children</u></a></p>	<p><a href="#"><u>Poster #17: Caitlin Hurley, Sharynne McLeod and Robert Anthonappa: Children's speech and premature loss of primary maxillary incisors</u></a></p>	<p><a href="#"><u>Poster #18: Sandrine Ferré, Marlène Gasnier and Bénédicte Grandon: Prosody at the word level in autistic children with and without phonological deficit</u></a></p>

<p><a href="#"><u>Poster #19: Leah Fabiano-Smith, Sabrina Sieg and Jessica Barlow: The Role of Markedness in Between-Language Interaction in Latinx Preschoolers: Evidence from Substitution Errors</u></a></p>	<p><a href="#"><u>Poster #20: Ran Xiao, Ting Cui, Jialu Fan, Liang Chen and Jianghua Lei: The Effect of Intelligibility and Primary Mode of Communication on Sign-supported Speech Perception in Students with Hearing Impairment</u></a></p>	<p><a href="#"><u>Poster #21: Jenna Pui-Yin Mak and Dustin Kai-Yan Lau: Facilitating syntax acquisition for Cantonese-Speaking Preschool Children with DLD: Target Selection Considerations Based on the Can-LARSP</u></a></p>
<p><a href="#"><u>Poster #22: Marion Lieberman, Anette Lohmander and Carmela Miniscalco: Follow-up of 3-year-old children with delayed babbling at 10 months of age</u></a></p>	<p><a href="#"><u>Poster #23: Paohsiang Chi: Phonological Short Term Memory in Mandarin-Speaking Children With Speech Sound Disorders in Taiwan</u></a></p>	<p><a href="#"><u>Poster #24: Kristina Klintö, Karin Brunnegård, Emilie Hagberg, Cecilia Nelli, Åsa Okhiria and Christina Havstam: Longitudinal speech outcomes in children born with unilateral cleft lip and palate – a prospective Swedish inter-centre study</u></a></p>
<p><a href="#"><u>Poster #25: Sabine Leonhartsberger: Clinical characteristics and predictors of word reading in children with childhood apraxia of speech (CAS)</u></a></p>	<p><a href="#"><u>Poster #26: Jialu Fan, Huina Gong, Ran Xiao, Liang Chen and Jianghua Lei: Valence and Intensity of Facial Expressions and Affective Words during Speechreading in Deaf and Hearing College Students in China</u></a></p>	<p><a href="#"><u>Poster #27: Sharynne McLeod and Julie Marshall: Accomplishment of the Sustainable Development Goals requires Communication</u></a></p>
<p><a href="#"><u>Poster #28: Martina Sekulić Savić, Aleksandar Savić, Dušica Filipović Đurđević, Marko Liker, Nikola Ljubešić, Jan Šnajder, Kristina Štrkalj Despot and Irina Masnikosa: Psychosis speech and language database in the Croatian language.</u></a></p>	<p><a href="#"><u>Poster #29: Anna Nyman, Sofia Strömbergsson and Carmela Miniscalco: Differences in communication in two children with Down Syndrome with similar levels of speech and language functioning – a case study</u></a></p>	<p><a href="#"><u>Poster #30: Carol K. S. To, R. Gao and Kenny Mok: Atypical rhythm Childhood Apraxia of Speech (CAS) in Chinese – An Acoustic Analysis</u></a></p>
<p><a href="#"><u>Poster #31: Mark Gibson, Mónica González and Marcel Schlechtweg: A Random Forest analysis to explain visual and audio integration of information when perceiving speech.</u></a></p>	<p><a href="#"><u>Poster #32: Karla Washington, Leslie Kokotek, Hailey Spencer and Megan Miller: Diagnostic contributions of acoustic and transcription-based measures of production variation in the Jamaican context.</u></a></p>	<p><a href="#"><u>Poster #33: Po Yi Tang, Kai Yan Lau, Yu Yin Hsu and Man Tak Leung: Semantic content categories produced by Mandarin-speaking children with and without language difficulties.</u></a></p>

<p><a href="#">Poster #34: Mridhula Murali, Joanne Cleland, Jane Stuart-Smith, David Young and Anja Kuschmann: Investigating variability in child’s speech (VariCS)</a></p>	<p><a href="#">Poster #35: Sefela Yalala, Ulrika Marklund, Ellen Marklund, Lisa Gustavsson and Christina Samuelsson: Relationship between gestures and vocabulary in young children -a cross-linguistic comparison between Swedish- and Setswana-learning children.</a></p>	<p><a href="#">Poster #36: Kate Crowe, Harpa Stefánsdóttir, Egill Magnússon, Mark Guiberson, Thora Másdóttir, Ösp Vilberg Baldursdóttir and Inga Ágústsdóttir: How is speech intelligibility measured for children who are d/Deaf or hard of hearing?</a></p>
<p>17:00 – 18:00 ICPLA Business Meeting</p>		
<p>19:30 – 23:00 Conference Dinner at Festung Hohensalzburg</p>		
<p>Friday, 7th July 09:00 – 12:00 Registration</p>		
<p><a href="#">09:00 – 10:30 Keynote: Julia Büttner: Pragmatic Impairments and Resources in Patients with Neurocognitive Disorders</a></p>		
<p>10:30 – 12:00 Poster Session 2 (including Coffeebreak)</p>		
<p><a href="#">Poster #1: Alice Lee, Nicola Bessell, Henk van den Heuvel, Satu Saalasti and Katarzyna Klessa: DELAD for sharing corpora of disordered speech: An update</a></p>	<p><a href="#">Poster #2: Martin Ball, Joan Rahilly and Nicole Müller: New Symbols for Frictionless Continuant Approximants for Clinical Phoneticians</a></p>	<p><a href="#">Poster #3: Wing Yee Anna Lee: Phonological awareness in three subtypes of poor English readers in Hong Kong: a retrospective observational study</a></p>
<p><a href="#">Poster #4: Tim Bressmann, Keena Eloise, Livia Isnar and Kristen Wong: Use of forward voice focus to facilitate voluntary denasalization in typical speakers: A pilot study</a></p>	<p><a href="#">Poster #5: Evita Hiu-Yan Chang and Dustin Kai-Yan Lau: The effects of morphological awareness training on Chinese language learning</a></p>	<p><a href="#">Poster #6: Phoebe Hiu-Man Chan and Dustin Kai-Yan Lau: Promoting productions of elaborated verb phrases among Cantonese-speaking children with language difficulties using statistical learning</a></p>
<p><a href="#">Poster #7: Mile Vuković, Lana Jerkic Rajic, Ljiljana Simić, Tanja Milovanović and Vesna Stojanovik: CLITICS PRODUCTION IN SERBIAN SPEAKERS</a></p>	<p><a href="#">Poster #8: Vanessa Giacchini: Standard Model for The Acquisition of Contrasts and Structures – MAC-S</a></p>	<p><a href="#">Poster #9: Li Qun, Gladys Tang and Haolun Luo: Written Chinese Grammar Development of Students who are Deaf and Hard of Hearing (DHH)</a></p>
<p><a href="#">Poster #10: Karrie Kwan Kiu Chan and Dustin Kai Yan Lau: Feature-based phonology approach for phonological-based intervention for speech sound disorder in Cantonese</a></p>	<p><a href="#">Poster #11: Larissa Cristina Berti, Mayara Ferreira de Assis and Denis Burnham: Integration of auditory-visual cues on Speech Perception in children with phonological disorder</a></p>	<p><a href="#">Poster #12: Leslie Kokotek, Karla Washington and Gabrielle Matz: The cultural responsivity of language sample analyses across dialects of English: Answers from single-case studies with preschoolers</a></p>

<p><a href="#">Poster #13: Eleftheria Geronikou: The development of Lexical Representations for Polysyllabic words by Greek-speaking children</a></p>	<p><a href="#">Poster #14: Cymie Wing Yee Ng, Michael Chi Fai Tong, Tan Lee and Kathy Yuet Sheung Lee: Prevalence of Speech Sound Disorder among pre-schoolers in Hong Kong: A cross-sectional study on the performance in Single Word Articulation Test</a></p>	<p><a href="#">Poster #15: Ben Maassen and Barry de Groot: Digital game based learning for dynamic assessment of early reading difficulties. Cross-linguistic studies of GraphoLearn.</a></p>
<p><a href="#">Poster #16: Xiangyu Jiang and Liang Chen: The use of inferential language in the narratives of adolescents with and without SLI</a></p>	<p><a href="#">Poster #17: Eleftheria Geronikou and Elena Babatsouli: A contemporary report on children's Greek speech norms: Preliminary results</a></p>	<p><a href="#">Poster #18: Maria João Freitas, Ana Margarida Ramalho, Marisa Lousada, Patrícia Oliveira and Rodrigo Pereira: PHONODIS: a PhonBank database for the study of atypical phonology in Portuguese children</a></p>
<p><a href="#">Poster #19: Rose-Marie Svensson: Long-term follow up interviews after a prescribed joint book reading intervention: caregivers experiences after two years.</a></p>	<p><a href="#">Poster #20: Anita Lorenc, Agnieszka Borowiec, Daniel Król, Katarzyna Klessa, Anna Wojnarowska-Borowiec and Łukasz Mik: Functional-morphological relationships in functional articulation disorders. A perception-based and acoustic-phonetic study.</a></p>	<p><a href="#">Poster #21: Jenna Pui-Yin Mak, Karrie Kwan-Kiu Chan, Jocelyn Yee Ching, Ronald Lung-Yat Chui and Dustin Kai-Yan Lau: Mental representations of lexical tones in Chinese – Evidence from a patient with tone errors but preserved syllables</a></p>
<p><a href="#">Poster #22: Felipe Venâncio Barbosa, Janice Gonçalves Temoteo Marques and André Nogueira Xavier: Analysis of Signing Fluency in Brazilian Sign Language</a></p>	<p><a href="#">Poster #23: Elena Theodorou, Athanasia Lambrou and Kaki Petinou: Development of personal narratives skills of Greek Cypriot children: focusing on microstructure</a></p>	<p><a href="#">Poster #24: Louise Lendt, Magnus Becker and Kristina Klintö: Velopharyngeal function in foreign-born and Swedish-born 5-year-old children with cleft lip and palate - a registry study</a></p>
<p><a href="#">Poster #25: Thomas Kaltenbacher, Birgit Breninger: Extremely Early Incubator Intervention in an extremely premature infant - a two year follow up case study.</a></p>	<p><a href="#">Poster #26: Bin Li, Siyan Zhu and Cuiling Zhang: Acoustic characteristics of Cantonese Tones in Whisper</a></p>	<p><a href="#">Poster #27: Marie Dokovova, Joanne Cleland, Lisa Crampin and Lindsay Campbell: Using a visual analogue scale (VAS) to assess the effect of speech therapy in children with cleft lip and palate</a></p>

<p><a href="#"><u>Poster #28: Felipe Venâncio Barbosa and Bencie Woll: Age of Acquisition and Developmental and Acquired Language Disorders: a study of Short Narratives produced by Deaf People</u></a></p>	<p><a href="#"><u>Poster #29: Niamh O'Donnell and Irena Yanushevskaya: Establishing Cepstral Peak Prominence (CPP) normative data for young adults in Ireland: the impact of gender, speech task and recording conditions</u></a></p>	<p><a href="#"><u>Poster #30: Luyuan Geng and Li Sheng: Reference production in the narrative discourse of Mandarin-speaking children with developmental language disorder (DLD) and typical development.</u></a></p>
<p><a href="#"><u>Poster #31: Fen Zhang, Jianghua Lei, Xuehan Wei, Xin Wang and Liang Chen: Hearing status affects the relationship between speechreading and reading comprehension in Chinese</u></a></p>	<p><a href="#"><u>Poster #32: Yuanyuan Lin, Li Sheng, Huanhuan Shi, Wenjie Yan and Yiwen Zhang: Narrative Generation and Narrative Recall Recruit Different Executive Functions in Preschoolers with and without Developmental Language Disorder</u></a></p>	<p><a href="#"><u>Poster #33: Vitor Zimmerer, Natasha Adamczyk, Chui Thing Kiew, Dicky Lim, Lin Wang, Fiona Yang, Sebastian Bello Lepe and Rosemary Varley: A usage-based approach to language in Alzheimer's disease: the effect of collocation strength on patterns of impairment.</u></a></p>
<p><a href="#"><u>Poster #35: Kate Crowe, Jóhanna T. Einarsdóttir, Thora Másdóttir and Ewa Czaplewska: Cross-linguistics collaboration: Screening children's speech and language skills</u></a></p>	<p><a href="#"><u>Poster #36: Tempo Po-Yi Tang and Dustin Kai-Yan Lau: An intervention to promote writing abilities among school-aged children with written language disorders in Chinese</u></a></p>	
<p>12:00 – 13:30 Farewell Address, ICPLA 2025 &amp; Award Ceremony</p>		
<p>“Nicole Müller and Martin Ball Prize for Best Oral Presentation” and “Martin Ball and Nicole Müller Prize for Best Poster”</p>		

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## **Keynote: Pathways to Language: from Fetus to Adolescent**

Lisa Bartha Döring (Medical University of Vienna, Department of Pediatrics and Adolescent Medicine, Comprehensive Center for Pediatrics)

The identification of unique neural features that might predict language development is not only of scientific interest to explain the cognitive success of the human species, but also of growing importance in clinical settings. Identifying children at risk for later language developmental deficits may help in counseling parents and providing early interventions. In this talk, I will introduce the current state of scientific knowledge and present recent studies from our Lab. We use structural and functional magnetic resonance imaging in healthy fetuses and fetuses with neurological diseases to investigate the very early development of language-associated brain areas, examine neural speech discrimination abilities in neonates with functional near-infrared spectroscopy, and follow these children in their first years of life with neurodevelopmental and language examinations. While some of these studies are still ongoing, first results contribute important information about the neuronal underpinnings of the development of language during the prenatal period. Furthermore, neural language discrimination at birth may serve as a biomarker for later language development.

Lisa Bartha-Doering is Associate Professor at the Department of Pediatrics and Adolescent Medicine at the Medical University of Vienna, Austria, where she heads the Developmental Cognitive Neuroscience Lab. She is a neurolinguist and clinical linguist, was trained at the University of Innsbruck, Austria and the University of California Irvine, USA, and worked at the University of Münster, Germany. She has received several research awards, managed several third-party funded projects, published numerous scientific papers, and is a member of the ethics committee of the Medical University of Vienna.

Link:

[Developmental Cognitive Neuroscience Lab](#)

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## **Keynote: Lifelong language learning and significant life events: Re-examining threshold hypotheses.**

Simone E. Pfenninger (University of Zurich, UZH)

Full Professor for English Linguistics

The possible existence and nature of thresholds in the process of language learning and use across the lifespan raises many questions. For instance, although the existence of thresholds has often been suggested in various fields of linguistics – prominent examples being the Critical Period Hypothesis (Lenneberg 1967), the Linguistic Threshold Hypothesis (Alderson, 1984), the Activation Threshold Hypothesis (Paradis 1997), thresholds in language maintenance and shifts (Grin 1993), thresholds for cognitive and brain reserve capacities (Stern 2002) as well as thresholds for a diagnosis of dyslexia (Cilibrasi & Tsimpli 2020) – the search for the most likely location for a threshold has turned out to be difficult. In part, this has to do with the fact that, more often than not, the relationship between language (be it L1 or L2) and some ID variable (such as age) has largely been examined using linear methodologies, such as correlation or regression modeling.

In this talk, I propose novel ways of detecting and estimating thresholds in the association between a continuous independent variable and a continuous dependent variable. My main focus is on retirement as a socially determined and linguistically constructed concept that potentially alters the process of cognitive aging and language acquisition, use and attrition later in life. Life course theory (Elder 1992) emphasizes that retirement, like so many other significant life events, is not an isolated event, but rather a transition and process embedded in a person's biography of prior and current roles and relationships. I suggest that this requires not only more complex, non-linear statistical models to estimate the point of change in a slope as a function of retirement, but also qualitative approaches that examine how L2 learners interpret their experiences 'here and now' as being coherent with their own internal frameworks, and how socially constructed categories are changing. I will also propose that apart from its analytical relevance, a clear concept of 'threshold' could provide a powerful tool for planning and intervention.

### Bionote:

Simone E. Pfenninger is Professor of English Linguistics at the University of Zurich. Her principal research areas are (variationist) second language acquisition, psycholinguistics and multilingualism, especially in regard to quantitative approaches and statistical methods and techniques for language application in education. Recent books include *SLA and Lifelong Learning* (2023, co-authored, Routledge), *The Changing English Language: Psycholinguistic Perspectives* (2017, co-edited, CUP), and *Beyond Age Effects in Instructional L2 Learning: Revisiting the Age Factor* (2021, co-edited, Multilingual Matters). She is co-editor of the SLA book series for Multilingual Matters, President of the International Association of Multilingualism (IAM), and Vice President of the European Second Language Association (EuroSLA).

### Links:

<https://www.simonepfenninger.eu/>

<https://www.es.uzh.ch/en/aboutus/team/spfenninger.html>

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## **Keynote: Pragmatic Impairments and Resources in Patients with Neurocognitive Disorders**

Julia Büttner-Kunert (Ludwig Maximilian University Munich, Dept. of Linguistics /Speech-Language Therapy)

Pragmatic refers to the ability to act with language. Pragmatic skills contribute significantly to the success of communicative interaction and information processing. In addition to linguistic functions, skills that enable flexible adaptation to the context are also needed in understanding and producing texts and conversations. Cognitive functions that can organize the communication process play a special role. Here, mainly abilities from the spectrum of executive functions, social cognition, or theory-of-mind are involved.

With few exceptions, discourse-pragmatic disorders have not been studied in German-speaking regions. This is all the more surprising because it is precisely the context-specific communicative skills that are crucial for successful individual participation.

The talk presents the main results from the research project NEUROPRAG (2019-2022) in which various pragmatic and cognitive assessments were used in people with different neurocognitive disorders (Traumatic Brain Injury (PwTBI), Alzheimer Dementia (PwAD), Fronto-temporal dementia (PwFTD)).

Depending on the underlying cognitive disorders, pragmatic disorders as well as resources were apparent. For each of the subgroups studied, specific profiles can be identified that should be used for treatment planning. Due to the close interaction of cognitive, linguistic and behavioral symptoms, the diagnosis and treatment planning should always be done in an interdisciplinary way. The examination of pragmatic abilities should be an integral part of the treatment of people with neurocognitive disorders due to their high relevance for communicative participation.

About the speaker:

[Julia Büttner-Kunert's Profile Page at LMU Munich](#)

[DFG Network "Kognitive Kommunikationsstörungen bei Schädel-Hirn-Trauma"](#)

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## **Diagnostic contributions of acoustic and transcription-based measures of production variation in the Jamaican context**

Karla Washington (University of Toronto), Leslie Kokotek (University of Cincinnati), Hailey Spencer (University of Cincinnati) and Megan Miller (University of Cincinnati).

**Background:** Bilingual children speaking Jamaican Creole (JC) and English represent a growing populace in several English-dominant countries including Canada, the United Kingdom, and United States (Washington et al.,2017). For these speakers, language is produced across a linguistic continuum, from JC-to-English, where variation in word production is expected (León et al.,2022). Through a monolingual lens, however, variation in speech production might be viewed as patterns associated with a suspected speech sound disorder (sSSD), increasing the risk of misdiagnosis. To enable culturally responsive practices, research-based tools are needed that capture this variation while also informing Jamaican children's developmental status. To address this clinical problem, this study applied acoustic and transcription-based methods to children's repeated productions to determine the diagnostic contributions of each method.

**Methods:** Thirty-one children aged 3;6-to-4;11 participated in assessment session with a speech-language pathologist (SLP). Using the converging evidence approach (i.e., parent+teacher/SLP concerns about JC and English speech productions), children were classified as typically-developing (n=23) or sSSD (n=8). Children completed three repetitions of single-words (consistent[1]/inconsistent[0]) using the Word Inconsistency Assessment subtest of the Diagnostic Evaluation of Articulation and Phonology in sessions counterbalanced by language. Children's single-word productions in each language were analyzed using acoustic analyses (whole-word duration, PRAAT©) and transcription-based accuracy (Percentage-of-Consonants Correct-revised, Phon©).

**Results:** Receiver Operating Characteristics (ROC) and Area Under-the-ROC Curve (AUC) informed classification accuracy. For English, AUC was fair across methods ranging from 0.73(Acoustic)-to-0.78(Transcription). For JC, AUC was poor across methods ranging from 0.63(Transcription)-to-0.64(Acoustic). Sensitivity values were acceptable for both methods/languages; however, only English acoustic duration specificity values were acceptable.

**Conclusion:** Measures of acoustic duration and transcription-based accuracy across repeated productions may support differential diagnosis of sSSD in bilingual Jamaican children. However, limitations exist in the diagnostic contribution of each method based on language spoken, highlighting the need for research-based tools that enhance sensitivity.

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## **Clinical linguistics and sign language: a study on age of acquisition and brain injury in deaf adults**

Sylvia Lia Grespan Neves (School of Medical Sciences of Santa Casa of Sao Paulo) and Felipe Venâncio Barbosa (University of Sao Paulo).

This research aims to describe the linguistic behaviour of deaf adults in a language screening based on Brazilian Sign Language (Libras). In addition, it had the following specific objectives: (i) to analyze the possible differences between deaf people with early Libras acquisition, deaf people with late Libras acquisition and deaf people with brain damage; and (ii) to describe the linguistic production, from the applied screening, of deaf people with brain damage. A data collection of 109 deaf adult participants and users of Libras was carried out. Each of them answered an anamnesis questionnaire containing linguistic and health history. Then each participant was tested with the application of the Libras Linguistic Skills Screening (BARBOSA, 2017), conducted by a deaf and fluent Libras examiner. Participants were divided into three groups: the first with sign early language acquisition (Ap), the second with late sign language acquisition (At) and the third with brain injury diagnosis (Dn). The descriptive-exploratory analysis focused on 15 cases, divided into four groups: 1) injury acquired in childhood: participants presented breaks at the narrative and pragmatic levels, such as the topic of conversation deviation and circumlocutions about adjacent subjects, which in their narratives they observed the indication of scenes that were not following the board used for elicitation and discursive organization, not obeying the temporal and logical order; 2) CVA, which, even with a motor impairment such as hemiparesis, did not show linguistics disorders, except at the phonetic-phonological level, due to the motor limitations imposed by the lesion; 3) ECNE, which presented disorders at the phonetic-phonological level. In this group, it was possible to notice changes in some specific parameters of the signals. All showed maxillary displacement while signing, with vague gaze direction. In addition, different types of signing were observed depending on the type of ECNE, for example, with the presence of stiffness and slowness, with the presence of eye contact with the interlocutor and, in other cases, uncontrolled movement without the possibility of maintaining eye contact; 4) Parkinson's, who had a lack of facial expressions, absence of critical grammatical items for the construction of meaning in sign languages, in addition to static gaze and low frequency of blinking or eye movements. A decrease in the amplitude of movements in the signing was also observed, as the lack of adequate use of space to create meanings in their productions, the use of tokenized spaces or strategies of surrogacy or any spatial syntactic organization. The data obtained demonstrated the importance of early language acquisition for using the individual's linguistic potential and suggested that late language acquisition may be a predictor of language disorders. Apart from that, the brain injury cases did manifest disorders in language processing at various levels, with productions that differ from manifestations in the oral-auditory modality due to its being a visuospatial language.

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## Use of forward voice focus to facilitate voluntary denasalization in typical speakers: A pilot study

Tim Bressmann (University of Toronto), Keena Eloise (University of Toronto), Livia Isnar (University of Toronto) and Kristen Wong (University of Toronto).

**Background:** Hypernasal patients with cleft palate and typical speakers do not have conscious proprioceptive control over the movement of their velopharyngeal sphincter. As a result, there are currently no effective techniques that speech-language pathologists can use to teach voluntary velopharyngeal closure. In previous research, we have investigated the effect of forward vs. backward voice focus (shortened vs. lengthened vocal tract) on oral-nasal balance in speech. The longer vocal tract and posterior tongue position in the backward voice focus condition open up space and decrease the impedance of the oral cavity, which results in lower nasalance scores for nasal speech stimuli. The shortened vocal tract and anterior tongue position in the forward voice focus usually result in constricted space and higher impedance, resulting in higher nasalance scores. However, we have found that select individuals with cleft palate as well as some typical speakers showed considerable drops in nasalance scores in the forward voice focus condition. A possible explanation is that the reduced and constricted pharyngeal space in forward voice focus may facilitate more complete velopharyngeal closure, which could offer a new perspective on behavioural approaches to the therapy of hypernasality. The present pilot study assessed the use of extreme forward voice focus to facilitate voluntary denasalization in typical speakers, measured with nasalance scores.

**Methods:** Five typical female speakers of Canadian English (mean age 22.6 years) took part in the study. They were instructed by the second author how to produce an extreme forward voice focus. The speakers then used the forward voice focus together with visual biofeedback from a Nasometer to reduce the nasality in their speech. They were then instructed to reduce the forward voice focus while keeping the nasalance scores low. Recordings with a Nasometer were made in the following conditions: initial baseline, maximum forward focus, forward focus with reduced nasality, reduced nasality without forward focus, and after washout (reading of the Rainbow passage in typical voice).

**Results:** For a nasal sentence ('Mama made some lemon jam'), nasalance scores dropped from 59.8 (SD 2.7) at baseline to 28.0 (SD 14.2) after washout. For a mixed sentence ('My hamper was damp so the towels are smelly'), nasalance scores dropped from 32.6 (SD 2.1) at baseline to 20.8 (SD 8.4) after washout. For a second mixed sentence ('The rainbow is a division of white light into many beautiful colours'), nasalance scores dropped from 30.2 (SD 4.5) at baseline to 22.9 (SD 7.2) after washout. For a non-nasal sentence ('Look at this book with us, it's a story about a zoo'), nasalance scores only changed minimally from 13.5 (SD 5.3) at baseline to 12.3 (SD 3.6) after washout. A repeated-measures ANOVA showed a significant effect of condition,  $F(4,186)=22.53$ ,  $p<0.01$ . Post hoc Bonferroni tests showed that the nasalance scores in the reduced nasality and after washout conditions were significantly lower than in the other three conditions ( $p<0.05$ ).

**Conclusion:** The typical speakers in the present study were able to significantly reduce their nasalance scores on speech stimuli with nasal sounds. The forward voice focus may help speakers change the configuration of their velopharyngeal sphincter and facilitate more complete closure. In future research, the procedure should be further developed and tested with hypernasal speakers with cleft palate.

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## The relationship between vocabulary and grammar in two children with 5p deletion syndrome

Kristian Emil Kristoffersen (Nord university and Frambu Resource Center for Rare Disorders) and Hanne Gram Simonsen (University of Oslo).

It is well known that vocabulary growth and grammatical development are related in young children, but the exact nature of this relationship is less certain: is it vocabulary that influences grammar (e.g., Marchman & Bates, 1994), or grammar that influences vocabulary (e.g., Yuan et al., 2012), or is the relationship bidirectional (e.g., Dixon & Marchman, 2007)? The relationship may possibly change over time, with vocabulary preceding grammar at the beginning of development, but grammar catching up with age. There may also be other factors, for example input, that influence both (e.g., Brinchmann et al., 2018; Hoff et al., 2018).

In this study we examine the relationship between lexical and grammatical development in two Norwegian-speaking children with 5p deletion syndrome, a congenital genetic disorder often associated with severe speech and language problems. Data were collected by the MacArthur-Bates CDI Words and Sentences form. One child was followed across four time points from 5;0 to 6;3, and the other across eleven time points from 3;9 to 6;4.

We look at the development of the vocabulary size in each child, seen in relation to the development of grammar (Inflections, Word forms, Combination of words, Complexity, and Three longest sentences), and see to what extent they can be compared to the Norwegian norms (Simonsen et al., 2014). Preliminary analyses indicate that they follow a similar pattern to typically developing children, but delayed, and with slightly different individual profiles.

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## On the acquisition of the alveolar lateral by Portuguese children with atypical development

Jéssica Gomes (School of Arts and Humanities of the University of Lisbon; Center of Linguistics of the University of Lisbon), Ana Margarida Ramalho (Center of Linguistics of the University of Lisbon) and Maria João Freitas (School of Arts and Humanities of the University of Lisbon; Center of Linguistics of the University of Lisbon).

**Background:** The alveolar lateral is phonetically and phonologically complex (Mateus & D'Andrade, 2000; Rodrigues, 2015; Ladefoged & Maddieson, 1996) and one of the last segments to be acquired in European Portuguese (EP) (Freitas, 1997; Amorim, 2014; Mendes et al., 2013; Ramalho, 2017). In this study, we describe the acquisition of /l/ based on EP data from PhonoDis, a database stored in PhonBank, thus contributing to the characterization of Development Language Disorders (DLD) and Speech Sound Disorders (SSD).

**Methods:** We examined the production of /l/ by 8 Portuguese-speaking children with DLD and 7 with SSD. Data were collected through the CLCP-PE test (Ramalho et al., 2014). Results were compared with typical acquisition data available in the literature and collected using the same test (cf. Ramalho, 2017; Freitas et al., 2022).

**Results:** The lateral /l/ provides precise discrimination between the typical and the atypical samples, given differences in success rates and repair strategies. The variables syllable structure and word stress were relevant to characterize the atypical acquisition of /l/: (i) complex syllable constituents had lower success rates (Simple Onset >> Coda >> Complex Onset); (ii) /l/ in stressed syllables showed higher accuracy. All differences were statistically significant. However, a heterogeneous linguistic behavior regarding word-level position in both clinical samples was attested. As for the repair strategies, children with atypical acquisition had more difficulties with complex syllable structures: mismatch patterns reflected negative structural constraints (deletion of C2 or deletion of Coda) rather than segmental constraints (substitutions).

**Conclusion:** Our results on the impact of prosody in atypical development match the ones reported for other languages (Tamburelli & Jones, 2013; Ferré et al., 2015; Almeida et al., 2019). The lateral /l/ shows up as a potential clinical marker in EP. The data highlight the importance of examining all aspects of the phonological hierarchy.

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## Disfluencies and Cognitive Decline: An Investigative Study

Megan Thomas (University of Sheffield).

Cognitive decline (CD) affects speech and language in different ways, depending on the severity of the CD. For example, Alzheimer's Disease, a type of neurodegenerative dementia (ND), is known to cause aphasia. Numerous studies have shown significant differences between the length and number of filled and unfilled pauses (such as [əmə]) used by people with mild cognitive impairment (MCI) compared to healthy controls. Additional disfluencies that may be more prevalent in the speech of people with early stages of CD, such as repetitions or prolongations, have not been investigated as thoroughly. This study presents an analysis of the prevalence and diagnostic utility of several types of disfluencies using knowledge gained from the field of forensic linguistics and the Taxonomy of Fluency features for Forensic Analysis framework. These disfluencies include prolongations, repetitions, speech errors, alongside filled and unfilled pauses. Data was collected from people interacting with a virtual agent in a memory clinic. Participants (n = 55) were separated into four different diagnostic labels: healthy controls (HC), MCI, functional memory disorder (FMD), and neurodegenerative dementia (ND). A manual disfluency analysis was conducted on the recordings using Praat. We found significant differences in the frequency of different disfluencies across the groups. The MCI group had more frequent and longer prolongations compared to the HCs ( $\alpha = 0.05$ ,  $p = 0.004$ ), the ND group had significantly more additions than the HC group ( $\alpha = 0.05$ ,  $p = 0.04$ ), and significantly more word repetitions were observed in the ND group compared to the FMD group ( $\alpha = 0.05$ ,  $p = 0.006$ ). These findings suggest that a closer look at disfluency information may be useful in the diagnosis of different stages of cognitive decline.

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## The effects of morphological awareness training on Chinese language learning

Evita Hiu-Yan Chang (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University) and  
Dustin Kai-Yan Lau (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University).

**Background:** Chinese words are morpho-syllabic based where each syllable/ character corresponded to one morpheme, hence, morphological awareness is significant for Chinese learning in nature. Furthermore, previous studies showed that the compounding strategy is a highly productive way to form new words in Chinese. In the current study, a treatment designed to promote morphological awareness was conducted on a group of children with reading difficulties in Chinese. The result is expected to help to elucidate the relationship between morphological awareness and Chinese reading abilities.

**Methods:** A total of 20 children reported to have difficulties learning to read Chinese were recruited. The children were initially assigned to the Treatment group and the Control group. The Treatment group received 12 treatment sessions designed to promote their awareness of relationship between compound words and their constituent morphemes in terms of meaning relatedness, using explicit instructions. Pre- and post-treatment outcome measures of compound word naming tests designed to measure the effects of morphological productivity, boundedness and semantic transparency were conducted. Finally, a standardized Chinese character naming test was conducted on each children before and after treatment.

**Results:** Results indicated significant morphological productivity, boundedness, and semantic transparency effects observed among the Treatment group but not the Control group after treatment. Yet, the two groups demonstrated comparative levels of improvement in the standardized Chinese character naming test across time.

**Conclusion:** The significant morphological effects observed among the Treatment group indicated their improved morphological awareness after the treatment sessions. That the Treatment group did not outperform the Control group in the standardized Chinese character naming test suggested that their improved morphological awareness did not result in improved Chinese character naming abilities. This observation is considered to be consistent with the literature that morphological awareness of Chinese were observed to have stronger relationship with reading comprehension than word decoding.

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## **Cajun French Today: Research for the Clinic**

Elena Babatsouli (University of Louisiana at Lafayette).

**Background:** Negligible research exists on the disordered speech of adult Cajun French speakers (e.g., Ball, 2015). Similarly, despite abundant screening tests of child monolingual French speech worldwide (e.g., Kehoe et al., 2020), there is no assessment of Cajun French (CF) phonologies in Louisiana's bilingual English-French context. The most authoritative record of CF to-date is the Dictionary of Louisiana French (Valdman et al., 2009). The present study investigates adult spoken French in Louisiana's Acadiana establishing a clinical prognostic protocol for CF disordered speech, ultimately enhancing clinical multilingual assessment resources in the region, as per general recommendations to enhance cultural competence (ASHA, 2013).

**Methods:** Speech data from a control group of 40 participants (21 female, 19 male) in four age groups (20-29: 3, 60-69: 9, 70-79: 16, 80-89: 12) are elicited using the Phonological Assessment of Louisiana French (PALF) that comprises 125 common, culturally relevant terms, representing Cajun French phonotactics, phone frequency distributions, and predominant dialectal variation. Sixteen of the participants are balanced English-CF bilinguals and twenty-four are English-dominant.

**Results:** The data model typical CF speech as an instrument to guide differentiation between speech Disorder and Difference in CF bilinguals. Specifically, similarity in the balanced bilinguals' productions sketches the profile of CF speech today which manifests phonetic variability in targeted vowels /a i y u/, semi-vowel /ɥ/, voiceless plosives, affricates and the rhotic, while documenting some inventory deviation compared to previous records (Valdman et al., 2009). The English-dominant speakers' French demonstrates category assimilation (e.g., Flege & Bohn, 2021) and phonological transfer (Flege & Davidian, 1984). Weaknesses of the piloted tool are identified, and steps are proposed to enhance methodological reliability/validity for clinical use.

**Conclusion:** The study shifts the focus of linguistic research on the French spoken in Louisiana from general and historical linguistics to bilingual assessment and diagnosis of adult speech disorder.

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## **A Random Forest analysis to explain visual and audio integration of information when perceiving speech**

Mark Gibson (Universidad de Navarra), Mónica González (Universität Potsdam) and Marcel Schlechtweg (Carl von Ossietzky Universität Oldenburg).

Our previous psychoacoustic work showed general confusion in discriminating the Spanish rounded back vowels [o,u] in contexts of noise (with background babble comprised of 1-16 speakers and the signal-to-noise ratio, set at 0, -6, and -12 decibels, henceforth dB, and their interaction) by different populations (native monolingual Spanish-speaking adults, native monolingual Spanish-speaking children, ages 6-12, and native monolingual Spanish-speaking children with cochlear implants, ages 6-12). We attributed this confusion to the fact that tongue height, detectable through F1, is obfuscated by F3 (lip rounding) and that in the absence of a visual input by which a listener can discriminate mid and high vowels by a control parameter such as lip aperture (or jaw angle), listeners experience notable difficulty in discerning vowel categories. For the present study, we trained a series of Random Forest models in an unsupervised learning environment in addition to K-means clustering with visual (video) and audio (acoustic) data, with parameters specified for two noise conditions (mimicking our psychoacoustic tests) to test whether the integration of visual and auditory information computationally increases perception accuracy. Results from the models seem to indicate that the access to a visual stimulus increases discrimination accuracy in noise conditions, though not equally so for all empirically tested populations.

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## **Concept and evaluation of a digital tool for interprofessional exchange of information in the assessment of language development of four- to six-year-old children**

Stefanie Hahn (Martin Luther University Halle-Wittenberg, Department of Special and Inclusive Education), Maren Eikerling (Martin Luther University Halle-Wittenberg, Department of Special and Inclusive Education) and Stephan Sallat (Martin Luther University Halle-Wittenberg, Department of Special and Inclusive Education).

**Background:** The successful children's educational biographies are closely related to language development (Hasselhorn & Sallat, 2014; Kotzerke et al., 2013). In Germany and many other countries, several professions are involved in assessing children's language abilities from their own perspectives (Sallat et al., 2017), e.g. during the transition from kindergarten to school. Despite the undisputed importance of interprofessional collaboration, structural complexity, different knowledge bases, and poorly coordinated communication processes often result in the coordination between the professions involved not successful. There is a need for low-threshold instruments that make it possible to gather information across institutions from a child-centered perspective. These can serve as a basis for planning of interventions at a "round table", where individual support can be coordinated (Giel, 2021; Krebs et al., 2012).

**Methods:** For the interprofessional assessment of language development, based on n = 5 focus group interviews (representing the five above mentioned professions involved in language assessment, support and intervention) with n = 3 participants each (Hahn et al., in prep.), the digital instrument "SprachNetz Profil" was developed. It maps the child's language performance in the context of general development as well as the individual and educational perspective with the surveys of the actors from kindergarten, speech and language therapy, medicine, special education and elementary schools. Individual competencies to be collected for specific professional groups result in an individual profile. In the next step, the content of the individual assessment scales is evaluated in a survey. The goal is to understand whether the tool is considered enhancing client-centred interprofessional collaboration.

**Results:** The first evaluation is currently in progress and includes the participation of at least 30 representatives of each of the five professional groups with a focus on completeness, practicability and comprehensibility. Content of the presentation is the conception of the instrument and first evaluation results.

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## **Facilitating syntax acquisition for Cantonese-Speaking Preschool Children with DLD: Target Selection Considerations Based on the Can-LARSP**

Jenna Pui-Yin Mak (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University) and Dustin Kai-Yan Lau (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University).

**Introduction.** Syntax deficits are common among Cantonese-speaking children with language difficulties, which require language intervention. One major challenge of language intervention concerns the appropriateness of target selection. According to a corpus study with longitudinal data, the Can-LARSP identified the five most common morphosyntactic structures to be subject-predicate, verb-object, modifier-head, serial-verb, and verb-complement, which accounted for over 80% of Cantonese-speaking preschool children's sentence production. The Can-LARSP further proposed that the syntactic complexity of Cantonese can be understood as a multiple hierarchical organization, in which lower-level phrases are nested within higher-level phrases and/or clauses. Using this framework, at least two levels of treatment implication were identified. First, for children who failed to master any of the five most common morphosyntactic structures, introducing the missing structure(s) will be needed. Second, for children who demonstrated limited abilities of nesting lower-level phrases within higher-level ones, introducing the new forms that promote maximum generalization of nesting will be needed. This study aimed to evaluate the efficacy of a statistical learning-based syntactic intervention that incorporates the Can-LARSP framework into treatment design to inform target selection that promotes better generalization.

**Methods.** In this proposed language intervention, the mastery of the five common structures in lower- and higher-order levels by the target children will be first analyzed to inform target selections in language input. Two Cantonese-speaking children (each suitable for one of the treatment levels described) with language difficulties will be recruited. Ten treatment sessions designed according to the corresponding treatment levels will be conducted starting from March 2023. Treatment effects will be measured in terms of pre- and post-treatment comparisons of the number of morphosyntactic structures and that of nested morphosyntactic structures.

**Results & Discussion.** Results, together with theoretical and clinical implications, will be presented at the conference.

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## Follow-up of 3-year-old children with delayed babbling at 10 months of age

Marion Lieberman (Division of Speech and Language Pathology, Department of CLINTEC, Karolinska Institutet, Stockholm, Sweden), Anette Lohmander (Division of Speech and Language Pathology, Department of CLINTEC, Karolinska Institutet, Stockholm, Sweden) and Carmela Miniscalco (Child and Adolescent Neuropsychiatry Unit & Speech and Language Pathology).

**Background:** Onset of canonical babbling (CB) before 10 months is positively associated with later expressive language, yet little is known about the trajectories of language and overall development in children lacking CB at 10 months.

**Purpose:** The aim of this study was to 1) investigate speech, language, cognitive and motor development in a group of children lacking CB at 10 months, and 2) compare their outcomes at 36 months with a group of children with established CB at 10 months but delayed language development at 36 months.

**Method:** Out of 1126 children who participated in a babbling screening study at age 10 months, 1.4% (n=16) lacked CB and 14 of these were followed up at 12, 18, and 36 months with assessments of babbling, consonant production, parent-reported expressive vocabulary and cognitive, language and motor development. At 36 months, the results were compared to the results of children (n=21) who had passed the babbling screening but failed the routine language screening at 2.5/3 years.

**Results:** Of the children lacking CB at 10 months, 40% (6/15) at 18 months and 21% (3/14) at 36 months had expressive vocabulary results below the 10th percentile. Regarding consonant production, mean number of true consonants at 18 months was 4.5 and at 36 months the percentage correct consonants was 89% (SD 0.17). Regarding general development, there was 21% (3/14) who scored below the normal range on cognitive and/or motor measures. There was no statistically significant difference on any of the included speech, language, cognitive or motor measures between the groups with and without established CB at 10 months.

**Conclusion:** Most children lacking CB at 10 months seem to catch up in expressive language by 36 months. For the group of children who don't, the babbling delay seem to be part of a more general developmental disability.

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## Feature-based phonology approach for phonological-based intervention for speech sound disorder in Cantonese

Karrie Kwan Kiu Chan (Polytechnic University of Hong Kong) and Dustin Kai Yan Lau (Polytechnic University of Hong Kong).

**Objectives:** The research aims to investigate the application of feature-based phonology into intervention for phonological-based speech sound disorder (SSD) in Cantonese using a single-case study.

**Methods:** A preschool boy with phonological-based SSD was recruited. In the initial assessment, consistent phonological processes of final consonant deletion, diphthong reduction, as well as fronting, deaspiration, and stopping of initial consonants were observed in the boy's speech. Analysis using feature-based phonology indicated that the [continuant] and [spread-glottis] features were missing in the boy's inventory. In addition, it is further hypothesised that the processes of final consonant deletion and diphthong reduction indicated either an unmarked coda segment in the boy's syllable structure representation or delinked [consonantal] and [sonorant] features with the coda at the segmental level. Initial consonants /f/ and /h/ were selected as treatment targets to establish the [continuant] and [spread glottis] features. For the coda position, the consonant /ng/ which carries both [consonantal] and [sonorant] features was selected. A total of 15 weekly treatment sessions with balanced production-based and perceptual (minimal pair discrimination and identification) training will be implemented starting from mid February 2023. Pre- and post-treatment phonetic inventory of the boy will be analyzed based on language samples collected using narratives and conversation tasks.

**Expected results and Discussion:** It is expected that direct treatment effect of correct productions of /f/, /h/ and /-ng/ will be resulted. In addition, it is expected that generalisation to initial consonants /s/ (sharing with /f/ the [continuant] feature) and aspirated plosives /ph/ and /th/ (sharing with /h/ the [spread-glottis] feature) are expected. Besides, generalisation to all final consonants (sharing with /ng/ the [consonantal] feature) and all diphthongs (sharing with /ng/ the [sonorant] feature at the coda position) is also expected. Finally, generalization to initial consonants /k/ and /kh/ (both sharing the [velar] position feature with /ng/) is also anticipated.

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## **Performance on syllable repetition tasks by Cantonese-speaking preschool children with childhood apraxia of speech and typical development**

Helen Ching Chung (The Department of Chinese and Bilingual Studies, Hong Kong Polytechnic University), Eddy Chun Ho Wong (The Department of Chinese and Bilingual Studies, Hong Kong Polytechnic University), Min Ney Wong (The Department of Chinese and Bilingual Studies, Hong Kong Polytechnic University), Shelley L. Velleman (Department of Communication Sciences and Disorders, the University of Vermont) and Jess Loh (The Department of Chinese and Bilingual Studies, the Hong Kong Polytechnic University).

**Background:** The Syllable Repetition Task (SRT) was developed to measure speech processing constraints in English-speaking children with childhood apraxia of speech (CAS). It has been reported to be a promising tool to identify CAS, with cut-off points on four scores, namely competency, encoding, memory, and transcoding. This study applied the SRT to Cantonese speakers with CAS to examine its ability to identify CAS in this population.

**Methods:** Five children with CAS, 18 children with speech sound disorders (SSD) only, and 38 children with typical speech-language development (TD), aged 3;00 to 5;11, have completed the SRT so far. Four Z scores were calculated for each participant with CAS based on the performance of the children with SSD and TD in their respective age groups separately. The English cut-off scores for each measure were applied to the CAS group.

**Results:** Children with CAS had significantly lower competency and memory scores than the TD and SSD groups, while the TD and SSD groups performed comparably in all four areas. Although all children with CAS had Z scores lower than -1 on competency and memory scores, only two (40%) and three (60%) children with CAS did so on transcoding scores when compared with the TD and SSD groups, respectively. Only competency cut-off scores accurately informed CAS diagnosis.

**Conclusion:** The SRT did not accurately assess speech processing constraints in Cantonese in this study. The SRT scores do not appear to reflect underlying deficits in phonological planning, phonological memory, and motor programming skills in children with SSD. The SRT differentiated children with CAS from those with TD and SSD based on competency and memory scores. However, the expected underlying deficits in motor programming in the CAS group were not shown by the transcoding score. Possible explanations will be discussed.

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## **Vowel perception in noise: A comparison of children with cochlear implants and their peers with typical hearing**

Marcel Schlechtweg (Carl von Ossietzky Universität Oldenburg), Mark Gibson (Universidad de Navarra), Judit Ayala (Universidad de Navarra), Xianhui Wang (University of California Irvine) and Li Xu (Ohio University).

Cochlear implants (CIs) permit individuals with severe-to-profound hearing loss to have (better) access to spoken language, even though the signal is distorted (see, e.g., Faes and Gillis 2017). Therefore, although we see that perception improves after cochlear implantation, it frequently differs from perception patterns found for children with typical hearing (TH) (see, e.g., Faes and Gillis 2017). Moreover, humans often communicate in noisy environments, which makes perception even harder. Here we look at how children with CIs perceive the five peripheral vowels in Spanish [a e i o u] in noise, in comparison to peers with TH. We focus on Spanish-speaking children, in both steady-state noise and background babble (6 talkers), and various signal-to-noise ratios (SNR; 0, 6, 12 dB). Our participants were exposed to the syllables [da de di do du] in noise and were requested to click on the syllable (written on the computer screen) that they heard (240 stimuli). Results (14 children, 7 from each group) pointed to an inferior overall vowel-recognition performance for the children with CIs than for the children with TH (Accuracy: 68 % versus 84 %). The accuracy scores for individual vowels (data pooled across all participants, noise types, and SNRs) were [a] 87 vs. 96 %; [e] 84 vs. 96 %; [i] 68 vs. 88 %; [o] 53 vs. 84 %; [u] 47 vs. 57 %, for the children with CIs and TH, respectively. Vowel [u] seemed to be especially challenging for the children with CIs, it was often confused with [o]. We will discuss these findings and possible relevant factors, such as the role of different formants in perception in noise or the lack of a visual, articulatory support.

**References:**

Faes, J., Gillis, S. 2017. Consonant cluster production in children with cochlear implants: A comparison with normally hearing peers. *First Language* 37 (4), 319–349.

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## Generalization from the treatment by different therapeutic models

Vanessa Giacchini (Federal University of Rio Grande do Norte).

Speech-sound-disorder with a cognitive linguistic aspect is a disorder characterized by the inappropriate use of language phonemes. It is of unknown etiology and is characterized by omission, substitution and simplification during the production of phonemes. Speech therapy focusing on phonology seeks to reorganize the phonological system of children with speech alterations. It aims at the generalization and improvement of speech intelligibility while reducing treatment time. The generalization process is characterized by the expansion of production and the correct use of target phones in different training contexts and in untrained environments. This should lead to a more efficient therapy and to less treatment time. The aim of this study was to verify the generalization in the phonological therapy of four children with speech-sound-disorder with a cognitive linguistic aspect. The chosen method was a cross-sectional study with a descriptive, qualitative analysis, conducted with children diagnosed with speech-sound-disorder with a cognitive linguistic aspect. Inclusion criteria for the test-persons were: not having undergone previous speech therapy, being between five and eight years of age, suffering from no other language disorder outside phonology. Therapy was performed in two weekly visits of forty-five minutes. The children underwent therapy based on the ABAB model (TYLER & FIGURSKI, 1994) or on the Minimal Pairs/Maximum Oppositions model (GIERUT, 1992). The results of the analysis showed that the generalization could be verified for phonemes not trained in the therapy for both models applied. The best results were observed in children submitted to the ABAB model (TYLER & FIGURSKI, 1994) with PCC index (SHRIBERG,1997) of mild degree. It can be concluded that models that seek phonological reorganization are effective in the therapy of speech-sound-disorder with a cognitive linguistic aspect.

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## Language and Executive Functions in Patients with Transcortical Motor Aphasia and Broca's Aphasia

Mile Vuković (Faculty of Special Education and Rehabilitation, University of Belgrade, Serbia) and Liang Chen (University of Georgia).

**Background:** The relationship between executive functioning (EF) difficulties, language impairment, and different types of aphasia is poorly understood.

**Aims:** In the present study, we investigated EF skills in Serbian speakers with transcortical motor aphasia (TMA) or Broca's aphasia, as well as the relationship between EF skills and language skills.

**Methods & Procedures:** Participants included Serbian speakers with TMA (N=19) and with Broca's aphasia (N=19), as well as 25 healthy controls. Boston Diagnostic Aphasia Examination (BDAE) was administered to all the participants with aphasia. In addition, an EF test battery was administered to all participants, including the Verbal Fluency test, the Stroop test and Trail-Making Test.

**Outcomes & Results:** Results first revealed that both individuals with TMA and those with Broca's aphasia showed EF deficits in comparison to healthy controls. Secondly, performance on EF subtests was highly correlated with each other for healthy controls, but such significant correlations were largely absent for the two groups of participants with aphasia. Thirdly, EF skills were significantly correlated with linguistic skills for participants with Broca's aphasia, but not for participants with TMA. Even for participants with Broca's aphasia, the relationship differed depending on the linguistic measures or the EF tasks, such that six linguistic measures on BDAE (i.e., Nonverbal agility, Word repetition, Responsive naming, Oral sentence reading, Visual confrontation naming, Understanding written language: Reading sentence and paragraphs) were not correlated with performance on any of the EF tasks.

**Conclusion & Implications:** These results suggest that individuals with both TMA and Broca's aphasia show EF deficits. They also show that the relationship between EF deficits and language impairments in individuals with aphasia might depend on the type of aphasia, aspects of language, as well as components of EF measured.

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## Differences in nasalance scores obtained with different Nasometer headsets

Tim Bressmann (University of Toronto) and Blanche Hei Yung Tang (Hong Kong University).

**Objectives:** The goal of the present research study was to investigate possible differences in nasalance scores between different Nasometer headsets.

**Methods:** Frequency response characteristics of microphone pairs in a Nasometer model 6200, a model 6450 and two model 6500 headsets were compared using long-term average spectra of white noise and multi-speaker babble signals. Prerecorded soundfiles from a male and a female speaker were used to record nasalance scores with the four Nasometer headsets and to calculate cumulative absolute differences within and between the headsets.

**Main Outcome Measures:** Cumulative absolute differences between the decibel (dB) values in the frequency bins from 300-750 Hz for the nasal and oral channels of each microphone pair. Cumulative absolute differences between nasalance scores of repeated stimuli within and across Nasometer headsets were tabulated.

**Results:** Cumulative absolute differences for the frequency range 300-750 Hz were between 6.58 dB to 7.68 dB. Within headsets, 95.6% to 100% of measurements of all four Nasometer headsets were within 3 nasalance points, although test-retest differences of up to 6 nasalance points were found. Between headsets, 56.1% to 98.9% of measurements were within 3 nasalance points, with a single largest difference of 8 nasalance points.

**Conclusion:** Differences between repeated nasalance scores obtained with the same and different headsets were noted. Clinicians should allow a margin of error of +/- 6 to 8 nasalance points when interpreting scores from different Nasometer headsets.

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## Differences in communication in two children with Down Syndrome with similar levels of speech and language functioning – a case study

Anna Nyman (Karolinska Institutet, Department of Clinical Science, Intervention and Technology (CLINTEC)), Sofia Strömbergsson (Karolinska Institutet, Department of Clinical Science, Intervention and Technology (CLINTEC)) and Carmela Miniscalco (Gillberg Neuropsychiatry Centre, Sahlgrenska Academy, Gothenburg University).

Down syndrome is associated with severe difficulties with speech and language. The association between speech/language measures and communication ability has however rarely been examined, at least not after infancy and toddlerhood. Here, we present case data indicating that children with similar levels of speech and language functioning may present with very different levels of communication. Two cases were chosen from a larger project, examining children with different neurodevelopmental disabilities. Two types of data on communication ability were collected: parental reports (based on the Communication Matrix, CM) and annotations of video recordings of parent-child interaction (based on the Modified Classroom Observation Scale to Measure Intentional Communication, M-COSMIC). The two participants (age 7 years, one boy and one girl) both had severe difficulties with language comprehension. The percentage of consonants correct on a standardized test was 61 and 64%, respectively, and intelligibility was poor (a median of 26 and 29% of syllables perceived as understood by trained listeners). Despite these similarities, communicative forms and functions showed many differences. According to the CM, participant A used all 17 communicative functions, whereas participant B used 9. The same pattern was seen in the video recorded interactions – participant A used 7/8 different communicative functions in the M-COSMIC, but participant A used only 4. On the CM, parents of both participants reported that their child used spoken words as their main communicative form. However, according to the M-COSMIC analyses, participant B used both vocalizations and actions more frequently than spoken words, in contrast to participant A, where spoken words were predominating. For these two participants, the similar results on speech and language measures did not correspond to results on communicative forms and functions. The possible implications for research and clinical practice in the field of intellectual disabilities will be discussed.

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## **Prevalence of Speech Sound Disorder among pre-schoolers in Hong Kong: A cross-sectional study on the performance in Single Word Articulation Test**

Cymie Wing Yee Ng (The Hong Kong Polytechnic University), Michael Chi Fai Tong (The Chinese University of Hong Kong), Tan Lee (The Chinese University of Hong Kong) and Kathy Yuet Sheung Lee (The Chinese University of Hong Kong).

**Background:** Speech sound disorder is a common communication disorder in children's development. Delay of intervention may bring negative effects on the children's social, emotional and academic challenges (Hitchcock et al., 2005). Early identification and intervention are crucial in preventing the disorder to be developed as persistent SSD. The lack of information about current prevalence may lead to mis-allocation of manpower in healthcare service. In this research study, the prevalence rate of SSD in Hong Kong is studied by observing the performance of pre-schoolers in a single word articulation test. It aims to provide a picture of the current situation of SSD in Hong Kong and bring important information to both SLP professionals and allied health service providers on service planning and delivery.

**Methods:** A large-scale of data was collected from 1,986 aged 3-6 pre-schoolers from kindergartens in Hong Kong. Each child underwent the Hong Kong Cantonese Articulation Test (HKCAT, 2006) which is a standardized single word assessment tool used by qualified speech therapists in diagnosing children with speech sound disorders. The scaled scores, age of acquisition and the occurrence rate of speech sound errors were observed. The correlation of the occurrence rate of SSD with age and gender is also studied.

**Results:** The overall prevalence rate obtained in this study is 12.49%. A statistically significant correlation was obtained with both the age and gender; boys are more likely to be diagnosed with SSD and older children tend to have less occurrence of SSD in both genders.

**Conclusion:** The result obtained from current study is comparable to other prevalence studies previously done in other countries. The finding of the prevalence study brings practising speech therapist insight on the current situation and severity of SSD in Hong Kong.

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## **Manipulation of voiced VOT in prominence and Parkinson's disease: Effects on intelligibility**

Thea Knowles (Michigan State University), Nathaniel Cline (University at Buffalo) and Meghan Clayards (McGill University).

One way in which talkers convey important information to conversational partners is by manipulating prosodic prominence to make certain words more salient. In English, acoustic prominence is typically achieved by greater duration, intensity,  $f_0$ , and hyperarticulation. The control of some of these cues may be reduced in talkers Parkinson's disease (PD), which could impact a listeners' ability to understand their message. In the present study, 20 older adults with and without PD partook in a simple instructional speech activity in which they directed a research confederate to move pictures around on a board. Utterances were designed to manipulate prominence on stop-initial monosyllabic target words that differed in onset voicing (/p/ versus /b/). Non-prominent words were repeated in the spoken instructions ("Move the pot above the chair; now move the [pot] above the box"), while prominent words contrasted with a minimal pair differing in either onset voicing ("Move the pot above the chair; now move the [bot] above the chair"). Naïve listeners transcribed the target word in the second half of the instructions mixed with +3dB signal-to-noise ratio of multi-talker background noise. Listener accuracy in transcribing stop onsets was modelled as a function of group, condition, voicing, and voice onset time (VOT). Overall, prominent words were more accurately transcribed than non-prominent words. In particular, prominence led to better intelligibility of voiced stops for controls, but not PDs. Further interactions with VOT suggest this was due to differences in how the groups modulated voiced VOT in prominent words, which was longer for the PD group compared to controls. That is, PDs were less likely to make voiced stops more "voiced-like" to signal prominence than controls and thus saw little intelligibility benefit. Findings will be discussed in the context of speech motor control and listener-oriented modifications.

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## **PANEL: Can we add depth to the systematic evaluation of speech and language therapy interventions? A comparison of realist and systematic approaches to literature reviews**

Jill Titterington (Ulster University).

**Aims:** To compare systematic and realist reviews and highlight the potential value of the realist review in exploring what speech and language interventions work, how, why and for whom in different contexts

**Background:** Traditionally, systematic reviews (in particular those including meta-analyses) have been seen as the gold standard for evaluating the effectiveness of speech and language interventions. Some key issues with this approach in the field of paediatric speech and language therapy are the lack of robust randomised controlled trials (RCTs) of interventions (which are the study design of choice for systematic reviews) and the tendency for systematic reviews to adopt a restricted perspective to intervention effectiveness i.e., interventions work, do not work, or there is not enough evidence to support either view.

In contrast, the more recently developed realist review methodology probes the black box underpinning interventions to extract what it is about an intervention that works, why, how, for whom, and under which circumstances. This approach is becoming more widely used as researchers have begun to see that carefully designed and delivered interventions which might work in the sophisticated and controlled environments of the RCT, simply do not work in the context of real life.

Both approaches to reviewing interventions are valuable but they offer different learning opportunities. This presentation aims to compare the methodologies of each approach and share the learning that can be gleaned from each in case studies (one of a systematic review into speech, language and communication interventions for children with Down syndrome and another of a realist review into what, how and in which contexts, effective, intensive, digital parent-implemented interventions work for children with speech sound disorder).

**Outline:**

1) Short presentation introducing the topic and comparing the overarching aims and methodologies/processes underpinning:

- A systematic review (SR)
- A realist review (RR)

2) Two paper presentations, each of which represents a worked example of a SR and a RR outlining how each may contribute to knowledge and understanding (20 minutes):

- Worked example of a SR
- Worked example of RR

3) Panel discussion and questions – mentimeter.com will be used throughout to give the audience the opportunity to answer questions and comment on the various areas covered. Wordles from mentimeter.com will be shared, and questions posed to the audience to stimulate discussion

4) Wrap up and summary

**Presenters/organisers:**

Jill Titterington (PhD, Speech and Language Therapy Lecturer, School of Health Sciences, Ulster University)

Naomi Leafe (PhD researcher, Speech and Language Therapy, School of Health Sciences, Ulster University)

Vesna Stojanovik (PhD, Professor of Clinical Linguistics, School of Psychology and Clinical Sciences, University of Reading)

Emma Pagnamenta (PhD, Speech and Language Therapy Lecturer, School of Psychology and Clinical Sciences, University of Reading)

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## **Velopharyngeal function in foreign-born and Swedish-born 5-year-old children with cleft lip and palate – a registry study**

Louise Lendt (Lund university), Magnus Becker (Lund university) and Kristina Klintö (Lund university).

**Background:** Children with cleft lip and palate (CLP) get surgery at an early age. Despite this, some children with cleft palate with or without cleft lip (CP/L) have incompetent/insufficient velopharyngeal function (VPF), which can lead to hypernasality, audible nasal air leakage, weak articulation, and articulation difficulties. Previous studies have shown that Swedish-speaking children with CP/L have poorer speech than children without CP/L. There are indications that Swedish foreign-born children with CP/L have poorer speech than Swedish-born peers with CP/L. The purpose of this study was to increase the knowledge of VPF in Swedish foreign-born children with CP/L compared to Swedish-born peers with CP/L, to better adapt follow-ups and intervention.

**Methods:** Registry data from 763 5-year-old children born 2009-2016 with CP/L from the Swedish CLP registry were analyzed. VPF was assessed on a three-point-scale (incompetent, marginally incompetent and competent). Speech data were compared between Swedish-born and foreign-born children, and in different sub-groups based on cleft type and gender.

**Results:** Preliminary results indicate that for children with unilateral CLP more Swedish-born boys (60%) and girls (68%) had competent VPF compared to foreign-born boys (47%) and girls (38%). For children with bilateral CLP, more Swedish-born boys (54%) and girls (48%) had competent VPF compared to foreign-born boys (30%) and girls (20%). More Swedish-born girls (58%) with isolated cleft palate (CP) had competent VPF compared to foreign-born girls (44%). However, more foreign-born boys (60%) with CP had competent VPF compared to Swedish-born boys (53%).

**Conclusion:** The preliminary results indicate that more Swedish-born children with CP/L have competent VPF than their foreign-born peers. Statistical analyses will be performed to further investigate VPF and possible influencing variables.

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## **Narrative Generation and Narrative Recall Recruit Different Executive Functions in Preschoolers with and without Developmental Language Disorder**

Yuanyuan Lin (Shanghai Children's Medical Center, Shanghai Jiao Tong University School of Medicine, Shanghai), Li Sheng (Department of Chinese and Bilingual Studies of the Hong Kong Polytechnic University), Huanhuan Shi (New York University), Wenjie Yan (Shanghai Children's Medical Center, Shanghai Jiao Tong University School of Medicine, Shanghai) and Yiwen Zhang (Shanghai Children's Medical Center, Shanghai Jiao Tong University School of Medicine, Shanghai).

**Background:** Preschool-age years are critical for the development of narrative abilities and Executive Functions (EF). This study explores the relationship between EFs in daily life contexts and narrative abilities in children with and without Developmental Language Disorder (DLD).

**Methods:** We enrolled 14 preschoolers (11 boys) with DLD and 34 typically-developing preschoolers (23 boys) (TD) from March 2019 to August 2020. All children had normal non-verbal IQ. The two groups were comparable in mean age, maternal education level, and amount of Mandarin exposure but differed significantly on standardized language test scores. The Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF) was used to investigate executive behaviors in everyday activities according to parents. Narrative abilities were measured by a generation task and a recall task using the Multilingual Assessment Instrument for Narratives.

**Results:** TD group outperformed the DLD group on narrative macrostructure and microstructure (i.e., mean length of utterance, total number of words, and number of different words), and the inhibit, shift, and global executive composite dimensions on the BRIEF. On the narrative recall task, after controlling for standardized language test scores, working memory scores from the BRIEF explained unique variance in both narrative macrostructure and microstructure performance. On the story generation task, after controlling for language skills, both inhibition and working memory predicted macrostructure performance, and inhibition also predicted microstructure performance.

**Conclusion:** Narrative recall relies heavily on working memory capacity as children must recall the details provided in the mature adult model; narrative generation requires inhibition and working memory skills as children must selectively attend to relevant visual details in the pictorial stimuli and monitor their own language production.

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## Acoustic characteristics of Cantonese Tones in Whisper

Bin Li (City University of Hong Kong), Siyan Zhu (City University of Hong Kong) and Cuiling Zhang (cuilingzhang@hotmail.com).

**Background:** Tonal contrasts in phonated speech use multiple acoustic correlates with pitch variations as the major one. However, whispered speech lacks vibration in the vocal cords, which poses challenges to the mechanism of tonal contrasts. This study investigated phonetic realization of Cantonese tones in whispered speech. The lexical tones occurring in non-entering syllables include three level ones (T55, T33, T22), two rising ones (T23, T25), and an extra low one (T21), which contrast in pitch onset, mean, and direction of pitch change.

**Methods:** A list of 46 monosyllabic (Consonant-Vowel) words was selected to cover five monophthong vowels bearing six lexical tones. The words were also embedded in natural contexts to form short sentences. Adult native speakers of Hong Kong Cantonese read the word list and sentences in normal phonation and in whisper. Phonetic correlates of the recorded speech, including duration, intensity, and first two formants (F1 and F2) of vowels, were measured and calculated. Statistical analysis was run with phonation type, tone, and linguistic context as independent variables and speakers as random variables.

**Results:** Tones in whisper were produced with damped intensity but longer duration. Mean intensity levels of whispered tones from high to low were ranked as T55 > T33 > T21 > T25 > T22 > T23. F1 and F2 of vowels /a/ and /ɔ/ were higher in whisper than in normal phonation. Moreover, phonetic modifications were more significant in words produced in isolation than in sentences, which may be due to facilitation from semantic and syntactic cues.

**Conclusion:** Cantonese tones in whisper show significant changes in phonetic realization of major tonal correlates, but the effects of whisper may be emoliated by contexts. Our findings provide implications to using whispers in hearing tests and in speech rehabilitation among Cantonese speakers.

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## **Exploring the use of speech recognition technology in detecting children speech sound disorders: A cross-disciplinary collaboration**

Cymie Wing Yee Ng (The Hong Kong Polytechnic University), Herman Si loi Ng (The Chinese University of Hong Kong), Kathy Yuet Sheung Lee (Department of Otorhinolaryngology, Head and Neck Surgery, The Chinese University of Hong Kong), Tan Lee (The Chinese University of Hong Kong) and Michael Chi Fai Tong (The Chinese University of Hong Kong).

**Background:** Speech sound disorder (SSD) is a common communication disorder in children's development. Early identification and intervention are always crucial in preventing the disorder to be developed as persistent SSD. However, limitation in resource allocation of healthcare management is always the barrier in achieving such an ultimate goal. The use of technology which brings cost-effectiveness may be one possible future solution. Automatic speech recognition (ASR) technology is rapidly developing in the recent decades and the use has been widely applied in our daily life. It has caught researchers' attentions on its applicability in recognizing disordered speech. During the past decades, research collaboration between different disciplines has become more frequent. In exploring ASR for pathological speech, collaboration across speech and language pathologist (SLP) and electronic engineer (EE) is always emphasized. In this research study, we aim to investigate the effectiveness of the cross-disciplinary collaboration during the study of applying ASR on speech sound disorder.

**Methods:** Cantonese speech sound from pre-schoolers is collected and used to form a large-scale corpus. Normal and error speech sound are extracted from the corpus to develop difference machine learning based acoustic systems. Both microscopic system which utilises a DNN-based consonant classifier and macroscopic system which involves speaker verification approach are proposed to detect speech errors. Cross-disciplinary collaborations are established through different stages of a research project studying application of ASR in recognising speech errors produced by pre-schoolers. The effectiveness and obstacles during the research are investigated.

**Results:** A large-scale database, CUCHILD, which contains Cantonese speech sound of 1,986 pre-schoolers in Hong Kong is formed. The results obtained from both microscopic and macroscopic machine learning based acoustic systems were found to be efficacious. Frequent communications between the speech and language pathology and electronic engineering are needed during the preparatory stage, data collection, corpus formation, data processing and analysis, and ASR systems development.

**Conclusion:** With the favourable results obtained, cross-disciplinary collaborations are found to be effective and crucial to the possibilities of developing future ASR researches.

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## **Exploring the effect of Vocabulary Acquisition and Usage for Late Talkers Treatment approach for Cantonese-English bilingual late talkers**

Tai-Ying Lee (University of Hong Kong).

**Introduction:** Working with bilingual late talkers are a clinical challenge as there are many issues to address in intervention such as the language of intervention, and intervention language input conditions. This study examined the effect of the Vocabulary Acquisition and Usage for Late Talkers (VAULT) treatment approach for Cantonese-English bilingual late talkers across three language input conditions.

**Methods:** A multiple baseline single case experimental design was utilised with three Cantonese- English bilingual late talkers aged 25-35 months. Intervention was provided twice weekly for 30 minutes each session over 6 weeks. Children were randomly assigned to one of three language input conditions; alternating (target provided in either language), concurrent (target provided in both languages) and blocked (target in one language per session). Four of the 10 target words selectively derived from pre-intervention assessments were in each session. Target word input was at a minimum of 64 doses per session. Word frequency and phonological neighbourhood density (PND) of targets were controlled. Pre and post measures of expressive vocabulary, and weekly probes on target and controls were completed.

**Results:** Increased production of target words and expressive vocabulary indicating significant treatment effects were evident across all three input conditions. Growth in Cantonese expressive vocabulary consistently larger than English for all three children. Expressive vocabulary size increased by an average of 19 words for Cantonese and 5 words for English, with a range of 39-234 words for Cantonese and 13-90 words for English, learnt over the intervention period. Effect of PND were mixed but not statistically significant.

**Conclusion:** Results indicate the feasibility of the VAULT intervention approach for Cantonese-English bilingual late talkers, independent of language input condition. Language exposure and dominance appears to impact intervention effect. Further investigation is needed to determine role of language exposure, PND and feasibility of VAULT in clinical contexts for bilingual late talkers.

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## **Phonological and phonetic difficulties in children with Childhood Apraxia of Speech**

Dora Knežević (University of Zagreb) and Ben Maassen (University of Groningen).

**Background:** Childhood apraxia of speech (CAS) is a motor speech disorder in which the precision and consistency of speech sounds are impaired due to deficits in motor planning and programming. Although the underlying nature of CAS is thought to be motoric, debate has arisen as to whether the nature of the impairment is phonological as well. The phonological level could be considered embodied phonetics, implying that developmentally phonological difficulties can arise from phonetic difficulties. The purpose of this study was to investigate the relationship between phonological and phonetic measures in children with CAS.

**Methods:** Croatian children with CAS (N=30) and typically developing children (N=28) aged 5 to 7 years participated in this study. Exclusion criteria were: neurological or physical cause of speech sound disorder, general motor impairment, cognitive impairment, hearing impairment, and inadequate receptive language skills. A test battery was created for this study under the premise of the process-oriented approach.

**Results:** Results show that children with CAS exhibit significant difficulties on both phonological (phonological awareness, repetition of words and non-words) and phonetic measures (PCC, PVC, PCCI, PCCF). Spearman rank correlation for CAS children shows a positive correlation between phonological and phonetic measures. At least 3 out of 4 phonetic measures correlate moderately to highly with phonemic segmentation, phonemic blending, word and non-word repetition. PVC is a phonetic measure least correlated with phonological measures.

**Conclusion:** The core features of CAS (ASHA, 2007) are consistent with a deficit at the level of speech sound planning and programming. However, theoretical considerations (Ziegler, 2016) and the positive correlation between phonological and phonetic measures challenge the phonological – phonetic dualism, which may imply that trying to categorically distinguish between phonological and motor deficits involved in speech production, is not only difficult but also clinically counterproductive.

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## Links between lexical and syntactic reduction in infant-directed speech and early language development

Veronika Harmati-Pap (Hungarian Research Centre for Linguistics, Budapest, Hungary), Noémi Vadász (Hungarian Research Centre for Linguistics, Budapest, Hungary), Ildikó Tóth (Institute of Cognitive Neuroscience and Psychology, Research Centre for Natural Sciences, Budapest, Hungary) and Bence Kas (Hungarian Research Centre for Linguistics, Budapest, Hungary).

**Background:** Infant-directed speech (IDS) is characterized by reduced vocabulary and structural simplification compared to adult-directed speech (ADS) showing an adaptive trend related to the infants' language growth (e.g. Genovese et al. 2019). However, there is considerable variation between mothers in the degree of lexical and syntactic reduction of their IDS (Harmati-Pap et al., 2022). This study aims to investigate the impact of the inter-individual variation of these characteristics of IDS on infants' vocabulary development.

**Methods:** 72 dyads of mothers and their firstborn infants participated in the study. We recorded both IDS and ADS (to an adult experimenter) storytelling by the mothers based on standard picture stimuli of the same fairy tale at 6 months of their infants' age. The degree of lexical and syntactic reduction in IDS narratives were expressed by intra-individual ADS-IDS differences in type-token ratios of verbs and nouns and mean length of utterance (MLU). Vocabulary outcomes were measured at 18 months using the Hungarian adaptation of the MacArthur-Bates CDI W&G form.

**Results:** Spearman's rho revealed that ADS-IDS differences in type-token ratios showed weak but significant positive correlations with infants' sentence comprehension ( $\rho=0.234$ ,  $p=0.049$ ) and noun vocabulary ( $\rho=0.241$ ,  $p=0.043$ ) at 18 months. ADS-IDS differences in type-token ratios of verbs showed weak but significant positive correlations with infants' total receptive vocabulary ( $\rho=0.357$ ,  $p=0.002$ ), sentence comprehension ( $\rho=0.366$ ,  $p=0.002$ ), receptive noun vocabulary ( $\rho=0.340$ ,  $p=0.004$ ), receptive verb vocabulary ( $\rho=0.289$ ,  $p=0.015$ ), total expressive vocabulary ( $\rho=0.249$ ,  $p=0.035$ ) and expressive noun vocabulary ( $\rho=0.289$ ,  $p=0.015$ ). ADS-IDS differences in MLU correlated significantly with expressive verb vocabulary ( $\rho=0.31$ ,  $p=0.009$ ). A linear regression model using six ADS-IDS difference variables explained for 17.8% of the variance in total receptive vocabularies of infants at 18 months,  $F(6,65)=2.35$ ,  $p=0.041$ .

**Conclusion:** Our study found a link between linguistic simplification of maternal IDS in storytelling at 6 months and the vocabulary development of their infants at 18 months in Hungarian language. Infants whose mother tends to modify their linguistic complexity more in response to the listener show higher vocabulary development. Interestingly, it was the reduction of the set of verbs used in the IDS narratives that showed the strongest correspondence with later language development. The results might be applied to enhance communication strategies in parents of children with language delay.

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## **Phonological awareness in three subtypes of poor English readers in Hong Kong: a retrospective observational study**

Wing Yee Anna Lee (The Hong Kong Polytechnic University).

Phonological awareness, in particular phonemic awareness, has a long-established, bi-directional relationship with learning to read. Together with phonics and vocabulary, phonemic awareness is one of the core components in reading instruction. In Hong Kong, little is known about the phonological awareness skills in bilingual poor English readers. Phonics is taught in kindergartens. However, some children still struggle to read in primary school. A retrospective observational study was conducted on 74 Cantonese-speaking children, aged between 5;9 and 10;2; who were enrolled in the English Reading and Spelling Training programme in the Hong Kong Polytechnic University between 2018-2023. Before the training, they were assessed on English oral vocabulary, single word-reading, spelling, and phonological awareness. Three groups were identified: those with poor oral vocabulary, reading and spelling (PVRS), those with poor reading and spelling (PRS), and those with poor spelling only (PS). Their scores on phonological awareness, measured in syllable and phoneme deletion tasks, were compared using a two-way ANOVA with group and types of phonological awareness. Main effects and interaction were found. The PS group performed the best in all tasks, followed by the PRS and PVRS groups. All groups showed good syllable deletion but poor phoneme deletion in consonant clusters. Deletion of final consonants were better than that of initial consonants. The results replicated previous studies that the development of phonological awareness is related to oral vocabulary, reading and spelling abilities. Individual profiles in the PS group reveal spelling difficulties despite good phoneme awareness, suggesting that learning to spell may need other skills such as application of rules, orthographic regularities, and morphological knowledge. Clinical implications on the importance of (1) a comprehensive assessment to differentiate the subtypes of poor English readers; and (2) intervention targeting on vocabulary, phonological awareness, and phonics according to the needs of different subtypes, will be discussed.

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## **Investigating variability in child's speech (VariCS)**

Mridhula Murali (University of Strathclyde), Joanne Cleland (University of Strathclyde), Jane Stuart-Smith (University of Glasgow), David Young (University of Strathclyde) and Anja Kuschmann (University of Strathclyde).

**Background:** Learning to speak requires mastering the intricate interplay of the speech production mechanisms of respiration, phonation, resonance, and articulation. Children vary considerably in how quickly they master this process. This project aims to investigate variability ranges in typical child speech of primary-school aged children, and how variability patterns evolve in this group over time. We aim to identify to what extent i) patterns reflect specific developmental trajectories of speech; and ii) speech measures in one subsystem predict performance in other subsystems. Comprehensive understanding of variability in typical speech development and its change over time will allow identification and interpretation of developmental patterns that exceed typical ranges.

**Methods:** Speech data will be collected from 500 children in central Scotland aged 5 to 11 every 6 months over 1.5 years. The data will be collected through a designed iPad app, and will include connected speech from a story retell, picture description, and sentence repetition. This will be complemented by a single word picture naming task, and non-speech tasks including sound prolongation and DDK. Acoustic measures pertaining to all four speech subsystems that are commonly used in the literature to differentiate between typical and atypical speech such as articulation rate and formant frequencies will be extracted from the recordings.

**Results and Conclusion:** The outcomes of the project will contribute the field's understanding of variability in typical child speech development and elucidate the potential link between different subsystems measures. The project will also give rise to i) an open access archive of child speech recordings, and ii) a reference database for speech and language therapists to aid in diagnosis and treatment of children's speech and voice disorders available through a look-up facility on the project website. Additionally, the app developed for data collection offers opportunities for future research on aspects of child speech.

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## The effects of phonological complexity on word production in French-speaking children

Margaret Kehoe (Université de Genève).

**Background:** Word complexity indices, such as the Index of Phonetic Complexity (IPC, Jakielski, 2000) and the Word Complexity Measure (WCM, Stoel-Gammon, 2010) code a target word in terms of featural and structural properties known to pose difficulty in phonological development (e.g., presence of dorsals, fricatives, codas, clusters, etc.). Several studies have investigated the influence of such word complexity measures on vocabulary and stuttering development; however few studies have examined the influence of word complexity on consonant precision itself. This study investigates whether a word's complexity score predicts how accurately the word will be produced.

**Methods:** Four different databases consisting of the word productions of French-speaking monolingual children ( $n = 96$ ), aged 2;6 to 4;9, were analyzed. All words were coded in terms of the IPC, the WCM, as well as additional features (e.g., presence of alveopalatal consonants) associated with complexity in phonological development. Using binomial logistic regression, we examined which phonological complexity measure (the IPC, the WCM, or an alternative index) best accounts for consonant accuracy (as measured by the percentage of consonants correct). We also investigated whether the influence of complexity changes across age.

**Results:** Results indicated that phonological complexity as based on the IPC and the WCM significantly influenced consonant precision; however, an index tapping fewer complexity features provided superior model fit at all age ranges. At younger ages, the presence of fricatives and liquids were important complexity features whereas, at later ages, clusters and codas influenced consonant precision. At all ages, the presence of alveopalatal fricatives in the target word was associated with reduced consonant accuracy.

**Conclusion:** Findings suggest that current word complexity indices provide only approximate indications of how a word's different featural and structural properties influence production accuracy. We propose an alternate index based on fewer complexity features to better predict consonant precision across age.

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## Phonological description of Speech Sounds Disorder of Spanish speaking children from Central Mexico

Aline Herrera-Rangel (National Institute of Rehabilitation).

**Background:** As an L1, Spanish is the second most spoken language, with central Mexico hosting the largest population of Spanish speakers worldwide. Studies of Speech Sounds Disorder (SSD) acknowledge the dialect, and there's paucity of information on Central Mexico variety of Spanish (CMS). As a non-linear phonology approach, Phonological Simplification Processes (PSP) allow to observe the interaction of segments within words.

**Methods:** We outline the PSP of CMS-speaking children with SSD. Locally developed CEFI (Developmental Phonology Test) was used for the visually cued, 63 word-naming task. Age, sex, Weschler execution IQ, social background, family history of speech disorders and linguistic features were considered. Recordings were analyzed for three main types of PSP and subtypes: Substitution SUB (place- manner), syllabic SYL (cluster reduction SYL-CR, weak syllable deletion SYL-WSD, final sound deletion SYL-FSD), assimilation ASM (progressive ASM-P, regressive ASM-R, coalescence ASM-C), and two-stepped phenomena of a main PSP and secondary PSP.

**Results:** 46 children (3.5-6.5 years,  $5.0 \pm 0.75$ , 72% males). SYL accounted for 43% of PSP, with predominance of SYL-CR (62%); substitution 39% (place: fronting 44%, manner: stopping 41%, voicing: 1.5%); assimilation 16% (ASM-P 2%, ASM-R 42%, ASM-C 44%). Two-stepped PSP 3%, pairing SUB, SYL-CR, or ASM-C with a harmonizing ASM-R. Analysis per age revealed slight reduction in overall PSP with age, less frequent syllabic PSP in older children but no changes in SUB or ASM frequency across ages; SYL-WSD was most frequent among younger subjects. No significant effects of sex, executive IQ, family background or syntactic competence were found.

**Conclusion:** In children with SSD speaking CMS, age moderately affects the phonological features of the disorder. The very low frequency of voicing change in SUB calls for further study as it likely helps preserve intelligibility. Increasing the sample size and the participation of youngest and oldest individuals may improve validity of results.

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## **Training morphosyntactic skills in pre-schoolers with DLD**

Inge van Dijke (Royal Dutch Auris Group), Iris Duinmeijer (NSDSK), Lisanne Geurts (Royal Dutch Auris Group),  
Luisa de Heer (NSDSK) and Anouk Scheffer (Royal Dutch Auris Group).

**Introduction:** Problems in morphosyntactic development are a core symptom of developmental language disorder (DLD). In this study, effects and usability of a newly developed group-based intervention to improve the morphosyntactic skills of toddlers with DLD are tested.

**Methods:** Twenty-seven pre-schoolers diagnosed with DLD (2;10-3;9) participated in a single-subject A-B study in which the used target and control structures were monitored with a morphosyntactic task and language sample analyses (LSA). Progression during eight weeks care-as-usual was compared to progression during eight weeks morphosyntactic intervention. The intervention consisted of a weekly script-based group session in which one morphosyntactic structure was targeted, and daily activities in which the target structure was repeated. The intervention was provided by trained pedagogical practitioners, who were coached by a speech and language therapist. Usability was evaluated using questionnaires.

**Results:** Analyses demonstrate that children show progress in their use of grammatical structures during care-as-usual and the intervention period. Growth seems larger in the intervention period than in the period care-as-usual. However, the slopes are only significantly different for the use of control structures in LSA and not for the use of target structures. Evaluations among practitioners showed that they are positive about the intervention. They note that the intervention improved their deployment of techniques to stimulate the morphosyntactic development of children with DLD.

**Conclusion:** Although effects of the intervention could not be shown statistically, usability proved to be high. The absence of an intervention effect might be explained by methodological issues. In this presentation, we will discuss our findings and share the insights this study brought for clinical practice and research on (group-based) interventions for pre-schoolers with DLD.

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## **Age of Acquisition and Developmental and Acquired Language Disorders: a study of Short Narratives produced by Deaf People**

Felipe Venâncio Barbosa (University of Sao Paulo) and Bencie Woll (University College London).

Language acquisition depends on input received by the child from the environment, and, accessibility to the language of the environment is essential for cognitive and linguistic development. The development of specific assessment instruments for the acquisition of Brazilian Sign Language (Libras), as is the case for other sign languages, is necessary, but difficult to achieve, given the small number of Brazilian researchers engaged in this area. Language assessment can be undertaken by observing one or several levels of linguistic analysis, cognitive functions or mental status. One way to observe expressive language skills is the analysis of narratives. The main objective of the project presented here is the analysis of short narratives in Libras based on the same stimuli produced by three groups of deaf people: (i) those who have experienced early language acquisition, (ii) those with delayed language acquisition and (iii) those with acquired language disorders. Thirty-seven samples of video-recorded short signed narratives in Libras were analyzed from the database of the Sign Language and Cognition Research Group of the Department of Linguistics at the University of São Paulo. The narratives presented in the videos were transcribed and analyzed using a protocol developed for this research, based on the work of Herman et al. (2004), Petersen (2008) and Jones et al. (2016). The results show an impact of age of acquisition in the production of short narratives. The performance of deaf people with early acquisition is better than the performance of deaf people with the late acquisition and of deaf people with acquired language disorders. The number of signs, type/token ratio (number of different signs), MLU (mean length of utterance) and sign speed (number of signs per minute) are lowest in the group with language disorders, with markedly poorer performance in relation to the use of specific linguistic features of Libras, showing a relationship between both macro and micro levels. The results provide useful evidence in relation to policy about early language and communication in families with deaf children, as well as having potential to be developed as a language assessment tool for use with deaf children and adults.

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## **The efficiency of an explicit approach to improve complex syntax in French-speaking children with developmental language disorder: A pilot study**

Hélène Delage (University of Geneva), Eleonore Morin (Institut de Rééducation et d'Education pour la Communication, l'Ouïe et la Vue, Tours) and Emily Stanford (University of Geneva).

**Purpose:** Children with Developmental Language Disorder (DLD) have persistent language difficulties in complex syntax (Delage & Frauenfelder, 2020; Tuller et al., 2012). To date, few studies have examined the effectiveness of syntactic training focusing on complex grammar, with no existing studies having been conducted in French. In English, the SHAPE CODING (SC) system (Ebbels, 2007), which combines shapes and colors to identify the nature and function of words and sentence types, has been shown to be effective with children and adolescents with DLD (Ebbels, 2014; Balthazar et al., 2020). Our study assesses the effectiveness of a French adaptation of the SC method on the mastery of three syntactically complex structures: object relatives, accusative clitics and passives.

**Methods:** We developed a training protocol, inspired from SC principles, consisting of thirteen sessions of 30 minutes, and compared the ability of eighteen French-speaking children with DLD aged 7 to 11 to produce the target structures before and after syntactic training.

**Results:** Comparison of scores, as measured by individual baselines, shows that training results in significantly improved performance for all target structures, whereas no progression is observed on control items (verbal inflexions), which are not trained. More specifically, results show an improvement on sentences directly trained during the protocol, but also on new sentences that contain the same target structures, indicating a generalization effect.

**Conclusion:** Results support the existing literature on the effectiveness of explicit approaches to grammar in children with DLD. They showed that our French adaptation of the SC system led to better performance on complex structures, both trained and untrained. We hope that this work will open the door for future syntactic training studies with French-speaking children, as well as more frequent use of explicit approaches in clinical settings. The implications of the results are also discussed at the individual level.

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## **Reference production in the narrative discourse of Mandarin-speaking children with developmental language disorder (DLD) and typical development (TD)**

Luyuan Geng (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University) and Li Sheng (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University).

**Background:** Referring expressions in narrative discourse reflect the speaker's assumptions on the conceptual accessibility of a referent to a listener (Bock & Warren, 1985). The ability to use adequate referring expressions has been discovered to be related to working memory capacity (Whitley & Colozzo, 2013). This study aims to examine the knowledge of the functional and syntactic constraints of referential forms among Mandarin-speaking TD and DLD children and further investigate the effect of working memory on their reference adequacy.

**Methods:** Referring expressions were coded in a narrative corpus in which 5-year-old children with TD (N=21) and DLD (N=21) completed telling and retelling tasks in the Mandarin version of the Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2021; Luo et al., 2020). Children's working memory was measured by the Behavior Rating Inventory of Executive-Preschool Version (BRIEF-P; Gioia et al., 2003) completed by parents. Referring expressions were coded according to 1) the degree of definiteness: definite, indefinite and indeterminate; 2) syntactic position: preverbal and postverbal; 3) discourse function of referring expressions: introduction, maintenance and reintroduction; and 4) adequacy of referential forms.

**Results:** Higher working memory and the retelling task condition predicted higher adequacy for both groups. The DLD group produced fewer adequate referring expressions. Both groups exhibited the lowest adequacy for introduction among three discourse functions. In terms of functional constraints, children preferred definite forms for referent maintenance but indefinite and indeterminate forms for introduction and reintroduction. As for syntactic distribution, the preverbal position was preferred over the postverbal position for definite and indeterminate forms, whereas the opposite was true for indefinite forms.

**Conclusion:** Working memory and elicitation methods influenced children's referring skills in narrative discourse. Although DLD children performed worse in producing clearly identifiable referents, they held similar knowledge of the functional and syntactic constraints of referential forms.

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## **DELAD for sharing corpora of disordered speech: An update**

Alice Lee (University College Cork), Nicola Bessell (University College Cork), Henk van den Heuvel (Radboud University, Nijmegen), Satu Saalasti (University of Helsinki) and Katarzyna Klessa (Adam Mickiewicz University in Poznań).

**Background:** Database Enterprise for Language And speech Disorders (DELAD) is an initiative that aims to provide researchers a platform to discuss ongoing technical, legal and ethics issues related to sharing recordings of speech disorders, and to assist them in archiving their data for sharing with colleagues for research and education purposes. The project was initiated by Professors Martin Ball and Nicole Müller in 2015. This poster will report the latest progress of DELAD since our last presentation at ICPLA 2020 (June 2021).

**Methods:** To achieve the aims of DELAD, the Steering Group members meet monthly to update each other any pertinent issues and identify opportunities (e.g., conferences) to advertise the initiative. We organise regular workshops and invite researchers with relevant expertise to contribute to discussions related to open access of research data. We also follow up on items/tasks that arose from participants' suggestions at the workshops.

**Results:** The Steering Group had held the fifth and sixth Workshop online in January 2021 and September 2022 respectively, with IT support from CLARIN (Common Language Resources and Technology Infrastructure). A paper about DELAD based on the conference poster presented at ICPLA 2020 was published in "Clinical Linguistics and Phonetics" in early 2022. A case scenario specific for corpora of speech disorders for a role-play exercise around Data Protection Impact Assessment was developed based on the work of Esther Hoorn (a member of the CLARIN Legal and Ethical Issues Committee). A page of guidelines on consent and data storage was added to the DELAD website (<http://delad.net/>). Guidelines about annotation of disordered speech will be available on the website before the conference.

**Conclusion:** Steady progress for the development of DELAD has been made. Directions for further advance of the initiative will be discussed and information about contributing to the network will be made available.

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## **CLITICS PRODUCTION IN SERBIAN SPEAKERS**

Mile Vuković (University of Belgrade, Faculty of Special Education and Rehabilitation, Belgrade), Lana Jerkic Rajic (University of Belgrade, Faculty of Special Education and Rehabilitation), Ljiljana Simić (University of Novi Sad, Faculty of Medicine), Tanja Milovanović (Rehabilitation Clinic Dr Miroslav Zotovic, Belgrade) and Vesna Stojanovic (University of Reading School of Psychology and Clinical Language Sciences Reading).

**Background:** Clitics are words that do not have their own accent but form an accent unit with neighboring words that are behind or in front of them. In this study, we tested production of clitics in adult, neurologically healthy speakers of the Serbian language. Our aim was to examine whether there is a difference between respondents from different Serbian-speaking regions when the achievements are evaluated according to prescriptive grammar rules. Also, we wanted to examine the influence of different sociodemographic variables (age, years of education, region of residence) on the production of clitics. Finally, we tried to determine the psychometric characteristics of the Test for the assessment of clitics in Serbian speakers.

**Methods:** The sample included 250 respondents from five Serbian-speaking regions, 50 respondents from each. Retesting was performed in a sub-sample of 100 respondents from the sample, equally represented in percentage from each region. The Serbian Clitic Test was used to collect data.

**Results:** The results showed that the Serbian Clitic Test meets the criteria of different types of reliability, as well as having satisfactory construct validity. It was shown that years of education influence production of clitics. Specifically, people with more years of education produce more clitics. Also, when prescriptive grammar rules were followed in the assessment, a significant difference was observed in the production of clitics between respondents from different Serbian-speaking regions.

**Conclusion:** Years of education and region of residence can significantly influence the production of clitics among healthy speakers of the Serbian language.

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## **Evaluating effective, intensive, digital parent-implemented interventions for children with speech sound disorder using realist methodology: what works, how and for whom?**

Naomi Leafe (Ulster University), Jill Titterington (Ulster University), Emma Pagnamenta (University of Reading), Laurence Taggart (Ulster University), Mark Donnelly (Ulster University) and Angela Hassiotis (University College London).

**Background:** Speech and Language Therapists (SLTs) worldwide report challenges providing evidence-based intervention intensity for children with severe speech sound disorder (SSD). Existing research indicates that empowering parents to deliver intensive home-intervention, facilitated through digital tools, could support more effective, efficient service delivery. Phase one of this study, a realist review (RR), identified active ingredients and contexts affecting outcomes of digital parent-implemented interventions for children with SSD. A subsequent realist evaluation (RE) (phase two: reported on here), aimed to deepen understanding from the RR about what digital, parent-implemented interventions work, for whom, and in what circumstances.

**Methods:** To evaluate the RR's findings, 40 SLTs and 32 parents of children with SSD (4-5 years) were invited to participate in 5 SLT focus groups and 4 parent focus groups (n=6-8 participants per group). Following RAMESES guidelines; realist interview, coding, and analysis techniques gathered stakeholder perspectives, further refining thinking from the RR. The Capability, Opportunity, Motivation, and Behaviour (COM-B) model (mapped to the Theoretical Domains Framework) considered behaviour change required to drive successful parent-implemented intervention. A steering group informed development of recruitment methods, interview schedules and study documentation.

**Results:** The RE analysed the active ingredients identified in the RR as contributing to effective digital parent-implemented interventions, relating to: 1. Partnership and collaboration; 2. Intervention intensity; 3. Child participation; 4. The child-parent dynamic; 5. Parent-training. The RE analysis refuted, confirmed, or refined the RR theories and contributed to an overarching explanatory model about what makes parent-implemented interventions work for whom and in which contexts.

**Conclusion:** RE provides stakeholder insight on existing thinking about digital intensive parent-implemented interventions, leading to deeper understanding about the active ingredients and contextual factors that influence parent/child responses in home-interventions. This understanding will inform future intervention development, delivery and implementation, maximising effectiveness and efficiency of service delivery for children with SSD.

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## **Capturing Teaching Moments via Dynamic Assessment Methods during Speech Sound Disorder Intervention**

Amy Glaspey (University of Montana), Andrea MacLeod (University of Alberta), Pyper Trumble (University of Montana) and Megan Andersen (University of Montana).

During speech sound disorder intervention, speech-language therapists (SLTs) make many in the moment changes to their models and instruction. A teaching moment occurs when an SLT presents an antecedent, the child produces a behavior, and the SLT responds with a consequence (Baker, et. al, 2018). These three actions can be highly variable across therapists and children. The current study, explored applying dynamic assessment (DA) methods to (1) capture these SLT choices within the teaching moment, and (2) monitor progress across treatment sessions to better understand the essential elements of phonological intervention. One DA, the Glaspey Dynamic Assessment of Phonology (GDAP), provides children with a series of increasingly complex linguistic environments and a range of supportive cues. This graduated prompt approach is typically used for diagnostic purposes; however, the current study explored using the GDAP scoring system to code clinician actions and document the child's skill development. The participants included two boys (ages three and six) with speech sound disorder engaged in modified cycles treatment. Two trained coders viewed video-recordings. They used the GDAP 15-step hierarchy to describe teaching moments during sessions, and recorded each child's accuracy. Results indicated that DA principles could be applied as a tracking method for documenting changes within the teaching moment; however, challenges were observed in describing accuracy of the children's responses. In this presentation, the DA strategy will be described and the challenges of assessing therapeutic accuracy will be discussed. Overall, this preliminary research supports that dynamic assessment may lead to dynamic intervention, thus bridging assessment and treatment practices.

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## **How reliable is assessment of children's sentence comprehension using a self-directed app? A comparison of supported versus independent use**

Pauline Frizelle (University College Cork), Ana Buckley (University College Cork), Tricia Biancone (University College Cork), Anna Ceroni (University College Cork), Darren Dahly (University College Cork), Paul Fletcher (University College Cork), Dorothy Bishop (University of Oxford) and Cristina McKean (Newcastle University).

**Background:** This study reports on the feasibility of using the Test of Complex Syntax- Electronic (TECS-E), as a self-directed app, to measure sentence comprehension in children aged 4 to 5 ½ years old; how testing apps might be adapted for effective independent use; and agreement levels between face-to-face supported computerized and independent computerized testing with this cohort. The study also explores how young independent testing could be used reliably.

**Methods:** A pilot study was completed with 4 to 4;06-year-old children, to determine the appropriate functional app features required to facilitate independent test completion. Qualitative information was collected on children's level of independence; type of tester support required; and level of engagement. Test features were modified accordingly. The main study was a within subject design whereby participants completed the TECS-E app twice (independently or with adult support) (4 - 4;05 (n = 22) 4;06 - 4;11 months (n = 55) 5 to 5;06 (n = 113)). Test re-test reliability was examined.

**Results:** Qualitative observations, supported by statistical analyses indicated difficulties completing the test independently for the younger two cohorts. Pearson's correlation indicated adequate test re-test reliability for children between 5 and 5;6 years ( $r = .71$ ). A Bland -Altman analysis revealed a mean difference of -2.56 between scores in the supported versus independent test conditions. The rank ordering of children's understanding of constructions was similar in both conditions.

**Conclusion:** Independent test completion posed problems for children under 5 years. However, children between 4;06 and 4;11 years understood the process more reliably than the younger cohort. For children 5 years and over TECS-E when used as a self-directed app, is a reliable method to assess children's understanding of complex sentences.

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## **Atypical rhythm Childhood Apraxia of Speech (CAS) in Chinese – An Acoustic Analysis**

Carol K. S. To (The University of Hong Kong), R. Gao (The University of Hong Kong) and Kenny Mok (The University of Hong Kong).

**Background:** In this study, we explore whether acoustic rhythm measures can differentiate Chinese (Cantonese)-speaking children (1) with suspected CAS (sCAS), (2) typically developing (TD) children, and (3) children with SSD not related to motor speech disorders (nonCAS).

**Methods:** All participants are school-age children native in Cantonese. Children in sCAS group showed poor intelligibility and were to be unresponsive or showed unexpectedly slow progress to traditional intervention. They have no history of diagnosed dysarthria. Language disorders were observed in some of these children. Six children with SSD not related to motor speech deficits, and 10 TD children were also recruited. About 4-minute narrative samples were elicited from each child. Speech samples were transcribed orthographically by speech-pathology undergraduates and then cross-verified in PRAAT. The orthographic annotations were submitted to Speech Phonetization Alignment and Syllabification (SPPAS) (Bigi, 2015) to carry out forced alignment. Acoustic data of each syllable, words, utterance were extracted. Rhythm measures including the pairwise variability index for vowels and consonants (nPVI-V, rPVI-C) and the coefficient of variation for vowels, and consonants (VarcoV, VarcoC) during narrative production were calculated and combined using R (R Core Team, 2020).

**Results:** Preliminary results revealed significant group differences between the TD and the sCAS groups in terms of  $\Delta C$ ,  $\Delta V$ , VarcoC, & VarcoV). Two deviated groups were observed - 5 children demonstrated lower and 1 showed higher  $\Delta C$  and  $\Delta V$  than the controls in the  $\Delta C$  by  $\Delta V$  plot.

**Conclusion:** The significant differences support the descriptive features of impaired prosody in children with CAS (ASHA, 2007). Further comparison with the non-CAS group will be conducted. Observed differences will be discussed in terms of motor-speech deficits described in the literature.

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## **Structural and functional oral-motor abilities in typically developing Cantonese-speaking preschool children and children with childhood apraxia of speech**

Eddy C. H. Wong (The Hong Kong Polytechnic University), Min Ney Wong (The Hong Kong Polytechnic University), Shelley Velleman (The University of Vermont), Edwin M. C. Lai (The Hong Kong Polytechnic University) and Twinkie Y. K. Cheung (The Hong Kong Polytechnic University).

**Background:** Oral-motor examination is commonly used in the assessment of children with childhood apraxia of speech (CAS). Without a set of normative data for Cantonese speakers, the interpretation of performance relies on clinicians' experience. This study aimed to examine the oral-motor abilities of Cantonese-speaking preschool children with CAS by comparing their performance to that of typically developing (TD) peers.

**Methods:** Four Cantonese-speaking children with CAS and 60 TD children (aged 3;0 - 5;11) have been recruited so far. The participants performed the items from the adapted version of the Robbins & Klee (1987) oral-motor assessment protocol. This includes 24 oral structural items, 16 oral function items, 30 speech function items, 10 diadochokinesis items, and 6 prosodic observations. Two raters scored the children's performance via video recordings. Group, age, and gender effects were examined on the ten measures (i.e., maximum phonation time [MPT]; structural, oral function, speech function, and five diadochokinesis tasks; and prosodic scores). Additional case comparisons between each of the children with CAS and their TD peers were performed by calculating Z scores.

**Results:** Groups were different on six measures, except [pha], [tha], [kha], and [phathakha] repetition rate. There were no gender effects in the three TD groups, except 4-year-old females had faster [kha] repetition rates than 4-year-old males. Age effects were found for three measures. Three- and 4-year-old children differed from 5-year-old children on oral function; 3-year-old children differed from 5-year-old children on MPT and [pha] repetition rate. Case comparisons showed that all the children with CAS had difficulty with oral and speech functions, prosody, and repetition of the 3-syllable phrase, [phau2 thin1 khiu4] (which means "running on the bridge").

**Conclusion:** This study provides reference data on the oral-motor abilities of Cantonese-speaking preschool children and suggests that children with CAS have functional oral-motor difficulties.

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## **The cultural responsivity of language sample analyses across dialects of English: Answers from single-case studies with preschoolers**

Leslie Kokotek (University of Cincinnati), Karla Washington (University of Toronto) and Gabrielle Matz (University of Cincinnati).

**Background:** In English dominant settings such as the United States, children fluent in the mainstream variety of English but who are also bilingual or speak non-mainstream dialects are at an increased risk for misdiagnosis of a developmental language disorder (Paradis et al., 2021). These children's English proficiency increases the likelihood they will be evaluated using assessments standardized for monolingual speakers of Mainstream American English (MAE) (Peña et al., 2006). However, a growing body of research suggests that language sample analyses (LSAs) may mitigate challenges related to misdiagnosis for linguistically diverse populations, yet research documenting the cross-linguistic applicability of LSAs is limited (Washington et al., 2019). The aim of this study was to compare the spontaneous productions of children who speak African American English (AAE), Jamaican English (JE), or MAE to document the responsivity of LSAs in accurately characterizing language use.

**Methods:** Three typically developing 4-year-olds (AAE-, JE-, or MAE-speaker) completed a 15-minute play-based language sample in an English context. Children's language samples were evaluated for: mean length utterance (words, morphemes), developmental sentence score, and Index of Productive Syntax (IPSyn; subscales, total score) as well as number-of-different words and total number-of-words, representing lexical diversity.

**Results:** Children's linguistic patterns demonstrated contrastive and noncontrastive features across dialects spoken; however, a Kruskal-Wallis H (non-parametric) test revealed no significant differences in scores obtained using each LSA,  $\chi^2(2)=2.00$ ,  $p=.368$ . The IPSyn demonstrated the greatest responsivity across LSAs by revealing presence/absence of morphosyntactic structures as they were used in each dialect of English versus applying rigid expectations of MAE.

**Conclusion:** LSAs support the description of linguistic patterns produced as well as scores achieved by young children who speak varieties of the same language. The IPSyn holds promise in offering cross-linguistic applications, critical to characterizing language profiles in pre-schoolers whose backgrounds demonstrate shared linguistic foundations.

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## Prosody at the word level in children with autism with and without phonological deficit

Sandrine Ferré (Université de Tours).

Prosody at the word level in children with autism with and without phonological deficit The prosody of people with autism is often described as atypical (e.g. Peppé et al. 2007). The variability of the measures used (F0, intensity or duration, from vowel to utterance levels), of the tools and of the subjects tested does not lead to any solid consensus to characterize its specificity. However, the links between prosodic and phonological structures suggest that an alteration in one domain could unbalance the whole. Our study aims to determine how prosodic aspects are altered in autism, particularly in the context of phonological deficits. We compared mean F0, F0 range, and vowel duration of the vowels /a, i, u/ in productions of nonwords of 1 to 3 syllables in two groups of 15 children aged 6 to 12, one with autism spectrum disorder (ASD) with (ASDip) or without (ASDnp) phonological deficits, and the other with typical development (TD). The mean F0 and the F0 range on the first vowel were significantly higher for the ASDip children than for the children without phonological deficits (ASDnp and TD). ASD groups have longer vowels than TD children in all nonwords. In trisyllabic words, ASDip children show a significant lengthening of the 2nd vowel whereas ASDnp children lengthen the 3rd vowel more than TD group. Duration results, also found in Olivati et al. (2017), confirm a strong interaction between prosodic and phonological levels. These results also attest to the importance of considering language profiles in children with (Silleresi et al., 2020). Analyzing vowels through the prism of phonological deficit has made it possible to avoid some of the pitfalls of studies on prosody in autism. However, we only observed a tiny part of what prosody is, and it is necessary to continue to look at various aspects of the prosodic structure to understand the complexity of the mechanisms at work.

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## Hearing status affects the relationship between speechreading and reading comprehension in Chinese

Fen Zhang (Beijing Normal University), Jianghua Lei (Central China Normal University), Xuehan Wei (Zhenzhou University of Technology), Xin Wang (Macquarie University) and Liang Chen (University of Georgia).

**Purpose:** Speechreading affects reading ability in children with hearing impairment (HI) and normal hearing (NH), but whether speechreading affects reading ability in adults with HI is less unclear (Mohammed et al., 2006).

**Methods:** A group of 164 adults with HI and a group of 97 adults with NH in China were assessed on measures of vocabulary knowledge, reading comprehension, phonological awareness, and speechreading. Then participants in each group were further divided into three subgroups of HIGH, MID, and LOW based on their speechreading scores.

**Results:** Repeated ANOVA showed that there was an interaction between group (HI, NH) and speechreading ability (LOW, MID, HIGH). For the group with HI, adults with high speechreading ability had significantly higher reading performance than those with low speechreading ability. However, no significant difference in reading comprehension was found among the LOW, MID, and HIGH speechreading subgroups adults with NH.

**Conclusion:** These results provide support for the idea that a phonological code derived through speechreading may underpin reading success in individuals with HI (e.g., Harris & Moreno, 2006), and visual speech information from speechreading affects reading comprehension in adults with HI, but not in adults with NH. During the process of reading written material for comprehension, adults with HI may adopt a bottom-up strategy in perceptual processing, and speechreading may play a facilitative role. In contrast, reading has become a relatively automatic process for adults with NH without the need for assistance from speechreading.

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## **Narrative training enables generalization between narrative tasks in children with Developmental Language Disorder**

Olivia Hadjadj (University of Geneva), Margaret Kehoe (University of Geneva) and H el ene Delage (University of Geneva).

**Purpose:** Children with Developmental Language Disorder (DLD) are known to present difficulties in storytelling, both in macrostructure (i.e., narrative scheme) and in microstructure (i.e., language complexity). These difficulties can be found in different types of narrative tasks, such as storytelling and retelling (Pinto et al., 2018). DLD children can improve their narrative performance through specific interventions, which target macrostructure using visuals (Favot et al., 2020). While most intervention studies explore the impact of intervention on one type of narrative task (Pico et al., 2021), we aim to determine whether there is generalization between narrative tasks, from story retelling to storytelling.

**Methods:** We developed a training protocol, targeting macrostructure elements in a retelling activity. Children had 1) to make the correspondence between an icon and a macrostructural element, 2) to learn macrostructure elements within a story and 3) to practice the retelling of this story. Fifteen French-speaking children with DLD (aged 7;5 to 10;2) were trained in two groups of 7/8 children, during 6 sessions of 45 minutes each. In order to assess improvement between pre- and posttest, children were assessed via four baselines: two story-retelling (with only one that was trained), one storytelling and a control measure (Rapid Automatized Naming test).

**Results:** Children significantly improved on the three stories, in terms of the number of macrostructural elements learned ( $F_{Story1(1,14)} = 12.41, p = .003$ ,  $F_{Story2(1,14)} = 6.59, p = .02$  and  $F_{Story3(1,14)} = 5.25, p = .04$ ). No improvement was observed on the control measure ( $p = .35$ ).

**Conclusion:** Our results confirm that an intervention focusing on macrostructure leads to improvement in this specific domain and that DLD children can generalize learning acquired within a retelling activity to a storytelling one, which has clinical applications for intervention on narratives in speech-language therapy.

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## **Non-lexical speech measures in typical developing children and children with speech sound disorders aged 3;0 to 5;11 years**

Wiebke Freese (Institute of Health Sciences, University of L ubeck), Sarah Masso (Faculty of Medicine and Health, The University of Sydney) and Annette Fox-Boyer (Institute of Health Sciences, University of L ubeck).

**Background:** To distinguish different types of speech sound disorders (SSD) standardised assessments are needed (McLeod & Baker, 2017). Internationally, non-lexical speech measures like non-word repetition (NWR), articulatory diadochokinesis (DDK) and stimulability of phones are frequently described tools (Fox-Boyer & Schulte-M ater, 2020; Thoonen et al., 1996). In German-speaking countries, there is a lack of assessments for differential diagnosis of SSD as well as missing normative data from typical developing children (TD) on these tasks.

**Methods:** Three non-lexical speech tasks (NWR, DDK, stimulability) were designed. 52 children with phonological impairment (delay, consistent phonological disorder) and 52 TD-children ( $n=104$ ) aged 3;0 to 5;11 years were assessed by a standardised protocol. Additionally, a speech assessment was carried out (PLAKSS-II; Fox-Boyer, 2014).

**Results:** NWR, phone stimulability and articulatory DDK differentiated TD children and children with phonological impairment across all age groups. While NWR differentiated between typical and disordered but not delayed development, stimulability differentiated between typical and phonological impaired development in general. For the analysis of DDK results indicated that the phonological patterns produced by the children should be considered. For TD children an increase of performance with age was observable, especially between the group of 3-year old and 5-year old children.

**Conclusion:** Non-lexical speech measures are useful in the process of differential diagnosis of children with SSD. Normative data for German-speaking children are needed. There is first evidence that these tasks might be helpful for the differentiation of children with severe forms of SSD such as CAS and inconsistent phonological disorder for German.

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## **Mental representations of lexical tones in Chinese – Evidence from a patient with tone errors but preserved syllables**

Jenna Pui-Yin Mak (The Hong Kong Polytechnic University), Karrie Kwan-Kiu Chan (The Hong Kong Polytechnic University), Jocelyn Yee Ching (The Hong Kong Polytechnic University), Ronald Lung-Yat Chui (The Hong Kong Polytechnic University) and Dustin Kai-Yan Lau (The Hong Kong Polytechnic University).

**Background.** Chinese is a tonal language, in which syllables of different lexical tones refer to different morphemes. One frequently asked theoretical question regarding tonal language concerns the nature of mental representations of syllables in the lexicon - E.g. Are lexical items stored as tonal syllables or are they stored as non-tonal syllables which undergo separate tonal processing in the lexical retrieval process. In the current study, we report a case study conducted using the cognitive neuropsychological approach to address this question.

**Methods.** TOT, a stroke survivor at the age of 56 years who speaks Cantonese (a dialect of Chinese used in Hong Kong) primarily, reported to have tone production problem after stroke was recruited. TOT's premorbid normal tone production was confirmed using audio recordings obtained from her WhatsApp conversation history during the assessment session. Initial assessment using the Cantonese Aphasia Battery (Yiu, 1994) indicated TOT suffered from conduction aphasia (AQ score = 61.8). TOT was further assessed using various production and identification tasks.

**Results.** In the passage reading and picture naming tasks, TOT demonstrated lots of tonal errors (where the onsets and rhymes of target words are correctly produced but tones are incorrectly produced). In a written homophone judgement task, TOT was instructed to select from six characters (including the target, an orthographic distractor, a semantic distractor and three phonological distractors differ from the target by only onset, rhyme or tone correspondingly) the one that is homophonous to a presented character. She made 28 errors in all 100 trials. Results of Chi square test indicated that among all the errors, she showed a significantly higher tendency ( $p < .05$ ) of selecting tonal distractors.

**Discussion.** TOT's tone errors with preserved onset and rhyme representations in both production and identification suggested that onsets and rhymes are probably represented independent of tone in Chinese.

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## **PANEL: Advances in dynamic assessment for diagnosing language disorders in diverse populations**

Katrin Skoruppa (Université de Neuchâtel), Bernard Camillieri (City University of London), Andrea MacLeod (University of Alberta), Amy Glaspey (University of Montana), Salomé Schwob (University of Neuchâtel), Olivia Hadjadj (University of Geneva), Mélodie Matrat (University of Geneva), Margaret Kehoe-Winkler (University of Geneva) and Hélène Delage (University of Geneva).

With increasing awareness of the diversity of clinical populations in speech and language therapy, especially in terms of multilingualism, the need for alternatives beyond classic standardized language assessments becomes apparent (e.g. Armon-Lotem et al. 2012). One promising solution are dynamic assessment procedures, designed to measure the learning process rather than its end product (following e.g. Vygotski 1978). In this panel, four research groups working in different contexts, with different language combinations and on different language domains, will share their latest clinical applications with children of preschool and early primary school age.

First, we will consider the lexical domain, with Bernard Camillieri (City, University of London) sharing results from studies using the ‘Dynamic Assessment of Word Learning’ (DAWL) and the ‘Dynamic assessment of Preschoolers Proficiency in Learning English’ (DAPPLE), which evaluate children’s quick incidental learning’ (DAWL) and ‘fast mapping’ (DAPPLE), respectively. Both assessments were developed for children with a range of cultural and linguistic backgrounds in an inner-city London context. Bernard will discuss the possibility of assessing lexical learning abilities beyond current performance, comparing the information gained from the two assessments.

Second, we will continue with a word-learning task developed by Andrea MacLeod (University of Alberta) and Amy Glaspey (University of Montana) that is dynamic and language-neutral (MacLeod & Glaspey, 2022). The task was designed to build on multilingual children’s abilities to apply language transfer, fast mapping and socially embedded language to the learning of new words. Their focus was on a multilingual kindergarten context where many children have limited experience with the language used at school and for testing (i.e., French). Thus, they carefully reduced the impact of the amount and duration of exposure by relying on common cognates and cross-linguistically frequent phonological properties. This dynamic task was found to tap into multilingual children’s vocabulary learning but was not influenced by the amount of exposure to the test language.

Furthermore, we will have two presentations combining linguistic domains: Salomé Schwob and Katrin Skoruppa (Université de Neuchâtel) compare how French- and Portuguese-speaking children with and without language disorders (n = 49) aged 5-8 years learn novel words and novel inflections in an autonomous computer game situation and in an interactive shared reading situation. They report good diagnostic accuracy, with a clear advantage for the interactive situation, independently of linguistic status (mono- vs. bilingual).

Finally, Olivia Hadjadj, Mélodie Matrat, Margaret Kehoe and Hélène Delage (University of Geneva) will investigate lexical learning via the spaced retrieval method and narrative performance in French-speaking children, mono- and bilinguals, aged 6-10 years for lexical learning (n = 80) and 6-12 years for narrative production (n = 100). Their results show that the tasks discriminate children with and without language disorders (DLD) and avoid disadvantaging bilinguals, as is often the case in common language assessments.

The panel will conclude with a brief ‘round table’ discussion with members of the research teams, addressing issues and perspectives in the field, such as possible standardizations of dynamic procedures, combination with other assessment tasks, time-efficacy considerations and benefits for subsequent intervention.

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## **Integration of auditory-visual cues on Speech Perception in children with phonological disorder**

Larissa Cristina Berti (São Paulo State University), Mayara Ferreira de Assis (São Paulo State University) and Denis Burnham (Western Sydney University).

Speech perception is an auditory-visual event once it involves the integration of auditory and visual cues into a unitary phonological entity (Dodd et al, 2008). So, an inability to correctly produce sounds would interfere with the ability to lip-read, such as in the case of children with phonological disorder (PD). This study aimed to compare the cues integration in 15 typical development (TD) children and 15 children with PD and to verify whether the phonological class (stops and fricatives) interferes with this integration. PD children were recruited from service at the Speech-Language Therapy Clinic, while TD children were matched with them by age and sex. The auditory and visual stimuli were: [pa], [ta], [ka], [fa], [sa] and [ja]. Participants were asked to identify syllables with congruent (AV+) and incongruent (AV-) auditory and visual components, audio-only (AO), and video-only (VO) presentations, for stops and fricatives separately. For the AO condition, TD children were better than PD children on fricative identification but equally good on stop identification. For the VO condition, TD and PD children did not present differences. Stop class presented a higher percentage of correct responses than fricative class for both groups. Considering the general visual influence (AV+>AV-), TD children were better at integrating A and V for stops while PD children were better at integrating A and V for fricatives. Phonological deficit presented by PD children seem to affect both auditory processing and visual processing in the integration of auditory-visual cues on speech perception. However, there seems to be a differential effect for stops and fricatives.

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## **When do communication facilitators intervene in people with communication impairment's phone calls?**

Maria Cromnow (Region Östergötland), Christina Samuelsson (Karolinska Institutet), Henrik Danielsson (Linköping University) and Charlotta Plejert (Linköping University).

The Swedish Communication Facilitation Service "Taltjänst" offers assistance to people with communicative impairments, commonly caused by neurological disabilities, and their conversation partners. The facilitators offer support in conversations in various settings, including phone-call conversations. This study aims to investigate interaction in "Taltjänst", with a focus on what occasions interventions by the facilitator, exploring; 1) When does the facilitator intervene? 2) When is the conversation managed by the main conversation participants (i.e., the person with communicative impairment and his/her conversation partner), without support of the communication facilitator? Data consists of two phone calls where the facilitator is placed together with the client with a disability. Conversations were analysed using multimodal interaction/conversation analytical methods. In one of the phone calls, the client has acquired aphasia and in the other, the client has congenital dysarthria. This allows comparison of interactional challenges concerning different impairments, faced by the communication facilitator. Analyses show that; 1) facilitators are commonly invited to intervene by means of eye gaze of their client, and 2) it appears to be a routine to intervene after all noninterrupted turns of the client with dysarthria, while for the client with aphasia, the pattern of what occasions intervention is more diverse. Results provide insights into the work of communication facilitators, and anyone supporting phone calls involving a participant with a communicative impairment. Increased knowledge of interactional practices by communication facilitators may also contribute to a development of this, so far unexplored, but important service.

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## **Plural processing in German-speaking children with a cochlear implant: an eye-tracking study**

Bénédicte Grandon (University of Oldenburg, Oldenburg, Germany), Marcel Schlechtweg (University of Oldenburg, Oldenburg, Germany) and Esther Ruigendijk (University of Oldenburg, Oldenburg, Germany).

Cochlear-implants (CIs) allow their users to have a better access to acoustic information, which results in gains in the perception of sounds. However, the CI only transmits an incomplete version of the input (Drennan & Rubinstein, 2008). This can lead to difficulties in processing certain speech sounds and to delays in language acquisition, at all linguistic levels (e.g., Boons et al., 2013). Sound perception plays a role in oral processing of morpho-phonological information, yet the links between the perception of sounds with CIs and higher processing levels have not been explored. Our study aims at understanding how children with CIs are able to process the segmental information carried by plural marks in German, a language with a morphologically-rich inflection system (e.g., Köpcke, 1988) in which plural relies on phonological (stem-vowel change or umlaut), morphological (suffixation) and phonetic (voicing alternation of the stem-final consonant) cues. We hypothesize that for children with CIs, the processing of this variety of material is affected by the imperfect input transmitted through the CIs. We compared the processing of plural marking in German-speaking children aged 5 to 11 with a CI (N=16) with typical hearing (N=30), using a combined behavioral and eye-tracking paradigm. We selected items combining 1 to 3 cues to plural marking. Accuracy is higher for children with NH and for both groups, it is better when more cues to plural are provided. RT is lower when the target word is plural (vs. singular). Older children have a better accuracy and lower RT. Gaze fixation towards the target is similar in both groups, and earlier when the target word is a plural, when 1 cue to plural is provided (vs. 2 or 3). Finally, plural is processed faster when it relies on suffixes or no umlaut; voicing alternation does not affect plural processing.

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## **Functional-morphological relationships in functional articulation disorders. A perception-based and acoustic-phonetic study**

Anita Lorenc (University of Warsaw), Agnieszka Borowiec (Speech Laboratory in Warsaw (Laboratorium Mowy w Warszawie)), Daniel Król (University of Applied Sciences in Tarnow), Katarzyna Klessa (Adam Mickiewicz University in Poznan), Anna Wojnarowska-Borowiec (University of Warsaw) and Łukasz Mik (University of Applied Sciences in Tarnow).

**Background:** The key role in the functional efficiency of the stomatognathic system is played by primary functions – tongue rest position and swallowing (Proffit, Fields 2001; Hiimeae, Palmer 2003), which affect the surrounding structures (e.g. Fatima, Fida 2019), and may affect speech articulation (e.g. Kravanja et al. 2018, Borowiec 2018) because their functional conditions pertain to the motor abilities of the same system.

**Methods:** The functional-morphological relationships were analyzed based on subjective judgements of speech of 204 people with impaired primary functions and functional articulation disorders (F.80.0 in ICD-10 (2019) classification), captured with video images and time-lapse photography. We also used AFDA (an acoustic field distribution analyser), a non-invasive device designed based on our previous studies of standard pronunciation (e.g., Lorenc et al. 2015; 2018). We used beamforming algorithms directly on 1-bit, oversampled (3 MHz) pulse density modulation streams from the microelectromechanical system microphone array and new post-processing algorithms, which enhanced the dynamic range of the acoustic pressure differences near the speaker's face.

**Results:** We identified three types of disordered tongue rest posture depending on apex location which lead to a compensatory swallowing mechanism. Each mechanism corresponds to a specific anatomy of the oral cavity. The mechanisms used in the formation of compensatory articulatory strategies were also analysed, with a focus on laterality. We discriminated between central and lateral realizations and visualized the outcome for 5 persons with functional articulatory disorders using AFDA.

**Conclusion:** Our findings contribute to the assumption that the orofacial system, which makes speech expression possible, is a functional–morphological set, forming a functional whole influenced also by body symmetry and cranial positioning. Our preliminary research shows that AFDA as a reliable, non-invasive tool, could be used on large scale, both for detailed phonetic-acoustic analyses, as well as a diagnostic tool in clinical settings.

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## **Prosody at the word level in autistic children with and without phonological deficit**

Sandrine Ferré (University of Tours & INSERM U1253 iBrain), Marlène Gasnier (University of Tours) and Bénédicte Grandon (Universität Oldenburg & Hearing4All Cluster of Excellence).

The prosody of people with autism is often described as deviant (e.g. Peppé et al. 2007). The variability of the measures used (F0, intensity or duration, from vowel to utterance levels), of the tools and of the subjects tested does not lead to any solid consensus to characterize this deviation. However, the links between prosodic and phonological structures suggest that an alteration in one domain could unbalance the whole. Our study aims to determine how prosodic aspects are altered in autism, particularly in the context of phonological deficits. Mean F0, F0 range, and vowel duration of the vowels /a, i, u/ of nonwords of 1 to 3 syllables were collected in productions of two groups of 15 children aged 6 to 12, one with autism spectrum disorder (ASD) with (ASDip) or without (ASDnp) phonological deficits, and the other with typical development (TD). The mean F0 and the F0 range on the first vowel were significantly higher for the ASDpi children than for the children without phonological deficits (ASDnp and TD). ASD groups have longer vowels than TD children in all nonwords. In trisyllabic words, ASDip children show a significant lengthening of the 2nd vowel whereas ASDnp children lengthen the 3rd vowel more than TD group. Duration results, also found in Olivati et al. (2017), confirm a strong interaction between prosodic and phonological levels. These results also attest to the importance of considering language profiles in children with (Silleresi et al., 2020). Analyzing vowels through the prism of phonological deficit has made it possible to avoid some of the pitfalls of studies on prosody in autism. However, we only observed a tiny part of what prosody is, and it is necessary to continue to look at various aspects of the prosodic structure to understand the complexity of the mechanisms at work.

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## **Psychosis speech and language database in the Croatian language**

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This research aims at creating the first Croatian speech and language database of a clinical population (psychosis) for educational and scientific research purposes. It is a part of the global multilingual "Speech Bank Project" initiated by the "Consortium for Research in Thought, Language and Communication in Psychosis", recognizing the need for such a resource, and acknowledging existing evidence on the importance of language processing changes in psychotic disorders, including schizophrenia-spectrum disorders, and those at risk of developing psychosis. The goal of the Speech Bank Project is to collect speech and language samples using the same methods and comparable materials across different languages. For this purpose, the Consortium created the Protocol, the uniform set for the collection of discourse in psychosis and for the analysis at all language levels. The Protocol was translated and adapted into the Croatian language. The test material consists of a series of tasks: discourse (questions-general topics), descriptive discourse (visual stimuli-pictures), prompted narratives (verbal stimuli-stories), reading task, and retelling. This research includes patients diagnosed with psychosis and healthy controls matched by sociodemographic data. After recording and transcribing the responses of participants, the research will focus on a multilevel phonetic and linguistic analysis, including analyses using natural language processing. The analyses will shed new light on the lexical-semantic and pragmatic dysfunctions that are typically observed on different levels of language processing in psychosis. In conclusion, this research builds on the body of research showing the important role of speech and language markers in psychosis and expands on it by joining multidisciplinary team of scientists and introducing standardized data collection protocols as well as protocols for the analysis on multiple levels of processing, promising to yield novel insights into psychosis and predictive models that could be useful in clinical practice.

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## **An ultrasound study of variability in children with and without speech sound disorder**

Amy Smith (University of Strathclyde), Maria Dokovova (University of Strathclyde), Eleanor Lawson (University of Strathclyde), Anja Kuschmann (University of Strathclyde) and Joanne Cleland (University of Strathclyde).

**Background:** Increased tongue shape variability has been observed in children with Speech Sound Disorders (SSD), which may be indicative of subtle speech motor control issues. However, a lack of data from typically developing children (TD) hinders our understanding of how the two groups compare and what is the expected range of variability in a TD child.

**Methods:** In this study, data from TD children (n= 10, 7-14 years) was collected using ultrasound tongue imaging (UTI) at a public engagement event. This was compared to 10 age matched children with SSD from open access corpora. Both groups of children repeated the consonants /s/, /t/, /k/, /ɹ/ in /aCa/ ten times. Using Articulate Assistant Advanced software, we automatically traced contours of the tongue's surface at the maximum point of articulation. The mean Nearest Neighbour Distance (NND) was calculated for the ten repetitions of each consonant of each child. We predicted that children with SSD would have larger mean NNDs, indicating increased variability across repetitions. A linear mixed effects model was fitted with mean NND as the dependent variable and diagnosis as the independent variable and random intercepts per participant.

**Results:** The factor, diagnosis, was found to significantly affect mean NND in the linear mixed effects model, with the SSD group showing significantly larger mean NNDs for the consonant repetitions than the TD group.

**Conclusion:** This result supports the hypothesis that children with SSD have more variable tongue shapes compared to TD children when producing multiple consecutive repetitions of consonants. However more research is needed to establish variability norms for TD children to understand the range of expected variability and how this compares to children with SSD.

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## **How is speech intelligibility measured for children who are d/Deaf or hard of hearing?**

Kate Crowe (University of Iceland), Harpa Stefánsdóttir (University of Iceland), Egill Magnússon (University of Iceland), Mark Guiberson (University of Wyoming), Thora Másdóttir (University of Iceland), Ösp Vilberg Baldursdóttir (University of Iceland) and Inga Ágústsdóttir (University of Iceland).

**Background:** It is important for d/Deaf and hard-of-hearing children (DHH) children who communicate with spoken language to have intelligible speech, as intelligible speech is crucial for effective verbal communication. Thus, the measurement and monitoring of speech intelligibility for DHH children is a central concern for clinicians supporting the habilitation of DHH children and for researchers examining the development and outcomes of DHH children. Anecdotally it is known that there is great variability in the methods and measures used for this purpose both clinically and in research.

**Methods:** A systematic search (following the Preferred Reporting Items for Systematic reviews and Meta-analyses guidelines) was used to examine three questions about speech intelligibility measurement for DHH children: (a) Which measures and methods have been used in research studies? (b) What rationale have authors given for their method/measure choice? and (c) how do the measures used align with the International Classification of Functioning, Disability, and Health – Children and Youth (World Health Organization, 2007).

**Results:** Review of the 204 included studies showed many different measures/methods were used with the most common being Allen et al.'s (2001) speech intelligibility rating scale. Many studies included insufficient details to determine the measure that was used. Rationales for measure/method choice were presented in only 24% of studies. Measures looks almost exclusively at Body Functions, and not to children's Activity and Participation.

**Conclusion:** Although speech intelligibility is commonly measured for DHH children, results are difficult to compare across studies due to differences in measurement method and tools and poor reporting of study methodology. In addition, the measures/methods used largely lack a broad perspective that can consider children's functional use of speech in their everyday lives.

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## **Word learning in children with developmental language disorder: a meta- analysis testing the encoding hypothesis and the contribution of working memory**

Paola Calabrese (University of Reading), Nicholas Hedger (University of Reading), Katherine Pritchard (University of Reading), Vesna Stojanovik (University of Reading) and Emma Pagnamenta (University of Reading).

**Background:** Children with Developmental Language Disorder (DLD) experience difficulties in learning novel words compared to their Typically Developing peers (TD). It has been suggested that the difficulty results from challenges with encoding newly encountered words, despite spared consolidation and retention abilities (Bishop & Hsu 2015; Jackson et al 2021). The previous meta-analysis on word learning and DLD (Kan and Winsor 2010) included 28 papers (DLD  $n = 574$ , TD  $n = 611$ ) prior 2008, testing the encoding phase only. The present work compares word learning in children with DLD ( $n = 1049$ ) and TD ( $n = 1601$ ) to: - Identify which stage of word learning is impaired in DLD - Explore whether the difficulties are predicted by children's lexical knowledge and/or working memory capacity.

**Methods:** 831 papers were retrieved via PsycINFO, MEDLINE/PubMed, Web of Science, the Linguistics and Language Behaviour Abstracts. Forty group comparison studies (DLD vs TD) met inclusion criteria and 122 effect sizes were analysed via random effect model.

**Results:** The meta-analysis of encoding indicates a large effect size ( $k = 73$ ,  $d = 0.88$ ,  $[0.69, 1.07]$ ,  $p < .001$ ). An effect of short-term memory (STM) on the encoding was detected ( $k = 22$ ,  $\beta = 2.57$ ,  $p < .001$ ), with only a marginal effect of receptive vocabulary ( $k = 50$ ,  $\beta = 0.25$ ,  $p = .101$ ) and no effect of non-word repetition ( $k = 21$ ,  $\beta = 0.25$ ,  $p = .245$ ).

**Discussion:** The results supported the encoding hypothesis confirming that children with DLD encode fewer lexical labels than TD. STM was identified as the most significant predictor of encoding suggesting that the difficulty in DLD might be related to STM rather than to poor linguistic knowledge. These findings shed light on the nature of word learning difficulties in DLD with implications for the assessment and management of these clients in clinical practice.

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## **The role of two slave-systems of working memory in speechreading for students with hearing impairment in China**

Huina Gong (Central China Normal University), Ling Jia (Xinjiang Normal University), Qin Peng (Central China Normal University), Ran Xiao (Central China Normal University), Jialu Fan (Central China Normal University & Nanjing Normal University), Jianguhua Lei (Central China Normal University) and Liang Chen (University of Georgia).

**Background:** According to Baddeley (2000), working memory (WM) consists of two so-called "slave systems", the phonological loop and the visuospatial sketchpad. They are dedicated to the storage and processing of verbal and visual information respectively. The phonological loop in turn consists of phonological store and articulatory rehearsal. While WM has been found to contribute to speechreading performance, there is no consensus on the exact role of the slave systems in speechreading.

**Purpose:** The study was designed to address the question whether speechreading involves only the phonological loop, only the visuospatial sketchpad, or both slave systems.

**Methods:** Seventy-three young adults with hearing impairment (HI) completed WM test batteries and Chinese speechreading tests targeting three linguistic levels (i.e., words, phrases, and sentences).

**Results:** The hierarchical regression analyses showed that the articulatory rehearsal process and visual phonological store were the most important predictors of all of the components of WM for speechreading, and the contribution of WM for speechreading decreased with the increase of linguistic complexity.

**Conclusion:** These results demonstrated that speechreading relied more on the efficiency of high-level phonological storing and articulatory rehearsal in the phonological loop, rather than the shallow processing of pure visual feature in visuospatial sketchpad. Besides, the speechreading task at the high linguistic level might need the participation of other cognitive factors.

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## The use of inferential language in the narratives of adolescents with and without SLI

Xiangyu Jiang (Harbin Institute of Technology, Weihai Campus) and Liang Chen (University of Georgia).

**Background:** Inferential language is an essential aspect of narrative storytelling since it not only offers details about events such as cause and effect, character cognition (e.g., intentions, actions, and reactions), but other evaluative and descriptive language. Previous studies have shown children with specific language impairment (SLI) exhibit weakness in narrative development and such weakness is suggested to be unlikely to resolve over time. However, little is known about inferential language use in narratives of SLI adolescents. The aim of this study was to investigate whether inferential language use by SLI adolescents would remain problematic or achieve close-to-normal performance.

**Methods:** We compared the use of inferential language in the oral narratives of SLI adolescents and their typically developing (TLD) peers. The narratives of 19 TD adolescents (Mean age = 14.5; SD = 0.84) and 19 SLI adolescents (Mean age = 14.3, SD = 0.64) based on the wordless picture storybook "Frog, where are you?" were compared. Each transcribed narrative was coded for inferences across five primary categories, namely, character actions/ attempts, internal states, causality, character dialogue, and other inferences. Nonparametric statistical analysis was conducted to detect the similarities and differences between these two groups.

**Results and Conclusion:** Results indicated that the two groups performed similarly except for assigning physical settings, which suggests that SLI adolescents may approximate their TLD peers in the inferential language use in narratives.

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## An ultrasound investigation of Irish English /ɹ/

Nicola Bessell (University College Cork), Alice Lee (University College Cork) and Aoife Hennessy (University College Cork).

**Background:** The English alveolar approximant /ɹ/ is an articulatorily complex sound. It is late in acquisition and can require therapy for a dialectally acceptable pronunciation. Research on /ɹ/ in North American English identifies several articulatory variants, from a raised tongue tip with lowered tongue dorsum, to a lowered tongue tip and a raised tongue dorsum ('bunched'). Some studies report an articulatory difference between prevocalic /ɹ/ and post-vocalic /ɹ/. Given the high incidence of /ɹ/ misarticulation and the range of attested tongue shapes, it is useful to investigate /ɹ/ production in dialects of English outside North America. Here we present data from southern Irish English, which is rhotic, but lacks any direct articulatory data on /ɹ/ production.

**Methods:** Ultrasound images from two adult female native speakers of southern Irish English were recorded (Mindray DP6600 ultrasound scanner) and analysed with Articulate Assistant Advanced software (Articulate Instruments Ltd.). The stimulus list consisted of /ɹ/ in initial and final position in naturally occurring /ɹVp/ or /pVɹ/ words, where V is /i, e, a, o, u/. Participants also produced a sustained /ɹ/ and unstressed 'schwar' in 'zipper' for a total of 140 tokens per speaker. Splines were fitted on ultrasound images at the temporal midpoint of /ɹ/ production.

**Results:** Tongue shape analysis of both speakers shows a lowered tongue tip, a raised tongue dorsum and a bulge in the tongue root that suggests a constricted pharynx. There is no clear distinction in tongue shape between rhotics in word-initial or final position.

**Conclusion:** Tongue shapes from both speakers are similar to the 'bunched r' found in varieties of North American English. Further research is needed to assess a more representative sample, but clinicians can use therapy tools based on a 'bunched' tongue shape with confidence that this is a naturally occurring variant in Irish English.

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## **The feasibility of an online language through music programme and the impact of dosage on vocabulary outcomes in young children with Down Syndrome**

Pauline Frizelle (University College Cork), Eva McMullan (University College Cork), Eibhlín Looney (University College Cork), Ciara O'Toole (University College Cork) and Nicola Hart (Down syndrome Ireland).

**Background:** There is a dearth of effectiveness studies investigating the effects of language interventions for very young children with Down syndrome, where dose frequency has been manipulated. Additionally, none have reported on the use of music as a medium through which language and sign can be learned in an engaging way.

**Aims:** To 1) examine the feasibility and acceptability of a language through music intervention programme for young children (1 – 3;06 years) with Down syndrome, 2) determine the effectiveness of the intervention, 3) compare effectiveness at two intervention dose frequencies.

**Methods:** The study was carried out in two phases using a mixed methods design. Phase 1: qualitative data were gathered (survey and focus groups) to examine feasibility issues when implementing a video-based language through music intervention at home. Phase 2: effectiveness of the intervention was examined comparing two groups, randomly assigned to a high and low intervention dose frequency. The Down syndrome Education checklists were used as the primary outcome measure. Process data were gathered to determine the acceptability of the intervention in practice and to identify factors that would improve successful future implementation. Acceptability data were analysed with reference to the theoretical framework of acceptability (V2).

**Results:** 43 parents completed the phase 1 survey, and a subgroup (n=5) took part in the focus groups. Once weekly (<30 minute) sessions in the morning were indicated as the preferred scheduling choice. Quantitative data will be analysed using multi-level linear modeling (not yet completed). Parents perceived the intervention to be effective for their child with Down syndrome and noted a positive cascading effect on the family.

**Conclusion:** The results of this study will add to our knowledge of real-world effective online-interventions, specifically levels of dosage required to effect change in the receptive, signing, and expressive vocabulary of young children with Down syndrome.

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## **System-Wide Generalization in Intervention for Phonological Disorder**

Philip Combiths (University of Iowa).

**Background:** Phonological disorder is one of the most common developmental communication impairments (Black et al., 2015), and decisions about treatment target selection can impact treatment efficiency for these children. Targeting complex phonological structures that are absent from a child's inventory of speech sounds has been shown to stimulate broad, system-wide change (i.e., generalization; Maggu et al., 2021). However, individual responses to treatment with complex targets is highly variable, the parameters for complexity-based treatment target selection have only been systematically proposed for English, and the majority of SLPs worldwide don't yet employ this approach. This may be due—at least in part—to unfamiliarity with the active ingredients of this approach.

**Methods and Results:** To address these issues of implementation, transcription data were analyzed from the elicited productions of 277 English-speaking children (ages 3;0-7;0) with functional phonological disorder from the Developmental Phonologies Archive of the Learnability Project (Gierut, 2015) to derive, for each child, independent and relational measures of speech ability to capture their phonological systems before and after receiving intervention targeting one or more speech sound structure(s). Change in phonological knowledge is modelled with linguistic parameters of their treatment target (e.g., singleton manner class, cluster status) and participant characteristics of age and scores on standardized and non-standardized tests of speech, language, and cognitive ability.

**Results:** Ongoing analysis results are discussed according to the relationship between structures targeted in treatment, the amount and type of system-wide generalization to untargeted sound structures following treatment, and the interacting effects of child-internal variables.

**Conclusion:** Retrospective analysis of pre- and post-intervention data from 277 children who received treatment for phonological disorder allows us to better understand the impact of linguistic parameters in treatment target selection and how this interacts with individual differences in speech, language, and cognitive ability to explain variable responses to speech intervention.

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## **A usage-based approach to language in Alzheimer's disease: the effect of collocation strength on patterns of impairment**

Vitor Zimmerer (University College London), Natasha Adamczyk (University College London), Chui Thing Kiew (University College London), Dicky Lim (University College London), Lin Wang (University College London), Fiona Yang (University College London), Sebastian Bello Lepe (University College London) and Rosemary Varley (University College London).

**Background:** Decline in language capacity is a core feature of Alzheimer's disease (AD) and almost all other types of dementia. Identification of language change in dementia serves the design of clinical tools for detection and tracking and helps test linguistic theory. Many language studies carried out on dementia are informed by generativist "words and rules" approaches. Usage-based approaches on the other hand focus on the effects of experience with language. For instance, previous work found speakers with AD produced stronger word collocations (specific combinations of words that appear together often) than controls, suggesting that strong collocations are affected less by impairment. In the current study, we compared usage variables with more conventional measurements of grammatical complexity, and investigated the effect of collocation strength on the presence and duration of speech pauses as indicators of cognitive effort.

**Methods:** We investigated "Cookie Theft" picture descriptions from 18 people with a diagnosis of AD, and 21 healthy controls. All participants were English speakers. We determined dementia severity using the Montreal Cognitive Assessment (MoCA). We applied computerized methods to determine word frequency of each word, and collocation strength of each word combination, using the British National Corpus as reference. We also applied the Northwestern Narrative Language Analysis to determine grammatical complexity of samples. We determined pause duration using ELAN.

**Results:** In speakers with more severe dementia symptoms, grammatical complexity was lower, content words were more frequent, and collocation strength was stronger. Linear models suggest that collocation strength is a stronger predictor of MoCA scores than grammatical complexity. At the time of abstract submission, pause data are being analysed.

**Conclusion:** Results indicate that collocation strength of word combinations is an important predictor of language impairment in AD, and more relevant to tracking disorder than grammatical complexity. Its effect on speech pauses will provide information on how affects effort in language production. Usage-based, frequentist approaches offer new and valuable contributions to understanding acquired disorders.

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## A first look into the capability of Catalan and Spanish-speaking individuals with Williams syndrome for syntactically combining words

Lluís Barceló-Coblijn (University of the Balearic Islands) and Elga Cremades (University of the Balearic Islands).

Williams syndrome (hereinafter, WS) is a rare neurodevelopmental disorder characterized by the deletion of 19 to 25 genes on chromosome 7 and appears in 1 of every 20,000 births (Schubert, 2009). Such deletion affects different organs, including the brain, which shows a reduced white matter (Osório et al., 2014) and an increase in glial cells in the caudate nucleus (Hanson et al., 2018). Some authors (Bellugi, 1994; Clahsen & Almazan, 1998) have provided evidence that the linguistic ability of people affected by WS is good. However, there are claims that language develops in an atypical way for speakers with WS (Karmiloff-Smith et al., 1997; Benítez-Burraco et al., 2016; Díez-Itza et al., 2019). Therefore, the question of how language develops in speakers with Williams syndrome remains open (Schaner-Wolles, 2004). The aim of this paper is thus providing an answer to the following question: regarding syntactic networks, to which extent does the capacity to syntactically combine words differ in WS speakers and the typically developed speakers? To do that, a corpus of WS spontaneous speech was analyzed. Specifically, the corpus contained 20 audio file sessions of spontaneous speech, divided into 10 WS speakers and 10 typically developed speakers. Both groups included 5 Catalan L1 speakers and 5 Spanish L1 speakers. The analysis was carried out using Netlang, a software that was specifically created to analyze, utterance by utterance, the speaker's expressions (Barceló-Coblijn et al. 2017) and that is based on Dependency Grammar (Hudson, 1990). The result of the analysis is a macroscopic picture of the speakers' capacity for combining words syntactically. Statistical calculations such as the normal distribution of words and syntactic relations, as well as deviations, were performed, showing the differences between WS and TD speakers regarding their capacity for syntactically combining words.

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## **An intervention to promote writing abilities among school-aged children with written language disorders in Chinese**

Tempo Po-Yi Tang (The Hong Kong Polytechnic University) and Dustin Kai-Yan Lau (The Hong Kong Polytechnic University).

**Background:** Chinese character writing is considered important for students to “survive” in mainstream education in Hong Kong, as the majority of assessments in schools require individuals to answer in written format. Recent theories further suggest that handwriting practice is essential for an individual to learn the motor representations of writing units of different grain sizes, which in turn strengthens the abstract symbol representations when one learns literacy. In other words, learning to write Chinese characters should be considered not only as a “school-task”, but also as a means to achieve better lexical quality in general. Treatment that can promote writing abilities of Chinese children with writing difficulties is, therefore, necessary.

**Methods:** A total of six children (4 boys and 2 girls; mean age = 7.95 years) reported to have writing difficulties in Chinese were recruited. They received eight treatment sessions designed to promote their awareness of writing units of different grain sizes in Chinese, consolidate their motor representations of gross- and fine-grain writing units, and facilitate better organization of orthographic representations that allow easy retrieval and processing. A delayed copying task consisting of 10 treatment targets, 10 generalisation targets with untrained characters but trained constituent writing units, and 10 control targets with untrained consistent writing units was conducted before and after treatment.

**Results:** A 2 (Time) x 3 (Target types) analysis of variance with repeated measures was calculated. Results indicated that the improvements across time on treatment targets and generalisation targets were significant while improvements on control targets were not.

**Discussion:** The improvement in the delayed copying task on treatment and generalization targets in the absence of improvement on control targets was attributed to the participants’ improved abilities to segment and memorize characters efficiently and effectively using the constituent writing units introduced in the treatment. Limitations and future studies will be discussed.

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## **Children’s speech and premature loss of primary maxillary incisors**

Caitlin Hurley (University of Western Australia), Sharynne McLeod (Charles Sturt University) and Robert Anthonappa (University of Western Australia).

**Background:** Dental caries (tooth decay) world-wide affects 532 million children. Extractions may be the only treatment option if dental caries is not treated early. This paper explores the association between children’s speech and the extraction of their primary maxillary incisors.

**Methods:** Participants were ten preschool-aged children with two or more primary maxillary incisors planned for extraction. A dual-qualified speech-language pathologist and dentist (primary investigator), administered the Diagnostic Evaluation of Articulation and Phonology and the Intelligibility in Context Scale (ICS) before and one month after dental surgery. Speech analysis included the percentage of consonants correct (PCC). Caregiver and child perception of the child’s oral health related quality of life (OHRQoL) was assessed pre-and post-operatively using a modified Scale of Oral Health Outcomes for 5-year-old children (SOHO-5).

**Results:** There was no statistically significant change in the PCC ( $p=0.185$ ) or the ICS ( $p=0.230$ ) pre- and post-operatively. Post-operatively, there were no significant changes to OHRQoL by child report, and the children did not report increased difficulty in speaking. Caregivers reported improved child OHRQoL ( $p=0.014$ ).

**Conclusion:** Premature loss of the primary maxillary incisors did not result in a clinically significant impact on speech production over one month. Dental treatment and speech intervention could occur concurrently as speech and the presence of primary maxillary incisors appear to be independent. Interdisciplinary care between dentists and speech-language pathologists can ensure optimal outcomes for children with dental caries.

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## **Deterioration in nonword repetition performance of German children between 2008 and 2019: Growing deficits in phonological short-term memory or weaker German language skills?**

Eugen Zaretsky (Department of Phoniatics and Paediatric Audiology, Marburg University Hospital), Benjamin P. Lange (Department of Social Sciences, IU International University of Applied Sciences) and Christiane Hey (Department of Phoniatics and Paediatric Audiology, Marburg University Hospital).

**Background:** Deficits in phonological short-term memory (PSTM) are often associated with language-related medical issues such as hearing disorders. Therefore, PSTM tasks are utilized in numerous language tests for the identification of children with language(-related) impairments. No evidence is available on changes in the children's performance in nonword repetition (NR) tasks over the last decades. Considerable improvements can be expected due to earlier and more elaborated diagnostics and therapies.

**Methods:** Data of 1,511 children (age: 4;0-4;11 years) were analysed. Both monolinguals (MO, n = 684) and bi/multilinguals (BM, n = 827) were included. PSTM (NR), speech comprehension, vocabulary, articulation, and grammar were assessed by the language screening KiSS.2, children's sociodemographic characteristics by questionnaires for parents and kindergarten teachers. NR and German language scores were compared for two test phases: 2008-2009 (n = 600) and 2017-2019 (n = 911).

**Results:** Children scored lower in NR, speech comprehension, vocabulary, and grammar in 2017-2019 than in 2008-2009. In the articulation subtest, the same tendency did not reach statistical significance. Percentages of children with language-related medical issues remained stable. NR showed weak correlations with medical issues and higher correlations with KiSS.2 linguistic subtests. Some transfers from BM's L1 were found in NR.

**Conclusion:** MO's and BM's NR performance and German language skills got worse between 2008 and 2019. No evidence was found that this deterioration can be explained by a misbalance in the percentage of children with language-related impairments. Also, low NR scores were only weakly associated with such impairments. Because NR tasks were German-based, that is, followed the rules of the German phonotactics and contained some German morphology, the deterioration in the NR performance might reflect the deterioration of German language skills.

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## **Speech sound development of young Dutch children with DLD: A complex matter**

Anouk Scheffer (Royal Dutch Auris Group and Utrecht University, Institute for Language Sciences), Brigitta Keij (Utrecht University, Institute for Language Sciences), Britt Hakvoort (Royal Dutch Auris Group), Esther Ottow-Henning (Royal Dutch Auris Group), Ellen Gerrits (Utrecht University, Institute for Language Sciences and HU University of Applied Sciences Utrecht) and Frank Wijnen (Utrecht University, Institute for Language Sciences).

**Background:** Approximately 50% of young children with a developmental language disorder (DLD) also have problems with speech production. Speech production skills can be assessed with relational analyses; indicating how children's productions relate to adult targets (i.e., accuracy), and with independent analyses; indicating the structures and sounds children produce irrespective of accuracy. Research and clinical diagnostics of speech production difficulties focus mostly on relational analyses. Consequently, we do not know if children who do not improve in accuracy, improve in other aspects that can be captured by independent analyses.

**Aims:** (1) to contribute to a more comprehensive overview of the speech sound development of Dutch children with DLD by including independent analyses, (2) to develop an independent measure to assess these children's speech production capacities, and (3) to examine the relation between independent and relational speech production measures for children with DLD.

**Methods:** We describe the syllable structures and sounds of word productions elicited in two picture-naming tasks of 82 children with DLD and speech production difficulties (2;7-6;8). Cross-sectional overviews of their performance on relational and independent measures are provided. We conducted a correlation analysis to examine the association between relational and independent measures.

**Results:** Children with DLD produce a greater variety of consonants and syllable structures than they can produce correctly. Based on existing literature and our results, we propose a Dutch version of an independent word complexity measure, originally designed for English (WCM; Stoel-Gammon, 2010), in which word productions receive points for word structures, syllable structures, and sounds. We do find a strong positive correlation between relational scores and scores on this independent measure.

**Conclusion:** Our results indicate that independent measures, including the WCM, complement relational measures in monitoring development and identifying treatment goals. In this presentation we will discuss the results and the application of our proposed measure.

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## Evaluation of a caregiver-led book reading intervention with an interactional focus for children with speech, language and communication needs

Karin Myrberg (Centre for Research and Development, Uppsala University/Region Gävleborg, Sweden) and Inger Lundeberg-Hammarström (Department of Biomedical and Clinical Sciences, Speech and Language Pathology, Linköping University, Linköping, Sweden).

Parent-child book reading has numerous positive effects on child development in general and on language abilities in particular. Despite the documented benefits, the time that caregivers spend on reading to their children seems to steadily decrease. There is reason to believe that families of children with speech, language and communication needs (SLCN) might have more limited experiences of book reading compared to other families. Several studies indicate that reading with an interactional focus might be particularly language-enhancing.

The aims of this study were two-fold. First, to investigate caregiver-child book reading, reading habits and screen time in families of children with SLCN before and after an eight week intervention focused on daily interactive book reading, and second, to capture the caregivers' experience of the activity.

A consecutive sample of 135 of pre-school children with SLCN and their caregivers were recruited at their regular visit at a speech-language pathology unit in Sweden. They participated in a survey-based interview before and after receiving an intervention with recommendations of at least 10 minutes of daily book reading with an interactional focus, as an add-on to ordinary speech-language pathology (SLP) services. The results were analysed using descriptive statistics of the answers to the questions in the interview, as well as a thematic analysis of free-text comments.

The results demonstrate that a SLP-managed, caregiver-led book reading intervention is feasible and might have a positive impact on reading habits and reading time as well as other factors related to reading and screen time in families of children with SLCN. In this presentation, we will talk about the intervention, present the results from the study and discuss clinical implications.

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## Cognitive Control and Comprehending Passives in Mandarin Preschoolers with and without Risk for DLD

Yue Ji (Beijing Institute of Technology), Li Sheng (The Hong Kong Polytechnic University) and Li Zheng (Nanjing Normal University).

Background: Sentence comprehension difficulties are a hallmark deficit in children with developmental language disorder (DLD). Passive sentences cause greater difficulties among children with DLD than typically developing (TD) peers. These difficulties may be attributed to deficits in cognitive control for processing passives. Here we study the relationship between cognitive control and sentence comprehension in Mandarin-speaking preschoolers with and without risk for DLD.

Methods: Participants were 42 monolingual Mandarin-speaking children (Mage=5.6). Twenty-one were identified as AR (at risk for DLD) and matched with 21 TD peers. Both groups completed a sentence comprehension task including 6 passive *bei*-sentences and 6 SVO sentences. Children matched a semantically reversible sentence with one of four pictures (Fig.1). Participants then performed the Shape School task. In the first Control condition, children named 15 figures by their color as fast as possible (Fig.2). In Inhibit condition, children only named figures of a happy face; next in Switch condition, children named hatted figures by their shape and hatless figures by their color; last in Both condition, children named hatted and hatless figures of a happy face (Fig.3). Efficiency scores  $([\text{number of correct} - \text{number of errors}] / \text{time})$  were calculated.

Results: Both groups made more errors in understanding passive *bei*-construction than SVO-sentences ( $p=.001$ ). The AR group lagged behind their TD peers in both tasks ( $p<.05$ ; Figs.4-5). For the TD group, the efficiency score in the Inhibit condition was significantly positively associated with the accuracy of comprehending passives ( $p=.014$ ) but not SVO-sentences ( $p>.250$ ). For the AR group, efficiency scores were not associated with sentence comprehension performance ( $p>.150$ ).

Conclusion: Results from TD children provided new evidence for the positive effect of inhibitory control on understanding passives. This effect was not found in AR children, suggesting differences in the coordination of language and cognitive control in children with and without risk for DLD.

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## **A Speech Therapy Animation and imaging Resource (STAR)**

Joanne Cleland (University of Strathclyde), Eleanor Lawson (University of Strathclyde) and Jane Stuart-Smith (University of Glasgow).

Speech and Language Therapy (SLT) training and practice has been dominated by auditory and descriptive approaches. However, there is increasing evidence that vocal-tract visualisation can provide breakthroughs in intervention for speech sound disorders, e.g. through ultrasound tongue imaging visual biofeedback (UTI VB) (Sugden et al., 2019). UTI VB tools show huge potential in Speech Therapy, but are used rarely by SLTs. Studies involving Visual Animated Articulatory Models (VAAMs) in clinical settings also show that the provision of accurate visual models of the hidden speech articulators can have a breakthrough role in remediation of speech sound disorders (Massaro et al., 2004; Roxburgh, 2018), but quality and accuracy of commercial VAAMs is a potential issue.

The Speech Therapy Animation and imaging Resource (STAR) [www.seeingspeech.ac.uk/speechstar/](http://www.seeingspeech.ac.uk/speechstar/) is a Web-based, anglophone Speech and Language Therapy resource, under development, that will host over 1,000 videos, collected by speech researchers over the past ten years, showing the visible and hidden movements of speech articulators, using (i) UTI with lip camera video, (ii) magnetic resonance imaging (MRI), and MRI-based animation (animated frame-by-frame to match midsagittal vocal-tract movements). The STAR resource focuses on children's speech and language therapy and comprises of (1) a teaching and training website, which will host UTI videos of disordered and nondisordered child speech, nondisordered adult speech, and MRI videos of modelled speech (2) an in-clinic website hosting vocal-tract animations to aid speech therapy and speech practise at home.

STAR will be the first resource of its kind, providing SLTs, students and teachers, with examples of imaged and animated vocal-tract movement in disordered and nondisordered speech corpora. STAR also aims to improve SLTs familiarity with UTI technology. The sites will be designed with input from a Clinical Advisory panel of SLTs, and SLT trainers and will be evaluated by users during a beta launch phase.

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## **The Graz Vocabulary Test in kindergarten and Grade 1: differences in print and digital modes**

Susanne Seifert (University of Graz; University of Paderborn), Lisa Palecek (University of Graz) and Martin Schöfl (University of Education Upper Austria & Johannes Kepler University Linz, Research Institute for Developmental Medicine).

To adequately support children's reading development, it is helpful to assess, among other things, their vocabulary skills (Ennemoser et al., 2012). Assessment is often associated with a lot of work for teachers (e.g., interpretation based on standardized tables). However, the use of digital tools can facilitate assessment and offers many advantages over traditional print methods (Neumann et al., 2019). Yet, the results of digital and print assessments are not always comparable (Blumenthal & Blumenthal, 2020). The paper investigates the influence of the test mode using the Graz Vocabulary Test in its print and app version. To do so, we conducted three studies with kindergarten children (Study 1: N=85; Study 2: N=60), and first graders (N=440). Using a mixed-methods approach, our aim was to find out (a) whether the digital and print mode led to comparable results, (b) whether both modes showed comparable quality criteria, (c) if there were differences between the modes in terms of feasibility and acceptance by the children, and (d) which differences could be observed in the processing of both test modes. In general, the results showed high correlations between the test modes. Children enjoyed completing both versions, however, 72% preferred the digital version. The results are discussed in light of the advantages and challenges of digital diagnostics.

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## **On the use of Gestures in Young Children with Cochlear Implants – a comparison of everyday interaction and test situations**

Christina Samuelsson (Karolinska Institutet), Ulrika Marklund (Linköping University), Charlotta Plejert (Linköping University), Henrik Danielsson (Linköping University) and Björn Lyxell (University of Oslo).

**Background:** The development of speech and gestures are dependent on exposure and feedback. Before first words, early gestures emerge that are suggested to predict spoken language in both children with typical and atypical language development. Children with cochlear implants (CI) meet challenges in their language development, but little is known about their gestural development.

**Aims & Methods:** The overall aim of this study is to generate knowledge about the development of speech and gestures in young children with CI, and more specifically to study the relationship between gesture use in everyday settings and in test situations. Ten children aged 23-39 months with bilateral CI were individually tested with the test Picture Naming Game (PiNG) that targets receptive and expressive vocabulary. Data consists of video recordings during vocabulary testing with PiNG, and video recordings from everyday activities at home (7/10 children). Annotations of gestures and speech were made by the use of the video analysis software ELAN.

**Results:** Deictic gestures were by far the most common, both in the test situation and in everyday interaction at home. Conventional gestures were used in both settings, most often in the form of nodding for “yes”. Iconic gestures were sparse in both situations. At home the use of gestures varied with activity; gestures in general and deictic gestures, in particular, were more frequent in a book reading activity than during play.

**Conclusion:** The use of gestures is related to vocabulary development, and the use during a test situation resembles the use in everyday interaction at home.

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## **Development of personal narratives skills of Greek Cypriot children: focusing on microstructure**

Elena Theodorou (Cyprus University of Technology), Athanasia Lambrou (Cyprus University of Technology) and Kakia Petinou (Cyprus University of Technology).

Telling personal narratives is an ability that emerges relatively early and undergoes further development throughout the preschool and elementary school years. Sharing personal narratives promotes friendships, and physical and emotional health supports classroom participation and underpins academic and vocational success. Although personal narratives are universal discourse genres, little research has been conducted on children's ability to share personal narratives. This presentation describes how children aged 8 to 10 who speak the Cypriot-Greek dialect develop the ability to utter personal stories. Beyond the interest in personal narrative development, the bi-dialectal language context in Cyprus is discussed. Twenty children aged 8 to 10 years old participated. Global-tales protocol (Westerveld, Lyons, Nelson, et al., 2022) was used to elicit six personal narratives (excited, worried, annoyed, proud, problem situation, something important) from each child. Measures of micro-structure, including measures of syntactic complexity (Mean Length of Utterances, Percentage of Subordinated Clauses) and semantic complexity (Number of Different Words, Type Token Ratio), were examined as a function of age and topic. The initial results of the data analysis showed that some measurements (e.g. the number of different words) increase as a function of age, whereas others do not (e.g. MLU). The stories' topic was found to play a role in microstructure measurements, and individual differences were also found. The analysis still needs to be completed. Our findings are discussed in the context of translational clinical applications relative to assessment, diagnosis and intervention frameworks. In addition, the discussion focuses on how the findings relate to the theoretical discussion regarding a bi-dialectal context where native varieties differ from those used in classrooms and written materials.

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## **PANEL: Children's speech development in 70+ languages and dialects**

Sharynne McLeod (Charles Sturt University), Helen Blake (University of Technology Sydney), Kathryn Crowe (Charles Sturt University; University of Iceland), Marit Clausen (University of Southern Denmark), Ellen Gerrits (HU University of Applied Sciences Utrecht; Utrecht University), Yvonne Wren (University of Bristol), Jill Titterington (Ulster University), Joanne Cleland (University of Strathclyde), Andrea MacLeod (University of Alberta), Margaret Kehoe (University of Geneva), Annette Fox-Boyer (University of Lübeck), Elena Babatsouli (University of Louisiana at Lafayette), Kasia Petinou (Cyprus University of Technology), Krisztina Zajdó (University of Győr), Karla Washington (University of Toronto), Marjan Larimian (Babol University of Medical Sciences), Helen Grech (University of Malta), Kristian Kristoffersen (Frambu Resource Center of Rare Disorders; Nord University), Maria João Freitas (Universidade de Lisboa), Sofia Strömbergsson (Karolinska Institutet) and Inger Lundeborg Hammarström (Linköping University).

**Background:** From birth, children learn to communicate using their ambient languages. Many children accomplish the ability to intelligibly speak their local language and dialect as a natural and effortless part of their daily lives. There is evidence from recent cross-linguistic reviews of children's speech development that by 5 years of age children are intelligible to strangers (McLeod, 2020) and their acquisition of consonants is almost complete (McLeod & Crowe, 2018). Some children do not readily accomplish the ability to speak intelligibly, and require additional input from speech-language pathologists, communication specialists, and families. The aim of this panel is to present a cross-linguistic account of multilingual and/or monolingual children's speech development.

**Methods:** During this panel, international experts will compare children's speech development in languages and dialects including Danish, Dutch, English (English, Irish, Scottish), French (Canadian, Swiss), German, Greek (Cypriot, Standard), Hungarian, Jamaican Creole, Laki, Maltese, Norwegian, Portuguese (European), and Swedish. The panel will begin with an overview of children's speech development in over 70 languages and dialects across the world. Next, the authors will systematically present information about speech development to enable comparison between languages and dialects.

**Results:** Each presenter will describe the adult form of their language (dialect), including the consonants, vowels, consonant clusters, tones, prosody, word shapes and writing system. Next, they will present research evidence about children's speech development in the language (dialect). Finally, authors will review the assessments, interventions, and resources that are available in that language and dialect.

**Conclusion:** This information can be applied by researchers and communication professionals to uphold children's right to communicate.

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## PHONODIS: a PhonBank database for the study of atypical phonology in Portuguese children

Maria João Freitas (University of Lisboa, FLUL/CLUL), Ana Margarida Ramalho (University of Lisboa, FLUL/CLUL;ESSAlcoitão), Marisa Marisa (University of Aveiro/Cintesis-UA), Patrícia Oliveira (University of Lisboa, CLUL/FLUL) and Rodrigo Pereira (University of Lisboa, CLUL/FLUL).

**Background:** PhonBank (Rose & McWhinney, 2014) has been hosting corpora with the help of Phon (Hedlund & Rose, 2020). These open access corpora gather data from children acquiring the phonology of languages worldwide, favoring data sharing. Most of these corpora are from typically developing children. PHONODIS, a PhonBank corpus, offers production data on the acquisition of European Portuguese (EP) by children with protracted development. As far as we know, this is the first corpus of its kind for EP, and one of the few on protracted phonological development in an open access format.

**Methods:** PHONODIS contains experimental cross-sectional data audiotaped by three Speech and Language Therapists (SLTs). It offers audio files and phonetic transcriptions of data collected with CLCP-PE, a picture naming test developed at the Crosslinguistic Child Phonology Project (Bernhardt & J. Stemberger, 2010). It includes 150 lexical targets produced by 26 monolingual Portuguese children with protracted development, aged 3;2 to 11;05, from four districts in the country; data collection followed the procedures in Ramalho (2017). Informed consents and ethical procedures followed Behavioural Research Ethics Board of University of British Columbia guidelines.

**Results:** We will describe the corpus PHONODIS and provide success rates on syllable constituency and prosodic word variables (word length; position in the word) for children with primary phonological impairments; we will compare results with those on typical Portuguese monolinguals, collected in a similar experimental setting.

**Conclusion:** PHONODIS is useful for researchers, teachers and SLTs, in academic and professional contexts. It increases knowledge on EP acquisition by children with protracted phonological development and improves evidence-based practices in assessment and intervention contexts.

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## **Effectiveness of a serious game for grammatical therapy in Dutch school-aged children with DLD**

Rob Zwitserlood (HU University of Applied Sciences Utrecht), Annemarie Kerkhoff (Royal Dutch Auris Group), Ingrid Singer (HU University of Applied Sciences Utrecht) and Ellen Gerrits (HU University of Applied Sciences Utrecht).

**Background:** In research project 'ZINnig' at HU University of Applied Sciences Utrecht we have developed a serious game to enhance morphosyntax in children with DLD aged 7-10 years. The game 'Bouke Bouwt' was developed in co-design with researchers, SLTs, game designers, and children with DLD. The game is based on metalinguistic therapy programme MetaTaal (<https://tinyurl.com/mcrph2rj>), aimed at teaching children with DLD (aged 10+) complex syntax using Lego® bricks. Dutch SLTs expressed a need for a motivational therapy programme for younger children. Children are motivated to play games, however SLTs feel uncertain whether a serious game for morphosyntax is really effective.

**Methods:** In a pilot study, we compared 5 weeks of regular grammatical therapy (control condition) with 5 weeks of therapy using the game (experimental condition), with 20 minutes of treatment each week, targeting morphosyntax. Participants were 14 children with DLD (6 girls, 8 boys, mean age 8;8). Primary outcome was grammatical complexity measured as MLU in spontaneous language samples.

**Results:** At group level, no difference between control and experimental conditions were found for MLUw, grammatical accuracy, or clausal density. There was also no evidence for morphosyntactic growth over the whole treatment period of 10 weeks. Both the children and the SLTs were highly motivated to use the game.

**Conclusion:** A possible reason for the lack of growth is the small sample size and limited duration of the therapy. Alternatively, we were unable to demonstrate growth in spontaneous speech. We are currently running a larger (repeated baseline) effectiveness study with 26 children, a longer duration of 16 weeks, home assignments to increase the amount of intervention, more targeted outcome measures by using MAIN narrative tasks and CELF-5-NL sentence repetition task, and retention measurement 6 weeks post-intervention. We will discuss the pilot study and present preliminary data from the larger effectiveness study.

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## **Establishing Cepstral Peak Prominence (CPP) normative data for young adults in Ireland: the impact of gender, speech task and recording conditions**

Niamh O'Donnell (University of Galway) and Irena Yanushevskaya (Trinity College Dublin).

**Background:** Cepstral Peak Prominence (CPP) is currently recommended as a robust measure of dysphonia in clinical voice assessment (Patel et al, 2018). Its use in clinic is limited due to its relative conceptual complexity and also the lack of normative data against which clinicians would compare disordered voice analysis data. Furthermore, CPP values can vary significantly with recording conditions, analysis software used, speech tasks, and the age and gender of the speaker. This study aims to establish normative data for CPP for young adults in Ireland and to determine the extent of CPP variability across genders, speech tasks and recording conditions. It aims to fill the gap with regard to CPP data collected remotely.

**Methods:** Thirty four participants aged between 18 and 24 years were recruited (28 female). Participants produced a number of speech tasks (sustained vowels and sentences with different segmental composition). Recordings were completed onsite in a sound insulated room using a head-mounted microphone, and remotely using the participants' mobile phones. CPP values were extracted using Praat (Boersma & Weenink, 2022) and subsequently analysed using a complex mixed-effect ANOVA, with two within-subject factors (recording condition, speech task) and one between-subject factor (gender).

**Results:** We report CPP data for young normophonic adults living in Ireland. Collection of data for the project is ongoing. Our preliminary results suggest a significant effect of speech task (lower CPP in connected speech compared to sustained vowels) while the effects of recording condition and gender were not found significant.

**Conclusion:** Smartphones can be used to record audio data of adequate quality for acoustic voice analysis. Normative CPP data reported in the study could potentially contribute to the standardised use of CPP as a robust tool and facilitate its interpretation in the assessment and treatment of voice disorders, to evaluate treatment efficacy, and monitor progress.

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## **Clinical characteristics and predictors of word reading in children with childhood apraxia of speech (CAS)**

Sabine Leonhartsberger (Konventhospital der Barmherzigen Brüder, Linz).

Childhood apraxia of speech (CAS) is a heterogeneous speech disorder that affects communication. Many children with CAS have difficulties in word reading which lead in turn to difficulties in school and adult life. Studies that have characterized this population and monitored over many years tend to have small group samples. A retrospective longitudinal study is conducted with a sample of 202 children with CAS that were diagnosed at a specialized center (NLA). Clinical characteristics are described and compared to averages in the unimpaired population. Children are assigned into two groups whether those who consulted the NLA only in preschool years (n=82) and those who returned at school age (n=120) and compared in areas of interest. Correlations are calculated between the main characteristics. Children with CAS are not only impaired in articulation but also in expressive and receptive language and cognition. First words are often produced with a significant delay. Many children show signs of movement disorders that manifest early with a delay in the beginning to walk. Multilingual children seem to be underrepresented in this sample. Comparing these two groups, significant differences can be found. Children with school problems are more severely impaired in early childhood: they tend to come with higher ages and begin to walk later. They have more severe deficits in expressive vocabulary and receptive language, lower nonverbal cognitive levels, more behavioral and attentional problems and are more often affected by movement disorders. All of the important characteristics (word reading, language, cognition) seem to be linked up in this sample. There were many moderate to high correlations to be found. Word reading is connected not only to language development but also to motor development and nonverbal intelligence as well as attention. These domains seem to be interdependent. Basic skills such as nonverbal cognition and attention affect a child's speech and language development as well as the ability to learn new things and consequently the effectiveness of therapy.

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## **Phonological Short Term Memory in Mandarin-Speaking Children With Speech Sound Disorders in Taiwan**

Paohsiang Chi (Department of Special Education, National Taipei University of Education).

**Introduction and aims:** The purpose of the current study was to investigate phonological short term memory in Taiwanese children with speech sound disorders so as to explore the phonological representation of these children.

**Methods:** Participants 36 young children with speech sound disorders and 36 same-age peers with typical speech sound development participated in this investigation. The cognitive abilities and hearing of all 72 participants were within normal range. - **Tasks Administered** All participants completed a nonword repetition task. The nonword repetition tasks include 2, 3, 4, and 5 syllables nonwords, which were designed and selected to fit into Chinese phonotactic rules.

**Results:** The results showed that there was significant difference of nonword repetition abilities between children with speech sound disorders and children with typical speech sound development. In addition, it was found that frequency effect did not affect children's nonword repetition in both groups. However, as for correlation analyses, it was found that children's non-word repetition and vocabulary size were correlated. Finally, when phonotactic probability was taken into account, children's vocabulary size would affect their nonword repetition performance.

**Conclusion:** In sum, this research indicated that Taiwanese young children with speech sound disorders did evidence significantly weaker phonological short term memory. The findings implied that children with speech sound disorders might have particular limitations in storing phonological information, which might cause them to produce error sounds. Besides, it was also found that phonological short term memory was strongly correlated to lexicon size. Findings in this study could enhance the understanding of high level phonological knowledge in Taiwanese children with speech sound disorders, and provide the rich theoretical bases for using language based treatment approach for children with speech sound disorders.

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## **The Role of Markedness in Between-Language Interaction in Latinx Preschoolers: Evidence from Substitution Errors**

Leah Fabiano-Smith (University of Pittsburgh), Sabrina Sieg (University of Arizona) and Jessica Barlow (San Diego State University).

**Purpose:** The purpose of this study was to provide evidence for a theoretical model of between-language interaction in bilingual phonological representation through the examination of substitution error patterns through the lens of markedness, or relative featural complexity. Specifically, we observed what targets bilingual children avoid and what phones bilingual children use as substitutes for those targets. Due to the nature of between-language interaction, we predicted that phonemes shared between languages with lower markedness values would be used as substitutes for unshared sounds with higher markedness values.

**Methods:** Seventy children, ages 3;11-6;7 (years;months), participated in this study: sixty-three typically developing bilingual Spanish-English speaking children and seven bilingual Spanish-English speaking children with speech sound disorders. Substitution errors in single-word speech samples were analyzed in relation to their markedness values in terms of both targets avoided and substitutes produced.

**Results:** Findings indicated both typically developing and bilingual Spanish-English speaking children with speech sound disorders preferred the use of unmarked phonemes that are shared across languages over the use of marked, language-specific phonemes. Evidence of between-language interaction was observed in both the (1) substitutes employed; (2) phonotactics, and (3) phonemic targets avoided. Regardless of disability status, bilingual children abided by the phonological rules of their languages in errors of substitution.

**Conclusion:** Through the examination of substitution errors, evidence of between-language interaction and recognition of relative complexity emerged. These results have implications for multidimensional, cross-linguistic interactions as well as the language-specific patterns demonstrated in substitution errors.

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## **Clinical feasibility of a German adaptation of the Language-Neutral Assessment of Motor Speech in Young Children (LAMS)**

Gertraud Erlacher (Institut für Sinnes- und Sprachneurologie, Barmherzige Brüder & Research Institute for Developmental Medicine, JKU).

**Background:** In this study, the „Language-Neutral Assessment of Motor Speech in Young Children“ (LAMS, Velleman et al. 2017) is applied for the first time in a German-speaking region in order to assess childhood apraxia of speech. The aim is to describe the assessment (as a German adaptation) in detail and to put it in context with current clinical procedures, to examine feasibility in the local clinical setting (notably practicality, acceptance and adaptation), and to collect initial data regarding reliability.

**Methods:** This pilot study is conducted as a series of single case descriptions (N=7) with monolingual German-speaking children. The collected data are processed solely descriptively with additional qualitative observations.

**Results:** Overall, the test results are consistent with profiles that would be expected in CAS. With regard to feasibility, practicality of a complete administration of the LAMS is limited because it is time-consuming, acceptance in children and parents is high for most parts of the test. Adaptations to economise the time investment (notably leaving out video analysis) without a significant reduction of quality seem feasible. Initial data show a well acceptable retest- and interrater-reliability.

**Conclusion and clinical implications:** With limited adaptations, implementation of the LAMS in the local clinical settings looks promising. In the German-speaking region a German adaptation of the LAMS can fill a gap in the assessment of motor speech disorders in young, hard-to-test children. More data regarding reliability and validity are needed.  
Preference: Oral Presentation

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## **Early social communication intervention for young children with Down syndrome: Results from a feasibility randomised controlled trial**

Vesna Stojanovik (University of Reading, United Kingdom), Emma Pagnamenta (University of Reading), Sarah Sampson (University of Reading), Rachel Sutton (University of Reading), Benjamin Jones (University of Exeter), Victoria Joffe (University of Essex), Kate Harvey (University of Reading) and Elena Pizzi (University College London).

This paper reports the results from a feasibility trial of an early parent-delivered social communication intervention for young children with Down syndrome ('ASCEND'). The intervention focuses on developing children's early social communication skills, in particular responding to shared attention. The aim was to inform the feasibility of running a full-scale trial, to assess whether the intervention is effective in improving language skills before children with Down Syndrome start school.

**Methods:** This was a two-arm feasibility randomised controlled trial (RCT), with 1:1 randomization stratified by trial site, comparing the intervention plus standard NHS speech and language therapy provision and no intervention (only standard NHS speech and language therapy provision). We recruited 20 children with Down Syndrome aged between 11 and 36 months through three NHS speech and language therapy services, 19 of whom were randomized (10 children -intervention group, 9 -control group). Pre and post intervention and 6 month follow-up Assessments included language, social communication skills, adaptive behavior, quality of life (parents and children), parental anxiety and depression. The intervention was parent-delivered with parents having access to SLT services and the research team. Data were collected on recruitment and retention, standard care, treatment fidelity, acceptability of the intervention by the parents and speech and language therapists, feasibility of collecting health economic measures and suitability of the primary outcome measure.

**Results:** The sample was sufficient for a feasibility study. The intervention (manual, support, materials) was positively received by the participating parents. Speech and language therapists also evaluated the acceptability of the intervention positively. Treatment fidelity and retention were acceptable. The preliminary health economic data suggest that this intervention will be low cost.

**Conclusion:** Based on recruitment, retention and treatment fidelity, as well as the acceptability of the intervention to parents and speech and language therapists, a full-scale trial would be feasible in order to assess the effectiveness of the intervention.

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## **The co-construction of a reading assessment checklist with adults with Down syndrome: a meaningful literacy approach**

Pauline Frizelle (University College Cork), Sean O'Donovan (University College Cork), Mary Jolley (University College Cork), Lisa Martin (Down syndrome Ireland) and Nicola Hart (Down syndrome Ireland).

**Background:** The need to develop appropriate measures of broad-based reading-related literacy skills for adults with Down syndrome has been highlighted in the literature. In this study we aimed to co-construct a valid and reliable assessment measure that can be used to document meaningful everyday reading, in adolescents and adults with Down syndrome.

**Methods:** The study was carried out in two stages. Stage 1 used an inclusive participatory design in which individuals with Down syndrome were research collaborators (n = 46). Items to be included in the measure were identified and ecological, face and content validity were established through an iterative process. In stage 2 we examined the reliability of the tool and explored potential relationships between meaningful reading score and 1) age, 2) receptive vocabulary and 3) reading ability as measured by standardized assessments. In addition, we profiled what a pilot cohort of adults with Down syndrome read (n= 33) and how they experience reading in their everyday lives.

**Results:** Results showed that 46 items were generated for inclusion in the meaningful reading measure. The tool was found to have internal and external reliability and to have ecological and content validity. There were no associations between meaningful reading score and any of the other variables examined. There was considerable variability in items read (range 12 - 44) which reflected a broad range of reading practices. Adults with Down syndrome identified reading as a pleasurable activity to be most important and as something that aids learning.

**Conclusion:** The Meaningful Reading Measure developed here can be used 1) as a reading intervention outcome measure to complement existing standardized tools, 2) to profile meaning reading in adults with Down syndrome, 3) to guide reading module content, and 4) to capture change in adults' perceptions of themselves as readers.

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## **Gestural and lexical development in 5p deletion syndrome**

Kristian Emil Kristoffersen (Nord university and Frambu Resource Center for Rare Disorders) and Hanne Gram Simonsen (University of Oslo).

MacArthur-Bates Communicative development Inventories (MCDI) are widely used to assess lexical and grammatical development in infants and toddlers across a range of languages, and there have also been studies using this instrument to investigate skills in these areas in children from atypical populations. Two such studies, Pizzamigilo et al. (2013) and Kristoffersen (2020), both single case studies, have examined gestural and lexical development in children with 5p deletion syndrome.

Kristoffersen (2020) was a longitudinal case study of one child with this condition growing up in a Norwegian speaking family. The subject was followed over a period of five years, between ages 2;4 and 7;4. The most important findings were that the subject followed a considerably delayed, but not deviant, developmental trajectory in three areas, receptive vocabulary, productive vocabulary and communicative gestures, as compared to typically developing infants and toddlers.

In the present study five additional children with 5p deletion syndrome, all from Norwegian speaking families, are being assessed longitudinally with the same instrument. As in Kristoffersen (2020), parental reports for each child are completed 2 to 3 times every year. I will present preliminary results from these five children and compare them to the developmental profile of both typically developing children, and the boy with 5p deletion syndrome, whose gestural and lexical skills were described in Kristoffersen (2020).

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## Prevalence of SSD in German-speaking primary school children

Annette Fox-Boyer (University of Lübeck), Antonia Mörtstedt (University of Lübeck) and Clara Wolf (University of Lübeck).

**Background:** The prevalence of speech sound disorders (SSD) in German-speaking children aged 3;0 to school entry ( $\approx$  age 6) is reported as 16-20% (Neumann et al., 2011; Fox-Boyer, 2014). To date, there is a lack of data on the prevalence of persistent SSD at primary school age. Due to the well-known influence of SSD on later academic and literacy outcome (e.g. Wren, 2021), the aim of this study was to investigate the prevalence of SSD in first and third graders.

**Methods:** 165 mono- or multilingual German-speaking first or third graders (6-9 years of age), who were either typically developing (TD) or had special educational needs (SEN) participated in the study. Speech skills were assessed a) at word level the PLAKSS-II screening (Fox-Boyer, 2016) and b) at sentence level with two picture descriptions. Children's background information (e.g. language use, developmental information) was gathered via a parental questionnaire. Further, teachers filled in a questionnaire about the children's literacy competences.

**Results:** Analysis revealed speech difficulties in 23% of all participants, with 14% of those being classified as showing an isolated phonetic disorder and 9% as showing a persistent phonological delay or disorder. Most children with SEN showed a combination of phonetic-phonological difficulties. Children with phonological speech problems were also found to have weak literacy skills. Third graders showed less speech difficulties than first graders. No group difference in speech skills were found between mono- and multilingual children.

**Conclusion:** Results indicate that the SSD rate in first and third graders (9%) is higher than reported internationally (NIDCD, 2017). Teacher reported weak literacy competences specifically in children with phonological problems confirming the link between speech and literacy development. Implications and study limitations will be discussed.

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## Well-being in a large sample of young children with DLD

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**Background:** Many studies on children with Developmental Language Disorder (DLD) report lower social-emotional functioning (SEF) and quality of life (QoL) (Feeney et al., 2012, Yew & O’Kearny, 2013). Severity of the language problems do not predict outcomes in these domains, so other factors seem to play a role (Eadie et al., 2018). This study discusses parent-rated SEF and QoL in a large sample of young Dutch children with DLD. We consider which aspects of SEF and QoL seem to be impeded and discuss which factors could possibly explain the variation in these domains in DLD.

**Methods:** 511 children were recruited via early intervention groups for children with (presumed) DLD. Language and IQ-scores were collected before school entry (T0, mean age 3;11). SEF, QoL and intelligibility were measured in kindergarten with parental questionnaires (T1, mean age 4;8). T-tests were used to analyse differences between the participant group and norms of the SDQ and KINDL. The contribution of child factors (language, IQ and intelligibility) and environmental factors (SES and multilingualism) to SEF and QoL was tested with regression analyses.

**Results:** SEF and QoL are markedly lower compared to norms ( $p < .001$ ,  $d = .82$  for SDQ and  $d = .38$  for KINDL). Differences are especially large for subscales on peer problems, hyperactivity/inattention and emotional problems in the SDQ and for the friends, school and emotions subscales of the KINDL. Furthermore, intelligibility is the only significant predictor of variation in QoL ( $F = 8.41$ ,  $p < .001$ ). SEF is predicted by a combination of IQ and intelligibility ( $F = 24.55$ ,  $p < .001$ ). However, the proportion of explained variation remains low (adjusted  $R^2 = .12$  for QoL and  $.098$  for SEF).

**Conclusion:** Social-emotional functioning and quality of life might deserve more attention in clinical settings and research on DLD, especially for children with decreased intelligibility. In this presentation, we will discuss the clinical implications of our findings.

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## Which clinical speech metrics are used to measure outcomes of interventions for children with speech sound disorder of unknown origin?

Sam Burr (Bristol Speech and Language Therapy Research Unit), Joanne Cleland (University of Strathclyde), Sam Harding (Bristol Speech and Language Therapy Research Unit), Helen Stringer (Newcastle University) and Yvonne Wren (Bristol Speech and Language Therapy Research Unit).

**Background:** The aim of this study was to determine which metrics of speech output should be included in a diagnostic protocol, Core Outcome Set (COS), and minimum dataset (MD) for children with speech sound disorder (SSD) of unknown origin for use in UK speech and language therapy services.

**Methods:** An umbrella review of SSD intervention studies was conducted to identify preliminary content for the COS and MD through structured database searches. Extracted data included outcome metrics. These metrics were refined through participatory workshops, which included SSD clinical experts from five UK NHS sites with parent representatives. Consensus on the final list of metrics to be included in the SSD diagnostic protocol, COS and MD was achieved through a modified 2-round Delphi process involving UK-based clinical and academic experts and an international panel.

**Results:** The umbrella review identified 24 metrics for SSD baseline and outcome measurement, of which 17 were retained for consideration in the participatory workshops and modified Delphi process. Activity is ongoing but the agreed set of metrics for inclusion in the diagnostic protocol, COS and MD will be reported at the conference. The final agreed SSD protocol will include a concise menu of appropriate metrics based on the specified speech sample to be collected for each child. The diagnostic protocol, COS and MD will include an agreed set of metrics to be used for outcome assessment of children with SSD in NHS services in the UK.

**Conclusion:** An agreed, evidence-based set of metrics for use in the diagnosis and outcome measurement of children with SSD has been established as part of a diagnostic protocol, COS and MD. Adoption of the protocol, COS and MD across intervention studies for children with SSD of unknown origin will lead to greater uniformity of reporting and comparison of results across studies.

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## Using a visual analogue scale (VAS) to assess the effect of speech therapy in children with cleft lip and palate

Marie Dokovova (University of Strathclyde), Joanne Cleland (University of Strathclyde), Lisa Crampin (NHS Greater Glasgow and Clyde) and Linsay Campbell (NHS Greater Glasgow and Clyde).

**Background:** Most speech intervention studies use metrics such as percentage consonants correct to measure changes in speech production after intervention. This typically takes a binary view of correctness of targeted speech sounds. However, emerging evidence suggests that some children make phonetically gradient changes to their speech during, and after intervention. This study measures changes in speech production using a visual analogue scale (VAS) in a 7-year-old child with repaired unilateral cleft lip and palate receiving articulatory intervention for backing of consonants.

**Methods:** Speech materials were 30 /t/-initial word tokens (12 unique words), which could be minimal pairs with /k/, and 18 /k/-initial word tokens (6 unique words), which could be minimal pairs with /t/. Each word was produced with a schwa at the start (e.g., /ə'kap/). The recordings of the /t/-initial words were derived across six speech therapy sessions. The recordings of /k/ were derived from assessment sessions before and after therapy. Listeners were undergraduate Speech and Language Therapy students in their final (4th) year of training. They used a digital visual analogue scale to rate how close each initial consonant was to /t/ or /k/. Responses were converted to continuous responses from 0 to 100, where 0 was most /t/-like and 100 was most /k/-like. A linear mixed effects model (LMEM) was fitted with VAS as an outcome variable, phoneme as a predictor, and accounting for the multiple ratings per listener and per word. The effect of therapy session on VAS was investigated using a LMEM on a subset of the data containing only /t/.

**Results and conclusion:** Data collection and analysis is ongoing. Preliminary analysis suggests that listeners had significantly higher VAS ratings for /k/ than for /t/. VAS shows potential to be used to measure speech production changes in children with cleft lip and palate.

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## **Valence and Intensity of Facial Expressions and Affective Words during Speechreading in Deaf and Hearing College Students in China**

Jialu Fan (Central China Normal University & Nanjing Normal University), Huina Gong (Central China Normal University), Ran Xiao (Central China Normal University), Liang Chen (University of Georgia) and Jianghua Lei (Central China Normal University).

**Background:** Emotional Valence describes the extent to which an emotion is positive or negative, whereas intensity refers to the strength of the associated emotional state. A rich literature exists that documents the valence and intensity effects in processing both words and facial expressions. It remains unclear, however, whether the influence of valence and intensity varies while speechreading affective words under facial expressions.

**Purpose:** In two experiments, we manipulated valence (POSITIVE or NEGATIVE) and intensity (HIGH or LOW) of facial expressions and affective words, asking what impact they have on speechreading processing in deaf and hearing young adults.

**Methods:** Adopting a video-to-word matching design, we assessed the speechreading of affective words in 32 deaf participants and 32 hearing participants in two experiments. In experiment 1, participants viewed silent videos of a talker producing high or low intensity positive words (PWs) with high or low intensity positive (HAPPY) facial expressions. In experiment 2, the talker produced high or low intensity negative words (NWs) with high or low intensity negative (ANGRY) facial expressions.

**Results:** There were three major findings. First, high-intensity words were speechread more accurately than low-intensity ones, regardless of their valence polarity. Second, the valence of the facial expressions of the talker interacted with the intensity. PWs produced with a low-intensity happy facial expression were speechread faster than those with a high-intensity happy face, but participants had superior speechreading performance on NWs produced with a high-intensity angry face. Third, the hearing students had superior speechreading performance of high-intensity NWs than the deaf students.

**Conclusion:** The valence and intensity of both facial expressions and affective words contributed to speechreading performance. However, the relationship between valence and intensity differed between facial expressions and affective words during speechreading. Specifically, the effect of valence on speechreading is an inverted-U with intensity for affective words, but is interactive with intensity for facial expressions. What's more, the hearing participants' superior speechreading performance on high intensity NWs suggests the need to strengthen the emotional representation of high intensity NWs for the deaf.

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## **Longitudinal speech outcomes in children born with unilateral cleft lip and palate – a prospective Swedish inter-centre study**

Kristina Klintö (Skåne University Hospital/Lund University), Karin Brunnegård (Umeå University/Umeå University Hospital), Emilie Hagberg (Karolinska University Hospital/Karolinska Institutet), Cecilia Nelli (Linköping University Hospital), Åsa Okhiria (Uppsala University Hospital/Uppsala University) and Christina Havstam (Sahlgrenska University Hospital/Gothenburg University).

**Background:** Studies on the impact of cleft palate surgery on speech with scientifically sustainable methodology are requested, since we still do not know the best timing or method for surgery. The purpose of this study was to report on longitudinal speech outcomes at 5, 7, and 10 years for all Swedish-speaking children born with a non-syndromic unilateral cleft lip and palate, in 2008 to 2010, treated at the six Swedish cleft lip and palate centres, and to compare speech outcomes between centres.

**Methods:** At 5 years of age 57 children participated, at 7 years of age 56 and at 10 years of age 54. The speech was assessed with percent consonants correct (PCC), based on phonetic transcriptions from audio recordings by five independent judges at 5 years of age, and by four independent judges at 7 and 10 years of age. At 5 years PCC was adjusted for age. Also, perceived velopharyngeal function was assessed on a 3-point scale.

**Results:** The median PCC for all children was 94 (range 15-100) at 5 years of age, 96 (range 44-100) at 7 years of age, and 100 (range 84-100) at 10 years of age. At 5 years of age, 10 children (18%) were perceived as having incompetent velopharyngeal function, at 7 years of age three children (5%), and at 10 years of age one child (0.02%). No significant differences were seen among the six groups.

**Conclusion:** The speech was clearly improved from 5 to 10 years of age. No significant differences were seen among the six groups treated at different cleft lip and palate centres; however, the groups were small.

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## **International perspectives and attitudes towards speech and language therapy and multilingualism**

Theresa Bloder (Catholic University Eichstaett-Ingolstadt), Maren Eikerling (Martin-Luther-Universität Halle-Wittenberg), Sofia Castro (Jagiellonian University), Tanja Rinker (Catholic University Eichstaett-Ingolstadt) and Maria Luisa Lorusso (Scientific Institute IRCCS E. Medea, Bosisio Parini).

**Background:** For decades, survey studies have shown that adequately assessing and treating multilingual children is challenging for Speech Language Therapists (SLTs; Mennen & Stansfield, 2006; Williams & McLeod, 2012; Stankova et al., 2021, Bloder et al. 2021). Policy reports have also emerged in recent years to guide SLTs in their clinical practice (Garraffa et al., 2019, Lorusso et al., 2022). This questionnaire study examines which policies SLTs consider particularly important.

**Methods:** We investigate how multilingualism is dealt with in speech therapy. In an online survey, 311 SLTs from 17 different countries were asked about their perspectives on SLT service provision for multilingual children with regard to their practical applicability and relevance. In an online survey, participants were asked to rate 17 statements about multilingualism on a scale from 1-5 in order to express how strongly they agreed with any given statement (1 = strongly disagree, 5 = strongly agree). We only report results that indicate relatively strong (dis)agreement (i.e., a mean rating score of either <2.5 or >3.5).

**Results:** The results show that working with multilingual children is linked with great efforts. SLTs indicated that assessment tools in languages beyond the societal language are not easily accessible, and that they are not content with those that are currently available. Similarly, SLTs find it difficult to access interpreters to support them in the service provision for multilingual children. Participants also indicated that foreign language speakers should be recruited for the profession to increase the linguistic diversity among SLTs. Mandatory internships could be useful to increase concrete field-experience in working with multilingual patients.

**Conclusion:** The findings indicate a lack of resources. To promote the development of multilingual and multicultural attitudes and appropriate approaches to linguistic diversity in clinical practice, SLTs consider easy access to useful materials and concrete experiences with multilingualism important.

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## Effects of changed auditory feedback on oral-nasal balance in speech: The story so far

Tim Bressmann (University of Toronto).

Background: Nasality in speech is controlled by the velopharyngeal sphincter, which opens for nasal sounds and closes for oral sounds. Speakers have no conscious proprioception of their velopharyngeal movement, and voluntary control of oral-nasal balance is often limited, which makes the clinical management of nasality disorders challenging. Speech compensation experiments have shown that when speakers hear changed auditory feedback of their own speech, they tend to compensate into the opposite direction. Numerous studies have demonstrated such compensation for parameters such as loudness, pitch, and vowel formants. However, the effect of auditory feedback on the control of nasality had not been investigated.

Nasality in speech is commonly quantified using a nasometer. This instrument calculates a measure called nasalance, i.e., the percentage of the nasal signal to the nasal plus oral signal in a speech recording. In our experiments, participants wore a nasometer headset and a pair of headphones for auditory feedback. Additional tie-clip microphones on the nasal and oral sides of the nasometer separation plate were connected to a multitrack recorder, which allowed changing the nasal signal level auditory feedback in the speaker's headphones.

When the speech compensation research paradigm was applied to nasality, we found that when speakers heard themselves with increased nasal signal levels, their nasalance scores decreased in response. When speakers heard themselves with decreased nasal signal levels, the corresponding increase in nasalance scores was less pronounced. In subsequent studies, we found that this response pattern was similar in song, and that it remained unchanged even when speakers were informed about the nature of the manipulation. The effect also manifested as phonetic divergence when the nasal signal levels increased in the speech of a model speaker.

In the two most recent experiments, it was investigated whether sudden changes in the nasal signal level auditory feedback would result in similar compensatory responses and whether the compensation would persist with repeated presentation of increased nasal signal level auditory feedback.

Methods: In the first experiment with 9 female participants, the oral channel volume was held constant at 50%. A baseline measure of 9 repetitions of the phrase "My hamper was damp so the towels are smelly" was obtained (at 50% nasal channel volume), after which the nasal channel auditory feedback was suddenly increased to maximum level for 9 repetitions (100% nasal channel volume). This was followed by the opposite pattern of feedback where, after a baseline recording, nasal channel auditory feedback was suddenly decreased to a minimum level (0% nasal channel volume).

In the second experiment with 9 participants (8 females), a baseline of 9 repetitions at 50% nasal channel volume was obtained, then the nasal channel auditory feedback was increased to a maximum level for 9 repetitions and then brought back to baseline. This procedure was repeated over 6 trials.

Results: For experiment 1, the repeated measures ANOVA showed a significant effect of condition,  $F(5) = 4.24$ ,  $p < 0.01$ . Post-hoc analyses using Fisher's LSD tests showed a significant decrease in nasalance scores when nasal channel feedback level was increased from baseline to maximum. There was also a significant increase in nasalance scores when nasal channel feedback level was decreased from baseline to minimum. A significant difference was found between the maximum condition and the minimum condition (all contrasts  $p < 0.05$ ).

For experiment 2, the repeated measures ANOVA test showed a significant effect of condition,  $F(17) = 2.94$ ,  $P < .01$ . Post-hoc analyses using Fisher's LSD tests indicated a number of significant differences between conditions. Importantly for the analyses, a significant decrease was observed in nasalance scores between baseline and maximum nasal channel feedback conditions in trials 1, 2, 3 and 6. The average nasalance score of the baseline condition in trial 1 was significantly higher than the baseline conditions in trials 4 and 5. Visual observation of the data showed a gradual numerical decrease of average nasalance scores over trials.

Conclusion: In experiment 1, a sudden increase in nasal channel auditory feedback led to a decrease in nasalance scores, while a sudden decrease led to an increase in nasalance scores. Experiment 2 demonstrated that persistence of the compensatory response with repeated presentation of sudden increased nasal signal levels. The average magnitude of the compensation reactions was larger than in previous experiments that used a gradual manipulation. The usefulness of altered nasal signal level auditory feedback as a potential adjunct to the behavioural therapy of hypernasality needs to be investigated in future research.

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## **The use of Video in Speech and Language Intervention for Children with Developmental Language Disorder – a Survey Study**

Lovisa Elm (Linköping University), Inger Lundeborg Hammarström (Linköping University), Christina Samuelsson (Karolinska Institutet) and Charlotta Plejert (Linköping University).

**Background:** Prior studies have indicated that speech and language intervention for children with developmental language disorder (DLD) is largely based on results from formal language tests. Language tests offer information about a child's language abilities, but do not provide the full picture of the child's everyday language and communication skills and needs. Video recordings have proven valuable in terms of providing information about children's linguistic and communicative abilities in everyday life, but little is known about the use of video in speech and language pathologists' (SLP) practice.

**Aims & Methods:** The aim of the present study was two-fold. The first aim was to explore current practices of SPLs in Sweden regarding how they link their clinical intervention to the everyday language and communication abilities for children with DLD. The second aim was to investigate to what extent the SPLs use video recordings of the children in intervention, and how video was used. A web-based questionnaire was used, which included questions about the SPLs working methods in the areas of assessment, therapy, and evaluation.

**Results:** A total of 163 SPLs answered the questionnaire. The results show that SPLs supplemented results from language tests with various types of information about the children, primarily through anamnesis and observation of the children at the clinic. A majority of the SPLs considered the intervention to be consistent with the children's everyday language abilities to a fairly high degree, but to a somewhat lesser degree to the children's everyday communication skills. Furthermore, video recordings were rarely used with the target group for assessment, therapy, or evaluation.

**Conclusion:** Incorporating video recordings from the everyday life of children with DLD is a potentially easy and time-efficient way to strengthen the ecological validity of SLP intervention for this group.

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## **A Profile of Receptive and Expressive Verb Morphology in Arabic-Speaking Children with Developmental Language Disorder**

Deya Alharbi (University of Sheffield and Princess Nourah bint Abdulrahman University), Judy Clegg (The University of Sheffield) and Ozge Ozturk (The University of Sheffield).

**Background:** Developmental language disorder (DLD) is associated with grammatical deficits that vary in terms of their nature and severity across languages. This study aims to characterize the grammatical deficits of Arabic-speaking children with DLD by comparing their performance to typically developing (TD) children in terms of accuracy and error patterns.

**Methods:** Eighty-one Saudi Arabic-speaking children were recruited: 40 children with DLD ( $M = 59.60$  months,  $SD = 12.46$ ), and 41 TD age-matched children ( $M = 60.02$  months,  $SD = 11.62$ ). Receptive and expressive verb morphology tests were developed by the first author. The receptive test was based on a picture selection task in which the child must select the picture that corresponds to the correct verb inflection. The expressive test was based on a picture naming task examining the production of verbs inflected for tense, gender, and number. The accuracy of children's responses was assessed.

**Results:** Children with DLD scored significantly lower than the TD group in both receptive and expressive verb morphology tests. There were significant differences between the groups in marking tense and agreement. Qualitative error analysis is still ongoing and due to be complete by May 2023.

**Conclusion:** This is the first study to examine receptive verb morphology for the identification of DLD in Arabic. Children with DLD exhibited difficulties in both receptive and expressive aspects of verb morphology, particularly inflected verbs featuring increased markedness (i.e., future tense form). The developed tests used in this study showed potential for identifying DLD in Arabic-speaking children who lack adequate assessment resources. Many clinicians rely on English language norms, which may overlook language-specific features, resulting in inaccurate diagnoses. Thus, the findings of this study may contribute towards bridging this gap and supporting the accurate and effective identification of DLD in Arabic. Future research will determine the diagnostic accuracy of these tests.

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## Written Chinese Grammar Development of Students who are Deaf and Hard of Hearing (DHH)

Li Qun (West China Hospital of Sichuan University), Gladys Tang (The Chinese University of Hong Kong) and Haolun Luo (Sichuan University).

With limited or no access to spoken or signed languages, many DHH children struggle with language acquisition and the language delays often translate to problems in print literacy. In China, research is limited regarding assessments and strategies that result in increased grammatical abilities. Thus, Chinese Grammatical Assessment (CGA) was developed with the aim to assess DHH students' grammatical knowledge and to identify their strength and weakness in written language. Based on 1832 school-aged hearing students from Grade 1 to Grade 4, CGA was standardized with high reliability (0.94) and the ceiling effect was found at Grade 4. In this study, 268 primary school DHH students from Grade 2 to Grade 6 and 182 junior high school DHH students from Grade 7 to Grade 9 took part in the CGA. It is found that: 1) overall, DHH students lagged behind the hearing students. Even junior high school had significantly lower performance than hearing students as determined by Mann-Whitney U Test ( $U=77944$ ,  $p = 3.87e-14$ ); 2) although statistically DHH students' grammatical abilities increased gradually from Grade 2 to Grade 9 as determined by Kruskal-Wallis rank sum test ( $\chi^2 = 107.67$ ,  $df = 7$ ,  $p < 2.2e-16$ ), pairwise comparisons using Dunn's test indicated no group difference was found between Grade 3 and Grade 4 ( $p=0.91$ ), Grade 3 and Grade 6 ( $p=0.063$ ), Grade 4 and Grade 6 ( $p=0.063$ ), Grade 5 and Grade 6 ( $p=0.71$ ), Grade 5 and Grade 7 ( $p=0.11$ ), Grade 7 and Grade 8 ( $p=0.07$ ), Grade 8 and Grade 9 ( $p=0.63$ ), suggesting that DHH students' grammatical abilities displayed large variation and individualized educational plan should be made based on individual's diagnostic test rather than by grade; 3) the findings further revealed that some grammatical structures are extremely difficult to DHH students as they always performed poorly, such as cleft sentences (0.55 accuracy), relative clauses (0.57 accuracy), prepositions (0.62 accuracy), and so forth.

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## Narrative skills of Cypriot-Greek children with and without developmental language disorder

Theodora Papastefanou (Cyprus University of Technology) and Elena Theodorou (Cyprus University of Technology).

Background: Most of the previous research has focused on bilingual children and little is known about how billectalism (Rowe & Grohmann, 2013), affects children's language skills, even though billectalism is prominent worldwide, and particularly so in Europe (see, e.g., Auer, 2005). Previous research has shown that billectal children with developmental language disorder (DLD) have difficulties producing oral narratives (Theodorou & Grohmann 2010; Theodorou, 2012) compared to age-matched peers with typical language development (TLD). Narrative skills are often found to be limited for children with DLD (Wetherell et al. 2007). On the micro-structure level, studies have shown that children with developmental language disorder (DLD) perform weakly in various aspects, including morphosyntax (Reilly et al. 2004), lexical richness (diversity), and use of complex syntactic structures.

Aims: The current study aimed to investigate the language abilities of Cypriot Greek (CG) children aged 5 to 9 years old compared with their peers with DLD in Cyprus.

Methods: 120 Cypriot-Greek children aged 5 to 9 years participated in this study. The children were divided into four groups: two groups each of children with DLD and age-matched typically developing (TLD) children. The Bus Story test was used to collect language samples. The microstructural analysis included measures such as syntactic complexity based on the mean length of utterances in words and the number of subordinated clauses produced and semantic complexity based on the number of different words.

Results/Conclusion: The results showed differences between TLD children and children with DLD in a narrative at the microstructure level. The retelling coding scheme could permit differential diagnosis of DLD among billectal children within the scope of narrative assessment. As Paradis (2010) has argued, there are some structures where performance differences point to a temporary lack of opportunity for mastery, whereas other structures will be markers of underlying difficulties.

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## **L2 German articulation skills of successive bilingual children: work in progress**

Carolin Schmid (Department of Pediatrics and Adolescent Medicine, Medical University of Vienna) and Genti Zhitia (Department of Pediatrics and Adolescent Medicine, Medical University of Vienna).

**Background:** This study investigates articulation skills of successive bilingual children in their second language (L2) German. Up to now there is a lack of studies investigating articulation of successive bilingual children and a lack of speech assessments for these children. The widespread use of speech assessments with monolingual norms is misleading in many cases. Bilingual children are assumed to show similar phonological processes compared to monolingual children, but to require more time to overcome these processes. Additionally, there might be qualitative differences in articulation. Finally, depending on their specific L1, children might differ concerning the amount of discrepancy to monolingual German children (e.g., due to cross-language influence, psychosocial or socioeconomic factors).

**Methods:** 50 successive bilingual children aged between 4;5 and 6;0 years, with German as L2 and Turkish, Bosnian/Croatian/Serbian, Arabic, or other languages as L1 (10 children each), as well as 10 age-matched monolingual German children were studied. Articulation was evaluated using a picture naming task designed for monolingual German children. Size of phoneme inventory, number and type of phonological processes and phonetic errors were analyzed at group and individual levels. Possible effects of L1, German-proficiency, phonological awareness, time of first word production, duration of systematic L2-contact, and quantity of L2-use were calculated using linear mixed effects modelling.

**Expected Results:** Recordings and analyses of results are still underway. We expect more phonological processes and more phonetic variation in the bilingual groups compared to the monolingual group. Furthermore, effects of L1 (probably with L1-Turkish children showing the strongest phonological processes and phonetic variation), L2-proficiency, quantity of L2-use, and socioeconomic status are expected.

**Conclusion:** Findings of this study are relevant for professionals working with successive bilingual children. They will show whether there are significant differences between bilinguals and monolinguals, and even an effect of L1. The results will provide a reference for more reliable speech assessments of preschool children in Vienna speaking one of the three most widespread L1s besides German, potentially aiding treatment.

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## **Accomplishment of the Sustainable Development Goals requires Communication**

Sharynne McLeod (Charles Sturt University) and Julie Marshall (Manchester Metropolitan University).

**Background:** The United Nations' Sustainable Development Goals (SDGs) focus on people and the planet to address poverty, hunger, health, education, work, innovation, climate, cities, land, oceans, justice, and partnerships. Communication is central to the accomplishment of the SDGs and requires action from communication professionals, researchers, people with communication/swallowing disability, their families and communities.

**Methods:** This presentation will address the role of communication across the 17 SDGs by summarising 36 papers published in a 2023 special issue of International Journal of Speech-Language Pathology (open access). The 36 papers were written by authors who work in Australia, Austria, Benin, Cambodia, Cameroon, Canada, China, Columbia, Denmark, Egypt, Ethiopia, Ghana, Greece, Iceland, India, Iraq, Ireland, Italy, Jordan, Kenya, Lebanon, Maldives, Mozambique, Nepal, New Zealand, Nigeria, State of Palestine, Peru, Philippines, Rwanda, Serbia, South Africa, Uganda, UK, USA, Vietnam.

**Results:** Communication is important for the achievement of each of the 17 SDGs: for people and the planet. The far-reaching impact of communication disability can influence the achievement of the SDGs. Innovations by communication professionals and researchers have focussed on poverty, hunger, health, education, work, innovation, climate, cities, land, oceans, justice, and partnerships.

**Conclusion:** Communication for all is essential for the achievement of the SDGs and everyone has a role. Communication disability has far-reaching impact. This research supports the international call for SDG 18: Communication for All.

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## The Effect of Intelligibility and Primary Mode of Communication on Sign-supported Speech Perception in Students with Hearing Impairment

Ran Xiao (Central China Normal University), Ting Cui (Wuhan Sports University), Jialu Fan (Central China Normal University & Nanjing Normal University), Liang Chen (University of Georgia) and Jianghua Lei (Central China Normal University).

**Background:** Sign-supported speech (SSS), which involves the use of speech accompanied by signs and fingerspelling of the indigenous sign language, is commonly used in the education of students with hearing impairment (HI) as an alternative to oral communication. There is increasing evidence for the facilitate role of SSS in the acquisition and use of oral language by students with HI. However, the perception of SSS itself by students with HI has not been examined.

**Purpose:** This study set out to examine whether and how the level of intelligibility of SSS and the preferred mode of communication of students with HI would affect their perception of SSS.

**Methods:** Three groups of students with severe HI that differed in their primary mode of communication participated in the study: ORAL (N=18; Mean age=19.83), SIGN (N=20; Mean age=20.35), and MIXED (N=17; Mean age=20.76). Participants completed a video-recorded SSS sentence perception test at three intelligibility levels (HIGH, MODERATE, and LOW). Stimuli consisted of transitive sentences produced orally and accompanied with critical signs by the same sign model, and participants were asked to identify, among four pictures, one referring to the sentence orally communicated. Eye movements of the participants were tracked and data of dwell times, fixation counts, saccade times spent looking at the face or body area of the sign model were analyzed.

**Results:** Behavioral data analyses revealed that accuracy of SSS perception was higher for sentences with HIGH and MODERATE intelligibility than with LOW intelligibility; and for the MIXED group than the SIGN and ORAL group. A speed-accuracy tradeoff was also observed as a function of levels of intelligibility. Eye-tracking data analyses showed when the intelligibility level was MODERATE OR HIGH, the SIGN group looked significantly more at the body, but significantly less at the face than the ORAL and MIXED groups. No significant difference in gaze fixations was found when the intelligibility was LOW.

**Conclusion:** These results show that SSS perception was both influenced by levels of intelligibility and the primary mode of communication in students with HI.

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## **Relationship between gestures and vocabulary in young children – a cross-linguistic comparison between Swedish- and Setswana-learning children**

Sefela Yalala (University of Stellenbosch), Ulrika Marklund (Linköping University), Ellen Marklund (Stockholm University), Lisa Gustavsson (Stockholm University) and Christina Samuelsson (Karolinska Institutet).

**Background:** Gestures are movements with hands or other body parts (head, shoulder) as well as small face movements that are part of communication. Gesture use has been shown to predict various language skills. The relationship between gestures and language could also be explained by the fact that children's differing use of gestures elicit different linguistic behaviors from their parents, and that parents' use of gestures is related to children's language development.

**Aims & Methods:** The aim of this study is to investigate the relationship between gesture and vocabulary development by cross-linguistic comparisons between two different cultural contexts, i.e., Sweden and South Africa. The Swedish and the Setswana version of the parental questionnaire McArthur Bates CDI was used. Data consist of parental reports for 205 typically developing Swedish-learning children aged 14 months, and 101 Setswana-learning children aged 8-18 months. Gesture types examined were representational gestures classified as deictic gestures, conventional gestures, or object actions. A fine-grained analysis of gestures and lexicon, on both type and token level, was performed.

**Results:** Results show that in both language contexts, percentage of gestures used by infants predicts percentage of words in receptive vocabulary. However, looking at gesture type, the Swedish-speaking children's use of object-actions significantly predicts percentage of words in the receptive vocabulary, whereas use of deictic and conventional gestures does not. Contrarily, for Setswana-speaking children, deictic, conventional, and object-action gestures each predict the percentage of words in receptive vocabulary. For both Setswana-speaking and Swedish-speaking children, the relationship between gesture use and vocabulary size was not impacted by semantic category (food or clothes). Vocabulary in one of the semantic categories was predicted by object actions in either semantic category.

**Conclusion:** The results are in line with previous research and support reports of a robust positive relationship between the use of gestures and early word learning. The findings highlight the importance of including gesture use as part of early communication assessment in clinical settings.

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## **Modelo Padrão de Aquisição de Contrastes e Estruturas (Standard Model for The Acquisition of Contrasts and Structures – MAC-S)**

Vanessa Giacchini (Federal University of Rio Grande do Norte).

The MAC-S aims to present an acquisition model that allows describing the interaction between the acquisition of the syllabic structure and the formation of the phonological inventory. The model was structured from speech data gathered from typical children. The theoretical assumptions are: in the simple onset – Robustness Scale for Consonant Features (CLEMENTS, 2009), in the coda – Robustness Scale for Co-occurrence of Consonant Features (LAZZAROTTO-VOLCÃO, 2009), in the complex onset – Sonority Rating Scale by Clements and Hume (1995). From the three scales of analysis, the expansion and formalization of the MSC-S model for Brazilian Portuguese was obtained. It proposes that the phonological acquisition of simple onset occurs in four stages and that the most robust contrasts are acquired before the less robust. Likewise, the acquisition of the coda provoked em in four stages, with the final positions preceding the medial ones, except for the non-lateral liquid, for which the acquisition is concomitant. The acquisition of the complex onset occurs in two stages, starting with the acquisition of the first consonant of the onset and, in a later stage, leading to the mastery of the structure regardless of the class of segments. The model contains colors to facilitate understanding: red – first stage, blue – second stage, yellow – third stage, green – fourth stage. The first contrast established in the simple onset is between sonorants and obstruents, followed by a contrast in the point of articulation and sonority in the obstruents. In the next stage occurs the separation between nasals and liquids. In the last stage, co-occurrences lead to the differentiation of liquids. In the coda constituent, final positions are acquired before medial positions. Nasals are acquired first, followed by liquid /L/, fricatives and lastly /R/. In consonant clusters, the first consonant is performed first, and later the liquid that is part of the structure.

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## **Assessing dysfluency in Primary Progressive Aphasia: speech-related vs pause-related parameters**

Lorraine Baqué (Universitat Autònoma de Barcelona) and María Jesús Machuca (Universitat Autònoma de Barcelona).

**Background:** Speech fluency is one of the diagnostic features that enables to classify people with Primary Progressive Aphasia (PPA) into one of its main variants, namely logopenic (lvPPA), non-fluent (nfvPPA), and semantic (svPPA) (Gorno-Tempini et al., 2011). But fluency is defined by multiple features, which has led to a certain amount of confusion. The aim of this study was to analyse a wide range of fluency measures, related either to speech or pauses, to determine to what extent they are useful in characterising the (dys)fluency of the three main variants of PPA.

**Methods:** We analysed a picture description task from 43 Spanish speakers (13 lvPPA, 10 nfvPPA, 9 svPPA, 11 healthy controls). A range of fluency features related to either pauses (duration and frequency of each pause type per second of speech, syllable, and word) or speech (speech rate, length of inter-pause stretches, number of phones, syllables, words, and content words) was extracted from a manual alignment in Praat. The atypicality of each variant of PPA compared with the control group, and the dissimilarity among the three PPA groups, were estimated by means of linear regression models computed in R.

**Results:** Results showed atypical values in each variant of PPA, related both to speech (the lengthiest inter-pause stretch, and its SD) and pauses (frequency of pausing per word). None of the parameters analysed by itself sufficed to differentiate the three variants of PPA.

**Conclusion:** All three PPA groups presented some abnormality of fluency and can be considered as dysfluent. Analysing a wide range of both speech-related and pause-related parameters can contribute to a better understanding of the underlying deficits in PPA. We discuss the relationship between the different measures considered and specific deficits in articulation, lexical retrieval, and text or sentence planning, as well as with monitoring mechanisms.

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## The development of Lexical Representations for Polysyllabic words by Greek-speaking children

Eleftheria Geronikou (Department of Speech and Language Therapy, University of Patras, GR).

Word length is known to affect performance of English-speaking children (Gathercole et al., 1991), whereas polysyllabic stimuli may be sensitive in tracking speech production errors, not apparent in short words (James et al., 2008). In Greek polysyllabic words i.e. words of more than three syllables are frequently used (Aidinis & Nunes, 2001); therefore, it is important to investigate the development of lexical representations for polysyllabic words by Greek-speaking children. This has been explored through a longitudinal normative study and a small group study of children with speech sound disorders (SSD). Two groups of typically developing (TD) children: Group 1 (N=16) aged 3;0-3;5 years; Group 2 (N=22) aged 4;6-5;0 years were assessed longitudinally at three assessment points six months apart. Moreover, a Group of children with SSD (N=8) aged 5;6-6;0 years was included. In order to assess the accuracy of underlying phonological representations children were asked to complete a Mispronunciation Detection Task for polysyllabic words; to assess the accuracy of motor programs, children were asked to name pictures representing polysyllabic words. Results showed a main effect of time on Mispronunciation Detection for Group 1 ( $F(2, 13)= 16.41, p<.001$ ) and Group 2 ( $F(2, 15)=6.63, p=.009$ ). There was also a main effect of time on naming accuracy for Group 1 ( $F(2,13)=15.98, p<.001$ ) and Group 2 ( $F(2,14)=7.87, p<.001$ ). Children with SSD were outperformed by TD children of the same age in both tasks. Great variation in performance within the Group of children with SSD was observed as regards Mispronunciation Detection Task. Data provide evidence that the establishment of accurate phonological representations and motor programs is quite challenging, indicating that lexical representations for polysyllabic words are not fully developed by the age of six years. It is suggested that assessment of polysyllabic word processing provides unique information, necessary to inform clinical decision making.

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## Early language surveillance in children growing up in bilingual environments

Yvonne Wren (Cardiff Metropolitan University/University of Bristol/Bristol Speech & Lang Ther Research Unit, North Bristol NHS Trust), Sam Harding (Bristol Speech and Language Therapy Research Unit, North Bristol NHS Trust), Sharon Baker (Bristol Speech and Language Therapy Research Unit, North Bristol NHS Trust) and Rhonwen Lewis (Cardiff Metropolitan University).

Background: Bilingualism/multilingualism is common throughout the world. In Wales, both Welsh and English have official status and the latest census reports 538,300 people (17% of the population) able to speak Welsh. Welsh is actively promoted by the Government and therefore all children living in Wales experience a bilingual, or multilingual, language learning context. However, the percentage of Welsh-speakers ranges from 3% to 86% depending on the region. This poses challenges for those monitoring children's early language development where tools and practices need to take account of varying levels of language exposure. The aim of this work was to determine what tools are available which could be used for early language surveillance in Wales.

Methods: Three rapid scoping reviews in English, bilingual/multilingual populations and Welsh were carried out. Eligibility criteria included age range of 0 to 4 years, 11 months; sample size larger than 20; and tool designed for use by a non-specialist professional.

Results: An initial search produced over 76,000 relevant papers. After screening for eligibility, 107 tools were reviewed for validity, reliability, useability, impact and cost and ten surveillance tools were identified as potentially useful in a bilingual Welsh-English context. However, none of these fulfilled all of the criteria for use (screens all aspects of language development; suitable for use at various ages; meets recommended thresholds for reliability, validity, sensitivity and specificity; available in Welsh).

Conclusion: At present, no existing tools can be used to reliably monitor children's language development in Wales. While tools have been developed for use in England, these do not take into account the language environment in Wales. The review report included 14 recommendations, including a specification for a new tool. The presentation will include a description of these recommendations and how they could be applied to other countries with similar language environments.

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## **Cross-linguistics collaboration: Screening children's speech and language skills**

Kate Crowe (University of Iceland), Jóhanna T. Einarisdóttir (University of Iceland), Thora Másdóttir (University of Iceland) and Ewa Czaplewska (University of Gdańsk).

**Background:** There are limited ways of identifying children with communication difficulties (a) at an age that would allow them to gain the most benefit from early intervention, (b) when children speak a language other than English, and (c) when children are multilingual. An effective and validated screening tool that can be completed by children's parents/teachers to identify communication difficulties in young children who use a range of languages in the early preschool years is needed. Cross-linguistic collaborations can be used to develop tools that are rigorous, robust, and have utility across multiple contexts.

**Methods:** The LANIS (Language in Iceland) parent/teacher survey was initially developed for monolingual, Icelandic-speaking children. It has been culturally and linguistically adapted and developed to be used in a number of new contexts, including monolingual Polish-speaking children in Poland, bilingual Icelandic-Polish children in Iceland, and multilingual children speaking all languages in Iceland.

**Results:** The psychometric properties of LANIS have been examined with 3-year-old monolingual Icelandic-speaking children and monolingual Polish-speaking children and have been found to be promising. Parent and teacher interrater reliability is good, but varies across items.

**Conclusion:** Accurate identification of difficulties at this age is important for providing timely support to mitigate the potential negative impacts that entrenched communication difficulties may cause. Language specific tools that are both sensitive and specific in identifying children with concerns can be developed through collaboration across languages.

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## Speech disfluencies in individuals with Asperger syndrome in Croatian

Ana Vidović Zorić (Faculty of Humanities and Social Sciences, University of Zagreb) and Sara Blažeković (Faculty of Humanities and Social Sciences, University of Zagreb).

**Background:** Disfluencies in spontaneous speech, such as filled pauses, repetitions and self-corrections, are an important source of evidence for many aspects of language production. One of these aspects is their pragmatic function in a communication act. For example, Fox Tree (2001) suggests that uh and um function as a warning signal to the listener about the upcoming disruption in speech planning, and that these fillers are not random, but deliberately used in conversation. From the point of the listener, disfluencies help the listener in comprehension of the speaker's state, intentions, and difficulties at the moment of speaking. Previous studies (e. g. Colle et al., 2008) have shown that individuals with Asperger syndrome (AS) show a specific pragmatic deficit, due to the lack of the theory of mind. Research on disfluencies in individuals with autism spectrum disorder (ASD) has shown that participants with ASD use um less frequently than their typically developed (TD) peers, while the frequency of uh did not differ between groups (Irvine et al., 2016). The main questions of this investigation are whether individuals with AS use the same number of filled pauses, repetitions and self-repairs as their TD peers, and whether these groups use the same type of disfluencies during the spontaneous speech in Croatian.

**Methods:** Twelve individuals (11 boys and 1 girl, age 9-20) with the diagnosis of AS and twelve TD individuals who were matched in terms of age and gender with the AS group participated in this study. All participants were native speakers of Croatian. Participants were asked to watch a 5-minute cartoon, and then to retell it with as many details as they could remember. Participants were not interrupted during their narrative production. The narrative speech samples were recorded using a Zoom H2 device. These recordings were transcribed using standard Croatian orthographic rules, along with special characters for filled pauses, sound prolongations and interruptions.

**Results and conclusion:** This is an ongoing study. The preliminary results show that the rate of disfluencies between the two groups is similar, however, the AS group uses different types of disfluencies compared to the TD group. For instance, it seems that the AS group uses self-repairs less frequently than the TD group. These results confirm the findings of the previous research that individuals with AS display different disfluency patterns than typical ones, which could be interpreted as the result of different pragmatic abilities in the speech communication.

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## **Phonetic features of stop consonants in children with Speech Sounds Disorders who speak Spanish from Central Mexico.**

Carlo Hernandez-Morales (National Institute of Rehabilitation, Mexican Ministry of Health), Daniela Lopez-Palma (National Institute of Rehabilitation, Mexican Ministry of Health) and Aline Herrera-Rangel (National Institute of Rehabilitation, Mexican Ministry of Health).

**Background:** Autosegmental approaches to Speech Sound Disorders (SSD) entail measurements of subphonemic features of coarticulation, which have been sparsely studied in individuals speaking Spanish from Central México. Across dialects, voicing contrast of consonants in Spanish is observed between prevoicing and short-lag positive Voice-Onset Time (VOT).

**Methods:** Clippings of CV segments from 64 word-naming task CEFI (Spanish phonological developmental test) recordings were sorted and digitally analyzed (Voice-Onset Time VOT for voicing contrast between /p-b/, /t-d/, /k-g/, duration of stop occlusions SO). We compared time in ms for VOT and SO of children with SSD and typical language development (TLD). Proportion of plosives produced PPP (ratio of plosives produced per word to expected plosives per word) was also measured.

**Results:** 33 children with SSD (aged 4-0-6.5,  $5.2 \pm 0.75$ ; 70% males) were included; Praat measurements were compared with those of 2 children with TLD (5 years old, 1 female, 1 male). No significant variation was found for VOT or SO between SSD and TLD in any of the prototypical syllables, and analysis per age within the SSD group also failed to reveal consistent differences. PPP was over 0.8 in SSD patients.

**Conclusion:** Our results provide further crosslinguistic confirmation of phonological representations being at the center of SSD rather than protracted motor execution of speech sounds. High preservation of total plosivity of words despite phonemic substitutions and other phonological processes calls for further research, as it is likely relevant for intelligibility. Increasing the sample size and introducing judgements of intelligibility may improve the validity of results.

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## **Babbling in extremely premature infants at 12 months corrected age**

Ellinor Strandberg (Medical Unit Speech & Language Pathology, Karolinska University Hospital, Stockholm), Marion Lieberman (Division of Speech and Language Pathology, Department CLINTEC, Karolinska Institutet, Stockholm) and Anette Lohmander (Division of Speech and Language Pathology, Department CLINTEC, Karolinska Institutet, Stockholm).

**Background:** Babbling is an important precursor to speech in infancy, and deviations from the typical babbling development can predict later difficulties in speech, language, and communication. This cross-sectional study aimed to investigate babbling and early speech in Swedish extremely premature infants.

**Methods:** Samples of babbling were collected from 20 extremely premature infants (EPT group) at the corrected age of 12 months. Data collection was home-based and consisted of an audio-video recording of each infant playing with a parent. Presence of canonical babbling (CB), and three oral stop variables distinctive of typical babbling, and consonant inventory were assessed. The assessment was performed during a standardized observation of babbling. Data from the EPT group was compared to previously collected data of a reference group of 20 10-month-old infants without known medical diagnoses.

**Results:** The results showed that the EPT group had a lower proportion of infants producing CB, and that they used a significantly smaller consonant inventory compared to the reference group. Although not statistically significant, oral stops were less frequently found in the EPT group.

**Conclusion:** The findings of a restricted consonant inventory and low proportion of CB in the EPT group are not surprising considering that the group has been found to be at risk of speech and language delay in toddlerhood. Still, further research is needed to explore whether babbling at 12 months can predict speech and language skills at an older age in extremely premature infants.

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## **Analysis of Signing Fluency in Brazilian Sign Language**

Felipe Venâncio Barbosa (University of Sao Paulo), Janice Gonçalves Temoteo Marques (University of Campinas) and André Nogueira Xavier (Federal University of Parana).

Fluency is the smooth and continuous flow of speech production. In oral languages, studies on fluency of speech have been done since the 1930s. In sign languages, however, although proficiency has been observed the smooth and continuous production of the signs has yet to be the target of any research. Sign languages are natural languages; therefore their linguistic processing should follow principles similar to those observed in oral languages. This study aims to analyse the signing fluency of deaf and hearing individuals. Our specific goals comprehend comparing signed productions according to age, gender and auditory status (deaf and hearing). One hundred twenty-nine individuals participated in this study (98 deaf and 31 hearing). They use Libras proficiently, have no medical diagnosis related to disorders, and pass the Libras screening test (Barbosa, 2017). The collection and data analysis procedures were based on Andrade's (2000, adapted in 2017). The comparison between gender groups showed that only hesitation and sign repetition had a statistically significant difference. As for the comparison between age groups, it showed that sign repetition, and sentence repetition had a statistically significant difference. However, the mean values for total common disruptions and the percentage of sign discontinuity showed no statistically significant difference. Only sign repetition showed a statistically significant difference in the comparison between the deaf and hearing groups, being these differences related to the number of typical disruptions. All average values with statistically significant differences exhibited higher values for the deaf group. As for the three hypotheses, only two were confirmed. In other words, age does not affect the sign rate for deaf people, but, as hypothesised, gender does not affect the sign rate for deaf people, and deaf and hearing individuals' signing fluency is different.

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## **Digital game based learning for dynamic assessment of early reading difficulties. Cross-linguistic studies of GraphoLearn.**

Ben Maassen (Center for Language and Cognition Groningen (CLCG); Groningen University) and Barry de Groot (Center for Language and Cognition Groningen (CLCG); Groningen University).

**Background:** Early detection of reading acquisition failure is crucial since intervention is most effective if started early. Digital game based learning (DGBL) can provide for early dynamic assessment in combination with a motivating computerized environment to train basic literacy skills. This presentation gives a cross-linguistic overview of studies, conducted at our department, making use of the GraphoLearn (GL) environment in three languages. Aim of the studies is to evaluate game progress during the first months of playing, thereby evaluating the effectiveness and diagnostic value (dynamic assessment).

**Methods:** The GraphoLearn (GL) environment was used to develop early reading acquisition games in three languages: Dutch, Spanish and Bahasa (Indonesian). Spanish and Bahasa are at the most transparent side of the orthographic depth dimension, Dutch is intermediate. In each study, typically developing children and children with (suspected) DLD and/or reading difficulties participated in a research protocol consisting of a pretest at the start of reading education, followed by a period of playing GL, and concluded with a posttest and follow-up. The pre- and posttests comprised standard sets of preliteracy tests (phonological awareness (PA); letter knowledge (LK); rapid naming (RAN)). The posttests also included word decoding tests. Playing consisted of matching graphemes, written syllables, words or pseudowords presented on a computer screen with auditorily presented spoken fragments.

**Results:** Results show a mainstream learning trajectory (strong regression) from PA –stronger than LK or RAN—via accuracy and speed of letter-sound association during playing, to early (posttest) and later (follow-up) word and pseudoword decoding. Patterns of qualitative (e.g. error types) and quantitative (e.g. learning rate) in-game data predicting and influencing later reading fluency were found for different subgroups of children (e.g. with and without DLD).

**Conclusion:** We conclude that GL is an effective tool for early dynamic diagnostic screening, and to support early reading acquisition.

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## **Pupillometry in bilingual language assessment – preliminary results from early second language acquisition of German**

Anna-Lena Scherger (TU Dortmund University) and Isabel Neitzel (TU Dortmund University).

**Background:** In bilingual children, diagnostics of developmental language disorder (DLD) is challenging because of overlapping language production patterns between typically developing (TD) bilingual children and monolingual children with DLD.

**Methods:** The present paper introduces an innovative approach that does not tap into language production but into language processing. It focuses on the implicit language acquisition mechanisms and the ability to derive linguistic patterns out of a string of input, an ability that is said to be impaired in children with DLD. The target structure is an early clinical marker (subject verb agreement, SVA). In a first familiarization phase, grammatical SVA-structures are repeatedly presented to the children auditorily within grammatical stimuli, followed by a test phase including grammatical and ungrammatical stimuli. During this task, the children's changes in pupil diameters are monitored by an eyetracker. Familiarization and test phases are repeated twice. It is hypothesized that children whose language processing mechanisms are intact may react to ungrammatical stimuli encountered in their input with surprise – a sign of a violation of their expectations. Therefore, different pupil reactions to grammatical and ungrammatical stimuli after only short exposure are supposed to represent intact language processing mechanisms, whereas similar pupil reactions to grammatical and ungrammatical stimuli are supposed to indicate a risk for DLD. In the present paper, we present pupillometric data of N = 30 bilingual children with only 2 – 9 months of exposure to German and different first languages. In order to validate pupillometric data, it is correlated to non-word-repetition data collected from these children.

**Results:** Results will be discussed with respect to the accuracy of identification of children at risk for DLD by means of pupillometry.

**Conclusion:** If the pupil data prove to be accurate retrospectively in a longitudinal setting, this method could have high potential to diagnose DLD earlier in bilingual children.

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## **Screening for speech sound disorders: The impact of the elicitation method on assessment time and diagnostic accuracy**

Marit C. Clausen (University of Southern Denmark), Maja Bjerrum Larsen (University of Southern Denmark) and Stine Blicher Christensen (University of Southern Denmark).

**Background:** Speech screenings are used in preschools for the early identification of speech sound disorders (SSD) as children with persisting SSD are placed at risk socially, and academically. Screening materials should enable time-efficient assessment and a high level of diagnostic accuracy. Both factors can be influenced by the method used to elicit productions, i.e., imitation vs. spontaneous naming. It is unclear to what extent the elicitation method impacts children's productions. Some studies found no significant differences whereas other studies showed that imitation yielded more consonants correct than spontaneous naming. Thus, the elicitation method might influence the assessment scores and thereby the diagnostic accuracy of a given screening assessment. The aim of the present study was to examine whether the elicitation method influences 1) the assessment time, 2) children's speech scores, and 3) the diagnostic accuracy of a screening material used for the identification of SSD in Denmark.

**Methods:** Twentynine Danish-speaking children aged 2;10-3;4 years were assessed with Udtale af sproglyde (eng. Pronunciation of speech sounds). The screening was carried out using imitation and spontaneous naming. The assessment time and scores from the different elicitation methods were compared. Also, the diagnostic accuracy was calculated based on the scores of the two screening methods. A validated phonology test was used as the reference standard.

**Results:** Results showed that imitation took less time (2 min.) than spontaneous productions (6 min.) and lead to more initial consonants correct and higher speech scores. The diagnostic accuracy of the screening was low when imitation was used. Sensitivity improved through spontaneous naming.

**Conclusion:** The present study indicated that imitation was more time efficient. However, the study also indicated that imitation may overestimate children's productions and thereby affect the diagnostic accuracy of screening assessments used for the identification of SSD.

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## **New Symbols for Frictionless Continuant Approximants for Clinical Phoneticians**

Martin Ball (Prifysgol Bangor), Joan Rahilly (Queen's University Belfast) and Nicole Müller (University College Cork).

**Background:** Approximants that can be considered weaker versions of voiced fricatives (termed here 'frictionless continuants') are poorly served by the IPA in terms of symbolization as compared to lateral, rhotic and semi-vowel approximants.

**Methods:** In this poster we survey the range of approximants and the symbols and diacritics used to transcribe them. We focus on evidence for the use of frictionless continuants in both natural language (by which we mean non-clinical varieties) and disordered speech.

**Results:** Finally, we suggest some possible unitary symbols for those that currently require the use of a hard-to-read lowering diacritic beneath the symbol for the corresponding voiced fricative.

**Conclusion:** These proposals are developments from some earlier suggestions by the authors and we feel they would be of considerable use to clinical phoneticians especially as they are all available on common fonts.

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## **Development of a Novel Instrument for Assessing Children's Grammatical Skills Using Elicited Production**

Christina Kauschke (University of Marburg), Anne Tenhagen (Europäische Fachhochschule) and Kim Lawatsch (University of Marburg).

**Background:** The assessment of children's grammatical skills is a crucial component of diagnosing developmental language disorders. Elicited production is a commonly used method for obtaining data on a child's productive language abilities.

**Methods:** We introduce a new instrument developed as part of the third edition of a German test battery (Patholinguistische Diagnostik bei Sprachentwicklungsstörungen, PDSS, Kauschke et al., 2022). This novel instrument employs elicited production, in which participants describe colored pictures of everyday situations, to obtain four test scores: mean length of utterances, completeness of utterances, and two grammar scores comprising 39 target structures. The grammar scores were inspired by the Index of Productive Syntax (IPSyn, see Yang et al., 2022), modified for German and computerized. Raw scores can be converted to norm values, and detailed results provide a comprehensive profile of a child's syntactic and morphological strengths and weaknesses.

**Results:** Analysis of data collected from 250 monolingual German children aged between three and six years revealed age-related changes in the test scores. Additionally, the age range was determined for both milestones and "red flags," which may indicate potential problems in language development.

**Conclusion:** This newly developed, time-efficient instrument enables detailed assessment of grammatical skills, identification of potential intervention targets, and facilitates diverse research objectives.

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## Promoting productions of elaborated verb phrases among Cantonese-speaking children with language difficulties using statistical learning

Phoebe Hiu-Man Chan (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University) and Dustin Kai-Yan Lau (Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University).

Cantonese-speaking children with language disorders were found to perform poorly in syntax, as the majority of the children in Hong Kong have been reported to demonstrate low usage of complex constructions, especially elaborated verb phrases and prepositional phrases. Studies further suggested that poor syntax could associate with deficits in microstructures in narrative productions and affect children's academic development. Thus, it is hypothesized that language intervention on morphosyntax can enhance language acquisition among Cantonese-speaking children with language disorders. Recent studies further demonstrated that language intervention designed according to the statistical learning principles is effective in promoting the acquisition of not only typically developing children but also children with language difficulties. The current study aims to evaluate the efficacy of a language intervention designed according to the statistical learning principles to promote the acquisition of elaborated verb phrases and prepositional phrases on Cantonese-speaking children with language disorders.

**Methods:** A total of 16 Cantonese-speaking children (four female; mean age = 6.70 years) with language disorder were recruited. The participants were initially divided into the 'Treatment' and the 'Control' groups. A total of eight sessions of language treatment, which focused on giving systematic language input of elaborated verb phrases and prepositional phrases, were conducted on each child. Pre- and post-treatment measures of number of elaborated verb phrases and prepositional phrases in language samples collected from two narrative tasks and conversations with the clinicians were obtained.

**Results:** Results showed that the Treatment group produced significantly more expanded verb phrases in the post-treatment language samples, while the Control group did not. Neither the Treatment group nor the Control group showed improvements in the number of prepositional phrases produced.

**Discussion:** The significant group difference in the production of elaborated verb phrases supported that the Cantonese-speaking children with language disorders were responsive to language intervention designed according to statistical learning principles. The insignificant improvement in the production of prepositional phrases by both groups indicated that the acquisition of prepositional phrases in Cantonese may require much more than the statistical regularity of the corresponding structure. Theoretical and clinical implications will be discussed.

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## Research on the production of tone sandhi in Mandarin children with cochlear implants

Jiawei Huang (Sichuan University), Qun Li (West China Hospital of Sichuan University) and Guo Li (Sichuan University).

**Objectives:** Previous research has found remarkable deficits in lexical tone production and tone 3 sandhi in Mandarin-speaking children with cochlear implant, however, little attention has been paid to other tone sandhi rules except tone 3 sandhi. This study focuses on the production of three important tone sandhi rules in Mandarin-speaking children with cochlear implants.

**Methods:** Fifteen prelingually deaf children with cochlear implants and twenty normal hearing children participated in the study. All the participants were tested by the perception and production of Mandarin lexical tones before the production experiment of Mandarin tone sandhi. The experiment material include both real words and pseudo words. All the real words are disyllable words or phrases in Mandarin. The pseudo words were disyllable combinations that don't exist in Mandarin. The data was collected by elicitation with picture-naming. Acoustic analysis conducted mainly from the perspectives of F<sub>0</sub>(fundamental frequency), duration and phonation type using Praat. The accuracy was caculated by two researchers. Those correct data then would been analysed by Praat. The acoustic analysis was conducted from F<sub>0</sub>, duration, and the phonation type.

**Results:** The results show that there are significant differences in the accuracy rate of tone sandhi production between children with cochlear implants and normal hearing children, specifically, lower accuracy rates and greater variability in accuracy. And there were significant differences in the accuracy rates of real words and pseudo words for three tone sandhi rules in the prelingually deaf children with cochlear implant. In acoustic analysis, the most significant differences between the two groups were F<sub>0</sub>, that is different curves of fundamental frequency resulting in tonal errors and irregular tone range. This study also found higher frequency of creaky voice in children with cochlear implants.

**Conclusion:** (1) Children with cochlear implants who speaks Mandarin obviously lay behind their matched peers on the production of tone sandhi rules, even though they received cochlear implantation earlier and actively engaged in language rehabilitation. (2) The acquisition of tone sandhi rules by children is a long-term process, both groups acquire tone 3 sandhi first, followed by “bu” sandhi, and “yi” sandhi at last. (3) Normal hearing children can apply tone sandhi rules correctly to new words based on the computation mechanism, while children with cochlear implant still have difficulties in applying tone sandhi rules to new words, which means that they have not completely acquired the tone sandhi rules.

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## **Acoustic speech markers for tracking changes in hypokinetic dysarthria associated with Parkinson's Disease**

Mridhula Murali (University of Strathclyde), Joan Ma (Queen Margaret University) and Robin Lickley (Queen Margaret University).

Acoustic analysis has been successfully used for differential diagnosis of hypokinetic dysarthria associated with Parkinson's disease. However, acoustic parameters that are robust for differential diagnosis may not be sensitive to tracking speech changes over time. Previous longitudinal studies implementing acoustic analysis have had limited sample sizes or variable lengths between data collection. This study focused on using acoustic correlates of perceptual features to identify acoustic markers able to track speech changes in people with Parkinson's Disease (PwPD) over time.

Speech data was collected from 63 PwPD and 47 control speakers using an online podcast software at two time points, six months apart (T1 and T2). Recordings of a standard reading passage, minimal pairs, sustained phonation, and spontaneous speech were collected. Perceptual severity ratings were given by two speech and language therapists for T1 and T2, and acoustic parameters of voice, articulation and prosody were investigated. Two analyses were conducted to i) identify which acoustic parameters can track perceptual speech changes and ii) identify which acoustic parameters can track changes in speech intelligibility. Additionally, both analyses investigated if the acoustic parameters showed group differences for differential diagnosis between PwPD and control speakers at T1 and T2. Linear mixed model statistical analysis was conducted to answer the research questions.

Results showed acoustic parameters in articulation could detect significant group and speech change differences across T1 and T2. Other acoustic parameters in voice quality, articulation and prosody could either only differentiate between PwPD and controls or detect speech changes between T1 and T2. Results show promise for using acoustic parameters as markers to track speech changes in PwPD. Studies with longer data collection periods will indicate whether a trajectory of change can be observed. Further investigation could facilitate to the development of speech monitoring systems used by PwPD and speech and language therapists.

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## A contemporary report on children's Greek speech norms: Preliminary results

Eleftheria Geronikou (Department of Speech and Language Therapy, University of Patras, Greece) and Elena Babatsouli (University of Louisiana at Lafayette).

The prevalence of speech disorder in Greek-speaking children is 10% (Lissauer & Clayden, 2011). Summing Ethnologue information (Eberhard et al., 2022) provides an estimate of 4.5 million Greek speakers worldwide. Research on monolingual and bilingual children's phonological disorders (PD) in Standard Greek is under-represented (Babatsouli & Geronikou, 2022; Okalidou & Koenig, 1999; Geronikou et al., 2019), while reported norms (PAL, 1995) require replication to fine-tune existing indicators, inform non-existent or under-researched ones, and to better reflect children's phonological development in contemporary Greece. We begin focusing on consonantal acquisition in 110 children (55 boys, 55 girls), ages 3;0-4;0 (13, SD 4.9), 4;1-5;0 (29, SD 3.5), 5;1-6;0 (68, SD 3.7), utilizing the culturally sensitive picture-naming tool (150 terms/images) of the Phonological Assessment for Greek (PAel) (Babatsouli, 2019), the only freely-available procedures in Greek and English. PAel represents Greek distributional frequencies and expands phonotactic contexts (e.g., cluster types) tested previously. Preliminary results indicate singleton acquisition at: 97.8%, SD 2.9 (3;0-4;0), 98.4%, SD 3.5 (4;1-5;0), 99.5%, SD 1.03 (5;1-6;0). Mismatches (9/24 targets) are noted in /s, z, x, ð, r/ and allophones [ʃ, ʒ, ɲ, λ]. Previously unreported /#g/ is 100% acquired (3;0-4;0). The easiest clusters are /kl/, /st/ (previously reported acquired after 4;0 when present in 75% of children), and the previously unreported /bl/, all 92.3% acquired at 3;0-4;0. Challenging clusters (<50%) are: /dr, sc/ (46.2%), /zɣ/ (38.5%), and previously unreported: /xθ/ (46.2%), /fθ/ (38.5%), /ɣð/ (30.8%) (average 41%, SD 6.3) at 3;0-4;0. Among these, /xθ/ 51.7%, /fθ/ 55.2%, /zɣ/ 58.6% (4;1-5;0), and /fθ, zɣ/ 72.1%, /xθ/ 73.5% indicate Greek-specific /Fricative+Fricative/, under-researched cross-linguistically, still developing at 5;1-6;0, with /ɣð/ 55.9% being the slowest. The study advances knowledge regarding the normative acquisition of developing Greek phonologies, addresses gaps, and contributes to evidence-based clinical diagnosis of PD in Greek-speaking monolinguals/multilinguals, with implications for cross-linguistic research.

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## Long-term follow up interviews after a prescribed joint book reading intervention: caregivers experiences after two years

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"Prescribed book reading" is a Speech and language pathologist (SLP) managed, caregiver-led reading intervention adapted for preschool children with speech, language and communication needs. The method has been developed, evaluated and implemented as a standard clinical procedure in Gävleborg County and subsequently at various Speech and language pathology units in Sweden. The intervention package involves customized advice on reading and reading habits based on the families' earlier experiences, a thorough instruction on joint, interactive book reading with the child and explicit advice of daily book reading in the home setting. Caregiver compliance to the advice given as well as the method's feasibility has been previously examined with promising results. However, no long-term follow ups have been made. The aim of the present study was to investigate the effects of Prescribed book reading two years after the intervention. The study has been made as a master thesis in Speech and language pathology. Four caregivers of children with developmental language disorders that two years earlier received the Prescribed book reading intervention were recruited. Both mono- and multilingual caregivers were included and in-depths interviews were made to collect the families thoughts and opinions about the intervention, their current reading- and screen time habits and their childrens' general language development. The results were processed with thematic analysis.

The results demonstrate that all families enrolled in the present study have proceeded with frequent joint book reading with their children. The caregivers describe the method as easy to maintain and intergrate in the families' daily routines. Positive experiences particularly involve the interactive aspects of the method and that it's easy to maintain. Although all children enrolled have daily screen time, an increasing awareness of screen time is observed. Caregivers describe improvements of the childrens' language abilities and emphasize the interactive joint book reading component as a promoter for their new reading habits. In this presentation, results from the present study will be presented and the method will be described from a clinicians' point of view.

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## **Dynamic Temporal and Tactile Cuing (DTTC) for school aged children with Childhood Apraxia of Speech (CAS) plus comorbid language and neurodevelopmental disorders**

Ann Malmenholt (Karolinska Institutet & Karolinska University Hospital) and Anita McAllister (Karolinska Institutet & Karolinska University Hospital).

**Background:** Treatment studies on CAS often exclude children presenting with additional neurodevelopmental disorders although CAS prevalence estimates are higher in this group.

**Methods:** A single subject, multiple baseline design was used and replicated over three children for experimental control during the summer of 2021 (year1) and 2022 (year2). Follow-up at 3-month year1, 6-month year2. Participants were boys aged 7:4, 7:10, 10:2 at enrollment, with CAS and Language Disorder plus neurodevelopmental disorders (ASD, ADHD, mild cognitive impairment). The oldest participant had a FOXP2-mutation and comorbid dysarthria. PCC at enrollment was 68%, 76% and 25% respectively. None had been treated targeting speech motor control. DTTC was delivered by the same SLP, 2x30-minute sessions/day, 4xweekx2 (=16 sessions) year1 and 8, 12, 16 sessions year2. Treatment goals were individually selected words/phrases to enhance relevance and motivation. Number of treated stimuli was adjusted to the participants attention span.

**Results:** The ability to correctly produce trained stimuli words at final session year1 was 43%, 71% and 60%. Corresponding figures at final session year2 were 17%, 71% and 53%. At follow-up year1 50%, 62% and 25% were retained; at follow-up year2 0%, 23% and 32%. Generalization was achieved for 5, 13 and 15 words year1 and 2, 10 and 10 words/phrases year2. All participants generalized the highly motivated complex stimuli /Pokémon/ year1. PCC year2 was 86%, 83% and 29% respectively. Patient reported motivation increased over time and all parents reported taking part in sessions being instructive.

**Conclusion:** DTTC for school aged children with CAS and neurodevelopmental disorders added several relevant words/phrases to their expressive ability. Generalizing trained words into real life was not related to CAS severity or age but to participant motivation.

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## **PANEL: What's in a name: How should we describe and define speech sound disorder and why does it matter?**

Yvonne Wren (Cardiff Metropolitan University/University of Bristol/Bristol Speech & Lang Ther Research Unit, North Bristol NHS Trust), Helen Stringer (Newcastle University), Kasia Petinou (Cyprus University of Technology), Marit Clausen (University of Southern Denmark), Lucy Southby (Bristol Speech and Language Therapy Research Unit, North Bristol NHS Trust/Cardiff Metropolitan University) and Yolanda Holt (East Carolina University).

**Background:** The term speech sound disorder or SSD is now used internationally as a label for children with difficulties in the acquisition and mastery of the speech sound system or systems of the languages they are exposed to. This overarching term covers a range of conditions and presentations and also overlaps with other labels. In an online panel series organised by the Child Speech Committee of the International Association of Communication Sciences and Disorders, the term SSD was explored in terms of how it relates to other conditions and how that affects our descriptions and definitions of children's presentations and needs. The aim of this panel is to summarise the presentations from those panel meetings and to build on these through discussion with conference attendees, leading to clearer and more consistent terminology for use in research and clinical practice.

**Methods:** In this panel, specialists in SSD research will consider how definitions and descriptions of SSD are used in children with co-occurring developmental language disorder and in children born with cleft palate. We will also consider how concepts of speech difference vary across countries and across different cultural groups. The presentations will be used to generate discussion about terminology in SSD and to explore the degree of variation which exists internationally in labelling and description of children with SSD.

**Results:** This panel will encourage debate in an area which currently relies on assumptions. We assume that SSD means the same thing to all people and that labels applied to subtypes of SSD and descriptions of presentations are universal. This panel will explore the degree to which that is true and will help lead us towards consistency in the labels and descriptions applied to children with SSD.

**Conclusion:** The discussions from this panel will contribute to ongoing work on the development of consistency in international terminology used with children with SSD.

**Presentations:**

1. SSD and DLD - where do they overlap and where do they separate? - Helen Stringer, UK; Kasia Petinou, Cyprus; Marit Clausen, Denmark.
2. SSD and cleft palate – how differences in anatomy and physiology affect the way we label and describe SSD in children – Lucy Southby, UK
3. SSD and speech difference in diverse communities – where should we differentiate? – Yolanda Holt, USA.

**Disclosure:** The original online panels that are summarized in this panel are available online at the IALP Website and are being written up as a special issue for the International Journal of Language and Communication Disorders.

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## **Semantic content categories produced by Mandarin-speaking children with and without language difficulties**

Po Yi Tang (The Hong Kong Polytechnic University), Kai Yan Lau (The Hong Kong Polytechnic University), Yu Yin Hsu (The Hong Kong Polytechnic University) and Man Tak Leung (The Hong Kong Polytechnic University).

**Background:** Content, Form and Use are three basic dimensions of language (Bloom & Lahey, 1978). Impairment in language form of children with language disorders is well documented, while deficit in semantic content received relatively less attention. Some suggested that a universal set of semantic content categories (SCCs) in young children served as valid indicator in language acquisition (Stockman, 1996). This study aims to compare the acquisition of SCCs between Mandarin-speaking children with and without language difficulties, and explore the intervention direction by considerations from both syntactic and semantic perspective.

**Methods:** Mandarin-speaking children with typical development (TD, n=82), language difficulties (LD, n=4) and Autism Spectrum Disorder (ASD, n=3), all aged 2 to 5, were recruited in Shenzhen and Guangzhou. The LD and ASD participants were reported to encounter language difficulties that affects everyday functioning. Video-recorded language samples obtained using standardized procedures were transcribed orthographically and annotated with part of speech and 21 SCCs (Lahey, 1988). Age range of acquisition for each SCC were determined according to 90% emergence criterion within the whole age group.

**Results:** Results indicated that TD children's age is correlated with MLU and the number of different SCC. All LD children were found to have shorter MLU (below 1 SD), while all ASD children had comparable MLU comparing with age-matched peers. Three LD and two ASD children showed disruptions in acquiring certain SCCs.

**Conclusion:** Shorter MLU among children with LD observed was consistent with previous findings about syntactic deficits of the group. The difficulties in acquiring certain SCCs among LD observed suggest its potential role in identifying children with language difficulties. Mandarin-speaking children with LD may demonstrate different language manifestations syntactically and semantically. Hence, intervention with a balanced consideration of the two domains is suggested. Theoretical implications will also be discussed.

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## **Identification of Speech Sound Disorders in French-speaking preschoolers: the utility of parent and teacher concerns and their correspondence to standardized assessment**

Léonor Piron (Liege University), Andrea MacLeod (University of Alberta) and Christelle Maillart (Liege University).

Speech sound disorders (SSD) are associated with difficulties in communication, social participation, literacy, and learning [1-6]. An early identification process is highly necessary to prevent these consequences in children with SSD [2]. In this sense, parental and teacher concerns about speech sound development have already proven to be very useful measures in prior studies of English language [3,4]. These measures have shown significant correspondences with standardized tests, with a higher association for parental concerns [4]. Here, we aim to expand the evidence for the usefulness of parental and teacher concerns for the identification of SSD. We also hope to contribute to the current advances in the early diagnosis of SSD in French-speaking children [5,6].

192 French-speaking preschoolers aged from 35 to 67 months, without intellectual disability, hearing loss or multilingualism were recruited from preschools. Children were assessed directly by a standardized picture naming task in French [7]. Parents and teachers were invited to respond "yes", "a little" or "no" to the question, "Do you have any concerns about how your/this child talks and makes speech sounds". Binary (SSD/no SSD) scales were created for the purpose of Spearman correlations and sensibility and specificity analyses. Children with a score  $\leq$ -1SD on the standardized test were coded as "SSD"; when parents or teachers answered "yes" or "a little" to the question, children were coded as "SSD". All other results were coded as "no SSD" [4].

Results showed positive and significant correlations. Parental concern appeared as a poorly sensitive (55,4%) but specific (83,1%) measure, and teacher concern appeared as a fairly sensitive (75,7%) but specific (84,7%) measure, in comparison to the standardized test's conclusion.

Teacher and parental concerns emerged as predictive measures, in comparison to a standardized task. Both types of concern appeared to be specific, but teacher's concern was found to be more sensitive than parental concern.

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## Extremely Early Incubator Intervention in an extremely premature infant - a two year follow up case study.

Thomas Kaltenbacher (University of Salzburg), Birgit Breninger (University of Salzburg)

Background: It is established that prematurely born infants have a high risk of language acquisition delays, first noticeable in the absence of babbling and canonical babbling at the usual age (corrected age 4 months & 6 months). Lack of linguistic input and incubator noise are among the known causes, with neural and cognitive development delay being among the biological (i.e. the premature birth, with all its subsequent medical issues) and the social (i.e. lack of 'quality' linguistic exposure) consequences.

This presentations demonstrates how immediate linguistics intervention might counteract the negative effects on linguistic development, introducing an individually designed speech stimulation protocol.

Methods: An extremely premature infant (27th week of gestation, birthweight below 900 grams) received immediate parental and sibling linguistic stimulation in the incubator. This was possible because the Dräger Babyleo® TN500 incubator comprise a 3,5mm audio input compatible with all recording devices with a 3,5mm output (most phones and MP3 players). To protect infants against high pressure sound levels, the input is limited to 55dB.

Two days after the infant's birth, the parents recorded sequences of a total of 47 minutes, including infant directed speech and lullaby singing by both parents, an infant directed lullaby and short address by the 4 year old sibling as well as a recording of parents and sibling talking among each other. The recording was saved in uncompressed .avi format on an MP3 player. The NICU staff was asked to play the recording to the preterm baby as often as possible. During the 103 days in the neonatal care unit, the recordings were played more than 170 times.

Owing to Covid-19 restrictions at the time, only on parent was allowed to visit the baby and FFP2 masks had to be worn - thereby depriving the baby of the visemic input. Parents spent the maximum of allowed 'therapeutic cuddling' time with the baby and talking and singing to him as much as possible.

Results: The immediate feedback from the nursing staff was that listening to the recording helped the baby calm down and sleep. Cueing noises produced by the infant 6 weeks after birth – corresponding to the 33rd week of gestation - sounded 'normal'. The first recording of the infant on his corrected birthday showed cuing reaction to directed speech. At 5 months after birth (uncorrected) the baby showed appropriate reactions to smiling faces. At 4 months (corrected) the first babbling noises were documented. At 5 months corrected, canonical babbling samples resembling the first language of the baby were obtained. On the baby's first birthday (uncorrected), canonical babbling samples with a gestural drift were obtained - and the first utterance of [mama].. The first birthday (corrected age) neuropsychiatric examination showed age appropriate cognitive and articulatory development.

Conclusion: The extremely early, immediate linguistic intervention seems to be extremely promising. We will present the results of the 2nd birthday follow up neuropsychiatric examination together with the latest linguistic development at the conference.

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