

**NUS MSc (Speech & Language Pathology)
Student Research Seminar 2024**

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Abstract 1

Psychometric Properties of a New Dysphagia Screener for Adults With Developmental Disabilities

Lee Rui Qi, Rachel and Sim Gek Hun, Brenna

Background and Purpose: Swallowing disorder, also known as dysphagia, is prevalent among individuals with developmental disabilities. This makes early detection of swallowing difficulties via screening important. Recognizing this need, the Dysphagia Screener for Adults with Developmental Disabilities (DySADD) was developed in hope of providing a valid and freely accessible screener to detect those at risk of dysphagia in this population. This study examines the reliability and validity of DySADD.

Method: Nine healthcare professionals were invited to review DySADD on its content, upon which the screener was refined. 50 adults with developmental disabilities, were then recruited and assessed on DySADD and the Dysphagia Disorder Survey (DDS), an established swallowing assessment designed and validated for people with developmental disabilities.

Results: DySADD was found to have strong intra-rater and inter-rater reliability, acceptable internal consistency, and good concurrent validity with the DDS. Feedback from healthcare professionals also revealed good face and content validity.

Conclusion: DySADD holds promise as a reliable and valid screener for detecting dysphagia risk in this population. Validation with videofluoroscopy is recommended.

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Abstract 2

Testing the Waters: Comparing Outcomes of Standardised Screeners/Assessments for Dysphagia in Adults with Developmental Disabilities

Goh Jia Yen Kimberly and Tong Wan Yan

Background and Purpose: Dysphagia is prevalent among adults with developmental disabilities (ADDs) and aspiration pneumonia is a leading cause of their deaths. This can be due to the complications brought about by behavioural, cognitive and communication challenges. Accurate and timely dysphagia diagnosis is thus crucial. However, Dysphagia Disorder Survey (DDS), an established swallow assessment designed for ADDs, requires training and certification. Instead, swallow screeners/assessments validated in other population groups, e.g., stroke, are often used locally. This study compares assessment outcomes of two standardised dysphagia screeners/assessments — the Yale Swallow Protocol (YSP) and Mann Assessment of Swallowing Ability (MASA), which are commonly used but not validated for ADDs, with the DDS.

Method: YSP, MASA and DDS were administered individually to 50 ADDs, ages 22-75, in a Latin-square counter-balanced order. Their binary outcomes were analysed using Cochran's Q test.

Results: A significant difference was found in the proportion of participants identified as having dysphagia across YSP, MASA and DDS ($p < .001$). Post-hoc McNemar's test revealed a significant difference between DDS and YSP ($p < .001$) but no difference between DDS and MASA ($p = .11$).

Conclusion: YSP appeared to be less effective in identifying dysphagia in ADDs. MASA showed potential, but requires validation against instrumental assessments. A larger ADD sample with a more diverse range of developmental disorders will also help establish its applicability.

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Abstract 3

Cross-Geocultural Attunement: A Comparison of Perceptual Voice Ratings of Voice Speech-Language Therapists in Singapore and America

Chew Hsin Lei, Alexis and Chew Yew Foong, Phebe

Background and Purpose: Perceptions of voice disorders are influenced by cultural and geographical factors, so it makes sense to develop local norms for voice ratings (Boone et al., 2010; Behlau & Murry, 2012). Auditory-perceptual Analysis of Voice (APAV), despite being the clinical gold standard, is criticised for its subjectivity, especially across different cultures. This study compared the APAV ratings of Singaporean voice-specialist Speech-Language Therapists (VSLT-SGs) with those given by their American counterparts (VSLT-USs). The VSLT-SGs' ratings will also make up a local perceptual voice qualities database (PVQD).

Method: Four VSLT-SGs assessed 296 audio recordings on six voice quality parameters, with a subset of recordings reassessed within a month to determine intra- and inter-rater reliability using the Intraclass Correlation Coefficient (ICC). When compared against US ratings, Mann-Whitney U test was used.

Results: VSLT-SGs demonstrated excellent reliability on all parameters based on ICC, except for pitch. Results from Mann-Whitney U test showed that VSLT-SGs rated breathiness, pitch, and loudness more leniently than VSLT-USs. This alludes to potential cultural differences at play.

Conclusion: The study supports the need for local APAV ratings, given that differences were identified on at least three voice quality parameters. A PVQD with local APAV ratings should be a valuable training resource for voice professionals in Asia.

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Abstract 4

Can Teachers be Taught to Evaluate Voice?

Ng Wan Yi (Yvette) and Goh Shuang, Vanessa

Background and Purpose: Auditory-perceptual voice training has been proposed as a method to reduce the variability inherent in perceptual evaluation (Kreiman et al., 1993). This study explores the potential of asynchronous auditory-perceptual training to help teachers self-monitor for voice changes as a form of preventative care. Specifically, it investigates the effects of training on teachers' perceptual judgement of their own voices and the recorded voices of others.

Method: Thirty-one full-time teachers participated in an asynchronous auditory-perceptual training followed by two rating sessions. Paired samples t-tests and Wilcoxon signed-rank tests were employed to evaluate if their perceptual ratings significantly differed from those of clinicians, for other people's voices and their own. Overall Severity, Roughness, Breathiness and Strain were assessed.

Results: Teachers' perceptual judgements of other people's voices significantly improved post-training for Overall Severity. However, no significant improvements were observed for judging other vocal attributes or teachers' own voices.

Conclusion: Asynchronous auditory-perceptual training is effective in improving teachers' perceptual judgements of other people's voices in terms of Overall Severity, potentially because it is more perceptually salient. This study highlights the potential of auditory-perceptual training for at-risk individuals to monitor for voice quality changes as preventive care.

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Exploring the Impact of Auditory-Perceptual Analysis of Voice (APAV) Training and Music Training on the APAV Ratings of Teachers

Chye Ping Xuan Angeline and Ng Xiang Hui

Background and Purpose: APAV is widely used by medical professionals to assess and diagnose voice disorders, as well as to monitor treatment progress. When combined with patients' self-reports of their voices, using APAV for self-perception can promote a common understanding and calibrate expectations between patients and clinicians. As voice intervention is largely behavioural, self-APAV allows patients to manage their own vocal behaviours. APAV ratings can be influenced by auditory experience, including APAV training and music training. As such, this study aims to investigate the effect of APAV training and music training on APAV ratings, and if any interaction effects of the two exist.

Method: Twenty-nine full-time teachers participated in the study, with responses collected on Qualtrics (eighteen non-musically trained and eleven musically trained). Participants rated sixteen voice samples from the Perceptual Voice Qualities Database (Walden, 2022) and their self-recorded voice samples. Ratings were conducted both before and after a 13-minute online APAV training video.

Results and Conclusion: Music training had a significant effect on rating accuracy in PVQD samples. While none of the other effects reached statistical significance, improvements in ratings may have clinical relevance. Future studies can consider using a larger and more balanced sample as well as clearer and more concrete definitions of the different voice quality attributes.

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Abstract 6

SingSpeech - Characteristics and norms of spoken English production amongst 41-60-year-old Singaporeans

Chong Hwee Jane, Kang Audrey, Nurharizah Binte Mohamad Hamzah

Background and Purpose: Dysarthria not only causes physical impairment, but also disruptions at the emotional and social levels. Obtaining normative data for spoken Singapore English (SgE) using the NUS MSc (Speech and Language Pathology) Speech Screener, a locally developed dysarthria screening tool commonly used in Singapore would enable the detection of dysarthria and facilitate timely and effective dysarthria management. The data could also shed light about features of spoken SgE that may be considered errors under norms derived from other English-speaking populations.

Method: 15 English-proficient neurologically intact participants aged 41-60 years old of different genders, race, occupation and education background were assessed using the screener. Normative data were obtained from several speech tasks assessing the 5 key speech subsystems. Qualitative analysis of the “Grandfather” passage read by healthy adult participants were compared with the production of two patients diagnosed with mild dysarthria.

Results and Conclusion: Features of spoken SgE were observed amongst the healthy adult participants, as well as speech characteristics which would have been considered as pathological (e.g. nasal emissions). Taking into consideration these features and norms are important when clinicians attempt to identify dysarthria versus SgE speech errors. A passage reading analysis guideline was also developed.

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Little Sips Big Steps: Increasing Parental Knowledge and Confidence to Feed Their Fragile Infants in Intensive Care Units

Edelia Tan Jiamin, Sydelle Megan D Souza, Tan Jing Jie

Background and Purpose: Preterm infants are more likely to have feeding difficulties. Increasing parental competence in feeding them ensures positive outcomes. This study aims to: (1) determine whether an educational video will improve parental knowledge and confidence in feeding their infants, and (2) explore feeding-related concerns and experiences of parents whose infants have feeding difficulties while admitted to an intensive care unit (ICU).

Method: Sixteen parents whose infants were admitted to the ICU and referred to a Speech Therapist for feeding concerns were recruited. They viewed the educational video consisting of information on knowledge and skills relevant to feeding preterm babies. A questionnaire was administered before and after the video-viewing to measure their knowledge and confidence. Six parents were interviewed about their experience and concerns with feeding their babies, how these concerns could be addressed and their perception of the video.

Results: A paired samples t-test and Wilcoxon signed-rank test showed an increase in parental knowledge (7.0 → 7.63) and confidence (3 → 4) ($p < .05$) after video-viewing. Thematic analysis of the interview data revealed that (1) parents lacked confidence but adapted to their baby's needs, (2) caregiver training and staff-parent interactions addressed concerns, and (3) the video was useful.

Conclusion: Digital educational resources, hands-on practice with feedback and effective communication can potentially improve parental knowledge and confidence.

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Abstract 8

Empowering Teachers in Supporting Students With Speech and Language Difficulties in Singapore: A Survey

Amelia Sylvia Dawson and Nur Aqilah Iqromah Binte Mohamed Noor

Background and Purpose: Teachers play a critical role in the identification and support of those with speech and language difficulties. However, Singapore's bilingual and academic environment both complicate and amplify their role in supporting students of this profile. This study aims to: (1) investigate mainstream primary school teachers' knowledge regarding speech and language difficulties, (2) understand the challenges they face, and (3) understand training topics they desire.

Method: Forty mainstream primary school teachers responded to an online anonymous survey which obtained information on their knowledge, challenges, and desired training topics.

Results: Teachers self-rated their confidence and perceived knowledge to be moderate or lower. However, their actual knowledge was better than perceived. Teachers were familiar with literacy-related knowledge, but would benefit from further training on other areas of speech and language difficulties. Resource-based limitations and a lack of training were identified as their top challenges faced. Desired training topics included knowledge of speech and language development/difficulties, and support strategies.

Conclusion: Training focusing on speech and language development/difficulties are recommended as teachers indicated these as their needs. Other structural factors may be considered, such as: (1) introduction of Speech and Language Therapy services into mainstream school settings, (2) smaller class sizes, and (3) more specialised support.

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Abstract 9

“Why So Difficult?” Reducing AAC Knowledge Barriers Among Educators in a Special Education School Through Activity-Based Interventions

Tay Tzer Yuin and Zhang An Qi

Background and Purpose: In special education schools, educators are key communication partners for children with complex communication needs (CCN) who use Augmentative and Alternative Communication (AAC). However, knowledge barriers faced by the educators limit the participation of children with CCN. This study aims to investigate the effectiveness of activity-based interventions which are based on adult learning principles in reducing educators' knowledge barriers in 1) Aided Language Stimulation (ALS), and 2) Communication functions (CF).

Method: Study 1 (N = 36) and Study 2 (N = 34) were conducted separately to target the knowledge barriers of ALS and CF. A 2x2 mixed repeated measures design incorporated both experimental and control groups, with pre- and post-intervention knowledge questionnaires. The educators participated in an hour-long activity-based intervention, in which they used AAC to communicate when trying to win a game. The experimental group was given a different version of the AAC system halfway through the game.

Results: The score changes on the knowledge questionnaires were non-significant in both studies. However, educators displayed some understanding towards ALS from the analysis of an open-ended reflection question.

Conclusion: Activity-based intervention can be a potential modality of training in addressing AAC knowledge barriers among educators. Future research can consider exploring the effectiveness of the combination of activity-based intervention and explicit teaching.

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Beyond Barriers: Probing Teachers' Augmentative and Alternative Communication Skills and Strategies

Emma Yuana Muhamad and Nur Hanisah Ghazali

Background and Purpose: Children with complex communication needs (CCN) require Augmentative and Alternative Communication (AAC) for participation. Teachers in special education schools facilitate the use of AAC through strategies such as Aided Language Stimulation (ALS). This study aims to investigate the effect of (i) the implementation of standardised AAC and (ii) in-class ALS modelling by a speech therapist, on teachers' perceived skill barriers and frequency of using AAC strategies.

Method: In a single case experimental design, eight teachers from two special education schools were categorized into i) Index group (standardised AAC and ALS modelling at baseline), ii) Waitlist group (standardised AAC and a delayed implementation of ALS modelling), and iii) Control group (no additional AAC intervention). The teachers' utterances during circle time were recorded at baseline, post-intervention, and maintenance phase. They completed a questionnaire on perceived skill barriers at baseline and post-intervention phase.

Results: Frequency of ALS used by the teachers from both Index and Waitlist groups improved. Teachers from the Index group further maintained their use of ALS. No significant changes in the perceived skill barriers after the intervention for all teachers.

Conclusion: The implementation of a standardised AAC and ALS modelling is effective in improving the frequency of ALS. This can be incorporated into a robust training framework to further overcome the skill barriers of the teachers.

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Abstract 11

Classroom-Based Augmentative and Alternative Communication Intervention for Students With Autism Spectrum Disorder

Chua Pei Fen, Athena and Soh Hui Xin

Background and Purpose: In special education schools, challenges faced by teachers and speech-language pathologists (SLPs) limit the opportunities for students with Autism Spectrum Disorder (ASD) to learn and use Augmentative and Alternative Communication (AAC) to communicate and develop language. The study aims to investigate the effectiveness of a classroom-based AAC intervention which incorporated a standardized board and in-class Aided Language Stimulation (ALS) modelling by an SLP on communication outcomes and expressive language of the students with ASD.

Method: In a single case experimental design, six students with ASD were divided into 3 groups: Index group (standardized board and ALS modelling at Baseline), Waitlist group (standardized board and a delayed implementation of ALS modelling) and Control group (no additional classroom-based AAC intervention). Circle-time lessons at four timepoints were recorded and analyzed to measure students' frequency of communicative functions and words expressed.

Results: Students from Index and Waitlist groups showed positive changes in expressive language and communicative functions. AAC usage increased following the implementation of both the standardized board and ALS modeling.

Conclusion: The standardized AAC board and SLP ALS modelling are viable AAC intervention components that can be concurrently used to support the communication and expressive language of students with ASD while addressing teachers' and SLPs' challenges in AAC implementation.

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Abstract 12

Impact of Dialect on Speech Development Norms for Singaporean English-Mandarin Bilingual Children

Jacelyn Yoke Leng Lee and Tan Yan Lin, Vivianna

Background and Purpose: In Singapore, a linguistically diverse society that uses Singapore English (SGE), most speech assessments available to speech-language pathologists (SLPs) do not account for dialectal variation. While a previous study has established norms for children aged 3;6 to 4;5, there have yet to be norms published for older English-Mandarin preschoolers. This study aims to fill this gap by establishing normative data for English-Mandarin bilingual children aged 4;6 to 5;11 to improve the accuracy of diagnosis of speech sound disorders (SSDs).

Method: Ninety-two children were assessed using both the articulation and phonology subtests of Diagnostic Evaluation of Articulation and Phonology (DEAP-UK). Their responses were scored using a modified scoring system that integrated SGE dialectal features, alongside the British Standard English targets for comparisons.

Results: Phonetic inventory and age-appropriate phonological error patterns for English-Mandarin bilinguals was established. Dialectal variation has significant clinical implications on accurate identification of SSDs, with significant fewer children identified as using phonological error patterns or having phonological delays when SGE features were considered.

Conclusion: The findings underscore the need for localised norms and to account for dialectal variation, which help SLPs in identifying SSDs in the local population, reducing misdiagnosis and optimising therapeutic interventions.

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Abstract 13

Validity of Parent and Teacher Ratings of Intelligibility of English-Mandarin Bilingual Children

Kellyn Kay Yi Ting and Tan Shu Yee, Inez

Background and Purpose: Speech intelligibility is a key consideration when assessing children with speech sound disorders (SSDs). Speech-language pathologists (SLPs) often combine objective assessments with input from parents and teachers. This study aims to validate the Intelligibility in Context Scale (ICS) and the Speech Clarity Questionnaire – Teachers (SCQ-T) for use with English-Mandarin bilingual preschoolers in Singapore.

Method: Ninety preschool children aged 54 to 70 months were assessed using the Diagnostic Evaluation of Articulation and Phonology (DEAP-UK). Parents completed the ICS, rating their child's intelligibility across seven communication partners, while teachers completed the SCQ-T, rating intelligibility across two partners. The ratings were correlated with the children's Percentage of Consonants Correct (PCC), Percentage of Vowels Correct (PVC), and Percentage of Phonemes Correct (PPC) scores.

Results: Both parents and teacher ratings were comparably and significantly correlated with PCC and PPC scores for British Standard English (BSE) and Singapore English (SGE). Both ratings were not significantly correlated with PVC scores.

Conclusion: The ICS and SCQ-T are found to be valid screening tools for children at risk of SSD in the English-Mandarin bilingual population, offering insights into their speech intelligibility across various social settings.

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Abstract 14

Exploring Emotional Processing and Semantic Skills as Diagnostic Markers for Children with Autism Spectrum Disorder

Choy Car Men, Low Jia Hui (Jayley), and Yvonne Moh

Background and Purpose: Individuals with Autism Spectrum Disorder (ASD) often have difficulties relating to others' emotions and perspectives. Research suggests deficits worsen when social engagement (SE) increases and/or when negative/positive emotional information is present. Furthermore, there is heterogeneity in the semantic skills of children with ASD that remains unexplained by age or cognitive functioning.

Using a descriptive task with pictures of varying SE and emotional valence (EV), two research questions were examined:

- RQ1: How do typically-developing (TD) and ASD groups differ in their ability to interpret and process emotions?
- RQ2: How do TD and ASD groups differ in their semantic skills?

Method: This study analysed archival language data from 20 children with ASD and matched-TD controls, aged 5-12 years. Responses were evaluated for accuracy of emotional descriptions and word-use, across high/low social and negative/neutral/positive emotional conditions.

Results: In RQ1, TD group performed significantly better on positive than negative conditions, but no valence effects were found in the ASD group. In RQ2, the ASD group had lower semantic accuracy than TD counterparts, with smaller differences in neutral or low SE conditions.

Conclusion: Emotional valence and social engagement affected emotional processing and semantic skills differently in children with ASD and TD children. Clinical and theoretical implications are discussed.

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Abstract 15

Effects of Emotional Valence and Social Engagement Information on Speech Prosody in Children with Autism Spectrum Disorder

Loke Shuet Yern, Sharon and Chua Yong Qing

Background and Purpose: Children with Autism Spectrum Disorder (ASDc) reportedly struggle with processing social and emotional information, which may influence their speech patterns. Atypical prosody can negatively impact social interactions and perceptions. This study explores the influence of emotional valence and social engagement levels on prosody in ASDc and typically developing children (TDc).

Method: The study analyzed audio recordings from Teh et al. (2018), involving 20 ASDc and 20 TDc, aged 5–12 years, engaged in a picture description task. Mixed-design ANOVAs were conducted with three independent variables – diagnosis (ASD/TD), social engagement (low/high), and emotional valence (neutral/negative/positive) – on acoustic characteristics of speech rate, pitch range, and mean pitch.

Results: Speech rate was significantly slower in ASDc than TDc. For both groups, pitch range increased from low-social to high-social conditions, but the difference was smaller in ASDc. Additionally, social engagement moderated the effects of emotions in both speech rate and pitch range. For mean pitch, valence effects emerged in low-social pictures for TDc only.

Conclusion: Distinct prosodic patterns were observed in ASDc and TDc under varying social-emotional conditions. This study contributes to the limited literature on prosody in ASDc. The findings may be useful in designing prosody therapy through training ASDc to recognise emotions and social situations.

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