

National University of Singapore
Division of Graduate Medical Studies

**MSc(Speech & Language Pathology)
Student Research Symposium**

Time: 6pm – 8pm on Thursday, 12th July 2012

Venue: Level 1, Block MD11, Clinical Research Centre, 10 Medical Drive, Singapore 117597

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Abstract 1

Mandarin Receptive Grammar Test for Children

Background: No formal assessment tool has been developed that can aid in the diagnosis of language impairment in Singapore Mandarin-dominant children. Clinicians therefore rely on informal assessments and their own clinical judgment. This study describes the development of the Mandarin Receptive Grammar Test (MRGT), a picture-matching test that assesses children's sentence comprehension.

Method: The design of the MRGT was based on grammar developmental norms from other Mandarin-speaking populations. It comprises 60 items over six grammatical constructs: Negative, Spatial, Temporal, Aspect, Connective and Passive markers. The test was administered to two cohorts of linguistically normal, Mandarin-dominant children ($N=60$, age groups: 4;0 – 4;11 years and 5;0 – 5;11 years). To test validity, a Mandarin version of Bilingual Language Assessment Battery (BLAB) was also administered.

Results: The normative profile established for each age group reflected the grammar acquisition patterns in other Mandarin-speaking populations. Internal reliability ranged between 0.7 and 0.8.

Conclusion: The MRGT will support clinicians in their identification of language impairment in Mandarin-dominant preschool children in Singapore.

Keywords: Language Problems; Bilingual Children; Grammar Comprehension

Abstract 2

Oral Narratives of School Children with Nonsyndromic Cleft Lip&/Palate

Background: Children with nonsyndromic cleft lip and/or palate (CLP) have an elevated risk of language difficulties. Thus far, little is known of the narrative abilities of this population despite their known relation with academic success and socialization. This study examines the oral narrative, language and cognitive abilities of English-dominant bilingual Singaporean children with CLP.

Method: Thirty participants with CLP (aged 6;1 to 8;11) and 30 age-matched children with typical development were recruited. Narratives (personal and story retell), receptive vocabulary, verbal memory, nonverbal cognition and rapid automatic naming ability were assessed. Narrative macrostructure was analyzed using the Story Quality Rubric and High-Point Analysis, and narrative microstructure was compared for syntactic and semantic diversity. 10% of the narratives were rescored for inter-rater reliability.

Results: It is expected that the CLP group will score poorer in the narrative, language and cognition tests.

Conclusion: Oral narratives should be included in the routine assessment battery for children with CLP.

Keywords: Cleft Palate; Cleft Lip; Children; Singapore; Bilingual; School-Age; Expressive Language; Oral Narrative

Abstract 3

Aphasia and Dementia Screener in Hokkien – A Normative Study

Background: There are no reliable and valid assessment tools that combine cognitive and language processing for local Hokkien-speaking population in Singapore. This paper describes the development of a screening tool for older adults who may be at risk of aphasia and/or dementia.

Method: The ADSH was developed using a cognitive neuropsychological framework for language processing. Nine subtests cover comprehension, expression, memory and cognitive processing via verbal input and output modalities. Normative data, using locally standardised pictures, was collected from thirty neurological intact predominantly Hokkien-speaking adults aged between 50 to 95 years.

Results: Internal reliability of items was determined through reliability analysis. Descriptive statistics was used to profile the near ceiling (> 90% accuracy) performance of these participants.

Conclusion: The ADSH can help clinicians identify deficits in auditory comprehension, verbal production and episodic memory of local Hokkien-speaking older adults poststroke. Screening results reveal functional impairments and can guide treatment choice.

Keywords: Verbal Language Deficits; Memory Deficits; Hokkien

Abstract 4

Oral Narratives of Preschoolers with Nonsyndromic Cleft Lip &/or Palate

Background: Children with nonsyndromic cleft lip and/or palate (CLP) are known to be at risk of language impairment, but there is a lack of research on the narrative skills of this population. This study examined the narrative, language and cognitive skills of preschoolers with CLP.

Method: Twenty English-dominant children with CLP and 24 children with typical development (TD), aged 4 to 6 years 11 months were recruited. A test battery comprising seven subtests of hearing, speech, cognition, memory, vocabulary, and oral narrative skills was administered. The data were re-scored by a Speech-Language Pathologist to ensure inter-rater reliability.

Results: A story quality rubric and high-point analysis were used to analyse narrative macrostructure. The Systematic Analysis of Language Transcripts was used to analyse narrative microstructure.

Conclusion: If poorer scores in oral narrative, language and cognitive skills are seen in children with CLP, these should be routinely assessed by clinicians.

Keywords: Cleft lip; Cleft Palate; Preschool; Children; Bilingual; Expressive Language; Cognition; Oral Narrative

Abstract 5

Written Narratives of Typically-Developing & Language-Impaired Children

Background: There are currently no published normative data on written narratives for typically developing bilingual Singaporean children. This paper reports norms on vocabulary measures within written narratives, and discusses differences in the performance of language impaired children via three case studies.

Method: Participants were Primary Five students ($N = 81$, aged 10 years 3 months to 11 years 3 months), who wrote a narrative based on a picture stimulus within 50 minutes. Narratives were analysed for total length, lexical diversity and use of advanced words - abstract nouns, metacognitive verbs and metalinguistic verbs.

Results: Normative data for typically developing children are presented. Case studies of language-impaired children showed poorer performance but individual variations were observed.

Conclusion: Findings provide insight into vocabulary use in narrative writing by typically developing and language impaired children, and implications for instruction are briefly discussed.

Keywords: Narrative Writing; Vocabulary; Typically Developing; Language Impairment; Bilinguals

Abstract 6

The Singapore Receptive Grammar Test for Mandarin-Speaking Aphasics

Background: Knowledge of patients' language comprehension profiles is critical for successful intervention. This paper describes the development of a receptive grammar test in Mandarin, a language spoken by a substantial proportion of Singapore's adult population.

Method: The 110-item test was designed using frameworks of spoken Chinese grammar and administered to two cohorts of neurologically intact adults ($N=60$, age ranges 40-60, 61-80 years) and two dysphasic patients. The questions cover eleven parts of speech used in discourse, and all nouns, verbs, adjectives and picture referents were standardized locally.

Results: Non-patient participants should achieve near-ceiling scores while patient participants were expected to show deficits.

Conclusion: The Singapore Receptive Grammar Test-Mandarin is projected to be reliable and culturally relevant in assessing sentence comprehension. This tool will provide a systematic way of identifying receptive grammar deficits, and thereby facilitate intervention planning.

Keywords: Dysphasia; Aphasia; Language Difficulties; Stroke; Sentence Comprehension

Abstract 7

Parent and Teacher Involvement in Functional Communication for Children with ASD

Introduction: The influence of parent/primary caregiver and teacher involvement on the functional communication of low-communicative children with Autism Spectrum Disorder (ASD) is not yet clear in Singapore. To bridge this gap, the implementation of a modified picture exchange (pull-out) system to augment communication was evaluated.

Method: The study was a between-participants design with multiple baselines. Video recordings of 20 low-communicative students (aged between 4 and 12 years) diagnosed with ASD were coded for functional communication (e.g., frequency of requesting, percentage of spontaneous requests, accuracy of utterance, and mean length utterance), in order to evaluate the functionality of the pull-out system. Questionnaires and log sheets were used to determine the amount and type of parent/caregiver and teacher involvement.

Results: Communication measures are expected to show greater improvement with increased parent/caregiver and teacher involvement.

Conclusion: This study will add to the limited research available locally on the effect and importance of parent/caregiver and teacher involvement on functional language in low-communicative children with ASD, as well as shed light on their communicative ability.

Keywords: Augmentative and Alternative Communication; PECS; Pixon; Visuo-Spatial Ability; Non-Verbal; Parent-Involvement

Abstract 8

Picture Naming Norms in Mandarin for Bilingual Preschoolers

Background: The dearth of locally adapted and normed assessment tools increases the risk of misdiagnosing children in Singapore as being language disordered. The aim of this research is to collate Mandarin picture naming norms among bilingual preschoolers.

Method: Bilingual preschoolers ($N=83$, aged between 3;9 to 4;8) were recruited. Of these 43 were Mandarin-dominant and 40 were English-dominant bilinguals. Expressive vocabulary (EV) was collected using 70 object and 70 action pictures from an adapted version of the Druks and Masterson's (2000) Object and Action Naming Battery (OANB; 2000).

Results: The OANB results were validated against results on receptive vocabulary (RV) scores collected using 60 pictures from the Bilingual Language Assessment Battery (BLAB; Rickard Liow & Sze, 2009). Normative data for Mandarin receptive and expressive vocabulary for bilingual preschoolers was computed, and reliability was assessed.

Conclusion: These norms will help clinicians identify preschoolers with language difficulties.

Keywords: Mandarin; Bilingual; Picture Naming Norms; Language Exposure

Abstract 9

Cognitive-Communication Screener for Mandarin-Dominant Adults with Traumatic Brain Injury

Background: There is no reliable cognitive-communication screener for the Traumatic Brain Injury (TBI) population in Singapore. The aim of this research is to develop a sensitive and reliable TBI screener for use in acute setting with Mandarin-Dominant (MD) adults.

Method: Based on the range of cognitive-communication deficits associated with TBI, this research comprises seventeen subtests which tests for attention, memory, executive functioning and language. Education level was taken as an indicator of cognitive abilities. Normative data from the three educational groups (primary, secondary and tertiary) were taken from 56 neurologically-intact Singaporean adults (aged between 23 and 78 years).

Results: Normative data for each subtest were computed. The preliminary analysis on response time and qualitative performance revealed an influence of education level for primary vs. secondary groups. These findings are interpreted as cognitive effects confounded by language proficiency.

Conclusion: This is a screener which will support Speech-Language Therapist in identification of cognitive-communication deficits in adults with TBI and thereby facilitate intervention.

Abstract 10

Comparison of Chin-Tuck-Against-Resistance (CTAR) and Shaker Exercises

Background: For dysphagics, therapeutic exercise such as the Shaker exercise to strengthen the suprahyoid muscles are effective in restoring oral feeding. Our study compared surface electromyography (sEMG) activity of the suprahyoid muscles during CTAR (less strenuous alternative) and Shaker exercise.

Method: Forty healthy adults (20 males and 20 females, aged 21-40 years) each completed four tasks (isometric and isokinetic for both CTAR and Shaker). Order of the tasks was randomly assigned and counterbalanced across participants. During CTAR, participants were seated while tucking their chins against a rubber ball to perform an isometric and isokinetic task. The same participants also performed an isometric and isokinetic task during Shaker by lying flat and lifting their heads.

Results: Significantly ($p < 0.05$) higher maximum and mean sEMG values were obtained during isometric CTAR. For isokinetic CTAR, same or higher sEMG values were obtained.

Conclusion: CTAR appears to be similarly effective or superior to the Shaker in exercising the suprahyoid muscles, hence it may have the potential to achieve a similar therapeutic effect.

Keywords: Upper Esophageal Sphincter Dysfunction; Less Demanding; Chin Tuck; Strengthens Suprahyoid Muscles; sEMG

Abstract 11

Mandarin Receptive Grammar Test for Children

Background: Although 74.1% of the population in Singapore is ethnic Chinese, no language assessment tools have been developed for Mandarin-dominant children. The initial phase of the study involved developing a linguistically and culturally relevant Mandarin sentence-picture matching test to assess Singaporean children's comprehension in Mandarin grammar.

Method: The test was developed according to the grammar acquisition patterns of children from other Mandarin-speaking populations and contained 60 sentences over six grammatical constructs – Negatives, Temporal, Spatial, Aspect, Passives, and Connectives. It was administered to two groups of healthy Singaporean preschoolers with Mandarin as their first language ($N = 60$, age ranges 4;0-4;11, 5;0-5;11). To test validity, a Mandarin version of the Bilingual Language Assessment Battery (BLAB) was also administered on the participants.

Results: The normative profile established for each age group reflected the grammar acquisition patterns in other Mandarin-speaking populations. Tests of reliability and validity were conducted, and normative data were computed.

Conclusion: The Mandarin Receptive Grammar Test (MRGT) will support speech and language pathologists in identification of language impairment in Mandarin-dominant children in Singapore.

Keywords: Bilingual; Language Problems; Receptive Grammar; Assessment

Abstract 12

Neurocognitive-Linguistic Abilities of Primary Five Singaporean Children

Background: There are no standardised language assessment tools developed for use with brain-injured Singaporean children. The Pediatric Test of Brain Injury was developed in the US, thus reliability and normative data need to be established for local children.

Method: The PTBI, consisting of 10 subtests - Orientation, Following Commands, Word Fluency, What Goes Together, Digit Span, Naming, Story Retelling – Immediate, Yes/No/Maybe, Picture Recall, Story Retelling – Delayed, was administered to non-brain injured Primary five children from three government primary schools ($N = 35$, aged 10-11 years old), who were English-dominant, English-Mandarin bilinguals.

Results: Normative data collected covers constrained and unconstrained developmental abilities assessed using the PTBI. Subtest item reliability on the PTBI and data comparisons with Primary 2 norms are also presented. Findings from clarifications provided on culturally/linguistically unfamiliar test items and recommendations on selected subtest items are also discussed.

Conclusion: The data collected serves as a reference for Speech and Language Therapists in Singapore when assessing the local pediatric brain-injured population.

Keywords: Multilingual; Traumatic Brain Injury; Academic Performance; Attention; Memory; Executive Functions; Visuospatial skills

Abstract 13

Impact of Shyness on Expressive Language in Kindergarteners

Background: Past studies that investigated personality and speech and language tasks have found differences in performance between shy and non-shy children. Shy children displayed poorer performance in receptive and expressive language tasks, and produced speech that was less advanced. The aim of this study was to examine the expressive language skills of shy and non-shy kindergarteners using a locally standardized expressive language assessment and a language sample analysis.

Method: Teachers from two pre-school centres provided ratings of children's language dominance and level of shyness using the Colorado Childhood Temperament Inventory (Buss & Plomin, 1984; Rowe & Plomin, 1977). A total of 60 English-dominant kindergarteners were administered the Singapore English Action Picture Test (SEAPT), which measures expressive information and grammar. Spontaneous speech was also elicited via interaction with the examiner, and recordings were then indexed by mean length of utterance, total number of words, and number of different words.

Results: Independent *t*-tests will be used to compare differences between the groups of shy and non-shy children. The predicted results are that significant differences would be found between shy and non-shy children in the performance of SEAPT, as well indexes of expressive language based on language sample analysis.

Conclusion: The predicted findings on Singaporean children will be consistent with previous research in which shy children demonstrated poorer performance in language assessments and produced speech that was less advanced. If so, the provision of additional support to shy children in optimizing language development is recommended.

Abstract 14

Relationship Between Stuttering Severity, Anxiety & Language Dominance

Background: Stuttering can be disabling so it is important to understand factors affecting its manifestation and treatment outcomes. Anxiety and language dominance influence stuttering severity, but the relationship between these three variables is unclear. This study explores whether bilinguals who stutter (BWS) in Singapore have greater stuttering severity and anxiety measures in their less dominant language.

Method: Four male English-dominant, English-Mandarin BWS ($M = 22.3$ years, Range = 18.9–29.4 years) completed English and Mandarin versions of the Fear of Negative Evaluation and The Erickson Modified 24 Scales. Ten-minute conversational speech samples were collected pre-treatment in both languages within-clinic and by telephone.

Results: The data are presented as individual case studies. Speech samples were analysed for percentage syllables stuttered, stuttering severity and types of stutter. Stuttering and anxiety data were compared across languages.

Conclusion: The results will help improve clinicians' understanding of stuttering in English-Mandarin bilingual Singaporeans, and the variables that affect treatment outcomes.

Keywords: Bilingual; Multilingual; Stuttering; Anxiety; Attitudes Towards Communication; Language dominance

Abstract 15

The Singapore Receptive Grammar Test for English-Speaking Aphasics

Background: Patients with aphasia can have comprehension difficulties that are overlooked. These deficits affect care and management, and lead to frustration for them and their communication partners. The absence of culturally appropriate and locally-normed assessment tools in Singapore suggested that a sentence comprehension test for use with post-stroke adults would facilitate evidence-based practice by clinicians.

Method: The Singapore Receptive Grammar Test (SRGT) was developed in English and administered to a group of English-dominant neurologically intact adults ($N=35$, age range 40-80years). The 70-item test comprises two components: basic sentence element and sentence grammar, both of which are assessed through 1:4 forced-choice sentence-picture matching task.

Results: Participants are expected to achieve near-ceiling scores with 95% accuracy. Constructions yielding <80% accuracy by all the participants will be discarded. Cronbach's alpha will be computed to determine reliability of test items.

Conclusion: The SRGT is expected to be a clinically useful tool for clinicians in assessing the local population with sentence comprehension difficulties.

Keywords: Dysphasic; Syntax; Sentence Processing

Abstract 16

Picture Naming Norms for Malay-dominant Preschoolers

Background: T receptive (RV) and expressive vocabulary (EV) of Malay-dominant preschoolers will be examined with the aim of improving the crucial process of early detection of children at-risk of language difficulties.

Method: A pilot study on 10 Malay-dominant adults was carried out to select culturally-relevant items from the Object and Action Naming Battery (OANB) (Druks & Masterson, 2000). For the main study, 31 Malay-dominant preschoolers (15 boys and 16 girls, aged between 3; 9 to 4; 9), were recruited. EV is measured using the adapted OANB. For cross-validation of the results, participants' RV at one-word level is tested using the Bilingual Language Assessment Battery (BLAB) (Rickard Liow & Sze, 2009).

Results: Validity and reliability were assessed, and normative data for OANB picture naming and BLAB receptive vocabulary in Malay-dominant preschoolers was computed.

Conclusion: Findings from this study could be used to help teachers and clinicians identify language difficulties in preschoolers.

Keywords: Early Childhood; Bilingual; Malay; Developmental Delay

Abstract 17

Syntactic Complexity and Use of Connectives by P5 Students in Singapore

Background: Knowledge about the written narratives of children in Singapore can aid educators and Speech-Language Pathologists (SLPs) in identifying writing difficulties. This study describes the development of normative profiles of typically developing students' written narratives in English in terms of syntactic complexity and connectors, and compares them to the performance of students with language impairment.

Method: Participants were 78 typically developing bilingual students and two students with language impairment in Primary 5 in mainstream English-medium schools in Singapore (aged 10;0 to 11;9). They were given 50 minutes to produce a written narrative based on a stimulus picture of a school canteen scene, which was assessed for the use of complex sentences and different connectors.

Results: The results will be scored for T-units, and connectors showing time and cause and effect, and then tabulated as norms for Singaporean children bearing in mind language dominance. Children with language impairment are expected to have less complexity in their written narrative and use a smaller number of different connectors in their written narratives.

Conclusion: Discerning between clinical language impairment and typical written narratives that may have been influenced by the language exposure of a bilingual child in Singapore will aid identification and referral of students to SLPs for further evaluation and appropriate intervention.

Keywords: Written Narratives; Syntactic Complexity; Connectors; Specific Language Impairment; Bilingual

Abstract 18

Past Tense Marking In Oral Narratives of Primary 2 Singaporean Children

Background: The aim of this study is to examine whether Singaporean children who are at risk for SLI, mark regular and irregular verbs for past tense less frequently than Standard Singapore English (SSE) speakers and Singapore Colloquial English (SCE) speakers.

Method: Oral narratives were obtained from 180 participants, aged 7;0 to 8;11, using a picture book 'Frog, where are you?' Correct/incorrect use of regular and irregular past tense verbs was coded. Percentage of regular and irregular verbs marked for past tense correctly and number of types was calculated. Based on the number of types, participants were divided into 'at SLI risk' (types 1.25 – 1.5 SDs below mean) and control groups (types within 1 SD of mean). Within controls, SSE speakers were determined by more than 90% correct use of past tense, while SCE speakers marked tense less frequently.

Results: It is expected that SSE and SCE speakers will mark regular past tense less frequently than irregular past tense; children at risk for SLI will mark irregular past tense correctly more frequently than regular past tense and also mark regular past tense less frequently than controls.

Conclusion: Normative data from this study will aid differentiation of non-language impaired SCE speakers (language difference) from children at risk for SLI (language impairment), leading to increased accuracy in the diagnosis of SLI by speech therapists in Singapore.

Abstract 19

Grammatical Accuracy of Finite Verbs in Written Narratives of Singaporean Children

Background: There is a lack of data on the writing abilities of Singaporean children. The aim of this study was to compile norms on the grammatical accuracy of verbs used, and to consider errors related to regular past tense '-ed', in the written narratives of typically-developing (TD) Singaporean children. Case studies of Singaporean children with language impairment (LI) are used to explore the differences in their use of verbs from the norm.

Method: 77 Primary 5 TD bilingual children from two government schools produced a written narrative (at least 150 words long) based on a selected stimulus picture, within 50 minutes.

Results: Singaporean TD children show significantly different norms for verb accuracy from monolingual populations. LI Singaporean children show no significant difference in verb use from the local norm.

Conclusion: Absence of past tense marking in regular verbs is not a reliable indicator of language impairment in the Singaporean bilingual context.

Keywords: Specific Language Impairment (SLI); Bilingual; Assessment of Written Modality; School Age Language Difficulties; Singapore English

Abstract 20

Parent Report on Malay-speaking Children's Development

Background: Speech and language screening tools developed in the US and UK are unsuitable for use in multilingual populations. In light of the heterogeneity of languages in Singapore and Malaysia there is a pressing need for a reliable and valid pre-school language screening tool in Malay which will serve as a first step in identifying Malay-dominant children who are at risk of developing speech and language difficulties. The aim of this study is to develop a parent report checklist for 5-year old Malay-speaking children.

Method: The parent-report checklist was translated and adapted from the Singapore Pre-School Language Screener. Data was obtained from a total of 30 parents and their children from two-government run pre-schools in Malaysia. The Bilingual Language Assessment Battery (BLAB), a test of receptive vocabulary, was administered and used to establish validity.

Results: The correlation between the parent report checklist and the child's performance on BLAB was moderately positive ($r=.349$) and significant ($p=.029$), indicating validity. A test of item reliability showed a Cronbach alpha of .907).

Conclusion: As a valid and reliable tool, the parent report checklist can be used to identify Malay-dominant children who may be at risk of developing speech and language difficulties.

Keywords: Screener; Malay Screening Tools; Speech and Language Disorders

Abstract 21

English Picture Naming Norms for Bilingual Preschoolers

Background: There is a risk of misdiagnosing language disorders in Singapore due to the lack of local language norms. The aim of this research was to collect norms on expressive single-word vocabulary in English for bilingual preschoolers.

Method: Data was collected from 116 English-Mandarin and English-Malay bilingual preschoolers (aged 3;9 to 4;8). Language dominance was determined through a Language Background Questionnaire (LBQ) completed by participant's parents. Expressive vocabulary was collected using 70 object and 70 action pictures from the Druks and Masterson's (2000) Object and Action Naming Battery (OANB). Performance on the Bilingual Language Assessment Battery (BLAB), a receptive vocabulary task, was used to validate the results of the OANB.

Results: Norms will be computed for subgroups based on different language backgrounds for OANB and BLAB.

Conclusion: This normative data on OANB and BLAB will support evidence-based practice by facilitating the identification of language impairments in Singaporean preschoolers by teachers and clinicians.

Keywords: Noun-Verb Acquisition; Early Language Development

Abstract 22

A Normative Study of the NUHS Aphasia Screening Test for Malay speakers

Background: There is no bedside aphasia screening tool for the Malay-speaking population in Singapore. Clinicians often have to rely on informal assessments or translations, which may not be culturally or linguistically appropriate.

Method: Based on the cognitive neuropsychological model of the Malay language, a screener was developed to assess all modalities of language processing (understanding, speaking, reading and writing) across ten subtests. Performance of 30 neurologically-intact adults aged 40 – 60 years old who are Malay-English bilinguals was recorded and tabulated.

Results: Neurologically-intact adults performed near ceiling on the test. Minimum, maximum and percentile scores as well as means and standard deviations were computed to establish performance of normal healthy participants.

Conclusion: The NUHS AST Malay version demonstrates how the use of cognitive neuropsychological approach as a framework for a culturally and linguistically appropriate screener can assist clinicians to identify the breakdown of any processes to facilitate differential intervention.

Keywords: Language Processing; Bilinguals; Dysphasia

Abstract 23

A Cognitive-Communication Screener for English-Dominant Traumatic Brain Injury (TBI) Population

Background: To date, there are no reliable screening tools for cognitive-communication deficits in the TBI population in Singapore. To address this gap, a cognitive-communication screener for the English Dominant (ED) adult TBI population will be developed.

Method: Normative data will be collected from 60 neurologically intact, English language dominant participants between 21 and 80 years old, of these 60 participants, 30 individuals will be selected from each educational group (secondary and tertiary education) and will be balanced across gender and age. The 18 subtests would assess attention, memory, organisation, sequencing, word fluency, naming, reasoning and problem solving.

Results: An independent *t*-test would be conducted to compare subtests scores for the screener across the two educational groups and age ranges. Internal reliability of the entire screener would be carried out using Cronbach's alpha. Means, standard deviation, percentile norms for accuracy and time will be computed.

Conclusion: This screener will help speech therapists identify areas of deficits and select appropriate further assessments and intervention for TBI patients, amongst whom only 25% return to work within one-year post injury.

Keywords: Traumatic; Brain Injury; English; Screener; Singapore

Abstract 24

Evaluating the Hybrid Communication System with Low-Functioning Autistic Children

Background: Children with low-functioning Autistic Disorder (Lo-AUT) defined as children who are nonverbal or have low-verbal abilities, have been found to benefit from alternative and augmentative communication (AAC) systems. This study aims to evaluate the effectiveness of a hybrid AAC system with improved organization, which combines aspects of the Picture Exchange Communication System and Pixon, in facilitating functional communication in Lo-AUT.

Method: Twenty children with Lo-AUT, aged between 4 and 12 years, will be recruited, and divided into two groups. The treatment group will receive thrice-weekly intervention sessions with their teachers using the hybrid system, while the control group uses non-hybrid systems. Multiple baselines will be recorded, and measures of functional communication including frequency of requesting, spontaneity, and level of prompting assessed.

Results: The treatment group will make significantly more gains on all measures of functional communication.

Conclusion: The results will have implications for developing communication in children with Lo-AUT.

Keywords: Nonverbal Autism; Cognition; Visuo-spatial Working Memory; Disorganization; Intentionality

Abstract 25

Pediatric Test of Brain Injury: Norms for Primary 2 Children

Background: The Pediatric Test of Brain Injury (PTBI) was developed in the United States. It assesses neurocognitive-linguistic skills that are vulnerable to pediatric brain injury, and relevant to functioning well in school. The aim of this project is to obtain normative data on the performance of non brain-injured Singaporean children for the PTBI.

Method: The full test (10 subtests) was administered to English-Mandarin bilingual Singaporean children with English as their first language ($N = 35$, age range 7-8 years).

Results: Normative data based on accuracy were computed. An item analysis revealed that subtest 7 and 10 were highly reliable, with $> 80\%$ accuracy for first-language speakers of English. The data suggest that gender and social economic status does not systematically influence the cognitive linguistic abilities sampled by the PTBI.

Conclusion: Normative data obtained in this research study can serve as a guide for Speech and Language Therapists in Singapore when interpreting results from age-matched brain injured children with the same language profile. These data will facilitate decision-making on integration into mainstream schools. Suggestions are also made on improving cultural/ linguistic relevance of the PTBI for the Singaporean population.

Keywords: Local Norms; Language; Cognition; Development; English-Dominant

Abstract 26

Semantic Assessment Battery for Mandarin-Dominant Adults with Aphasia

Background: There is a paucity of appropriate assessment batteries for Mandarin-dominant adults with aphasia in Singapore. Therefore, the aim of this project is to develop and norm a Mandarin semantic assessment battery. The effects of word familiarity, word class, modality and types of tasks on language processing will also be analysed.

Method: The battery, comprising six subtests each for nouns and verbs in written and auditory/oral modality (Picture Matching, Picture Naming and Semantic Matching) was developed using the principles of cognitive neuropsychology, and administered to 34 neurologically-intact Mandarin dominant adults (aged 50-80 years).

Results: Cronbach's alpha for the subtests ranged from .613 to .891. Statistical analyses revealed significant effects ($p < .05$) of word familiarity, word class, modality and type of tasks effects on participants' performance.

Conclusion: This battery will provide quantitative and qualitative information on areas of language breakdown in Mandarin dominant adults with aphasia and thereby guide the design of intervention programmes.

Keywords: Semantics Processing; Language Problems; Chinese

Abstract 27

Comparing Teachers' Voices Before and After Using Vocal Warm-Up

Background: Teachers are at significant risk of developing voice disorders as a result of their work. While effective programmes have been developed to treat voice problems, little attention has been paid to their prevention. The aim of this research is to examine if a particular set of vocal warm-up exercises will improve vocal quality and reduce fatigue, thus preventing voice problems.

Method: 11 female teachers, aged between 21 and 45 years, were recruited from secondary and primary schools. Over two weeks, participants met experimenters three times after their teaching day. Teachers' voices were audio-recorded before and after they had been taught the warm-up exercises. Participants also filled in two questionnaires to find out their pre- and post- perceived levels of vocal fatigue.

Results: Acoustic measures indicating vocal quality are expected to show significant improvement post treatment. Similarly, the level of perceived vocal fatigue is expected to drop post treatment.

Conclusion: Vocal warm-up exercises can improve vocal quality, reduce fatigue, and may prevent voice problems.

Keywords: Vocal technique; Voice therapy

Abstract 28

Semantic Assessment Battery for English-Dominant Adults with Aphasia

Background: There is a paucity of culturally and linguistically appropriate language assessment tools for English-dominant bilingual adults in Singapore.

Method: Using the principles of cognitive neuropsychological models of language representation and processing, an English semantic assessment battery comprising six subtests covering auditory and written input and output modalities was developed. Normative data were collected from neurologically-intact English-dominant adults ($N= 33$, age range 50 – 76 years) and analyzed to study the effects of psycholinguistic variables (word class, word familiarity, language processing modality and types of task) on normal language processing.

Results: The Written Picture Naming subtest was found to be internally reliable (Cronbach's alpha value > 0.70). It is expected that there would be main effects of the psycholinguistic variables on the performance of normal adults.

Conclusion: This assessment battery will enable Speech and Language Pathologists (SLPs) to make informed decisions to provide appropriate intervention for Singaporean English-dominant adults with aphasia.

Keywords: Singapore; Bilingual; Semantic Processing; Language Problems; Speech Therapy