

National University of Singapore
 Division of Graduate Medical Studies
 Master of Science (Speech & Language Pathology)
 SLP 5116 Research Project Titles

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Abstract 1: SGH Aphasia Test in Mandarin and English

Currently, there are few locally standardised aphasia assessments suited to the Singaporean population. The Singapore Aphasia Test (SGAT) was developed to address limitations to aphasia assessment locally. Normative data was collected for English and Mandarin-speaking Singaporeans and analysed for age, gender and education effects. In addition, the SGAT was compared against a well-established aphasia test, the Boston Diagnostic Aphasia Examination (BDAE) Short Form (Goodglass, Kaplan & Barresi, 2001). Participants performed at ceiling on the SGAT with no significant effects on test performance across the listed variables. Scores on the SGAT were comparable to those on the BDAE Short Form, except where test items contained cultural bias. The SGAT was found to be applicable across age, gender and education, and appears to be better suited for the local population than the BDAE. The SGAT will assist assessment and intervention planning for speech and language therapists in Singapore.

Abstract 2: Picture Naming Norms in English (40-60 year olds) using Masterson & Druks Object & Action Battery

An adaptation of Druks and Masterson's (2007) Object and Action Naming Battery (OANB) into Mandarin for the Singaporean adult population was done because there is a lack of formal assessment for Mandarin-speaking adults with aphasia. The morphosyllabic nature of Mandarin and cultural differences further justify this study. A pilot study on 10 adults was first conducted to select the pictures. The final sample of 32 participants aged 40 to 82 years old named 112 pictures of objects and 77 pictures of actions. A coding scheme from 1 to 10 was devised to capture the variety of responses. Pictures items that were incorrectly named because of poor picture clarity, lack of naming specificity, poor naming agreement and low frequency were eliminated. The final set of pictures consisting of 94 objects and 62 actions were tested for reliability and percentile norms were developed. This adaptation of the ONAB provides useful guidelines for clinical assessment.

Abstract 3: Picture Naming Norms in Mandarin (40-60 year olds) using Masterson & Druks Object & Action Battery

There are no local norms for a picture naming battery for identifying patients with communication disorders in Singapore. A pilot study was done and a reduced version of Druks & Masterson's (2000) Object and Action Naming Battery (OANB) consisting of 112 object and 77 action pictures was used to obtain normative data from 42 neurologically-intact English-speaking adults aged 40 years old and above. After item analyses, data collected from 90 objects and 70 action pictures was validated against the Bilingual Language Assessment Battery (BLAB) (Rickard Liow & Sze, unpublished). Consistent with previous work, the results showed significant better performance for nouns than verbs and for participants with self-reported higher language proficiency.

Abstract 4: Picture Naming (Druks & Masterson) in Malay with validation in Kindergarten using BLAB scores

The lack of localised language assessments in Singapore increases the risk of missing or misdiagnosing language disorders. Preschool is a crucial time for linguistic development, so early identification of language disorders is important for effective intervention before school-entry. The aim of this research project is to collect norms on expressive single-word vocabulary from twenty-five Malay-dominant speaking Singaporean preschoolers (N=25, aged 4:6 to 5:4 years) to develop appropriate assessment tools. Expressive vocabulary was collected using 112 object and 77 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. The BLAB requires spoken-word to picture matching (1 word and 4 pictures) of 100 items. Thus the results indicate an object naming advantage over action naming but also surprising levels of code mixing. The heterogeneity of results may also reflect varied language proficiency levels within the sample.

Abstract 5: Teachers' voices across day: subjective/objective & amplification

The purpose of this investigation was to study voice changes during a teacher's working day in order to understand the relationship between vocal loading and fatigue in real working situations. Thirty-four participants' voices were recorded before and after their teaching day. There were significant acoustic changes in fundamental frequency (F0) (increase), sound pressure level (SPL) (increase) and noise harmonic ratio (NHR) (decrease). Self-reported vocal fatigue also increased significantly. The study also evaluated whether the use of voice amplification to teach in class for a day would result in less damage to the voice. Participants' (12 teachers) SPL was significantly reduced and maximum phonation time (MPT) significantly longer on the day when amplification was used. In comparing teachers who report more compared to less voice problem symptoms, teachers with a high vocal handicap index (VHI) score increased their SPL significantly more over a working day than those with a low VHI score.

Abstract 6: Nasalance scores in normal/healthy & Nasal sentences

There are no established nasalance norms for Singaporean speakers of English. Also, current nasometry speech protocols used can be lexically and syntactically challenging, difficult for use with young, non-literate and non-compliant children. Normative data for two standard speech protocols – Zoo Passage (Fletcher, 1972), Nasal Sentences (Fletcher, 1978) and one newer, simpler test – The MacKay- Kummer Simplified Nasometric Assessment Procedures Revised (SNAP test- R) (Kummer, 2005) were collected from typically developing children aged 3:0 - 8:11 ($N = 53$) in Singapore. Results suggested that Singaporean nasalance norms differed significantly from overseas norms. The SNAP test- R was also found to have good concurrent validity and internal reliability. Clinical implications of these findings are that Speech and Language Therapists (SLTs) working with children who speak Singaporean English should reference local normative data in nasometry assessments. They can also use the SNAP test- R to increase compliance and accuracy of nasometry assessments.

Abstract 7: Communication attitudes and expectations of negative social evaluation

Although there has been extensive research on the influence of psychosocial issues on stuttering in monolinguals, there is still limited research on bilingual stuttering populations. This study explored the relationship between attitude towards communication, fear of negative evaluation, stuttering severity and language dominance in BWS. English-dominant, English-Mandarin bilinguals who stutter (BWS; $N = 20$) and bilinguals who do not stutter (BWNS; $N = 84$) completed the English and Mandarin modified versions of the S-24 scale and the Fear of Negative Evaluation scale. For BWNS, the scores of both scales were affected by language dominance but not for age and educational group. There was no gender effect on the scores of the S-24 scale in both languages, and the Fear of Negative Evaluation scale in English. However, the women BWNS had a significantly higher fear of negative evaluation in Mandarin as compared to the men. For BWS, the scores of both scales were affected by stuttering and language dominance. The study revealed that a person with a poor attitude towards communication may also have a high expectation of negative evaluation. Language dominance and stuttering were found to have affected the attitude towards communication and fear of negative evaluation of our participants.

Abstract 8: Cleft Children's Spelling

Preliminary studies on cognitive and language skills in Asian children with clefts have indicated that they have elevated learning and language difficulties. Learning difficulties can affect language development, which can then affect literacy development in school-aged children. Despite this, we have limited knowledge of the literacy skills of these children, especially in spelling. Spelling difficulties can affect a child's academic development. To address the limited understanding of these children's literacy skills, 2 experiments were conducted. Experiment 1 compared 10 children with nonsyndromic clefts (CL/P) against 10 controls, and Experiment 2 compared 5 children with CL/P with articulation disorders against 5 children with CL/P without articulation disorders on measures of spelling, articulation, verbal memory and phonological awareness. Participants were aged between 6 and 8 years, matched for age and first language. In Experiment 1, controls performed significantly better on phonological awareness and nonword spelling. There were positive relationships between phoneme isolation and real word spelling in the control group, and between phoneme deletion and nonword spelling in the CL/P group. There were no significant findings in Experiment 2. Overall results suggest that children with CL/P may benefit from speech intervention for phonological awareness to support their literacy skills.

Abstract 9: Effects of a Multimodal AAC Intervention Approach on pragmatic Functions in Children with Down Syndrome

This study investigated whether teaching children with Down syndrome new words using three modalities (speech, signs and visuals) would facilitate their communicative functions as measured by their ability to sustain or initiate joint attention in a language sample analysis, compared to a control condition where children were taught new words using only two modalities (speech and signs). The study involved 13 children with Down syndrome (ages ranging from 2 to 5 years of age) who are in the early intervention programme at a special school in Singapore, with no visual or hearing impairment, with a cognitive age between 12 to 36 months and a receptive vocabulary of at least 30 words. The children were divided into two groups matched on verbal and non-verbal cognitive ages and were randomly allocated to receive either the multimodal or dual modal teaching strategy in learning a total of 16 new words. Intervention involved 30-minute sessions with the teacher, speech therapist and parent for six times each, over a period of 10 weeks. The analysis showed an increased change in rate of initiation of joint attention after receiving the multimodal teaching approach regardless of the order of receiving them, possibly due to the increased opportunities for shared referencing in the multimodal approach. It is suggested that a longer time period may be needed for generalization and consolidation of skills learnt before a significant effect on communicative functions can be seen. Implications of findings and general considerations of intervention are discussed.

Abstract 10: Effects of Intervention Modality and Parents' Attitudes towards AAC on Language Development in Children with Down Syndrome

Children with Down syndrome face particular difficulty with language learning. This study investigated if different teaching approaches would differentially affect their vocabulary acquisition. A within subject cross-over study design was used to investigate the hypotheses that multimodal intervention would improve vocabulary, parents' attitudes towards their children learning and using signs and picture symbols, and parents' frequency of sign use more than dual modal intervention. Participants were 13 children with Down syndrome from a special school who received both multimodal and dual modal interventions over two 6-weeks periods, their parents, speech therapists and teachers. Vocabulary outcomes were measured from transcribed language samples and parents' reports. Parents' attitudes and frequency of sign use were quantified from a newly constructed questionnaire and coded language samples respectively. Results showed a greater increase in vocabulary after multimodal intervention and a positive correlation between parents' attitudes, their frequency of sign use and their children's vocabulary.

Abstract 11: Sec 1 computerised lang/reading/spelling & NV

At present, there are no language assessment tools that can adequately and efficiently screen bilingual adolescents in mainstream secondary schools in Singapore. Thus, students with language disorders are not routinely identified and do not receive much-needed additional learning support. A locally-developed language screener that can be administered by teachers will enable mass screening in schools to identify adolescent students at risk of having language disorders so that more in-depth evaluation and appropriate intervention or adaptation of classroom teaching styles and materials can take place. This thesis seeks to pilot a culturally and linguistically-appropriate bilingual adolescent language screener that can identify adolescent students at risk of a language disorder through mass testing.

Abstract 12: P3 computerised lang/reading/spelling & NV

Due to difficulties conducting screening for language disorders in younger children in a heterogeneous multilingual society, these children possibly remain undiagnosed even in their adolescence. It is crucial to develop a screener suitable for the bilingual adolescent population, assessing a range of language abilities. This study explores the need for separate norms based on language dominance, and reports the relationship between performance on the screener and formal subtests to determine which components of the screening tool should be retained. A screening battery assessing spelling, syntactic-morphological knowledge and reading comprehension was administered to 315 bilingual male adolescents. A subset of this sample ($N = 132$) were administered subtests of formal assessments for reading, sentence repetition and semantic relationship knowledge. There was limited evidence to suggest that language dominance affected performance on the screener. Of the three tests in the screener, spelling scores were the most predictive of performance on formal subtests.

Abstract 13: Gesture and Theory of Mind in ASD 5-6 year olds

Individuals with Autism (ASD) have long been documented to be deficient in Theory of Mind (ToM) ability, The present study looks at a subset of ToM, emotional understanding. This skill is of significance when determining level of social integration and acceptance in the environments in which they are a part of. The aim here is to determine an intervention for preschoolers with Autism that can help circumvent possible socialization problems due to a lack of emotional understanding. To this end, imitation training was conducted, as imitation has been widely accepted to be impaired in ASD in addition to being a hypothesized precursor to ToM development. Three types of imitation training were carried out with seven preschoolers with ASD: Non-meaningful and meaningful gesture, and orofacial imitation. An emotional understanding test was developed and tested at pre-training and post training. Results showed that the exception of one subject, all improved in emotional understanding scores at post-test, suggesting that imitation training may facilitate emotional understanding in ASD. However due to the small sample size of the study, further research needs to be done with a larger cohort of children to reach definitive conclusions to validate this hypothesis. The observations made during training as well as possible factors affecting performance on emotional understanding and imitation training were also discussed.

Abstract 14: Norming Screening Test in Mandarin

There is currently no quick and reliable aphasia screening tool for the local Mandarin-speaking community. In an acute hospital setting, the use of comprehensive language assessment batteries is often not practical due to time constraints. Hence, based on a cognitive neuropsychological model of Chinese language, the Mandarin version of the NUHS Aphasia Screening Test (NUHS-AST) was developed to provide a culturally and linguistically appropriate screener for the local hospital setting.

This normative study of the Mandarin NUHS-AST comprised two phases. The first phase involved analysing the sensitivity of the stimuli and involved a pilot study on 5 neurologically-intact participants and 5 aphasic stroke patients, age ranging from 40 to 60 years old. The pilot study consisted of 10 subtests with 250 stimuli that assessed the four modalities of language processes. From the pilot study, 127 stimuli comprising 82 culturally appropriate line drawings were selected for the normative study which was administered to one cohort ($N = 42$, age range 40-60 years old) of neurologically-intact adults who reported Chinese to be their dominant language. The normative profiles developed suggested that language dominance influenced processing abilities, especially reading and writing skills. The results were also used as a reference for the language profiling of 4 aphasic patients using the NUHS-AST in this report.

Abstract 15: Case Studies using AAC with dementia/TBI

Many researchers have investigated the efficacy of the cognitive neuropsychological approach for people with oral language difficulty due to neurological damage. There have been limited studies investigating the effectiveness of the approach for people with spelling problem. A treatment that involved repeated copying and exposure strengthened the words' representation in the orthographic output lexicon, thus compensating for the deficit at the output buffer. It resulted in significant item-specific treatment effect. Additionally, most of the studies using the cognitive neuropsychological approach were done on people with stroke. The work on people with dementia was more limited. Case studies could thus make an important contribution to evidence-based practice in treating people with dementia. In this study, the treatment strengthened the words' representations in the phonological output lexicon via the summation of activation from semantics and orthographic input lexicon. It resulted in significant item-specific improvement with potential for transfer to functional settings. The study also revealed many factors important for treatment planning for people with dementia. Finally, a comparison between the two case studies revealed reasons for the differential response to treatment and the clinical implications of such a difference.

Abstract 16: Adult Swallowing instructions

Making appropriate recommendations for safe drinking among different age groups requires understanding of possible differences between young and older adults in following them. This study investigated the relationship between age and instructions of drinking speed. Thirty young (mean age 24.7 years) and 30 older (mean age 66.9 years) healthy female participants were recruited to drink three cups of water with different instructions each: “as they normally would”, “as quickly as is comfortably possible”, and “drink slowly”. Results showed that when asked to drink quickly, both age groups increased drinking speed to a similar extent. However when asked to drink slowly, there was significantly less reduction in older adults’ drinking speed and their bolus size was significantly larger than young adults’. This suggests that in clinic, advice of drinking slowly may be insufficient precaution for older patients. Supervised feeding and spoon drinking were explored as alternatives to reliance on verbal instructions.

Abstract 17: DEAP norms with PCF children

This study investigated the effect of language dominance on the acquisition and use of English consonants in Singaporean English-Mandarin bilingual children. Sixty-seven children, aged between 3;6-4;5, took part in this study. The Diagnostic Evaluation of Articulation and Phonology (Dodd, Zhu, Crosbie, Holm and Ozanne, 2002) was used to assess phonological accuracy, age of phoneme emergence and error processes. Overall, it was found that language dominance plays a role in young Singaporean children’s English phonological development. The English-dominant children develop English phonology faster than their Mandarin-dominant counterparts. Language dominance also affected type and extent of error processes produced. Preliminary norms were developed which will be of use to Speech Language Pathologists’ assessment of speech sound disorders.

Abstract 18: Standardising Semantic Test (English) for MCI

With life expectancy increasing worldwide, the number of elderly at risk of dementia increases, potentially posing significant repercussions on caregivers and the individuals inflicted with the disease. There is presently no culturally appropriate and standardized screening tool based on local language norms. The first aim of this research project is to develop a Language Screening Assessment (LSA-M) which can be used with the local Mandarin-speaking population. The LSA-M comprised of: Sentence Comprehension, Story Comprehension, Picture Naming, Verbal Fluency, Picture Description, and Matching Semantically-related Items. The second aim was to collate normative data for cognitive tests (Raven's Coloured Progressive Matrices (RCPM) and Rapid Automatized naming (RAN) and Delayed Picture Recall) and the LSA-M. This will help establish threshold scores that pick up 'real' language deficits rather than marks lost due to culturally inappropriate stimuli. 36 healthy Mandarin-speaking elderly in Singapore participated in the normative study. Results showed that no significant differences were found between *Object* and *Action Naming* and between the categories (animals and fruits) for *Verbal Fluency*. Majority of the elderly sampled has achieved ceiling or close to maximum scores for most tests. Main effects of educational level and age, however, were observed in *Story Comprehension*, *Picture Comprehension* and *Categorical Naming Tasks*. The next step is to assess Mandarin-speaking persons diagnosed with dementia and determine the LSA's diagnostic value in picking up cognitive and language deficits.

Abstract 19: Standardising Semantic Test (Mandarin) for MCI

The impact of communication problems in both patients with dementia (PWD) and their caregivers is prominent. Early identification of cognitive and language deficits in patients with dementia (PWD) enables early intervention or compensatory strategies to be taught, thus reducing the frustration. A Cognitive and Language Screening (CALS) was developed in this study to aid early identification of such deficits. Thus the first purpose of this study was to collect data on the CALS for normal elderly persons (N = 29, aged 50 to 65 years). The results of the normative data emphasized the importance of cognition in language. Since there is a period of time that cognition is already affected before the definite clinical diagnosis of dementia, cognitive and language deficits may already be picked up before the definite clinical diagnosis of dementia. 2 case studies of people at risk of dementia were examined to see if any cognitive and in particular, language deficits could be detected using the CALS. The results of the 2 case studies show that language deficits are already present and this is likely due to the affected cognition. Differences in the performance between the 2 case studies at risk of dementia and the normative population suggest that the CALS may be a useful tool in early identification of cognitive and language deficits.