

2nd MSc (SLP) Research Seminar
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2nd MSc (SLP) Student Research Seminar

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Abstract 2: Vocalisations of Young Children with Cleft Lip and/or Palate: Early Results

Abstract 3: Early Spelling Skills of Bilingual Children with Non-syndromic Cleft Lip and/or Palate

Abstract 4: Early Reading Abilities of Bilingual Children with Nonsyndromic Clefts

Abstract 5: Language Dominance Effects on Speech Sound Development: Single-Word vs Connected Speech Assessments

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Abstract 1

Vocabulary Development of Bilingual Toddlers with Cleft Lip and/or Palate

LEE See Fei Freda, Selena Ee-Li YOUNG, Melanie CHASTAN, TAN Seok Hui

Research on bilingual children with non-syndromic cleft lip and/or palate (CL/P) has shown expressive language delays in children aged three-years and above (Young et al., 2010). The aim of this study was to address the lack of research on language development in younger bilingual toddlers with CL/P. Twelve pairs of toddlers with CL/P or typical development, aged between 0;11 and 2;2 (at Time-point 1), were compared for age at first words, as well as expressive vocabulary using the Singapore Communicative Development Inventory (SCDI), at Time-point 1 (T_1), and four months later at Time-point 2 (T_2). Preliminary results indicate no significant differences in age at first words, English expressive vocabulary between typically developing (TD) toddlers and toddlers with CL/P at either time-point. This suggests that prior to 30 months, language intervention may not be necessary for bilingual toddlers with CL/P. However, further research on conceptual expressive vocabulary is desirable.

Keywords: Cleft Palate, Children, Bilingual, Lexical Development

Abstract 2

Vocalisations of Young Children with Cleft Lip and/or Palate: Early Results

YANG Ailian Fidelia, Selena Ee-Li YOUNG, Melanie CHASTAN, TAN Seok Hui

Studies on vocalisations of infants and toddlers with cleft lip and/or palate (CL/P) have yielded mixed findings regarding consonant inventory sizes of young children with CL/P compared with typically-developing (TD) children (Chapman & Hardin, 1992; Scherer & D'Antonio, 1995). For this study, a matched-pairs comparison of the consonant inventory size of 11 toddlers (aged between 14-25 months) with repaired CL/P and their TD peers was made. Audio-recordings of these 22 children were made for 30 minutes during free play, and 60 consecutive utterances for each child were phonetically transcribed to obtain individual consonant inventories. Preliminary results indicate no significant difference in the number of consonants produced between the two groups. Consonant inventory sizes of children with CL/P and TD children appear to be comparable at this early stage, suggesting there is a positive impact of therapy and regular monitoring for children with CL/P. Future work with a larger sample is recommended.

Keywords: Cleft Lip, Cleft Palate, Toddlers, Children, Consonant Inventory, Speech Therapy

Abstract 3

Early Spelling Skills of Bilingual Children with Non-syndromic Cleft Lip and/or Palate

Dawn Patricia Chuan Yu YOUNG, Selena Ee-Li YOUNG, Susan J. RICKARD LIOW, Lay Choo LEE & Michelle Heng Yue CHEONG

Literacy skills are fundamental for academic success, but little is known about the early spelling development of children with cleft lip and/or palate (CL/P). Seventeen English-dominant and eighteen Mandarin-dominant bilingual children with non-syndromic CL/P (aged between 4;0 and 7;0) were matched pairwise with English- and Mandarin-dominant children with typical development (TD). Mandarin-dominant children with CL/P showed significantly poorer spelling and phonological awareness compared with their Mandarin-dominant TD peers. These differences were not observed between the English-dominant children with CL/P and TD. Slower rapid naming ability, but not weaker English receptive vocabulary, was found to be positively correlated with poorer spelling abilities in children with CL/P. In contrast, English receptive vocabulary, but not rapid naming, was correlated with spelling in children with TD. Findings indicate group differences in the development of cognitive-linguistic processes and the need for early literacy screening, using rapid naming tasks, in children with CL/P.

Keywords: Bilingualism, Rapid Automatic Naming (RAN), Phonology, Early Intervention

Abstract 4

Early Reading Abilities of Bilingual Children with Nonsyndromic Clefts

Michelle Heng Yue CHEONG, Selena Ee-Li YOUNG, Susan J. RICKARD LIOW, Lay Choo LEE, & Dawn Patricia Chuan Yu YOUNG

Monolingual children with cleft lip and/or palate (CL/P) have been reported to have higher-than-average rates of reading difficulty but the underlying factors are not well understood, and little is known about the literacy abilities of bilingual children with CL/P. Thirty-five English-Mandarin bilingual children with CL/P (between 3 to 7 years) were matched pairwise on age, socioeconomic status, and language dominance to a group of typically-developing (TD) children. All participants were assessed on single-word reading accuracy (WRAT-4) and related cognitive-linguistic factors, such as vocabulary and rapid automatized naming (RAN). Reading accuracy was not significantly different between CL/P and TD groups. However, faster RAN correlated with better reading accuracy in the CL/P but not the TD group, while receptive vocabulary correlated with reading accuracy in the TD but not the CL/P group. These findings may suggest that different factors underlie reading in children with CL/P, and that literacy assessment and intervention should be tailored accordingly.

Keywords: Screening Literacy, Bilinguals, Cleft Lip, Cleft Palate

Abstract 5

Language Dominance Effects on Speech Sound Development: Single-Word vs Connected Speech Assessments

HO Sher Min, Susan J. RICKARD LIOW, Helen CHANDLER-YEO, YEO Xin Ying Delia

The development of phonology in bilinguals depends on their language dominance (Holm & Dodd, 1999). There are also discrepancies between target word production in single words and in connected speech (Howard, 2012). These known differences suggest that gathering local norms for single-word and connected speech is important for reliable clinical assessment in Singapore. For this study 50 English-Mandarin bilingual children (25 English-dominant; 25 Mandarin-dominant) aged between 4;0 to 4;5, were tested on the Phonology (single-word) subtest of the Diagnostic Evaluation of Articulation and Phonology (DEAP, Dodd et al., 2002) and a novel Connected Speech Assessment. The percentage of consonants correct and qualitative analyses on the single-word and connected speech tasks will be compared between the two language dominance groups. Differences and implications will be discussed.

Keywords: Bilingualism, Singapore Norms, Phonological Processes

Abstract 6

Language Dominance and Bilingual Speech-Sound Development

CHER Poh Gaik, Susan J. RICKARD LIOW, TNG Siok Keng

Bilingualism results in speech-sound development (SD) that differs from that of monolingual children (Hambly et al., 2013; Holm et al., 2005). This suggests that published milestones for speech-sound development in monolingual English-speaking children may not be reliable for local bilingual children. The aim of this study was to describe the English speech-sound development of bilingual Singaporean children by examining phonological processes (PP) in their speech. The participants (aged between 5;7 and 6;6) were 102 typically-developing children from three different language dominance groups (English-L1, Mandarin-L1 and Malay-L1). Each child completed a 20-item picture-naming task in English. Responses were transcribed phonetically and analysed for presence and type of phonological process. The results showed that within this age range, only consonant-cluster errors persisted, while the other phonological processes appeared to have ceased for all three L1 groups. Importantly, Malay-dominant children were significantly more likely to produce consonant-cluster errors than their English- or Mandarin-dominant age peers. This finding further supports the view that language dominance influences speech-sound development and should be considered during clinical assessments of bilingual children.

Keywords: Early Childhood, Speech Milestones, Speech Errors

Abstract 7

Cognitive-linguistic Assessment for Preschool Children: A Case-Series Study

KUAN Yvonne, Eugenia TAN, Susan J. RICKARD LIOW

There is no standardized bilingual assessment tool available that can be used to differentiate between Singaporean children with language impairments and those who are English second language learners (Teoh et al., 2012). The Cognitive-Linguistic Profile (Lee, 2013) is a recently developed assessment battery which has potential to address this gap. It comprises 11 subtests suitable for Singaporean English-L1 and Mandarin-L1 bilingual pre-schoolers (aged 3; 7 - 6; 7) and covers nonverbal processing, short-term memory, expressive and receptive vocabulary, phonological awareness, and early literacy skills. The aim of this study was to evaluate the clinical utility of the Cognitive-Linguistic Profile using a case-series of Singaporean English-Mandarin bilingual pre-schoolers (aged 4; 2 - 5; 8) with four different language problems. Test-retest results showed positive indications of the tool's ability to reflect different language profiles, and its sensitivity to change within a 3-month period. The feasibility of using this new tool in clinical settings is discussed.

Keywords: At-Risk, Specific Language Impairment, Language Delay

Abstract 8

Tongue Measurements Using the IOPI on Singaporean Children

Valerene Si Jie TAN, Janice LEONG, Susan J. Rickard LIOW

Tongue weakness affects speech and swallowing. Currently, there are no normative tongue measures for the Singaporean paediatric population. The aims of this study were to: 1) Obtain normative tongue measurements; 2) Understand the relationship between age, gender and ethnicity (Chinese/Malay) in relation to tongue measures, and 3) to discuss the clinical implications of applying normative measures on children with cerebral palsy (CP). Part 1: Tongue measures were obtained from 35 children between 4 years old and 5 years 11 months, with no speech and swallowing disorders, using the Iowa Oral Performance Instrument (IOPI). Maximum tongue pressure (Pmax) values were found to increase with age with no conclusive finding regarding maximum tongue endurance (Emax). Part 2: Pmax values from two children with CP (with and without dysphagia) were obtained and compared to the new normative data. Clinical implications are discussed.

Keywords: Tongue Strength, Tongue Endurance, Dysphagia, Paediatric, Isometric Pressure, Singaporean

Abstract 9

Effects of an Exercise Program on Verbal Output of Nonverbal ASD Children

TAN Li Hao Bernard, KANG Poh Sim & Susan J. RICKARD LIOW

Treatment of Autism Spectrum Disorder (ASD) by speech-language pathologists has traditionally focused directly on core deficits in language use, social impairments and behavioural problems. These intervention methods have proven reasonably effective (Vismara & Rogers, 2010), but could be supplemented with regular physical exercise, which is often overlooked for this population. The purpose of this study was to determine the effectiveness of a 12-week exercise program (Voice Stimulation program - VSP) on the verbal output of 8 nonverbal children with ASD. In the first 6 weeks (Phase I), 4 children (group A) received the VSP. This was followed by another 6-week period (Phase II), where all 8 children (groups A & B) received the VSP. Following treatment, improvements in syllable imitation were seen in both groups but there were no improvements in the duration of sustained vocalisation. Results suggest that VSP improved verbal output of the participants overall, and indicate the potential of incorporating regular physical exercise in intervention for this population.

Keywords: Physical Activity, Low-Functioning Autism, Speech Output, Vocal Output

Abstract 10

Nasalance Norms for Singaporean Primary School Children: Influence of Language Background

Alice TAY, LIM Wen Xin, Lynn, Selena Ee-Li YOUNG & Susan J. RICKARD LIOW

Nasometry assessments provide an objective measure of nasality and are used in clinical assessment of resonance disorders. Various studies have indicated different nasalance values across languages and dialects (Leeper et al., 1992; Brunnergard & van Doorn, 2009). The aim of this study was to establish nasalance norms for bilingual Chinese Singaporean children. Normative data for standard Singapore English and Mandarin speech protocols were collected from 44 typically-developing bilingual Chinese Singaporean children, aged between 6 to 9 years (26 English-dominant, 18 Mandarin-dominant). Preliminary results revealed that the median nasalance scores of Singaporean bilingual children on the English speech protocol differ from published norms for monolingual English speakers elsewhere, reflecting the unique phonetic system of spoken English in Singapore. However, no significant difference in nasalance was found between the English-dominant and Mandarin-dominant groups within Singapore. Local normative data will help clinicians more accurately diagnose resonance disorders in bilingual Singaporean children.

Keywords: Nasometer, Language Dominance, Bilingual Children

Abstract 11

Nasalance Norms for Singaporean Pre-schoolers: Influence of Language Background

LIM Wen Xin Lynn, Alice TAY, Selena Ee-Li YOUNG & Susan J. RICKARD LIOW

Nasalance is the most widely used non-invasive objective measure that relates to perceived nasality. This measure is sensitive to speaker characteristics, and effects of age, gender and language background on nasalance scores have been noted in typically-developing children and adults. Given Singapore's multilingual background, establishing local nasalance norms for speakers of Singapore English and Mandarin, will provide a more accurate reference point for assessing resonance disorders in the local population. In this study, normative data for standard Singapore English and Mandarin speech protocols were collected from 54 typically-developing ethnic Chinese bilingual Singaporean children aged between 4 and 6 years; 33 English-dominant (EL1) and 21 Mandarin-dominant (CL1) children. Preliminary results indicate that the median nasalance scores of Singaporean children are different from those of other English-speaking children internationally, but nasalance scores of the EL1 children did not differ significantly from that of the CL1 group across all speech protocols.

Keywords: Nasometer, Language Dominance, Normal Singaporean Children

Abstract 12

Cognitive-Communication Screener for Early Dementia/MCI in the English-Dominant Population

Karen CHIN Chien Ling, Sajjia Binte JALIL & Susan J. RICKARD LIOW

Dementia and Mild Cognitive Impairment (MCI) are increasingly prevalent in Singapore (MOH, 2013). The development of a sensitive and reliable cognitive-communication screener for the local population is important for early intervention programs which facilitate important decision-making and slower degeneration. A screener with eight cognitive-communication tasks and a functional communication questionnaire were developed. All items were designed to be culturally appropriate, and the data were normed on 30 neurologically-intact English-dominant locals aged between 41 and 68 years old. The findings will also be validated against patients with MCI or early dementia, to ensure its sensitivity in detecting these impairments.

Keywords: Elderly, Assessment, Memory, Language Screening, Geriatric

Abstract 13

Cognitive-Communication Screener for Early Dementia/MCI in the Mandarin-Dominant Population

POR Wan Ling, Sajlia Binte JALIL, & Susan J. RICKARD LIOW

As the prevalence of dementia and mild cognitive impairment (MCI) is predicted to increase rapidly over the coming years in Singapore (Ministry of Health, 2013), it is critical that older adults are screened for abnormal cognitive decline, and provided with intervention as early as possible. However, standardised culturally- and linguistically-appropriate screening tools are still not available for the local population. For this study, a cognitive-communication screener was developed for detecting early dementia and MCI. The battery comprises 8 verbal cognitive-communication tasks and a Functional Communication Questionnaire. The psychometric properties of this screening tool were examined by testing a sample of 30 neurologically intact Mandarin-dominant participants aged between 45 and 68 years. Preliminary investigation of the clinical utility and of the norms will also be performed using a case-study design involving participants who have provisional or confirmed diagnoses of dementia or MCI.

Keywords: Elderly, Assessment, Healthcare, Geriatric, Language Screening

Abstract 14

Cross-language Effects in Aphasia Therapy for English-Mandarin Bilinguals

Kristen KIONG Wan Li, FOO An Qi, Angie, Sajlia Binte JALIL, Susan J. RICKARD LIOW

Research on cross-language therapy for bilinguals with aphasia has focused on European languages. Limited resources in local clinics and the population of Singaporeans who speak English and Mandarin, suggest the usefulness of exploring cross-language intervention effects in order to gauge the effectiveness of therapy for bilingual patients. Two bilingual participants with aphasia, both more 6 months post-onset, were recruited for the study. They were both assessed in English and Mandarin for picture naming at five time points over 18 weeks: Two baselines (Week 1 and 3), after 5 weeks of Semantic Feature Analysis therapy (2-hour sessions) in their home language (one in Mandarin, one in English) and after five weeks of the similar therapy in the other language, and during a maintenance phase (Week 18). Results show some evidence of positive cross-language effects when items were being treated in the stronger language but gains were not maintained. Further qualitative analyses are planned.

Keywords: Picture Naming, Confrontation Naming, Vocabulary, Translation Equivalent, Single Words

Abstract 15

Surface Electromyography (sEMG) Fatigue Analysis Comparing Chin Tuck Against Resistance (CTAR) Against the Shaker Exercise

SZE Wei Ping, YOON Wai Lam, Nicolas R. ESCOFFIER, & Susan J. RICKARD LIOW

The purpose of both Shaker and Chin Tuck Against Resistance (CTAR) exercises is to improve swallowing through the strengthening of the suprahyoid muscles. However, a major limitation of the Shaker exercise was its early fatiguing of the sternocleidomastoid (SCM) (White et al., 2008). In this study, we aim to evaluate the extent CTAR recruits the suprahyoid and whether it fatigues SCM. 39 healthy adults performed both Shaker and CTAR exercises, while surface electromyography (sEMG) recordings on the suprahyoid and SCM were simultaneously collected. Strength (Maximum amplitude and Root Mean Square) and fatigue (Median frequency and percentage of determinism) measures showed CTAR activating the suprahyoid to a significantly greater extent. In addition, the rate of fatigue was significantly lower for the SCM compared to the suprahyoid, during CTAR. Together, these data provide evidence that unlike the Shaker exercise, CTAR is able to recruit the suprahyoid muscle, without substantially fatiguing the SCM.

Keywords: Dysphagia Therapy, Rehabilitation, Deglutition, Spectral Analysis

Abstract 16

Factors Affecting Dysphagia in Patients with Cervical Osteophytes

ENG Tze Hao, Sajlia Binte JALIL, Susan J. RICKARD LIOW

Current management of dysphagia in patients with cervical osteophytes (PCO) is problematic due to a lack of understanding of the impact of factors affecting dysphagia in PCO. Data such as medical diagnosis, case and medical history of the patient, and location of anterior cervical osteophytes were taken from 151 Videofluoroscopic Swallowing Studies (VFSS) reports of PCO and their corresponding VFSS videos. Penetration/aspiration events were also rated on the Penetration-Aspiration Scale (PAS) and whether the presence of osteophytes was likely to contribute to dysphagia. Medical diagnosis and age of the patient are expected to be predictive risk factors for dysphagia in PCO. This provides useful information for future identification of such patients.

Keywords: Bone Spur, Mechanical Obstruction, Geriatrics

Abstract 17

Efficacy of VitalStim Therapy on Patients with Dysphagia

WEE Xuefeng, FOO An Qi Angie, Sajlia Binte JALIL & Susan J. Rickard LIOW

The aim of this study was to evaluate the efficacy of VitalStim Therapy (VST) with traditional swallowing therapy (TST) on patients with dysphagia. There were two parts to this study. (1) Using videofluoroscopy reports from 7 male patients (47 to 85 years old) with moderate to severe oropharyngeal dysphagia, the swallow function scale (SFS), penetration-aspiration scale (P/A) and functional oral intake scale (FOIS), were used to rate individual's swallow function prior to, and after, VST and TST. The review found that 3 out of the 7 patients benefitted from VST and TST. (2) A case study of patient with acute bilateral pontine stroke who had undergone 12 sessions of VST with TST was conducted, and the above method and scales were also used to determine the patient's swallow function prior to, and after, VST and TST. The patient showed improvements on SFS with no change on FOIS and P/A scale.

Keywords: Neuromuscular Electrical Stimulation (NMES)

Abstract 18

Citric Acid Cough Reflex Testing: Normative Data in the Asian Population

BOH Fengmei Brenda, Michelle BOO, Valerie LIM Puay Cheng, GOH Huai Zhi

Current clinical bedside tests of swallowing such as pulse oximetry and cervical auscultation are unreliable in detecting silent aspiration (Ramsey et al., 2003). Recent research has identified citric acid cough reflex testing (CRT) as a potentially reliable clinical tool in identifying patients at risk of silent aspiration (Miles et al., 2013). The aim of this study is to establish normative data for suppressed cough thresholds (SCT) in CRT, and to investigate the effects of gender and diurnal variation. 167 healthy Asians of Chinese, Indian, Malay and Eurasian ethnicity between 21 to 60 years old were recruited. Participants inhaled nebulized citric acid in increasing concentrations from 0.4M to 1.2M. Results showed that 72.4% of participants triggered SCT at 1.2M. This data suggests that Asians may have similar SCT compared with a previous research study conducted on Caucasians (Monroe, 2010). Gender and diurnal variation differences were not found to significantly affect the SCT.

Keywords: Dysphagia, Inhalation Cough Challenge, Aspiration Pneumonia, Sex Differences, Fluctuations In The Day, Singapore

Abstract 19

Tongue Pressure and Endurance in Adults Using the IOPI

Kai Ting KOH, Selena Ee-Li YOUNG, Wai Lam YOON, & John Carson ALLEN Jr

Research on tongue pressure and endurance has been conducted on Caucasian populations (e.g., Crow & Ship, 1996). However, given the tongue anatomy differences between Caucasian and Asians, published findings may not be applicable to the predominantly-Asian Singaporean population. The purpose of this study was to develop norms for tongue pressure and endurance on healthy Singaporean adults. Using the Iowa Oral Performance Instrument on 197 adults (105 females, 92 males), mean tongue pressure and endurance were compared between Sexes, and Age Groups (Younger 21—39 years old, Middle 40—59 years old, Older 60—79 years old). Two-way ANOVA revealed higher tongue pressure in males than females, and Younger had higher tongue pressure and endurance than Older. Quantile regression was used to estimate age-related norms for tongue pressure and endurance. Findings can facilitate identifying individuals at risk of swallowing difficulties, setting treatment goals and monitoring progress for the local population.

Keywords: Tongue Strength, Tongue Fatigue, Isometric Pressure, Deglutition, Deglutition Disorders

Abstract 20

Relationship between Language Dominance and Anxiety in Adult Singaporeans

NG Jia Yue, Kristl ALPHONSO & Valerie LIM Puay Cheng

Current literature suggests that language dominance and anxiety have effects on stuttering severity. Specifically, English-dominant, English-Mandarin bilinguals who do not stutter (BWNS) have been found to have higher anxiety when communicating in their less dominant language (Yin, 2010). Whether BWNS with other language-dominance profiles show similar anxiety patterns is still unclear, and there are no anxiety measures based on local normative data. The relationship between language dominance and anxiety in BWNS who are English-dominant, Mandarin-dominant, and balanced English-Mandarin bilinguals was further investigated, and local normative data for use with bilinguals who stutter (BWS) was established. Participants (N=164) between 18 to 40 years old completed the Brief Fear of Negative Evaluation-Straightforward Items (BFNE-S) and the Unhelpful Thoughts and Beliefs about Stuttering (UTBAS). Preliminary results indicated that English-dominant BWNS had higher levels of anxiety in their less dominant language and both Mandarin-dominant and balanced BWNS had higher anxiety levels in English.

Keywords: Fluency, Norms

Abstract 21

Relationship between Personality and Voice Problems among Teachers

Christina TAN Li Fen, Laura CHUA Teng Teng and Melvin J. YAP

Neuroticism and Extraversion are two personality traits associated with voice disorders (i.e., dysphonia). The aim of this study was to examine if these two traits predict voice outcomes in teachers, a subclinical group at risk for dysphonia. Understanding the role of personality in relation to other occupational factors can contribute to developing an effective intervention programme for teachers. A survey design was used, with voice outcome measured using the self-reported Voice Symptoms Scale (VoiSS), and personality traits measured using the International Personality Item Pool Five-Factor Model (IPIP FFM) measure. Preliminary results, based on data from 249 teachers and lecturers, indicate that Extraversion predicts self-report voice outcome after controlling for gender, history of reflux symptoms, and anxiety, with lower scores on Extraversion predicting higher VoiSS scores. However, Neuroticism did not predict self-reported voice outcome.

Keywords: Teaching, Vocal Health, VoiSS, Voice Dysfunction, Voice Care