University of Reading

Construction of the Malay Cross-linguistic Lexical Task: a preliminary report

Article

Published Version

Yap, N. T., Razak, R. A., Haman, E., Łuniewska, M. and Treffers-Daller, J. ORCID: https://orcid.org/0000-0002-6575-6736 (2017) Construction of the Malay Cross-linguistic Lexical Task: a preliminary report. Language Studies Working Papers, 8. pp. 47-61. ISSN 2040-3461 Available at https://centaur.reading.ac.uk/70928/

It is advisable to refer to the publisher's version if you intend to cite from the work. See Guidance on citing.

Publisher: University of Reading

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the End User Agreement.

www.reading.ac.uk/centaur

CentAUR

University of Reading

Central Archive at the University of Reading

Reading's research outputs online

Vol. 8 (2017) 47-61 University of Reading ISSN 2040-3461
LANGUAGE STUDIES WORKING PAPERS
Editors: S. Payne and R. Leonard

Construction of the Malay Cross-linguistic Lexical Task: A Preliminary Report

Ngee Thai Yap, Rogayah A Razak, Ewa Haman, Magdalena Łuniewska and Jeanine Treffers-Daller

Funded by the Centre for Literacy and Multilingualism, University of Reading.

This paper reports on the development of the Malay Crosslinguistic Lexical Task (LITMUS-CLT) following the initiative of the COST Action IS0804 to create parallel tasks assessing various aspects of language development in bilingual and multilingual children (Armon-Lotem, de Jong, & Meir, 2015). LITMUS-CLTs are picture naming and picture choice tasks assessing receptive and expressive knowledge of single nouns and verbs. CLTs are created according to the same criteria in each language individually with the use of a common picture database. The development of the Malay CLT follows the procedure designed within the COST Action IS0804 with the modifications required for a new language in the sample of CLT languages. To that end, two preparatory studies with adult native speakers of Malay were conducted: a picture naming study using CLT picture base and a subjective age of acquisition (AoA) survey for words obtained in the picture naming study. The results of the two studies show that although Malay is typologically distant from languages included so far in the CLT sample, patterns similar to previous studies were obtained: nouns had higher naming agreement than verbs and AoA for all words was within the range of three to nine years (Łuniewska, et al., 2016).

1. Introduction

Specific language impairment (SLI) is a developmental language disorder diagnosed among children who do not have any hearing loss, neurological, intellectual or social-emotional impairment (Bishop, et al., 2000; Leonard, 1998; Tallal & Stark, 1981). Children with SLI may present deficits in linguistic skills, auditory memory, working memory and executive function skills (Armon-Lotem, et al., 2015). Currently, diagnosis of bilingual SLI children is challenging as typically developing bilingual children may share language characteristics that are found among monolingual SLI children (Armon-Lotem, et al., 2015). In Malaysia, a multilingual country, assessment of language development is a challenge as appropriate assessment tools are still lacking (Jin, et al. 2014). Although the ultimate goal to prepare tools for the many languages present in Malaysia is still beyond our reach, the initiative to construct assessment tools for Malay is considered a good starting point as Malay is a language spoken by most children in Malaysia either as a first or a second language.

The current project builds on work carried out in the framework of networking programme COST Action IS0804 (Bi-SLI; http://www.bi-sli.org/). Within this programme, one of the working groups (WG3) aimed at the development of fully comparable assessment tools for vocabulary and lexical processing for bilingual preschool children **(**Haman, et al., 2015). The Crosslinguistic Lexical Tasks (LITMUS-CLTs; henceforth: CLT) were developed in the framework of the COST Action IS0804 Bi-SLI ("Language impairment in a multilingual society: Linguistic patterns and the road to assessment"). The Action resulted in a battery of tasks measuring various aspects of language development, with the umbrella name of Language Impairment Testing in Multilingual Setting (LITMUS) to which CLT belongs. CLTs are designed to measure production and comprehension of nouns and verbs that are commonly

used by five-year-old children. The tasks involve picture naming and picture choice and provide information about accuracy as well as reaction times for each test item (when the e-version for touch screen is available). The unique procedure to construct lexical tasks for cross-linguistic comparisons in a parallel way and per strictly defined criteria was initially applied to the sample of 34 languages (Haman, et al., 2015). The procedure included several stages that required conducting of preparatory studies, and it was accomplished for 22 languages of the initial sample. Subsequently, two additional versions for languages not included from the very beginning in the sample were prepared (American English and Czech) following a modified procedure. The Malay CLTs will add to this number and this paper is the first one to describe the modified procedures introduced for the construction of CLTs for new languages.

Currently, CLTs exist for 18 languages that are spoken in Europe and six spoken outside Europe (including the two Englishes: American and South African; Afrikaans, Hebrew, isiXhosa and Lebanese). The contribution of the current paper is to extend the project to languages which originate in other parts of the world and are typologically and genetically different from languages included so far in the CLTs sample. To that end, we report on the development of a CLT for Malay, a language spoken by 270 million people in different countries (such as Singapore, Indonesia, Brunei) across the Straits of Malacca and South China seas, although our focus here is on the Malay language, formally called Bahasa Malaysia, the national language of Malaysia.

In this article we present the results of the first two stages in the process of the development of a CLT for Malay, namely selecting the CLT-candidate words via picture naming of pictures from the CLT picture base, and eliciting subjective Age of Acquisition ratings for the words which were elicited in the first stage. We begin with a sketch of the Malaysian context before moving on to reporting the results from the picture naming study and the Age of Acquistion study conducted with adult native speakers for the development of the CLT. Finally, we summarise the findings and provide some directions for future research.

2. Assessing Vocabulary in the Malaysian Context

Malaysia is a multilingual and broadly diglossic or even polyglossic country (Asmah, 1992; Hashim, 2014; How, et al. 2015). The verbal and speech repertoires of most Malaysians would include not only a native tongue or first language but also a second or further languages (Nair-Venugopal, 2000). Most Malaysians including Malays speak at least two but many, particularly those who are ethnically Chinese or Indian, speak three to five languages (Banks, 1993). This is supported through a study by Low, et al. (2010) which examined the language use practices among 100 ethnically Chinese mothers in urban Penang, Malaysia with their young children aged between six and 36 months. When the mothers were asked about languages they understand and speak, 92% of them reported speaking a combination of at least five languages which included Mandarin, English, Malay, Hokkien and Cantonese.

The diversity found in the multilingual profiles among Malaysian children presents a challenge for any large scale language assessment studies that represent Malaysian children. According to Ooi and Wong (2012) the process of collecting normative data for the development of assessment tools for each bilingual group can be arduous due to the local language mosaics. Malaysia has 20 ethno-linguistic groups (e.g., Chinese Hokkien, Chinese Cantonese, Malay, Kelantan Malay dialect, Tamil, Malaysian English, etc.) which combine in different ways to form a variety of bilingual groups. Each bilingual group can be characterized by its combination of languages, the time when the languages are learnt (simultaneous bilinguals, sequential bilinguals) and the function of the second language in different settings: home, school or national (How, et al., 2015).

Currently, there is a lack of locally developed normed referenced tests in local languages to meet speech language therapy (SLT) needs in Malaysia. The commonly used tool, the Malay

Development Language Assessment Kit (MDLAK), uses approximate norms as it has yet to be normed. The first standardized local language test available in Malaysia is the Malay Preschool Language Assessment Tool (A Razak, et al., 2010). Speech and language therapists in Malaysia rely on the use of imported tests from the west which are normally translated, adapted for local use and the scores interpreted loosely. Lack of studies on bilingual children's use of local languages adds to the difficulty in identifying SLI among bilingual children as reported by Ooi and Wong (2012). The prevalent use of a local variety of English, which is quite distinct from other standard varieties of English, in everyday conversations by bilingual speakers of English in Malaysia adds another dimension of complexity in the problem of assessing language development of Malaysian children. For example, the omission of grammatical morphemes is common in the local variety of English although ungrammatical in other standard varieties of English. Any assessment of English use among bilingual children in Malaysia based on standard varieties in English could result in a misdiagnosis of language delay. The lack of research on bilingualism for SLT purposes and the lack of assessment tools also contribute to SLI being under-diagnosed. The proposed Malay CLT tool would help to fill in the gap of limited assessment tools for the bilingual Malaysian population.

The state-run national primary schools administer a Literacy and Numeracy Screening (LINUS) test with LINUS version 1.0 testing Malay language literacy and Mathematics and the subsequent modified LINUS 2.0 includes the English Literacy component (Mohd Asraf, et al., 2016). LINUS is used to screen children between six and seven years old in national and vernacular schools in terms of literacy and numeracy skills (Hadzir, et al., 2016). It is important to assess the language abilities of children at the preschool level for intervention purposes before they enter formal schooling in national primary schools. A Malay Crosslingustic Lexical Task (Malay CLT) is a good start because the medium of instruction in national government schools is the Malay language and the ethnic Malays form the biggest group in the population in Malaysia i.e. Malays (50.1%), Chinese (22.6%), Indigenous (11.8%), Indians (6.7%), others (0.7%) and non-citizens (8.2%) (IndexMundi, 2016). Subsequently, CLTs for the different bilingual groups could be developed. The Malay CLT would be a good starting point as parallel versions of these lexical tasks can be developed to pave the way towards the development of an assessment tool for multilingual Malaysian children.

There are typological differences between the Malay language and English as pointed out by A Razak, et al. (2010). Malay does not have tense and instead uses time adverbials and auxiliaries as temporal markers. Malay, like most Malayo-Polynesian languages, has very few inflectional morphemes but is rich in derivational affixes (Onn, 1980). Accordingly, Malay children seem to employ mainly derivational morphology while English children uses both inflectional and derivational morphology. According to Abu Bakar, et al. (in preparation), Malay affixation constitutes a more important problem for children with SLI than the use of temporal adverbs.

It is clear that there is an urgent need for suitable language assessment tools to cater to the multilingual population in Malaysia, accounting both for language specificity and variety. The development of parallel or comparable lexical tasks seems to be a promising direction to take and it may be the key to addressing the challenges faced in assessing language development of multilingual children.

3. Cross-Linguistic Lexical Tasks

Cross-linguistic Lexical Tasks (CLTs) were developed (see Haman, et al., 2015) in line with the aim of COST Action IS0804 to propose new tools for disentangling the effects of bilingualism from those of Specific Language Impairment (SLI). Delayed and impaired lexical abilities are among the earliest indicators of risk for SLI (Leonard, 1998; Leonard & Deevy, 2004; Mc Gregor, et al., 2010). Although tools that measure lexical knowledge, in the form of

normed vocabulary tests are available in Europe, these tests have low predictive value in monolingual SLI diagnosis (e.g. Gray, et al. 1999; Spaulding, et al., 2013). Gatt, at al. (2008) as well as Hewitt, et al. (2005) and Mainela-Arnold, et al. (2010) argue that measures of lexical abilities which include accuracy in naming and processing speed can be used as diagnostic tools together with other measures to identify SLI children as their performance is relatively low compared to their typically developing peers.

Bilingualism is also becoming more common in Europe due to migration and as a result there is an increase in the number of bilingual children in schools and clinical settings. In the UK, the number of children for whom English is an additional language has risen year-on-year from 7.6% in 1997 to 16.2% in 2013 (Strand, et al. 2015). The profiles of bilingual children in the UK and elsewhere in Europe is also very varied because of the different language combinations and the wide range of migration histories which make it difficult to generalize. In clinical settings, diagnosis is often done in the majority language and most often only monolingual norms are available resulting in the possibility of overdiagnosis as the language development of bilingual children often does not conform to monolingual norms. However, for the diagnosis of SLI it is crucially important to be able to assess a child's performance in his/her languages (Chiat, et al., 2013).

The CLTs were conceived as a fully comparable assessment for vocabulary and lexical processing to enable objective testing of vocabulary and processing skills in a wide range of languages. Currently there are 24 language versions available for research purposes and the use of these versions for diagnostic purposes will be made possible when norming studies have been completed with the specific populations of monolingual and bilingual children.

The construction of CLTs is guided by two basic assumptions which may increase their utility as a diagnostic tool for bilingual SLI children. First, the word categories in the lexical tasks are limited to two universal categories: verbs and nouns. This is based on the observation that performance of verbs and nouns helps discriminate SLI children from their typically developing peers as the discrepancy between performance on the word classes are greater in SLI children (Andreu, et al., 2012; Black & Chiat, 2003; Skipp, et al., 2002). Second, the CLTs measure receptive as well as productive vocabulary and typically children perform better in the receptive task compared to the productive task (Benedict, 1979; Goldfield, 2000; Harris, at al., 1995). The production task is usually more difficult for SLI children as their speech may be impaired (Capone & McGregor, 2005; McGregor, et al., 2002; Messer & Dockrell, 2006).

CLTs were designed to account for both comparability among a wide range of languages and specificity for each language. Thus a common list of potential target words was established for 34 languages present in the design from the start of the project. The 299 words were selected in a preparatory picture naming study as mostly shared among all languages. Two indices were then used to establish word characteristics and their relative difficulty in each language: a complexity index related to word form (established by expert ratings) in each language and a subjective age of acquisition index obtained in an empirical study (Łuniewska et al., 2016). Subsequently the two indices were used for the selection of target words in each language which resulted in individual selection of words in each language according to the parameters obtained in the same manner but possibly with different values in each language. Therefore the target words themselves may differ across languages but the same characteristics were used in the selection of words in all versions of CLTs (see details in Haman, et al., 2015). For all 299 potential CLT target words (CLT-candidate words) new pictures were designed (many with more than one version to account for gender and racial variability across cultures involved in the project) which now form a CLT picture base (© University of Warsaw). Only pictures prepared exclusively for CLT are used in all subsequent studies in all languages.

Although 34 languages were involved when establishing the list of 299 words (see Łuniewska, et al., 2016), these languages were mostly Indo-European (26 out of 34). Other language families included Semitic (Hebrew, Lebanese and Maltese) and Uralic (Finnish and Hungarian) and other (Basque, IsiXhosa and Turkish). This poses a challenge for adding new

languages to the set of initial 34 languages. The Malay language (or any other non-Indo-European language present in Malaysia) was not included in the sample. Thus a modified procedure for including new languages in the CLT design was proposed and applied for Malay (as well as other languages such as Czech and American English). Subsequently this procedure can be applied to the other languages spoken in Malaysia or elsewhere. This procedure involves: (1) obtaining the CLT-candidate words via a picture naming study (using new CLT picture base) to be conducted with adult native speakers of a given language; (2) AoA study (subjective ratings done over the list resulting from the picture naming study by adult native speakers with the previously established procedure, compare Luniewska, et al. (2016); (3) obtaining word form characteristics for the complexity index via expert ratings; (4) target word selection based on the values of indices obtained in (2) and (3).

The profiles of bilinguals in Malaysia present a unique opportunity to examine pairing of languages from very different language families. Malay and the indigenous languages spoken in Sabah and Sarawak such as Iban, Bidayuh and Kadazanduzun are members of the Austronesian family of languages. Mandarin Chinese is a member of the Sino-Tibetan language family while Tamil is a member of the Dravidian language family. Although currently only the Malay CLT project has started, constructing CLTs for other languages in Malaysia is our ultimate goal.

In the next sections, the Malay CLT project will be described. The project was a collaborative research project involving four universities: the Universiti Putra Malaysia, the Universiti Kebangsaan Malaysia, the University of Warsaw and the University of Reading. To date, two phases of the project have been completed: the picture naming and the AoA study. Initial findings and challenges faced in these two phases of the study will be reported.

4. Picture Naming Study

The main aim of the picture naming study is to facilitate selection of words in the target language for the subsequent phases of construction of the CLT. Haman, et al. (2015) presented arguments against the use of translation in adapting an instrument from one language into another target language. Morever, since the CLT project involved many languages that are from different language families, there was a need to identify a common list of words with equivalent meanings across these various languages.

The original picture naming study that was reported in Haman, et al. (2015) involved 93 competent native speaker judges from 34 languages and ratings were obtained for 1024 pictures (differing in style and colour; ranging from coloured photos to black and white line drawings; gathered from various previous studies and sources). In this study, pictures were named both in the native language and in English by competent judges. Naming agreement was estimated based on English equivalents provided by the judges. The final list, based on naming agreement ratings, consisted of 158 nouns and of 141 verbs and included words that obtained best naming agreement across all languages. As mentioned above new pictures were designed for these words and these new pictures were used in the Malay study as described in this paper.

4.1 Methods

The pictures for the picture naming task were selected from the existing database of pictures which comprises 416 pictures. Selection was made by the first two authors. One of the authors is a native speaker of Malay while the other is a near native speaker of Malay having learned and used Malay from the age of three. Culturally inappropriate pictures were identified. They included pictures for three verbs: *stroke*, *sunbathe* and *pee*. These pictures were not used in the naming task. The Malay words for stroke is *membelai* and it has a sexual connotation and was therefore considered inappropriate for children. Sunbathing is not a common practice in

Malaysia as it involves inappropriate dressing in public and urinating in public places is considered taboo. Nine pictures were redrawn to account for cultural variability in the way women and men are depicted in the pictures representing verbs such as *cook, lick, massage, pour, sew, smell, weigh, wash* and *write.* These pictures were redrawn to represent the Malay Muslim majority in Malaysia. The attire of women in five of these pictures reflected what is commonly seen in Malaysia. Their clothing is more covered up and the women don the *hijab* and two of the four men wore head caps. When more than one picture was available for a given CLT candidate word, only the one most culturally appropriate was selected by the first two authors. An online version of the picture naming study was created with a total of 293 pictures with 156 nouns and 137 verbs.

Fifty three subjects (43 female and ten male) were recruited for the naming study. They were all adult native speakers of Malay who were undergraduate or postgraduate students from two public universities in Malaysia: the Universiti Putra Malaysia and the Universiti Kebangsaan Malaysia (see Table 1). The majority of the participants were Malay-English bilinguals who reported that Malay was their main language used. Six indicated that they knew only one language due to their low proficiency in English. Two of the participants were trilinguals, as they also spoke either Arabic or Mandarin. Each participant took between two to three hours to complete the picture naming task. The participants completed a short background survey before starting the picture naming task. For each picture that was presented in a random order, they had to answer a series of questions about whether the picture evokes a word and whether the picture is suitable for children. See Appendix A for an example.

	Range	**Mean**	**SD**
Age	21-28	23.9	2.2
Years of Education	12-22	16.4	1.8
Number of Native-like L2	0-2	0.74	0.54

Table 1. Demographic of participants in the picture naming study

4.2 Results

The results of the picture naming task show that there were very few pictures that did not evoke any word. In total there were only 359 out of a total of 15,529 trials when a picture did not evoke a word. There were fewer instances for nouns (128, 0.8%) compared to verbs (231, 1.5%). The top four objects that failed to evoke any word include *barrel, scarf, snowman* and *thermometer* while the top five actions are *to snow, to hitchhike, to burst, to conduct* and *to plough*. All these pictures involved words that are culturally unfamiliar and are related to climate. As it never snows in Malaysia, a snowman is only encountered in the media or in reading materials. The climate is hot or rainy the whole year round. Therefore there is little use for scarfs and thermometers. Furthermore, as the majority of the people in Malaysia are Muslims, alcohol is prohibited. Barrels are often associated with wine making and wine or alchohol dispensing. The water containers used in Malaysia do not look like the picture available from the CLTs picture base. The same is true for the picture for ploughing. Most Malaysians would be more familiar with the image of the traditional method of ploughing where a buffalo is used to pull the plough manned by the farmer in water-filled paddy fields compared to the image of a tractor in dry and open fields. When images were culturally unfamiliar, there were greater instances of variation in the words provided in the naming task. For example, hitchhiking is also not a common practice in Malaysia. This resulted in more general verbs named for the action such as *menahan* ‘to stop’, *menumpang* ‘to get a ride’ and *berdiri* ‘to stand’. Similarly with the image for conducting, the words provided included a mixture of verbs such as *mengetuai* ‘to head/lead’, *memimpin* ‘to lead’, *mengajar* ‘to teach’,

and *berdiri* ‘to stand’ as well as nouns such as *orkestra* ‘orchestra’, *maestro* ‘maestro’, *koir* ‘choir’, and *musik* ‘music’.

As in the previous picture naming study (Haman, et al., 2015), two indices were used for estimating picture facility to evoke a word and naming agreement in Malay. Meaning Availability Index (MAI), measures the ability of the picture to evoke a word. MAI is the proportion derived from the number of ratings ‘evoking one word’ or ‘several words similar in meaning’ divided by the total number of ratings. The second criterion is Dominant Name Index (DNI), which is the proportion derived from the number of times the dominant Malay word was used for the given picture, divided by the total number of responses.

The DNI and MAI indices were in general higher for pictures featuring objects (DNI: M = 0.84, SD = 0.16, MAI: 0.85, SD = 0.16) than for pictures featuring actions (DNI: M = 0.69, SD = 0.23, MAI: M = 0.74, SD = 0.22). These differences were also found in the picture naming study reported in Haman et al. (2015) who argued that the results are in line with claims that nouns are more stable cross-linguistically than verbs (Gentner, 1981; 2006). There was a high naming agreement for most words as indicated in the distribution of the MAI scores for the pictures used in the naming task as shown in Table 2. There were more pictures denoting objects with MAI ≥ 0.8 (120, 76.9%) compared to pictures that denote actions (70, 51.1%). A higher percentage of images for objects elicited only one dominant word compared to images for verbs. Among the pictures that elicited only one noun in Malay are *gunting* ‘scissors’, *bas* ‘bus’, *ikan* ‘fish’, *bateri* ‘battery’, *lilin* ‘candle’, *pembaris* ‘ruler’, *loceng* ‘bell’, *tulang* ‘bone’, and *bintang* ‘star’ while the images that elicited only one verb in Malay are *ketuk* ‘to knock’, *dengar* ‘to listen’, *tidur* ‘to sleep’, *memancing* ‘to fish’, *ukur* ‘to measure’. *tolak* ‘to push’, *baca* ‘to read’, *urut* ‘to massage’, *timbang* ‘to weigh’ and *panjat* ‘to climb’.

MAI	**Nouns**	**Verbs**
0.9-1.0	89	48
.8-.89	31	22
.7-.79	7	7
.6 -.69	12	20
.5-.59	8	17
.4-.49	7	10
below .4	2	13

Table 2. Frequency of MAI for nouns and verbs

Lower naming agreement was found when there was a second dominant word that was elicited. There were twenty pictures which elicited a second dominant word. The second dominant word was identified when the difference between the number of answers with each of the words for a given picture was between 0-10%. The list of words is presented in Table 3. For the nouns, the second dominant word is either a compound word that provides more specific details about the object or a superordinate word for the same category. There is more variation in the second dominant verb obtained for pictures denoting actions. While some are semantic equivalents (synonyms) such as *memberus gigi* and *gosok gigi* which can be used interchangably for brushing teeth, and *meminta sedekah* and *mengemis* for begging, other examples involve different interpretations of the action. For example, the picture denoting mixing was interpreted as *kacau* ‘to mix’ and *memutar* ‘to turn/stir’ while the picture denoting ‘to post’ elicited *mengepos surat* ‘to post a letter’ and the more generic verb *masukkan* ‘to insert’ referring to the act of posting a letter which involves inserting the letter into a mailbox.

	Images	Word 1	DNI	Word 2	DNI
Noun	nest	sarang	0.49	sarang burung	0.49
	scarf	selendang	0.43	scarf	0.40
	chair	kerusi	0.49	bangku	0.45
	sunglasses	cermin mata	0.31	cermin mata hitam	0.27
	boot	but	0.38	kasut	0.30
	carrot	lobak merah	0.51	lobak	0.41
	tennisball	bola tenis	0.46	bola	0.35
Verb	to light	memetik	0.36	menyala	0.36
	to mix	kacau	0.23	memutar	0.23
	to swing	main	0.30	hayun	0.28
	to drip	menitik	0.33	menitis	0.31
	to brush	gosok gigi	0.29	memberus gigi	0.25
	to sink	tenggelam	0.45	karam	0.40
	to talk	bercakap	0.35	berbual	0.29
	to send	mengepos surat	0.22	masukkan	0.15
	to clap	tepuk tangan	0.54	tepuk	0.46
	to conduct	mengetuai	0.21	mengajar	0.13
	to beg	meminta sedekah	0.30	mengemis	0.20

Table 3. Pictures which elicited two dominant names

Lower MAI scores were also found when the pictures were considered culturally odd. As mentioned earlier, pictures for words such as *conduct*, *hitchhike* and *bath* resulted in more variations in the word elicited. Other instances of lower naming agreement resulted from code-switching among the participants. Instead of providing the Malay words for *jump, dance, jog, nose* and *bed*, the English word was provided. There were also instances of verb-noun confusion resulting in inaccurate labelling. For example instead of naming the action of *barking*, *throwing* or *sewing*, objects related to the actions were mentioned such as *dog, garbage* and *shirt*. There were also instances of confusion between object and function. For example, there were instances when *telinga* 'ear' was elicited instead of *mendengar* 'to listen', and *pistol* 'gun' for *menembak* 'to shoot'.

4.2 Conclusion of the Picture Naming Study

The Malay-CLT demonstrated the dichotomy between nouns and verbs where the DNI and MAI indices were higher for pictures depicting nouns compared to verbs. This is in line with the developmental data on the growth of vocabulary among speakers of a language and across languages. Culturally unfamiliar words failed to evoke any word or displayed greater variation in the responses recorded. Lower naming agreeement was found in several situations i.e. in the presence of a second dominant word, a culturally odd word, code-mixed word, and a confusion between word category verb-noun and object-function. However, most of the pictures obtained high naming agreement as reflected in the Dominant Name Index (DNI) which suggest that they can be used as target words in the construction of the Malay CLTs.

5. Age of Acquisition Study

The effect of age of acquisition (AoA) of words on the performance of various psycholinguistic tasks is well documented for both children and adults in the literature (Łuniewska et al., 2015). In most cases, the AoA of stimulus items are obtained subjectively from adults who were asked to estimate when they had learned given words, by indicating either the exact age (in years) or an age range on a scale. Some studies used objective measures of AoA from a corpus of early word production while others use norms available from MacArthur-Bates Communicative Development Inventories (Fenson et al., 1993; 2007) which has been adapted into 62 languages (Dale & Penfold, 2011). However, as argued in Łuniewska, et al. (2016), most studies on AoA are limited to only one language or one language pair.

The purpose of conducting this survey was to obtain information about the relative order of acquisition of words among native speakers of Malay to facilitate the selection of items for the final construction of the CLTs. Words that are acquired early are presumed to be processed more efficiently compared to words that are acquired later. Łuniewska, et al. (2016) compared the AoA ratings across 25 languages and found consistency in the order of ratings across these 25 languages. In this paper, we will present the AoA results conducted with a group of adult Malay native speakers. Comparison of the AoA results in Malay and other languages is reported in Haman, et al. (in preparation).

5.1 Methods

Using the DNI scores from the picture naming task, 311 words (162 nouns and 149 verbs) were identified for the age of acquisition survey. These words were equivalent for the 299 words present on CLT candidate-word list plus a few synonyms that were second dominant answers identified in the picture naming study. Additional words were selected for AoA if the difference in DNI between the first most popular answer (dominant word in naming) and the second most popular one was lower or equal .10. A Malay version of the survey was translated from English by the first two authors and its final wording was established after piloting and discussing the potential discrepancies between the two language versions with the rest of the authors. It was made available online (http://words-psych.org/?lang=ms) and participants could download and complete the survey in their own time at the university or at home. There were four sheets in the survey. The first sheet contained basic information about the study and instructions on how to complete it. The second sheet elicited demographic information from the participants. The third and the final sheet contained the list of nouns and verbs that were selected from the picture naming study. Participants were required to enter the age from one to 18 for each word in the two lists. Each participant saw the words in random order on each list.

Forty participants (30 female and 10 male) were recruited for this study. The participants were all native speakers of Malay. Table 4 presents a summary of the demographic information for the participants in the study. The majority of the participants learned English as a second language from an early age, generally from age five to seven (N= 28; 77.8% of all participants) which is the average age of starting preschool and formal education in Malaysia. Six reported having started learning English before the age of five.

	Range	Mean	SD
Age	19-27	21.7	2.3
Years of Education	12-22	16.4	2.6
Age of Learning English	0-11	5.5	1.9

Table 4. Demographic of participants in the AoA survey

5.2 Results

The mean AoA for all words was within the range of three to nine years (Mean = 5.42, SD = 1.31) as shown in Table 5. A paired samples *t*-test showed that the mean AoA for nouns was significantly lower compared to the mean AoA for verbs [t (39)= 5.56, $p < 0.01$] (see Haman et al., in preparation). A correlation analysis conducted with the DNI and the AoA reported for each word showed that there is a moderate correlation in the negative direction [r=-.41, p <.001]. The results show that the later a word is acquired, the more variable it is in eliciting a name in a picture naming task. Both of these measures will be used to select candidate target words for the design of the Malay CLTs. Words with a high mean AoA will be avoided as they will likely have a low naming agreement which will make scoring of the picture naming task difficult. Similarly, words with low naming agreement may result in higher error rates or slower reaction times in the picture selection task. However, since the correlation between the two indicators is not very high, both indicators will have to be used in the selection of the target words. A cut-off point of DNI ≥ 0.8 and mean AoA ≤ 5.0 results in the selection of 69 nouns and 34 verbs. Clearly, a lower cut-off point is needed in the selection of target verbs as verbs are generally lower in naming agreement compared to nouns. Table 6 shows the top 20 candidates selected for Malay nouns and verbs that are potential candidates for the target words in the final crosslinguistic task. Most of the selected nouns are toys, body parts, animals and household items. The selected verbs, on the other hand, are intransitive and motion verbs. However it should be noted that the complexity index based on expert ratings for each of the Malay words has to be calculated before final decisions about the list of target words for Malay CLTs are made.

	Range	**Mean**	**SD**
Verb (N= 149)	3.26-9.10	5.82	1.41
Noun (N= 162)	3.3-8.87	5.06	1.06
Overall	3.26-9.1	5.42	1.31

Table 5. Mean Age of Acquisition

Noun		**Verb**	
helicopter	*Helicopter*	baca	*to read*
jarum	*Needle*	bangun	*to wake up*
hidung	*Nose*	buka	*to open*
mata	*Eye*	cium[1]	*to kiss*
kucing	*Cat*	cubit	*to pinch*
bola	*Ball*	dengar	*to hear*
telinga	*Ear*	duduk	*to sit*
pokok	*Tree*	gigit	*to bite*
ayam	*Hen*	hujan	*to rain*
rumah	*House*	jatuh	*to fall*

[1] A reviewer commented that the meaning of *cium* is ambiguous in Malay since it could also mean 'to smell' as in *mencium bau wangi* 'to smell the fragrance'. However, the word *cium* was the dominant word given for the action 'to kiss' in the picture naming study. Kissing is not smelling but in the process of kissing, the incidental act of smelling may also occur. However, our native informants indicated that the meaning of kissing is more salient in *cium*.

Noun		**Verb**	
burung	*Bird*	lap	*to wipe*
kereta	*Car*	lari	*to run*
botol	*Bottle*	lompat	*to jump*
pisang	*Banana*	lukis	*to draw*
kapalterbang	*Aeroplane*	makan	*to eat*
bunga	*Flower*	mandi	*to shower*
pintu	*Door*	minum	*to drink*
semut	*Ant*	tidur	*to sleep*
katak	*Frog*	tolak	*to push*
lembu	*Cow*	tulis	*to write*

Table 6. Top 20 potential target words for the Malay CLTs

5.3 Conclusion of the Malay AoA Study

The results of the AoA study confirm earlier diary studies on early words in various languages (such as Clark, 2009) which show that early nouns usually fall within the semantic categories such as food, body parts, animals, toys and household objects, whereas early verbs are about routines and states. The results also show that most early words in Malay are disyllabic rather than monosyllabic as is usually the case in English. The frequency of disyllabic words in the list of early words is not a surprise as there are very few monosyllabic words in Malay. A search in the Malay lexical database of 9592 words from Yap, et al. (2010) resulted in only 157 instances compared to 3169 instances of disyllabic words. Lee, et al. (2014) in a comparison of word frequency in Malay and English children stories also reported this difference between early words in English and Malay. This difference should be taken into consideration when designing the Malay CLTs as the processing time may be slightly longer compared to the parallel English version.

6. General Discussion and Concluding Remarks

This paper is the first one to report on the modified procedure for constructing CLT for a new language not included in the initial CLTs sample of 34 languages (Haman, et al., 2015). The modification involved conducting a newly designed picture naming study with adult native speakers of the language, which was followed by the AoA study. We indicated the need for constructing new tools which in the long term might develop into proper diagnostic tools for multilingual children (Armon-Lotem, et al., 2015). Such tools are lacking in many societies and are specifically important in countries where most people including children are multilingual. One example of such a country is Malaysia where most citizens are multilingual (Nair-Venugopal, 2000; Low et al., 2010). Assessment of language development and diagnosis of language disorders, including specific language impairment (SLI) is a real challenge if no standardized tools with norms for specific language pairs of bilingual children are available (Ooi & Wong, 2012). Although the ultimate goal to prepare such tools for many languages present in Malaysia is still beyond our reach, the initiative to construct CLT for a language spoken by majority of citizens of Malaysia may be a good starting point.

The previous sections gave an overview of progress that has been made thus far with the construction of the Malay CLT. The next steps in the process will be obtaining word complexity characteristics in terms of morphology and phonology to categorise the candidate words as simple versus complex words. Age of acquisition scores and the complexity index which is based on word characteristics will be used for the final selection of the target words for the CLT. Once the target words and distracters have been selected, the picture boards for

the Malay CLT can be prepared using power point slides after which the Malay CLT can be piloted with monolingual and multilingual children in Malaysia. The results from the pilot study can be used to fine-tune the selection of the target words and distracters. Once the above stages have been completed, we will have an assessment tool in Malay which can be used for Malaysian children. However, before the Malay CLT can be used as a diagnostic tool, it has to be normed for monolingual, bilingual and multilingual children in Malaysia.

A natural step forward is in the creation of parallel CLTs in the other languages used by Malaysian children. As discussed earlier, there is a substantial proportion of Malaysian children who speak Mandarin Chinese or Tamil as their mother tongue. Therefore, a natural extension of the study would be to construct parallel CLTs in Mandarin Chinese and Tamil. Once we have the parallel versions in these dominant languages, we can then address the question about how bilingual and multilingual children perform when tested with different versions of the CLTs. The construction of new CLTs for new typologically and genetically different languages may pose new challenges. The nature of these challenges may, however, be difficult to predict at the moment (Łuniewska, et al., 2016). In particular further research may reveal cross-linguistic differences that would make the process of full assessment of lexical knowledge across all languages of a given multilingual child more demanding (Haman, et al., accepted). However, in the long run we still envisage it as a way forward for more accurate and more valid diagnosis of one of the crucial aspects of child development, i.e. language, which is essential when the child is vulnerable to developmental problems or disorders. Accurate diagnosis may help in proposing adequate support for such a child and facilitate multilingual children in their language development (Pearson, 2008) even though they might not be at risk of language disorder. We hope that CLTs will add to the deeper understanding of multilingual language development and will contribute to the improvement of identification and treatment of multilingual children at risk of speech and language impairment.

References

Abu, Bakar, S., A Razak, R., Lim, H.W., & Marinis, T. (in preparation). Comprehension and production of passives in Malay speaking children with Specific Language Impairment.

Andreu, L., Sanz-Torrent, M., & Gurdia-Olmos, J. (2012). Auditory word recognition of nouns and verbs in children with Specific Language Impairment (SLI). *Journal of Communication Disorders*, **45**(1): 20-34.

A Razak, R., Madison, C., Siow, Y.K., & Aziz, M.A.A. (2010). Preliminary Content Validity and Reliability of a Newly Developed Malay Preschool Language Assessment Tool. *Asia Pacific Journal of Speech, Language, and Hearing*, **13**(4): 217-234.

Armon-Lotem, S. (2011). Introduction: Bilingual children with SLI – the nature of the problem. *Bilingualism: Language and Cognition*, **15**(1), 1-4.

Armon-Lotem, S., de Jong, J., & Meir, N. (2015). *Assessing Multilingual Children*. Bristol: Multilingual Matters.

Asmah, O. (1992). *The Linguistic Scenery in Malaysia.* Kuala Lumpur: Dewan Bahasa dan Pustaka.

Banks, E. (1993). Learning values about languages in the multilingual schools of Malaysia. Paper presented at the 60th Biennial Meeting of the Society for Research in Child Development. New Orleans, US. Available at: < https://eric.ed.gov/?id=ED361069> [accessed on: 24/05/2017].

Benedict, H. (1979). Early lexical development: Comprehension and production. *Journal of Child Language*, **6**(2): 183-200.

Bishop, D.V.M, Bright, P., James, C, Bishop, S.J., & Van Der Lely, H.K.J. (2000). Grammatical SLI: A distinct subtype of developmental language impairment? *Applied Psycholinguistics*, **21**: 159-181.

Black, M., & Chiat, S. (2003). Noun-verb dissociations: a multi-faceted phenomenon. *Journal of Neurolinguistics*, **16**(2-3): 231-250.

Capone, N. C., & McGregor, K. K. (2005). The Effect of Semantic Representation on Toddlers' Word Retrieval. *Journal of Speech, Language, and Hearing Research*, **48**(6): 1468-1480.

Chiat, S., Armon-Lotem, S., Marinis, T., Polišenská, K., Roy, P., & Seeff-Gabriel, B. (2013). The potential of sentence imitation tasks. In: Mueller Gathercole, V.C. (ed.). *Issues in the Assessment of Bilinguals.* Bristol: Multilingual Matters, pp. 56-89.

Clark, E. V. (2009). *First Language Acquisition*. 2nd ed. Cambridge: Cambridge University Press.

Dale, P. S., & Penfold, M. (2011). *Adaptations of the MacArthur-Bates CDI into Non-U.S. English Languages.*

Available at: http://mb-cdi.stanford.edu/documents/AdaptationsSurvey7-5-11Web.pdf [accessed on: 24/05/2017].

Gatt, D., Letts, C., & Klee, T. (2008). Lexical mixing in the early productive vocabularies of Maltese children: Implications for intervention. *Clinical Linguistics & Phonetics*, **22**(4-5): 267-274.

Gentner, D. (1981). Some interesting differences between verbs and nouns. *Cognition and Brain Theory*, **4**(2): 161-178.

Gentner, D. (2006). Why Verbs are Hard to Learn. In: Hirsh-Pasek, K. & Golinkoff, R. (eds). *Action Meets Word: How Children Learn Verbs*. Oxford: Oxford University Press, pp. 544-564.

Goldfield, B. A. (2000). Nouns before verbs in comprehension vs. production: the view from pragmatics. *Journal of Child Language*, **27**(3): 501-520.

Gray, S., Plante, E., Vance, R., & Henrichsen, M. (1999). The Diagnostic Accuracy of Four Vocabulary Tests Administered to Preschool-Age Children. *Language, Speech, and Hearing Services in Schools*, **30**(2): 196-206.

Hadzir, N., Alia, A.M., Kamaruzaman, A.L., & Mohd Yusoff, H.M. (2016). Teachers' perception of literacy, numeracy and screening (LINUS 2.0): Assessing features based on Year 1 students' performance. *Research Journal of English Language and Literature*, **4**(1): 40-47.

Haman, E., Łuniewska, M., & Pomiechowska, B. (2015). Designing Cross-linguistic Lexical Tasks (CLTs) for Bilingual Preschool Children. In Armon-Lotem,S., de Jong, J., & Meir, M. (eds.). *Methods for Assessing Multilingual Children: Disentangling Bilingualism from Language Impairment*. Bristol: Multilingual Matters, pp. 194-238.

Haman, E., Łuniewska, M., Hansen, P., Simonsen, H., G., Chiat, S., Bjekić, J., Blažienė, A., Chyl, K., Dabašinskienė, I., Engel de Abreu, P., Gagarina, N., Gavarró, A., Håkansson, G., Harel, E., Holm, E., Kapalková, S., Kunnari, S., Levorato, C., Lindgren, J., Mieszkowska, K., Montes Salarich, L., Potgieter, A., Ribu, I., Ringblom, N., Rinker, T., Roch, M,., Slančová, D., Southwood, F., Tedeschi, R., Tuncer, A. M., Ünal-Logacev, Ö., Vuksanović, J., & Armon-Lotem, S. (accepted). Noun and verb knowledge in monolingual preschool children across 17 languages: data from Cross-linguistic Lexical Tasks (CLTs). *Clinical Linguistics and Phonetics.*

Haman, E., Łuniewska, M., Kouba-Hreich, E., Kroll, J., Messara, C., Razak, R. A., Smolik, F., Treffers-Daller, J., Wodniecka, Z., & Yap, N. T. (in preparation). Extending the limits of similarity in order of acquisition of words: AoA study in American English, Czech, Lebanese and Malay.

Harris, M., Yeeles, C., Chasin, J., & Oakley, Y. (1995). Symmetries and asymmetries in early lexical comprehension and production. *Journal of Child Language*, **22**(1): 1-18.

Hashim, A. (2014). English and the linguistic ecology of Malaysia. *World Englishes*, **33**(4): 458-471.

Hewitt, L. E., Hammer, C. S., Yont, K. M., & Tomblin, J. B. (2005). Language sampling for kindergarten children with and without SLI: Mean length of utterance, IPSYN, and NDW. *Journal of Communication Disorders*, **38**(3): 197-213.

How, S.Y., Chan, S.H., & Abdullah, A.N. (2015). Language Vitality of Malaysian Languages and its Relation to Identity. *GEMA Online Journal of Language Studies*, **15**(2): 119-136.

IndexMundi (2016). *Malaysia Demographic Profile 2016*. Available at: <www.indexmundi.com/Malaysia/demographic-profile.html> [accessed on: 24/05/2017].

Jin, L., A Razak, R., Wright, J., & Song, J. (2014). Issues in developing grammatical assessment tools in Chineseand Malay for speech and language therapy. In: Winskel, H. & Padakannaya, P. (eds). *South and Southeast Asian Psycholinguistics.* London: Cambridge University Press, pp. 145-158.

Leonard, L. (1998). *Children with Specific Language Impairment.* Cambridge, MA: MIT Press.

Leonard, L. B., & Deevy, P. (2004). Lexical Deficits in Specific Language Impairment. In: Verhoeven, L. & van Balkom, H. (eds). *Classification of Developmental Language Disorders*, Mahwah, NJ: Lawrence Erlbaum, pp. 209-233.

Lee, L.W., Low, M. H., & Mohamad, A.R. (2013). A Comparative Analysis of Word Structures in Malay and English Children's Stories. *Pertanika Journal of Social Sciences & Humanities*, **21**(1): 67-84.

Low, H. M., Nicholas, H., & Wales, R. (2010). A sociolinguistic profile of 100 mothers from middle to upper-middle socioeconomic backgrounds in Penang-Chinese community: What languages do they speak at home with their children? *Journal of Multilingual and Multicultural Development*, **31**(6): 569-584.

Łuniewska, M., Hansen, P., & Haman, E. (2016). Is there a road to universal assessment of lexical knowledge in multilingual children? Cross-cultural aspects of Cross-linguistic Lexical Tasks. In Enger, H-O. & Norvik Knoph, M.I., Kristoffersen, K.E. & Lind, M. (eds). *Helt fabelaktig. Festskrift til Hanne Gram Simonsen på 70-årsdagen*, Oslo: Novus forlag, pp. 147-165.

Łuniewska, M., Haman, E., Armon-Lotem, E., Etenkowski, B., Southwood, F. & Unal-Logacev, O. (2016). Ratings of age of acquisition of 299 words across 25 languages: Is there a crosslinguistic order of words? *Behavior Research Methods*, **48**: 1154-1177.

Mainela-Arnold, E., Evans, J.L., & Coady, J.A. (2010). Explaining lexical semantic deficits in specific language impairment: The role of phonological similarity, phonological working memory, and lexical competition. *Journal of Speech, Language, and Hearing Research*, **53**: 1742-1756.

McGregor, K. K., Newman, R. M., Reilly, R. M., & Capone, N. C. (2002). Semantic representation and naming in children with specific language impairment. *Journal of Speech, Language and Hearing Research*, **45**(5): 998-1014.

Messer, D., & Dockrell, J. E. (2006). Children's naming and word-finding difficulties: Descriptions and explanations. *Journal of Speech, Language and Hearing Research*, **49**(2): 309-324.

Nair-Venugopal, S. (2000). *Language choice and communication in Malaysian business*. UKM Publisher: Bangi.

Ooi, C.W., & Wong, A.M.Y. (2012). Assessing bilingual Chinese-English young children in Malaysia using language sample measures. *International Journal of Speech-Language Pathology*, **14**(6):499-508.

Onn, F. (1980). *Aspects of Malay phonology and morphology: A generative approach*. Bangi: UKM Publisher.

Pearson, B. Z. (2008). *Raising a Bilingual Child*. New York: Random House.

Ratnawati Mohd Asraf, Hazlina Abdullah, & Ainul Azman Mat Zamir. (2016), Literacy among Malaysian primary schoolers: How do boys perform relative to girls. *International Electronic Journal of Elementary Education*, **9**(1): 225-238.

Skipp, A., Windfuhr, K. L., & Conti-Ramsden, G. (2002). Children's grammatical categories of verb and noun: a comparative look at children with specific language impairment (SLI) and normal language (NL). *International Journal of Language & Communication Disorders*, **37**(3): 253-271.

Spaulding, T. J., Hosmer, S., & Schechtman, C. (2013). Investigating the interchangeability and diagnostic utility of the PPVT-III and PPVT-IV for children with and without SLI. *International Journal of Speech-Language Pathology*, **15**(5): 1-10.

Stark, R.E., & Tallal, P. (1981). Selection of children with specific language deficits. *Journal of Speech and Language Disorders*, **46**: 114-122.

Strand, S., Malmberg, L., & Hall, J. (2015). *English as an Additional Language (EAL) and Educational Achievement in England: An Analysis of the National Pupil Database*. Oxford University: Department of Education.

Yap, M.J., Rickard Liow, S.J., Jalil, S.S., & Faizal, S.S.B. (2010). The Malay lexicon project: A database of lexical statistics for 9,592 words, *Behaviour Research Methods*, **42**: 992-1003.

Appendix A: Instructions for the Picture Naming Task

Adakah gambar ini dengan mudah dapat mengingatkan/menghasilkan satu kata nama dalam Bahasa Melayu?
'Does this picture easily evoke a NOUN in Malay?'

- *Tidak. Langsung tidak.* 'No. Not at all'
- *Tidak, tetapi saya dapat ide yang kabur.* 'No, but I have some vague ideas.'
- *Ya, ianya membangkitkan satu perkataan.* 'Yes, it evokes one word.'
- *Ya, ianya membangkitkan beberapa perkataan dengan makna yang hampir sama.* 'Yes. It evokes several words similar in meaning.'
- *Ya, ianya membangkitkan beberapa perkataan dengan makna yang berbeza.* 'Yes. It evokes several words different in meaning.'

Sila nyatakan perkataan Bahasa Melayu pertama dibangkitkan oleh gambar ini dan perkataan Bahasa Inggeris yang setaraf. (Anda boleh merujuk kamus untuk tujuan ini).
'Please provide the FIRST word in Malay which comes to your mind for this picture and its English equivalent. (You can use a dictionary.)'

Sila nyatakan samada GAMBAR ini merupakan CONTOH yang tepat untuk menampilkan OBJECT yang dimaksudkan oleh perkataan yang anda gunakan.
'Please rate the PICTURE whether it is an accurate EXAMPLE of the OBJECT depicted by the word you used for it'

- sangat baik 'very good'
- memuaskan 'satisfactory'
- agak kekok 'a bit strange'
- sangat kekok 'very strange'

Author Bios

Ngee Thai Yap, PhD, is an associate professor in the English Language Department, Faculty of Modern Languages and Communication, Universiti Putra Malaysia (UPM). Her research interests include speech perception and production, language processing, first and second language acquisition, and the neuroscience of language. Her current research projects include assessment of vocabulary knowledge of ESL learners at the tertiary level and multilingual Malaysian children at primary school level.

Rogayah A Razak, PhD, is an associate professor in the Speech Sciences Program, School of Rehabilitation Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM), Malaysia. She is the founding member of the Clinical Linguistics postgraduate program, the first of such a program in the South East Asia region. Her research interests cover developmental language, clinical linguistics, and Malay grammar. She has developed tests in local languages: the first standardized Malay Preschool Language Assessment Tool (MPLAT), Malay-LARSP and Chinese-LARSP language profiles, a prototype *The Malay Early Language Profile* (a parent checklist), Malay Hearing in Noise Test (My-HINT), Malay Boston Naming Test, among others. She has recently published a chapter on *Profiling Malay children's Syntactic Development: a Malay-LARSP*. She is also the main editor of a forthcoming book *Malay Syntactic Theories* which will be out in 2017.

Ewa Haman, PhD, is an adjunct at the Faculty of Psychology, University of Warsaw. She specializes in research on lexical development of monolingual and bilingual children. She is the co-author of several normed psychometric tools assessing language in Polish children (e.g. Obrazkowy Test Słownikowy - Rozumienie OTSR [Picture Vocabulary Test - Comprehension]; Test Rozwoju Językowego [Test of Language Development). She was a co-leader in COST IS0804 (Bi-SLI) networking programme aimed at disentangling bilingualism and SLI. She co-authors the design of LITMUS-CLT (Cross-Linguistic Lexical Tasks, part of Language Impairment Testing in Multilingual Settings) developed within Bi-SLI for 24 languages (http://psychologia.pl/clts/).

Magdalena Łuniewska is a PhD student at the Faculty of Psychology, University of Warsaw, and Nencki Institute of Experimental Biology, Polish Academy of Sciences. She is a co-author of the design of Cross-Linguistic Lexical tasks (CLTs) developed as a part of Bi-SLI LITMUS, currently available in 24 languages. She co-authored several standardized tests of language skills in Polish. Currently she works on mental lexicon in SLI children in Polish and on neural correlates of impaired phonology in dyslexia.

Jeanine Treffers-Daller is Professor of Second Language Education, Institute of Education, University of Reading, UK. She has published widely on the measurement of vocabulary knowledge and use among bilinguals and second language learners and has recently edited a volume with Carmen Silva-Corvalán on *Language dominance in bilinguals: issues of operationalization and measurement*. She is a member of the Editorial Board of the *International Journal of Bilingualism* and of *Bilingualism, Language and Cognition*.