The Association between Vocabulary Size and Language Dominance of Bilingual Malay-English Undergraduates

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ABSTRACT

Bilingual learners' inadequate English vocabulary size is one of the most frequently stated problems in applied linguistics. Using mostly qualitative case studies, earlier findings reported several factors (e.g. negative attitude, lack of exposure, poor proficiency, and age of acquisition) as related to bilingual learners' insufficient English vocabulary size. Therefore, the present study undertakes an in-depth quantitative study to measure language dominance, which encompasses language history, use, proficiency, and attitude towards Malay, the first language (L1), and English, the second languages of 96 Malay-English bilingual undergraduates. It also examines the relationship between vocabulary size and overall dominance scores. The 20,000 Vocabulary Size Test was used to measure English vocabulary size and the Bilingual Language Profile (BLP) was used to determine the dominance score. The results show that most of the Malay-English bilinguals are Malay dominant. A positive and statistically significant association was found between the overall language dominance score and English vocabulary size. One of the most striking findings to emerge from this study is that the language dominance score accounts for 30% of the variability in the vocabulary size of Malay-English undergraduates.

Keywords: vocabulary size; bilingualism; language dominance; second language acquisition; tertiary students; language testing

INTRODUCTION

Malaysia has placed English as a second language (L2) in the country's education system (Gill 2007) and English language is taught from the first year of primary education up to tertiary level. Therefore, the government administers a bilingual education system with English taught alongside native languages (Darmi & Albion 2013) and the learners are commonly bilingual or multilingual. Malaysian bilinguals usually acquire and use one language at home (e.g. Malay, Tamil, or Mandarin) (Shah & Ahmad 2007, Ting & Mahadhir 2009) but they depend on English language for education and success in employment (Pennycook 2017, Ha, Kho & Chng 2013). Even among the early Malay-English bilinguals who learn Malay and English concurrently in their earlier age, one language is usually dominant and this type of language history is prevalent in a number of Asian countries (Lim, Liow, Lincoln, Chan & Onslow 2008). Lim et al. (2008) further suggest that a bilingual's Age of First Exposure (AoE) to a particular language, duration of formal education, and the number of years of language experience influence his/her mastery in that language. Malarz (1998) and Sandhofer and Uchikoshi (2013) argue that bilingual learners' language learning is influenced not only by the AoE, but also by chances to use each language, circumstances of learning, the social value of the languages, and the level of education attained. In a recent

study, Birdsong (2014) reported a significant positive relationship between Spanish-English bilinguals' language dominance and lexical frequency with performance in naming tasks; thus, he pointed out that bilinguals' age of acquisition of a language can play a significant role in understanding which of the bilinguals' two languages is comparatively more dominant than the other and to what extent.

Many past studies (e.g. Mokhtar et al. 2010, Lin, Pandian & Jaganathan 2015, Harji, Balakrishnan, Bhar & Letchumanan 2015, Yunus, Mohamad & Waelateh 2016, Mathai et al. 2004) conducted in Malaysian university contexts have shown that students' vocabulary size is lower than the 9,000 word family which was argued to be the requirement for success in college education (e.g. Nation 2006, Schmitt & Schmitt 2014, Laufer Ravenhorst-Kalovski 2010). For instance, Mathai et al. (2004), one of the earliest study was conducted with 441 diploma students from the faculty of Engineering and reported a mean vocabulary size of below 3,000 word families. Another study conducted by Mokhtar et al. (2010) also found a rather low range of vocabulary size among 360 first through third year Diploma students in a public university: 1691, 1691, and 2154 word families respectively. A more recent study by Harji et al. (2015), which was conducted among 120 first year undergraduates in a private Malaysian university, found a mean vocabulary size of only 2,000 word families. Lin et al. (2015) reported a vocabulary size of 3,335 word families among 106 tertiary remedial students, while Yunus et al. (2016) found that first year English major undergraduates have an average of 4,460 word family. While these studies are interesting, these studies have only provided information about vocabulary size of different groups of Malaysian learners. Some of the variance in the performance could be due to factors such as level of education, field of study, language of instruction in those study programmes, as well as other individual factors such as age of acquisition, attitude towards English and level of proficiency in English.

Some studies did in fact explicitly discuss factors that may have impacted students' vocabulary knowledge (e.g. Kaur 2006, Ismail 2008, Hassan & Selamat 2017) or their vocabulary size (e.g. Mokhtar et al. 2010, Mathai et al. 2004) and they have attributed the students' poor performance to the students' limited English environment, negative attitude, and lack of exposure to the target language (English) as key factors affecting bilingual learners' overall English vocabulary size in Malaysia. For example, Mathai et al. (2004) pointed out that the engineering students in their study were not eager to learn English, not attentive to reading, not self-reliant to speak the language, and that they were also mostly reliant on instructors' clarifications. However, most of these studies were based on anecdotal or qualitative observations. There were no attempts made to measure these factors and associate them with vocabulary size.

However, it has been suggested that while getting a measure of bilingual learners' vocabulary size was useful, several factors should be taken into consideration such as the learner's language experience in the school environment, and the quality and amount of the student's exposure to both languages (Unsworth 2015, Thordardottir 2011, Smithson, Paradis & Nicoladis 2014, Hoff et al. 2012). In their study on vocabulary learning strategy of Malaysian learners, Robani, and Majid (2013) reported that most of the learners usually encounter new English words in their everyday social and media interactions and learners' negative attitude was regarded as the leading barrier towards development of the English vocabulary. This view was supported by Laufer (1997) who claimed that new words need to be discovered in wide-ranging contexts and this could be a key source of L2 vocabulary learning. August and Shanahan (2006) also found that bilingual Spanish-English learners who tend to use more English at home had larger vocabularies than the bilinguals who prefer to use more Spanish at home. Similarly, Dixon, Zhao, and Quiroz (2012) who explored the Singaporean context found that parents' ethnic language use to their children improved the ethnic language vocabulary of the children but for parents who used English or any other

languages with their children, a negative effect on ethnic vocabulary development was found. Another study by Scheele, Leseman, and Mayo (2010) in the Netherlands showed that the more the mothers used the L1 at home, the higher their children's L1 vocabulary, but when they used more Dutch that was their L2, at home, the children's L1vocabulary significantly dropped. Taken together, these studies support the notion that bilinguals' language background, use, attitudes and proficiency play a key role in influencing the development of the vocabulary in their respective languages. However, little is known about the influence of these dimensions on Malaysian ESL learners' L2 learning at the tertiary level. These findings prompted the researcher to undertake an in-depth quantitative study to explore the personal and contextual factors of language use, attitudes, proficiency that might act as facilitators of or constraints on the Malay-English bilingual's vocabulary development. In addition, a quantitative documentation of the Bilingual Language Profile of 2nd year Malay-English tertiary learners' language history, use, attitude, and proficiency, in this case, seems relevant to supplement existing studies that have been mostly qualitative in nature with regards to the factors associated with vocabulary knowledge of Malaysian English as a Second Language (ESL) learners at the tertiary level. The present study also aspires to measure the extent to which Malay 2nd year tertiary ESL learners' vocabulary size correlates with their language dominance.

LITERATURE REVIEW

Birdsong (2006) argues that dominance can be defined in terms of a quantitative difference in processing ability between the learners' L1 and L2 and while dominance and proficiency may overlap, proficiency and dominance are necessarily distinct constructs. Proficiency refers to the mastery of grammar, vocabulary, and pronunciation. According to Birdsong (2014), dimensions and domains of language dominance are the two key aspects of language dominance. Properties of dimensions cover linguistic competence, production, and processing of morpho-syntactic knowledge, lexical diversity, utterance length, and fluency of speech whereas, the domain of language dominance includes situations and contexts of language use. Thus, the aspects of domain include counting, watching news, conversations with families, interactions in the place of work or school; in other words, the concept of the domain of language is connected with events about choice or speaker intention, while dimensions of language denote the intrinsic capacities of the bilingual (Birdsong 2014). Gathercole and Thomas (2009) as well as Kohnert (2013), however, argue that language dominance denotes the comparative ability of the two languages within the same bilingual. Tokowicz, Michael and Kroll (2004) in a similar vein pointed out that proficiency alone does not define language dominance. To them, a person can be dominant in a language without being skilled in that given language. Even though Hulstijn's (2012) definition suggests that proficiency is an integral part of dominance, Harris, Gleason and Aycicegi (2006) argue for a different perspective. They argue that language dominance refers to the frequent use of a language in general situations which make it more accessible in everyday life. Birdsong (2014) further clarifies the issue citing Bahrick, Goggin, Bahrick and Berger's (2004) assessment of lexical decision, category generation, vocabulary, and oral comprehension that report tasks that formulate processing and those that address competence or depiction which deliver inconsistent evidence about language dominance. On the contrary, certain features, for instance, cultural recognition (Marian & Kaushanskaya 2004) and motivation (Piller 2002) perform a vital role in developing language attitudes that usually influence language dominance.

Lim et al. (2008) state that identifying language dominance in multilingual and multiracial countries, for example, Malaysia, Singapore, China, Taiwan, and India is difficult, where the difference in the use of L1 and L2 is not straightforward and differs from one family to another. In many Asian countries like Malaysia, Singapore, and India, English language is often used as the lingua franca and to some extent, English is considered a prestigious language and is predominantly used as an official language (Nunan 2003, Kaplan & Baldauf 2008, Hamid, Nguyen & Baldauf 2015 Crandall & Bailey 2018). However, each of the country's native language has a great significance in the daily life of that country because the majority of the day-to-day communication is done in the mother tongue (Kirkpatrick 2016, Butler 2015). In addition, language practice, language attitudes, and language choice are the important interrelated factors upon which acquisition and maintenance of a bilingual's two languages depend (Hakuta & D'Andrea 1990).

The literature of bilingualism includes studies on language dominance, which are measured both subjectively and objectively. The relationship between self-reported or subjective and objective evaluation of bilingual language dominance and the degree of bilingualism have been observed in Pangarkar's (2015) study on language dominance in Urdu-English bilinguals. Bivariate correlational investigations uncovered that self-evaluations of language dominance score were significantly and highly associated with their Oral Proficiency Interview and naming test scores. Pangarkar (2015) also emphasized that self-reporting measures provided detailed perspectives of language use in different settings. Similarly, Gollan, Weissberger, Runnqvist, Montoya, and Cera (2012) showed that Spanish-English bilinguals were capable of determining their range of proficiency and the degree of language dominance to a noteworthy level with a self-scoring language dominance tool. Sheng, Lu, and Gollan (2014) further confirm the significant association between participants' self-rating bilingual language profile scores and objective measures of language proficiency of 62 Mandarin-English bilinguals. Baird (2015) conducted a study to examine whether there is any correlation between peak alignment and bilingual language dominance among Spanish-K'ichee' bilingual and Guatemalan Spanish monolinguals. The outcomes of a Pearson correlation exploration indicated a strong positive relationship between average comparative peak alignment scores and BLP scores of these bilinguals. According to him, individual speaker factors like age, history of language use and attitude might be more relevant and can account for variation in bilingual language communities. In addition, Amengual (2013) reported a series of studies which mostly observed the relationship between BLP and perception and production of speech sounds, for instance, the study on bilingual Catalan-Spanish learners' speech production and perception, which discovered both significant, and non-significant relations between BLP and the Euclidean distance of mid-vowels. In a similar investigation of the front and back mid vowel articulation, Amengual (2015) finds that there is no notable relationship between the Catalan-dominant individuals in any of the stimulus categories. However, there is a reliable worth mentioning association for the Spanish dominant. This supports the idea that the degree of language dominance has a notable role in the way phonological information is characterized in the lexis and, overall, it is a solid indicator of the appropriateness of the lexical choice task (Amengual 2015).

To the best of our knowledge, past studies reporting low vocabulary knowledge among bilingual Malay ESL learners' focused only on measuring the vocabulary knowledge of the learners and have attributed the low scores to various factors in a rather anecdotal manner. Among the factors reported are negative attitude towards English, lack of L2 practice, lack of exposure, and lack of support in Malaysia (Kaur 2006, Ismail 2008, Mokhtar et al. 2010, Hassan & Selamat 2017, Mathai et al. 2004, Robani & Majid 2014). However, none of the studies offers a quantitative assessment of the extent or the degree of these above-mentioned factors. In essence, what seems to be lacking in the literature is a quantitative

assessment of Malay-English bilingual learners' language profile and the relationship between their overall language dominance score and vocabulary size. This is the gap in the literature which this paper intends to fill.

OBJECTIVES OF THE STUDY

This study set out to examine the bilingual language profile along with the language dominance score of Malay-English bilinguals. It also determines the extent to which the degree of language dominance associates with vocabulary size.

METHODOLOGY

Based on the above research objectives, this study undertook a non-experimental, quantitative design with descriptive, and Pearson's product moment correlation analyses. Since the central goal of this study is to explain the association between vocabulary size and language dominance, the explanatory research design was considered appropriate. The population of the study was second year undergraduates in a public university. To ensure equal proportion of samples, four undergraduate programmes were chosen by way of stratified sampling methods from the 17 programmes within the university. In stratifed sampling, the population is identified according to the unit of interest and subsequently, data is elicited from a specific number of subjects that is representative of the units identified earlier (Ary et al. 2018). In the present study, the overall population was stratified and grouped according to English-major and non-English-major programmes in the public university. Therefore, the data samples were taken from two English-major and two non-English-major second year students namely, Bachelor of Art in English Language, Bachelor of Education (Teaching of English as a Second Language), Bachelor of Engineering (Civil), and Bachelor of Economics.

Criteria for the inclusion of the number of subjects were based on the assumption of correlation analysis since the results of the analysis was the key objective of this study. As stated by Cohen (1992), eighty-five participants are necessary for a correlational study to detect a medium size effect (r = .3) with the standard α-level of .05. Likewise, Fraenkel and Wallen, (2009) and Creswell (2013) suggest that more than 30 participants are required for a correlational study. To fulfill these inclusion criteria, 96 participants in total were recruited for the present study.

Furthermore, only Malay ESL learners were chosen because they represented the bilingual language learners in the Malaysian context. Indian or Chinese Malaysian tertiary learners were not included as their language background is different from the Malay participants. Even though students from other ethnicities such as Indian and Chinese are also Malaysians, these students may be trilingual or multilingual and not just bilingual. In addition, one of the questionnaires used in the present study was Birdsong, Gertken, and Amengual's (2012) Bilingual Language profile (BLP) that was prepared to measure dual language students' language dominance scores. Hence, the questionnaire mostly requires responses for language history, attitude, and proficiency for bilingual subjects. Therefore, the Indian and Chinese groups who were likely to be trilinguals were not included in the study.

INSTRUMENT

BILINGUAL LANGUAGE PROFILE (BLP)

The Bilingual Language Profile (BLP) developed by Birdsong et al. (2012) is a research assessment tool that has been prepared in collaboration with the Center for Open Educational Resources and Language Learning, one of the 15 Foreign National Language Centers financed by the US Department of Education (Gertken et al. 2014). Onnis, Chun & Lou-Magnuson (2018, citing Gertken et al. 2014) points out that the BLP is a validated self-reported questionnaire for measuring bilinguals' language dominance. The BLP was constructed following Dörnyei (2003) formula of questionnaires in second language research and it has undergone a number of validation processes. At first, a pilot study was conducted among 16 bilinguals of both L2 learners and simultaneous bilinguals. Consequently, there had been several changes in the BLP questionnaire. The questionnaire was then administered to 68 English-French bilinguals living in America and France and underwent further validation. A factor analysis was administered to examine the factorial structures of the four dimensions of the BLP (History, Use, proficiency, & Attitude) and the analysis revealed that the questionnaire was broad enough to cover variance of English-French bilinguals among the participants (Gertken et al. 2014). In addition, a test of reliability of the questionnaire was also conducted which involved checking the Cronbach's alpha for each module. Gertken et al. (2014) reported that :

> A test of reliability for each module was found to be moderately to highly reliable, indicating that the items within each module measure the same variable while still contributing unique information.   (p. 218)

In order to investigate the association between the L2 dominance score and various motion-event tasks, Parker (2016) conducted a series of analysis in his doctoral dissertation on L2 Effect on Bilingual Spanish/English Encoding of Motion Events and found a significant positive association among the variables. He also concluded that the BLP (Birdsong et al. 2012) was an accurate tool for robust analyses as well as to measure L2 dominance (Parker, 2016). In an experimental study, Cooperson (2013, cited in Lindsey 2013) found a statistically significant association between dominance as measured by the BLP and reaction time in a naming task. Consequently, Birdsong et al.'s (2012) BLP was chosen for this study since it is the most recent and comprehensive instrument at the time when this research was carried out. It also provides measures on an interval scale and not on a categorical scale which is appropriate for a correlation analysis as highlighted by Treffers-Daller & Korybski (2016). Since one of the main goals of this research is to offer a systematic means of conceptualization and evaluation of bilingual language dominance, the BLP would serve as a useful instrument that would meet the demands for standardization of procedures for measuring language dominance.

The BLP comprises an introductory section and four major sections namely language history, language use, language proficiency, and language attitude. The introductory section requires the participants to give background information such as their name, age, sex, place of residence and the highest level of formal education. The section on language history covers data about age of acquisition of the respective languages, the exact age at which a bilingual feels comfortable practicing that particular given language, as well as the schooling years of each language. The section on language use includes the weekly average percentage of use for each language in different settings: with family, friends, and at work/school, and the frequency of counting in a particular language. The section on language proficiency deals with participants' current level of reading, speaking, writing, and listening proficiency in

each of the languages. The final section on Language attitude elicits information about the learners' attitude towards the use of the specific languages. All the features (language history, language use, language proficiency, and language attitudes) were structured in four units, which receive equivalent weightage in light of the global language dominance score.

VOCABULARY SIZE TEST

The Vocabulary Size Test 20,000 (Version A) by Nation and Beglar's (2007) was designed to measure the receptive vocabulary size of the participants. The Vocabulary Size Test (VST) requires test takers to have "a moderately developed idea of the meaning of the word" (Nation & Beglar 2007) so that they can identify the most accurate definition which frequently has constituents of meaning with the distractors. Because of this, the VST is more challenging and pragmatic when compared with the Vocabulary Levels Test (Schmitt, Schmitt & Clapham 2001, Nation 1983) where forms or meanings of the tested items are not linked to definitions.

Up to now, a number of approaches have been used in previous studies to establish the validity and reliability of the VST. Beglar (2010) used Messick's six facets of validity (content, substantive, structural, generalizability, external, and consequential validity) to validate vocabulary size test of the 14,000 version and the test items were found to be the best fit to Rasch model. He also found various combinations of items providing specific measurement for these participants as examined by Rasch reliability indices >0.96 and the items demonstrated a high degree of unidimensionality with the Rasch model explaining for 85.6% of the variance (Beglar 2010). Amirian, Salari, Heshmatifar, and Rahimi (2015) in an Iranian study showed that there is a highly significant relationship between learners' scores on the 20,000 version of monolingual and bilingual VST. Lin, Pandian and Jaganathan (2015) in a study among university-level Malaysian ESL learners found similar statistically significant relationship between the monolingual and bilingual versions of VST group means. Nguyen and Nation (2011) conducted another validation study by creating a bilingual version of Nation and Beglar (2007) 14K monolingual vocabulary size test. Following this, they administered both the monolingual and bilingual version of the 14K vocabulary size test to 62 third year English major undergraduates in a Vietnamese university. The findings reveal that the students scored more or less equally on both of the test items measured in the two versions of the vocabulary size test (Nguyen and Nation, 2011). Since most of the recent findings suggest that the VST is a current and useful receptive vocabulary size test, the study adopted it as a means to elicit information about the vocabulary knowledge of Malay-English bilingual undergraduates. The instrument VST was further tested with another independent measure of English language proficiency, the official scores of the Malaysian University English Test (MUET) which is reported in Arifur Rahman (2017). The correlation test between the VST and the MUET scores yielded a high correlation [r=.756, p<0.001].

STATISTICAL CONCEPTS

To ensure that the assumptions of correlation analysis are met, outliers, collinearity, random normally distributed errors and homoscedasticity and linearity were tested. At first, the *z* score was calculated to examine the outliers according to the assumption of Field (2009). Therefore, one serious case was detected as it contained the value bigger than 3.29 (in BLP). To reduce the influence of the outliers, the outlier was converted into the value to the next highest non-outlier ratio found in the data set and plus one unit increment higher (Field, 2009). Furthermore, a *z* score analysis was carried out for a second time to ensure the non-existence of outliers in the data (see Appendix 1).

To determine the normality of the vocabulary size test scores and BLP, the Kolmogorov-Smirnov and Shapiro-Wilk tests were taken into consideration with the assumption that Kolmogorov-Smirnov and Shapiro-Wilk test score should be between ±1. Values between ±2 were also acceptable (George & Mallery 2003). Table 1 shows the result of the normality tests.

TABLE 1. Normality Test of the 20k Vocabulary Size Test and BLP

	Kolmogorov-Smirnov a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
VST 20K	.066	96	.200*	.987	96	.460
BLP	.073	96	.200*	.983	96	.238

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The test results of the 20K VST indicated that the Kolmogorov-Smirnov value is .066 whereas the value of Shapiro-Wilk is .987. With regards to the BLP, the Kolmogorov-Smirnov value is .073 and the value of Shapiro-Wilk is. 983. Therefore, it can be concluded that the data are normally distributed. Furthermore, Normal Q-Q Plot of VST and the Detrended Normal Q-Q Plot of VST suggested normal distribution of the data (See appendix 1 for more details). Next, a Collinearity Test was administered to check the assumption of collinearity. The results of the test indicated that multi-collinearity was not a concern (20KVS Scores and BLP, Tolerance = 1.00, VIF = 1.00, cf. Appendix 1). Based on the Durbin-Watson value which is 1.675, the data also fulfilled the assumption of independent errors. Finally, the assumption of Random Normally Distributed Errors, Homoscedasticity, and Linearity were tested. The histogram of standardized residuals provided in appendix 1 showed that the data was approximately normally distributed like the normal P-P plot of standardized residuals. The scatterplots indicate that the points were dispersed from the line, but they were very close. The presence of standardized residuals on the scatterplots confirmed the fitness of data based on the assumptions of homogeneity of variance and collinearity.

RESULTS AND DISCUSSION

THE BILINGUAL LANGUAGE PROFILE AND LANGUAGE DOMINANCE SCORE OF BILINGUAL (MALAY-ENGLISH) TERTIARY STUDENTS

This question only deals with the scores and graphs that have been obtained from the self-scoring Google spreadsheet (Birdsong et al., 2012) of Bilingual Malay-English learners. Table 2 below shows the bilingual Malay-English learners' score of Language History, Language, Use, Language Proficiency, and Language Attitudes together with their English and Malay dominance. Finally, it provides the overall dominance score of the learners.

TABLE 2. Bilingual Malay-English Learners' Score of Language History, Language Use, Language Proficiency, and Language Attitudes

II. Language History		III. Language Use		IV. Language Proficiency		V. Language Attitudes	
English	Malay	English	Malay	English	Malay	English	Malay
43.13	51.30	22.89	31.61	45.4	54.48	43.13	54.48

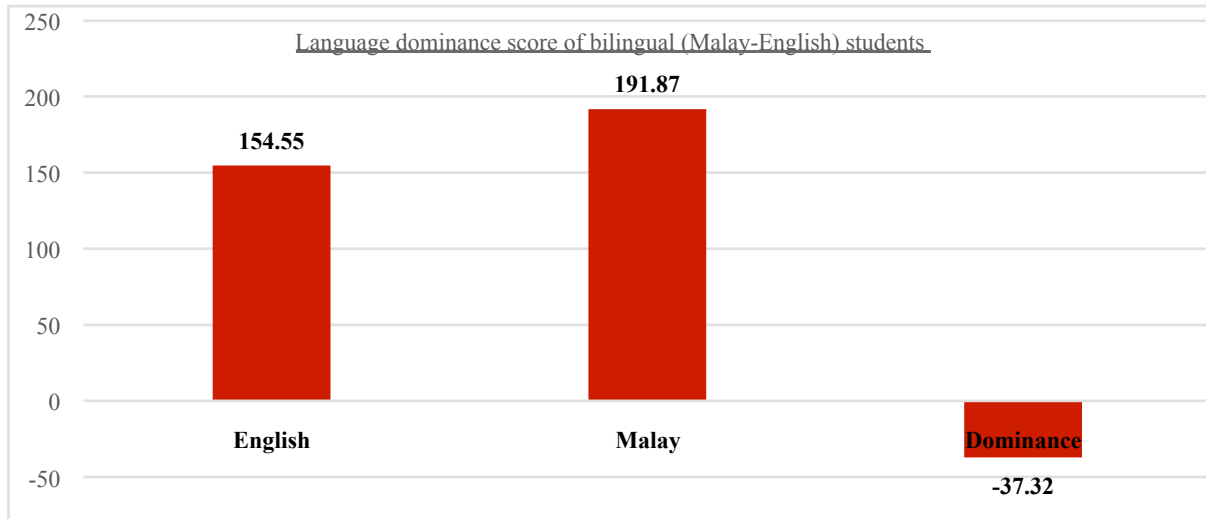| Total Score		
English	Malay	Dominance
154.55	191.87	-37.32

FIGURE 1. Language dominance score of bilingual (Malay-English) students

Based on the detailed documentation of the four domains of language dominance and the overall graphical representation of language dominance score reported in Figure 1 in this study, it was found that most of the learners are Malay dominant. Using the Bilingual Language Profile (Birdsong et al. 2012), all bilingual Malay-English participants were measured for language dominance. As mentioned earlier, the BLP is a self-scoring tool that produces a bilingual language dominance score for each respondent based on measures from four dimensions namely, language history, language use, language competence, and language attitudes. The BLP does not simply categorize a bilingual as dominant in one language or another, rather it produces a score on a continuum that ranges from +218 in another language to zero to -218 in the other language. Therefore, in the current study, the highest dominance score for Malay was found as 135.13 whereas, the highest dominance score of English was 85.37. As expected, most of the Malay-English tertiary learners are likely to be 'Malay dominant'.

The present findings corroborate the outcomes of Aziz (2007), Ismail (2008), and Darmi and Albion (2013) that Malaysian tertiary ESL learners' use of English language is limited to classrooms and the learners face language anxiety when they need to use English. Moreover, university instructional practices along with the socio-cultural influence insulate learners psychologically and linguistically from the use of English language. Some possible explanations can be found in the literature (Mokhtar et al. 2010) that suggests that the English language is used only in reply to lecturer's questions in English classes and learners do not have adequate scope to practice English outside the classrooms. There is also lack of encouragement and support from the parents to use English at home settings and in the community (Robani & Majid 2013). Furthermore, sometimes English is not considered as a medium of instruction and communication. Therefore, learners frequently use Malay for both academic and individual communications. The overall mismatch between language policy and practice in the Malaysian English Language Teaching (ELT) core curriculum was reported to have a negative effect on learners' English language use (Ali 2008, Musa Koo, Lie & Azman 2012, Pandian 2002). However, it may be difficult to compare the results of these studies as they employed different methods to determine language dominance. The present quantitative measure of Malay ESL learners' language dominance may be regarded as a more comprehensive picture of their bilingual profile.

RELATIONSHIP BETWEEN MALAY ESL LEARNERS' LANGUAGE DOMINANCE SCORE AND VOCABULARY SIZE

To determine the relationship between the Malay-English bilinguals' vocabulary size and language dominance score, the Pearson's product moment correlation analysis was run. A positive and moderate correlation were found [r =.556, p<.001] between the two variables which is shown in Table 3 below. The analysis indicates that learners' vocabulary size significantly correlates with their language dominance scores. There is also a significant, moderate, positive correlation between vocabulary size and dominance score for English, [r = .417**, p <.01]. However, a negative correlation [r = -.371, p <.01) between the Malay dominance score and the English vocabulary size confirms that the extracted scores from four dimensions of language dominance score are valid and reliable. In other words, the overall language dominance, and the English dominance score are positively correlated whereas the degree of Malay dominance score is negatively or inversely correlated with English Vocabulary size. This outcome confirms that the instrument (BLP) has yielded an accurate and reliable measure of bilingual Malay ESL learners' language dominance.

TABLE 3. Correlations between Vocabulary size of 20,000 and Language Dominance Score (N=96)

		VST 20,000 LEVEL	OVERALL LANGUAGE DOMINANCE	ENGLISH DOMINANCE	MALAY DOMINANCE
VST 20,000LEVEL	Pearson Correlation	1	.556	.417	-.371
	Sig. (2-tailed)		.000	.000	.000
OVERALL LANGUAGE DOMINANCE	Pearson Correlation	.557	1	.776	-.649
	Sig. (2-tailed)	.000		.000	.000
ENGLISH DOMINANCE	Pearson Correlation	.417	.767	1	-.062
	Sig. (2-tailed)	.000	.000		.546
MALAY DOMINANCE	Pearson Correlation	-.371	-.649	-.062	1
	Sig. (2-tailed)	.000	.000	.546	

Furthermore, to determine the proportion of variance in one variable that can be explained for by the change in the second, Pearson's r was squared. [r^2 =.556*.556 = 30]. That is to say, the coefficient of determination [30%] of the variability of the vocabulary size test scores can be explained by the variability in their bilingual language dominance score. Thus, strong effect sizes are found for the correlation between vocabulary size and language dominance score among the Malay-English bilinguals in Malaysia.

The finding shows a crucial area of vocabulary development that relates to bilingual learners' language dominance; this is eventually seen as a guiding and facilitating feature of vocabulary growth. It has been suggested in earlier studies (Daller & Yixin 2016, Daller & Xue 2009, Daller & Phelan 2013) that an adequate vocabulary size leads to higher academic achievement and the result of correlation confirm that Malay-English bilinguals' language dominance is significantly associated with their vocabulary size. The speculation that both the dimensions and domains of the bilingual student's language dominance are significantly and positively correlated with their language advancement is in line with the earlier discoveries for related measures i.e: relationship between language dominance and perception and production of speech sounds, peak alignment and dominance, dominance scores and Pillai scores (cf., Amengual 2013 & 2016, Baird 2015). This strong relationship further supports the findings of Pangarkar (2015), Sheng et al. (2014), and Gollan et al. (2012) which found that both the subjective (self-evaluations of language dominance) and objective measure of language proficiency of language dominance are highly correlated. Therefore, the accumulated result of dominance score yielded from the four dimensions of the Malay-English learners' Language History, Language Use, Language Proficiency, Language

Attitudes found in the present study also validates the instrument (BLP) itself by providing a significant positive relationship between dominance score and vocabulary size of Malay-English bilinguals. Consequently, the significant result that was found in the present study does not come accidentally since the aforementioned dimensions of dominance have a great influence on language learning.

This result may be explained by the fact that bilingual learners' language history and language use influence their dual language learning. This also accords with earlier observations, which showed that bilingual learners' years of education and extent of residence in a second language country, average self-reported use of first and second language use, and language learning environments have a significant contribution on bilinguals' language dominance, which thereby facilitates bilinguals' language learning (Flege & Liu 2001, Carroll 1967). Furthermore, this study brings novel and specific insights into this relationship of bilingual Malay-English undergraduates' vocabulary size and language dominance by the detailed documentation of their language dominance scores in each language. Language dominance scores found in this study also provide useful insight into the receptive vocabulary development of the bilingual Malay-English learners. The relationship between language dominance and vocabulary achievement is identical for the language dominance measures of this study and this is not surprising given that bilinguals' increased usage of L2 generally precedes their overall second language development. It was found by the earlier research (e.g. Gathercole & Thomas 2009, Oller 2005, Rhys & Thomas 2013) that the bilinguals develop different vocabulary from diverse contexts and this development is significantly associated with their linguistic exposure. The close association between the bilingual Malay ESL learners' receptive vocabulary size and their language dominance is expected as the earlier studies (Oller & Eilers 2002, Paradis, Tremblay & Crago 2008) reported that language dominance is one of the crucial factors that seems to be influential for a bilingual learners' ultimate linguistic achievements in both the society and within the individual. This combination of findings provides some support for the conceptual premise of the present study that bilingual Malay ESL learners 'language dominance scores can explain 30% of their present receptive vocabulary size.

CONCLUSION AND IMPLICATIONS

The study used the Bilingual Language Profile (BLP) to measure language dominance, which provides an in-depth understanding of the bilingual Malay ESL learners' degree of language dominance towards both Malay and the English language with the former showing a higher dominance over the latter. However, a modest link was found between the degree of language dominance and vocabulary size. Nevertheless, one of the more significant findings to emerge from this study is that language dominance score provides 30% of the variability in their vocabulary size. In other words, 30% of the second year Malay ESL students' vocabulary size can be explained based on their language dominance scores. This study provides the first quantitative assessment of all those variables (history, use, attitude, proficiency) and put forward a quantitative ratio of these factors. Arifur Rahman (2017) also showed that vocabulary size was the only significant predictor of academic achievement when a step-wise regression analysis was performed using language proficiency using MUET scores, language dominance and vocabulary size as factors in the regression analysis. Taken together, with this understanding of students' degree of language dominance, it can be argued that there may be beneficial effects from getting students to start using the L2 from their childhood and to increase the use of the target language in everyday life and in the workplace to foster positive attitude towards the L2 which may be effective strategies to develop and enhance vocabulary

knowledge of bilingual students. Nation (2015) argues that successful vocabulary learning occur when learners frequently encounter the particular words as well as pay attention to learn those words at each encounter. Thus, the more the students encounter the words, the more likely they are to learn them. Also, the more engaged they are with the new words, the better they retain the knowledge of these new words. Future studies that studies effective vocabulary learning strategies can also consider language dominance as an additional factor when examining differences in groups of subjects. Past studies have often only considered proficiency level (e.g. Paiman, Thai & Yuit 2015).

Earlier studies in the Malaysian context reported that a large proportion of the tertiary students have insufficient vocabulary size ranging from 2000-4000 word family level only, except the study of Arifur Rahman (2017). It is still an open question whether the difference in the performance is due to the specific population of students sampled in these studies or a result of other factors such as language dominance, age of acquisition, frequency of use, location of the study and level of education. An important implication derived from the findings of our study is that both language dominance and vocabulary size should be taken into account when measuring the vocabulary size of any particular group of bilinguals. As the sample size of the present study is relatively small and recruited from a single public university, further studies may consider sampling from a bigger population, possibly from both public and private universities in Malaysia. Future studies should compare different groups of Malaysian ESL students' and measure their language dominance scores too to further develop our understanding on the reason for their achievement in terms of vocabulary knowledge which can impact their academic and future work success.

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APPENDIX 1

CORRELATION ANALYSIS ASSUMPTION TESTS

HISTOGRAM OF STANDARDIZED RESIDUALS

Coefficientsa
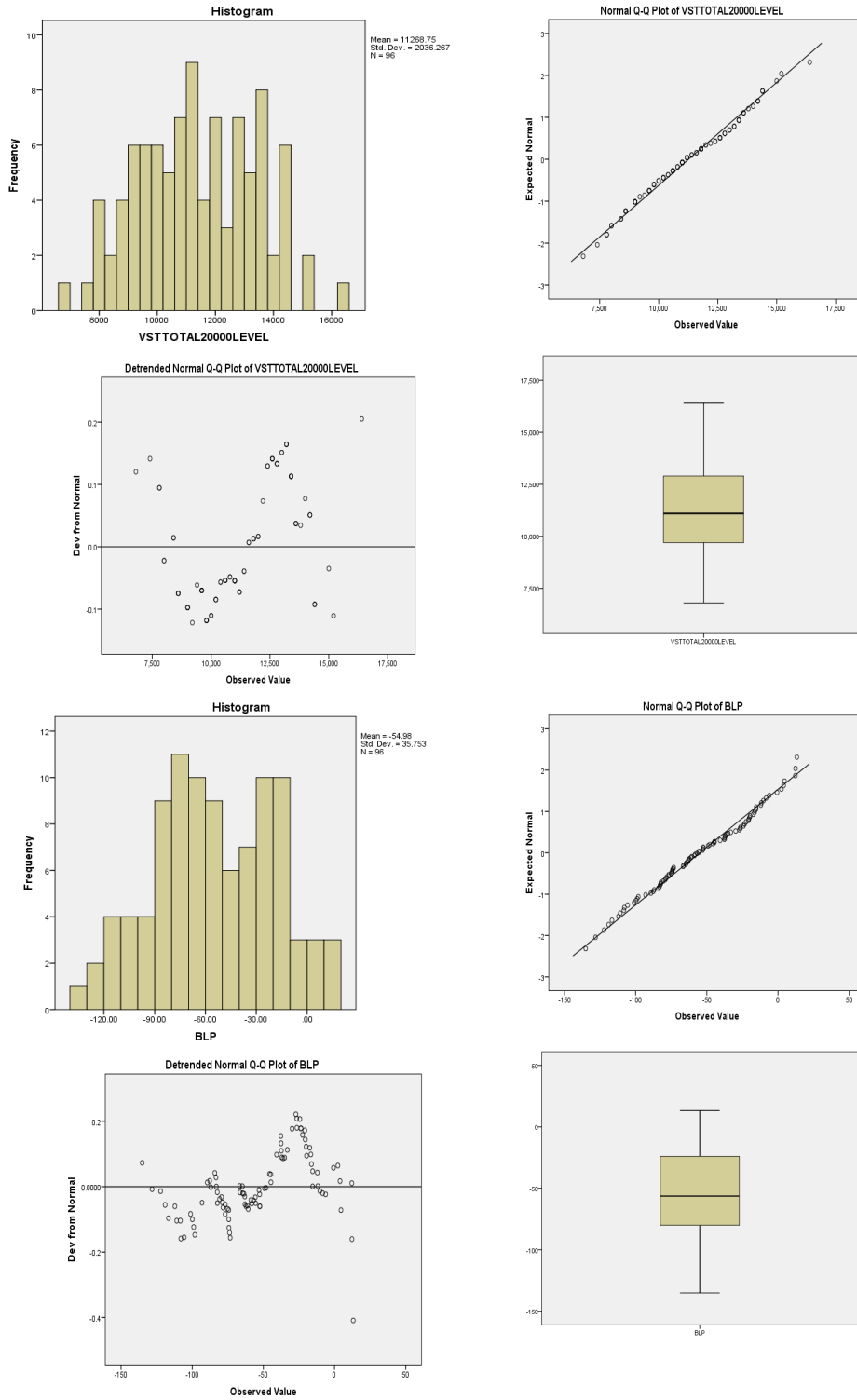
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	12985.258	321.696		40.365	.000		
	BLP	31.222	4.913	.548	6.355	.000	1.000	1.000

a. Dependent Variable: VSTTOTAL20000LEVEL

Collinearity Diagnosticsa

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	BLP
1	1	1.840	1.000	.08	.08
	2	.160	3.387	.92	.92

a. Dependent Variable: VSTTOTAL20000LEVEL

Scatterplot
Dependent Variable: VSTTOTAL20000LEVEL

Histogram
Dependent Variable: VSTTOTAL20000LEVEL