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Investigating Cross-Language Relations in the Phonological Awareness of Children's Early Reading

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ABSTRACT

This study investigated whether the cross-language relations of children's phonological awareness skills influenced their first- (L1: Chinese), second- (L2: English) and third-language (L3: Malay) early reading ability. A battery of tests was designed to measure children's phonological awareness and reading ability. Three tasks of phonological awareness and two tasks of reading were administered in Chinese, English and Malay languages. The tasks that assessed phonological awareness skills included deletion, blending and segmentation of sound, and two early reading tasks included word and sentence reading. One-hundred and fifty (150) Chinese-speaking children participated in this study. These participants were Year 1 students from six national Chinese primary schools in Malaysia. Partial Least Squares-Structural Equation Model (PLS-SEM) was used to analyse the data. Results revealed that there was no skill transfer from L1 to L2 and L3 due to orthography differences. Cross-language transfer was found in L3 phonological awareness which strongly predicted L1, L2 and L3 early reading ability.

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INTRODUCTION

The need for children to acquire two or more languages in the school context or in their daily communication is increasing. Reading is a fundamental skill to master a language, especially in the early stages. Phonological awareness has proved to be

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the most powerful predictor of early reading (Adams et al., 1998; Anthony & Francis, 2005; Castles et al., 2011; Gillon, 2004; Litt, 2010; Lonigan et al., 2009). However, the studies which investigate the cross-language relations in the phonological awareness of children's early reading in Malaysia context still underexplored. The influence of the first language (L1) on children's reading performance in second language (L2) and third language (L3) still needs more attention from the researches.

Phonological awareness is an essential skill that underlies a child's ability to learn to read. It is referred to as the ability to manipulate the sound structure of spoken language regardless of meaning (Wagner & Torgesen, 1987). Phonological awareness skills are commonly measured by tasks of manipulating sounds in words such as counting, matching, deleting, blending, and segmenting sounds within words (Anthony & Francis, 2005). This ability to manipulate units of sound helps children make connections between sounds and letters in print (Wagner & Torgesen, 1987). It allows children to decode the phonological code represented by the symbols. This process is known as word decoding. Research carried out by Lonigan et al. (2009) indicated that children who had difficulty in the coding process were most likely to lack phonological awareness as they could not describe the smaller units of sound in words.

Cross-Language Transfer

When there is a relationship between two languages there is a tendency for the languages to influence each other. These influences are known as "interference" and they are interdependent (Paradis & Genesee, 1996). Paradis and Genesee (1996) suggested that although phonological systems were different in other languages they did not develop separately. However, they were interdependent which brought in the force of "*transfer*", i.e. the more dominant element in one language would be transferred to the weaker one.

The transfer may occur in both directions from one language to the other or vice versa. It may facilitate or accelerate the acquisition of phonological skills in weaker languages, for example, the same phonetic sound in two languages. This is said to be the "positive transfer" effect (Goldstein & Bunta, 2012). However, interactions may also cause a negative transfer when the sound in one language does not have the same phonetic sound, which delays the phonological development in a second language. This is known as "negative transfer" (Goldstein & Bunta, 2012). The influence and interaction between languages is a common phenomenon in the reading development of bilingual or multilingual children (MacWhinney, 2012). Studies suggest that reading skills such as phonological awareness can be transferred across languages regardless of their orthographic whether alphabetical or non-alphabetical (Chen et al., 2010; Chow et al., 2005; Chung & Ho, 2010; Cummins, 1981; Goodrich et al., 2013; Lafrance & Gottardo, 2005; Li et al., 2010).

Cummins' Interdependence Hypothesis (2008) had explained how cross-language transfer occurred between languages. Cummins (2008) suggested that languages were interconnected and might influence one another. Children develop a common underlying proficiency in first and second language (L1 and L2, respectively) which is transferable across languages (Cummins, 1981). Common underlying proficiency involves general cognitive processing skills such as phonological awareness, working memory and rapid automatic naming. These cognitive skills underlie L1 and L2 reading processes (Goodrich et al., 2013). To enable these transfer processes, a minimum level of language proficiency is needed (Cummins, 1981). Depending on the characteristics of both languages, children may develop more advanced phonological awareness skills in the languages through cross-language transfer. The transfer may occur in any direction provided there is sufficient exposure to L2 either in school or environment, and motivation to learn L2.

Alternatively, there is the script-dependent hypothesis introduced by Cummins (1979), which suggests that the characteristics of different scripts may influence the acquisition of languages and cause different reading and writing problems. Different orthographic features and phonological systems demand different reading skills in different languages. It is possible to predict whether transfers occur between languages depending on the orthographic and phonological characteristics of both languages (Chung & Ho, 2010).

Effects of Phonological and Orthographic Structure on Phonological Awareness

Phonological and orthographic structure influence the acquisition of second language reading (Perfetti et al., 1992; Ziegler & Goswami, 2005) and it may determine whether skills can be transferred across languages. The Chinese writing system differs substantially in both phonological and orthographic structure from the English and Malay, which are alphabetic writing systems. The acquisition of an alphabetic orthography plays an important role in the development of phonological awareness, particularly in the development of phonemic awareness (Anthony & Francis, 2005; Castles et al., 2011; Litt, 2010; Lonigan et al., 2009).

On the other hand, Chinese is relatively simple in phonological structure than Malay and English. The basic unit of the Chinese writing system is character. Unlike the alphabet system, Chinese scripts are not based on phonemes; they are based on syllabic-morpheme where Chinese characters are based on graphic units containing morphemes and syllables (McBride-Chang et al., 2008). A Chinese character can provide orthographic information (writing), syllables (mentions) and morphology (meaning) (Li et al., 2010). Syllable is a basic unit of pronunciation in Chinese and each syllable is divided into two parts namely onset-rime, for example

syllable / mei3 / divided into / m / (onset) and / ei3 / (rime). It is more consistent and reliable when larger grain size units, including syllables and rhymes, are utilised. As a result, Chinese favour larger grain size units (Chung & Ho, 2010; Ziegler & Goswami, 2005).

English and Malay consistent with strong letter-sound correspondence and units of phonemes are favoured. Balota et al. (2004) described the onset-rime structure in English syllables. A single syllable consists of onset and rime. The rime consists of a nucleus and a coda. The nucleus is represented by the vowel, the coda is represented by the final consonant and the onset is represented by the initial consonant. For example, the word "pat" / pæt / consists of three letters "p", "*a*" and "*t*", where "p*"* represents sound / *p* /, "*a*" sound / *æ* / and "*t* " / *t* /.

The Malay language consists of 26 letters and all alphabet names in Malay are similar to that of English. It has 34 graphemes which include 26 letters, five digraphs (gh, kh, ng, ny and sy) and three diphthongs (ai, au and oi). Most phonemes in Malay are also similar to phonemes in English (Awang, 2004). For example, "g" for "girl' and "h" for "house" are similar in Malay such as "g" for "*guru*" (teacher) and "h" for "*hidung*" (nose). Some of the phonemes are different in both languages. For example, the letter "c" which sounds like /ch/ and the letter "u" which sounds like /oo/ in Malay language. Syllables are salient units in Malay words, even though consistent with letter-sound correspondence. It is because Malay words have distinct syllable structures (Haron, 2011).

Both English and Malay are Roman scripts, but both languages have different transparency relationships. According to Haron (2011), one of the key factors of the Malay language being an easy-to-learn language is due to its very easy phonological system. It is considered a transparent orthography because of the relationships between the phonemes that can be matched completely. It has a close relationship between letters and sounds like English, but it has a systematic phonological system of which one letter represents only one phoneme. English, on the other hand, is considered to have "deep" orthography because of its complex phonemes. The English phonological system is disordered and not symmetrical, and there is no phonemic. Each English letter may represent two, three or four phonemes. For example, the letter "a" and the letter "c" represent several different phonemes of sound in English. "a" in the words "apple", "arm" and "caught" represent three different phonemes, and "c" in the words "cut", "cent", "place" and "chair" represent four different phonemes.

In the Malay language, the example of the letters "a" and "c" only represent a phoneme / a / and / c / in all word combinations except the letter "e" which represents two phonemes. Examples of the letter "e" are contained in words such as "*emak*" and "*enam*", and the letter "é" pepet in words like "*elok*" and "*esok*". Based on these different phonological systems it is

assumed the process of acquiring reading skills in English and Malay is different, and the effectiveness of an English-language teaching technique may not be used as a guide to teach early reading of Malay language (Haron, 2013). Though there are differences in graphic-phonemic relationships, early reading of children in both English and Malay languages is entirely dependent on phonological skills including phonological awareness and decoding to read words (Pasquarella et al., 2015). This study was conducted due to several unclarified issues, including whether first-language phonological awareness skills influence the development of second and third language early reading.

This study aimed to examine the relations between phonological awareness and early reading in the acquisition of Chinese, English, and Malay language. The study investigated the cross-language transfer of phonological skills in acquiring three different languages. This study presented two research questions: (a) Do phonological awareness skills predict children's early reading? (b) Do phonological awareness skills in L1 transfer to early reading in L2 and L3 or vice-versa? The study investigated whether the cross-language relations of phonological awareness skills influenced children's early reading ability in trilingual acquisition. Phonological awareness was expected to predict children's early reading ability, which could be transferred across languages.

METHODS

Participants

One-hundred and fifty (150) Chinese-speaking children participated in this study. These participants were 6 to 7 years old and enrolled in Year 1 (this is equivalent to Grade 1, for example, in the UK or US). They were randomly chosen from six national Chinese primary schools in Selangor, Malaysia. Three schools are situated in urban areas and another three schools are in rural areas (https://www.selangor.gov.my). The participants consisted of 85 boys and 65 girls. 78 were from urban schools and 72 were from rural schools. Participants used Chinese as their native language and attended local primary schools in which Chinese was the teaching medium. They had been exposed to written forms of Chinese, English and Malay languages starting from 4 or 5 years old in kindergarten. The children learned English and Malay as second and third languages. After defining the criteria, participants were randomly selected by using pattern number selection from their class name list.

Measures

A battery of tests was designed to measure participants' phonological awareness and reading ability. Three tasks of phonological awareness and two tasks of reading were administered in Chinese, English and Malay languages. These tasks were adapted and comparable to each language.

Phonological Awareness. Participants were given the adapted phonological

awareness subtests of the Comprehensive Test of Phonological Processing (CTOPP-2) (Wagner et al., 2013), which was deemed suitable to the participants. The phonological awareness contained three subtests: deleting, blending and segmentation of sounds. Each task consisted of four practice trials and 10 experimental trials.

Chinese phonological awareness. In the sound deletion task, participants were asked to delete either the onset or rime unit of a syllable. For example, when given syllable /ba1/, participants were asked to delete the onset /b/ sound. The answer in this case is /a1 /; or syllable /mei3/ delete rime /ei3/ sound where answer is /m/. In the sound blending task, participants combined the onset and rime unit of a syllable. For example, onset /c/ and rime /ai4/ were sounded out separately and participants were asked to combine these two sounds to produce a syllable /cai4/. Lastly, in the sound segmentation task participants were asked to detect the onset and rime sound, and then sound them out separately. For example, syllable /hua1/ segment it into /h/ and /ua1/ (Chow et al., 2005; Li et al., 2010).

English phonological awareness. In the sound deletion task, participants were asked to delete the onset-rime or phonemic unit of a syllable. For example, participants were given a task to "say /pat/ without /p/ at the onset-rime level or phonemic level, or to "say /book/ without the /k/ sound. In the sound blending task, participants combined the onset-rime or phonemic unit of a syllable to produce a word. For example, combining phonemes /c/, /a/ and /p/ to sound out the syllable /cat/. In the sound segmentation task, participants were asked to detect the onset-rime or phonemic sound and then sound them out separately. Example: "tell me the first sound, middle sound and the last sound of /map/", where the response will be /m/, /a/ and /p/ (Wagner et al., 2013).

Malay phonological awareness. For the sound deletion task, participants were asked to delete the onset-rime or phonemic unit of a syllable. For example, participants were given a task to "say /kan/ without /k/ at onset-rime level or phonemic level, or to "say /lam/ without the /m/ sound. Participants combined the onset-rime or phonemic unit of a syllable to produce a word. For example, combining phonemes /d/, /a/ and /n/ to sound out the syllable / dan/. For the sound segmentation task, participants were asked to detect the onset-rime or phonemic sound and then sound them out separately. Example: "tell me the first sound, middle sound and the last sound of /mah/", where the response will be /m/, /a/ and /h/ (Lee, 2008; Lee & Wheldall, 2011).

Early Reading. ***Word reading.*** The single word recognition items were chosen from the Grade 1 vocabulary word list in the Chinese, English and Malay languages curriculum for national schools (Curriculum Development Centre, Ministry of Education). The words on the vocabulary word list were first analysed and categorised based on their phonological structure (both syllable and phonic structure). Items were chosen based on the resultant categories that emerged. The final selection consisted of 50 words. Participants were required to read

aloud all the words that were arranged in order of increasing phonological complexity.

***Text reading*.** The text reading sentences were chosen from Grade 1 Chinese, English and Malay languages textbooks in accordance with the curriculum for national schools (Curriculum Development Centre, Ministry of Education). Sentences were chosen based on the complexity of the words in the sentences. Two or three paragraphs were selected from the front, middle and back chapters of the books.

Procedure

Parental/guardian consent was obtained before testing. Participants answered the questions asked by the researcher. All task instructions were administered in Chinese language, which was the first language of the participants. Two testing sessions were conducted to avoid any risk of fatigue on the participants and every session is about 20 minutes.

Data Analysis

The PLS path modelling was used to analyse the relationships. Firstly, descriptive analysis was conducted to calculate means and standard deviation for all the tests in three languages (see Table 1). Secondly, prior to the main analysis, steps such as coding data, treating missing data and checking normality were conducted (Hair et al., 2010). Once these steps were done, the PLS path modelling was done using Smart PLS 3.0 software to test the theoretical model (Ringle et al., 2015). Thirdly, measurement model properties were assessed to ascertain the validity and reliability of the relations between the indicator and latent constructs. Lastly, structural model analysis was conducted to assess the significance of the path coefficients for the main model (Hair et al., 2014).

Table 1

Means and standard deviations of children's phonological awareness and early reading performance for three languages

Task	Language					
	Chinese		English		Malay	
	M	SD	M	SD	M	SD
Phonological Awareness (Max =10)						
Sound deletion	4.49	3.42	4.93	3.88	6.30	2.89
Sound blending	5.57	3.94	5.44	3.35	7.45	2.70
Sound segmentation	3.51	7.74	5.88	3.43	7.27	3.26
Early Reading (Max = 100)						
Word reading	74.25	25.38	59.92	34.27	63.45	35.79
Text reading	83.48	25.13	72.43	32.85	68.81	35.80

RESULT

Table 1 presents means and standard deviations of the measures.

Measurement Model Assessment. To assess the measurement model, internal consistency reliability, individual item reliability, convergent and discriminant validity were ascertained (Hair et al., 2014). Individual item reliability was assessed by examining the outer loadings of each construct's measure. Items with loading at least 0.708 or above indicated that the items used obtained significant reliability (Hair et al., 2014). Table 2 shows the outer loading for all the items ranging from 0.838 to 0.976.

Internal consistency reliability of measures was ascertained by examining the composite reliability coefficient. Table 3 shows the composite reliability coefficients of the latent construct ranging from 0.908 to 0.977. Based on the rule of thumb, the composite reliability should be at least 0.70 or above (Hair et al., 2014). It shows adequate internal consistency reliability of the measurements. Convergent validity was ascertained by examining Average Variance Extracted (AVE). The AVE of the latent constructs shown in Table 3 ranged from 0.767 to 0.955 in which the above rule of thumb minimum value 0.50 was met (Hair et al., 2014).

Table 2

Individual item reliability (outer loading)

	PAL1	PAL2	PAL3	L1	L2	L3
PAL1-1	0.897					
PAL1-2	0.838					
PAL1-3	0.890					
PAL2-1		0.915				
PAL2-2		0.906				
PAL2-3		0.910				
PAL3-1			0.879			
PAL3-2			0.922			
PAL3-3			0.888			
ReadL1-1				0.975		
ReadL1-2				0.973		
ReadL2-1					0.977	
ReadL2-2					0.978	
ReadL3-1						0.975
ReadL3-2						0.976

Table 3

Internal consistency reliability and convergent validity

Latent Construct	Items	Conbach's alpha	Composite reliability	AVE
Chinese Phonological Awareness	PAL1	0.848	0.908	0.767
English Phonological Awareness	PAL2	0.897	0.935	0.829
Malay Phonological Awareness	PAL3	0.878	0.925	0.804
Chinese Early Reading	L1	0.947	0.974	0.949
English Early Reading	L2	0.953	0.977	0.955
Malay Early Reading	L3	0.949	0.975	0.952

Besides, the Fornell-Larcker criterion was used to ascertain discriminant validity (Fornell & Larcker, 1981). It compared the correlations of square roots of AVE with the latent variables. To establish discriminant validity, the square root of each latent construct's AVE should be larger than its correlations with other latent constructs (Hair et al., 2014). In Table 4, all the latent constructs met this criterion indicating adequate discriminant validity.

Structural Model Analysis. The causal relationships between latent constructs were obtained by running the PLS-SEM algorithm (Ringle et al., 2015). Path coefficient which represents the causal relationships indicated by direct effect, β. A non-parametric bootstrap procedure was used to test the significance of the path coefficients for the structural model. In bootstrapping, a number of 5,000 bootstrap samples was applied (Ringle et al., 2015). Table 5 presents the path coefficients of all direct effects, β for the research model. Figure 1 depicts all the significant paths between latent constructs for the research model. The numbers shown near the arrows is the path coefficient between the latent constructs. Value of β indicating the strength of the path coefficient.

Table 4

Validity discrimination (correlations among latent construct)

Latent Construct	L1	L2	L3	PAL1	PAL2	PAL3
L1	**0.974**					
L2	0.676	**0.977**				
L3	0.675	0.913	**0.976**			
PAL1	0.390	0.660	0.657	**0.876**		
PAL2	0.451	0.756	0.741	0.877	**0.910**	
PAL3	0.620	0.842	0.887	0.755	0.815	**0.897**

Table 5
Path coefficients

	Direct effect, β
Chinese phonological awareness -> Chinese early reading	-0.163
Chinese phonological awareness -> English early reading	-0.130
Chinese phonological awareness -> Malay early reading	-0.116
English phonological awareness -> Chinese early reading	-0.041
English phonological awareness -> English early reading	**0.310***
English phonological awareness -> Malay early reading	0.148
Malay phonological awareness -> Chinese early reading	**0.779****
Malay phonological awareness -> English early reading	**0.688****
Malay phonological awareness -> Malay early reading	**0.853****

Note. *Significant at $p < 0.01$, **Significant at $p < 0.001$

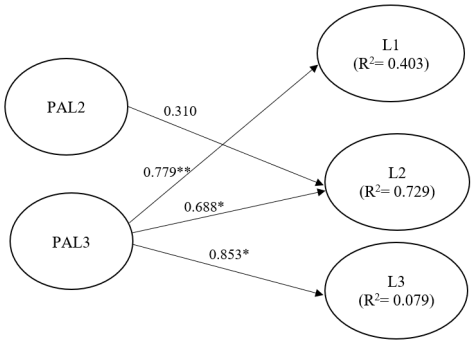

Figure 1. Significant path of research model
Note. PAL2 = English phonological awareness, PAL3 = Malay phonological awareness, L1 = Chinese early reading, L2 = English early reading, L3 = Malay early reading.
*Significant at $p < 0.01$. **Significant at $p < 0.001$

This study focused to answer two research questions. Firstly, do phonological awareness skills predict children's early reading? Phonological awareness is expected to be able to predict children's early reading ability. Results in Table 5 revealed that Malay phonological awareness had a very strong significant positive relationship with Malay early reading (β = 0.853, $p < 0.001$), followed by English phonological awareness in a significant positive relationship with English early reading (β = 0.310, $p < 0.01$). However, there was no significant relationship between Chinese phonological awareness with Chinese early reading. Results showed that phonological awareness only predicts children's early reading in English and Malays languages, not Chinese.

Secondly, do phonological awareness skills in L1 (Chinese) transfer to early reading in L2 (English) and L3 (Malay), or vice-versa? Results indicated Chinese phonological awareness did not affect early reading in English and Malay. In addition, English phonological awareness also suggested no effect on Chinese and Malay early reading. However, the results provide empirical support for cross-language transfer in Malay phonological awareness

because Malay phonological awareness showed significant positive relationships with Chinese and English early reading ($\beta = 0.779$, $p < 0.001$ and $\beta = 0.688$, $p < 0.001$).

After the significance of path coefficients for the research model were ascertained, next the level of the R-squared values was assessed. Figure 1 presents the *R*-squared values of the latent constructs of early reading in Chinese, English and Malay (L1, L2 and L3). As depicted in the numbered circles, the construct of phonological awareness showed the most variances in Malay early reading (L3) at 79% of the total variance. This was followed by English early reading in which phonological awareness showed 72.9% of the total variance. Phonological awareness showed only 40.3% of the total variance in Chinese early reading. *R*-squared value of 0.10 was proposed as a minimum acceptable level (Falk and Miller, 1992). Following this recommendation, latent constructs of L1, L2 and L3 had an acceptable level of *R*-squared values.

DISCUSSION

This study aimed to examine the relations between phonological awareness and early reading in the acquisition of Chinese, English and Malay languages. Results revealed that phonological awareness had a strong and positive relationship with early reading in both Malay and English languages, but not Chinese. When comparing the three languages, phonological awareness strongly predicts children's early reading in the Malay and English languages, while phonological awareness was not a predictor for early reading in Chinese.

According to Ziegler and Goswami (2005), different languages vary in the orthographic consistency and grain size of the orthography-phonology correspondences, which play important roles in the acquisition of reading. Reading in consistent orthographies involves small linguistic units, whereas reading in inconsistent orthographies requires the use of larger units also. English and Malay, due to the nature of their alphabetic script, are consistent orthographies with strong letter-sound correspondence. Small grain size units of processing such as single letters and phonemes are favoured. Phonological awareness of smaller units of phonemes tend to be strongly associated with early reading, especially word decoding in English and Malay. Chinese, on the other hand, is an inconsistent language because of its logographic script which favours larger grain size units such as syllables and rimes.

Phonological awareness did not predict Chinese character recognition and text reading. This finding, in line with previous studies (Chow et al., 2005; Chung & Ho, 2010; Mc-Bride-Chang et al., 2008; Wang et al., 2003), demonstrate that phoneme awareness is relatively less important for Chinese reading because the phoneme is not explicitly represented in Chinese orthography. Larger grain size including syllables and rimes may be better predictors of Chinese reading development, unlike the alphabetic orthographies of English and Malay where phonemes tend to be strongly

linked to the reading process (Li et al., 2010; Ziegler & Goswami, 2005).

In this study, phonological awareness skills in the first language were investigated to determine whether to facilitate second or third language early reading. Results indicated Chinese phonological awareness did not associate with English and Malay early reading. In this case, Chinese phonological awareness skills did not facilitate English and Malay early reading. English phonological awareness also revealed no effect on Chinese and Malay early reading. These findings indicated no cross-language transfer from neither Chinese nor English phonological awareness to facilitate early reading in the acquisition of three languages. However, results indicated that Malay phonological awareness showed significant and positive effects on Chinese and English early reading. This provides empirical evidence to cross-language transfer of Malay phonological awareness to Chinese and English early reading (L3 → L1 and L3 → L2).

The theory of backward transfer was supported in this study (Goldstein & Bunta, 2012). Previous cross-language transfer studies had provided evidence for backward transfer (Cenoz & Gorter, 2011; Chen et al., 2010; Jarvis & Pavlenko, 2007; Talebi, 2012). For example, Jarvis and Pavlenko (2007) stated that skills transfer can take place in many directions, such as "forward" (L1 → L2) and "backward transfer" (L2 → L1 or L3 → L2). Cenoz and Gorter (2011) have shown several possible transfer directions, includes L2 (Basque) → L1 (Spanish), L3 (English) → L2 (Basque), and L3 (English) → L1 (Basque). Chen et al. (2010) proved that L2 second language phonological instruction (English) speeds up phonological awareness of children in their first language (Chinese) through cross-language transfer (L2 → L1). In addition, the findings of this study are also in line with the findings of Talebi (2012). Talebi had proven that the transfer of reading strategies could be transmitted across all languages regardless of the orthography and phonological systems. Therefore, in this study, it can be expected that phonological awareness can also be transferred as a reading strategy. Talebi believes that by teaching reading strategies in second language learning, not only could improve their second language reading, but also increased their ability to read in the first language as a result of the backward transfer.

Transfer of phonological awareness skills may occur from L3 to L1 or L2, because phonological awareness skills involve in common underlying cognitive processing for any language acquisition. The positive transfer relationship showed in this study, indicated that an increase in phonological awareness development in Malay early reading would facilitate the acquisition of phonological awareness skills, which can be applied to English and Chinese early reading.

Findings did not support the Interdependence Hypothesis (Cummins, 1979) for Chinese phonological awareness. L1 phonological awareness not transferable to L2 and L3 early reading due to the

drastic orthography differences. However, findings did support Cummins's Threshold Hypothesis which proposed that skills transfer might occur provided the child had attained a certain level of competence in a language. The skills transfer may occur from dominant to the weak one (Cummins, 1981). In this study, Malay phonological awareness demonstrated high performance in sound deletion, blending and segmentation tasks (see Table 1). These high performance skills may be transferred and facilitate or accelerate the acquisition of phonological awareness in Chinese and English, which are weaker in these skills (Goldstein & Bunta, 2012).

The transfer from L3 to L1 and L2 occurs. This is probably because the phonological system of the Malay language is easier to master and makes it more likely to be transmitted and shared with other languages. The Malay phonological system is easier to learn compared to English because of its simple phonological system (Haron, 2011). The syllabus method was used in Malaysia to teach children to read the Malay language at the beginning of the reading as early as at the kindergarten level (Abd. Talib, 2000). It has grapheme-phoneme correspondence like English, but it also has a systematic phonological system of one letter representing one phoneme. Thus, children are exposed to the syllable system at kindergarten and are able to acquire syllabus skills easily comparable to Chinese and English. Indirectly, the concepts of the phonemes and some phonological skills may be transferred.

Literacy skills also help children to understand the relationship of grapheme-phonemes in alphabetic writing systems, thus increasing phonemic awareness (Chen et al., 2010). Children begin to receive early reading instructions and orthographic depth has an important impact. This study found that children who learn to read shallow orthography including the Malay language can develop phonemic awareness faster than children who are learning to read deep orthography including English, where the grapheme-phoneme correspondence is less consistent (Goswami, 2003). In addition, based on Chinese orthography in which each basic graphic unit of Chinese is a character that is associated with a morpheme, children acquire Chinese reading skills by "look-and-say" regardless of grapheme-phonemes. Subsequently, the transfer of phonological awareness from Chinese to English or Malay does not occur. Instead, the transfer occurs from Malay (L3) to Chinese (L1) and English (L2). This is due to the adequacy of exposure and motivation to L3. Finally, the Malay phonological system is easily mastered, and phonological awareness skills tend to be transferred and shared in English and Chinese reading.

CONCLUSIONS

The cross-language relations between phonological awareness and early reading in the acquisition of Chinese language, English and Malay were investigated. Results revealed that phonological awareness had strong and positive relationships with early reading in both Malay and English

languages, but not Chinese. Phonological awareness is relatively less important for Chinese reading because the phoneme is not explicitly represented in Chinese orthography. Larger grain size may be better predictors of Chinese early reading. The alphabetic orthographies of English and Malay where phonemes tend to be strongly linked to the reading process. Furthermore, there was no skill transfer from Chinese language to English and Malay due to orthography differences (logographic vs alphabetic). However, cross-language transfer was found as Malay phonological awareness strongly predicted Chinese and English early reading ability. The backward transfer of phonological awareness skills had been proven in this study.

These findings provide important information for teaching and learning second and third languages in the classroom. The children from a non-alphabetic L1 background such as Chinese tend to apply word reading strategies that are effective for reading Chinese when they need to decode English or Malay words. This may lead to reading problems in English or Malay languages. Thus, explicit instructions in phonological awareness is necessary in children's early years.

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