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中国英语学生在拼读上的跨语言迁移

The Cross-linguistic Transfer In the Reading and Spelling of Chinese ESL Students

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Abstract: Previous cross-linguistic research has well established that transfer in the literacy development of English-as-the-second-language (ESL) students exists. Less extensive is the research on the effect that the distinct features of diverse first languages (L1) have on the specific reading-related cognitive abilities and academic performance in the second language (L2). The current study was conducted to investigate English reading and spelling skills of students from different language backgrounds (English, Chinese- and Persian-speaking ESL) in Grade 6 by examining their reading and spelling. The results showed similar performance on word reading and spelling tasks, however, differences were found on tasks reading comprehension. The Chinese L1 group performed at a higher level than Persian L1 group on the two reading comprehension tasks, and no difference was found between English L1 and the two ESL groups. Interestingly, the three groups demonstrated distinct patterns in correlations between reading and spelling tasks. Taken together, these results clearly suggested comparable performance in lower level reading tasks of ESL students from diverse L1 backgrounds and possible L1 influence on linguistic tasks with higher demands in middle and upper grades of Chinese- and Persian-ESL groups.

Introduction

Previous research (Gottardo, Chiappe, Yan, Siegel, & Gu, 2006; Lesaux & Siegel, 2003; Plaza & Cohen, 2006; Wade-Woolley, 1997) comparing the reading performance of ESL and native English students found cognitive processes related to the reading of ESL students. However, fewer attempts have been made to explore ESL students whose L1s are of distinct orthographic features (e.g., nonalphabetic language, such as Chinese and non-Roman alphabetic language, such as Persian).

Two of the cross-linguistic reading theories being mostly argued about are universalist hypothesis and script-dependent hypothesis. The universalist hypothesis, or linguistic-interdependence hypothesis (Cummins, 1979), posits that the development of reading skills in different languages are shaped by common underlying cognitive and linguistic processes. Contrastingly, the script-dependence hypothesis proposes that each language develops from one another and that reading develops with its own orthographic features in each language.

Would Chinese- and Persian-speaking students read and spell in English similarly or differently? A brief review of the Chinese and Persian language features would help a better understanding of the cross-linguistic transfer across the languages.

Chinese language features

Traditionally, Chinese speech is analyzed into syllables. The Chinese syllable is an easily accessible unit because one morpheme is represented by one character, thus

Chinese is also considered as a morphosyllabic or a morphographic language in which the graphemes represent the syllables that are morphemes rather than phonemes (Wang, Cheng, & Chen, 2006). It is therefore hypothesized by some researchers that the role of morphological awareness in Chinese will be analogous to the role of phonemic awareness in reading English (Wang et al., 2006). The extant literature has also well established that phonological processing is used by Chinese L1 children reading Chinese in Chinese-speaking environment (Chan, & Siegel, 2001; Ho & Bryant, 1997; Knell, Siegel, Haiyan, Lin, Z., Miao, Wei, & Yanping, 2007; So & Siegel, 1997) and English-speaking context (Gottardo, et al., 2006).

Persian language features

Persian is written as a modified version of Arabic, with the letters written from right to left. There are 29 letters representing consonants and three letters representing long vowels (*alef, vav, ye*). Persian is described as transparent in reading as it has very regular grapheme-to-phoneme correspondence rules because each grapheme has a single pronunciation (Arab-Moghaddam & Senechal, 2001; Baluch & Besner, 1991). However, similar to English, there are six phonemes (e.g., the phonemes /z/, /s/, /t/, /h/, /a/, and /gh/) that can be marked by more than one letter. Therefore, the Persian orthography is described as polygraphic, namely, the same phoneme can be represented by more than one letter (Rahbari & Senechal, 2009). Arab-Moghaddam and Senechal (2001) found that phonological and orthographic processing skills each predicted unique variance in word reading in English and Persian. However, spelling in English was predicted similarly by phonological and orthographic processing skills, whereas spelling in Persian was predicted by orthographic processing skills only (Arab-Moghaddam & Senechal, 2001).

The present study

Since the initial aim of the present study was to understand the relationship between all the reading-related cognitive abilities and reading and spelling among Chinese- and Persian-speaking ESL, and English L1 students, the performance of Grade 6 students was examined in the study. The research questions were:

Do the students in the three language groups (i.e., English, Persian and Chinese) perform differently in reading (word reading and reading comprehension) and spelling? What are the correlations between reading and spelling performance of the three language groups in Grade 6?

The hypotheses for this part were students from the three different language backgrounds might perform differently in their reading and spelling; and similarly, the difference in their L1 orthographies might lead to distinct spelling performance across the three language groups.

Method

Participants

The participants were part of a longitudinal study from a school district in North Vancouver in Canada. The participants were classified as ESL students if they speak a

language other than English at home to their parents, siblings and grandparents from the information obtained from school records. Most of the ESL students had some experience of reading and speaking in their first languages. The participants in this study were 131 (40 Chinese ESL, 44 Persian ESL and 47 English L1) sixth-grade students from the same school district. The mean age of the children was 11.38 years ($SD = .46$). All of the ESL students had had at least two years of full-time English classroom instruction. The ESL students had received the same instruction as their English L1 peers. The participants of the three language groups were matched for initial status in reading, spelling, gender and classroom.

Design

The ESL participants were normally-achieving readers and spellers who scored above the 25th percentile on the spelling and reading subtests of the Wide Range Achievement Test (WRAT-3, Wilkinson, 1995). The English L1 students were randomly selected from the same classrooms as the ESL students. The English L1 students also needed to have their reading and spelling scores falling within the same range as that of the ESL groups.

Procedure

Trained graduate and undergraduate students conducted the assessments in the schools. Each child was individually assessed in a quiet room for all the tasks except that the tasks of reading comprehension were administered in group settings in classrooms.

Measures

Word Reading:

The Wide Range Reading Achievement (WRAT-3, Wilkinson, 1995) *reading subtest*: The WRAT-3 reading subtest was an individually administered, standardized oral reading achievement test. This test required the children to identify 15 upper-case letters and a set of words presented in the order of increasing difficulty.

Word Identification: This task is the Word Identification subtest of Woodcock-Johnson Psycho-Educational Battery-Revised (Form A) (WJ-R, Woodcock & Johnson, 1989). Word identification was an individually administered, standardized test.

Word Attack: This task was the Word Attack subtest of Woodcock-Johnson Psycho-Educational Battery-Revised (Form A) (Woodcock & Johnson, 1989). Word attack was also an individually administered, standardized test consisting of a list of non-real words of different numbers of syllables.

Reading comprehension:

The Stanford Diagnostic Reading Comprehension Test (SDRT, Karlsen & Gardner, 1994): The SDRT reading comprehension subtest was a standardized reading comprehension test. Each student was given a booklet and asked to respond to multiple-choice questions about each passage within a time limit.

Planet Filk and Greb: This was an experimental reading comprehension task. The task was composed of short stories containing novel and made-up information. Such a task was valuable to the study of ESL reading in the assessment since most other reading comprehension tasks require some degree of vocabulary and culturally-based knowledge. The maximum score on this task was 14.

Spelling:

The Spelling subtest of the Wide Range Achievement Test-3rd Edition (WRAT-3, Wilkinson, 1995): This was a standardized and group-administered test made up of a list of increasingly difficult series of words orally presented to the participants in group, who were required to spell out the correct form of the words.

Spelling of Sounds: This task was the spelling subtest of Woodcock Johnson-III Tests of Achievement (WJ-III, Woodcock, McGrew, & Mather, 2001). The tester orally presented a list of pseudowords to the participants, who were required to spell out the words. This task was to test the spelling and phonetic coding skills.

Results

This study examined the reading and spelling performance and the development of the cognitive abilities related to reading and spelling of Grade-6 students from diverse language backgrounds (English, Persian and Chinese in this study).

Do the students in the three language groups perform differently in their reading (word reading and reading comprehension) and spelling?

The mean scores and standard deviations of all reading measures were shown in Table 1.

Table 1. Word Reading and Reading Comprehension by First Language.

	English n = 47	Persian n = 44	Chinese n = 40
Wide Range Reading Achievement Test-3 reading			
Mean	109.06	111.11	112.33
SD	9.71	8.58	9.24
Woodcock Johnson-III word identification			
Mean	116.11	119.45	115.93
SD	13.77	13.31	11.69
Woodcock Johnson-III word attack			
Mean	120.43	122.07	122.38
SD	17.18	11.95	14.34
Stanford Diagnostic Reading Comprehension Test			
Mean	684.15	664.93	689.80
SD	35.88	31.77	35.62
Filk & Greb			
Mean	9.53	8.58	10.05
SD	2.07	2.15	1.65

Wide Range Reading Achievement Test-3 (Wilkinson, 1995); Woodcock Johnson- III = Woodcock Johnson Psycho-Educational Battery-Third Edition (Form A) (WJ-III, Woodcock & Johnson, 1989); Stanford Diagnostic Reading Comprehension Test (Karlsen & Gardner, 1994)

ANOVA was used to examine the difference on reading performance separately among the three L1 groups. To control for Type I error, alpha level was set .017. Eta-squared (η^2) was used as a measure of effect size, with .009 being small size, .059 being the medium size and .138 being the large size (Cohen, 1988, p.286-287). No significant difference was found on any of the word reading tasks: WRAT-3 reading, $F(2, 128) = 1.41$, ns, $\eta^2 = .02$; word identification, $F(2, 128) = 1.02$, ns, $\eta^2 = .02$; word attack, $F(2, 128) = .23$, ns, $\eta^2 = .004$. However, significant differences were found on both reading comprehension tasks, SDRT(Stanford Diagnostic Reading Test, Karlsen & Gardner, 1994), $F(2, 128) = 6.14$, $\eta^2 = .09$, $p < .005$; Filk and Greb, $F(2, 127) = 5.92$, $\eta^2 = .09$, $p < .005$. Post Hoc Tukey HSD showed Persian L1 group performed lower than Chinese L1 groups ($ps < .005$) on both SDRT and Filk and Greb. No significant difference was found between English L1 and two ESL groups. The performance on the two spelling measures was also investigated across the three groups. The mean scores and standard deviations were shown in Table 2.

Table 2. Spelling by First Language.

	English N = 47	Persian N = 44	Chinese N = 40
Wide Range Achievement Test-3 spelling			
Mean	112.23	114.86	117.95
SD	10.84	10.86	9.89
Woodcock Johnson-III spelling sounds			
Mean	108.81	108.75	107.38
SD	10.93	10.08	10.20

SD = standard deviation

AONVA was conducted and no significant difference was found on the task of WJ-III spelling of sounds (Woodcock et al., 2001), $F(2, 128) = .25$, ns, $\eta^2 = .004$, and WRAT-3 spelling task (Wilkinson, 1995), $F(2, 128) = 3.16$, $\eta^2 = .047$.

What are the correlations between reading and spelling performance of the three language groups in Grade 6?

The Pearson Product-moment correlations among the three word reading and decoding tasks, two reading comprehension tasks and two spelling tasks were shown in Table 3, with $r = .10$ being small effect size, .30 being medium, and .50 being large (Cohen, 1988, p. 79-80).

The three groups showed correlations of similar magnitude between most measures of word recognition and spelling, with rs ranging from .34 to .78 for English L1 speakers, .39 to .65 for Persian L1 speakers and .35 to .69 for Chinese L1 speakers, except Persian speakers displayed weaker correlations between nonword spelling (WJ-III spelling sounds, Woodcock, McGrew, & Mather, 2001) and two word recognition tasks, with $r = .26$ for the WRAT-3 reading and $r = .10$ for the WJ-III

word attack (Woodcock & Johnson, 1989). Chinese L1 students also displayed weaker correlations between nonword spelling and real word reading task (WRAT-3 reading, Wilkinson, 1995), with $r = .02$.

Table 3. Correlations Between Reading and Spelling by First Language

	1	2	3	4	5	6
English						
1. WRAT-3 reading						
2. WJ-R word identification	.71**					
3. WJ-R word attack	.68**	.77**				
4. WRAT-3 spelling	.66**	.78**	.70**			
5. WJ-III spelling sounds	.34**	.50**	.38**	.54**		
6. SDRT	.43**	.46**	.34**	.51**	.24	
7. Filk& Greb	.38**	.42**	.51**	.42**	.28	.54**
Persian						
1. WRAT-3 reading						
2. WJ-R word identification	.65**					
3. WJ-R word attack	.48**	.39**				
4. WRAT-3 spelling	.58**	.65**	.42**			
5. WJ-III spelling sounds	.26	.42**	.10	.39**		
6. SDRT	.05	.35**	.12	.46**	.23	
7. Filk& Greb	.25	.43**	.21	.51**	.12	.48**
Chinese						
1. WRAT-3 reading						
2. WJ-R word identification	.58**					
3. WJ-R word attack	.57**	.60**				
4. WRAT-3 spelling	.57**	.53**	.69**			
5. WJ-III spelling sounds	.02	.47**	.35**	.41**		
6. SDRT	.02	.24	.17	.25	.41**	
7. Filk& Greb	-.22	-.10	-.24	-.24	.20	.55**

** means p is significant at .01; WRAT = Wide Range Achievement Test-3; WJ-III = Woodcock Johnson-III; SDRT = Stanford Diagnostic Reading Test.

A different picture was noted in the correlations between reading comprehension and word reading, decoding and spelling across the three L1 groups. Significant correlations were found between all reading comprehension tasks and word reading, decoding and spelling tasks for English L1 group, with r ranging from .30 to .59, except nonsignificant correlations between SDRT and nonword spelling, $r = .24$. However, although Persian L1 group demonstrated significant correlations between reading comprehension tasks and word identification task, $r = .35$ for SDRT and .43 for Filk and Greb, and between WRAT-3 spelling (Wilkinson, 1995) task and two reading comprehension tasks, $r = .46$ for SDRT and .51 for Filk and Greb, the correlations were not significant between WRAT-3 reading (Wilkinson, 1995) task and two reading comprehension tasks, with $r = .05$ for SDRT and .25 for Filk and Greb; and between Word attack (Woodcock & Johnson, 1989) and two reading comprehension tasks, with $r = .12$ for SDRT and .21 for Filk and Greb in this group. Interestingly, no significant correlation was found between all the reading comprehension tasks and word reading, decoding and spelling tasks except the

significant correlation between nonword spelling task and SDRT, with $r = .41$ among Chinese L1 students.

Discussion

The first research question addressed whether the students achieve differently as a function of their L1 backgrounds. The results indicated that L1 backgrounds did not seem to have an impact on the performance on word reading tasks. Nevertheless, Persian L1 readers showed less proficiency in both reading comprehension tasks than Chinese L1 readers. Reading comprehension is considered a higher level process than word reading including reader level and text level (Lesaux, Lipka, & Siegel, 2006). Reader level factors, according to research, involve reading motivation, reading self-concept, reading behavior and reading comprehension (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012), and text level factors subsume text and question types (Eason, Goldberg, & Cutting, 2012), discourse structure, clarity and syntactic complexity (Lesaux, Lipka, & Siegel, 2006). Since the prime focus of the current study is on the reading-related cognitive abilities rather than the other factors, the finding at least suggested that the processes of relatively complex linguistic and syntactic structures in passage reading were influenced by L1s (Chinese and Persian). This finding is consistent with the recent studies showing that the use of morphemes was a strong predictor for reading comprehension (Nunes, Bryant, & Barros, 2012) and that syntactic skills significantly predicted sentence reading comprehension (Chik, Ho, Yeung, Chan, Chung, Luan, Lo, & Lau, 2012). There might also be possible impact from the L1 learning cultures on the ESL students' background knowledge or motivation which are beyond the limit of current study.

The examination of the spelling performance showed the three L1 groups were comparable in applying phoneme-grapheme correspondences in English and might even demonstrate equal proficiency when more spelling strategies such as memory, sight word are integrated in the tasks of real-word spelling. This finding has lent support to the universalist hypothesis indicating that the L1 orthography did not influence the spelling in L2 in the current sample.

The second research question addressed whether the relationship between reading and spelling was similar for English L1 and ESL students from two distinct L1 backgrounds (Chinese and Persian). Different correlations between word reading vs. spelling and reading comprehension vs. spelling across the three L1 groups indicated an impact of L1 backgrounds on the students' specific approaches in reading words and reading passages in Grade 6. Positive and significant correlations among all word reading and spelling measures across the groups revealed that learning to read and spell single words in English are similar processes regardless of the L1 backgrounds.

However, strategies used in reading passages with more complicated linguistic demands involving morphological and syntactic abilities seemed influenced by the L1 backgrounds. English L1 readers showed significant correlations between word reading and decoding, spelling and reading comprehension, indicating that English L1 readers in Grade 6 are consistent in applying the phoneme-grapheme correspondences (PGC) and grapheme-phoneme correspondences (GPC) in spelling and both lower

level (word reading) and higher level (passage reading) reading tasks, while Persian L1 and Chinese L1 readers tended to process the reading comprehension tasks differently from word reading processes. Rahbari and Senechal (2009) found both transparent and opaque words were read faster by Persian speakers than nonwords even though the nonwords were transparent and nonpolygraphic (words that one phoneme corresponds to one grapheme). They (Rahbari and Senechal, 2009) also found Persian speakers read transparent and opaque words being affected by word frequency. The present study similarly found Persian L1 readers tended to rely on lexical access to read, indicated by the significant correlations between word identification and WRAT-3 spelling, two reading comprehension tasks; and non-lexical access to spell, indicated by the non-significant correlations between two spelling tasks and word attack. This result is also consistent with the research of Akamatsu (2002) and Rahbari and Senechal (2009). Chinese L1 readers, however, did not demonstrate any significant correlation among the two reading comprehension tasks and word reading, decoding and spelling tasks, indicating Chinese L1 readers access higher level reading tasks with approaches (e.g., morphological awareness and syntactic awareness) somewhat different from decoding and coding strategies used for the lower level reading tasks. This finding is in line with the studies of Ho, Wong, Yeung, Chan, Chung, Lo, and Luan, (2012), McBride-Chang, Shu, Zhou, Wat, and Wagner, (2003) and Wang, et al. (2006).

Conclusion and implications

To summarize, cross-linguistic transfer influence the literacy of ESL students in Grade 6 more on the processing of complicated linguistic structures than lower level processes and distinct language backgrounds continued to be pertinent to the reading strategies utilized by different ESL groups despite years of exposure in English instruction.

This study provided suggestions for future research. For instance, tasks measuring metalinguistic skills in ESL students' L1 would provide better understanding of ESL students' capacities in L2 learning.

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