

# Cross-Linguistic Transfer Revisited: The Case of English and Persian

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## Abstract

The present study sought to investigate the evidence for cross-linguistic transfer in a partial English immersion and non-immersion educational setting. To this end, a total of 145 first, third and fifth graders in a partial English immersion program and 95 students from the same grade levels in a non-immersion program were chosen. Six different English and Persian tests were administered: the Cambridge English for Young Learners (YLE) Test for Reading, a Persian reading achievement test, the English and Persian Phonological Awareness Sound Detection tests and the English and Persian Rapid Automatized Naming Tests. Given the nature of the research question and the design of this study, linear regression analysis was run through Statistical Package for Social Sciences (SPSS). The findings suggest that there is an apparent cross-linguistic transfer between English reading achievement and Persian cognitive predictors in both educational settings. Relatively speaking, Persian cognitive predictors can moderately predict English reading achievement in Grades 1 and 5 and can weakly predict English reading achievement in Grade 3.

**Keywords:** Cross-linguistic Transfer, Phonological Awareness, Rapid Automatized Naming, Bilingual Education

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## **1. Introduction**

English is increasingly used worldwide today for international communication. Likewise, English instruction as a second or foreign language for children at an early age is becoming more common worldwide (Li, 2008). Hence, the need for innovative methods of teaching English to students in their early years has risen dramatically over the past few decades. This is especially the case in Asian countries including Iran. Therefore, bilingualism in early childhood is the rule, rather than the exception.

Bilingualism is a world-wide phenomenon. Among other things, research into bilingualism, since the 1960s, has focused on the impact of bilingualism on children's linguistic and cognitive development (Johnson & Swain, 1997). Research evidence gleaned so far invariably suggests that bilingual education contributes to students' overall literacy development and academic success (Genesee, 1985; Johnson & Swain, 1997). The basic objective of bilingual education "is making students proficient in the second language while, at the same time, maintaining and developing their proficiency in the first language and fully guaranteeing their educational development" (Stern, 1972, p. 6). Depending on the social, linguistic, educational, and political contexts, these goals of bilingual education can be achieved in many ways, immersion education being one of them (Swain, 2000).

Immersion education involves the teaching and learning of school subjects through two different languages. As a successful bilingual program model, French Immersion (FI) in Canada has demonstrated that immersion is an effective means of facilitating preschool and primary school students' language proficiency, literacy and cognitive development, without undermining competence in their first language (Cummins, 1981; Cummins & Carson, 1997; Swain, 1996). Nonetheless, closely related to the immersion program, which is

*Cross-Linguistic Transfer Revisited: The Case of...*

widely carried out in the world, is the partial immersion program. The difference between the two is essentially a difference between a second language setting and a foreign language setting: in the former, there is total immersion; the whole curriculum is presented in the second language, while in the latter the foreign language is taught as a subject for a limited number of hours per week (Lyster, 2007).

Learning to read and spell is a central part of becoming literate (Ehri, 1987). In many places around the world, children read and spell in two languages. There is a large body of research on reading and spelling in first and second languages. For many years, research on early reading ability has mainly focused on the predictive power of phonological skills. These skills include phonological awareness, which refers to the ability to manipulate the sounds in words and the awareness of the sound structure of words, and phonological decoding, which enables the reader to convert written words into oral language by analyzing individual graphemes into their corresponding phonemes (Adams, 1990; Wagner et al., 1994). Therefore, these two provide a solid foundation for word reading. However, researchers have recently found that phonological processes are not sufficient to explain all of the variance in reading ability. Some researchers (e.g., Johnston & Kirby, 2006; Wolf & Bowers, 1999) have argued that naming speed is a precursor of orthographic processing and makes a unique contribution to reading performance independent of phonological awareness. An important issue is whether phonological awareness and naming speed are associated with different aspects of reading, with phonological awareness being more related to phonological decoding (Wagner et al., 1994; Wagner et al., 1997) and naming speed being more related to orthographic processing (e.g., Bowers & Wolf, 1993; Manis, Seidenberg, & Doi, 1999). Although there is considerable evidence that phonological awareness and

naming speed are crucial to word reading (Scarborough, 1998; Share & Stanovich, 1995; Wagner et al., 1994; Wagner et al., 1997), several studies (e.g., Kirby et al., 2003; Torgesen et al., 1997) have shown that phonological awareness and naming speed predict both word reading and reading comprehension. In addition, word reading has turned out to be highly correlated with reading comprehension because the meaning of text must depend on accurately apprehending the individual words of the text. Poor reading comprehension can be expected as a result of deficiencies in word reading (Shankweiler et al., 1999).

Cross-linguistic Influence (CLI) is a related concept and has been scrutinized in various studies into bilingualism. It refers to different ways of interaction in the mind of different language systems (i.e., two different languages or two different varieties of the same language) and how this impacts linguistic performance and/or linguistic development of the individual (Sharwood Smith, 1983). A large body of research shows that phonological awareness skills in L1 and L2 transfer cross-linguistically, and can predict word reading development in children's L1 and L2 (Bruck & Genesee, 1995; Comeau et al., 1999; Durgunoglu et al., 1993; Geva & Wang, 2001; Wade-Woolley & Geva, 2000). More recent studies have been conducted on cross-linguistic transfer of reading processes in early reading and have primarily focused on correlations between phonological awareness measures in bilingual children (Durgunoglu et al., 1993; Leafstedt & Gerber, 2005; Swanson et al., 2004).

Given that the studies so far have produced mixed results and that cross-linguistic transfer is conspicuously under-researched in the Iranian context, the current study sought to scrutinize cross-linguistic transfer in English and Persian in terms of cognitive predictors. The findings of the study could have

### *Cross-Linguistic Transfer Revisited: The Case of...*

implications for bilingual education in the Iranian context in that bilingual education is gradually gaining a foothold. Given that bilingual education makes huge demands on students, it is necessary to scrutinize these programs in terms of possible impacts which they could have on students. In the light of the findings, it would be possible for educational policy makers to make informed decisions about bilingual education.

## **2. Objectives of the Study**

Given the findings so far, which have been inconsistent in some cases, the present study aims to investigate the cross-linguistic transfer between the cognitive predictors and reading achievement in the Iranian context. Specifically, the question addressed in the current study is whether there is cross-linguistic transfer between Persian cognitive predictors of Phonological Awareness and Rapid Automatized Naming (henceforth, PA and RAN, respectively) and English reading achievement in different grade levels of both partial English immersion and non-immersion programs.

## **3. Literature Review**

In today's world, bilingualism is quite widespread. In bilingualism, an individual or a group of speakers, such as the inhabitants of a particular region or a nation can speak two languages (Richards & Schmidt, 2002). Schreuder and Weltens, (1993) have classified bilingualism into three dimensions: societal dimension, pertaining to ethnic diversity in one country; individual dimension, pertaining to a person whose parents speak different languages; and educational dimension, pertaining to acquisition and conscious instructed learning.

Since the 1960s, a number of researchers have studied the impact of bilingual education on children's linguistic and cognitive development (Byram & Morgan, 1994; Johnson & Swain, 1997; Lapkin & Swain, 1990, to name just a few). According to Stern (1972), the basic objective of bilingual education is to make students proficient in the second language while, at the same time, maintaining and developing their proficiency in the first language and fully guaranteeing their educational development. Depending on the social, linguistic, educational, and political contexts, the goals of bilingual education can be achieved in many ways.

To accomplish the goals of bilingualism, since the 1960s, a variety of English teaching methods have been in place in language classrooms, content-based instruction (CBI) being one of them. This method is consistent with communicative approach, which has greatly impacted language education since the 1980s. Brinton et al. (2003) define content-based instruction as "the concurrent study of language and subject matter, with the form and sequence of language presentation dictated by content material" (p. 6). According to Brown (2001, p. 49), once "language becomes the medium to convey informational content of interest and relevance to the learner, then learners are pointed towards matters of intrinsic concern. Language takes on its appropriate role as a vehicle for accomplishing a set of content goals". Closely related to content-based instruction is immersion education which emphasizes the principle of acquiring content through language (Richards & Rogers, 2001). Another growing body of research exploring cognitive processes in learning to read focuses on the role of naming speed or rapid automatized naming (RAN) in explaining basic reading processes of children learning to read concurrently in two languages, and children learning to read in L2. According to Gholamian and Geva (1999), based on the 'central processing' (universal) perspective, the

*Cross-Linguistic Transfer Revisited: The Case of...*

development of word-based processes in different languages is shaped by common underlying cognitive and linguistic processes, such as verbal memory and rapid automatized naming. In their study, Gholamian and Geva (1999) examined the linguistic, cognitive, and basic reading skills of 70 children in Grades 1-5 learning to read concurrently in English (L1) and Persian (L2). They indicated that naming speed in Persian (Farsi) significantly explained variance in English reading tasks, and naming speed in English significantly predicted reading tasks in Persian.

In his work, Li (2008) worked out two methods to assess cross-linguistic transfer. The first was a liberal method of hierarchical regression or correlation analysis. For example, Chow et al. (2005) found that Chinese phonological awareness can predict English word reading abilities concurrently and longitudinally after accounting for variance due to age, Chinese vocabulary, and visual skills performance among 227 kindergarteners in Hong Kong. This study explored cross-linguistic transfer, taking into account age and Chinese vocabulary, but without controlling for English phonological processing skills. The second way to explore cross-linguistic transfer is more conservative. Not only are age and native language vocabulary controlled, but phonological processing skills in the other language are also controlled. For example, McBride-Chang and Ho (2005) tested 90 Chinese children on phonological processing and other reading skills, once at age 4 and again 22 months later. They indicated that English letter-naming knowledge uniquely predicted Chinese word recognition and English word reading after controlling for Chinese vocabulary and Chinese phonological processing skills. They found that L1 phonological awareness contributed unique variance to L2 word reading performance even if the children's L2 phonological awareness was controlled.

Arab-Moghaddam (1997) suggested that there is cross-language transfer between English and Persian since there is a positive correlation among equivalent tasks in Persian and English. She also argued that based on the orthographic Depth Hypothesis, phonological skills play a more important role in a shallow orthography (Persian) than a deep orthography (English), while orthographic skills play a more predominant role in a deep orthography (English) than a shallow orthography (Persian). Shallow orthographies (e.g., Persian) refer to the orthographies that have simple grapheme-to-phoneme correspondence whereas deep orthographies (e.g., English) are the orthographies in which one or more graphemes map unpredictable phonemes. However, the advantage of the shallow orthography for reading in Persian could not be maintained for spelling in Persian, since more than one grapheme representation for a phoneme is possible.

In sum, the studies touched upon in the review of literature do not provide conclusive evidence for cross-linguistic transfer and this area of bilingual education clearly remains under-researched whereas a good number of studies have been conducted to reveal the significance of phonological awareness and naming speed of early reading development skills in both second and foreign language environments. Given that Persian and English have different grapheme-to-morpheme representations, it is necessary to scrutinize bilingual programs to see whether there is any evidence of cross-linguistic transfer in terms of cognitive processes in both Persian and English and reading achievements in a partial immersion program, as compared with a non-immersion program in Iran.



## **4. Methodology**

### **4.1. Design**

Due to the type of research question, the approach employed in this study is a quantitative approach. The method which is used in this study is ex post facto. Specifically, this study utilizes a multiple regression model which is a type of ex post research method, and a type of quantitative research approach to test a hypothesis.

### **4.2. Sampling Procedure**

In order to gather the data for the study, two types of sampling were utilized: a sampling design which is based on probability and a sampling design which is not based on probability. In this study first, a judgment sampling which is a type of non-probabilistic sampling design was employed to select the schools. Based on the purposes of this study, two primary schools, one with a partial English immersion and the other with non-immersion educational program, were chosen. It should be noted that the first school (i.e., Mehr-e-Taban Bilingual School) is the only primary school with a partial English immersion program in Shiraz, and the second school (i.e., Nour-e-Kherad) is also the only school that has a non-immersion program, in the same district as the first school in Shiraz.

Second, a simple random sampling, which is a type of probability sampling, was employed. After selecting the two schools, a number of students were randomly selected from the total population. This study was conducted with a total of 240 female students with Persian as their first language (L1) and English as their second language (L2). 145 students were randomly selected from the total population of the partial English immersion programs and 95 students were randomly selected from the total population of the non-

immersion programs. It is worth mentioning that of the total number of the students studying in each school, 53 students (36 from the partial immersion program and 17 from the non-immersion program) were left out because they did not qualify for the study. Following this deletion, a total of 240 students were selected from the remaining population, using the simple random sampling technique. The age range of students in this study was 6 to 11. The distribution of the participants is provided in the following table.

**Table 1. Students' Distribution by Program in Each Grade Level**

Gender	Grade1		Grade 2		Grade 3	
	PI	NI	PI	NI	PI	NI
Female	55	30	50	35	40	30

*Note.* PI = Partial immersion program; NI = Non-immersion program.

### **4.3. Data Collection**

In order to gather the required data for the purpose of this study, six different English and Persian tests were administered to both the English immersion and non-immersion groups. The English and Persian reading achievement tests were administered to the sample. The English and Persian phonological awareness and rapid automatized naming tests were administered individually to each student. The Cambridge YLE reading and writing tests, the Persian reading achievement test, the English and Persian PA tests, were all scored objectively. YLE tasks and phonological awareness tasks were registered as the total number of correct answers, with higher scores indicating better performance. The English and Persian RAN tasks were also scored objectively and reported in terms of seconds; that is, shorter times indicated better performance.

#### 4.4. Data Analysis

Since the basic objective of the study was to investigate the cross-linguistic transfer between the test takers' scores on the test of English reading achievement and their scores on the tests of Persian PA and Persian RAN, linear regression analysis and ANOVA were run. This was conducted for students in different grade levels in the two programs involved.

### 5. Results and Discussion

#### 5.1. Results

Descriptive statistics including mean and standard deviation for each of the three grade levels of partial English immersion and non-immersion groups are presented in the following tables. Table 4.1 shows the descriptive statistics for partial immersion students.

**Table 2. Descriptive Statistics for Partial English Immersion Students**

Variable	Grade 1 (N=55)		Grade 3 (N=50)		Grade 5 (N=40)	
	M	SD	M	SD	M	SD
English academic achievement	19.60	3.67	33.10	4.46	38.15	7.07
E.PA	17.23	2.08	17.96	1.45	17.62	1.84
E.RAN	0.96	0.36	0.61	0.13	0.59	0.15
Persian academic achievement	19.02	1.01	19.26	0.78	18.11	1.46
P.PA	18.09	1.28	19.26	0.72	18.65	1.45
P.RAN	0.87	0.23	0.64	0.12	0.61	0.13

A close analysis of the data shows that the mean score for English and Persian RAN has decreased as students' age increased in the partial English immersion group, indicating a better performance. An interesting finding

observed among partial English immersion students is that the mean score of English and Persian PA and English and Persian reading achievements have increased in Grade 3 compared with that of the first and fifth grades. The following table presents the descriptive statistics for non-immersion students.

**Table 3. Descriptive Statistics for Non-immersion Students**

Variable	Grade 1 (N=30)		Grade 3 (N=35)		Grade 5 (N=30)	
	M	SD	M	SD	M	SD
English academic achievement	17.30	2.76	20.97	5.33	22.63	5.28
E.PA	14.96	2.42	15.57	2.77	16.66	2.35
E.RAN	2.52	0.77	1.10	0.35	0.79	0.19
Persian academic achievement	18.26	1.29	18.62	1.45	17.75	1.65
P.PA	17.93	1.46	18.28	1.67	17.83	1.70
P.RAN	1.07	0.36	0.73	0.20	0.67	0.12

A close analysis of the data shows that the mean score for English and Persian RAN has decreased as students' age increased in the non-immersion group. A similar relationship to that of the partial English immersion group can also be observed in the Persian PA of the non-immersion group. That is, the mean score of Persian PA has increased in Grade 3 compared with the first and fifth grades. However, the English PA seems to increase with students' age, that is, the fifth graders did better than the third graders who, in turn, did better than the first graders.

The comparison of the results found in Tables 2 and 3 reveals that the mean scores of all English and Persian tasks seem to be higher in the partial English immersion group compared with the non-immersion group. This can partly be due to the lack of time which is spent on teaching English compared with the partial English immersion group.

*Cross-Linguistic Transfer Revisited: The Case of ...*

Since the basic objective of the study was to investigate the cross-linguistic transfer between the test takers' scores on test of English reading achievement and their scores on test of Persian PA and Persian RAN, linear regression analysis was run. The results obtained for this question are presented for the three different grade levels, and the two different groups in the following tables. Given the nature of the question to be addressed, linear regression analysis was run for first Graders in partial English immersion.

**Table 4. Coefficients for Grade 1 Partial English Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	1.18	.40	.41	2.94	.00
P.RAN	-5.44	2.18	-.35	-2.49	.01

*Note.* Dependent Variable: English reading achievement

The results reported in the above table indicate that a change of one standard deviation in P.PA results in a change of 0.41 of a standard deviation in English reading achievement. The findings also show that a change of one standard deviation in P.RAN leads to a change of -0.35 of a standard deviation in English reading achievement.

It was necessary to run regression analysis for first graders in the non-immersion group. Table 5 presents the coefficients of first graders in the non-immersion group.

**Table 5. Coefficients for Grade 1 Non-Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	1.01	.47	.53	2.14	.04
P.RAN	-1.58	1.86	-.21	-.84	.40

*Note.* Dependent Variable: English reading achievement

The results indicate that a change of one standard deviation in P.PA results in a change of 0.53 of a standard deviation in English reading achievement. However, the results also indicate that a change of one standard deviation in P.RAN does not bring about a significant change in the standard deviation of English reading achievement.

Regression analysis was also run for third graders in the partial English immersion group. The results are given in the table below.

**Table 6. Coefficients for Grade 3 Partial English Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	3.060	1.071	.495	2.856	.006
P.RAN	-5.423	6.424	-.146	-.844	.403

*Note.* Dependent Variable: English reading achievement

The findings indicate that a change of one standard deviation in P.PA brings about a change of 0.49 of a standard deviation in English reading achievement. However, the results clearly suggest that a change of one standard deviation in P.RAN does not lead to a significant change in the standard deviation of English reading achievement. In a like manner, for the third graders in the non-immersion group, the regression analysis was run. Table 7 presents the respective coefficients.

**Table 7. Coefficients for Grade 3 Non-Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	1.52	.72	.47	2.10	.04
P.RAN	-3.80	6.00	-.14	-.63	.53

*Note.* Dependent Variable: English reading achievement

*Cross-Linguistic Transfer Revisited: The Case of ...*

The data suggests that a change of one standard deviation in P.PA results in a change of 0.47 of a standard deviation in English reading achievement whereas a change of one standard deviation in P.RAN does not cause a significant change in the standard deviation of English reading achievement. The coefficients of Grade 5 learners in the partial English immersion group are given in Table 8.

**Table 8. Coefficients for Grade 5 Partial English Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	1.382	.990	.285	1.39	.171
P.RAN	-20.459	10.393	-.402	-1.969	.057

*Note.* Dependent Variable: English reading achievement

The findings of the regression model suggest that a change of one standard deviation in P.PA does not lead to a significant change in the standard deviation of English reading achievement. However, a change of one standard deviation in P.RAN brings about a change of -0.40 of a standard deviation in English reading achievement. Table 9 reports Grade 5 coefficients in the non-immersion group.

**Table 9. Coefficients for Grade 3 Non-Immersion Group**

Model	Unstandardized	Standardized	Beta	t	Sig.
	Coefficients	Coefficients			
	B	Std. Error			
P.PA	1.502	.778	.484	1.930	.064
P.RAN	-9.404	10.282	-.229	-.915	.368

*Note.* Dependent Variable: English reading achievement

From the findings above, it could be understood that a change of one standard deviation in P.PA leads to a change of 0.48 of a standard deviation in

English reading achievement. However, the results also indicate that a change of one standard deviation in P.RAN does not result in a significant change in the standard deviation of English reading achievement.

To sum up, with regard to the cross-linguistic transfer of the partial English immersion and non-immersion students, the results suggest that phonological awareness skills in L1 and L2 transfer cross-linguistically, and can predict word reading development in children's L1 and L2. However, it needs to be noted that Persian cognitive predictors can moderately predict English reading achievement in Grades 1 and 5 and can weakly predict English reading achievement in Grade 3.

## **5.2. Discussion**

The research question was an attempt to investigate the cross-linguistic transfer between the cognitive predictors and reading achievement. Viewing the review of literature, (Bruck & Genesee, 1995; Comeau et al., 1999; Durgunoglu et al., 1993; Geva & Wang, 2001; Wade-Woolley & Geva, 2000), several research studies have shown that phonological awareness skills in L1 and L2 correlate with each other, transfer cross-linguistically, and can predict word reading development in children's L1 and L2. For example in their study, Geva and Wang (2001) investigated the orthography- or language-specific processes in the development of basic reading skills in school age children. For this purpose, children who learnt to read concurrently in their L1 and/or in a second language (L2) were examined. The findings of their study suggested individual differences in phonological processing skills, verbal memory, and rapid naming predict the development of reading in L1 and L2 children in various alphabetic and non-alphabetic languages. In addition, they also found that such skills can be transferred cross-linguistically and improve learners' reading achievements.



*Cross-Linguistic Transfer Revisited: The Case of...*

In a study of 70 students attending Grades 1 to 5 in Canada, Gholamain and Geva (1999) found that students who performed better on measures of reading and cognitive skills in English, their primary language, were more likely to perform better in Persian (their second language). More specifically, it was found that RAN significantly predicted reading achievements, and also a cross-linguistic transfer was perceived in students with English as their first language and Persian as their second language. Furthermore, in another study, Arab-Moghaddam (1997) examined the development of reading and spelling skills when children learn in two languages which differ in terms of orthographic complexity. After examining 71 students attending Grades 2 and 3 and also the differences between Persian and English orthographies, she found a cross-language transfer between the two languages since there was a positive and significant correlation between equivalent tasks in Persian and English.

The results from the regression analysis of the current study are generally in line with previous research studies and suggest that English reading achievement could moderately be predicted through Persian cognitive predictors. More specifically, the findings show Persian cognitive predictors (PA and RAN) are moderate predictors of English reading achievement in Grades 1 and 5, and weak predictors of English reading achievement in Grade 3.

A close analysis of the data suggested that the adjusted Rs between Persian cognitive predictors and English reading achievement in Grade 1 were 0.50 and 0.52 for the partial English immersion and non-immersion, respectively. Moreover, the adjusted Rs between Persian cognitive predictors and English reading achievement in Grade 3 were 0.37 and 0.35 for the partial English immersion and non-immersion, respectively. Finally, the adjusted Rs between Persian cognitive predictors and English reading achievement in Grade 5 were

0.42 and 0.43 for the partial English immersion and non-immersion, respectively.

As the results suggest, there is a similar relationship between the two educational systems. In both systems, the Persian cognitive predictors moderately predict English reading achievement and suggest a moderate cross-linguistic transfer in Grades 1 and 5. However, the Persian cognitive predictors weakly predicted English reading achievement in Grade 3; hence there seems to be little evidence of cross-linguistic transfer.

Based on the research findings, there is a significant cross-linguistic transfer between the Persian cognitive predictors and reading achievement. In other words, there is a significant relationship between learners' English reading achievement and their Persian cognitive predictors.

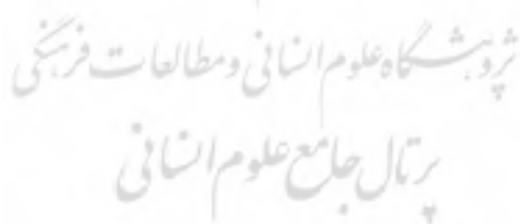
## **6. Concluding Remarks**

In the present study, an attempt was made to determine whether there is any cross-linguistic transfer between Persian cognitive predictors (i.e., PA and RAN) and English reading achievement in different grade levels of both the partial English immersion and non-immersion programs. To accomplish this, a total number of 250 students were selected from the partial English immersion and non-immersion programs in an attempt to arrive at an answer to the above-mentioned question. In order to gather data, six different English and Persian types of tests were utilized in this study. A close analysis of the data, carried out through the relevant statistical procedures, confirmed cross-linguistic transfer for the partial English immersion and non-immersion students. This finding is in line with several research studies which show that phonological awareness skills in L1 and L2 correlate with each other, transfer cross-linguistically, and can predict word reading development in children's L1 and L2 (Bruck &

*Cross-Linguistic Transfer Revisited: The Case of ...*

Genesee, 1995; Comeau et al., 1999; Durgunoglu et al., 1993; Geva & Wang, 2001; Wade-Woolley & Geva, 2000). Furthermore, Arab-Moghaddam (1997), who studied the differences between English and Persian orthographies, also confirmed cross-linguistic transfer between Persian and English since there was a positive and significant correlation among equivalent tasks in Persian and English.

In the current study, only the onset-rime awareness of learners' using the initial and final sound detection tasks was measured. Given that phonological awareness consists of syllable awareness, onset-rime awareness, and phoneme awareness, it is possible to replicate the study exploring other levels of phonological awareness. In addition, letter naming RAN tasks were employed in this study. Other researchers might be interested in examining the effect of picture naming and digit naming tasks on learners' reading achievements.



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*Cross-Linguistic Transfer Revisited: The Case of ...*

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*Cross-Linguistic Transfer Revisited: The Case of...*

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