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Reading Development in Adolescent First and Second Language English Learners: A Comparison Using Age Match Design

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Reading Development in Adolescent First and Second Language English Learners: A Comparison Using Age Match Design

By

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Abstract

Fourteen Iranian-Canadian bilingual students were tested for language ability as well as cognitive and phonological processing skills in two languages: Farsi and English. They were compared to 30 Iranian monolingual chronological age matched students and 30 Canadian chronological age matched peers. Since there were not any standardized tests in Farsi, one of the aims of this study was to begin creating the language ability measures in Farsi, and to test their reliabilities. In general, from six developed and translated Farsi tasks, three of them were found to be reliable. It was found that bilingual students perform better on memory tasks, compared to two other monolingual groups. There were not any group differences on English measures of reading comprehension and word reading among Iranian bilingual students and their English age matched peers. Additionally, the results of this study showed that Iranian bilinguals performed better on the measure of receptive vocabulary, knowing more English words in comparison to Canadian monolinguals. This finding could be explained by the higher socio-economic status and greater number of English books that Iranian bilinguals have. The final key finding is that Iranian bilinguals perform more poorly on Farsi tasks, and better on English measures compared to Iranian monolinguals.

Keywords: reading comprehension, monolingual, bilingual, literacy, second language acquisition.

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This research is especially dedicated to my beloved husband,

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&

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For their continuous support

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Reading Development in Adolescent First and Second Language English Learners: A Comparison using Age Match Design

Literacy has been the focus of extensive research in psychology for several decades, and it has been defined as the essential ability to read and improve knowledge (Bialystok, Shenfield & Codd, 2000). Literacy is an important issue because it is a good predictor of future academic success as well as cognitive maturity (Bialystok, 2007). In fact, having a low level of literacy is correlated with many social problems, such as unemployment. As a consequence, low literacy is one of many underlying causes of social and psychological issues, which are currently on the increase in our society (Statistics Canada, & organization for economic cooperation and development, OECD, 2005). During the past two decades, several studies have examined how children acquire literacy (e.g. Ehri & Wilce, 1983; Gough & Hillinger, 1980). Literacy is usually acquired in childhood in a person's native language. However, second language (L2) literacy may be acquired at a later stage for those learning a second language. Therefore, in multicultural societies, such as the United States and Canada, which welcome people from all around the world, who may not speak English as a first language, understanding L2 literacy becomes increasingly important. One large group of immigrants to Canada, within the top 20 countries of origin, includes Farsi speakers from Iran. Since Farsi speakers represent a large group of immigrants, it is important to study how children who arrive in Canada at different ages acquire English as a second language as well as literacy in their second language, English. This knowledge will inform specific practice as well as general theory about interlinguistic relationships. The present study will examine the

language and literacy skills of Iranian students who live in Canada, who attend schools in which English is the language of instruction.

In this document, related past research will be reviewed. In the literature review, firstly, literacy and its importance is discussed. Next, second language acquisition, in children and adults, is examined with an emphasis on reading, including reading comprehension and word reading. Research related to cognitive and phonological processing skills related to reading will be introduced in two sections dealing specifically with phonological awareness and working memory. The next section in the literature review deals with oral language skills as well as word reading, and listening comprehension. Later, the rationale for the use of a matched design in psychological studies is described. Finally, the unique features of the Farsi language are introduced. Later, two goals and five hypotheses of the study will be introduced, followed by the method, results, and discussion.

Literature Review

Literacy

Several factors have been found to contribute to literacy. One of these factors, and the most important environmental factor, is family background or socioeconomic status (Cadima, McWilliam, & Leal, 2009). The financial and occupational situations of parents as well as their education levels are strong predictors of children's literacy level (Bradley & Corwyn, 2002). Similar in importance to the family factor, the quality of preschool education plays an important role in children's literacy development. For instance, in a recent comprehensive study involving a large sample, findings show that there is a strong relationship between the quality of preschool classrooms and children's literacy

(Cunningham, 2010). In another study, researchers focused on the impact of classroom quality on students' vocabulary knowledge and print awareness (Guo, Piasta, Justice, & Kaderavek, 2010). Although the results of this study did not show a significant relationship between vocabulary knowledge and classroom quality, they indicate that there is a significant correlation between the classroom's quality and print awareness (Guo et al., 2010). In short, family socioeconomic status and school quality are two important factors in students' literacy level.

Second Language Acquisition

For English Language Learners (ELL), additional variables include first language (L1) proficiency and the nature of L1 script. L1 testing is often recommended when assessing the learning potential of immigrant children who are newcomers to Canada (Westernoff, Nilssen-Lalla, & Bismilla, 2000). These recommendations are based on theoretical and empirical work, which suggests that L1 proficiency is related to second language (L2) proficiency either across general oral language skill, as in the Linguistic Interdependence Hypothesis (Cummins, 1983), or across specific linguistic skills (Durgunoglu, 2002). The Linguistic Interdependence Hypothesis argues that the "L2 competence which a bilingual child attains is partially a function of the type of competence the child has developed in the L1 at the time when intensive exposure to the L2 begins" (Cummins, 1983, p.233). Many researchers believe that basic language skills are the same across languages, and could be transferred (e.g. Durgunoglu, 2002; Geva & Siegel, 2000). For instance, Geva and Siegel (2000) found that reading skills are the same across languages, while individual differences could be a significant predictor of literacy. Specifically, Durgunoglu (2002) in her comprehensive review revealed that many

domains such as phonological awareness, syntactic awareness, knowledge of genres and meaning-making strategies transfer across languages (Durgunoglu, 2002). However, not all skills transfer perfectly. For example, L1 and L2 phonological processing have been found to be separate but related factors (Branum-Martin, Mehta, Francis, Foorman, Crino, Miller, & Iglesias, 2006; Gottardo & Mueller, 2009), and oral language proficiency, specifically vocabulary knowledge and grammatical knowledge in the L1 and L2 are often not highly corelated (Genessee & Geva, 2006; Gottardo, 2002; Gottardo & Mueller, 2009; Verhoeven & Jong, 1992).

Furthermore, there are some factors that have an impact on relations across L1 and L2 skills: literacy in the L1, age of arrival, and script and linguistic features of each language. Literacy in the L1 might have an impact on the L2 literacy. For instance, ELLs usually make the same types of errors in both languages, and as a consequence, the strength and weakness of specific processes would be predictable (San Francisco, Carlo, August, & Snow, 2006). Similarly, the age of arrival might be another factor that effects L2 acquisition. Young students can learn a second language much faster in comparison to older students (Flege, Mackay, & Piske, 2002). Last but not least, script and linguistic features of the L1 and L2 may interfere with learning the L2 (Ziegler & Goswami, 2005). Therefore, these three factors, literacy in the L1, age of arrival, and script and linguistic features of each language, have been recognized as the most influential components in the L1 and L2 relation.

Even though some researchers believed that the L1 has influence on learning the L2 (Ziegler & Goswami, 2005; San Francisco, Carlo, August, & Snow, 2006), nowadays, it is believed that L1 experiences influence the process of L2 acquisition (Durgunoglu,

2002; Genesee et al., 2004). Genesee and his colleagues consider three oral language components as the most powerful factors in L2 acquisition which affect from L1 experiences: phonology, vocabulary, and grammar (Genesee et.al, 2004). For instance, a language such as Farsi has a different morphological and syntactic structure from English. Therefore, one may expect that students make errors in English based on their L1. For example, word order errors frequently occur when Farsi speakers create sentences in English.

It is important to note that bilingualism can positively affect linguistic and cognitive performance among L2 learners. For example, Bialystok (2008) noted that despite the fact that ELLs perform poorer on linguistic tasks in comparison to English Native Speakers (ENS), they perform better on some aspects of cognitive and phonological processing, such as speed of lexical access, executive control, and working memory, compared to their peers (Bialystok, 2008).

Although students' educational history in the L1 should be taken into account, due to demographics and official language status, special attention has been paid to Spanish and French L1 in the United States and Canada, respectively (e.g., Spanish: Austin, 2007; French: Lafontaine & de Serres, 2007). However, there has been insufficient research on other languages. Moreover, in many languages, such as Farsi, the appropriate L1 measures are not available. The absence of standardized measures in different L1s leads educators to use informal measures (e.g., story retells) administered by laypeople (e.g., parent volunteers) to assess students in their L1. Therefore, despite the recommendation to conduct an educational assessment in the L1, it is impossible to

follow this recommendation in many languages such as Farsi because of the lack of standardized measures in the L1.

Previous research revealed that ELLs lose their native language skills when they learn English as their second language (Fillmore, 1991). Two major causes of "language loss" among ELLs are a change in the language spoken at home, and a loss of fluency in L1 (Crawford, 1996). According to Fillmore (1991), almost 51 % of families reported changes of home language after their children enter English-only schools. As a result, decreased use of the L1 could lead to forgetting the L1 (Fillmore, 1991). Although these pupils could not maintain their L1 and would be less proficient in their L1 compared to their monolingual native speaking peers, they also will not reach the level of English proficiency of native speakers of English (Twist, Schagen, & Hodgson, 2007). Despite recommendations to test ELLs every year to determine their annual growth, these studies have not been conducted due to methodological difficulties (Ferrara, 2008; Herman, 2008). It is important to test students' longitudinally in their L1 in order to see if these students maintain their native language proficiency. This task is impossible without the L1 standardized tests.

In the present study second language students will be defined as individuals who learn an additional language to their mother tongue after the age of 3 (Genesee, Paradis, & Crago, 2004). There are some typical stages that these children need to pass in learning to speak. Tabors (1997) mentioned four hierarchical stages:

1. "Home language use" stage, which focuses on the usage of the L1 at home with the family members and the use of the L2 in the new environment. Tabors (1997) believed that this stage will pass very quickly and child could differentiate between these

two places. However, in some rare cases, it would take very long for these children to gain this ability to differentiate linguistic contexts.

2. "Nonverbal period" stage, which consists of the time that children are collecting receptive knowledge in their second language. However, for a period of time, they are not able to produce any words or only produce a limited number of words. In this stage, gesture plays an important role for these children.

3. In the "telegraphic and formulaic use" stage, children are not able to produce full sentences, which are grammatically correct and complete. Interestingly, Tabors (1997) found that children start to learn the clarification questions first (e.g. "what's happening?"). Children's L1 grammar could play a significant role here (Gottardo, 2002), and its similarity to the L2 would influence this stage.

4. The last stage is called "productive language use," which consists of making sentences productively. She believes that a productive sentence is a series of words that have not been memorized by the children (Tabors, 1997). While these stages were observed for children, little is known for adolescents. It is expected that they follow the same pattern; however, it is not the objective of this research to study these stages on adolescents.

Reading Component

Reading comprehension. In this part, the essential sub-skills of reading comprehension are mentioned, and then four different theories in reading are discussed. Afterwards, the reading skills in monolinguals and bilinguals are described. Finally, the factors that play a role in reading comprehension among ELLs are introduced.

Davis (1944), one of the pioneers in the field of reading comprehension identified nine basic skills, which are essential for reading comprehension. One's word knowledge is the first prerequisite. Additionally, the ability to guess the meaning of new phrases or words as well as the ability to follow the passage as a whole are necessary for comprehending written text. Another necessary skill is the ability to obtain the main idea of the text and the ability to answer some questions. Drawing inferences as well as identifying the mood and tone of the text would help one's comprehension. Finally, students should be able to find the purpose of the writer (Davis, 1944). Generally, reading comprehension is described as one's performance on tasks to determine essential factors of the reading comprehension process (van Gelderen, Schoonen, Stoel, Glopper, & Hulstijn, 2007). In other words, reading comprehension is the "process of understanding speech written down and the goal is to gain access to meaning" (Ziegler & Goswami, 2005, p.3).

There are four distinct theories about learning to read. One is "Top-Down Theory," proposed by Goodman (1967) and Smith (1978). The theory states that reading is strongly related to the reader's purpose and motivation to read, and instead of understanding every word, good readers take the essential information of the text. According to these two theorists, "readers rely heavily on their acquired knowledge of the word and of conventional graphemic, syntactic, and semantic structures to hypothesize or predict the words to come and to confirm the sense of what they have read" (Clark & Uhry, 1995, p.4). Another theory is called "Bottom-Up Theory," which is contrary to the Top-Down Theory. According to this theory, reading occurs in hierarchical steps, which should be processed from the small parts (graphemic information) to the larger parts

(purpose and making inferences). It is important to note that if readers do not properly process small parts, they will not be able to process the larger chunks (LaBerge & Samuels, 1974). Another theory of reading is called "Interactive Theory." In this theory, Rumelhart (1981) believed that reading elements are processed in parallel. He believed that readers process the small parts, such as graphemic information at the same time as large parts, such as text purpose (Rumelhart & McClelland, 1981).

Finally, the "Simple View of Reading" was introduced by Gough and Tunmer in 1986. In this theory, it is believed that the product of decoding and linguistic comprehension equates to reading comprehension (reading comprehension = decoding x comprehension). They thought that "...the skilled decoder is exactly the reader who can read isolated words quickly, accurately, and silently" (Gough & Tunmer, 1986, p.7). To be a skilled reader, both skills, decoding and linguistic comprehension, have to develop partially (Gough & Tunmer, 1986). Among these four theories, "Simple View of Reading" was used as the framework in this study since it is a more comprehensive theory in comparison to the three others for the current study. Another reason to choose the simple view of reading theory was because the research was conducted using a bilingual group. Research using this theory is lacking in terms of explaining ELLs reading comprehension (Kirby & Savage, 2008). In a study by Gottardo and Mueller (2009), the simple view of reading theory used as the main framework. They wanted to test this theory as a model of L2 reading comprehension on 79 Spanish-English bilinguals, who were tested in their first grade and followed on the second year. The results supported the theory as a model of reading development in the sample group (Gottardo & Mueller, 2009). In the present study, participants were tested in both

languages (Farsi and English) on core variables from the simple view of reading, specifically word reading, phonological awareness, and oral language proficiency. To sum up, the simple view of reading was used as the main framework of current study because of the potential utility for the bilingual students and the ability to test key variables in both languages, Farsi and English.

There is a large body of research on reading comprehension and its connection in the L1 and L2. A recent longitudinal study was done on 858 children to see if the identical component processes are involved in reading in different language backgrounds (Chiappe, Siegel & Wade-Woolley, 2002). In total, 858 students were assessed: 727 ENSs, and 131 ELLs. All the students were enrolled in kindergarten, with the average age of 64.4 months. Not surprisingly, ENS performed better on phonological and linguistic processing; whereas, "the acquisition of basic literacy skills" were equivalent in both ENS and ELL (Chiappe, Siegel & Wade-Woolley, 2002). In another longitudinal study conducted with 389 Dutch students followed from Grade 8 to grade 10, it is shown that over the first year of English learning, reading comprehension increased sharply, while in the second year, surprisingly, it decreased slowly. The authors explained this decrease by the loss of the motivation towards reading and the low frequency of reading books among the sample group. High correlations between reading comprehension in L1 and L2 were hypothesized in this study, and were supported by a correlation of .84. They also found two factors that played a role in L1 and L2 reading comprehension, which are grammar and vocabulary knowledge (van Gelderen, et al., 2007). Another study with 261 Spanish second language learners, done by Nakamoto, Lindsey, and Manis in 2007, showed the same results of van Gelderen and colleagues (2007). They found that oral

language had a positive but no significant association with the rate of growth (Nakamoto, Lindsey & Manis, 2007). Both of these studies agreed that there is a significant correlation between reading comprehension in L1 and L2 (van Gelderen et. al., 2007; Nakamoto et. al., 2007). Hence, proficiency in L1 reading comprehension, grammar, and vocabulary knowledge are three factors that have an influence on reading comprehension in the L2. Additionally the acquisition of the basic skills related to reading comprehension is same between bilinguals and monolinguals.

There is a gap between ENSs and ELLs in reading comprehension in that ELL students perform more poorly (Geva & Yaghoub Zadeh, 2006; Nakamoto et. al., 2007). Some researchers believe that this gap will decrease over time (Lesaux, Rupp, & Siegel, 2007), and could be diminished by a high level of oral language proficiency in ELLs (Geva & Yaghoub Zadeh, 2006).

Additionally, it is important to know what factors play a role in L2 acquisition of reading. Low and Siegel (2005) assessed 884 ENS as well as 284 ELLs on the relationship between reading comprehension and three cognitive processes, specifically phonological processing, verbal working memory, and syntactic awareness. Although ENS performed better on grammatical structure tasks in comparison to ELLs, there is no difference between these groups on phonological awareness. Similar to previous findings, there is a strong relationship between cognitive processes and reading comprehension. Also ELLs, in comparison to their native speaker peers, lag behind in reading comprehension skills (Low & Siegel, 2005). Goswami (2008) in her comprehensive literature review found that all the studies so far support that phonological awareness is the prerequisite of word reading and therefore reading comprehension across all

languages. However, because of grammatical inconsistency, reading comprehension skills vary from one language to another (Goswami, 2008). The relationship between memory and reading was determined in a study by Geva and Siegel (2000), which considered the importance of individual differences. In their study, these researchers concluded that once children have proficiency in skills related to word reading, such as phonological awareness and naming speed, other oral language skills do not contribute much to differences in word reading skills (Geva & Siegel, 2000). Bialystok, Luk, and Kwan (2005) reported that early reading development in L2 is affected by the relation between the two languages and writing systems in a way that the ELLS with two different writing systems performed better on reading ability tasks in comparison to those who had the same alphabetic systems (Bialystok, Luk, & Kwan, 2005).

Word reading. In this section, first types of words are mentioned, and then effective factors in word reading are introduced. Finally, a related study is discussed.

There are two distinct types of words in English. Some words are pronounced the same way as they are written (e.g. mint), whereas others pronounced differently from what they look like (e.g. known) (Plaut, 1996). To be a proficient reader, one needs to be able to read both types of words.

There are some factors, which may affect word reading ability in children. One factor is the age of acquisition of reading. This factor, albeit limited, was found to be important in later word reading (Zevin & Seidenberg, 2002). Another factor is Socio-Economic Status (SES). High SES was shown to be related to word reading among kindergarten ELL students (D'Angiulli, Siegel, & Maggi, 2004). In addition to these two

factors, reading books can boost word reading ability, especially in the early years (Kim, 2007).

In a recent study, researchers studied 133 monolingual English-speaking children in three distinct groups: less skilled readers (68 participants), chronological age match group (44 participants), and reading level match group (23 participants). They tested these participants on different standardized and experimental language measures, such as word reading, phonological sensitivity, and pseudowords. Interestingly, less skilled readers perform poorer in reading pseudowords and phonological sensitivity in comparison to their reading level match group. They noted that this finding is strong evidence for reading difficulties, which are caused by spelling-sound coding problems. (Gottardo, Chiappe, Siegel, & Stanovich, 1999).

Cognitive and Phonological Processing Skills

This section describes two skills associated with word reading. These important underlying skills are phonological awareness, and working memory.

Phonological awareness. Children in the process of learning to read words need to learn about each sound and the combination of sounds, which is called phonological awareness (Goswami, 2008). More precisely, it has been defined as "...awareness of sounds in spoken (not written) words that is revealed by such abilities as rhyming, matching initial consonants, and counting the number of phonemes in spoken words" (Stahl & Murray, 1994, p.221). Interestingly, the process of learning individual sounds starts from the first year of age and extends with oral language comprehension to the sixth year of age with phonemic awareness (Goswami, 2008). It is important to note that

training can be effective in the development phonological awareness, specifically, if training focuses on phonological and letter training (Bus & van IJzendoorn, 1999).

There are different techniques to assess the level of phonological awareness. For instance, isolating one single letter (what is the first sound of cat?), recognizing the rhyme (cat and bat), deleting a phoneme (say cat, without saying /k/), and blending (what does /c-a-t/ say?) are some common ways to measure the level of phonological awareness in children and adults (Stahl & Murray, 1994).

Phonological awareness is strongly correlated with reading performance, and interestingly, it is a strong predictor of reading comprehension in two different languages in bilingual speakers. To clarify, a recent study involving a longitudinal sample conducted by Lafrance and Gottardo (2005), illustrates that the level of phonological awareness in two different languages (English and French) is almost the same. Furthermore, phonological awareness in these two languages predicts reading comprehension in that corresponding language as well (Lafrance & Gottardo, 2005). Not surprisingly, many studies support the claim that phonological awareness is highly correlated in two different languages (Branum-Martin, Mehta, Fletcher, Carlson, Ortiz, Carlo, & Francis, 2006), and even it can be transferred across the two languages (Durgunoglu, 2002; Cho & McBride-Chang, 2005).

One influential study in this area was conducted by Durgunoglu and her colleagues (1993). They studied 31 Spanish bilinguals on different aspects in both Spanish and English. They found that phonological awareness transfers across the languages. In summary, those who performed well in Spanish phonological awareness were better at word recognition in English. Thus, phonological awareness was found to

be a strong predictor of word recognition tests both within and across languages (Durgunoglu, Nagy, & Hancin-Bhatt, 1993).

Working memory. In this section, working memory and its relation to reading comprehension will be discussed. Afterwards, some previous research, which focused on this relationship, will be described.

According to Baddeley (1983), working memory is made up of three distinct components: Executive processing, the phonological loop, and visual-spatial sketch pad. Executive processing has several functions such as storage of information, organizing operations, shifting, and retrieving from long term memory. On the other hand, while the phonological loop deals with phonological processing, the visual-spatial sketch pad stores and manipulates the information temporally (Baddeley, 1983). The traditional working memory task was digit span, which involves repeating some digits in the same order or backwards. However, researchers did not find a strong relationship between the digit span task and reading comprehension. In 1980, Daneman and Carpenter created a test, which was developed to assess both working memory and reading comprehension. In this new task, participants were required to read some sets of sentences, to identify if they are accurate and to recall the last word of each feature when the entire set had been presented. They were able to identify that working memory plays an important role in determining reading span and therefore reading comprehension. The relationship between working memory and reading has been defined as "... storing pragmatic, semantic, and syntactic information from the proceeding text and use it in disambiguating, parsing, and integrating the subsequent text" (Daneman and Carpenter, 1980; p.450).

In 2005, Seigneuric and Ehrlich conducted a study, which examined the contribution of working memory to reading comprehension. Their longitudinal study had three waves, testing first, second and third graders. In each year, they measured working memory as well as reading comprehension, vocabulary knowledge, and non-word reading. They found that working memory capacity is a powerful predictor of reading comprehension. Specifically, grade 1 vocabulary knowledge and grade 2 working memory contribute to the students' reading performance in grade 3 (Seigneuric & Ehrlich, 2005).

An influential study by Holsgrove and Garton (2006) examined the relation of working memory with phonological and syntactic processing and reading comprehension. They created a measure, which involved recalling non-words in sets. The new measure and reading comprehension were significantly correlated. Furthermore, the authors of this study found that the phonological loop or phonological short term memory, not the central executive processing, played a role in reading comprehension (Holsgrove & Garton, 2006).

Although previous research showed a strong relationship between working memory and reading comprehension, Payne, Kalibatseva and Jungers (2009) believe that reading comprehension is different in bilingual children. Bilingual children not only need good working memory but also sufficient skills in their first language. They conducted a study to test for a relationship between working memory in first language reading performance and reading comprehension performance in their L2, Spanish. The results illustrated that both working memory and first language ability are powerful predictors in reading performance in a second language (Payne et. al., 2009).

Oral Language Skills

In this part, two components of oral language skill will be introduced: vocabulary knowledge, and listening comprehension. These component skills are believed to be important for reading comprehension (Proctor, Carlo, August, & Snow, 2005).

Vocabulary knowledge. In this part, two types of vocabulary knowledge are introduced. In addition, the ways that one could increase this knowledge are described. Finally, some related variables are discussed.

There are two types of word knowledge mentioned in previous research. One is called expressive vocabulary, which are the words that we produce while we write and speak. On the other hand, receptive words are those words, which we receive when we listen to language or read text (Baumann, Kame'emui, & Ash, 2003). Nagy and Anderson believed that on average, a student gains approximately 3,000 to 4,000 new words each year (Nagy & Anderson, 1984).

However, the important question here is: "How could this knowledge be increased?" Baumann and his colleagues in their comprehensive review concluded that training could be a powerful manner to increase vocabulary knowledge (Baumann et. al., 2003). There are two different ways to train people: one is to teach the words with their meanings. Finding and memorizing words from dictionary is a good example of this method. In addition to the first way, the other manner suggested by Baumann is to teach learners how to generalize and transfer meanings from the same word family (Baumann et. al., 2003). For instance, the root of "develop" can be changed to create different word format like development, developmental, redevelop, and developer with almost the same root meaning.

Memory plays a role in one's vocabulary knowledge. Previous research indicates that those students with greater memory capacity also know more word meanings, in comparison to those who have a lower memory capacity (Calvo, 2004; Majerus, Poncelet, Greffe, & Van der Linden, 2006; Leclercq & Majerus, 2010). Additionally, previous research found a significant correlation between vocabulary knowledge and reading comprehension (Cain, Oakhill, & Lemmon, 2004; Chiappe, Chiappe, & Gottardo, 2004).

In a recent study, Cain, Oakhill, and Lemmon (2004) examined 25 students in two different groups (skilled vs. less skilled comprehenders) of 9–10 years old in the first experiment and 24 students in three groups (skilled vs. less skilled comprehenders with high vocabulary knowledge, and less skilled comprehenders with low vocabulary knowledge). The sample groups were assessed for their vocabulary knowledge, reading comprehension, as well as working memory. The results of both experiments illustrate that less skilled comprehenders were also poor at inferring unknown vocabulary in the text. Furthermore, working memory and vocabulary knowledge are positively related (Cain, Oakhill, & Lemmon, 2004).

Listening comprehension. Although in Canadian schools, the reading and writing level of students who are ELL is assessed before entering schools, listening comprehension (or oral language proficiency) is not being assessed. Additionally, the level of language proficiency cannot be recognized without assessing speaking and listening skills (Wet, Walt, & Niesler, 2009). More importantly, listening comprehension is linked to many other language abilities like reading comprehension, and it could be a strong complementary way to assess children in reading comprehension (Berninger &

Abbott, 1994). For example, listening comprehension is a key component of reading comprehension in the simple view of reading. It is important to note that one significant factor in listening comprehension is memory in a way that both short-term and working memory could predict listening comprehension in preschool students (Florit, Roch, Altoe, & Levorato, 2009).

Farsi Language

According to Statistics Canada, persons of Iranian nationality are one of the top 20 nationalities who have immigrated to Canada, with a population of more than 92000 in 2006. The official language of Iran is Farsi, and internationally, over 100 million people communicate in Farsi (Statistics Canada, 2006). Farsi is an Indo European alphabetic language with script different from roman script used to write English (see Appendix A). It is also important to note that Farsi is written from right to left. While Farsi grammar is similar to that of many European languages, it has a different grammatical structure from English. These differences include marking person on the verbs and differences in word order in sentences as compared to English. In addition, Farsi has fewer words with multiple meanings in comparison to English. These differences in script and linguistic grammatical rules between the Farsi and English languages present unique challenges to students, who must integrate into the Canadian education system.

Goals

This study has two objectives. The first goal is to compare the Iranian-Canadian students with their Chronological Age Matched (CAM) groups: Farsi native speakers who lived in Iran, and English native speakers who lived in Canada. Today, in most

reading research, a chronological age matched design is used. Researchers choose children of the same age but with different performance patterns in a specific skill. This design allows researchers to compare peers and examine possible reasons for the differences in performance independent of age. However, some of these differences might be the result of exposure instead of underlying processing abilities.

Since there is not any standardized test of language ability in Farsi, the second goal of this study represents the first step in creating a valid and reliable measure of language and reading ability in Farsi.

Hypotheses

The current study has five major hypotheses:

1. There will be a main effect of age for cognitive and phonological processing across participants. It is expected that older participants are more advanced at cognitive and phonological processing because they obtain this knowledge over time.

2. Iranian-Canadian students will perform better on cognitive and phonological processing compared to Canadian native speakers. Since these students are practicing these skills in two different languages, it is likely that they perform better in these measures compared to ENS. Some previous research supported this hypothesis on different language and ethnic backgrounds (Bialystok, 2008).

3. There will be a main effect of language ability on the oral and reading skills in the English language. It is anticipated that ENS will perform significantly better on English oral language and comprehension tasks in comparison to Iranian-Canadians.

4. It is also hypothesized that Iranian students who lived in Iran will perform better on Farsi language ability tasks and poorer on English measures in comparison to

their Iranian-Canadian peers who lived in Canada. Here the main focus is on the language of the environment. It is believed that although these students all are Iranian, the exposure to the societal language will play a strong role in their language test performance.

5. Performance on the Farsi language measures will be a predictor of English language performance for Iranian-Canadian students. Based on previous literature, it is believed that performance on L1 tasks could be a strong predictor of performance on L2. If a student is proficient in his native language, most likely, he could perform well on his L2 as well.

Method

Participants

Seventy-four students participated in the study in three different groups: 30 Iranian monolinguals, 14 Iranian-Canadian bilinguals, and 30 Canadian monolinguals. The average age of the participants is 13.3 years (range from 10.04 to 17.11; SD=1.41). Thirty-six of the participants were male, and 38 were female.

Iranian Monolingual. Thirty Farsi monolinguals who lived in Iran participated in the study. They all lived in a high socio-economic status area in Tehran, Iran. In this group, there are 20 girls, and 10 boys. The average age of this group was 12.10 and ranged from 11.01 to 13.06 (SD=.54). Table 1 illustrates the grade in which they were enrolled at testing time (see Table 1). The Iranian students in Iran were introduced to English language at the 6^{th} level (grade 6). Then, they need to take a compulsory English course each year, which is scheduled for at least 2 hours a week. As with all of the other courses in Iran, students taking the English course are required to pass a weekly test, do homework, and memorize English vocabulary.

Iranian Bilingual. Fourteen Farsi-English bilinguals who lived in Canada participated in the study. They all lived in Kitchener-Waterloo area, except two of them, who were from Toronto area. In this group, there are 5 girls, and 9 boys. The average age of this group is 12.04, ranging from 10.04 to 15.06 (SD=1.38). Table 2 illustrates the grade in which they were enrolled at testing time (see Table 2). Approximately, 79 percent of the students in this group only speak English and Farsi at their home, and other 21 percent has French as their third language. All of the students reported that they talk to their parents in both English and Farsi languages, and the majority of them (60%) reported that they only speak English with their siblings. They reported that they communicate in Farsi with their Iranian friends "rarely" and that they use English in most of their communications either at school or at Iranian gatherings. Interestingly, they allocate more time to watch English programs at home in comparison to Farsi programs with 30 percent reporting that they never watch Farsi programs. While 71 percent of this group reported that they have more than 25 Farsi books, they allocate more time to reading in English.

Canadian Monolinguals. Fifty-five English native speakers participated in the larger study, which was focusing on the comparison between Canadian monolinguals and Canadian bilinguals (Pasquarella, 2009). They were tested on the same English measures as this study. The Canadian monolinguals consisted of 30 males and 25 females with the mean age of 15.04. Twenty-three of this group who participated on the study were from Cambridge, six from Kitchener, and 23 from Waterloo area (Pasquarella & Gottardo, 2009). From this larger group, 30 students were matched with the Farsi-English bilinguals after omitting the students who were outliers based on their age. In the

Canadian monolingual group used for the data analyses in this study, there were 13 girls, and 17 boys in this group. The average age of this group was 14.07 and ranged from 14. 03 to 17.11 (SD=.84). Table 3 illustrates the grade in which they were enrolled at testing time (see Table 3).

Measures

This part consisted of two sets of measures which are the English tasks and the Farsi tasks.

English tasks

There are four different parts in this section: reading components, oral language skills, cognitive and phonological processing skills, and self report questionnaires.

Reading components

Word reading. The Woodcock Word Identification (Woodcock, 1991) was administered to assess the students' word reading. This task contains 106 words: from high monosyllabic words (e.g. is) to low frequency multisyllabic words (e.g. zeitgeist). The students were informed that this task was not timed. The experimenter discontinued testing after six consecutive errors. Raw scores on this test consisted of the number of words that were read correctly, and raw scores were transferred to standardized scores. Based on the Word Identification test's manual, the reliability of this test is .92 (Woodcock, 1991).

Reading comprehension. The Gates MacGinitie Test of Reading Comprehension form E was used to assess reading comprehension levels of participants in English. This form is appropriate for students from grade 7 to grade 9. It contains 14 short passages, and after reading each one, participants were required to answer some multiple-choice

questions. The raw scores were changed to standardized scores. Based on the Gates MacGinitie Reading Comprehension test's manual, the reliability of this test is .80 (MacGinitie, MacGinitie, Maria, Dreyer, & Hughes, 2006). Additionally, the Woodcock Passage Comprehension was selected to assess reading comprehension in English from another perspective. This task has 43 items for which the participants had to fill in the blanks. It starts with easy items and progresses to difficult ones. For the purpose of this study, participants were asked to start at item number 20. In these two reading comprehension tests, each question was worth one point; therefore, higher numbers on these measures express better comprehension.

Oral language skills

Vocabulary knowledge. The Peabody Picture Vocabulary Test – Fourth Edition (PPVT-IV; Dunn & Dunn, 2007) was chosen to assess the vocabulary knowledge of groups. In this task, while participants were required to look at four pictures, the experimenter read a word aloud and asked them to point out the corresponding picture. After making eight mistakes in a set, the session was stopped. The raw score was obtained by taking the number of the last item coded and subtracting the number of incorrect answers given throughout the test. Based on the Peabody Picture Vocabulary test's manual, the reliability of this test ranges from .87 to .93. Using test-retest reliability method, it ranges from .92 to .96, and for internal consistency, split half, the reliability ranges from .94 to .95 (Dunn & Dunn, 2007).

Cognitive and phonological processing skills

Nonverbal ability. Participants completed the second (Reasoning by Analogy) and fourth (Spatial Visualization) subtests of the Matrix Analogies Reasoning Test

(Naglieri, 1985), which is considered to be a culture-free test of reasoning ability. Participants were asked to pick the option that completed a picture or a series. There are 16 items in each subtest, and the maximum score that one could get is 32. The items were arranged in a progressively more difficult manner. If participants failed 4 consecutive items, they were asked to stop. The raw score of each participant consisted of the number of correct items in each set (Naglieri, 1985).

Working memory. To assess the students' memory, the Digit Span from the Wechsler Intelligence Scale for Children (Wechsler, 1991) was used. In this task students had to repeat the series of numbers backwards. The raw score of the test was calculated for a series of numbers that one repeated correctly backwards (Wechsler, 1991). Moreover, an adapted version of working memory from Daneman and Carpenter (1980) was utilized (Gottardo, Stanovich & Siegel, 1996). The task has some sets of sentences and asked participants to identify the accuracy of each sentence as well as recalling the last word of each sentence after the set was finished. The raw score was obtained from the number of correct responses to true/false questions and the number of accurately recalled words (Daneman & Carpenter, 1980; Gottardo, Stanovich & Siegel, 1996).

Phonological processing. Three subtests from the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgesen, & Rashotte, 1999) were selected: elision, rapid letter naming and rapid digit naming. In the elision task, students were asked to repeat a word (e.g. cup) without saying a part of the word (e.g. /k/), while the answer has to be a meaningful word in English (e.g. up). The test was stopped after a participant missed three test items in a row. There are six practice items, and 20 test items, and the maximum raw score, which one could obtain, was 20. In rapid letter

naming, there are 72 letters, in two forms, and participants were required to read them as fast and accurately as possible. They were informed that they were going to be timed. The score of this test was the number of seconds that it takes the examinee to name all of the letters on form A and B combined. Rapid digit naming is exactly the same in all the steps as the rapid letter naming subtest except on the digits instead of letters.

Nonword repetition (Hebrew). A Hebrew-like non-word repetition task was selected as a complementary test from Farnia and Geva (in press). In this task, there are 27 Hebrew-like non-words, ranging in length from two syllables to five syllables. The participants were asked to repeat the Hebrew-like non-words after they heard them from a recorded audio file (Farnia, & Geva, in press).

Self report questionnaire

Motivation and attitude towards learning a second language. The intrinsic interest in reading questionnaire (Frijters, Barron, & Burnello, 2000) was utilized as the measure of reading motivation. Students were required to rate the extent to which they agreed or disagreed with 18 statements in regards to their motivation and attitude to learn a second language (e.g. Knowing English is not an important goal in my life). Responses were scored on a 6-point scale from 1 to 6 – strong disagreement gets a score of 1 where strong agreement gets a score of 6. The maximum score on the scale is 120. Higher scores reflected greater interest in reading (see Appendix B).

Language use questionnaire. The language use questionnaire was used to collect descriptive information. In this test, the participants were asked to provide some information regarding their current grade, how long they have lived in Canada, and what age/grade they were in when they first immigrated to Canada. They were also asked how

often they speak English with their family and friends, as well as how often they read English print and watch television in English as well as Farsi. Additionally, participants rated how many books they have in their native language and in English (none, 1-5, 6-10, 10-25, more that 25) (see Appendix C).

Parent Questionnaire. The parent questionnaire was used to collect background information from participants' parents. In this questionnaire, parents were asked to answer some questions regarding when they moved to Canada, and previous countries that they lived in. They were also asked to provide information about their reading, writing, listening and speaking ability in both languages (Farsi & English) on a 10-point Likert-scale. Finally, they were asked to report their occupation and educational level in order to estimate their socio-economic status (see Appendix D). It is important to note that if parents were not proficient in English, translated forms of this questionnaire were given to them.

Farsi Tasks

This part is broken down into two parts: developed tasks, and translated tasks.

Developed tasks

This study was a starting point for developing L1 measures in languages other than Spanish or French, specifically Farsi. There were some challenges in creating L1 measures that differ in language typology from English in terms of script and linguistic features such as grammatical rules and vocabulary use. Besides the differences in scripts and linguistic features, there were some other differences like cultural differences. Finding the appropriate level of difficulty in terms of the literacy skills of the target group was another challenge that we had to deal with. This challenge is the result of varying

levels of systematic exposure to the L1 in immigrant children. These students might have discrepancies in oral and written language skill based on exposure. The development of reliable L1 measures is important, particularly for students who are newcomers and have limited exposure to English. Additionally, if learning disabilities were suspected, it is important to determine if English language weaknesses are also found in students' L1.

Word reading. A Farsi word reading measure was developed based on the Persian words introduced in Iranian school books. Generally, there are 180 words in six levels (thirty words in each level). The test represents words taught in Iran in grades 3 to 8. The test is designed to include words that are progressively longer and more difficult. Raw scores of this test consist of the number of words read correctly. The students were informed that this task was not timed. The experimenter discontinued testing after the participants failed reading accurately half of the words in a level.

Reading comprehension. An age or grade appropriate test was developed to measure reading comprehension in Farsi. There are 6 short passages, followed by comprehension questions. The participants were required to answer some factual and inferential multiple-choice questions. The measure had three different kinds of passages: authentic, information/expository, and literary. Two authentic passages were taken from an Iranian newspaper. It is published every week, and the audiences are adolescents. Two information/expository passages were taken from a science book, which was rated for ages of 11 to 16. Finally two literary passages were taken from classic Persian books. Some of the sentences in these passages were omitted because of the difficult words included in these sentences. The order and length of passages, as well as the number of questions from each passage showed in Table 4 (see Table 4).

For the test, each correct response was granted one score. The maximum score that one could obtain in this test was 27. Therefore, higher score in this measure expresses better reading comprehension.

Listening comprehension. A listening comprehension test was developed to assess participants' listening comprehension. It included three genres of passages: information (taken from a science book), authentic (taken from an Iranian newspaper), and literary (taken from a classic Persian book). Students were asked to recall the passages right after they heard them, and afterwards, answered some comprehension questions. The order and length of passages, as well as the number of questions from each passage is shown in Table 5 (see Table 5). For the test, each correct response was granted one score. The maximum score that one could obtain in this test was 12. Therefore, higher score on this measure expresses better listening comprehension.

Phonological processing. A Farsi version of the phonological awareness task was developed for this study. The task contains 24 Persian words in three types: verb (one), noun (twenty), and adjective (three). The words range from one syllable to three syllables. In the test, participants were asked to repeat the word omitting one specific letter or sound. In many cases, the remaining letters and sounds made a meaningful word. A raw score was obtained from the number of correct responses.

Nonword repetition. Nineteen non-words in Farsi were selected to develop non-word repetition task in Farsi. At the beginning, 50 Farsi words were selected, and by changing one or two consonant(s) and/or vowel(s) nonwords were created. Among all of them, 19 were selected to create nonword repetition test. Basically, students had to repeat

the non-words right after they heard them from a recorded audio file. They ranged from one syllable to three syllables in length. The maximum raw score in this task is 19.

Spelling. Spelling in Farsi is challenging for three reasons. Firstly, there are four consonants with different symbols, but pronounced same. For instance, there are four symbols for the sound /z/. Another reason which makes Farsi spelling challenging is that there are some exceptions in Farsi writing. Lastly, there are some words, which pronounced exactly same, but written in different ways, depending on their meaning in a sentence. Fourteen words were chosen, and Iranian students were asked to write down the words that they heard. The examinee also put each word in a sentence for the student to clarify the meaning of the words. They consisted of Farsi nouns, adjectives and verbs. This test was designed so that the words increased in length and difficulty. The maximum score was 14 on this test.

Translated tasks

Vocabulary Knowledge. The translated version of Expressive Vocabulary Test–Second Edition (EVT-2; Williams, 2007) was selected to measure the participants' vocabulary knowledge level in Farsi. The EVT-2 consists of 190 items. For the purpose of this study, only 64 items were given to the participants (every third item). Students were required to answer each item while they were looking at the corresponding picture. The questions were repeated only once, and students were given ten seconds to answer each question. Testing was discontinued after five consecutive incorrect responses. Based on the manual of this test, reliability of this test in English varies from .83 to .91(Williams, 2007).

Besides the EVT-2 that was used for expressive vocabulary knowledge, an attempt was made to translate the PPVT-3 for use as a measure for receptive vocabulary in Farsi. First of all, one major challenge was that fewer words in Farsi have multiple meanings. For instance, in some cases, the appropriate word with same difficulty level did not exist in Farsi. For example, in Farsi one generic word exists for "cow" and is a high frequency word. Therefore the equivalent of "cattle", a low frequency word in English does not exist. Consequently, some of the items seemed to be very difficult for the target age group, while others appeared to be too easy for them. Therefore, many of the items could not be translated, and as a result, this version of the PPVT-3 was not used as receptive vocabulary measure in Farsi. The only vocabulary measure that utilized was the translation of EVT-2 as a expressive vocabulary task. Future attempts to translate the PPVT will entail a large-scale study with extensive development and standardization.

Procedures

The first step of this study involved creating the Farsi measures. According to Sireci, Han, and Wells (2008), the first step in developing such measurements is a "sensitivity review" (Sireci, Han, & Wells, 2008). After developing a first draft of Farsi tasks, several Iranian experts (both in Canada and Iran) were asked to review our Farsi assessments. The next step included asking participants to complete the tasks. By the end of data collection stage, data analysis was begun. Some of the measures were removed because of low reliability (e.g. grammatical judgment), and some measures were changed to establish the higher reliabilities. Table 6 illustrates the tests administered based on the sample groups (see Table 6).

All of the three groups followed these steps: firstly, consent forms and self-report parent questionnaires were sent to students' homes. If parents and students both agreed to participate in the study, the students had to return both signed consent and assent forms (parent and student) and a completed parent questionnaire.

Volunteer students were invited to participate in two sessions of approximately 2 hours. In each session, participants were asked to complete one of the group or individual test batteries. Table 6 illustrates the details regarding the tests administered in the sample groups. Participants were compensated $20 upon the completion of the two sessions.

Results

The results will be described in five subsections. These sections include a discussion of the experimenter developed measures reliability, descriptive statistics, means comparisons, correlations, and regression analyses.

Reliability Analysis

The reliability of tests is important because it allows researchers and practitioners to determine whether performance is expected to be consistent across time and items. Because almost all Farsi measures used in this study were developed by the researcher and were novel in the Farsi language, reliability analyses were carried out. The internal consistencies of the tasks (Cronbach alpha) are presented in Table 7. The means and standard deviations of these tasks are also illustrated in Table 7. The reliabilities range from high reliabilities to low. For three tests, reading comprehension, listening comprehension, and non-word deletion, one item was removed to increase the reliabilities to the levels reported below. These questions were removed to increase the reliability.

However, the questions were not in any known way different from other question types. Therefore, no inference can be drawn by exploring these questions (see Table 7).

Three of the tests had high reliabilities with $\alpha \geq .81$. The translation of EVT-2 showed the highest reliability ($\alpha = .86$). It also had a significant correlation with PPVT-IV, without considering the sign (r=-.61, p<0.01). Another test with the measure of high reliability is the measure of reading comprehension (α =.82). Reading comprehension in Farsi was moderately correlated with reading comprehension in English (r=.55, p<0.05). The final task with high reliability in this study was the questionnaire measuring motivation and attitudes towards learning a second language ($\alpha = .81$).

Three other tests, which had low reliabilities, include non-word repetition, listening comprehension, and phonological awareness. It is anticipated that ceiling effects occurred for the non-word repetition task. In other words, the test items were not challenging enough for the participants. As can be seen in Table 7, the mean of the test is 16.57 while the highest possible score is 19. There is not any significant relationship between non-word repetition in Farsi and non-word repetition in Hebrew (r =.08, p>0.05). The low reliability of the listening comprehension task can be explained by floor effects. It means the test items were more difficult than the student's abilities although the test was created to be at the appropriate grade level. Whereas the maximum score one could obtain was 10, the mean of the test was 2.23, with the standard deviation of 1.48. The last task was phonological awareness with a reliability of .21. It could be clarified by the ceiling effect even though the mean and standard deviation seem to be normal. It is important to note that all of the participants answered 11 questions from 24 questions correctly. Therefore, it means 11 items were too easy for the participants, and the other

13 items were challenging enough since there were a variety of answers. It also has a low association with phonological awareness task in English (r=-.11, p>0.05), which shows it was not an appropriate task, generally.

Descriptive Statistics

Table 8 illustrates the means and standard deviations for each task for all the groups. As can be seen, for some tasks, there is a noticeable variability in group means. For instance, the Iranian monolingual group mean for the PPVT task is 73.03; whereas the Canadian monolingual group mean is 163.87, and the Iranian bilingual group mean is 197.5. On the other hand, in some cases, like the Gates-MacGinitie reading comprehension task, there is not a huge variability among the group means. While Canadian monolingual mean group is 29.03(9.56), Iranian bilingual group mean is 29.14 (see Table 8).

Means Comparison Analysis

This section is divided into two parts, which include two and three way comparisons. In this section, Iranian monolinguals were not compared to Canadian monolingual group on the English tasks because the differences are noticeable, and expected due to the students' linguistic background and experience.

Three way comparison (English Measures). Table 9 illustrates the mean differences for all of the groups, as well as F test. Although Iranian bilingual students are not significantly different from Canadian monolinguals in English reading comprehension test ($F(1,43)$=.001; p=.97), there is a significant difference between the two Iranian groups on the English reading comprehension task with the mean difference (MD) of 21.97, and p<.001($F(2,73)$=336.16; p<.001). There is a significant difference in

English word reading ($F(2, 73)$=182.97; p<.001) with the Iranian monolinguals performing more poorly compared to the Iranian bilinguals (MD=47.62; p<.001), while significant differences were not found for English word reading between the two other groups (Iranian bilingual & Canadian monolingual) (see Table 9).

As expected, there is also a significant difference among the three groups in English vocabulary knowledge ($F(2, 73)$=544.35; p<.001). Iranian bilingual students know more English words in comparison to Iranian monolingual students (MD=124.46, p<.001), but it was also found that Iranian bilingual students performed better on the English vocabulary knowledge test than Canadian monolingual students (MD=11.43, p=.02). Whereas all three groups performed same on non-verbal ability test ($F(2, 73)$=1.84; p=.16), they differed significantly in memory as measured by digit span ($F(2, 73)$=8.13; p<.001). Iranian bilinguals had better memory scores compared to Iranian monolinguals (MD=2.45, p<.001), and Canadian monolinguals (MD=1.95, p=.02). Finally, the analysis of students' intrinsic interest in reading inventory showed that the Canadian monolinguals had significantly higher interest in reading than Iranian bilinguals ($F(2, 73)$=6.66, p=.002; MD=14.09, p=.009).

Two way comparison (Farsi Measures). Table 10 shows the mean comparisons between the two Iranian groups on the Farsi measures. As can be noticed, Iranian monolinguals perform better than Iranian bilinguals on Farsi reading comprehension (F=21.99, p<.001; MD=26.97, p<.001), Farsi word reading (F=144.42, p<.001; MD=52.94, p<.001), and on the Farsi vocabulary knowledge test (F=44.83, p<.001; MD=31.69, p<.001). There was not any significant difference between these two groups on the Farsi phonological test (F=.24, p=.62; MD=1.31, p=.06) (see Table 10).

Correlational Analysis

The associations between variables are analyzed based on the correlational analyses presented in Table 11. This part is divided into five subsections in which the significant correlations will be highlighted. Although some of the expected correlations were not significant, in contrast to previous research. However, it is important to look at them and consider why they are not significant.

Reading comprehension. There are some variables that have significant relationships with reading comprehension in English. Vocabulary knowledge (r =.96, p<0.01) and word identification (r =.95, p<0.01) are good examples in this group. Interestingly, word reading in Farsi has a negative correlation with reading comprehension in English (r =-.86, p<0.01). Age and grade are a good predictors of reading comprehension in English with correlations of .61 and .7; respectively. Memory in English plays a role in reading comprehension in English, and showed a moderate significant correlation (r =.45, p<0.05). Moreover, reading comprehension in Farsi is positively correlated with years of education in Farsi (r =.68, p<0.01), word knowledge in Farsi (r =.64, p<0.01), and word reading in Farsi (r =.77, p<0.01), but negatively correlated with word knowledge in English (r =-.59, p<0.01), reading comprehension in English (r =-.55, p<0.05), and word identification in English (r =-.51, p<0.05). It is important to note that there is not any significant correlation between phonological awareness and reading comprehension either in English or in Farsi (see Table 11).

Vocabulary knowledge. Age and grade are powerful predictors of vocabulary knowledge in English with correlations of .61 and .71, respectively. As mentioned above, reading comprehension has a significant correlation with vocabulary knowledge in

English. On the other hand, vocabulary knowledge in English has a negative relationship with reading comprehension (r =-.59, p<0.01), word reading (r =-.87, p<0.01), and vocabulary knowledge in Farsi (r =.61, p<0.05). Vocabulary knowledge in Farsi increases based on years of education in Farsi (r =.85, p<0.01), and it has a close association with reading comprehension (r =.64, p<0.01) and word reading in Farsi (r =.87, p<0.01). While it is believed memory plays a large role in one's vocabulary knowledge, this relationship was not found in the sample studied here (see Table 11).

Memory. It is found that both of the memory tests have a significant correlation with each other (r =.48, p<0.05). Additionally, there is a moderate correlation between reading comprehension and memory (r =.45, p<0.05). Although there is a moderate correlation between vocabulary knowledge and memory in English (r =.58, p<0.05), the same pattern was not found between Farsi vocabulary knowledge and English memory measure in this sample (r =.22, p>0.05) (see Table 11).

Word reading. Word reading in English is also significantly correlated with age (r =.62, p<0.01) and grade (r =.70, p<0.01). In addition, a student who knows more words in English as measured by the PPVT, would be more proficient in word reading as well (r =.93, p<0.01). Word reading in Farsi is positively correlated with years of education in Farsi (r =.91, p<0.01), as well as word knowledge in Farsi (r =.87, p<0.01). Word reading in Farsi is negatively correlated with reading comprehension in English (r =-.86, p<0.01), and vocabulary knowledge in English (r =-.87, p<0.01). Interestingly, an association between word reading and rapid digit and letter naming tasks was not found in this sample (r =.22, p>0.05) (see Table 11).

Phonological processing. While moderate correlations were found in the relationship between phonological processing in English and age (r =-.35, p<0.05) as well as memory (r =.34, p<0.05), it is not the case in Farsi. It is believed that this lack of relationship is because of the low reliability of the phonological awareness test in Farsi (see Table 11).

Nonverbal ability. Reading comprehension in English has a significant correlation with non-verbal ability with the correlation of .57. There is not any significant relationship between non-verbal ability and any of the other variables.

Regression Analyses

To find the significant relationship among some of the variables for the different groups, regression analyses were run. The first regression analysis includes all participants, based on the groups who received the given measures. For each analysis, group membership (IM, IB, and CM) was coded and entered as a dummy variable to determine if group membership explained variability in performance on the dependent variables beyond the key cognitive-linguistic measures. The Woodcock passage comprehension (English) was entered as a dependent variable, and the PPVT as well as the Woodcock Word Identification were entered as predictors. R square is .95. In other words, 95 percent of the variance in Woodcock passage comprehension is accounted for by PPVT and Woodcock Word Identification. It is important to note that the F (3,73) is equal to 464.61, p < .001. It could be concluded that there is a significant linear relationship between reading comprehension in English and vocabulary knowledge and word reading in English. For vocabulary knowledge, the t statistic has the value 7.72, p<.001. In other words, there is a relationship between vocabulary knowledge and

reading comprehension in English. Similarly, the *t* statistic for word reading in English is equal to 5.86, $p<.001$ (see Table 12).

The second regression analysis examined the relationship between Woodcock Word Identification, as a dependent variable, and Memory (Daneman & Carpenter), Rapid Letter Naming, and CTOPP Elision, as predictors for two of the groups, Iranian bilinguals and Canadian monolinguals. R square is .42. In other words, 42 percent of the variance in Woodcock Word Identification is accounted for by the predictor variables. The $F(4,42)$ is equal to 6.91, $p < .001$. Therefore, there is a significant linear relationship between word reading in English and memory and phonological processing. The *t* statistic has the value 2.06, $p=.046$ for phonological processing. There is a significant relationship between word reading and phonological processing in English (see Table 13).

The third regression was run to examine the relationship between English reading and the Farsi tasks for Iranian bilinguals and Iranian monolinguals. The Woodcock Word Identification was entered as a dependent variable, and word reading and phonological awareness in Farsi were entered as predictors. R square is .61. In other words, 61 percent of the variance on the Woodcock Word Identification is accounted for by Farsi phonological processing and word reading. The $F(2,42)$ in this equation is equal to 31.36, $p < .001$. It could be concluded that there is a significant linear relationship between word reading in English and phonological processing as well as word reading in Farsi. For Farsi word reading, the *t* statistic has the value -7.89, $p<.001$. It could be inferred that there is a significant negative relationship between word reading in English and word reading in Farsi (see Table 14).

The last regression was run to determine the predictors for reading comprehension in English between Canadian monolinguals and Iranian bilinguals to determine the additional effects of contextual variables. Vocabulary knowledge in English, as well as English word reading, and SES, which was coded based on parents' educational and occupational situation, were entered. R square is .54, which means 54 percent of the variance in Woodcock passage comprehension is accounted for by PPVT, Woodcock Word Identification, and SES. The $F(3,40)$ is equal to 16.001, $p < .001$. Therefore, there is a significant linear relationship between reading comprehension in English and vocabulary knowledge, word reading in English, and SES. For vocabulary knowledge, the t statistic has the value 2.67, p=.011. In other words, there is a relationship between vocabulary knowledge and reading comprehension in English. Similarly, the t statistic for word reading in English is equal to 3.342, p=.002. On the other hand, the t statistic for SES did not predict English reading comprehension among these two groups. The t statistic had a value of 1.105, p=.276 (see Table 15).

Discussion

This section has four parts. The first part will discuss the findings and their relation to the past research. Additionally, the other significant findings will be described in this section. The second part includes the limitations of this study. The third part will introduce some ideas for the future studies. Lastly, the conclusion will review the key findings of the study.

The group differences are clear from the descriptive statistics, which were supported by the statistical analyses. Significant differences were found when comparing all three groups on cognitive and phonological processing tasks. It is found that the

Iranian bilinguals performed better on these tasks compared to the Canadian and Iranian monolingual groups. The result confirms previous findings, which suggest that bilingual students are better than their monolingual peers on cognitive and phonological processing skills; generally, it is believed that bilingualism provides an advantage for working memory (Bialystok, 2000; Miyake, Friedman, Emerson, Witzki, & Howerter, 2000). The results of this study illustrate that there is no difference among the three groups in non-verbal reasoning. Similarities among the three groups were expected for this task as it measures non-verbal skills, and is not related to language ability. Therefore, no differences were found because the test is completely separate from participants' language ability.

Another significant difference is the dissimilarity among Iranian groups on the Farsi tasks. As expected, Iranian monolinguals were more advanced in terms of Farsi language ability than their bilingual peers. For example, Iranian students who live in Iran performed better on reading comprehension, word reading, and vocabulary knowledge. This finding could be easily explained by the differences in years of education and the amount of exposure to Farsi (Louden & Hunter, 1999). Another finding is the differences between Iranian groups on English language ability. As expected, Iranian bilinguals are more advanced on English tasks in comparison to Iranian monolinguals. This finding is likely a reflection of home language use. Whereas Iranian monolinguals speak Farsi to all of their friends, watch TV, and read books in Farsi, Iranian bilinguals utilize English for their communications more often. They also watch more English programs on TV, and read more English books compared to Iranian monolinguals. Another key factor is the language that they speak at home. Visual inspection of the questionnaire data showed that

if Iranian bilinguals have a brother or sister, they prefer to speak in English with them, while Iranian monolinguals speak Farsi in all circumstances. The use of the L2 with siblings has been reported in the literature (Fillmore, 1991; Garcia, 1983; Driessen & Withagen, 1999).

One interesting finding is that Iranian bilinguals know more English vocabulary in comparison to Canadian monolingual peers. This finding was somewhat unexpected. To explain this difference, multiple comparisons were run. It was found that Iranian bilinguals had more books in English compared to Canadian monolinguals. It was also found that they come from middle socio-economic status, while Canadian monolinguals in this sample showed more variability in their families' socio-economic status. Another possible explanation could be that Iranian bilinguals practice their English language skills in a more organized and purposeful manner in order to enhance their vocabulary skills. Small sample size as well as selection biases would be two key factors that may have resulted in this pattern. This result is not consistent with previous findings, which suggest a gap between bilinguals and monolinguals in English language skills (Farnia & Geva, in press; Geva & Farnia, 2009; Geva & Yaghoub Zadeh, 2006; Nakamoto et al., 2007).

It was also found that vocabulary knowledge and word reading in English are two important factors in English reading comprehension. This finding is consistent with previous results (Cain, Oakhill, & Lemmon, 2004; Tunmer & Hoover, 1993). This finding could also be explained by the "Simple View of Reading" theory. In this theory, it is believed that reading comprehension is dependent on two main factors, which are

listening comprehension and decoding (Gough & Tunmer, 1986), which is consistent with this finding.

Another point worth noting is that for this sample there is not any relationship between vocabulary knowledge and working memory, whereas the previous research does not support this finding (Calvo, 2004; Majerus, Poncelet, Greffe, & Van der Linden, 2006; Leclercq & Majerus, 2010). However, a study suggested that "... the ability to represent unfamiliar phonological material in working memory underlies the acquisition of new vocabulary items in foreign language learning" (Service, 1992, p.21). Therefore, the finding of this specific study is consistent with the result of this study.

One goal of this study was to begin creating tests of Farsi language and reading ability. The results of this study showed that two of the tasks developed, the reading comprehension and the motivation and attitude questionnaire, and one translated task, the Expressive Vocabulary Test, were reliable. However, three tasks, non-word repetition, listening comprehension, and phonological awareness, need more revision in order to be more reliable and therefore usable. Two of the tasks had ceiling effect, which means they were too easy for the participants. These tasks include non-word deletion and phonological awareness. The ceiling effect is clear from the high average score on the non-word repetition task. However, for the phonological awareness measure, the test average does not indicate floor or ceiling effects. On the other hand, all of the participants answered 11 of the questions correctly. The first step of the item analysis involves finding patterns for these 11 items, but after a preliminary review of these items, it seems that there is not any specific pattern and they only were very easy for participants. One explanation why this task was not reliable could be less variety in number of syllables in

the words. Ten of the words in this task had one syllable, 13 with two syllables, and one with three syllables. Finding words that result in a meaningful word after omitting a sound was a very difficult task. This task was developed and tested on the Iranian monolingual group first, and the items with low reliability were omitted. After adding the new items, and testing the test on the Iranian bilingual group, it was still not reliable. One suggestion is to create Farsi nonword deletion task. In this manner, there would not be all these challenges, and it is anticipated that such a task would have higher reliability. Farsi listening comprehension task had low reliability because of floor effects. It means that the task was very challenging for participants. Another explanation for this finding may lie in the length of the passages. The passages were too long, so that the participants may not have been able to concentrate and recall the content and respond to the related questions afterwards.

This study had five main hypotheses, and this section will explain each individual hypothesis and whether the related results support each hypothesis.

1. A main effect of age was expected for cognitive and phonological processing, but the results of this study did not support this hypothesis. Although age affects the language ability, it was not the case for cognitive and phonological processing ability in this sample. It may be because of the small sample size. The results could also be explained by a selection bias for the sample. In other words, this sample may not be a good representation of the normal population because only those who accepted to participate were tested.

2. It was anticipated that the Iranian bilinguals would perform better on cognitive and phonological processing in comparison to two other groups. The results of this study

did support this claim which is consistent with previous findings. For this study, it was found that the memory skills of Iranian bilinguals as measured by digit span were significantly better than the other groups. A study by Bialystok supported that bilingualism has advantages in terms of cognitive and phonological processing ability. The results of this study illustrated that bilingual students have better memory if the construct is measured by non-language related tasks (Bialystok, 2008). Hence, the findings of this study are consistent with the research of Bialystok (2008).

3. The hypothesis that there is a difference in the English oral language skills and reading ability of Iranian bilinguals and Canadian monolinguals was not supported in this study. The findings show that Iranian bilinguals perform similar to the Canadian monolinguals on measures of reading comprehension and word reading, and performed better than their peers on vocabulary measure.

4. It was hypothesized that there would be a difference between Iranian monolinguals and Iranian bilinguals in a way that Iranian monolinguals would perform better on Farsi tests and poorer on English ones. The results of this study did support this hypothesis and can be explained by the language of their social and educational environment. Since Iranian bilinguals live in English environment, they are likely to perform better on English tests and poorer on Farsi tests in comparison to their peer group.

5. It was anticipated that performance in Farsi would be strong predictor of performance in English for Iranian bilingual students. The results of this study did not support this hypothesis. Any significant relationship between L1 and L2 word reading, reading comprehension, and vocabulary knowledge was not found which might be related

to the small size of the Iranian bilingual group or different scripts in Farsi and English. Gottardo and colleagues (2006) concluded that the differences in L1 and L2 scripts might influence the relationships among performance on reading measures (Gottardo, Chiappe, Yan, Siegel, & Gu, 2006). In summary, although past research confirms this association between L1 and L2 skills (Cummins, 1983), the results of this study were not consistent with them likely because of two major reasons: small sample size and different scripts.

Limitations

Having a small number of participants in the Iranian bilingual group was a limitation of this study. It is important to have more students to be able to generalize the findings. Moreover, developing new tasks that measure Farsi grammatical awareness was challenging. These challenges were because of the Farsi language structure. Although a grammatical judgment test was developed at the beginning of this study, the questions were either very easy or very challenging for the students. Therefore, it had a very low reliability and was therefore not considered for analysis in this study. Another challenging issue was cultural experience. Students in Iran have not encountered the cultural concepts such as Halloween and Thanksgiving Day that are presented in some of the tests.

Future Studies

One of the goals of this study was to create reliable tests in the Farsi language. Considering the fact that there are no standardized tests in Farsi, developing new tasks is considered one of the contributions of this study. Further work needs to be done to create reliable language tasks that measure listening comprehension, grammatical judgment, phonological awareness, and non-word repetition. Furthermore, since in most reading

studies, reading level match design is preferred, it would be interesting to expand this study using a reading level match design. For this kind of design, researchers select students based on their reading performance. These students are then matched with younger peers who have the same reading ability. This design is useful because it may help to distinguish causes and consequences of reading difficulties: if poor less-skilled readers do not perform as well as their younger peers on specific tasks, then the related skills might potentially cause the difficulties (Bowey, Cain, & Ryan, 1992). Studying these Iranian students in comparison to their reading level match and chronological age match peers would be an interesting study. Finally, it is suggested that these students be studied longitudinally, to see how much they forget their first language. The results of this study have shown that for this group of ELLs, they have already caught up with their monolingual peers both in literacy skills (word reading and comprehension) and in oral language. Future research is needed to find out if these results are replicable.

Conclusion

To recapitulate the major results briefly: Three reliable tasks were developed and translated in Farsi that could be use to evaluate Iranian students in Canada on three aspects: vocabulary knowledge, reading comprehension, and motivation and attitudes towards learning a second language. Additionally, bilingual students in this study performed better on memory tests in comparison to monolingual students. Moreover, bilinguals and English native speakers in this study did not perform differently from each other on reading comprehension and word reading. Another key finding is that Iranian bilinguals knew more English vocabulary compared to Canadian monolinguals. Finally,

the Iranian monolinguals performed better on Farsi tasks, and not as well as on English tasks compared to Iranian bilinguals.

Table 1

Descriptive data from the Iranian monolingual group

Grades	Gender		Age	
	M	F	Minimum	Maximum
Six	10	17	11.01	12.10
Seven	0	3	13.02	13.06

Table 2

Descriptive data from the Iranian bilingual group

Grades	Gender		Age	
	M	F	Minimum	Maximum
Five	1	0	10.04	10.04
Six	3	2	11.04	12.05
Seven	3	0	12.09	13.03
Eight	2	1	13.02	13.08
Nine	0	1	15.00	15.00
Ten	0	1	15.16	15.06

Table 3

Descriptive data from the Canadian monolingual group

Grades	Gender		Age	
	M	F	Minimum	Maximum
Nine	13	8	14.03	15.10
Ten	4	4	15.05	16.04
Twelve	0	1	17.11	17.11

Table 4

Farsi reading comprehension task characteristics

Passage	Type	Length(Number of Words)	Number of questions
One	Literary	314	4
Two	Information	292	4
Three	Authentic	144	5
Four	Information	231	5
Five	Literary	228	5
Six	Authentic	150	4

Table 5

Farsi listening comprehension task characteristics

Passage	Type	Length(Number of Words)	Number of questions
One	Information	109	5
Two	Authentic	157	4
Three	Literary	54	3

Table 6

Test administrations in the sample groups

Measures	Sessions		Groups		
	G	I	IM	IB	CM
English Measures					
Woodcock Word Identification		X	X	X	X
Gate MacGinitie	X			X	X
Woodcock Passage Comprehension	X		X	X	X
PPVT-III	X		X		X
PPVT-IV	X			X	
MAT	X		X	X	X
Digit Span		X	X	X	X
Working Memory Task		X		X	X
CTOPP Elision		X		X	X
CTOPP RAN Digit		X		X	X
CTOPP RAN Letter		X		X	X
Nonword repetition (Hebrew)		X		X	
Motivation and Attitude	X		X	X	X
Language Use	X		X	X	X
Parent Questionnaire			X	X	X
Farsi Measures					
Word Reading-I		X	X		
Word Reading-II		X		X	
Reading Comprehension-I	X		X		
Reading Comprehension-II	X			X	
Listening Comprehension		X		X	
Phonological Awareness-I		X	X		
Phonological Awareness-II		X		X	
Nonword repetition		X		X	
Spelling	X			X	
EVT-1		X	X		
EVT-2		X		X	

Note. *G* = Group testing; *I* = Individual testing; *IM* = Iranian monolinguals; *IB* = Iranian bilinguals; *CM* = Canadian monolinguals.

Table 7

Reliability of Farsi developed and translated measurements

Measures	Reliability (Cronbach's alpha)	Max Score	Means	SD
EVT-2	.86	43	21.64	9.73
Reading Comprehension	.82	27	9.98	4.88
Motivation and Attitude	.81	102	56.21	11.67
Non-Word Deletion	.57	19	16.57	5.97
Listening Comprehension	.41	10	2.23	1.48
Phonological Awareness	.21	24	10.57	1.05

Table 8

Descriptive statistics in three groups

Measures	Groups		
	IM	IB	CM
English Measures			
Woodcock Word Identification	41.73	89.36	88.2
	(12.32)	(5.94)	(9.7)
Gate MacGinitie	a	29.14	29.03
		(10.17)	(9.56)
Woodcock Passage Comprehension	8.17	30.14	28.4
	(3.22)	(3.48)	(3.51)
PPVT	73.03	197.50	163.87
	(16.51)	(14.43)	(19.39)
MAT	20.6	24.5	22.73
	(5.55)	(6.11)	(7.63)
Digit Span	5.4	7.86	5.9
	(1.77)	(2.07)	(1.95)
Working Memory Task	a	30.08	28.57
		(7.59)	(7.34)
CTOPP Elision	a	18.57	17.27
		(1.45)	(1.61)
CTOPP RAN Digit	a	29.6	24.69
		(7.15)	(4.49)
CTOPP RAN Letter	a	31.01	27.2
		(5.22)	(6.1)
Nonword repetition (Hebrew)	a	21.85	a
		(3.23)	
Farsi Measures			
Word Reading	77.56	24.65	a
	(6.88)	(22.06)	
Reading Comprehension	50.25	23.28	a
	(14.94)	(22.85)	
Listening Comprehension	a	2.23	a
		(1.48)	
Phonological Awareness	90	88.69	a
	(8.7)	(6.62)	
Nonword repetition	a	18.14	a
		(2.1)	
Spelling	a	5.79	a
		(4.15)	
EVT	77.22	45.53	a
	(7.9)	(12.58)	

Note. IM: Iranian Monolinguals; *IB:* Iranian Bilinguals; *CM*: Canadian Monolinguals; *a*: missing data.

Table 9

Three way comparison (English and Farsi tasks) in all three groups

Measures			Means Differences	Sig	F	Sig
Reading Comprehension (Woodcock Passage Comprehension)	IB	IM	21.97*	.000	336.16*	.000
		CM	1.74	.11		
Word Reading (Woodcock Word ID)	IB	IM	47.62*	.000	182.97*	.000
		CM	1.15	.87		
Vocabulary Knowledge (PPVT)	IB	IM	124.46*	.000	544.35*	.000
		CM	11.43*	.02		
Memory (Digit Span)	IB	IM	2.45*	.000	8.13*	.000
		CM	1.95*	.02		
MAT	IB	IM	3.9	.61	1.84	.16
		CM	1.76	.69		
Intrinsic Interest in Reading Inventory	IB	IM	-.22	.96	6.66*	.002
		CM	-14.09*	.009		

Note: IM: Iranian Monolinguals; *IB:* Iranian Bilinguals; *CM:* Canadian Monolinguals.

Table 10

Two way comparison (Farsi Tasks)in two Iranian Groups

Measures			Means Differences	Sig	F	Sig
Reading Comprehension	IB	IM	-26.97*	.000	21.99*	.000
Word Reading	IB	IM	-52.94*	.000	144.42*	.000
Phonological Awareness	IB	IM	1.31	.06	.24	.62
Vocabulary Knowledge (EVT)	IB	IM	-31.69*	.000	44.83*	.000

Note: IM: Iranian Monolinguals; *IB*: Iranian Bilinguals.

Table 11

Correlations between tasks in all three groups

r	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
A	1																			
B	-	1																		
C	9**	-	1																	
D	-	-	- 07	1																
E	20	- 06	19	41	1															
F	7**	- 25	61**	- 84**	7**	1														
G	- 24	000	- 15	85**	61**	- 55**	1													
H	71**	- 28	61**	- 85**	62**	96**	- 61**	1												
I	7**	- 26	62**	- 77**	63**	95**	- 49**	93**	1											
J	- 19	26	- 04	68**	23	- 55*	64**	- 59**	- 51*	1										
K	- 4*	33	- 22	91**	24	- 86**	87**	- 87**	- 77*	77**	1									
L	13	- 04	08	-	37	32*	- 07	29	37*	- 21	- 4	1								
M	18	- 22	20	-	45*	45*	22	58*	59*	- 6	- 3	48*	1							
N	- 33	- 26	- 35*	- 35	16	33	- 13	24	35	- 14	- 35	34*	25	1						
O	- 4*	- 21	- 46*	- 34	- 26	- 03	- 24	08	- 22	- 24	- 56*	- 03	- 18	23	1					
P	- 3*	- 20	- 34*	- 28	- 24	- 07	- 20	12	- 22	08	- 44	- 11	- 2	23	8**	1				
Q	- 10	- 18	- 17	12	- 08	- 11	19	- 07	- 05	22	23	07	- 24	- 11	- 2	- 3	1			
R	10	38	- 04	- 17	18	31	27	- 05	28	- 44	09	32	- 17	- 15	- 2	- 45	44	1		
S	65*	51	6*	21	36	47	41	50	7**	- 42	27	39	52	- 1	- 12	- 04	- 18	2	1	
T	14	- 24	14	- 28	57**	32	05	27	3	- 23	- 4	39	25	37	- 18	- 11	1	03	08	1

Note. *.Correlation is significant at the 0.05 level (2-tailed). **.Correlation is significant at the 0.01 level (2-tailed).

A: Grade; *B:* Gender; *C:* Age; *D:* Years of Education In Farsi; *E:* Reading Comprehension (Gates MacGinities); *F:* Reading Comprehension (Woodcock Passage Comprehension); *G:* EVT(Farsi); *H:* PPVT(English); *I:* Woodcock Word Identification; *J:* Reading Comprehension (Farsi); *K:* Word Reading(Farsi); *L:* Memory (Digit Span); *M:* Memory (Daneman & Carpenter); *N:* CTOPP Elision; *O:* Rapid Digit Naming; *P:* Rapid Letter Naming; *Q:* Phonological Awareness (Farsi); *R:* Nonword Deletion (Farsi); *S:* Nonword Deletion (Hebrew); *T:* MAT.

Table 12

Predicting English reading comprehension in all three groups

Model	*B*	*Std. Error*	*t*	sig
PPVT	.102	.013	7.720	.000
Word ID	.184	.031	5.864	.000
Groups	.132	.389	.340	.735

Table 13

Predicting English word reading in two groups: Iranian bilinguals and Canadian monolinguals

Model	*B*	*Std. Error*	*t*	sig
RAN Letter	-.308	-.200	-1.514	.138
CTOPP Ellison	1.485	.721	2.060	.046
Memory	.559	.156	3.577	.001
Groups	-.392	1.255	-.312	.757

Table 14

Predicting English word reading in two groups: Iranian monolinguals and Iranian bilinguals

Model	*B*	*Std. Error*	*t*	sig
Farsi Phonological Awareness	.368	.306	1.203	.236
Farsi Word Reading	-.704	.089	-7.893	.000

Table 15

Predicting English reading comprehension in two groups: Iranian bilinguals and Canadian monolinguals

Model	*B*	*Std. Error*	*t*	sig
Word ID	.174	.052	3.342	.002
PPVT	.089	.521	2.668	.011
SES	.575	.033	1.105	.276

Appendix A: Farsi alphabet

ذ	د	خ	ح	چ	ج	ث	ت	پ	ب	ا
[z]	[d]	[x]	[h, Ø]	[ʧ]	[ʤ]	[s]	[t]	[p]	[b]	[ʔ, ɔ] [æ, Ø]
غ	ع	ظ	ط	ض	ص	ش	س	ژ	ز	ر
[ɣ] [q, ɢ, x]	[ʔ, Ø]	[z]	[t]	[z]	[s]	[ʃ]	[s]	[ʒ]	[z]	[r]
	ی	ه	و	ن	م	ل	گ	ک	ق	ف
	[j, i, e]	[h, Ø] [ɛ, æ]	[v, u] [o, ow]	[n]	[m]	[l]	[g]	[k]	[q, ɢ]	[f]

Appendix B: Motivation and Attitude towards learning a second language task

The following are a number of statements with which some people agree and others disagree. Please circle one alternative below each statement according to the amount of your agreement or disagreement with that item. Which one you choose would indicate your own feelings based on everything you know and have heard. Note: there is no right or wrong answer.

1) My parents help me learn English.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

2) My English class is a waste of time.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

3) Studying English is important because I will need it for my career.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

4) I never finish my English homework.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

5) Knowing English is not an important goal in my life.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

6) I think my English class is boring.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

7) It is important to me to practice using my native language

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

8) I ask my English teacher for help when I need it.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

9) Studying English will help me get a job.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

10) Learning English is a waste of time.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

11) I plan to learn as much English as possible.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

12) I get nervous when I have to speak English.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

13) Speaking English anywhere makes me feel worried.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

14) Most of my friends speak English.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

15) It is not important for me to learn new words in my native language

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

16) I usually watch TV in English.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

17) I ask for help when I don't understand something on an English assignment.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

18) I finish my English homework, even when it takes a long time.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

19) How many hours of English homework do you usually do each day? _____

Appendix C: Language Use Questionnaire

Date of Birth:_____ Gender: M F

What grade are you currently enrolled in? _____

1. a) Were you born in Canada? Yes No

   b) If you were not born in Canada, how old were you when you moved to Canada? _____

   c) In what grade did you start school in Canada? _____

2. What language or languages are spoken at home?

   English French Other(s): _____

3. How often do you speak to the members of your household in **English**?

	Always	Frequently	Sometimes	Rarely	Never
Parent 1					
Parent 2					
Brothers & Sisters					
Grandparents					

5. How often do you speak to your friends in **English**?

	Always	Frequently	Sometimes	Rarely	Never
Friends at school					
Friends in community					

6. How often do you speak to your friends in your **native language**?

	Always	Frequently	Sometimes	Rarely	Never
Friends at school					
Friends in community					

7. How often do you watch TV or videos in **English** and in your **native language**?

	More than 2 hours per day	1-2 hours per day	2-5 hours per week	Less than 2 hours per week	Never
English					
Native Language					

8. How often do you read at home in **English** and in your **native language**?

	More than 2 hours per day	1-2 hours per day	2-5 hours per week	Less than 2 hours per week	Never
English					
Native Language					

9. Approximately **how many books** do you have around the house (including library books) in English and in your native language?

	0 - 5	5 - 10	10 - 15	15 - 20	20+
English					
Native Language					

Appendix D: Parent Questionnaire

In order to be able to better understand the factors that influence a child's ability to learn in a second language, we would like to obtain some information about language knowledge and language use in the home. We would greatly appreciate it if you would complete the following questions concerning your family and your child who is in the study.

Today's date: _____

1. My child in the study is _____,

   Name of current school _____

2. Did the child attend school in any country besides Canada?
No. Yes. How many years?
Which country?

3. When did your child learn to speak their native language?
   First words _____
   Sentences _____

4. Has you child ever received extra help in the following areas:

	Reading	Writing	Speaking	Math
In Canada				
In native country				

Circle who is completing this questionnaire: Mother Father Other:
_____

5. What is your native language(s)? _____
   What is your native country? _____
   If you were not born in Canada, at what age did you move to Canada? _____

6. For each of the following **English** language skills, please rate how well you feel that you can currently perform the skill (circle one number per skill).

			ability									
			none									very fluent
Understanding			1	2	3	4	5	6	7	8	9	10
Speaking			1	2	3	4	5	6	7	8	9	10
Reading			1	2	3	4	5	6	7	8	9	10
Writing			1	2	3	4	5	6	7	8	9	10

7. For each of the following **native language** skills, please rate how well you feel that you can currently perform the skill (circle one number per skill).

			ability									
			none									very fluent
Understanding			1	2	3	4	5	6	7	8	9	10
Speaking			1	2	3	4	5	6	7	8	9	10
Reading			1	2	3	4	5	6	7	8	9	10
Writing			1	2	3	4	5	6	7	8	9	10

8. Please place an X beside the highest level of education that you have attained.

_____ Elementary school
_____ Some high school studies
_____ Completed high school
_____ Some college or university studies
_____ Completed college diploma
_____ Completed undergraduate degree
_____ Some postgraduate studies
_____ Completed graduate or professional degree

9. What is your occupation? : _____

If you are a new Canadian and were employed before immigrating to Canada, please indicate your occupation in your former country _____

Questions 10-15 are the same as Questions 5-9 but concern another adult with whom your child lives (for example, his or her other parent or a step-parent), or with whom your child has regular contact (for example, a parent no longer living in the household). If there are several people to whom this might apply, it should be filled out by (or for) the person who has most influenced the language abilities of your child. If there is no one to whom this applies, put a check on the following line _____ and leave Questions 10-15 blank.

10. Relationship of Adult 2 to the student _____

11. What is Adult 2's native language(s)? _____

What is Adult 2's native country? _____

If not born in Canada, at what age did Adult 2 move to Canada? _____

12. For each of the following **English** language skills, please rate how well Adult 2 can currently perform the skill. (circle one number per skill)

			ability								
			none								very fluent
Understanding			1	2	3	4	5	6	7	8	9	10
Speaking			1	2	3	4	5	6	7	8	9	10
Reading			1	2	3	4	5	6	7	8	9	10
Writing			1	2	3	4	5	6	7	8	9	10

13. For each of the following **native language** skills, please rate how well Adult 2 can currently perform the skill. (circle one number per skill)

			ability								
			none								very fluent
Understanding			1	2	3	4	5	6	7	8	9	10
Speaking			1	2	3	4	5	6	7	8	9	10
Reading			1	2	3	4	5	6	7	8	9	10
Writing			1	2	3	4	5	6	7	8	9	10

14. Please place an X beside the highest level of education attained by Adult 2:

_____ Elementary school
_____ Some high school studies
_____ Completed high school
_____ Some college or university studies
_____ Completed undergraduate degree
_____ Some postgraduate studies
_____ Completed graduate or professional degree

15. Adult 2's occupation: _____

If Adult 2 is a new Canadian and was employed before immigrating to Canada, please indicate occupation in your home country _____

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