The effects of bilingualism on phonological awareness and word reading tasks in primary school children

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Abstract
The purpose of this study was to explore the roles of bilingualism and similarity/dissimilarity between first language (L1) and second language (L2) on word reading and phonological awareness of bilingual students. Totally 1614 monolingual and bilingual pupils from Tehran [Persian monolingual (Pm) area], Sanandaj [Kurdish-Persian bilingual (KPb) area] and Tabriz [Turkish-Persian bilingual (TPb) area] were included who were assessed on a word reading and also four phonological tasks (word chains, rhyming, phoneme deletion, and reading for non/pseudo-word). Kurdish language is similar to Persian language according to orthography and phonology but from these points of view Turkish and Persian languages are supposed to be dissimilar. Both of them are spoken languages in Iran and are mainly based on phonological processing. According to the results Pm were better than bilinguals in word reading and non/pseudo-word reading tasks. In rhyming and phoneme deletion tasks, KPb were better non-significantly than Pm but there was no difference between TPb and monolinguals. In word chains, there was no significant difference between bilinguals and monolinguals. The results suggest that bilinguals can benefit from similarity between L1 and L2 since KPb were better than TPb in all reading and phonological tasks. The bilingual advantages are observed more in phonological tasks. Findings are discussed based on different patterns existed on word reading and phonological awareness tasks in bilinguals and monolinguals, similarity and dissimilarity between languages, grade and gender differences.

1. Introduction
Although it’s now almost 50 years of scientific research, educational experts and parents feel concerned about children’s development when it includes a bilingual experience. Bilingualism as a global phenomenon involves simultaneous activation of two languages [1] and requires an ability to efficiently control these languages [2] affecting cognitive abilities. It has either no effect or positive effects on cognitive development e.g., Kormi-Nouri et al [3] found positive relationships between some cognitive variables (e.g. memory) and bilingualism. Above all basic cognitive processes, there is reading ability which is considered as a cognitively challenging task. This is especially true for non-native speakers, bilinguals and cultural minorities. It is a composite cognitive process of decoding symbols for the intention of composing or extracting meaning (reading comprehension). The academic achievement for children depends on their ability to read proficiently [4].

The original background knowledge that differs from what is asked to read and write can be considered as a barrier for bilingual learners [5]. Although, most of the research has been devoted to investigate in the field of bilingualism and reading consequences especially regarding English language (as L1 or L2), this study aimed to study reading and phonological awareness abilities in bilingual and monolingual primary school children in Iran as a multilingual country with totally different language characteristics. Generally bilingual children tend to score lower on some measures such as reading task. It seems that bilingualism affects the process of reading in children such that reading process in bilingual somewhat differs than monolingual children [6].

Learning to read relies to three chief factors: the lexical store, metalinguistic abilities (phonological, syntactic, lexical awareness, etc.) and cognitive development [7]. Achieving the successful reading demands several integrated capabilities which one of them is referred to phonological awareness, the conscious sensitivity to the sound structure of language, which is one of the most studied phonological processing skills [8] and is considered as a chief component of reading acquisition [9]. The low level of it is strongly associated with reading deficits [10].

In the present study we explored it in L1 of two groups of Iranian children with different L1 background i.e., TPb and KPb students whose language of learning in school is not the same as language of home and they require reading in a language different from the one they use in non-academic environment. So they’ve to develop amount of cognitive abilities necessary for fluent reading in their non-native
language. Monolingual readers adjust their reading strategies depending on the usage of the text and their own perceived proficiency but for bilinguals the situation is different since the instructional language is not consistent with their L1. TPb & KPb in Iran are considered as minority linguistic populations whose schooling contents neglect their L1 instruction and principals to great extent. There is no research so far studying reading abilities within Persian sub-languages. The Persian alphabet is written from right to left. Turkish and Kurdish are two dialects which are spoken widely in certain parts of Iran. Acquisition of literacy skills in bilinguals is related to similarity/dissimilarity between languages. Indeed, L1 characteristics affect reading processing in L2. If two languages are enough similar they may coexist in the long term [11]. Kurdish and Persian are more similar in linguistic aspects such as phonology, morphology, and syntax. But Persian and Turkish are less similar [12].

1.1. Method
1614 (770 boys and 844 girls) primary school students participated. They were included of 513 (260 boys and 253 girls) primary school students from Tabriz and 519 (255 boys and 264 girls) primary school students from Sanandaj and as control group we used a population of 582 (255 boys and 327 girls) primary school students from Tehran. By random selection 70 elementary schools (30 schools in Tehran, 20 in Tabriz and 20 in Sanandaj) were selected from different districts. We considered an intermediate definition of bilingualism suggested by [13].

1.2. Measures
1- **Word Reading**: The child has to read accurately and rapidly 60 meaningful words during a limited time (3 minutes).
2- **Words Chains**: The reader had to mark each word boundary with a pencil out of 50 word chains including 4 or 4 Persian words [14].
3- **Rhyming Task**: In this task participants had to determine whether the target word match with other words according to a predefined rule. This task in this research consists of 20 words.
4- **Phoneme Deletion Task**: The orally presented word had to be pronounced without a target sound (e.g. "Say stop, but without /p") consisting 30 words.
5- **Reading for Non/Pseudo words**: In this task, subjects read 40 non/pseudo-word from right to left and top to down [14].

Results
A 2 (Gender) × 3 × (Language) × 5 (grade) factorial design was used. All factors were used as between-subjects variables. Regarding word reading task, the MANOVA analysis showed a main effect for language, $F(2, 1610) = 16.1$, $Mse = 631.007$, $p<0.001$. A post-hoc Tukey test showed that the scores were significantly higher for Pm ($M = 37.17$, $SD = 6.75$) than for KPb ($M = 35.88$, $SD = 8.38$) and TPb ($M = 35.02$, $SD = 9.39$). For word chain task, the MANOVA showed that the effect of language was significant, $F(2, 1605) = 7.08$, $Mse = 284.81$, $P<0.00$. A Tukey test indicated that there was no significant difference between Pm ($M = 13.89$, $SD = 7.74$) and KPb ($M = 14.19$, $SD = 8.38$). The MANOVA for Rhyming task showed that the effect of language was significant, $F(2, 1601) = 13.72$, $Mse = 114.28$, $P<0.00$. Tukey showed that both KPb ($M = 8.36$, $SD = 2.99$) and TPb ($M = 8.01$, $SD = 3.23$) were significantly better than Pm ($M = 7.24$, $SD = 2.59$). The MANOVA regarding Phoneme Deletion Task showed that the main effect of languages was not significant $F(2, 1614) = 1.24$, $Mse = 42.4$, $p>0.2$ and the MANOVA analysis for reading for Non/Pseudo-word showed that the main effect of languages was significant $F(2, 1604) = 37.67$, $Mse = 2537.38$, $p<0.001$ indicating that Pm ($M = 35.59$, $SD = 7.39$) were significantly better than TPb ($M = 31.72$, $SD = 5.47$) and KPb ($M = 32.7$, $SD = 5.47$).

Discussion
The aim of this study was to examine if the languages spoken at home might influence the phonological knowledge and reading ability that TPb and KPb preschooler rely on in the process of developing and deploying two languages together. Pm had significantly better function than bilinguals on word reading and reading for non/pseudo-word tasks and there were big differences between means across two groups of bilinguals and also monolinguals whose significant difference were observed just in first grade. Regarding to reading for
non/pseudo word task, there was a great difference between bilinguals and monolinguals in first grade. Noteworthy there are actually same differences in higher grades as well. In the longitudinal study of [15], they found that first-grade reading ability was a strong predictor of all of the 11th-grade outcomes. It seems that during the first grade main necessary prerequisites of reading process usually set out and appear largely and in following years reading progress will be accomplished in a more slowly trend. Results are in consistent with other studies which insist in academic mastery of L2 requiring considerable time. Bilingual children in first grade are less proficient and haven’t been familiar with L2 since the main language using at home is mother tongue language. In Iran there is not any academic education involving instructional needs of bilingual students regarding their L2 acquisition. So they’re just trained in Persian and cannot benefit the dual education that according to some studies have positive effects [16]. It has been indicated that such education policy should be focused on the quality of instruction through two languages [17]. These bilingual kids live in regions of Iran that people speak Turkish & Kurdish and the mere opportunity to encounter Persian language is that broadcasted typically of media like TV. So when they enter school at the age of 7, they’ve been rarely familiar through structure of Persian language. Similarity of Persian & Kurdish must help to facilitate rhyming before entering school. Phoneme deletion is relatively a difficult task than others. Perhaps with increasing of cognitive demands of tasks, there’ll be an advantage for bilinguals. Bilingualism relates to higher superiority on the task demanding higher levels of control process as proposed by [18].Moreover, the result is in line with [19] that reported bilinguals were better in phoneme detection but worse in the vocabulary measure. Regarding the common phonetic isoglosses shared by Kurdish, Persian, and Baluchi [20] implied that speakers of these languages may once have been in closer contact. The results of study in all of word reading and phonological awareness showed that KPb had better function than TPb. Similarity between languages facilitates acquisition of L2. This finding is consistent with [21].

References