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Effects Of Persian Language Quantitative Characteristics Of Rhythm On Children`S English Songs

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Abstract

Linguists believe that languages have different rhythms. Rhythm is one of the important connections between speech and songs. One of the quantitative rhythmic differences between stress and syllable timed languages have been demonstrated by Grabe and Low (2002). In this method they measured the length of a syllable by vowel length which resulted in greater variability in syllable length where as a language with little variation in vowel length would have little overall variation in syllable length. This model to measure the amount of durational variability in a language is called the normalized pair wise variability index (nPVI). In this research in order to find out the effect of Persian language rhythm on the rhythm of children`s English songs, the duration of vowels of 10 Persian songs and 10 English songs, that had been sung by Iranian children between 3 to 5 years of age, which had been recorded with a Shure microphone in a silent room, have been measured. Then the relative duration of vowels have been measured by nPVI. The results of this study indicate that means of durational variability of vowels in Persian and English vowels are different and the nPVI Values differ as well. Therefore the Persian rhythm affects the rhythm in English songs read by children of 3 to 5 years old.

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1. Introduction

The two languages English and Persian are said to differ in rhythmic patterning. The contrasting rhythmic properties of two varieties of English which is commonly described as stress- timed, but Persian is classified to be syllable- timed.

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One of the quantitative rhythmic differences between stress and syllable-timed languages have been demonstrated by (Grabe and Low, 2002). (Pike, 1946; Abercrombie 1965,1967) suggested that all spoken languages reveal isochronous units of Speech, and that languages are either stress – timed or syllable – timed. (Haghshenas, 2005) believed that Persian rhythm is syllabic and English rhythm is stressed. A syllable – timed language is a language whose syllables take approximately equal amounts of time to pronounce. It can be compared with a stress-timed language, where there is approximately the same amount of time between stressed syllables. The research in this paper involves the comparative investigations of the quantitative characteristics of rhythm in English and Persian songs among Iranian Children

There is an obvious difference between languages such as Persian and English. (James, 1940) researched languages' rhythms in Spanish and Italian with Dutch and English. He stated that elements repeat at regular intervals of time. Spanish and Italian were syllabic and Dutch and English were stressed. Further studies classified Germanic, Slavonic and Arabic as Stress – timed, Romance languages as syllable – timed, and a third class called mora-timed languages such as Japanese and Tamil (Abercrombie,1967; Ladefoged, 1975; Pike,1945, etc)

Later studies by (Dupoux and Mehler, 2003) showed that adult speakers could discriminate between rhythm classes, e.g. English vs. Spanish, but not within rhythm classes, e.g. English vs. Dutch. (Dasher and Bollinger, 1982; Roach, 1982) suggest that the degree of vowel reduction in unstressed syllables is important in making stressed syllables relatively noticeable in stress-timed languages. Some studies by (Mehler et al., 1996) postulated that rhythm type should be correlated with the speech of any given language. In other words, speakers of stress-timed languages should represent speech in feet, speakers of syllable-timed languages in syllables, and mora-timed speakers in morae (Cutler, Mahler, Norris, and Segui 1992; Cutler and Otake, 1994).

Furthermore, the mentioned hypothesis also predicts that children exposing to a bilingual environment, they have no trouble selecting languages of the same representation unit; however, they are confused when they receive different inputs. Mehler et al. (1996) stipulates that children use rhythm to differentiate languages when they are bombarded to the languages of different rhythmic classes. Finally, the most persuasive support for the rhythm-based language discrimination guess is provided by (Bertoncini and Mehler, 1998), who demonstrated that French children can distinguish between English and Japanese sentences, but not between Dutch and English ones. They strongly suggest that rhythmic classes play an important role in children's perception of speech.

Therefore, the evidences were correct that the syllable-timing/stress-timing dichotomy may be connected in the human perceptual system. According to (Bertoncini, 1981; Dasher and Bollinger, 1982; Dauber, 1983), language rhythm is by-product of some phonological factors. And these phonological factors have some phonetic correlates which can be measured for determining the rhythmic class of vocalic intervals in the sentence (%V), the standard deviation of vocalic intervals within a sentence ΔV and the standard deviation of consonantal intervals within a sentence ΔC had been measured (Ramus, 1999). Ramus' research showed that there is a negative relationship between ΔC and %V, because more syllable types show more variability in the number of consonant and more duration variability of syllable that cause more ΔC and less %V. Grabe, Low and Nolan (2000) measured the durations of vowels, and the duration of intervals between vowels in a speech. Their empirical work in phonetics has shown that the nPVI of vowel durations in sentences is notably higher in stress-timed language such as German and English than in syllable – timed languages like French and Spanish (Grabe and Low, 2002; Ramus, 2002). They measured the normalized pair wise Variability index (nPVI) of vowel durations as:

$$nPVI = \frac{100}{m-1} \times \sum_{k=1}^{m-1} \frac{d_k - d_{k+1}}{\frac{d_k + d_{k+1}}{2}}$$

Where m is the number of vocalic intervals in an utterance and d_k is the duration of k th interval.

2. Methods

The present paper used Grabe and low’s (2002) method to show the influence of Persian language on children’s English songs.

Recordings were made of 10 children of Persian native speakers in a quiet room .The songs were recorded by a shure Microphone and a Praat software.

Then Text Grids have been made for each sentence in a way that the durational variability of each vowels are determined. Then the durational variability of vowels measured by nPVI.

3. Results

The results show the nPVI for Persian songs and English songs are different (mean nPVI= 37.29 vs. nPVI=33.54) (see fig. 2). The difference is not notable (Mann–Whitney U test, U = 54, P >0.01) (see Fig.2).

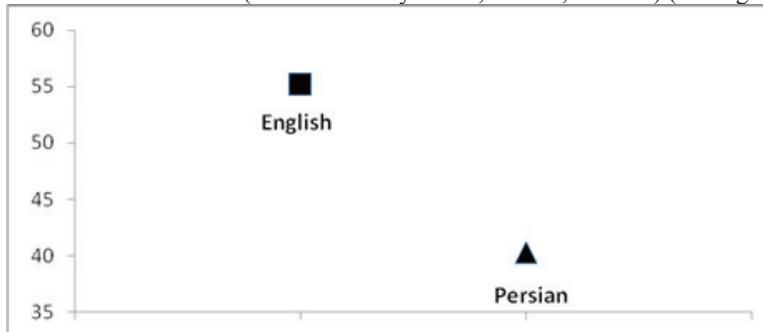


Fig. 1.nPVI values for sentences in English music Farsi music. English: mean = 47.37, Persian: mean= 38.05).Taghva and Abolhasanizadeh(2013)

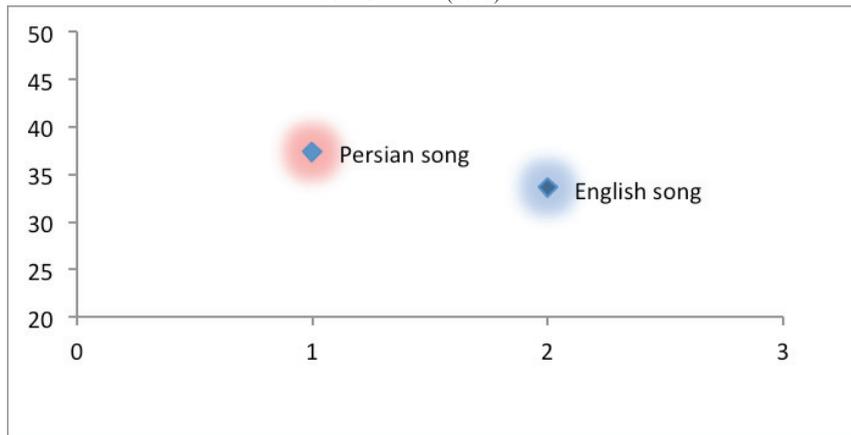


Fig. 2.nPVI values for sentences in English song and Persian song. English: mean =33.37, Persian: mean= 37.05).

The nPVI profiles provide acoustic evidence for rhythmic differences between English on the one hand, and Persian on the other. English has been described as stress-timed and show high nPVI values and Persian have been described as syllable-timed and reveals low nPVI values(see Fig. 1). The finding of Taghva and Abolhasanizadeh (2013)supports the rhythmic classification suggested by Pike (1946) and Abercrombie(1967).

4. Conclusion

On the basis of the data presented, we can conclude that languages considered stress-timed and others considered syllable-timed languages give different results in their nPVI.

The question is whether the Persian rhythm can affect English rhythm in children's songs. To consider that we used Grabe and low's (2000) quantitative measure of Persian native speakers. The results showed that the nPVI of these two languages is different. According to Taghva and Abolhasanizadeh's findings the nPVI in English is less than the one in Persian. In addition to this difference, the results show that Persian rhythm effects on English rhythm of children's songs read by children of 3 to 5 years old.

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