

## **A Comparative Typology on Phonological System of Russian, English and Persian Languages**

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**Abstract** – The aim of this study is to identify similarities and differences among phonological system of Russian, English and Persian languages. To achieve this, the main differences and rules on phonological system of these languages have been gathered. The data is presented in a systematic order. Moreover the study tries to identify the problematic areas in production of these sounds. The model used is Yarmohammadi's (1996). In this model, there are basically two choices for phonological comparison: taxonomic phonology and generative phonology. In this study the taxonomic model has been adopted because it is more suitable “for phonological CA, particularly in applied areas”. The results indicate that when a syllabus structure does not exist in a language it makes problem for correct pronunciation, and language learners try to use approximate syllables in their mother tongue and the issue is salient in Persian-speakers; however, the deviation in the vowels' behavior can be a very prominent linguistic phenomenon. This study can express a path for further studies on other linguistics field such as morphology and syntax.

**Keywords:** Comparative, Typology, Phonology, Linguistic

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### **1. INTRODUCTION**

Languages are classified based on their phonemes; because the phonemes are fixed in any language and actually phonological typology is the study of different languages according to varies of their sounds. Typology, in its most general sense, is the classification of languages or components of languages based on shared formal features. Contrastive typology helps learners to learn new language more easily.

Contrastive analysis can be a productive base on phonology (Richards, 1974). Thompson and Daniel (1996) have maintained that language learners study phonetics theory and do exercise based on that; and claim, in general analysis of speech sound and the differences among articulation of English sounds and foreign sounds can be investigated and demonstrated by means of articulated designed tools. According to Yarmohammadi (1996), Contrastive phonology is ‘the process of comparing and contrasting the phonological systems of languages to show their similarities and differences". It is a part of phonology as Ringbom (1994) claims finding differences between pronunciations via contrastive analysis (CA) works best. There are basically two choices for a phonological comparison: taxonomic phonology and generative phonology. In this study the taxonomic model has been adopted because it is more suitable “for phonological CA, particularly in applied areas” based on Yarmohammadi

(1996). At the theoretical level this study shows a picture of the sound system of English, Russian and Persian and it also demarcates the differences and similarities among them.

### **1.1. Statement of the Problem**

Phonetics is one of the most important parts of foreign language teaching. Most of the time pronunciation is considered the most difficult aspect of an L2 for teaching and learning. English, Russian and Persian phonological systems are different in their range of sounds as well as in their intonation and stress patterns. Therefore, it seems learners of these languages have great difficulty in perceiving and articulating vowels and diphthongs that are unfamiliar for them. Although many years ago the first studies on comparison typology took the initiative; studies in this field are limited. All people should communicate with each other and pronunciation is one of the most important parts of a successful communication with foreigners, because misunderstanding can be occurring. Mispronunciation can be a reason why sometimes a conversation leads to failure. Based on Setter and Jenkins (2005) pronunciation, has a vital role in successful social interaction, with considering both the sides productively and receptively. Phonology is considered a part of grammatical competence subcategorized with in communicative competence (Brown, 2007). Dewing & Munro (2005) foreign accent is an important aspect of any language that can have vital effects on speakers and listeners in both perception and production and even consequently, in communication. This study has investigated how much sounds in Persian, English, and Russian are similar or different and where is problematic area in production of these sounds for learners of any of these languages.

### **1.2. The purpose of study**

Studies in contrastive linguistics can be useful for speakers of different languages. This study helps learners of each of these languages to have a new perspective to their mother tongue and two other languages in order to learn a new language in an easier path. This study analyzes the phonology system of Russian, English and Persian. What is interesting in this study is that teachers of these three languages can use this paper for comparing their own language with the other languages and it can be a new window to a new world.

## **2. LITERATURE REVIEW**

Weinreich (1953) and Lado (1957) are known in the literature on contrastive analysis. In a broad sense contrastive analysis has been used in linguistics and language teaching (Johnson and Johnson, 1999; Brown, 2000; Yule, 2006; Fasold and Connor-Linton 2006; Ranta, 2010). Teachers have accepted that the native language affects acquisition of a second language (Odlin, 1989). The structural linguists of the 1940s and 1950s paid attention to the relevance of linguistic description in general and contrastive descriptions especially in language teaching (Cook, 1999). Within the theoretical framework of CA some scholars tried to extend its use beyond the word and sentence. Kaplan (1966) proposed that contrastive studies should be studied beyond the sentence level, what is now termed contrastive rhetoric (Odlin, 1989). The expansion of CA led to the developments of contrastive discourse, error analysis, and

contrastive pragmatics. CA still is useful, especially in phonology. Transfer is presented in phonology more than any other area in language and it is because of this fact that people can guess the native language of a speaker through his or her accent when speaking a second language. Iranian scientists have tried to compare and contrast various aspects of Persian with those of English. Mirhassani (1983) tried to explain pronunciation problems of Iranian students learning English. Since the source of problems lies in the differences between the two languages. Liu (2010) in his article on the phonetic contrastive analysis on English and Russian maintains that both English and Russian are alphabetic writing; it means letters are similar in sound and form. Only (р, щ, ы) in the 33 Russian letters are not in English so for learning English. They need to pay much attention to these letters in practicing these letters. In addition, special practice must be doing for the letters which are different in forms but same in pronunciation. Hall (2007) in her research on examines L1 Australian English speakers' perceptions of the effect of pronunciation on intelligibility of Farsi speakers of English points out that the aim of "the study is to understanding the phonological features of Farsi speakers of English and L1 English speakers in Australia perceptions of proficiency; so the study is conducted to cover three areas that are related to the goal of the study. The findings are classified into three parts: an unstructured interview, ten sentences with missing words, and twenty multiple choice questionnaires. The analysis shows that the absent phonemes in the Persian sound system make problem for the intelligibility of Persian learners of English, the differences in the Farsi and English syllable structures cause difficulties."

Davidson (2010) in his work on Phonetic bases of similar features in cross-language production: Evidence from Catalan and English show that his studies have three main goals. The first is to determine whether the analogy hypothesis or a language-independent phonetic hypothesis could explain the accuracy results. The second goal is to examine the cross-linguistic similarities or differences of errors on the initial sequences. Finally, the last aim is to investigate the role of input type, specifically, whether receiving auditory information on speakers' performance in comparison with combine orthographic and auditory input. Results demonstrate none of the linguistic factor interacted with language background; all speakers were less accurate on stop-initial sequences than fricative-initializes devoiced sequences than voiceless sequences

## **2.1. Persian Alphabet**

Farsi sound system alphabet is based on Arabic which is a consonantal system and includes thirty two letters: twenty six consonants and three vowels (Windfuhr, 1979, and Samareh, 2000). The names of the letter in Arabic and Persian are similar, except for the Persian pronunciation such as: (گ, ژ, چ, پ). According to Haghshenas (1977) standard Iranian Persian includes long vowels and short vowels /e/, /o/, /æ/ and that short vowels are usually not written, as is normally done in Arabic alphabet - Some letters in Persian are different in pronouncing and writing only due to the number of dotes such as: (چ, ج, ح, خ, ه, ث, ب, پ, ت). Some letters in Persian language have different forms but similar pronunciation, such as (غ).

## 2.2. English Alphabet

The English alphabet is a member of Latin alphabet. It consists of 26 letters (each having capital and small forms). According to Hall (2007) five of these letters are "vowels". Twenty one are "consonants". Although there are 26 letters in English alphabet; but there are more than 40 sounds in the English language. Sousa (2005) claims that English language includes twenty- four consonants; twelve vowels; eight diphthongs and a total of 44 phonemes. This shows that the number of sounds in a word always does not correspond the number of letters. Based on Hall (2007) English language involves five vowels letters "a, e, I, o, u", but these vowels have eleven or twelve different vowels, and 20 sounds of them are identified, long and short vowels and diphthongs. English letters can be in initial position, in the middle or at the end of the words. According to Haghshenas (1977) when consonant letters are produced with vibration of vocal cords, they are named voiced and When consonants letters are produced without vibration of vocal cords, they are named unvoiced.

## 2.3. Russian alphabet

According to Blinnikov (2011), Russian is related to the Slavonic branch of the Indo-European languages. The numbers of alphabet in Russian language is 33. The numbers of vowels in Russian language are ten, indeed six of them are vowels, and four of them are diphthongs. Based on Ovsinko (1995) Russian language has not long or short vowels. 21 consonant letters of the Russian alphabet are (б, в, г, д, ж, з, й, к, л, м, н, п, с, т, ф, х, ц, ч, ш, щ). Most consonants phonemes come in hard–soft pairs. With few exceptions, Russian consonants are pronounced either "soft" or "hard" depending on the type of a letter that there is after them; as the result, the 20 consonants of the Russian alphabet can designate 37 distinct consonant sounds. Beside them there are two signs that have not any sound but have effect on pronunciation of other words, these are well-known as hard твёрдый ('tvjɔ.rɗij) ) or plain soft (мягкий ('mjæ.x'kij)) or palatalized. Based on Vali poor (2006) Russian has six vowels in stressed syllables, /a e i o u/ and sometimes /i/, indeed it has two or three vowels in unstressed syllables: /a i u/ after hard consonants and /i u/ after soft ones. Some scientists in linguistic believe Russian has five vowel phonemes or six; scholars disagree as to consider (ɨ) an allophone of /i/ or there is an independent phoneme /i/. According to Ovsinko (1995) native Russian speakers have ability to articulate (ɨ) in isolation for example, in the names of respective letters, (ɨ) and (ɨ), Indeed ( И) is pronounced /i/ and it is used only if it follows a hard consonant.(И) or (и) is pronounced/i/ in ("kin") and /i/ is pronounced such as ("see") and it is palatalized the preceding consonant. It is not preceded by /j/ in isolation. The most popular view among linguists (and that taken up in this article) has related to Moscow school of thought in Russian pedagogy that shows Russian involve six vowels. Based on Anikina ( 2005) Hard vowels are А, О, У, Э, Ы and soft vowels are Я, Ё, Ю, Е, И end of words vibrate. According to Ovsinko (1995) When vocal chords are in vibration (VOICED): Б, В, Г, Д, Ж, З (b, v, g, d, zh, z) when Vocal chords do not vibrate are pronounced as voiceless, (VOICELESS): П, Ф, К, Т, Ш, С (p, f, k, t, sh, s).

### 3. SIMILARITIES AND DIFFERENCES IN PHONOLOGICAL SYSTEM OF ENGLISH, PERSIAN AND RUSSIAN LANGUAGES

According to Sussex and Cubberley (2006) Russian belongs to one part of the Slavonic branch that is related the Indo-European language family. According to Liu (2010), Alimorad (2014), Hall, (2007), and Blinnikov (2011), English, Russian and Persian are members of Indo-European languages. Persian and English have a common vocabulary core from an ancestor language, which scientists have called this Proto-Indo European. English, Persian and Russian are very different in many important aspects; some of Russian letters are similar to letters in the Latin alphabet that are used by English people; and these letters are completely different with the letters in Persian language. Based on Keshavarz (1994) due to differences in the phonological systems in different languages, it is relatively difficult for learners of these languages to acquire standards of pronunciation and intonation such as native-speakers. According to Hall (2007) and Ovsinko (1995) consonants such as (Б, Г, Д, К, Т and П) in Russian are pronounced like English and Persian (b, g, d, k, t and p) but with the expulsion of less breath, e.g. *бабушка*, (grandmother), *Газета*, (magazine), *да*, (yes), *кто* (who), *салат*. (Salad), *Папа*, (father). According to Keshavarz (1994) in English language, the aspiration means, in the time of pronouncing the letters such as (p, t, k) English speakers are used to straining their tongue and their lips; indeed a burst of air that comes out of their mouth as they say these sounds. Voiceless stops (p), (t), and (k) are aspirated when they occur before a stressed vowel, and there is no (s) in front of these voiceless stops. It means, they are not aspirated after (s), if they be before an unstressed vowel. In Russian, aspiration does not happen because consonants are pronounced without aspiration. (А) And (к), in these languages are pronounced very similar to each other, (А) In Russian is like the (a) the English (a) in car, but a little shorter, e.g. *радио* (radio); transcribed /a/. The letter (К) is pronounced like (k). As cited by Hall (2007) and Ovsinko (1995) some letters such as (В, е, ё, ж, з, и, й, м, с, ф, х, ц, Ч, э) in Russian are pronounced like English and Persian, (В) similar the English and Persian (v), in vet, e.g. *вино* (wine); transcribed /v/. (е) Similar the English *Ye* in yes, e.g. *если* (whereas); it is transcribed /je/. (ё) Similar the English *yo* and it is transcribed /jo/. (ж) Similar the English (s) in measure, e.g. *жена*(wife); it is transcribed /zh/. (з) Similar the English (z), in zoo, e.g. *казак*(kazak); it is transcribed /z/. (и) Similar the English (ee) in see, e.g. *или*; it is transcribed /i/. (й) Similar the English (y) in boy, e.g. *мой* (my); it is transcribed /j/. (ф) Similar English (f), e.g. *футбол* (football); it is transcribed /f/. (с) Similar English (s), e.g. *собака*; it is transcribed /s/. (х) Similar Scottish (ch) in loch, e.g. *хлеб* (bread); it is transcribed /kh/. (ц) Similar the English (ts) in nuts, e.g. *центр* (center); it is transcribed /ts/. (Ч) Similar Persian and English (ch) in church, e.g. *чай* (tea); it is transcribed /ch/. (э) Similar the English (e) in there, e.g. *это* (this); transcribed /e/. (Я) In Russian is pronounced like the English (ya) in yard, but slightly shorter, e.g. *моя*; it is transcribed /ja/. (О, у, Ю) in Russian are pronounced like English (o), in (for), and like (oo) in (cool), and (u) in (unite) it is transcribed /ju:/, only pronounced with more rounded lips, e.g. *очень* (very), *муж*, (husband) *юбка* (skirt). Based on Mirhassani (2003) the /θ/ and /ð/ sounds do not exist in Persian and Russian, so words such as *thin*, *then* and *clothes* are difficult for these speakers. The (ng) sound at the end of words like *sing* or *thinking* is difficult for Persian and Russian learners to produce accurately, such words often end up as *sin* or *thinkin*. /w/ and /v/ Russian and Persian speakers face with problem in producing English /w/ and /v/. They have trouble

in making separate these sounds. This can be a psycholinguistic phenomenon that happens when two sounds are merely variants of the same spatial sound. The Russian speakers tend to pronounce /l/ very dark, but not exactly such as /l/ in *call*, it means raising the tongue does not occur such as far back, in other words it is raised toward velum. Other difference is that the tip of tongue contacts with the roof of mouth behind the teeth, but Russian speakers contacts their tongue against the teeth, not behind them. For example, English speakers perceive clear /l/ and dark /l/ as two variations of a single /l/. According to Hall (2007) and Ovsinko (1995) /l/, /n/, /t/ and /d/: have similar equivalents in Russian, and Persian, on the other hand they are different enough to sound “foreign”. In Persian, English and in Russia, /n/, /l/, /t/ and /d/ all belong to one group. In producing palatal consonants, palatal secondary articulation have role. It is important to note that hard consonants like /t/ d/ /n/ /l/ are dental: (ṭ) (ḍ) (ṇ) (ḏ). It means that the tip of the tongue touches the back of the teeth. Soft /tj/ /dj/ /nj/ /lj/ are alveolar: (tʲ) (dʲ) (nʲ) (lʲ). These consonants are pronounced like the English and Persian consonants, except their palatalized. Slight frication happens with /tj/ and /dj/ in Russian, and hard /r/ considers post alveolar: (ɾ). Soft /r/ is dental and apical: (ɾʲ). Learners can sense these differences by pronouncing the /t/ in *Natasha* with the tongue striking the teeth. However, students need to be made aware of the fact that in English, these four sounds are alveolar not dental, in fact, these letters are articulated with the tongue striking the roof of the mouth exactly behind the teeth, not against them. One of the most important vowels that Russian speakers have problem to pronounce is /æ/, which is the vowel in *bat*. Russians tend to replace this vowel with /e/ (in fact /ɛ/ in IPA script format), which is the vowel in *bet*. (M) In Russian and Persian are pronounced like an English *m*, e.g. *ма́ма* (mother), *молоко́* (milk); it is transcribed /m/. (N) In Persian is exactly as like as English and in Russian is like as English *n*, but harder, is pronounced with the tongue behind the front teeth, e.g. *нет* (no); it is transcribed /n/. (O) In Persian is exactly as like as English and in Russian is pronounced with more rounded lips, e.g. *о́чень* (very), *мо́ре*(sea); it is transcribed /o/. (R) In Persian and Russian is like an English(r), but rolled at the front of the mouth, e.g. *ры́ба* (fish); it is transcribed /r/. (ш) Is pronounced as like as English (*sh*) in *shop*, but harder, and the tongue is lower, e.g. *шко́ла*, (school); it is transcribed /sh/. (ш) in Persian and English is pronounced as like as, soft English *sh*, and the (*sh*) in *should*, or such as an English (*shch*), as in *fresh cheese*; that, it is transcribed /shch/. (bI) in Russian is pronounced as the same as English (i) in *bit*, of course with the tongue further back in the mouth, e.g. *вы*. Based on Vali poor (2006) (Б) Soft sign (softness preceding consonant), e.g. *говори́ть* (speak); that is transcribed /ʲ/ like the English *e* in *date*; transcribed /e/ but it is not pronounced. (Ь) Hard sign (hardens the preceding consonant), e.g. нуль(zero); that it is transcribed /ʲ/

#### 4. RESULTS

It is so important that learners pay attention to the differences between the two sounds. Based on an online source (<https://onlineteachersuk.com/en/russian-mistakes-in-english-pronunciation>) one common mistake in Persian and Russian speakers is the “ch-” as /tʃ/ in words such as “chemistry”. Russian speakers pronounce this word (химия) (kh-) but probably these make problem with consideration of English orthography. Russian does not have /h/ phoneme, approximate phoneme for this can be /g/; To native, Persian and English speakers,

this can sound strange because they have both of these phonemes, for example: Harry Potter turn to Gary Potter; and Russian (x), (kh) is closer to the Persian and English /h/ phoneme, but /g/ is the standard transliteration and this can make problems in pronunciation of words such as “alcohol”. In English and Russian Language Combinations of two and even four consonants are completely common. For example, the common word for hello in Russian — *zdravstvujtye* (*zdrah-stvooy-tee*), this has two difficult consonant combinations (*zdr* and *vstv*). *pozdravlyat'* (*puh-zdruhv-lyat'*; to congratulate) *Rozhdyestvo* (*ruzh-deest-voh*); Christmas. Based on Aghai and Sayer (2016) Persian speakers tend to place a vowel after each consonant; therefore, the errors might occur because syllabus structure in Persian is limited in five, but in Russian is thirteen and in English eighteen, with comparing syllabus structure in English, Russian and Persian can be found that when a syllabus structure there is not in a language it makes problem for correct pronunciation, language learners try to use approximate syllables in mother tongue language and it issue is prominent in Persian-speakers because their syllabus structure is limited; for this reason they add an /e/ to words; and this issue is less in Russian language because their syllabus structure is more than Persian language (Table1).

Based on Federici and Tessicini (2014) nowadays in Persian alphabet, short vowels /e/, /æ/, /o/ is usually not written and it can make issue in reading and spelling for foreign learners, for example, feather and full are written as the same as each other in Persian alphabet. The phonological systems of these languages are very different from each other; because Persian has six vowels sound; Russian only has five vowels sounds, while English has 12. Consonants in Russian, Persian and English are roughly the same amount. Their sounds, however, are not completely compatible, but learner has to learn some sounds that are not the most familiar in their languages. Stress is an important concept in Russian. According to (Avanesov, 1964), wrong place in stress is not just a formal mistake, the meaning of some words can change based on where the stress is, for example, the word *zamok* ('zah-muhk) means "castle." However, if the stress shifts from the first syllable to the last, the word *zamok* (*zuh-'mohk*) now means "lock." Some Russian letters change depending on whether they are in an unstressed or a stressed syllable. The vowels (a, o, ye) and (ya) are in this type. When stressed, they behave normally and are pronounced in the usual path, but when they're in an unstressed position, they go through a process named reduction. This deviation in the vowels' behavior can be very prominent linguistic phenomenon. On the other hand there are words in Persian with common pronunciation and dictation but different meaning such as (*shir*) that has three different meaning.

## **5. DISCUSSION AND CONCLUSION**

When the learners have problems in hearing and identifying some the sounds of a word, they commit pronunciation errors. The learners' mispronunciation seems to be the cause of errors and this problem could be due to the absence of some sounds in Persian and Russian, which are but available in English. Phonological difficulties arise from individual's inability to pronounce correct phonological expectations. It can be realized that if contrastive analysis is taught well by language teachers, it will help to minimize the rate at which language learners of English, Russian and Persian commit errors in the pronunciation of vowels and consonants.

With comparing syllabus structures of English, Russian and Persian, it can be concluded that it is natural that Persian learners of English and Russian have difficulties in pronunciation of English and Russian words with consonant clusters. These results can be used in preparing teaching materials and even complementary materials for teaching of pronunciation, and preparing pronunciation tests, and diagnosing areas that need much time and energy. As cited by Brown (1995), minimal pairs not only are useful in teaching pronunciation a new language; but indeed there are other aspects of pronunciation which can be new ways of teaching and assessing vowel and consonant pronunciation, in this case teacher should use listening practice in minimal pairs, it means language learners only listen without text; it causes students pay attention to the effect of these sounds in changing meaning (Table 2).

This paper may be a source for learners of English, Persian and Russian and it may encourage researchers to do further studies in the field of syntax, morphology, and supra segmental features to have resources for learners of English Language, Persian and Russian Languages. In this discourse, only the very important aspects are compared for the limit length. From their comparison and usage, we can see that the application of the comparative typology among English and Russian and Persian, and it not only decreases the difficulty of the teaching and learning of these languages as a second or foreign language but also motivates students' enthusiasm in order to become master in others languages more conveniently and efficiently. One of the most important merits in comparative typology is solving the problem in teaching and learning another language. For example, with use of similarities and differences among English and Russian and Persian it is concluded, because Russian is a phonetic language, learners can recognize spelling from pronunciation and vice versa. As a whole in teaching phonology the focus should be on both segmental and supra segmental. In order for learners to be able to articulate any of the sounds of these languages correctly, they should be able to understand and perceive them well. Teachers, through using contrastive studies, can recommend complimentary practice for their students in order to decrease the negative effects of mother tongue on learning a new language. Besides, teachers can find the root and type of language errors and predict the best solution for the predicted errors.

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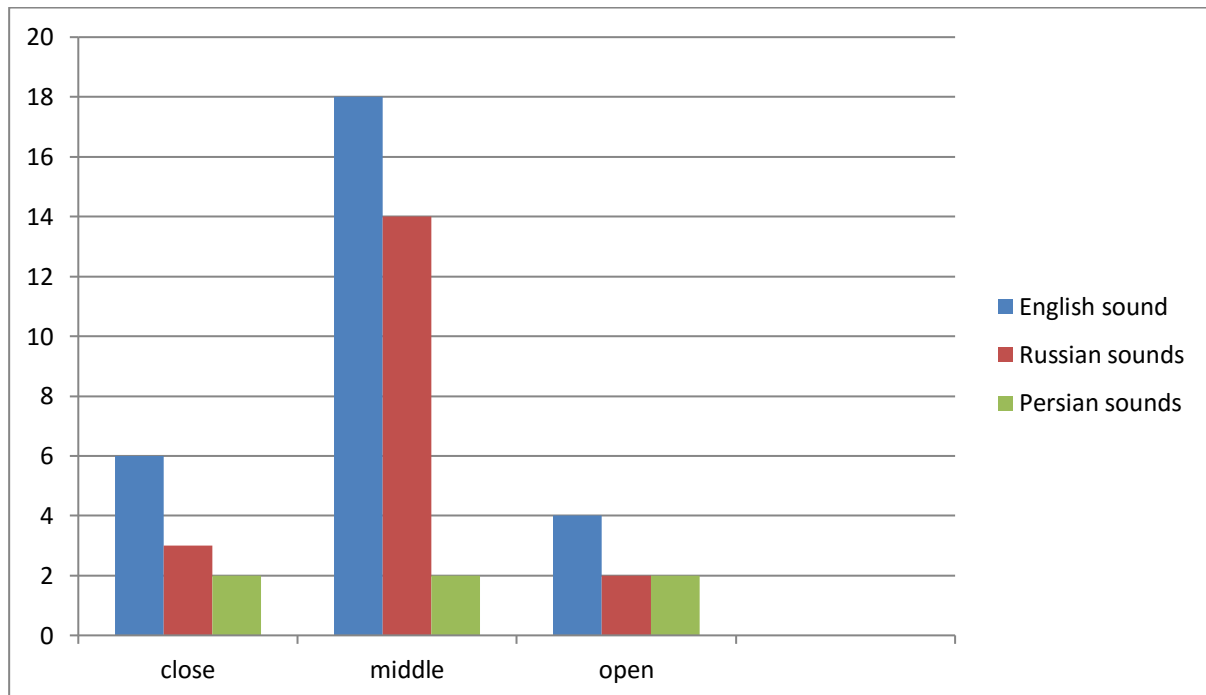
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**Table 1**

Syllabus structure in Persian	Syllabus structure in Russian	Syllabus structure in English
Cv	V / cv / vc / cvc / ccv /	V /cv /vc /cvc /ccv /cccv /vcc
cvc	cvcc / ccvc / ccv / ccccvc / cccvc/ ccvcc	vccc /vcccc /ccvccccvccccvcc cvcc / cvccc /cvcccc / ccvcc
cvcc	cvccc / ccvcccc	/ccvccc / cccvccc /

**Table 2**

Russian minimal pairs	Persian minimal pairs	English minimal pairs
Бес, без /с/: /з/	Qar , yar /q/: /y/	Cat ,cut /a/:/u/
Лы , ли/ы /:/и /	Par , har /p/:/h/	Pit ,bit /p/: /b/



*Figure 1: The place of tongue in producing vowel sounds in English, Russian, Persian languages*

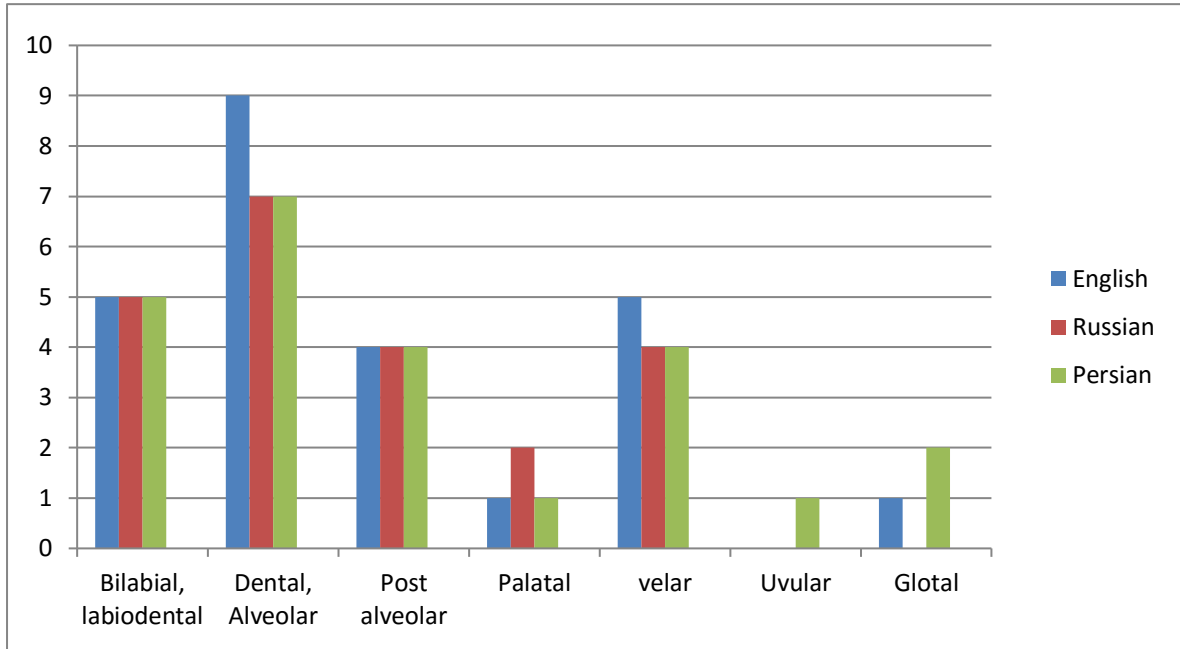


Figure 2: Comparing English, Russian, Persian base on manner of articulation

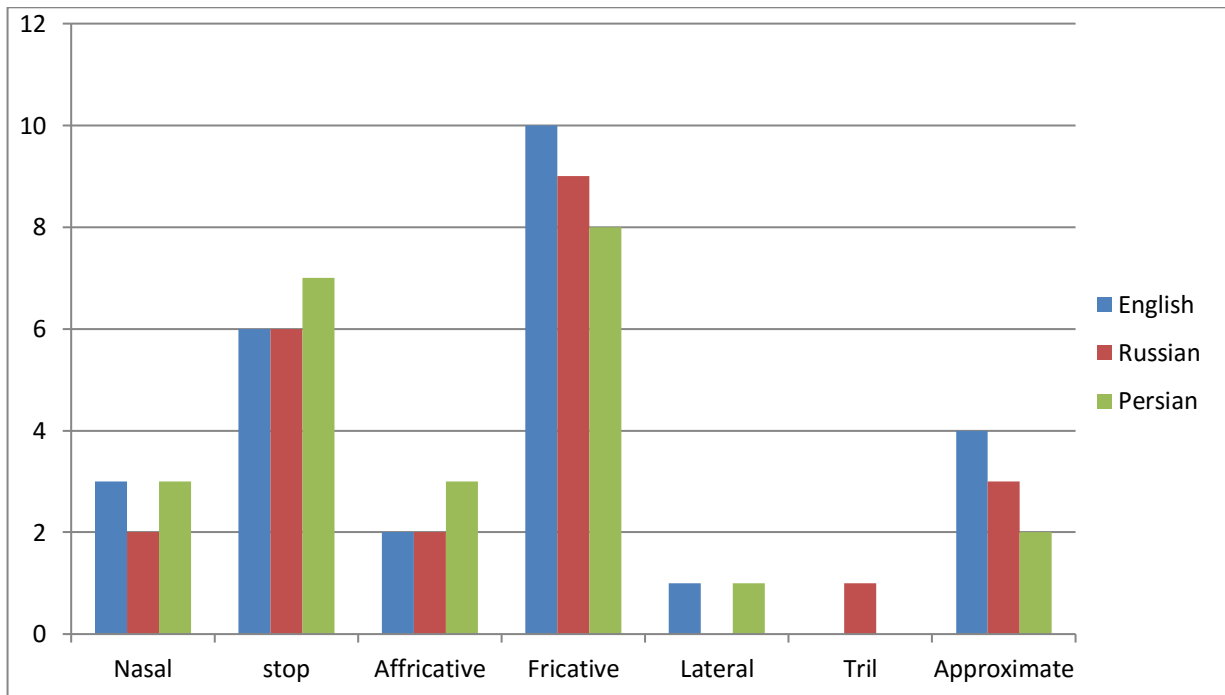


Figure 3: Comparing English, Russian, Persian base on place of articulation

Consonant phonemes												
Persian, English, Russian		Bilabial / Labiodental		Dental / alveolar		Post-alveolar	Palatal		Velar		Uvular	Glottal
		hard	soft	hard	soft	hard	soft	hard	soft			
Nasal		<u>mm</u>	<u>m</u> <sup>j</sup>	<u>nn</u>	<u>n</u> <sup>j</sup>					(ŋ) <u>ŋ</u>		
Stop	voiced	<u>bb</u>	<u>b</u> <sup>j</sup>	<u>dd</u>	<u>d</u> <sup>j</sup>					<u>gg</u>	(g) <sup>j</sup>	ʔ
		<u>p</u> <u>pp</u>	<u>p</u> <sup>j</sup>	<u>tt</u>	<u>t</u> <sup>j</sup>					<u>kk</u>	(k) <sup>j</sup>	
Affricate				<u>ts</u>	(ts) <sup>j</sup>	<u>tstetste</u>	<u>tɕ</u>				<u>ʁ</u>	
Fricative	voiceless	<u>ff</u>	<u>f</u> <sup>j</sup>	<u>ss</u> θ ð	<u>s</u> <sup>j</sup>	<u>ʃʃʃ</u>	(ɕ) <sup>j</sup>	<u>xx</u>	(x) <sup>j</sup>			<u>h</u>
	voiced	<u>vv</u>	<u>v</u> <sup>j</sup>	<u>zz</u>	<u>z</u> <sup>j</sup>	<u>ʒʒʒ</u>	(z) <sup>j</sup>	<u>y</u> (y) <sup>j</sup>				
Lateral				<u>l</u>	<u>l</u> <sup>j</sup>							
Trill					<u>r</u> <sup>j</sup>	<u>r</u>						
Approximant				<u>ll</u>	<u>l</u> <sup>j</sup>	<u>l</u>						
						<u>r</u>	<u>j</u> <sup>j</sup>	<u>w</u>				

## APPENDIX

CAPTAL RUSSIAN LETTER	SMALL RUSSIAN LETTER	CAPTAL ENGLISH LETTER	SMALL ENGLISH LETTER	IPA	APPROXIMATE EQUIVALENCE IN PERSIAN
А	а	A	a	a	آ،ع
Б	б	B	b	b	ب
В	в	V	v	v	و
Г	г	G	g	g	گ، ه، ح، غ، ق
Д	д	D	d	d	د
Е	е	E	e	e	ی
Ё	ё	y	ë	jo	یو، یی
Ж	ж	ZH	zh	zh	ژ
З	з	Z	z	z	ز، ض، ذ، ظ
И	и	i	i	i	ای
Й	й	y	y	j	ای، ی
К	к	K	k	k	ک
О	о	O	o	O	ا
П	п	P	p	p	پ
Р	р	R	r	r	ر
С	с	S	s	s	س، ص، ش
Т	т	T	t	t	ت، ط
У	у	u	u	u	او
Ф	ф	F	f	f	ف
Х	х	X	x	kh	خ
Ц	ц	TH	th	θ	-
Ч	ч	CH	ch	tʃ	چ
Ш	ш	SH	sh	ʃ	ش
Щ	щ	SH	shsh	tʃʃ	شش
*	ъ	-	-	-	-
Л	л	L	l	l	ل
М	м	M	m	m	م
Н	н	N	n	n	ن
Ы	ы	y	y	ɨ/, /i/, /i/,	نی
*	ь	-	-	-	-
Э	э	e	e	ɜ	ا
Ю	ю	U	u	ju	یو
Я	я	ya	ya	ja	یا، یی، یه

Russian alphabet with Latin transliteration and IPA transcription

<b>А а</b>	<b>Б б</b>	<b>В в</b>	<b>Г г</b>	<b>Д д</b>	<b>Е е</b>	<b>Ё ё</b>	<b>Ж ж</b>	<b>З з</b>	<b>И и</b>	<b>Й й</b>
a	b	v	g	d	e/ye	ë/yë	ž/zh	z	i	j/i/y
[a]	[b]	[v]	[g]	[d]	[je/e]	[jo/o]	[ʒ]	[z]	[i]	[j]
<b>К к</b>	<b>Л л</b>	<b>М м</b>	<b>Н н</b>	<b>О о</b>	<b>П п</b>	<b>Р р</b>	<b>С с</b>	<b>Т т</b>	<b>У у</b>	<b>Ф ф</b>
k	l	m	n	o	p	r	s	t	u	f
[k]	[l]	[m]	[n]	[o]	[p]	[r]	[s]	[t]	[u]	[f]
<b>Х х</b>	<b>Ц ц</b>	<b>Ч ч</b>	<b>Ш ш</b>	<b>Щ щ</b>	<b>Ъ ъ</b>	<b>Ы ы</b>	<b>Ь ь</b>	<b>Э э</b>	<b>Ю ю</b>	<b>Я я</b>
kh/h/x	c/ts/tc	č/ch	š/sh	šč/shch	''	y	'	è/e/eh	ju/yu/iu	ja/ya/ia
[x]	[ts]	[tʃ]	[ʃ]	[ʃtʃ/ʃtʃʃ]	-	[ɨ]	[j]	[ɛ]	[ju <sup>h</sup> /iu]	[ja <sup>h</sup> /ia]

Persian alphabet with Latin translation and IPA transcription

ذ	د	خ	ح	چ	ج	ث	ت	پ	ب	ا
z	d	kh	h	ch	j	s	t	p	b	-
[z]	[d]	[x]	[h, Ø]	[tʃ]	[dʒ]	[s]	[t]	[p]	[b]	[ʔ, ɔ] [æ, Ø]
غ	ع	ظ	ط	ض	ص	ش	س	ژ	ز	ر
gh	'	z	t	z	s	ʃ	s	zh	z	r
[ɣ] [q, ɛ, x]	[ʔ, Ø]	[z]	[t]	[z]	[s]	[ʃ]	[s]	[ʒ]	[z]	[r]
ی	ه	و	ن	م	ل	گ	ک	ق	ف	
y	h	w	n	m	l	g	k	q	f	
[j, i, e]	[h, Ø]	[v, u] [ɛ, æ]	[n]	[m]	[l]	[g]	[k]	[q, ɛ]	[f]	

English alphabet with Latin translation and IPA transcription

<b>A a</b>	<b>Á á</b>	<b>B b</b>	<b>C c</b>	<b>Č č</b>	<b>D d</b>	<b>Ď ě</b>	<b>E e</b>	<b>É é</b>	<b>Ě ě</b>	<b>F f</b>
á	dlouhé á	bé	cé	čé	dé	ďé	é	dlouhé é	é s háčkem	ef
[a]	[a:]	[b]	[t͡s]	[t͡ʃ]	[d]	[ɟ]	[ɛ]	[ɛ:]	[ɛ, jɛ]	[f]
<b>G g</b>	<b>H h</b>	<b>Ch ch</b>	<b>I i</b>	<b>Í í</b>	<b>J j</b>	<b>K k</b>	<b>L l</b>	<b>M m</b>	<b>N n</b>	<b>Ň ň</b>
gé	há	chá	í	dlouhé í	jé	ká	el	em	en	eň
[g]	[h]	[x]	[i]	[i:]	[j]	[k]	[l]	[m]	[n]	[ɲ]
<b>O o</b>	<b>Ó ó</b>	<b>P p</b>	<b>Q q</b>	<b>R r</b>	<b>Ř ř</b>	<b>S s</b>	<b>Š š</b>	<b>T t</b>	<b>Ť ť</b>	
ó	dlouhé ó	pé	qé	er	eř	es	eš	té	té	
[o]	[o:]	[p]	[kv]	[r]	[r̝]	[s]	[ʃ]	[t]	[c]	
<b>U u</b>	<b>Ú ú</b>	<b>Ů ů</b>	<b>V v</b>	<b>W w</b>	<b>X x</b>	<b>Y y</b>	<b>Ý ý</b>	<b>Z z</b>	<b>Ž ž</b>	
ú	dlouhé ú	ů s kroužkem	vé	dvojité vé	iks	ipsilon	dlouhé ypsilon	zet	žet	
[u]	[u:]	[u:]	[v]	[v]	[ks]	[i]	[i:]	[z]	[ʒ]	