SERBIAN AND TURKISH VOWEL SYSTEMS[1]

SIRPÇA VE TÜRKÇE ÜNLÜ DİZGELERİ

Senka İVOSEVIC İPEK[*]

ABSTRACT

This contrastive study examines Serbian and Turkish vowel systems, the articulation properties of vowels in the two languages, and also provides a closer look at the difficulties native Serbian speakers face when pronouncing Turkish vowels. Analysis of sounds according to the articulation parameters adopted in the study represents important basis for the identification and classification of sounds and can also be very useful in foreign language teaching and learning. According to the contrastive analysis, it was assumed that vowels found in both Serbian and Turkish would not cause problems for Serbian speakers learning Turkish, while vowels that are different in some respects or not found in Serbian would be more difficult for them. Although an experimental research conducted with native Serbian subjects learning Turkish showed that the assumptions in the contrastive analysis were confirmed, the results also revealed that the subjects were often unfamiliar with vowel lengthening and some variants (allophones) in Turkish that appear in certain sound environments and that this lack of knowledge usually had a negative effect on the correct pronunciation of Turkish vowels. It is hoped that the findings obtained in this study will help native Serbian speakers learn the pronunciation of Turkish more easily by raising awareness about the differences in the sound systems of the two languages and the sound characteristics of their native language, and will also help instructors of Turkish prepare teaching materials.

Keywords: *Vowel Systems, Serbian, Turkish, Articulatory Phonetics, Contrastive Analyses.*

ÖZ

Bu karşıtsal çalışma, Sırpça ve Türkçe ünlü dizgeleri ve iki dildeki ünlü seslerin söyleyiş özellikleri incelemekte, ana dili Sırpça olan kişilerin Türkçe ünlü seslerin sesletiminde karşılaştıkları güçlüklere yakından bir bakış sağlamaktadır. Çalışmada benimsenen söyleyiş parametrelerine dayalı ses analizinin, seslerin tanımlanması ve sınıflandırılması için önemli bir temel oluşturup yabancı dil öğretimi ve öğreniminde de oldukça yararlı olmaktadır. Karşıtsal analizden yola çıkarak hem Sırpça hem de Türkçede bulunan ünlülerin, Türkçe öğrenen anadili Sırpça olan kişiler için sorun yaratmayacağı, bazı açılardan farklı olan veya Sırpçada bulunmayan ünlü seslerin ise daha zor olacağı varsayılmıştır. Türkçe öğrenen anadili Sırpça olan deneklerle yapılan deneysel çalışmanın, karşıtsal analizdeki varsayımların doğrulandığını göstermesine rağmen sonuçlar aynı zamanda deneklerin ünlülerin uzatılmasına ve belirli ses ortamlarında ortaya çıkan Türkçedeki kimi varyantlara aşina olmadıklarını ve bu bilgi eksikliğinin Türkçe ünlülerin doğru sesletimini genellikle olumsuz etkilediğini ortaya çıkarmıştır. Bu çalışmada elde edilen bulguların, hem iki dilin ses dizgelerindeki farklılıklar ve anadillerinin ses özellikleri konusunda farkındalık yaratarak ana dili Sırpça olan kişilerin Türkçenin telaffuzunu daha kolay öğrenmelerine hem de Türkçe eğitmenlerinin öğretim materyallerini hazırlamalarına yardımcı olacağı umulmaktadır.

Anahtar Kelimeler: *Ünlü Dizgeleri, Sırpça, Türkçe, Söyleyiş Sesbilgisi, Karşıtsal Analiz.*

Introduction

Due to the universal structure of the human speech apparatus, every human is able to produce a great number of sounds, and it can be stated that the sounds in the world's languages practically cannot be counted. Nevertheless, every single language uses a limited part of these countless possibilities. Every language has its own sound repertoire, and when we compare sounds in two languages, we can see that there are sounds in one language which do not exist in another, and vice versa. During the articulation of sounds in one language there are some specific articulation habits imposed by speakers of that language who show deep-rooted tendencies in moving their speech organs. The whole of that habits and tendencies is called an *articulation basis* (Janković, 1987:20-22). According to Kašić (2003:90), articulation basis is a system of articulation habits automaticized by native speakers of one language. In traditional language framework articulation basis of a language is not investigated as genetic, inherent anatomic or physiologic property of a nation or people who speak that language, but as a result of acquisition of habits carried over from one generation to another (Janković, 1987:20). While, on the one hand, articulation basis provides fluent speech to the native speakers of one language, on the other, it represents restrictive factor in learning foreign languages (Kašić, 2003:93). The main problem of a person learning foreign language (and pronunciation of its sounds, naturally) is how to decrease the influence of the articulation basis of his/hers native language and achieve the articulation basis of target language.

It is natural to assume then that, in process of achieving an articulation basis of foreign language, learners actually compare articulation basis of their native language with the articulation basis of the target language. In connection with that, contrastive or comparative approach used in describing phonetic (articulation) phenomena, which aims to describe phonetic similarities and differences, or just to shed a light on phonetic properties of sounds and sound systems in given languages is proved to be very useful method in foreign language teaching and learning. According to Terzić (2003:5), this approach provides results which could be very helpful in finding and eliminating difficulties that arise in pronunciation of foreign language.

Keeping this in mind, a contrastive approach was also adopted in this study, as one of the main aims of this study is to help speakers of Serbian learn the pronunciation of Turkish vowels. In connection with this, this study attempts to answer the following questions regarding Serbian and Turkish vowel systems:

- What are articulation properties of vowels in isolation in the two languages?
- What properties do these sounds show when occurring in connected speech, namely, in words? What are their main variants (allophones) and to what environments are the variants restricted?
- What are distribution properties of vowels in Serbian and Turkish?
- What are the main similarities and differences between vowels in the two languages, according to articulation properties, variants of these sounds and their distribution?
- What are main difficulties that arise in pronunciation of vowels by native Serbian learners of Turkish?

In order to answer the above research questions, in the following sections we will briefly introduce some basic concepts related to articulatory phonetics and articulation, define the articulatory and distributional properties of vowels in two languages, compare them according to these properties (parameters), and present the results of an experimental study conducted with Serbian speaking subjects learning Turkish.

Some concepts related to articulatory phonetics and articulation of sounds

Phonetics is the science that studies where and how the sounds that form the system of a language are produced, and through which stages of evolution they pass, as well as classifying sounds according to pronunciation and acoustic features (Ergenç, 2002:61). In other words, this field of study deals with physical aspects of speech, namely, with its articulatory, acoustic and auditory aspects:

  1. Articulatory aspect is concerned with realization of speech phenomena, production of sounds in vocal apparatus and sounds classification. The study related to articulation aspect is called *articulatory phonetics*.
  2. Acoustic aspect deals with physical properties of sounds transmitted by sound waves. The study which investigates the sounds in this way is called *acoustic phonetics*.

3. Auditory aspect and related *auditory phonetics* describe the way listeners hear and perceive speech sounds.

More specifically, complete phonetic analyses of vowel [a] will include investigation of how this sound is produced in vocal tract, what are its acoustic characteristics, and how it is heard and perceived by listeners.

As stated in Janković (1987:33) articulation represents the most solid basis for the identification and classification of the sounds, and analysis based on articulation criteria has proven to be very useful method in teaching and learning foreign languages. We will adopt this perspective in this study, which aims to serve as a handbook for those interested in learning and teaching Turkish as a foreign language.

To better understand how vowels in Serbian and Turkish are articulated, it is important to start by explaining how the speech organs (*Figure 1.*) work when producing sounds:

As Bugarski (1991:76-78) points out, in most of world's languages speech sounds are produced by *egression*, that is, by expelling air from lungs. When the diaphragm (*1*) is raised, the previously inhaled air comes from the lungs (*2*), passes through the bronchi (*3*) and trachea (*4*) and reaches the larynx (*5*). After passing through the pharynx (*6*) it finally exits the oral (*7*) or nasal cavity (*8*). Larynx, consisting of vocal folds (*9*), is the first organ directly involved in the production of speech sounds. During normal breathing, a triangular-shaped space called the glottis (*10*) is formed between the vocal cords. During speaking, the glottis can be closed by bringing the vocal cords together. Due to air pressure, the glottis constantly opens and closes and naturally the vocal cords begin to vibrate. Sounds produced in this way are called *voiced sounds*. On the other hand, *voiceless sounds* are produced when the glottis narrows (tightens) and the vocal cords remain motionless. During the process of swallowing, the epiglottis (*11*) closes the larynx and prevents food from entering the trachea. The pharynx, oral and nasal cavities give the resonance of the sounds formed in larynx. The hard palate (*12*) and soft palate (*13*) separate the oral and nasal cavities.
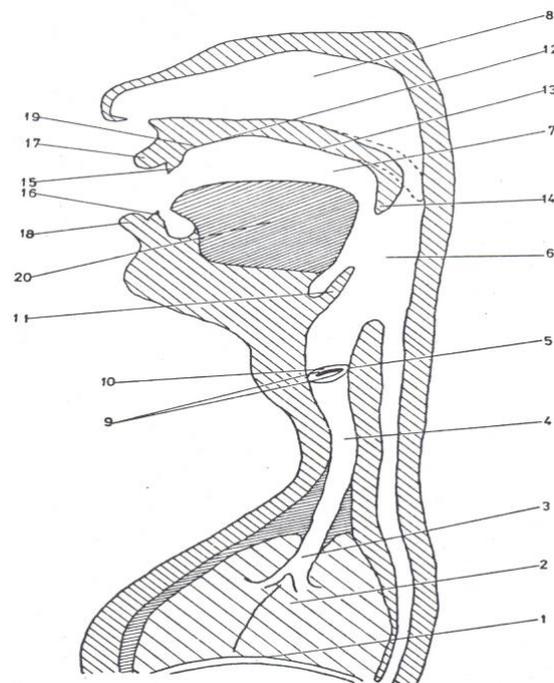
Figure 1. Speech organs (Bugarski, 1991: 77)

When the uvula (*14*) located at the end of soft palate rises, it closes the nasal cavity and air comes out of the oral cavity; the sounds produced in this way are called *oral sounds*. When the uvula lowers, the way to the nasal cavity opens and air comes out; sounds produced in this way are called *nasal sounds*.

In the oral cavity, in addition to the palate (hard and soft) there are also the lower and upper teeth (*15, 16*), the upper and lower lips (*17, 18*), the alveolar ridge (*19*) located between palate and teeth, and the tongue (*20*) which plays the main role in articulation.

In phonetic studies the tongue (*Figure 2.*) is usually subdivided into the following regions: the tip of tongue (apex), rim, blade (lamina), dorsum (the tongue body consisted of front and back parts of the tongue) and the root of the tongue (radix).
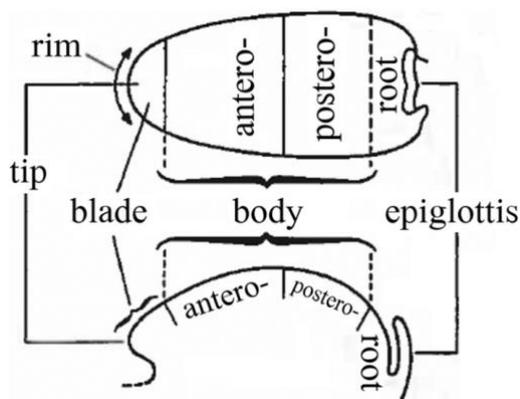
Figure 2. Parts of the tongue (Catford, 1988: 81)

Articulation of speech sounds in isolation involves three stages:

1. *Excursion* – an activity in which the speech organs move from the previous position to the position required for articulation of a given sound.
2. *Exposition* – speech organs take the necessary position for that sound.
3. *Recursion* – after the air is relased, the speech organs leave the position of that sound and move to a position for next sound or remain motionless.

Although this three-stage articulation is valid for sounds in isolation, during speaking sounds are pronounced in coordination with other sounds, and in this case it is very difficult to distinguish between the third stage (recursion) of the first sound and the first stage (excursion) of the next sound. These stages actually overlap and that is why the sounds adapt to each other. Aa issue that must also be considered here is that the speech organs move continuously in closed coordination (Janković, 1987:32). Thus, one sound will be influenced by the other and will be articulated somewhat differentially than the one articulated in isolation. All sounds produced in continuous speech are more or less subject to this change.

In traditional phonetic studies, vowels are generally defined as sounds that appear to have no obstruction to the passage of air through the oral cavity. This definition is somewhat inaccurate, because there is a constriction that the tongue and lips impose on the flow of air through the oral cavity, but it is a constriction of a less radical degree than with consonants. As in Catford (1988:123), the articulation of a vowel (at least, namely [i]) can be perfectly well described according to the same principles we use in describing consonants: it is a dorso-palatal approximant.[2] However, differences in the class of vowels are created by the shape and size of the oral cavity, the special shape of lips and the precise position of the tongue. Therefore, definite classification of vowels is usually made according to:

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[2] In approximant sounds articulators come close to one another, but they are not sufficiently close to induce turbulence, as it is case in fricative sounds.

1. the horizontal tongue position (front-central-back)
2. the vertical tongue position (high-mid-low)
3. lip position (rounded-unrounded[3])

Also, as in Ergenç (2002), we can add the fourth parameter, namely the angle of the jaw or *the position of the jaws* (open-close), in the definition and classification of vowels. As noted in Underhill (1994:11), jaw position and tongue position are interlinked, so when the tongue is relatively high and close to the palate, the jaw is usually relatively closed, whereas when the tongue is low the jaw is usually relatively open. The open-close distinction plays an important role in distinguishing variants of Turkish vowels, as will be shown latter. In addition to the mentioned parameters, the phonetic analysis includes some other important parameters in the description of vowels, such as *length or duration of vowels*[4], as well as additional modifications of vowels (nasalization[5], retroflection, rhotization).

Methodology

The description of the articulation of vowel sounds in this study is based on the articulation of vowels in isolation; as in Terzić (2003) we call these sounds *basic vowels*. According to Terzić (2003: 36), a typified sound representing a phoneme is determined from its variants and this sound is taken as the basic sound or basic variant of a phoneme. In terms of basic vocal, acoustic and pronunciation features, it is one of the most free variations from external factors. But, having in mind that the sounds in continuous speech are dependent on their environment and, therefore, show different characteristics when compared to the basic sounds, we will also show articulation and distribution properties of these sounds in order to make a clearer analysis. We call these sounds *variants (allophones)* of basic sounds. Apart from the basic sound, other variants belonging to the same phonemic field are more dependent on their sound environment and therefore their distribution is more limited. For example, Turkish vowel [a] which is generally a back, postdorsal vowel, sometimes, when pronounced with palatalized consonants such as [l,c,r,t,m,n] becomes predorsal, produced with the tongue placed forward in the oral cavity. We can also take as an example the Serbian nasalized [ã] which occurs before nasal consonants.

Descriptions of vowel sounds in the two languages served as a starting point for the contrastive analysis. In the contrastive analysis, the aforementioned articulatory phenomena such as the horizontal position of the tongue, the vertical position of the

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[3] In phonetic studies terms *rounded-neutral-spread* are also broadly used.

[4] When we talk about duration in phonetics we are referring to the duration of the particular articulatory postures (Catford, 1988:185).

[5] Nasalized sounds (e.g. nasalized [ã] in Serbian) involve lowering of the uvula that is not accompanied by complete occlusion in the oral cavity as in nasal consonants.

tongue, the position of the lips, and the position of the jaw were used as a comparison parameter. Following the comparative analysis, experimental research was also conducted to find out which sounds cause difficulty for speakers of Serbian learning Turkish. 30 subjects who completed their education at the Department of Turkish Language and Literature of the Faculty of Philology of the University of Belgrade or were continuing their education at the time of the research participated in the study. In the research, a word list consisting of 150 words was prepared. Vowels in the Turkish sound system were included in this list in all positions of words (initial, middle and final). The subjects were given a list and asked to read the words in order and their readings were recorded. Then, reading examples that did not comply with standard pronunciation were transcribed.[6] The transcriptions of the words in the list were created based on the reading samples of the two native Turkish speakers.

Description of the Serbian vowel system

Serbian vowel system contains five monophthongal vowels: [a], [e], [i], [o] and [u]. All these vowels can be long or short. While long vowels ([a,e,i,u]) are more open than short ones, in the case of [o] its short variant is open. But these open and close variants are not so evident in Serbian, and Serbian phonetic literature mostly represents them with five symbols, as shown above. Although all of these vowels are produced in oral cavity, in some cases a nasalized [ã] can also occur.

In addition to these five basic vowels, there is a syllabic trill [r̥] which is *sometimes pronounced with neutral vowel [ə] called schwa, for example, vrt ['vərt] "garden"* (IPA, 1999:67). This vowel of the central type between half-close and half-open (Catford, 1988) also occurs in Serbian when pronouncing the letters of the alphabet, for example: "b" [bə], "c" [ʦə], "č" [tʃə] etc. Because *schwa* is sometimes pronounced with sonorant sounds ([m,n,ɲ,l,j,ʎ,r,v]) native speakers of Serbian have no problem with pronouncing foreign names, such as *Vltava*, *Crystl*, *Mboa*, *Mstislav* (Kašić, 2003:110). But, it is also worth noting that the most native Serbian speakers are not aware of the existence of this vowel in their speech.

As already mentioned, Serbian vowels are monophthongal. Despite this, there are cases where vowels stand next to each other and form diphthong, regardless of whether there is a morphological boundary between them or not, e.g. *pauk* "spider", *poezija* "poetry", *neuk* (ne-uk) "untrained", *iako* (i-ako) "although". Diphthongs with a morphological boundary appearing at the end of the word are pronounced as one vowel by many Serbian speakers (for example *čitao* ['tʃîta·o] ~ ['tʃîtoː] "read" (3rd pers.sg.masc.perf.) or with glide [j] between [i] and [o]: *pio* (pi-o) ['pî·o] ~ ['pîjo] "drink" (3rd pers.sg.masc.perf.) (Kašić, 2003: 110).

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[6] For a complete list of words and transcriptions of misreadings see: "Ivošević, S. (2005). Sırpça ve Türkçenin ses dizgelerinin karşılaştırılması. Sırpların Türkçe sesletiminde karşılaştıkları güçlükler. Unpublished master's dissertation. Ankara: A.Ü. Sosyal Bilimler Enstitüsü."

To provide a more comprehensive picture of the Serbian vowel system, we present the vowel quadrilateral in *Figure 3.* below. This quadrilateral is formed according to IPA (1999: 67) and Miletić (1960) (in Janković, 1987: 38).
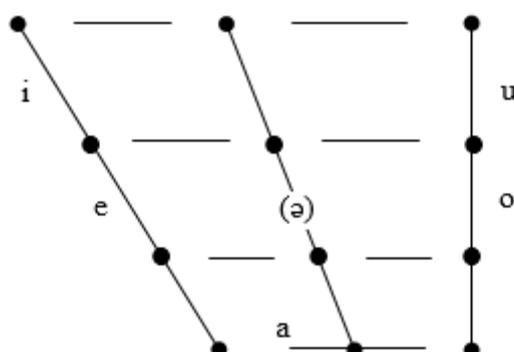

Figure 3. Vowel quadrilateral in Serbian

After examining some of the main features of the Serbian vowel system, we now consider each of the vowels in turn:

[a] – central, low, unrounded

In the articulation of the vowel [a] lower jaw is relaxed, the lips are in open position. The tongue is slightly retracted and spread in the oral cavity. The tip of the tongue moves forward towards to front lower teeth, but does not touch them.

According to Simić & Ostojić (1981:181), [a] is a very stable sound, it does not depend much on its environment. In some cases, however, it nasalizes in contact with nasal sounds, e.g. *pamtim* ['pã:ti:m] "I remember". Nasalized [ã] also occurs in some expressions of surprise, for example: *a?!* ("I can't believe!"), or in question expressions, for example: *a?* ("I didn't hear") (Kašić, 2003: 109).

Distribution: Sound [a], generally does not occur at the beginning of words of Serbian origin. However, there are very few exceptions to this rule. Words with vowel [a] in different positions:

word-initial	word-medial	word-final
ali ['âli] "but"	*pas* ['pâs] "dog"	*jela* ['jě:la] "fir tree"
aždaja [aʒ'dǎ:ja] "dragon"	*salo* ['sâlo] "fat"	*zora* ['zǒra] "dawn"
abnormalan ['âbnorma·lan] "abnormal"	*pakao* ['pǎkao] "hell"	*slika* ['slîka] "picture"

[e] – front, mid, unrounded

The sound [e] is pronounced with half-opened lips, with the tip of the tongue touching the lower teeth. The front part of the tongue is raised, it approaches to upper back teeth from both rims and slightly touches them.

Serbian [e] is a stable sound. In standard language there is a little difference between the open and close variants, the former occurring in longer syllables and the later in short ones.

Distribution: [e] usually does not appear in initial position in words of Serbian origin. Words with the vowel [e] in different positions:

word-initial	word-medial	word-final
energija [e'nĕrgi·a] "energy"	*strela* ['strĕːla] "arrow"	*dete* ['dĕːte] "child"
evo ['êʋo] "here is/are"	*mleko* ['mlĕːko] "milk"	*ždrebe* ['ʒdrêːbe] "colt"
emigrant [e'mĭgrant] "emigrant"	*prevoz* ['prĕːʋoz] "transport"	*pitanje* ['pĭːta·ɲe] "question"

[i] – front, high, unrounded

During pronunciation of [i] lower jaw approaches the upper one, the lips are spread. The entire tongue moves forward with the front part raised towards the hard palate. The tip of the tongue presses against the lower front teeth, and both of its rims touch upper back teeth.

Serbian [i] is a stable sound that has no variants (Simić & Ostojić, 1981:183).

Distribution: [i] is found in every position in words:

word-initial	word-medial	word-final
igla ['ĭgla] "needle	*mir* ['mîːr] "peace"	*svi* ['sʋî] "everybody"
ime ['îme] "name"	*mlin* ['mlîn] "mill"	*piti* ['pîti] "to drink"
iskra ['îskra] "spark"	*maslina* ['măslina] "olive"	*leti* ['lêti] "in the summer"

[o] – back, mid, rounded

Vowel [o] is pronounced with the lower jaw slightly lowered and the lips moving forward to round the lips. The tongue slides back in the mouth with the back part rising towards the soft palate. This gap between the tongue and the soft palate is very narrow.

[o] has two variants: In addition to the basic variant described above, there is a slightly more open variant in long syllables.

Distribution: [o] appears in every position in words:

word-initial	word-medial	word-final
oko ['ôko] "eye"	*polje* ['pôʎe] "field"	*sto* ['stôː] "table"
odmah ['ôdma·x] "right now"	*moj* ['mŏːi] ~ ['mŏːj] "my"	*blato* ['blâto] "mud"
osa ['ŏsa] "wasp"	*pod* ['pôd] ~ ['pôːd] "floor"	*pismo* ['pĭːsmo] "letter"

[u] back, high, rounded

In the articulation of [u] the lower jaw approaches the upper; the lips are pushed forward and rounded. The tongue moves back and up towards the soft palate. Tip of the tongue is behind the front lower teeth.

Serbian [u] is stable sound, it has no variants.

Distribution: [u] appears in every position. Serbian nouns do not end with [u] in nominative case.

word-initial	word-medial	word-final
uho ['ûxo] "ear"	*put* ['pûːt] "road"	*tabu* [ta'bû] ~ ['tăbu] "taboo"
upaljač [u'păʎa·tʃ] "lighter"	*dug* ['dûg] "long"	*slugu* ['slŭːgu] "servant-acc"
upis ['ŭːpis] "registration"	*supa* ['sûpa] "soup"	

Description of the Turkish vowel system

Turkish vowel system includes eight basic vowels: [a], [ø] <ö> , [e], [o], [i], [u], [y] <ü> ve [ɯ] <ı>. All these vowels are monophthongal and short. As noted in Ergenç (2002:26), Turkish vowels lost their actual length and, in today's Turkish, long vowels appear only in foreign words or in some special cases as a result of a sound loss. Although all Turkish vowels are monophthongal, there are some cases where diphthongs appear (for both

vowel lengthening and vowel formation, see the subsection entitled "The Role of 'soft g' <ğ> in vowel lengthening and diphthong formation").

Turkish has a very rich vowel system, and, as mentioned earlier, the terms open and close are used in a more refined sense. For example, Turkish vowels [i], [o], [u], [ø] and [y], have open and close variants. In speech, close and open variants of vowels [i], [o], [u], [ø] and [y] differ only in length (for example, close [i] is present in long syllables, and open [ɪ] in short ones). In the case of [a][7], its variants in the Turkish phonetic literature (Selen,1979; Ergenç,1984) are usually determined in terms of the horizontal position of the tongue, so that we have back, postdorsal and front, predorsal variants. Among Turkish vowels only the vowel [ɯ] has no variants. If we take into account vowel [ɯ] and the variants of the other vowels, we get vowel quadrilateral as shown in *Figure 5.* below (IPA, 1999: 3-13, Ergenç, 2002:21):
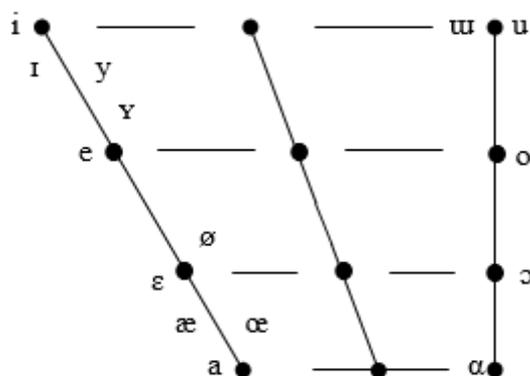
Figure 4. Vowel quadrilateral in Turkish

After reviewing some of the main features of the Turkish vowel system, we will consider the Turkish vowels one by one:

[a] – back, low, unrounded

In the articulation of the vowel [a] the lower jaw is relaxed, the lips are in an open position. The tongue is slightly retracted and spread in the oral cavity. The tip of the tongue moves forward towards the front lower teeth, but does not touch them.

There are two variants of this vowel, one is back, postdorsal [ɑ], and the other is frontal, predorsal [a] (Selen, 1979:22).

Although [a], like other Turkish vowels has lost its length, there are cases, such as those below, where a long [a] appears:

[7] When distinction between postdorsal [ɑ] and predorsal [a] is not relevant [ɑ] will be transcribed as [a]; the similar model will be followed in descriptions of other Turkish vowels, so open [ɛ] will be transcribed as [e], [ɪ] as [i], [ɔ] as [o], [œ] as [ø], [ʊ] as [u], [ʏ] as [y].

- In loan words, for example: *saat* ['sɑːt] "clock", *alaka* [ɑla:'kɑ] "connection".

- [a] before *soft g* (<ğ>) is lenghtened because <ğ> is inaudible, e.g. *ağrı* [ɑːɾɯ] "pain", *bağ* [bɑː] "string". In the sequences a+ğ+C any consonant can appear in the position of C, while in the sequences a+ğ+V we find only vowels correspondenting to vowel harmony[8], such as [a,u] or [ɯ] (Selen, 1979:23).

- Component words whose second morpheme is non-Turkish *hane* (meaning "house"). For example, if there is a vowel (usually [a]) in front of the *hane*, the [h] is not pronounced, the other two [a] vowels merge and as a result we get a long [a], e.g. pasta+hane > *pastane* [pɑstɑː'nɛ] "pastry". Also, in some cases where the *hane* is preceded by consonant, [h] is also inaudible, and the [a] in *hane* becomes long, even longer than in previous case (for example: tımarhane [tɯmɑɾɑː'nɛ] "insane asylum")) (Selen,1979:24).

Distribution: [a] is found in all positions in words. Predorsal [a] occurs only in foreign words and with consonants such as [l,c,ɟ,r,t,m,n] (Selen,1979:25; Ergenç,1984:73).

Postdorsal [ɑ]:

word-initial	word-medial	word-final
abla [ɑb'łɑ] "older sister"	*şal* ['ʃɑł] "shawl"	*kova* [kɔ'vɑ] "bucket"
adam [ɑ'dɑm] "man"	*kapı* [kɑ'pɯ] "door"	*istifa* [ɪstɪ'fɑ] "resignation"
anı [ɑ'nɯ] "memory"	*tane* [tɑː'nɛ] "peace"	*depolama* [depɔła'mɑ] "storing"

*Predorsal [*a*]:*

word-initial	word-medial	word-final
alkolizm [alkɔ'lɪzm] "alcoholism"	*şefkat* [ʃɛf'kat] "tenderness"	*mana* [mɑ'naː] "sense"
alşimi [alʃɪ'mɪ] "alchemy"	*metal* [me'tal] "metal"	*cila* [dʒɪ'laː] "wax"
alp ['alp] "hero"	*atomal* [ɑtɔ'mal] "atomic"	*meblağ* [meb'la·] "amount"

[e] – front, mid, unrounded

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[8] For a more detailed explanation of vowel harmony in Turkish, see Ergenç (2002).

In the pronunciation of [e] the lips are half-open, the tip of the tongue touches the front lower teeth, while its blade and front part approach the hard palate with both rims, slightly pressing the upper back teeth.

As stated in Selen (1979:37), there are close [e] and open [ɛ] variants that differ in the height of the to tongue, i.e. close [e] is pronounced with the tongue a little closer to the palate[9].

Distribution: Close [e] in the first syllable of a word with more than one syllable tends to open in the following syllables: *etkilemek* [etcɪlɛ'mɛc] "to influence", *dede* [de'dɛ] "grandfather". When some monosyllabic words with open [ɛ] get a suffix, the open [ɛ] changes to its close counterpart, e.g. *yer* ['jɛɹ] "place" > yerinde [jeɾɪn'dɛ], *zevk* ['zɛvc] "pleasure" > [zevc'lɪ] "pleasurable", *tek* ['tɛc] "only" > *teker* [te'cɛɹ] (in doublet *teker teker* "one at a time"). However, this is not always the case, e.g. *tek* ['tɛc] > *tekçi* [tɛc'tʃɪ]) "monist"). As stated in Ergenç (1984:78), long close [e] occurs in loanwords, e.g. *memur* [meˈmʊɹ] "government official", *temin* [teˈmɪn] "assurance", *tecil* [teˈdʒɪl], "postponement", *tesir* [teˈsɪɹ] "influence". According to Selen (1979: 38-39), in the sequences e+ğ+V only [e] and [ɪ] may appear in the place of V, e.g. *eğitim* [ɛˈɪ'tim] "education", *değer* ['dɛ·ɪɛɹ] "value". In the sequences e+ğ+C any consonant can appear.

Close [e]:

word-initial	word-medial
et ['et] "meat"	*melek* [me'lɛc] "angel"
elma [el'mɑ] "apple"	*serin* [se'ɾɪn] "chilly"
emekçi [emɛc'tʃɪ] "laborer"	*geçen* [ɟe'tʃɛn] "last"

Open [ɛ]:

word-initial	word-medial	word-final
eğer ['ɛ·ɪɛɹ] "if"	*değer* ['dɛ·ɪɛɹ] "value"	*efsane* [efsɑːˈnɛ] "legend"
eğlence [ɛ·ɪlɛn'dʒɛ] "entertainment"	*gerek* [ɟe'ɾɛc] "need"	*deve* [de'vɛ] "camel"
eylem [ɛ·ɪ'lɛm] "action"	*pembe* [pɛm'bɛ] "pink"	*menekşe* [menɛc'ʃɛ] "violet"

[9] There is also third, open [æ] variant of [e] which usually appears as a property of individual speech.

[o] – back, mid, rounded

As in Serbian, the vowel [o] is pronounced with the lower jaw slightly lowered and the lips moving forward to round the lips. The tongue slides back in the mouth with the back part rising towards the soft palate. The space between the tongue and the soft palate is very narrow.

Vowel [o] also has open [ɔ] (predorsal) and close [o] (postdorsal) variants. Unlike close [o], open [ɔ] is articulated with the tongue moved slightly forward (Selen, 1979: 30).

Distribution: According to Ergenç (1984: 74), in the o+ğ+C sequences close [o] is lengthened, e.g. *oğlak* [oːˈɫɑk] "goat; capricorn", *doğmak* [doˈmɑk] "to be born". In o+ğ+V sequences, in diphthongs such as [o·ʊ] and [o·ɑ] close [o] is slightly shorter than in the previous examples, e.g. *doğum* [ˈdo·ʊm] "birth", *soğan* [ˈso•ɑn] "onion". In some cases when [o] precedes the semivowel [j], the diphthong [o·ɪ] appears (the place and manner of articulation of [j] is similar to that of [i]), e.g. *doymak* [do·ɪˈmɑk] "be saturated", *goygoycu* [go·ɪgo·ɪˈdʒʊ] "jangler". Close [o] does not appear in word-final position.

Close [o]:

word-initial	word-medial
oğul [ˈo·ʊɫ] "son"	*doğru* [doːˈrʊ] "right"
oğlan [oːˈɫɑn] "boy"	*poğaça* [ˈpoːɑtʃɑ] "pastry"
oymak [o·ɪˈmɑk] "to carve"	*toynak* [to·ɪˈnɑk] "hoof"

Open [ɔ]:

word-initial	word-medial	word-final
obur [ɔˈbʊɪ] "gluttonous"	*yorum* [jɔˈrʊm] "comment"	*radyo* [ˈrɑdjɔ] "radio"
olay [ɔˈɫɑ·ɪ] "accident"	*sol* [ˈsɔɫ] "left"	*kambiyo* [ˈkɑmbɪjɔ] "exchange"
ozan [ɔˈzɑn] "poet"	*toz* [ˈtɔz̪] "dust"	*palto* [ˈpɑɫtɔ] "coat"

[ø] (<ö>) – front, mid, rounded

In the articulation of [ø] the lips move forward for rounding as for [o]. The position of the tongue is the same as in [e]: the tip of the tongue touches the lower teeth, its front part is raised and its both rims touch the upper back teeth.

According to Selen (1979), this vowel has two variants: open [œ] and close [ø]. These two variants differ in tongue heigth, but in spoken language they differ in length – close [ø] appears in long syllables and open [œ] in short ones.

Distribution: In the sequences ö+ğ+V the place of V can only be occupied by [y] or [e]. In both cases a diphthong can appear (for example, *göğüs* ['ɟø·ʏs] "chest", *öğe* ['ø:ɛ] "element")[10]. According to Selen (1979:47), in the sequence ö+ğ+C we usually find [l,r,m] at the C position, e.g. *çöğmek, öğle, öğrenci*.

Both of the variants of the vowel [ø] do not appear in word-final position.

Open [œ]:

word-initial	word-medial
övünç [œ'ʋʏntʃ] "pride"	*köstebe*k [cœstɛ'bɛc] "mole"
ödeme [œde'mɛ] "payment"	*kör* ['cœɹ] "blind"
ördek [œɾ'dɛc] "duck"	*gölge* [ɟœl'ɟɛ] "shadow"

Close [ø]:

word-initial	word-medial
öykü [ø:ɪ'cʏ] "story"	*köy* ['cø·ɪ] "village"
öğüt ['ø:ʏt] "advice"	*söğüt* ['sø:ʏt] "willow"
öğrenim [ø:ɾɛ'nɪm] "learning"	*göğem* ['ɟø·ɛm] "greenish violet"

[i] – front, high, unrounded

As in Serbian, in the articulation of Turkish [i] lower jaw approaches the upper one, the lips are spread. The entire tongue moves forward with the front part rising towards the hard palate. The tip of the tongue presses against the lower front teeth, and both of its rims touch the upper back teeth.

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[10] Word *öğe* ['ø:ɛ] can also be pronounced as ['ø·ɪɛ] or ['øjɛ] (Selen, 1979:47).

Vowel [i] has two variants, the close [i] and open [ɪ].

Distribution: Close [i] occurs in foreign words, e.g. *idam* [iˈdɑm] "execution", *lider* [liˈdɛɪ] "leader". The vowel [i], like other Turkish vowels lengthens when standing next to <ğ>, for example: *iğrenç* [iːˈɾɛntʃ] "disgusting", *çiğ* [ˈtʃiː] "raw". In e+ğ+V sequences only [i] and [e] appear, e.g. *siğil* [ˈsiːl] "wart", *ciğer* [ˈdʒiˑɛɪ] "liver", *diğer* [ˈdiˑɛɪ] "other" (in the sequences i+ğ+e diphthong occurs).

Close [i]:

word-initial	word-medial	word-final
iğde [iˈdɛ] "elaeagnus"	*çiğdem* [tʃiːˈdɛm] "autumn crocus"	*çiğ* [ˈtʃiː] "raw"
itibaren [iːtɪˈbɑːɾɛn] "from"	*nisan* [niːˈsɑn] "April"	*ciddi* [dʒɪdˈdiː] "serious"
ima [iˈmɑ] "implying"	*lime* [liːˈmɛ] (in doublet *lime lime* "in long strips")	*ilmi* [ɪlˈmiː] "scholarly"

Open [ɪ]:

word-initial	word-medial	word-final
ilgi [ɪlˈɟɪ] "relevancy; interest"	*erik* [ɛˈɾɪc] "plum"	*etki* [etˈcɪ] "influence"
iki [ɪˈcɪ] "two"	*çift* [ˈtʃɪft] "pair"	*belli* [belˈlɪ] "evident"
içten [ɪtʃˈtɛn] "from inside"	*giyim* [ɟɪˈjɪm] "clothes"	*neşeli* [neʃɛˈlɪ] "cheerful"

[u] - back, high, rounded

In the articulation of [u], the lower jaw approaches the upper jaw one, the lips are pushed forward and rounded. The tongue moves backward and up towards the soft palate. The tip of the tongue is behind the front lower teeth.

There are open [ʊ] and close [u] variants of this vowel. Unlike the close [u], the open [ʊ] is articulated with the tongue moved slightly forward in the mouth (Selen, 1979: 34).

Distribution: According to Selen (1979: 35), in the sequences u+ğ+V only vowel [u] can appear in the place of V, and in that case [u] becomes long, e.g. kuğu [ˈkuː] "swan", uğultu [uːɫtʊ] "buzz". The vowel [u] is also lenghtened in u+ğ+C sequences, e.g. *buğday* [buˈdɑˑɪ] "wheat", *tuğra* [ˈtuːɾɑ] "Sultan's signature", *uğramak* [uːɾɑˈmɑk] "stop by". Consonants that usually occur in these sequences are [l,r] and sometimes voiced plosives

[b,d,g], e.g. *muğlak* [muːˈɫɑk] "ambigous", *muğber* [muːˈbɛɹ] "offended", *buğday* [buːˈdɑ·ɪ] "wheat", *tuğgeneral* [ˈtuːɟɛnɛral] "brigadier general". u+ğ+C sequences are very rare.

In some loanwords or in Turkish words where [j] follows [u], a diphthong occurs. In those cases [u] is close, but a little shorter than in the examples with <ğ>, e.g. *muaf* [ˈmu·ɑf] "exempt", *kuyruk* [ku·ɪˈɾʊk] "tail".

Open [ʊ]:

word-initial	word-medial	word-final
usul [ʊˈsʊɫ] "method, way"	*lokum* [ɫɔˈkʊm] "Turkish delight"	*bu* [ˈbʊ] "this"
utanç [ʊˈtɑntʃ] "shame"	*kuşluk* [kʊʃˈɫʊk] "late morning"	*limonlu* [lɪmɔnˈɫʊ] "with lemon"
uzam [ʊˈzɑm] "extent"	*vuruş* [vʊˈɾʊʃ] "stroke"	*kuyu* [kʊˈjʊ] "well"

Close [u]:

word-initial	word-medial	word-final
uğur [ˈuːɹ] "good luck"	*tuğla* [ˈtuːɫɑ] "brick"	*huğ* [ˈhuː] "hut"
uydurma [u·ɪdʊɾˈmɑ] "fabrication"	*huy* [ˈhu·ɪ] "temperament"	*buğu* [ˈbuː] "steam"
uyku [u·ɪˈkʊ] "sleep"	*fuar* [ˈfu·ɑɹ] "fair"	*sutavuğu* [ˈsʊtɑvuː] "marsh hen"

[y] (<ü>) – front, high, rounded

As in vowel [u], the lips move forward and become rounded. The position of the tongue position is the same as for vowel [i] – the tongue moves forward and raises to the hard palate, the tip of the tongue touches the front lower teeth while the rims press the upper back teeth (Selen, 1979: 47).

This vowel also has two variants: an open one, which is represented by the symbol [ʏ], and a close variant, for which the symbol [y] is used.

Distribution: Open [ʏ] appears in all positions in words, while initial and final long [y] appears only in a few and not very frequent words, such as *üğrüm* [yːˈɾʏm] "share", *küğü*

['cy:] "fine wheat". In the sequences ü+ğ+V, after <ğ> only [y] or [e] can appear; when <ğ> is followed by [y], [y] is lengthened, e.g. *düğün* ['dy:n] "wedding", in the second case the diphthong occurs, e.g. *büğet* ['by·ɛt] "dam".

Open [ʏ]:

word-initial	word-medial	word-final
ülke [ʏl'cɛ] "country"	*dün* ['dʏn] "yesterday"	*ünlü* [ʏn'lʏ] "famous"
üst ['ʏst] "top"	*dökünmek* [dœcʏn'mɛc] "to spill"	*görgü* [ɟœɾ'ɟʏ] "good manners"
ürkek [ʏɾ'cɛc] "timid"	*pürüz* [pʏ'ɾʏẓ] "roughness"	*sözlü* [sœz'lʏ] "verbal"

Close [y]:

word-initial	word-medial	word-final
üğrüm [y:'ɾʏm] "share"	*düğme* [dy:'mɛ] "button"	*düğü* ['dy:] "fine wheat"
	büğlü [by:'lʏ] "saxhorn"	
	züğürt ['zy:ɾt] "penniless"	

[ɯ] (<ı>) – central, mid, unrounded

In the articulation of [ɯ], the lips are half-close, the tip of the tongue slides back, and the rims touch the upper back teeth. The back the tongue rises to the soft palate. The posture of tongue is the same as for [u], with only difference that the lips are not placed forward, but in a neutral position (Selen, 1979: 51-52). In these cases the tongue slides from the initial position of [ɯ] to [o] and finally to [u].

This vowel has no variants.

Distribution: [ɯ] appears in all positions in words. According to Selen (1979: 52) in the sequences ı+ğ+V no other vowel than [ɯ] can apear[11]. In examples such as *yığılmak* "collapse" or *yığıl* the occurrence of triphthong is seized, e.g. *yığılı* ['jɯ·o‿ʊɫ] "heaped" (Selen, 1979: 52).

Vowel [ɯ]:

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[11] There are also few cases where ı+ğ+a sequence occurs, e.g. *çığa* ['ʧɯ·ɑ] (a kind of a sturgeon fish, Acipenser ruthenus).

word-initial	word-medial	word-final
ısırgan [ɯsɯɾ'gɑn] "nettle"	*kılıç* [kɯ'ɫɯtʃ] "sword"	*sarı* [sɑ'ɾɯ] "yellow"
ıslak [ɯs'ɫɑk] "wet"	*sıpa* [sɯ'pɑ] "donkey-foal"	*ayı* [ɑ'jɯ] "bear"
ırk ['ɯɾk] "race"	*hırka* [hɯɾ'kɑ] "cardigan"	*bıyıklı* [bɯjɯk'ɫɯ] "with a mustache"

Role of "soft g" <ğ> in vowel lengthening and diphthong formation

As stands in Ergenç (2002: 43), the "soft g" <ğ> which appears in the Turkish alphabet not as a sound but as a grapheme, still has many functions in spoken language, as seen in spectrogram studies (Selen, 1979:25-30; Ergenç: 1984:186-200; 1989:91-92; 1991:51-55). <ğ> is a symbol for marking length and it helps forming diphthongs between the vowels with different characteristics.

The functions of <ğ> are represented below in more detail:

a) In V+ğ+V sequences <ğ> is not pronounced, the other two vowels merge and as a result we get a long vowel, e.g. *ağa* ['ɑː] "agha", *kuğu* ['kuː] "swan", *uğultu* [uːɫ'tʊ] "buzz".

b) If the vowels in V+ğ+V sequences are of different types, a diphthong occurs, e.g. *soğan* ['so·ɑn] "onion", *koğuş* ['ko·ʊʃ] "ward", *değil* ['dɛ·ɪl] "not".

c) If ğ+V sequences are preceded by front vowels, <ğ> can turn into [j]. Since the place and manner of articulation of semi-vowel [j] is close to that of [i], a diphthong occurs, e.g. *diğer* ['dɪjɛɪ] ~ ['di·ɛɪ] "other", *eğer* ['ɛjɛɪ] ~ ['ɛ·ɪɛɪ] "if", *geğirmek* [ɟɛjɪɾ'mɛc] ~ [ɟɛ·ɪɾ'mɛc] "to burp".

d) In a+ğ+ı sequences, the vowels [a] and [ɯ] form a diphthong; however, [ɯ] can disappear in these cases, which results in lengthening of [a], e.g. *yapacağım* [jɑpɑ'dʒɑ·ɯm] ~ [jɑpɑ'dʒɑːm] "I will do", *ağız* [ɑ·ɯz̠] ~ [ɑːz̠] "mouth", *ağır* [ɑ·ɯɪ] ~ [ɑːɪ] "hard" (Ergenç, 2002: 42). Similar case can occur in 'e+ğ+I' sequences, e.g. *vereceğim* [veɾɛ'dʒɛ·ɪm] ~ [veɾɛ'dʒɛːm] "I will give".

e) In V+ğ+C sequences, the vowels preceding <ğ> are lengthened, e.g. *doğru* [do'ɾʊ] "right", *ağlamak* [ɑːɫɑ'mɑk] "to cry", *yığmak* [jɯː'mɑk] "pile up".

f) In e+ğ+C sequences, <ğ> can turn into [j] or [i], e.g. *seğmen* [sɛj'mɛn] ~ [sɛ·ɪ'mɛn] "local security soldier".

g) In i+ğ+C sequences, <ğ> does not turn into [j], it only gets longer, e.g. *çiğnemek* [tʃiːnɛ'mɛc] "to chew", *iğrenç* [iː'ɾɛntʃ], "disgusting", *Niğde* ['niːdɛ] (a city in Turkey).

h) When the V+ğ sequence stands at the end of the word, vowel preceding <ğ> is lengthened, e.g. *yağ* ['jɑː] "fat", *tuğ* ['tuː] "horsetail", *çiğ* ['tʃiː] "raw".

Distribution: <ğ> appears only in medial and final positions:

word-medial	word-final
doğrultu [doːɾʊɫˈtʊ] "direction"	*sığ* ['sɯː] "shallow"
ağaç ['ɑːtʃ] "tree"	*meblağ* [mebˈlaː] "amount"
bağlı [bɑːˈɫɯ] "tied"	*dağ* ['dɑː] "mountain"

Comparison of Serbian and Turkish vowel systems

In the previous two sections, the vowels of Serbian and Turkish were described in detail, taking into account articulatory and distributive properties of these sounds. The contrastive analysis in this section is based on these independent descriptions. In order to make a more systematic analysis of the vowel systems in the two languages, we will first present the material to be compared in its entirety, namely Serbian and Turkish vowel inventories:

SERBIAN VOWELS	TURKISH VOWELS
a [a] – central, low, unrounded	*a* [a] – back, low, unrounded
e [e] – front, mid, unrounded	*e* [e] – front, mid, unrounded
i [i] – front, high, unrounded	*i* [i] – front, high, unrounded
o [o] – back, mid, rounded	*o* [o] – back, mid, rounded
u [u] – back, high, rounded	*u* [u] – back, high, rounded
	ö [ø] – front, mid, rounded
	ü [y] – front, high, rounded
	ı [ɯ] – central, mid, unrounded

Looking at the material presented above, it can be seen that the Turkish vowel system has three vowels that are not found in Serbian. Turkish vowel system consists of eight, while Serbian has five vowels. Turkish *central-mid-unrounded* [ɯ], *front-high,-rounded* [y], and *front-mid-rounded* [ø] are not found in Serbian.

Articulatory phenomena such as *horizontal tongue position* (front-central-back), *vertical tongue position* (high-mid-low), and *lip position* (rounded-unrounded) represent the main parameters on which the comparison is based, as clearly shown in *Table 1*:

COMPARATION PARAMETER	SERBIAN		TURKISH
1. horizontal tongue position	front	[e] [i]	[e] [i] [ø] [y]
	central	[a]	[ɯ]
	back	[o] [u]	[a] [o] [u]
2. vertical tongue position	high	[i] [u]	[i] [u] [y]
	mid	[e] [o]	[e] [o] [ɯ] [ø]
	low	[a]	[a]
3. lip position	unrounded	[i] [a] [e]	[i] [a] [e] [ɯ]
	rounded	[o] [u]	[o] [u] [ø] [y]

Table 1. Tongue and lip positions

In order to conduct more detailed analysis, following Ergenç (2002), *the position of jaws*, and *the horizontal movement of the tongue* were considered as parameters that can be used to distinguish open from close, and predorsal from postdorsal variants in Turkish (*Table 2.)* Since, according to Serbian phonetic studies (Simić & Ostojić: 1981), open and close variants in Serbian are not that evident, we did not use these parameters in the presentation of Serbian vowels.

1. position of jaws	open	[ɛ][ʊ][ɔ][ɪ][œ][ʏ]
	close	[e][o][u][i][ø][y][ɯ]
2. horizontal moving of the tongue	predorsal	[a]
	postdorsal	[ɑ]

Table 2. Position of jaws and horizontal movement of the tongue

Based on the descriptions in previous sections, we can also compare Serbian and Turkish vowels according to their distributional characteristics. Considering the Turkish variants, the distribution features of Serbian and Turkish vowels can be listed as in *Table 3* below:

Serbian vowels: *Turkish vowels:*

	INIT.	MED.	FIN.		INIT.	MED.	FIN.
[a] vowel:	+ —¹²	+	+	**[a]** vowels: [a]	+ —	+ —	+ —
				[ɑ]	+	+	+
[e] vowel:	+ —	+	+	**[e]** vowels: [e]	+	+	—
				[ɛ]	+	+	+
[i] vowel:	+	+	+	**[i]** vowels: [i]	+ —	+ —	+ —
				[ɪ]	+	+	+
[o] vowel:	+	+	+	**[o]** vowels: [o]	+	+	—
				[ɔ]	+	+	+ —
[u] vowel:	+	+	+ —	**[u]** vowels: [u]	+	+	+
				[ʊ]	+	+	+
				[ø] vowels: [ø]	+	+	—
				[œ]	+	+ —	
				[y] vowels: [y]	+	+	+
				[ʏ]	+	+	+
				[ɯ] vowel:	+	+	+

Table 3. Distribution properties of vowels

The following section draws conclusions from previous descriptions and analysis of the vowel systems in the two languages, contrasting each of the vowels in turn:

Vowel [a]: The vowel [a] in both languages differs by the horizontal position of the tongue: In Serbian [a] is vowel of central type, while in Turkish this vowel is produced with the tongue slightly back in the oral cavity. Turkish also has a predorsal variant of this sound, which mostly occurs in loanwords. As can be seen from vowel quadrilaterals on the previous pages, [a] in Serbian is roughly between Turkish postdorsal and predorsal variants. But those differences are very small and almost inaudible in spoken language.

The vowel [a] in both Serbian and Turkish occurs in all positions in the word. The initial [a] in Serbian, apart from a few examples, appears only in loanwords.

Vowel [e]: In both Serbian and Turkish vowel [e] is unrounded-mid-front vowel. While Serbian has only one variant of this sound, in Turkish there are two, even three variants appear: close [e], open [ɛ] and more open [æ]. Serbian and Turkish [e] vowels differ in the height of the tongue, which is clearly seen from vowel quadrilaterals given above.

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¹² Symbol "+ —" indicates that the given vowel mostly seen in loanwords.

Serbian [e] occurs in all word positions, with initial [e] mostly found in foreign words. On the other hand, Turkish close [e] does not appear in final position.

The vowels [i,o,u] are produced in the similar way in both languages. Although Turkish vowels [i,o,u] have open and close variants, in speech they differ only in length: close [i,o,u] are longer than open [ɪ, ɔ, ʊ] variants.

The vowels [ø], [y] and **[ɯ]** do not exist in Serbian. Although the vowel <ı> [ɯ] is not found in Serbian as a phoneme, articulation of [ɯ] is very similar to that of Serbian schwa [ə], but the Turkish [ɯ] is produced more prominently than its Serbian counterpart. While [y] and [ɯ] are found in every position in Turkish words, [ø] doesn't occur in final position.

Results of the experimental study. Difficulties that arise in Serbians' pronunciation of Turkish vowels

As a result of the description and comparison of vowels in Serbian and Turkish, we assumed that similar vowels in both languages will not cause pronunciation problems for native Serbian speakers, while vowels that are different in some aspects or are found in Turkish but not in Serbian, will be points where students will have difficulties. An experimental study was conducted to test these theoretical assumptions, (see *Section 3* for more details). It was found that the results of the experimental study conducted with the subjects corresponded to the theoretical expectations. In this regard, difficulties in the pronunciation the Turkish vowels and related errors can be summarized as follows:

- Reading <u> [u/ʊ] instead of <ü> [y/ʏ]: Vowel <ü> when pronounced as <u> changes the meaning of the word. This error is widespread among beginners of Turkish language. Although students with a better knowledge of Turkish know how to produce the sound in question, they can also make this type of error.

The reason for its appearance can be found in the similar way of production and writing of the two sounds, which leads to wrong lexical representations of the word, for example, the word *küsmek* [cʏs'mɛc] "to be angry" can often be pronounced as *kusmak* *[kʊs'mɑk] "to throw". A similar situation can arise in words that are not of Turkish origin, especially in Arabic loanwords which do not follow the vowel harmony rules in Turkish, so words like *vücut* [vʏ'dʒʊt] "body" can be pronounced as *[vʊdʒʊt] ~ *[vʏdʒʏt] ~ *[vʊdʒʏt] (with the accent on both the first and last syllable) or *mübarek* [mʏ'bɑːrek] "blessed" as *[mʊ'bɑːrek]. In words that also exist in Serbian we find a similar tendency, for example, word *Müslüman* [mʏslʏ'mɑn] "Muslim" in Serbian is pronounced as *musliman* [mus'lǐmaːn], and, in that way, as an influence of the native language, we can hear pronunciations like *[mʊsɫʊ'mɑn] ~ *[mʊsɫʏ'mɑn] or even *[mus'lǐmaːn], as it is in Serbian.

- Reading <o> [o/ɔ] instead of <ö> [ø/œ]: The vowel <ö> when pronounced as <o> changes the meaning of the word. In our research, this error was made by two first-year students. Sometimes, because the lips are not rounded enough, we can hear vowels close to <e> [e]. As it is case with vowel <ü>, due to incorrect lexical representations, students with a better knowledge of Turkish may pronounce this sound as <o>, even though they know how to pronounce the vowel <ö>.

- Reading <i> [ɪ/i] instead of <ı> [ɯ]: This error, which led to a changes in meaning, was made by three first-graders. This error occurs because the pronunciation and spelling characteristics of the sound <ı> [ɯ], which does not exist in Serbian, have not yet been fully acquired at this level.

The results of the experimental study also revealed that the subjects were often not familiar with vowel lengthening, diphthongs and some variants of vowels in Turkish that appear in certain sound environments and that this lack of knowledge usually negatively affected the correct pronunciation of Turkish vowels. These errors that were not foreseen in contrastive analysis can be summarized as follows:

- **Errors concerning length of vowels:**

a) Long reading of short vowels: This error is closely related to the stress/accent error and a typical example of negative transfer. In other words, it was made because Serbian vowels can be short and long, depending on the accent tone. This error is most often encountered in words *çabuk* [tʃɑˈbʊk] "quick" (mispronounced as *[ˈtʃɑːbʊk]), gaga [gɑˈgɑ] "beak" (mispronounced as *[ˈgɑːgɑ]) and *karpuz* [ˈkɑːrpʊʑ] "watermelon" (mispronounced as *[ˈkɑːrpʊz]). As can be seen from these examples, subjects tend to stress the vowel in the initial syllable rather than the final syllable, and lengthen the vowel in the stressed vowel. Subjects who made this type of error used different tones. For example, one student read the word *gaga* with a rising tone ([ˈgǎːgɑ]), and another student read the same word with a falling tone ([ˈgâːgɑ]).

b) Short reading of long vowels:
- In words of foreign origin: native Serbian speakers who learn Turkish make this type of error because they do not know that vowels should be read long in some words of foreign origin in Turkish. For example, they read *alaka* *[ɑɫɑˈkɑ] "relevance" instead of [ɑlaːˈkɑ], *cahil* *[dʒɑˈhɪɫ] "ignorant" instead of [dʒɑːˈhɪl]. This error occurs in all subjects.
- in V+ğ+C sequences: 50% of subjects made an error reading the vowel short in these sequences, and this type of error was mainly observed in the words *iğne* [iːˈnɛ] "needle" (mispronounced as *[ɪˈnɛ]) and yağmur [jɑːˈmʊɹ] "rain" (mispronounced as *[jɑˈmʊɹ]).

- **Misreading diphthongs in some enviroments:** Diphtongs usually do not cause problems for Serbian students. However, 60% of subjects read a long [e] rather than a diphtong in the word *eğlence* [ɛ·ɪlɛnˈdʒɛ] "entertainment" (which was mispronounced as *[e·ɫenˈdʒɛ] ~ *[eːˈɫenˈdʒɛ], *öğle* [ˈø·ɪlɛ] "noon" (mispronounced as *[ø·ˈɫɛ]. The reason for this error is that Serbian students do not know that the grapheme <ğ> forms diphthongs with preceding front vowels.

- Reading close [e] instead of open [ɛ]: This mispronunciation, which does not change the meaning of the word, is caused by the absence of the open [ɛ] variant in Serbian. One of the reasons for this widespread mispronunciation is the fact that the most subjects do not know that the Turkish vowel [e] opens with velarized sounds [l], [c], [ɟ] and [r] and [n].

-   **Reading postdorsal [ɑ] instead of predorsal [a]:** Since the position of Serbian [a] is roughly between Turkish postdorsal and predorsal variants, Serbian speakers pronounce these sounds by not moving tongue enough forward or back in the oral cavity, but this differences are not much salient.

Conclusion

In this study, some basic definitions and concepts related to phonetics and articulatory phonetics are given. In addition, the main features of the Serbian and Turkish vowel systems are examined and the vowels in both languages are described one by one. Based on these descriptions, some similarities and differences between the two languages were determined through contrastive analysis. Accordingly, it is assumed that similar vowel sounds in Serbian and Turkish will not cause pronunciation problems for Serbian speakers, while sounds that are different in some aspects or found in Turkish but not in Serbian will be main source of difficulties. In order to verify these theoretical assumptions, an experimental study was conducted that deals with the ways in which native speakers of Serbian articulate Turkish sounds. The research was carried out with 30 graduated and ungraduated Serbian students of Turkish language. The main concern of this research was to determine and describe the phonetic mispronunciations made by Serbian students. It was found that the data obtained as a result of the experimental research conducted with the informants coincided with theoretical expectations. In this regard, the identified mispronunciations are evaluated and the results can be summarized as follows:

- The vowels [ø], [y], and [ɯ], which do not exist in Serbian, are among the sounds that can cause problems, especially among students at the beginning level.

- Serbian speakers have no problem pronouncing the vowels [i,o,u] which are produced in a similar way in both languages.

- In addition to the aforementioned results that were expected in the contrastive analysis, experimental study also revealed some difficulties and mispronunciations regarding the postdorsal-predorsal variants of the vowel <a>, open-close variants of <e>, diphthongs occuring in V+ğ+V sequences where front vowels precede <ğ>, and errors related to vowel length. All these cases which depend on certain sound environments can be a problem for native speakers of Serbian.

In summarizing the results of experimental study we tried to explain some of the reasons for difficulties and errors. In this regard, we find that most errors are made mainly due to lack of knowledge of the articulation characteristics of certain vowels, and most importantly, the way in which the articulation of vowels is affected and changed by sound environment in continuous speech, that is, words. We hope that the descriptions and findings in this study will facilitate language teaching and enable Serbian speakers learning Turkish to learn the characteristics and pronunciation of the Turkish sounds more easily and quickly. In addition, it is expected that the findings obtained by comparing Serbian and Turkish languages will help future studies examining these two languages.

References

Aksan, D. (2000). Her yönüyle dil. Ankara: TDK.

Altunkaya, F. (1996). An introduction to Turkish- Englısh contrastive grammar. 3rd edition. Ankara.

Bugarski, R. (1991). Uvod u opštu lingvistiku. Beograd: Zavod za udžbenike i nastavna sredstva.

Catford, J. C. (1988). A practical introduction to phonetics. Oxford: Oxford University Press.

Čaušević, E. (1996). Gramatika suvremenoga turskog jezika. Zagreb: Hrvatska sveučilišna naklada.

Crystal, D. (1987). The Cambridge encyclopedia of language. Cambridge: Cambridge University Press.

Crystal, D. (1991). A dictionary of linguistics and phonetics. Cambridge: Cambridge University Press.

Davenport, M. and Hannahs, S. J. (1998). Introducing phonetics and phonology. London.

Demir, N. and Yılmaz E. (2003). Türk dili. El kitabı. Ankara: Grafiker.

Demircan, Ö. (1979). Türkiye Türkçesinin ses düzeni. Türkiye Türkçesinde sesler. Ankara: TDK.

Demirezen, M. (1990). "Sesbilimi ve uygulama alanları". Dilbilim araştırmaları, 1990. Ankara: Hitit Yayınevi.

Ergenç, İ. (1984). Almanca ve Türkçenin ses yapılarının karşılaştırılması. Ankara: DTCF yay.

Ergenç, İ. (1989). Türkiye Türkçesinin görevsel sesbilimi. Ankara.

Ergenç, İ. (2002). Spoken language and dictionary of Turkish articulation. İstanbul: Multilingual.

Gökmen, M. E. (1998). Korecede benzeşme türleri- benzeşme türlerinin Korece öğrenen Türklerdeki görünümleri. Unpublished MA dissertation. Ankara: A. Ü. Sosyal Bilimler Enstitüsü.

Gökmen, M. E. (2002). Türkçe ve Korecede ezgi örüntülerinin karşılaştırılması. Unpublished PhD dissertation Ankara: A. Ü. Sosyal Bilimler Enstitüsü.

Handbook of the International Phonetic Association (1999). Cambridge: Cambridge University Press.

Ivić, P. (1998). "Vokalske grupe u srpskohrvatskom jeziku": Petrović (ed.) (1998), 505-511.

Ivošević, S. (2005). Sırpça ve Türkçenin ses dizgelerinin karşılaştırılması. Sırpların Türkçe sesletiminde karşılaştıkları güçlükler. Unpublished master's dissertation. Ankara: A.Ü. Sosyal Bilimler Enstitüsü.

Janković, S. (1987). Arapski izgovor s osnovama arapskog pisma. Sarajevo: Svjetlost, OOUR Zavod za udžbenike i nastavna sredstva.

Kašić, Z. (2003). Fonetika. Beograd: Autorized manuSerbianript.

Krajišnik, V. (1994). Kvantitativne i spektralne karakteristike sonanata. Beograd: Filološki fakultet.

Olive, J. P. Greenwood, A. & Coleman, J. (1993). Acoustic of American English speech. A dynamic approach. New York: AT&T Bell Laboratories, Springer-Verlag.

Paunović, T. (2003). Fonetika i/ili fonologija: kritički prikaz fonoloških teorija XX veka. Niš: Filozofski fakultet.

Petrović, D. (ed.) (1998). Rasprave, studije, članci. Sremski Karlovci/Novi Sad: Izdavačka knjižarnica Zorana Stojanovića.

Roach, P. (1991). English phonetics and phonology. 2nd edition. Cambridge: Cambridge University Press.

Selen, N. (1979). Söyleyiş sesbilimi, akustik sesbilim ve Türkiye Türkçesi. Ankara: TDK.

Simić, R. and Ostojić, B. (1981). Osnovi fonologije srpskohrvatskoga književnog jezika. Pdgorica: NIO Pobjeda.

Stanojčić, Ž. and Popović, Lj. (1992). Gramatika srpskoga jezika za I-IV razred srednje škole. Beograd: Zavod za udžbenike i nastavna sredstva / Novi Sad: Zavod za izdavanje udžbenika.

Terzić, A. (2000). Fonetika ruskoga jezika u poređenju sa srpskim. Beograd: Slavističko društvo Srbije.

Toklu, O. (2003). Dilbilime giriş. Ankara: Akçağ A. Ş.

Vardar, B. (1998). Açıklamalı dilbilim terimleri sözlüğü. 2nd edition. Istanbul: ABC Kitabevi.