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Character and synharmony of consonants in the Kazakh language

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Abstract. This article is about the features of the modern Kazakh language, about synharmony in speech, within words, between words, and sounds. Until now, research has proven that among scientists, there were different opinions about synharmony. Most researchers argue that synharmony is vowel harmony. In our work, we have shown with examples that this also applies to consonant sounds. We have systematically grouped the work of scientists before us, especially researchers who studied the occurrence, pronunciation and auditory characteristics of sounds in the laboratory. We see that the correspondence of both vowels and consonants is of particular importance in determining the direction of personality development and the meaning of monosyllabic words in the modern Kazakh language. When processing the collected material, the emphasis was placed on the function of synharmony in language. The examples were systematized and grouped using comparative and contrastive methods. The participation of the vocal cords was based on the production of signs, and the production of sounds in our language was described by their vibrational waves. It is concluded that if the vocal cord vibrates completely – vowels, if it vibrates more – the tone is dull, if it vibrates partially – dull, and if it does not vibrate at all – solid dull.

Keywords: Kazakh language, consonants, vocal cords, synharmony, phonetics, articulation, sounds.

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Introduction

Up to the present, there has been a prevailing opinion that synharmony is the consonance of vowels. In the research, we have proven through examples that it also has to do with consonants. We have systematized the works of research scientists, especially researchers who have conducted laboratory analysis of the nature of sound formation, pronunciation, and hearing. We have observed that the correspondence of both vowels and consonants is of particular importance in determining the direction of personal and semantic development of words in the Kazakh language.

In processing the collected materials, special attention was paid to the function of synharmony in the language. Examples were systematized and grouped using comparative and contrastive methods.

The materials of the first research on the formation of consonants in the Kazakh language were reflected in the research works of N. Ilminsky, V. Radlov, P. Melioransky, and the research of A. Baitursynov, K. Zhubanov became the main and profound basis for analysis in our native language. In addition, in the studies of Ye. Omarov and K. Kemengeruly, the first conclusions were made about consonants. In the later periods, Zh. Aralbayev, I. Kenesbayev, B. Tailakbayev, A. Zhunisbekov, S. Omarbekov, M. Raimbekova, A. Koshkarov, S. Myrzabekov, S. Orazalin, A.Baimbetova, Zh. Issayeva, A. Moldasheva, et al. were comprehensively considered and systematized in the research. In our work, we decided to give examples from the works of the listed researchers.

In the verbal structure of the language, sounds are constantly used in harmony and concord according to the law of synharmony. If this harmony is not observed in pronunciation, this is due to the inability to distinguish between pronunciation and spelling. Writing can never accurately convey the pronunciation of words. In addition, in Kazakh writing, based on the morphological principle, the sound at the end of the root is recorded in its original form, without changing. For example: the verb көн (Eng. *to agree*) generates such words as көнді, көнбеді, көнген жоқ. In such words, the initial position of the root is preserved, and the nature of the pronunciation is neglected. However, the letter н (n) here sounds in three different forms during pronunciation. In this research work, we analyzed the characteristics of sounds, including pronunciation and listening to consonants, in addition to their writing.

Research materials and methods

A comprehensive study of the structure of words in Turkic languages, the connection of sounds with each other, taking into account their semantic patterns, makes it possible to find answers to unresolved and controversial opinions. For the conclusions made in the work to turn out to be accurate, we used the methods of experimental research and systematized them using examples.

A special branch of linguistics that unites, harmonizes and performs word-formation functions in our language is called synharmony. Synharmony extends to vowels as well as consonants. We call the *language harmony* the harmony of vowels in a single word (wordform), coming as a single soft or single hard depending on their function in the language. In the Kazakh language, the law of harmony is recognized primarily as the harmony of the language. Because this law can cover all the ancient words in our language, but the consonance of consonants has been neglected.

The law of harmony is violated if we pronounce the sound combinations нб *(nb)* and нг *(ng)* in words in the same way. According to the law of consonance, the combinations нб *(nb)* and нг *(ng)* do not intersect in terms of articulation (formation), although they correspond to each other in terms of voice relation; therefore, the double-lip consonant б (b) adapts and changes the frontal sound н (n) in front of it to the double-lip м (m), and the double-lip frontal consonant г (g) changes to the back sound ң (ŋ). Therefore, it follows that the combination нб *(nb)* is pronounced as мб *(mb)* (көмбеді), the combination нг is pronounced as ңг (көңген жоқ), that is, the sound of н (n) is pronounced both as м (m) and ң (n). We make sure that the consonants *m* and *n* in this exchange (көмбеді, көңген жоқ) do not have any phonemic value.

In addition, the words: қарағас *(қара қас)*, ағетік *(ақ етік)*, ағжол *(ақ жол)*, сабы *(сап-ы)*, тамағы *(тамақ-ы)* also reflect sound exchanges. This is due to the fact that the exchange of sounds (қ-ғ, п-б) is the result of the assimilation of sounds that are side by side with each other.

Alternation (lat. alternatio) means the transformation of sounds in a word or between words into another sound under the influence of a neighboring sound, which occurs in different words. For this reason, the exchange of sounds occurs as a result of sound integration in phonetic conditions. This is explained by the combinatorial change (lat. combihare combine, combinate) or positional (lat. - positio - position) [1, 125-126].

Analysis and results

Having studied the collected materials, we managed to achieve some results. Examples prove that in modern Turkic languages, including Kazakh, in the formation of synharmony, along with vowels, consonants also have a special function.

The analysis of sounds in the Kazakh language began to be classified according to the involvement of the vocal cords. The presence of the vocal cords is guided in the form of a sign of creation, and the creation of sounds in the Kazakh language is characterized by the waves of vibration of the nasal cavity. Therefore, if there is full vibration in the vocal cords, the voice pronounces vowels; if the vibration is more intense, it generates sonorants, if it vibrates partially, voiced consonants, and if it does not vibrate at all, it generates voiceless consonants. It is important to note that if voiced consonants are formed from partial vibrations of the vocal cords, then there are additional signs of the formation of these sounds. Depending on the presence of the lips, the effect of the adjacent sounds and variations on each other shall be different [2, 64]. «Part of the sounds in our language depend on the tone: these are vowels. The next branch is related to aspiration: they are consonants. If the sound is associated with a tone, vowels are formed and become melodic, and consonants associated with aspiration do not have this property," I. Kenesbayev said [3, 223]. Researcher I. Kenesbayev notes 25 consonants (б, в, г, ғ, д, ж, з, й, к, л, м, н, п, р, с, т, (у), h, ф, х, ц, ч, ш, щ, қ, ң), indicating that the sounds в, ф, х, ц, ч are borrowed from the Russian language [3, 241]. Researcher I. Kenesbayev, in his textbook, divides consonants into 3 groups (voiced, voiceless and sonorants) depending on the presence of the voice. «Voiced and voiceless consonants, when combined, are called quiescent (soundless). When pronouncing voiced consonants, the predominance of the voice is observed and creates aspiration. When we pronounce voiced consonants, we observe the predominance of aspiration over the voice, and when we pronounce voiceless consonants, there is no involvement of the voice; that is, there is no vibration of the vocal cords at all.

They are classified as:

Sonorants: м, н, ң, р, л, (у, и);

Voiced consonants: б, в, г, ғ, д, ж, з;

Voiceless consonants: п, т, к, қ, ф, с, ш, ч, щ, ц, х, һ" [3, 256]. He relied on K.Zhubanov in classifying consonants, applied the terms of *fricative/occlusive* and *continuous/discontinuous,* and distinguished plosives: п, б, т, к, г, қ, д, ч, ц; and fricatives: ф, в, с, ғ, ш, х, з, ж, һ" [3, 257]. However, I. Kenesbayev adds the sound 'g' to the group of continuous (occlusive) consonants, that is, non-exposive, fricative phonemes. We can see that Zh. Aralbayev agrees: "Consonants (other than affricate sounds) are classified into two groups depending on the way they are formed:

1. Plosive consonants. Plosives can be voiceless (aspiration) and voiced. Voiceless plosives are б, п, д, т, г, к, қ. There are three different articulatory phases in the creation of voiceless plosives", when pronouncing a plosive consonant п, there occur three different articulatory phases that follow one another, the first of which is the phase of adhesion of the vocal organs to each other (implosion), the second one is the phase of adhesion of the vocal organs (continuation of implosion), the third one takes place when the period of adhesion of the vocal organs ends and the period of sudden disjunction of one another of the vocal organs (explosion) starts [4, 67]. Zh. Aralbayev noted that fricative consonants include the sounds ф, в, с, з, ғ, ж, ш, х and mentioned: "Fricatives are formed by the closing of our vocal organ, not sticking together" [4, 68].

The sound features of aspirated plosives in the Kazakh language were considered in the works of the researcher B.D. Taylakbayev [5]. The researcher shows that the phonemes п, б, т, д, к, г, due to plosive pronunciation, are different from other aspirated sounds, and in the system of aspirated plosive consonants, sounds are classified as voiced/voiceless, strong/weak, and short/long in pronunciation. He gives an example of the duality of words on the examples of бақа-баққа, жапа-жаппа, теке-текке, аты-атты, etc., and argues that the concurrency of the same double consonant in the composition of these words (geminate) affects the meaning of the word, and underlines the opposition of the long and short pronunciation of such phonemes. Besides, on the example of the words балық-балығы, қап-қабы, ек-егін he explained the phonetic phenomena when a voiceless consonant standing between vowels is pronounced with a voice. The scholar also mentions that the phonemes п-у in the words тап-тау are contrasted by their strong/weak pronunciation. The scientist considers the inconsistency of consonants at the beginning of a word and at the end of a word in the Kazakh language by the strong/weak opposition of consonants. On aspirated plosives B.Taylakbayev stated as follows: "the system of aspirated plosive consonant phonemes in the modern Kazakh language consists of voiceless, tense, occlusive (п); voiced, occlusive and bilabial (б); voiceless, tense, occlusive and anterior consonant (т); voiced, occlusive and anterior consonant (д); and voiceless, tense, occlusive and velar consonant (к)" [5, 37].

A. Zhunisbek's followers, who substantiated the scientific principles of studying the sounds of the Kazakh language in a new direction, under the leadership of the researcher, conduct research based on scientific achievements. In this regard, it is necessary to name the research work of A. Baimbetova on the transformation of occlusive consonants [6]. He analyzed the features of interweaving, contrasting the occlusives formed by the contact of the organs of speech with each other with the adjacent consonants formed by the confluence of the organs of speech with each other. To determine the formation and transformation of the occlusives, he systematized a mixture of different sounds created by the movement of speech organs. From the point of view of phonetics, he gave a comprehensive description of the systems of pronunciation, formation, and hearing of interwoven consonants through analysis.

The analysis of sibilant consonants has been thoroughly examined in the works of S. Orazalin [7]. The scholar, relying on the latest scientific achievements, appropriately used newly introduced scientific terms in the Kazakh language. He characterized consonants based on the involvement and vibration of the vocal cords, referring to them as vibrant (voiced consonants), and as fricative consonants according to their manner of articulation, and provided an extensive analysis of the articulation and transformation features of such sounds as с, ш, з, and ж. According to their articulation, vibrant consonants are called uvular. S. Orazalin demonstrated that the production of vibrant fricative consonants results from the interaction of vocal cords and conducted a systematic analysis of their articulation. The researcher divided fricative consonants into *compact fricatives* (с, з) and *diffuse fricatives* (ш, ж). He paid special attention to the phonetic variants of each fricative consonant and provided a detailed phonological analysis.

In recent years, increasing attention has been given to studying the sound system of the Kazakh language in accordance with its natural characteristics and from the perspective of synharmonism. The number of sounds in the Kazakh language, as well as their articulatory, phonetic, and auditory features, are beginning to be systematically studied from the viewpoints of phonetics and phonology. In B. Baymukhanov's research on the articulation and transformation system of voiceless consonants, the articulatory properties of Kazakh consonants in relation to the vibration of the vocal cords—specifically, the formation of voiceless consonants and their harmony features—are analyzed [8].

The author substantiates the scientific importance of understanding the composition and structure of voiceless consonants based on their phonetic and phonological features, referring to the views of prominent scholars on the subject. Through concrete examples, it is demonstrated that there has been no consistent, scientifically proven opinion regarding the articulatory and auditory nature of the voiceless consonants қ and к in modern Kazakh. Presenting his own viewpoint, the author concludes: "In fact, the distinction between the consonants ғ and г, қ and к differs from the contrast between other pairs of consonants in terms of their 'hard' and 'soft' variants. The places of articulation for these sounds are significantly distant from each other, and their auditory characteristics are also distinct" [8, 9].

The author compares the nature of Kazakh and Russian sounds in terms of their *articulation*, *pronunciation*, and *auditory* perception, emphasizing the importance of distinguishing between the sounds of each language based on their pronunciation and spelling to avoid confusion. The differences in the articulatory bases of these two languages are analyzed concerning theoretical definitions of their phonological nature, and a systematic examination is conducted on the variation of voiceless consonants in Kazakh articulation. For example, the articulation of the voiceless fricative *s* in the word саз *(saz)* is described as follows: 1) the tip of the tongue approaches the boundary between the teeth and the alveolar ridge; 2) a slight gap remains between the tip of the tongue and the base of the upper incisors; and 3) the vocal cords remain neutral, meaning they do not vibrate [8, 12]. In the Kazakh language, the voiceless consonant с is articulated with the tip of the tongue, whereas in Russian, it is produced with the blade of the tongue. Therefore, from an auditory perspective, the Russian с has a stronger «whistling» effect, while in Kazakh it is referred to as a «hissing» consonant [8, 14]. B. Baymukhanov provides numerous examples to demonstrate subtle articulatory features that are not easily perceived or typically noticed in spoken language. He argues that identifying the phonological distinctions between Kazakh—a Turkic language based on the principle of synharmonism—and stress-accented languages like Russian must begin with a phonetic and phonological analysis

of speech sounds. The scholar convincingly points out, from both methodological and scientific standpoints, that it is incorrect to characterize certain sounds as unique to Kazakh without proper analysis. B. Baymukhanov substantiates, through numerous examples, the articulatory features that are not easily perceptible from an auditory perspective and often overlooked during speech. He methodologically and scientifically demonstrates the importance of beginning the identification of the phonological distinctions between Kazakh—a Turkic language based on the principle of synharmonism—and stress-accented languages such as Russian, with a phonetic and phonological analysis of speech sounds. The scholar rightly points out the methodological inaccuracy of isolating certain sounds and labeling them as unique to the Kazakh language without thorough analysis. In his work, B. Baymukhanov analyzes the model and structure of voiceless consonants in Kazakh, classifying them according to their manner and place of articulation. In his work, B. Baymukhanov analyzes the model and structure of voiceless consonants in the Kazakh language, classifying them according to their manner and place of articulation. In terms of *place of articulation*, he distinguishes: 1) bilabial (п), 2) labial or tongue-tip (т, с, ш), 3) mediolingual or palatal (к), and 4) uvular (қ). By *manner of articulation*, he categorizes them as: 1) complete closure (plosives – п, т, к, қ), and 2) partial closure (fricatives – с, ш) [9, 16]. He concludes: "Vowels can combine with all voiceless consonants, and these combinations occur throughout the entire word" [9, 17]. Accordingly, he proposes a model of adjacent compatibility (coarticulation) for voiceless consonants and makes scientific conclusions regarding how voiceless consonants form harmony variants depending on adjacent vowels, and on how their articulation is influenced by the horizontal and vertical (jaw) position of the tongue, as well as on the involvement of the lips, oral cavity, and pharyngeal space. A comprehensive study on the classification of consonants according to their pronunciation, particularly focusing on the phonetic characteristics of fricative consonants, was conducted by the scholar A. Koshkarov [10]. In his research, fricative consonants—referred to as sibilants—are analyzed from both phonetic and phonological perspectives. Each sound's articulatory, auditory, and phonetic properties, along with its distinguishing features, are examined systematically. S. Myrzabekov identifies a third group of stops and fricatives called trill consonants, to which he assigns the sound p [4, 58]. He explains that this sound is produced solely through the vibration of the tongue tip.

The research work of Z. Badambekkyzy, which determines the number of sounds in the articulatory base of the Kazakh language and identifies their distinguishing features, is of great importance. She studied the sound inventory of phonemes in the Kazakh language from the perspective of synharmonophology. The scholar systematically analyzed and described the distinctive features of each sound and the sound inventory of every phoneme in the language. The articulation of voiced consonants was systematically studied in the research of A. Moldasheva [11]. The articulation model of voiced consonants, based on the vibration of the vocal cords, was studied, and their common and distinctive features were classified according to their "hard" and "soft" harmony characteristics. A. Moldasheva analyzed the articulation of voiced consonants in words, phrases, and sentences, revealing their articulatory harmony. In her research, she demonstrates that the consonants ғ and г are articulated as stops at the beginning of a word and as fricatives in the middle of a word. She also provides examples of the variations of voiced consonants depending on the involvement of the lips and the tongue's position. The assimilation patterns of voiced consonants in the Kazakh language were analyzed in the research of Zh. Issayeva [12]. A systematic analysis was made regarding the phonetic characteristics of voiced consonants, their use within words, and their assimilation variations.

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The assimilation characteristics of consonants were further explored through the research of M. Raiymbekova.

The scholar A. Zhunisbek states that the number of consonant sounds in the Kazakh language is 17. He categorizes the sounds ғ-г and қ-к as variations of the same consonant in terms of assimilation [9]. "The articulation of consonants is characterized by three distinctive features (manner of articulation, place of articulation, and voicing), while the auditory properties are characterized by two features (the relationship between the oral and pharyngeal cavities, and the intensity of stops and fricatives), and the acoustic properties are defined by two features (the rate of stop and fricative intensity, and the voice quality)," concludes the scholar. According to A. Zhunisbek's research, the division of consonants into hard, soft, and voiced categories, is not based on articulation but on auditory characteristics. However, in phonetic science, these distinctions have traditionally been based on articulation. Therefore, the researcher considers it appropriate to give these sounds new names: hard (voiceless), soft (voiced), and voiced (vibrant), and concludes that «the primary classification of consonants is based on their voicing.»

In A. Zhunisbek's research, consonant sounds are classified as follows:

1. According to voicing: a) In voiceless consonants, the vocal cords do not vibrate (п, қ, к, с, ш); b) In voiced consonants, the vocal cords vibrate partially (б, *д*, ғ, г, з, ж); c) In nasal consonants, the vocal cords vibrate more (м, н, ң, р, *л*, и, у).

2. According to the place of articulation: a) Labial consonants are formed by the contact of the upper and lower lips (п, б, м, у); b) Alveolar consonants are formed by the contact of the tongue tip and the alveolar ridge (т, *д*, н, с, з, р, ш, ж, *л*); c) Velar consonants are formed by the contact of the tongue's back and the soft palate (қ (-к), ғ (-г), ң, и).

3. According to the manner of articulation: a) Stops are formed by the contact of speech organs (п, б, м, т, *д*, н, қ-к, ғ-г, ң); b) Fricatives are formed by the partial contact of speech organs (с, з, ш, ж, й, у, ғ, г, trill – р, lateral – *л*).

In phonetics, it is true that consonant sounds are considered as core consonants (the main allophone) based on the heavy back vowel harmony versions of sounds. Taking this issue into account, A. Junisbek classifies consonant sounds according to their harmony characteristics. Based on this classification, he proposes using terms like 'labial-velar' and 'progressive-regressive' to highlight the articulation characteristics of consonant harmony [9].

The analysis of singharmonism starts at the sound level. As a result of harmony analysis, the composition of vowel harmony sounds in the Kazakh language is fully identified. Thus, any word in the Kazakh language is formed from a combination of these sounds. As a result, the word, due to the harmonious combination of its sounds, will be naturally pronounced and sound natural. However, if the sounds in a word combine in a disorganized manner, it will not be a proper national word [13].

In the Kazakh language, there are four types of synharmony: back harmony, front harmony, labial harmony, and palatal harmony. However, in the structure of a syllable or word, the beginnings of two harmonies come together only when they meet:

- Back palatal harmony – [tɪs, taraq]
- Front palatal harmony – [t'is', t'ir'ek']
- Back labial harmony – [t°us°, t°usaq]
- Front labial harmony – [t'°üs'°, t'°ül'°ök'°]

For a word to have synharmony, it does not necessarily need to have multiple syllables; even monosyllabic words can exhibit vowel harmony. This proves that the principle of «harmony

of vowels» is incorrect because for vowel harmony to occur, a word must have at least two syllables. The composition of Kazakh consonant harmony is presented in the table (see Table 1).

Table 1 – Composition of Kazakh consonant harmony (According to A. Zhunisbek)

(SINGARMOLOGICAL) CLASSIFICATION OF CONSONANTS IN THE KAZAKH LANGUAGE						
Manner of articulation		**Voice involvement**	**Place of articulation**			
		bilabial	**labial**	**palatal**	**uvular**	
Plosives		**Voiceless**	**p p′ p° p′°**	**t t′ t°t′°**	**k′ k′°**	**q q°**
		Voiced	**b b′ b° b′°**	**d d′ d° d′°**	ɡ′ ɡ′°	ɣ ɣ°
		Sonorant	**m m′ m° m′°**	**n n′ n° n′°**	ŋ› **ŋ′°**	ŋ ŋ°
Fricatives	**Diffusive fricatives**	**Voiceless**		ʃ ʃ′ ʃ° ʃ′°		
		Voiced				ɣ ɣ°
		Sonorant				**y y°**
	Compact fricatives	**Voiceless**		**ss′ s° s′°**		
		Voiced		**zz′ z° z′°**	ɡ′ ɡ′°	
		Sonorant	**ww′**		**y′ y′°**	
	Vibration			**rr′ r° r′°**		
	Indirect			**ll′ l° l′°**		
Occlusive (affricate)		**Voiceless**				
		Voiced		**jj′ j° j′°**		
		Sonorant				

The analysis of the table shows that consonants are composed of four harmony resonances.

The primary place of articulation of consonant sounds does not change; instead, additional articulation is imposed upon it. This additional articulation indicates the harmony resonance of the consonant.

The oppositional relationships between the sounds in the linguistic system reflect the semantic paradigm of the language. Positional pairs of sounds are not only linguistic categories but also concepts that are interconnected with disciplines such as philosophy, logic, and psychology [14, 3].

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Consonant sounds (bilabial).

Harmonic consonants *п, б, м*: pronounced with a back resonance, and by their auditory features are classified as consonants with back resonance; since they are pronounced with a non-labial (spread-lip) resonance, their auditory feature is considered as *spread-lip* resonance.

Auditory feature: consonants with back spread-lip resonance.

Harmonic consonants *п', б', м'*: pronounced with a front resonance and, by their auditory features, are classified as consonants with front resonance; pronounced with spread-lip resonance, thus the auditory feature is *front spread-lip* resonance.

Auditory feature: consonants with front spread-lip resonance.

Harmonic consonants п°, б°, м°, у°: pronounced with a back resonance and are, accordingly, consonants with back resonance by auditory features; since they are pronounced with a labial (rounded-lip) resonance, the auditory feature is *back labial* resonance.

Auditory feature: consonants with back labial resonance.

Harmonic consonants *п'°, б'°, м'°, у'°*: pronounced with a front resonance and thus are classified as consonants with front resonance by auditory features; as they are pronounced with labial resonance, the auditory feature is *front labial* resonance.

Auditory feature: consonants with front labial resonance.

Other consonants in the Kazakh language are also transformed according to this system.

The 9-member harmony units

Harmony consonants *т, д, н*: These are pronounced with a back unrounded resonance, and according to their acoustic feature, they are classified as back unrounded resonant consonants.

Consonants *т', д', н'*: These are pronounced with a front unrounded resonance and are classified as front unrounded resonant consonants based on their acoustic characteristics.

Consonants *т'°, д'°, н'°*: These are pronounced with a front rounded resonance and are classified as front rounded resonant consonants according to their acoustic property.

Other consonant sounds in the Kazakh language, including the 12-member harmony units, are also transformed according to this system. Without delving into the full visual articulation model of Kazakh phonemes, we have provided only a few illustrative examples. The model clearly demonstrates the role of speech organs and their movement in the articulation of Kazakh sounds. To summarize briefly:

– The tongue's position within the oral cavity is categorized into four zones: tip of the tongue, mid-tongue, back of the tongue, and uvular region.

– The involvement of the lips in Kazakh sound production is also complex, consisting of five types: open lips, compressed lips, rounded lips, blunt lips, and pointed lips.

– The manner of articulation is also intricate, including: open, narrowed, approximant (with subtypes: lateral approximant, trilled approximant, wide approximant, and tight approximant).

– The vocal fold vibration presents four types: non-vibrating, fully vibrating, partially vibrating, and intermittently vibrating.

The analysis of the articulatory base of the Kazakh language shows that there are no front vowels/consonants or back consonants in the language.

It was also revealed that while some consonants share a common place of articulation across their harmony variants, other consonants have distant and differing places of articulation among their harmony variants.

Conclusion

Currently, the phenomenon of synharmonism in the Kazakh language—its phonetic and phonological nature, and its distinctive linguistic features—has been thoroughly studied and analyzed through various scholarly opinions and research. As a result, a phonetic characterization has been established in line with the level of development of contemporary phonetic theories.

Today, the phonetics of modern Kazakh is being examined extensively from the articulatory-acoustic perspective. In addition to articulatory and frequency parameters as physical properties, the auditory nature of speech sounds is also being investigated. There is a growing interest in conducting perceptual experiments on the acoustic features of speech sounds, as researchers seek to identify autonomous methods of phonetic description that could reveal the importance of linguistic signal properties and facilitate the transition to sound analysis. The perception of phonetic features in language plays a crucial role in linguistic communication, and experimental studies of these features is essential in determining the acoustic characteristics of a language.

In this article, we have attempted to comprehensively explore the phenomenon of synharmonism—a feature considered a systemic distinction from other world languages—within the phonetic system of contemporary Kazakh. Due to the lack of consistency in explaining the nature of common features in the sound system of Kazakh, the reasons for their change, distinguishing features, and causes of disruption, this issue remains one of the most pressing topics in contemporary linguistic science.

In recent years, new synharmonic and synharmonophonological theories have emerged within phonological studies. The integration of harmony theories alongside accent-phonemic theories within the broader field of phonology marks a significant achievement not only for Kazakh linguistics but for Turkology and global linguistic science as a whole. Analyzing and characterizing the origins, key concepts, terms, and methodological features of the currently established accent-phonemic and synharmonic theories remains an urgent and important task.

In this study, we have illustrated through examples and tables how Professor A. Zhunisbek was the first to provide a comprehensive phonetic description of the sounds of the Kazakh language, both from the perspective of synharmonism and beyond. During the analysis, consonant sounds in Kazakh were differentiated based on their articulatory features, and the structural forms of the core consonants were identified. The distinctive features of synharmonism were specified according to their phonological and phonetic characteristics and organized into a system aligned with the nature of the Kazakh language.

Today, while the harmonic alignment of vowel sounds is largely undisputed, the consonant harmony in Kazakh remains an unresolved issue. Analytical studies have demonstrated that consonants also play a specific role in a synharmonic language. Many scholars who have investigated the articulatory, acoustic, and auditory properties of sounds through laboratory methods have arrived at this conclusion. Most importantly, we emphasize that synharmonism unites sounds and syllables within a word and connects words in speech, thereby facilitating fluent and natural communication.

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Характер и сингармонизм согласных в казахском языке

Аннотация. В данной статье речь пойдет об особенностях современного казахского языка, о сингармонии в речи, внутри слов, между словами и звуками. До сих пор исследования доказали, что среди ученых существовали разные мнения о сингармонизме.

Большинство исследователей утверждают, что сингармония – это гармония гласных. В нашей работе мы на примерах доказали, что это относится и к согласным звукам. Мы систематически сгруппировали работы ученых, особенно исследователей, которые лабораторным путем изучали возникновение, произношение и слуховые характеристики звуков. Мы видим, что соответствие как гласных, так и согласных имеет особое значение в определении направления развития личности и значения односложных слов в современном казахском языке. При обработке собранного материала акцент был сделан на функции сингармонии в языке. Примеры были систематизированы и сгруппированы с помощью сравнительного и сопоставительного методов. Участие голосовых связок было основано на производстве знаков, а производство звуков в нашем языке описывалось их вибрационными волнами. Сделан вывод, что если голосовая связка колеблется полностью – гласные, если колеблется больше – тон глухой, если колеблется частично – глухой, а если не колеблется совсем – твердый глухой.

Ключевые слова: казахский язык, согласные звуки, голосовые связки, сингармонизм, фонетика, артикуляция, звуки.

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Қазақ тіліндегі дауыссыз дыбыстардың сипаты және сингармонизмі

Аңдатпа. Бұл мақалада қазіргі қазақ тілінің, сөйленістеріндегі, сөз ішіндегі, сөз бен сөздің арасындағы, дыбыстарындағы сингармонизмнің ерекшеліктері жайлы сөз болады. Осы уақытқа дейін сингармонизм жайлы ғалымдар арасында түрлі пікірлердің болғанын зерттеу жұмысы дәлелдеді. Зерттеушілердің көпшілігі сингармонизмді дауысты дыбыстардың үндесуі деген пікірді алға тартады. Біз өз жұмысымызда оның дауыссыз дыбыстарға да қатысы бар екенін мысалдар арқылы дәлелдедік. Өзімізге дейінгі ғалымдардың, әсіресе дыбыстардың жасалым, айтылым, естілім сипатын лабораториялық жолмен сараптаған зерттеушілердің еңбектерін жүйелеп топтастырдық. Қазіргі қазақ тіліндегі моносиллабтардың тұлғалық, мағыналық даму бағытын айқындауда дауыстылардың да, дауыссыздардың да сәйкестігінің маңызы ерекше екенін көре аламыз. Жинақталған материалдарды өңдеу барысында сингармонизмнің тілде атқаратын қызметіне баса назар аударылды. Мысалдар салыстырмалы, салғастырмалы әдістер арқылы жүйеге келтірілді, топтастырылды. Дауыс желбезегінің қатысуымен қазақ тіліндегі дыбыстардың жасалуы желбезектің тербеліс толқындарына байланысы арқылы көрінеді. Дауыс желбезегінің толық тербелуінен – дауыстылар, көбірек тербелуінен – үнді дауыссыз дыбыстар, орташа тербелетін болса – ұяң дауыссыз дыбыстар, ал мүлде тербелмесе – қатаң дауыссыз дыбыстар пайда болады деген тұжырым қорытындыланды.

Түйін сөздер: қазақ тілі, дауыссыз дыбыстар, дауыс желбезегі, сингармонизм, фонетика, артикуляция, дыбыстар.

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