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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

TYPOLOGY OF PHONEMIC OMBINATIONS IN LANGUAGE
(Based on materials from English and Azerbaijani)

Specialty: 5704.01 – "Theory of language"

Field of Science: Philological sciences

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INTRODUCTION

Relevance and extent of the topic. In typological studies of multistructural languages, the main point of theoretical relevance is not so much the identification of similar and different aspects in the phonological inventories of the languages being compared, but rather the discovery of the combinatorial possibilities and features in the organizing principles of their phonological systems. The comparative study of cross-structured languages from a communicative (functional) and linguistic perspective has theoretical and practical significance, because their comparative-typological research reveals not only common or different features, and also allows for the full disclosure of the individual characteristics of the languages under comparison (English and Azerbaijani). The study of the sequence of phoneme realizations in syntagmatics makes it possible to identify certain regularities that form the basis of phonological research. In this regard, the study of regularities in phonemic combinations in different languages also holds special *relevance* for typological linguistics, as a correct interpretation of this problem allows for the identification of similar and different aspects between the phonotactic models of dissimilar languages, lays the groundwork for determining the frequency of phoneme occurrence in the language.

The theoretical basis of the study is reflected in the works of many researchers (A.A. Akhundov [1] , S.M. Babayev [2] , T.I. Hidayatzade[3] , F.Y. Vaiselli[4] , F.H. Zeynalov[5] ; S.V. Androsova[6] ,

[1] Akhundov, A.A. The Phonemic System of the Azerbaijani Language / A.A. Akhundov. – Baku: Maarif, – 1971. – 302 p.

[2] Babayev, S.M. English Phonology (in English) / S.M. Babayev. – Baku: Nurlan, – 2004. – 204 p.

[3]Hidayətzadə, T.İ. The English Language in an Azerbaijani Classroom / T.İ.Hidayətzadə. – Baku: Maarif, – 1987. – 104 p.

[4] Veysəlli, F.Y. Fundamentals of Linguistics / F.Y.Veysəlli. – Baku: Mütərcim, – 2013. – 417 p.

[5] Zeynalov F.H., Hüseynova Z.Ə. Pronunciation and spelling in english. – Baku: – 1998

[6] Androsova, S.V. The Syllable: A Unit of Language or Speech? // Vestnik SPbGU. – 2009. – Ser. 9, Iss. 2, Pt. II. – pp. 91-102

L.Blumfield [7] , L.R. Zinder [8] , I.A. Boduen de Courtenay [9] , S.E. Poladova[10] , G.P. Torsuyev[11] , N.S. Trubetskoy[12] , L.V. Sherba[13] , P. Laidlaw[14] , P. Roach[15] , etc.).

Object and Subject of the Study. The object of the study is consonant combinations realized in various positions within the word or morpheme structure in multilingual languages. *The subject of the research* is to systematize and generalize the acoustic characteristics of consonant combinations in different positions of the word structure, based on the material of the languages under study.

Research Aims and Objectives.

-to analyze the theoretical literature on the topic;

-identifying the phonemes that make up the consonant combinations in the compared languages;

-to determine the sequence of articulation of the consonants in consonant clusters in both languages;

-determine the number of phonemes in the syllable structure;

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[7] Bloomfield, L. Language / L. Bloomfield. – Moscow: Editorial URSS, – 2002. – 608 p.

[8] Zinder, L.R. General Phonetics / L.R. Zinder. – Moscow: Vysshaya Shkola, 1979. – 312 pp.

[9] Baudouin de Courtenay, I. A. Selected Works on General Linguistics / I. A. Baudouin de Courtenay. – Moscow: Publisher of the Academy of Sciences of the USSR. – 1963. Vol. I. – 391 pp.; Vol. II. – 384 pp.

[10] Polaodava, S.E. Phoneme. Questions of Segment and Supersegment Phonology of Modern English / S.E. Polaodava. – Baku: – 2009. – 87 p.

[11] Torsakov, G.P. Issues of the Phonetic Structure of the Word: Based on the English Language / G.P. Torsakov. - Moscow; Leningrad: USSR Academy of Sciences Publishing House, 1962. – 155 pp.

[12] Trubetskoy, N. S. Principles of Phonology / N. S. Trubetskoy. – Moscow: Foreign Languages Publishing House, 1960. – 372 pp.

[13] Shcherba, L.V. Phonetics of the French Language: An Outline of French Pronunciation in Comparison with Russian / L.V. Shcherba. – Moscow: Vyshaya Shkola, – 1963. – 309 pp.

[14] Ladefoged P., Maddieson I. The Sounds of the World's Languages (Phonological Theory) / P.Ladefoged. – London: Blackwell, – 1995. – 448 p.

[15] Roach, P. English Phonetics and Phonology: A Practical Course / P. Roach. – Cambridge: CUP, – 2009. – 244 p.

-to determine the regularities of phonemic combinatorics in syntax (speech);

-to identify the different and similar aspects observed in phonemic combinations in the languages under study;

-record experimental material in native speakers' performances and conduct its acoustic and perceptual analysis;

-to perform a statistical calculation of the length indicators of individual components in phoneme combinations;

-to summarize the results of the experiment and to reveal the regularities observed in phoneme combinations in syntagmatics.

Research Methods. The research utilized the methods of induction, comparison, mathematical and statistical calculation, contrastive-relative description, as well as oscillographic and spectrographic analysis.

The main theses to be defended:

-determining the structure of phonemic combinations in syntax allows for considering the changes that occur in these combinations not as isolated events, but as a process that unfolds with a certain degree of interconnection;

-the realization features of syllabic models, including consonant clusters, must be studied not within isolated words, but in the act of speech, i.e., in the natural communication process;

-The position and context in which phonemes are realized must be taken into account when determining the structure of combinations in syntax, because the discovered classification of the distribution of phonemes by type and context reveals the regularities of the phonemics of the phonemes, serves to reveal the reasons for the possibility and impossibility of combinations;

The segmentation of the speech act must be carried out in accordance with the phonological information in the speech signals, because the language system imposes certain restrictions on the phonemic combinations realized in syntagmatics, which, in turn, is a leading criterion in the perception of speech signals.

Scientific novelty of the study. The functional approach allows for identifying the specific features of the phonological systems of the studied languages, allows for identifying the combinatorial

properties of phonemes within the composition of higher-level units, determining the effective functional loads of consonant and vowel subsystems, as well as characterizing the interactions and relationships of phonological units. *The scientific novelty of the work* lies in the statistical study of the frequency of occurrence of phoneme combinations in syntagmatics and the experimental-phonetic investigation of the phonetic changes that phonemes undergo in these combinations.

Theoretical and practical significance of the research. Its theoretical significance lies in the potential application of the work's findings to future research in phonotactics. The results of the study can be used in the development of a realization theory for units of the emic level in the etic level (speech). The practical significance of the study lies in the use of its findings to provide suggestions and recommendations for teaching English to an Azerbaijani-speaking audience. The results of the study can also be a useful resource for developers of programs in the field of speech synthesis and automatic recognition.

Acknowledgment and Application. The main provisions of the research are reflected in the author's published articles and were also presented at seminars of the General Linguistics Department of Azerbaijan University of Languages.

Name of the institution where the dissertation was completed. Completed at the Department of General Linguistics, Azerbaijan University of Languages.

The total volume of the dissertation, including the volume of its structural sections, is indicated. The dissertation consists of an introduction, three chapters, a conclusion, and a list of references. The Introduction is 7 pages (12,875 characters), Chapter I is 46 pages (90,719 characters), Chapter II is 37 pages (67,365 characters), Chapter III is 37 pages (60,218 characters), The Conclusion is 4 pages (7,542 characters), for a total of 238,719 characters.

MAIN CONTENT OF THE WORK

The introduction to the dissertation explains the topic's relevance, its object and subject, scientific novelty, theoretical and practical significance, the research's goals and objectives, the language material, and the research methods.

In the first paragraph, "General Notes," of **the** dissertation's **first chapter**, **"The Status of Phonemes in English and Azerbaijani,"** it is noted that in the typological study of languages, the placement of morphemes within the word structure is taken as the basis. As R.O. Jakobson noted, *"...typology reveals the laws of implication that constitute the basis of the various levels of language, i.e., the presence or absence of element A."*[16] A.A. Reformatsky, however, distinguishes two tasks in typological research: "1) *the creation of a general typology of the world's languages; 2) the typological description of the individual characteristics of specific languages, with a distinction between their regular and irregular phenomena*."[17]

The main task of phonological typology, however, is to reveal the functional properties of the phoneme. In determining the typology of language phonological systems, the following indicators are referred to: *1) the quantity and quality of the phoneme inventory based on articulatory-acoustic features; 2) the quantity and quality of phonemic oppositions and correlations determined based on an analysis of distributions and contrasts; 3) the presence of neutralization of phonemes in realization; 4) the strength of contrasts; 5) the distributions of phonemes and their frequencies of occurrence; 6) the function of the phoneme in the word.*

Paragraph 2 of the dissertation, titled *"Criteria for Determining Phoneme Status,"* notes that the basis for isolating a phoneme from the infinite variety represented by material-substantive sounds in an act of speech is a functional criterion.

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[16] Jakobson, R. O. Typological Studies and Their Contribution to Comparative- Historical Linguistics // Novoye v Lingvistike. Iss. III. – Moscow: – 1963. – p. 97.

[17] Reformatsky, A.A. Introduction to Linguistics / A.A. Reformatsky. – Moscow: Aspekt Press, – 2005. – p. 456.

In the phoneme theory of the Leningrad phonological school, the autonomy of the language's phonetic side occupies an important place. As L. V. Sherba wrote, "*...elements of meaning images (word forms and morphemes) in most cases create associations with elements of phonetic images, for example, /l/ in the words "pil, bil, vıl, dala" is associated with the past tense form, while in the words "korova, voda" /a/ is associated with the subject's perception, and in the words "korovu, vodu" it is associated with the object's perception. It is through such meaning associations that the elements of our phonemic imagery (phonemes) gain a certain independence*."[18]

The autonomy of the language's phonetic side means that once a connection with a morpheme is established in the language system, the sound thereby gains autonomy, and this independence is preserved even if the connection is not directly evident in other cases. According to L.R. Zinder, "*a phoneme has the status of an independent unit in a language by virtue of its ability to be isolated as an independent unit in cases where it is neither the sound-form of a morpheme nor of a word and carries no morphological function, that is, when it represents a purely phonological unit*."[19]

L. Bloomfield is interested in sounds only because they differentiate meaning.[20] This idea can be partially agreed with, because all languages have phonologically significant sounds. For example, if we replace the first consonant in the English word "man" with the consonant /p/, we will get the word "pan." In this way, it is possible to create a large number of words: *"fan", "pan", "ban", "tan", "ran",* etc. By changing the vowel in the root of a word, new words can be formed: *"mean", "moan", "men", "mine", "moon",* etc. In some words, replacing the final consonant yields a new minimal sequence: "*man", "mat", "mad", "map", "max*". Thus, the distinctive

[18] Shcherba, L.V. From Lectures on Phonetics // The Language System and Speech Activity. L.V. Shcherba. – Leningrad: Nauka, – 1974. – p.158.

[19] Zinder, L.R. General Phonetics / L.R. Zinder. – Moscow: Vysshaya Shkola, – 1979. – p. 39.

[20] Bloomfield, L. Language / L. Bloomfield. – Moscow: Editorial URSS, – 2002. – 608 p.

features of the word "man" are three units that cannot be divided into smaller parts.

According to D. Coon, a phoneme *is* "*a family of sounds in the language that are related by their character and in which one member cannot occur in the same phonetic position as another*."[21] In his view, "*a phoneme has a semantic function, because if a member of one phoneme can be in the same situation as a member of another phoneme, then the sequence can be changed by substituting one sound for the corresponding sound of the other phoneme*."[22] D. Counz confuses the semantic function of the phoneme with the functional importance of the sound. However, just as the functional value of the phoneme in paradigmatic relations is not clear, its value in syntagmatic processing is also indeterminate, because, according to the author, it is sounds, not phonemes, that are at work in syntagmatic relations.

H. Glisson, who defines the phoneme *as* "*the minimal unit of the expressive system of spoken language*"[23] , explains it as "*a class of sounds 1) phonetically similar; 2) characterized by certain distribution patterns in the language or dialect under study*."[24] The author, who does not accept the psychological nature of the phoneme, writes about the phoneme in the end: "*The phoneme is a unit of the structure of language. ... the concept of the phoneme is removed from psychological and acoustic considerations. ... the phoneme is a purely linguistic phenomenon*."[25] In American linguistics, the minimal pair method is used to determine a sound's phonological status. For example, "pit"–"bit." We cannot agree with the use of the minimal pair method to prove the phonemicity of any sound. In the words of F.Y. Veyselli, "*...the flaw in these views is*

[21] Jones, D. An Outline of English Phonetics // D. Jones. – Cambridge: Cambridge University Press, – 1997. – p. 48.
[22]Ibid., p. 13.
[23] Glosson, H. Introduction to Descriptive Linguistics / H. Glosson. – Moscow: LKI Publishing House, – 2008. – p. 39.
[24] Glisson, H. Introduction to Descriptive Linguistics / H. Glisson. – Moscow: LKI Publishing House, – 2008. – p. 233.
[25] Ibid., p. 243.

that, by taking mechanical word confrontations as a basis, they focus on the sound's meaning-differentiating function. ...the linguistic status of a language unit without meaning is determined by the semantics that lies beyond it."[26] L.R. Zinde, however, writes in[27] that in determining the phonemic composition of a language, most phonologists "*take as the basic criterion whether or not a given pair of sounds has a distinctive function*."

According to the L.V. Sherba school, a speech sound cannot be isolated from the speech stream by either acoustic or physiological criteria. L.V. Sherba's criteria were presented not on an implicit, narrow morphological basis, but precisely in the spirit of I.A. Boduen de Courtenay's idea of "*semasilogized phonetic phenomena*."[28] This idea of his was reflected in the research of L.R. Zinder.[29]

Since the contrastive, distinctive function is the primary function of a phoneme in most studies, some researchers reduce the determination of a language's phonemic composition to the procedure of searching for "minimal pairs" whose components differ by a single phoneme. According to L.R. Zinder, "...*the phoneme's discriminative function is based not on its occurrences in 'minimal pairs' in the language, but on its differences from other phonemes in that language*." [30] Thus, the "distinction-making" function of phonemes is based not on the existence of "minimal pairs" in the language, but on their differences from one another. In the words of L.R. Zinder, "...*phonemes serve not the differentiation of meanings, but the differentiation of words, for they constitute their sound-*

[26] Yadiğar, F. (Veysəlli). Issues of Phonetics and Phonology / F.V.Yadiğar. – Baku: Maarif, – 1993. – p.60.

[27] Zinder, L.R. General Phonetics / L.R. Zinder: – Moscow: Higher School, – 1979. – p. 63.

[28] Baudouin de Courtenay, I. A. Selected Works on General Linguistics / I. A. Baudouin de Courtenay. – Moscow: Publisher of the Academy of Sciences of the USSR. – 1963. – Vol. II. – p. 280.

[29] Zinder, L.R. General Phonetics / L.R. Zinder: – Moscow: Vysshaya Shkola, – 1979. – 312 pp.

[30] Zinder, L.R. General Phonetics / L.R. Zinder: – Moscow: Vysshaya Shkola, – 1979. – p. 41.

complex."[31] According to L.R. Zinder, a critic of the "minimal pairs" method, "*the function of the phoneme is not to distinguish words and word forms, but to identify these units of language*."[32]

However, in cases where the phoneme does not function as a component of a word or morpheme, the "residual division" principle proposed by L.L. Bulani comes to the researcher's aid. According to the principle of residual division, if one of the consonants in the word's phonetic makeup can be isolated by a morphological boundary, the other sound can be separated from the speech act according to the residual division. According to the author, "*if a phoneme is directly related to meaning, i.e., if it constitutes the sound shell of a word or morpheme, then it can be isolated in cases where it does not constitute the sound shell of a higher-level unit*." [33] For example, in the word /nɛt/, the /t/ can be detached by morphological binding, as in the word /ge:t/, and the /n/ can be detached by its connection to the morpheme (as a plural marker in /ta:fəl+n/) and by the principle of residual division in /ɛ/.

The 3rd paragraph of the work, titled *"Phonemic Systems and Phonological Encounters of* the *Azerbaijani and English Languages,"* indicates the importance of determining a language's phonemic inventory before studying any of its phonological system issues. According to D. Couza, there are 20 vowel phonemes in English—12 monophthongs and 8 diphthongs[34] According to P. Ladefoged, "*there are 12 monophthongs and 7 diphthongs in English*."[35] T.I. Shevchenko also writes that in English there *are* "*20 vowels*: *12 monophthongs (7 short, 5 long) and 8 diphthongs*."[36]

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[31] Ibid., p. 41

[32] Zinder, L.R. On "minimal" pairs // Language and Man. – Moscow: Moscow State University Press, – 1970. – p. 107.

[33] Bulanin, L.L. Phonetics of Modern Russian / L.L.Bulanin. – Moscow: Vysshaya Shkola, – 1970. – p.29.

[34] Jones, D. The Phoneme: its Nature and Use / D. Jones. – Cambridge: – 1950. – 260 p.

[35] Ladefoged, P. Vowels and Consonants: An Introduction to the Sounds of Languages / P.Ladefoged. – Oxford: Blackwells, – 2005. – p.96.

[36] Shevchenko, T.I. Phonetics and Phonology of the English Language / T.I. Shevchenko. – Dubna: Feniks+, – 2011. – p.75.

According to G. Alekperli, "*The Azerbaijani language has 12 vowel phonemes. Of these, 9 are short and 3 are long /e:, ə:, ö:/*."[37]

E.M. Demirchizade writes that "there are *9 vowel* phonemes *in the Azerbaijani literary language*,"[38] while F. Kazimov writes that there are 15 vowels: "9 *short, 6 long vowels*.[39] Both A.A. Akhundov[40] and F.Y. Veyselli show that there are 9 vowels in the Azerbaijani language.[41]

According to V.D. Arakin, "*the total number of consonant phonemes in English is 24 phonemes*."[42] T.I. Shevchenko also writes that there are 24 consonants in English,[43] . E.M. Demirchizadeh "*…25 consonant* phonemes *in the modern Azerbaijani literary language*"[44] , A.A. Akhundov "*25 consonant* phonemes" [45] , T. Hidayetzadeh 24 consonants [46] , and F.Y. Veyselli also writes that there are 24 consonants.[47]

According to N.S. Trubetskoy, "the phonemic composition of

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[37] Alekperov, A.K. The Phonematic System of the Modern Azerbaijani Language / A.K. Alekperov. – Baku: Elm, – 1971. – p.27.

[38] Dəmirçizadə, Ə. Modern Azerbaijani Language. Phonetics, Pronunciation, Orthography / Ə.Dəmirçizadə. – Baku: Maarif, – 1984. – p.47.

[39] Kazimov, F. The System of Vowel Phonemes of the Azerbaijani Language // "Izv. AN USSR, OLY", – 1952. Vol. XI, no. 4, – p. 300.

[40] Axundov, A.A. The Phonetics of the Azerbaijani Language / A.A.Axundov. – Baku: Maarif, – 1984. – p.21.

[41] Veysəlli, F.Y. Fundamentals of Structural Linguistics: [In 6 volumes] / F.Y.Veysəlli. – Baku: Mütərcim, Vol. I. – 2005. – p.144.

[42] Arakin, V.D. Comparative Typology of English and Russian Languages / V.D. Arakin. – Leningrad: Prosveshcheniye, – 1979. – p.72.

[43] Shevchenko, T.I. Phonetics and Phonology of the English Language / T.I. Shevchenko. – Dubna: Feniks+, – 2011. – p. 46 .

[44] Dəmirçizadə, Ə. Modern Azerbaijani Language. Phonetics, Pronunciation, Orthography / Ə.Dəmirçizadə. – Baku: Maarif, – 1984. – p.264.

[45] Akhundov, A.A. The Phonetics of the Azerbaijani Language / A.A. Akhundov. – Baku: Maarif, – 1984. – p. 88.

[46] Hidayezadeh, T.I. A Comparative Study of Azerbaijani and English Consonant Phonemes // Proceedings of the S.M. Kirov Azerbaijani State University, – Baku, – 1961. – p.17.

[47] Veysəlli, F.Y. Fundamentals of Structural Linguistics: [in 6 volumes] / F.Y. Veysəlli. – Baku: Mütərcim, Vol. I. – 2005. – p. 127.

a language is only a correlate of phonological oppositions. ... in phonology, the primary role belongs not to phonemes, but to contrastive oppositions**.**" [48] Regarding the author's statement that "the phonemic composition of a language is essentially only a correlate of phonological oppositions," we would like to note that in such an approach, the role of oppositions is greatly exaggerated. The basic unit of phonology is the phoneme, and the system of oppositions reflects various relationships between phonemes. The author divides oppositions according to the system and the relationship between the members of the opposition. Oppositions between members are privative (binary), gradational (hierarchical), and equipollent (equivalent). Oppositions between members are contrasted with oppositions in relation to the system, and in this context, propositional, isolated, and multi-dimensional oppositions are distinguished. In the English vowel system, there are 6 contrasts based on the tongue's horizontal movement: /i: - u:/ – "beat - book"; /æ - a/ -"cat - art"; /I - v/ – "kick - cook"; /a:- ɔ/ – "heart - hot"; /e - є/ – "bed - bird"; /(ʌ - ɔ:/ – "tuck - talk".

In the English vowel system, there are 9 contrasts due to the vertical movement of the tongue:

1) within the same rise: /i: - i) – "feel - fil"; /ɛ: - ə/ - "foreword - foruvard"; /u: - v/ - "pool - pul"; /ɔ: - ə/ - "pot - pot".

2) within different syllables: /i: - æ/ - "seed - sad"; /v-ʌ/ "look - luck"; /i: - e/ - "neat - net"; /i-e/ - "bil - bel"; /v - a:/ - "look - lark"; /u: -ɔ/ – lool - fal; /u: - o/ - "soup - sop".

In English, 20 vowel phonemes are contrasted against other phonemes in the system. 20 x 19 = 380. Each pairing is repeated—/o–a/; /a-o/—so the number of binary pairings is half, at 190.

Vowel contrasts in Englishbased on vertical tongue movements: /i/ - /e/; /ie/ - /ei/; /u/ -/ɔ/; /u:/ -/ɔ:/; /uɔ/ - /ɔi/; /i/ - /æ/; /iə/ - /ai/; /u:/ - / a:/; /uɔ/-/ou/; /e/-/æ/; /ei/-/ai/; /ɔ/-/ʌ/; /ɛə/ - /au/; /ɔ:/ - /a:/; /ɔi/ - /ou/.

In the phonological system of the Azerbaijani language, the number of consonant-vowel combinations is 9 x 8 = 72. The number

[48] Trubetskoy, N.S. Foundations of Phonology. Translated from the German with "Afterword" and "Notes" by Prof. F. Veyselli. – Baku: Mutərcim, – 2012. – p.87.

of binary combinations within the system will be 9 x 8 : 2 = 36.

Vowel encounters in Azerbaijani along the vertical axis of the tongue: /i/ - /e/; /i/ - /ə/; /i/ - /o/; /i/ - /ı/; /i/ - /a/; /ü/ - /e/; /ü/ - /ə/; /ü/ - /o/; /ü/ - /ı/; /ü/ - /a/; /u/ - /e/; /u/ - /ə/; /u/ - /o/; /u/ - /ı/; /u/ - /a/; /ö/ - /e/; /ö/ - /ə/; /ö/ - /o/; /ö/ - /ı/; /ö/ - /a/; /e/ - /a/; /ə/ - /a/; /o/ - /a/; /ı/ - /a/.

Meetings of vowels in Azerbaijani according to the horizontal movement of the tongue: /e/ - /ə/; /e/ - /ı/; /e/ - /a/; /e/ - /o/; /e/ - /u/; /i/- /ə/; /i/ - /ı/; /i/ - /a/; /i/ - /o/; /i/ - /u/; /ö/ - /ə/; /ö/ - /ı/; /ö/ - /a/; /ö/ - /o/; /ö/ - /u/; /ü/ - /ə/; /ü/ - /ı/; /ü/ - /a/; /ü/ - /o/; /ı/ - /a/; /ı/ - /o/; /ı/ - /o/.

Considering that there are 24 vowels in English, the number of pairings in this language should be 24 x 23, since a vowel cannot pair with itself. Therefore, there are 552 contrasts in the English language. Considering that each pair is repeated (e.g., /p-b/ and /b-p/), the number of binary contrasts should be halved: 24 x 23 : 2 = 276.

An analysis of consonant combinations (552 combinations) shows that the unary oppositions are as follows: /b-p/; /d-t/; /g-k/; /b-m/; /d-n/; /g-ŋ/; /ʤ- ʧ/, /θ-ð/; /v-f/; /s-z/; /s-ʃ/; /r-l/; /ʒ-ʃ/.

In English, of 552 contrasts, 72 are single-dimensional isolated oppositions, while the others are multi-dimensional contrasted oppositions. In English, the phoneme /h/ contrasts with /ʃ/, /r/, While the consonants /l/ form a monolateral isolated opposition with other phonemes, they form multilateral combinations with the phonemes /s/, /ʦ/, /ʧ/, /n/, /j/, /c,/, /k/, /g/, /ŋ/, /x/.

Considering that the Azerbaijani language has 24 consonant phonemes, the number of possible confrontations in this language should be 24 x 23. In the Azerbaijani language, there are 552 consonant combinations. Considering that each combination is repeated in the system (e.g., /p-b/ and /b-p/), the number of binary combinations should be halved: 24 x 23 : 2 = 276.

Of the total 552 consonant encounters in the Azerbaijani language, 65 are monophthongal proportional, while the remaining 422 are isolated. Of these encounters in the consonant subsystem of the Azerbaijani language, 20 are multimorphemic, 2 are monomorphemic, 1 is privative, 21 are equipollent, 6 are isolated,

and 16 are proportional.

The first paragraph, "Theoretical and Concrete Types of Phoneme Combinations," of **the second chapter** of the dissertation, titled **"Phonotactic Models of Phonemes,"** demonstrates that the syllable is included in all phonological studies. The syllable serves the grouping of phonemes according to the combinatorial laws of a specific language and performs a phonotactic-distributive function. According to E. Palgrem, "*if the syllable is the operational unit of all languages, then it is also a universal linguistic unit*."[49] F. Y. Vaiselli calls the syllable the place where phonemes are first realized, and in his opinion, "*the syllable is the smallest unit of prosody and it has no phonological significance*."[50]

In the second paragraph of the work, titled *"Consonant Combination (Combinatorics),"* it is noted that languages with a high degree of freedom in phoneme combinations are represented by various syllable models, while in languages with limited phoneme combinations, the syllable models are also limited. According to F. Y. Vəseyli, "*the study of regularities in phoneme combinations is also of great importance for typological linguistics*."[51]

C. Hockett distinguishes initial, nucleus, and coda in syllable structure: "*...the coda (the final consonant or group of consonants) has a relatively low rank in the hierarchy of the syllable in relation to the initial*."[52] T.I. Shevchenko writes that there are 19 syllable models in English.[53] G.P. Torsuyev accepts 23 syllable types in English.

A.A. Akhundov mentions 6 syllable types and 25 syllable patterns. [54] F.Y. Vaiselli writes that of the 21 possible syllable

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[49] Pulgram E. Syllable, word, nexsus, cursus / E.Pulgram. The Hague: Paris, Mouton, – 1971. – p.39.

[50] Veysəlli, F.V. Introduction to Linguistics / F.Y. Veysəlli. – Baku: Mütərcim, – 2017. – p. 200.

[51] Veyselli, F.Y. Selected Works / F.Y. Veyselli. – Baku: Mütərcim, Vol. I, – 2009. – p. 51.

[52] Hockett, Ch. A Manual of Phonology / Ch.Hockett. – Baltimore: – 1955. – 246 p.

[53] Ibid., p. 101.

[54] Akhundov, A.A. Phonetics of the Azerbaijani Language / A.A. Akhundov. – Baku: Maarif, – 1984. – p.245

patterns in monosyllabic words in the Azerbaijani language, 12 are encountered.[55]

The volume of texts from English subjected to statistical analysis: literary text – 10,112 characters (2,204 words), journalistic text – 10,056 characters (1,885 words), scientific text – 11,002 characters, (2,112 words). The volume of texts from the Azerbaijani language subjected to statistical analysis: literary text – 9,500 characters (1,528 words), journalistic text – 9,400 characters (1,500 words), scientific text – 9,980 characters (1,520 words).

In all three language materials, the highest frequency in syntagmatics belongs to the KV (consonant + vowel) sequence: 1004 syllables in the literary text, 616 in the journalistic text, and 554 in the scientific text. In English, another active model is the KVK model. This syllable model is recorded 152 times out of 1,434 occurrences in the literary text, 253 times out of 982 occurrences in the journalistic text, and 239 times out of 1,189 occurrences in the scientific text (See: table 2.2.1). The KVKK and KKVKK combinations are relatively less common in literary texts. A total of 21 consonants (excluding /ŋ, tʃ, dʒ/) serve as the first component in the formation of the CVC syllable model. In these types of combinations, the second component consists of 17 consonants (excluding the consonants tʃ, dʒ, ŋ, j, w, r, and ö). In these syllable models, the syllable peak is composed of 18 vowels.

Statistical results for English texts reflect the predominance of the open syllable model – 56%. A relatively weak indicator belongs to the covered-closed syllable type (KVK): 152 syllables in the literary text, 253 syllables in the journalistic text, and 239 syllables in the scientific text. In terms of quantitative ratio, this syllable structure makes up 16% of all the language material. In terms of frequency of use in the language material, the third place is occupied by the pure syllable (V): 86 syllables in literary texts, 18 in journalistic texts, and 21 in scientific texts. This type of syllable model accounts for 3.2% of the total syllable count. The VK syllable

[55] Veyselli, F.Y. Selected Works // F.Y. Veyselli. – Baku: Mutərcim, Vol. I. – 2009, – p. 53.

model, however, accounts for 12.8% of the total syllable count across the texts. The KS syllable model (recorded in 312 cases) accounts for 8% of the syllable models across the texts.

The following results were obtained from the statistical analysis of the Azerbaijani language material. In all three types of text, the KV (consonant + vowel) sequence has the highest frequency: 2,155 syllables in the literary text, 1,954 in the journalistic text, and 2,460 in the scientific text.

In the literary text, the ratio of words to syllables is 1528 : 3725. 1528 : 3725 = 0.41. In the publicistic text, the ratio of words to syllables is 1500 : 3742. 1500 : 3742 = 0.40. In the scientific text, the ratio of words to syllables is 1520 : 4673. 1520 : 4673 = 0.32.

The statistical results show that the open syllable model predominates in all three texts – 53%. A relatively weak indicator belongs to the covered-closed syllable type (KVK): 1356 syllables in the literary text, 1323 in the journalistic text, and 1520 in the scientific text. According to the quantitative ratio, this syllable structure makes up 34% of all the linguistic material. In terms of frequency of use, the 3rd place is occupied by the pure syllable (V): 270 syllables in the literary text, 220 in the journalistic text, and 280 in the scientific text. In 4th place is the closed syllable model: 180 syllables in the literary text, 185 in the journalistic text, and 205 in the scientific text. According to frequency of occurrence, the KVKK syllable model ranks 5th: 22 syllables in literary text, 50 in journalistic text, and 105 in scientific text. In terms of frequency of occurrence, the VCC syllable model comes in 6th place: 11 syllables in literary text, 10 in journalistic text, and 8 in scientific text. In the literary text, the KV syllable model constitutes 54% of the total syllable mass, while the KVK syllable model constitutes 34%. The KV and KVK syllable models make up 88% of the total syllable mass. In the journalistic text, the KV syllable model constitutes 52% of the total syllable mass, while the KVK model constitutes 36%. The KV and KVK syllable models make up 88% of the total syllable mass. These frequency rates indicate that in literary and journalistic texts, the KV and KVK syllable models account for 88% and 12% of the remaining syllable models, respectively.

In scientific text, the KV syllable model constitutes 53% of the total syllable mass, while the KVK model constitutes 33% of it. Overall, the KV and KVK syllable models make up 86% of the total syllable mass. These frequency indicators mean that in the scientific text, the ratio of KV and KVK syllable models to the remaining syllable models is 86% : 14%.

The KKV syllable model, however, is found in Azerbaijani in both literary and scientific texts: 1 time in the literary text and 8 times in the scientific text, KVKKK, KKVK, The KKKVK and KKVKK models are found only in the Azerbaijani scientific text, and they consist mainly of borrowed terms. In the scientific text, the KVKKK syllable model is found 20 times, the KKVK model 35 times, the KKKVK model 12 times, and finally, the KKVKK model 6 times. In all three language materials in the Azerbaijani language, the covered-closed KKVKKK, KKKVKK, KKKVKKK, the closed syllable models KVKKKK and KKVKKKK, and the open syllable model – KKKV – are generally not found. In the literary text, 7 viable syllable models were recorded; in the journalistic text, 6 viable syllable models; and in the scientific text, 11 viable syllable models.

Paragraph 3 of Chapter II of the study, titled *"The Combinatorics of Vowel-Consonant Combination,"* states that the constraints determining the combinatorial properties of phonemes are related to the function of the phonological system. A distributional analysis of a literary text in English reveals 20 consonants after the /i/ vowel, 17 consonants after the /e/ and /æ/ vowels, 19 consonants after the /ʌ/ vowel, 16 consonants after the /ə/ vowel, 16 consonants after the /ʊ/ vowel, 13 consonants after the /ə/ vowel, reflects that 14 consonants were recorded after the /i:/ vowel, 12 after the /ɑ/ vowel, 12 after the /ɔ:/ vowel, 8 after the /u:/ vowel, and 12 after the /ɜ:/ vowel. The highest count in the analyzed text belongs to the /i/ vowel—20 consonants. The lowest count was recorded for the /u:/ vowel—8 consonants.

In the English scientific text, the results for the CV model are as follows: 16 consonants follow the /a/ vowel, 15 follow /e/, 15 follow /æ/, 17 follow /ʌ/, and 15 follow /ɔ/. 7 consonants follow /ʊ/, 14 follow /ə/, 20 follow /i:/, 9 follow /ɑ:/, 10 follow /ɔ:/, 10 follow

/u:/, and 12 follow /ɜ:. In scientific text, the maximum consonant occurrence in the post-vocalic position belongs to the /i:/ vowel. The relatively low indicator is associated with the /ʌ/ vowel—17 consonants.

The results of the CV sequence in English journalistic text are as follows: after /a/ 21 consonants, after /e/ 18 consonants, after /æ/ 16 consonants, after /ʌ/ 16 consonants, after /ɔ/ 14 consonants, after /ʊ/ 15 consonants, after /ə/ 12 consonants, after /i:/ 12 consonants, 15 consonants follow /ɑ:/, 12 follow /ɔ:/, 9 follow /u:/, and 12 follow /ɜ:/. The highest count in the journalistic text was recorded for the /a/ vowel—21 consonants.

In the English language, all consonants except for /ŋ/ are found in the first pre-vocalic position, i.e., 23 consonants. In English, initial consonant clusters, with the exception of /ŋ/, /ʃ/, /z/, /ʒ/, and /ʤ/, can be represented as follows.

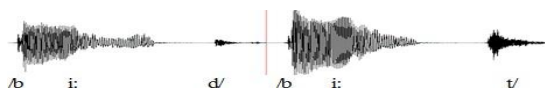
Among the Azerbaijani vowels, the highest frequency of occurrence belongs to the /a/ vowel – 5,931 words. The /i/ vowel comes in second place by frequency of occurrence – 3,547 words, and the /ə/ vowel comes in third – 3,015 words. The lowest frequency of occurrence belongs to the vowels /u/ and /ö/ – 1064 words and 970 words, respectively.

The principles for selecting and transcribing language material are described in *the first paragraph*, "*Experimental-Phonetic Study of Phoneme Combinations in the Compared Languages,"* **of the third chapter** of the work, titled **"Differences and Similarities in Phoneme Combinations and Phonological Encounters in English and Azerbaijani**." The PRAAT program was used for the acoustic analysis of the language material. Two hundred eighty monosyllabic words from both languages were subjected to phonetic analysis.

In the monosyllabic words with the CVC structure in English, such as "bead" /bi:d/ (bead), "beat" different duration values were obtained for the /d/ and /t/ consonants in the same phonetic position in the monosyllabic words with CVC structure in English: "bead" /bi:d/ (bead) and "beat"In the acoustic analysis of the language material, the PRAAT program was used. Two hundred eighty monosyllabic words from both languages were subjected to phonetic analysis.In the

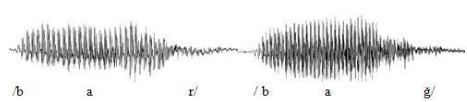
monosyllabic words with a CVC structure in English, the consonant /d/ in "bead" /bi:d/ and the consonant /t/ in "beat"The absolute duration of the /d/ consonant in the word "bead" is 176 ms, while the absolute duration of the /t/ consonant in the word "beat" is 890 ms. The absolute duration of the /d/ consonant in the syllable coda of "bead" is 176 ms, while the absolute duration of the /t/ consonant in "beat" is 277 ms. A comparison of the absolute timing values of the /d/ and /t/ consonants shows that the latter has a 101 ms greater duration (see: oscillogram 3.1b.1).

Oscillograms 3.1b.1. of the English words *"bead" and "beat"* oscillograms



In the Azerbaijani words "bar" and "bağ" of the KVK syllable type, the absolute mean duration for the /b/ consonant is 59 ms. In the words "tar" and "tağ," its voiceless equivalent has duration values of 106 ms. The absolute mean value for the /ğ/ consonant is 123 ms, and for the /r/ sonorant consonant, it is 142 ms. The absolute time values of the voiceless consonants exceed those of the voiced consonants in all positions (see: oscillogram 3.1b.6).

Oscillograms 3.1b. 6. of the Azerbaijani words *"bar" and "bağ"* ossillograms



In the Azerbaijani words "bir", "büt", "buz", "bel", the average articulation speed of the /b/ consonant is 60 m/s, "fal", The absolute mean duration of the /f/ consonant in the words "fil", "feil", and "fər" is 158 ms, while in the words "sər", "səs", "süd", "sol", "siz", and "sel" it is 226 ms. In the words "kol," "kəl," and "küt," the average duration of the /k/ consonant is 123 ms. The time difference in the absolute initial realizations of the consonants /b/, /f/, and /s/ was recorded in the following ratios: 60 : 158 : 226 ms (see: oscillogram

3.1b.8, figure 3.1.b.3 a, b).

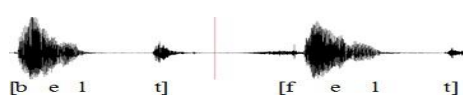
Oscillograms 3.1b.8. of the words *"bel" and "sel"* in the Azerbaijani language oscillograms



A component analysis of the acoustic indicators of the timing parameter for monosyllabic words of the KVKK type provides the basis for the following conclusion: the maximum duration is characteristic of the voiceless coronal stop consonant /s/ – 198 m/s. The voiced constrictive-burst consonant /b/ has the minimum duration – 76 m/s.

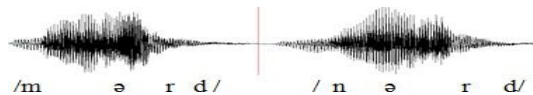
In the English words of the CVCC syllable model, "belt" /belt/ and "felt" /felt/, the time values for the consonant components are measured at 92-228 ms and 98-272 ms, respectively. The maximum duration falls on the second component, namely the voiceless stop-burst consonant /t/. The average duration of the /t/ consonant across the words is 250 ms, which is 156 ms longer than the duration of the /l/ consonant in those same words (see: oscillogram 3.1b,13).

Oscillograms 3.1b.13. of the English words *"belt" and "felt"* ossillograms



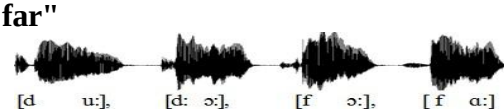
In the /rd/ consonant cluster realized at the end of the Azerbaijani words "dörd," "yurd," "qurd," "xırd," "mərd," "nərd," and "fərd," the timing values for the components are 88 : 109 ms. A comparison of the timing values of the /rd/ and /rt/ consonant clusters realized in the absolute final position shows that the /t/ occlusive-burst consonant is 23 ms/s faster (see: oscillogram 3.1b,16).

Oscillograms 3.1b.16. In the Azerbaijani language, *"mərd" and "nərd"* Oscillograms of the words "mərd" and "nərd" in Azerbaijani



In English, according to the KV syllable model, the monosyllables "do" /du:/ (to do), "door" /d:ɔ/ (door), and "for" /fɔ:/ (for), the time values are 140-336 m/s and 126-341 m/s, 232-372 m/s. For "far" /fɑ:/ (far), "mar" /mɑ:/ (to spoil), "tar" For the words with /tɑ:/ (tar), the length indicators are expressed by the following figures: 156-342 m/s, 132-341 m/s, and 147-347 m/s. The maximum duration corresponds to the /f/ consonant – 156 ms (see: oscillogram 3.1.b.18).

Oscillograms 3.1b.18. The English words *"do", "door", "for" and "far"* The oscillograms of the English words "do", "door", "for" and "far"



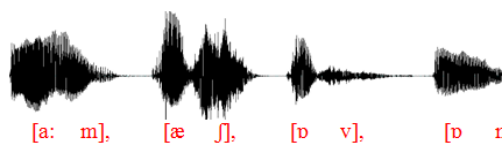
In the Azerbaijani KV words "bu," "qu," and "su," the consonants /b/, /q/, and /s/, which occur before the vowel /u/, are characterized by different timing values. In the word "bu," the duration of the voiced consonant /b/ is 57 ms; in the word "qu," the duration parameter for the consonant /q/ is 60 ms; and in the word "su," this indicator for the voiceless consonant /s/ is 160 ms. The maximum duration value was recorded for the /s/ voiceless consonant (see: oscillogram 3.1b.19).

Oscillograms 3.1b.19. Oscillograms of the Azerbaijani words *"bu", "qu", and "su"*



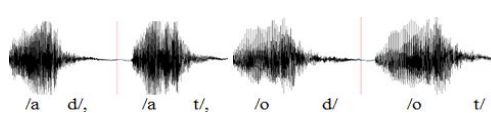
The VC syllable model is not widely represented in English; consequently, relatively few words of this type were included in the experiment. In the word "arm" [ɑ:m], the duration values of the components are 205-103 ms. In the word "ash" /æʃ/, by contrast, the timing values differ: 193-284 ms. The maximum duration is associated with the consonant /ʃ/ in absolute final position, which correlates with the acoustic quality of that sound (see oscillogram 3.1b.20).

Oscillograms 3.1b.20 Oscillograms of the English words "arm," "ash," "of," and "on"



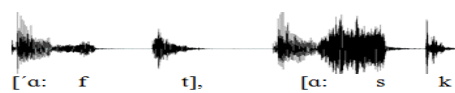
In Azerbaijani VC-type syllable models, although the first component is formed by different consonants, the same consonant appears as the second component. For example, in the words "ad" (name), "od" (fire), "öd" (bile), and "ud" (swallow), the mean absolute duration of the consonant /d/ is 114 ms. The VC-type words "at" (horse), "ot" (grass), "ət" (meat), and "it" (dog) show that the voiceless plosive /t/ in absolute final position has a mean value of 130 ms. These acoustic indicators reflect the fact that /d/ and /t/, although occurring in the same phonetic position, are expressed with different duration values: the mean value of /t/ exceeds that of its voiced counterpart by 16 ms (see oscillogram 3.1b.21).

Oscillograms 3.1b.21 Oscillograms of the Azerbaijani words "ad," "at," "od," and "ot"



An oscillographic analysis of the temporal parameters of word-final consonant clusters in English VCC-type closed syllables shows relatively high duration values for consonants in this position. For example, in the word "aft" /ɑ:ft/ the cluster /ft/ shows duration values of 194-217 ms, while in "ask" [ɑ:sk] the corresponding values are 233-194 ms. A comparison of the consonant duration values in both words shows that the values are higher for the second component. The maximum duration is recorded for the voiceless fricative /s/ (see oscillogram 3.1b.23).

Oscillograms 3.1b.23 Oscillograms of the English words "aft" and "ask"



In Azerbaijani VCC syllable models, one of the consonant components generally consists of a sonorant. An oscillographic analysis of the words "əql" (mind), "ədl" (justice), "əhd" (covenant), and "əsr" (century) shows that the temporal parameters of the consonant clusters in these words are realized in the following sequence: the cluster /ql/ at 73-123 ms, /dl/ at 74-118 ms, /hd/ at 102-86 ms, and /sr/ at 129-106 ms (see oscillogram 3.1b.26). The maximum duration in the first component of these clusters belongs to the voiceless fricative /s/, at 129 ms.

Oscillograms 3.1b.26 Oscillograms of the Azerbaijani words "əsr" (century), "əmr" (command), and "ərp" (plaque)



The influence of consonants on the quantitative characteristics of sonorants manifests itself in duration differences depending on the

voicing of the preceding consonant. After bilabial consonants, the duration of sonorants is reduced by up to 9%, and before voiced consonants by up to 7%. The position of sonorants after plosives and fricatives has a significant effect on their quantitative characteristics. For example, the duration of the sonorants /l/ and /r/ in clusters with plosives exceeds their duration in clusters with fricatives by up to 10% (see oscillograms 3.1b.26-3.1b.29).

In the 2nd paragraph of the work titled *"Differences and similarities in phoneme combinations in the compared languages,"* it is shown that the close temporal relationship between components corresponds to the consonant-vowel (CV) model. In the CVC syllable structure, a negative correlation is observed between the components in the temporal parameter, meaning that as the vowel lengthens, the following consonant shortens, and vice versa. This suggests that at the prosodic level, the primary syllable type in both languages is the closed CVC syllable model.

In CVC-type syllables in both languages, the postvocalic consonant has a strong influence on the overall syllable length. In this position, the absolute value of consonants exceeds the duration parameter of consonants in the pre-vocal position. In CVC-type syllable structures, maximum length for post-vocal consonants is characteristic of the group of sonants and for palatal consonants.

To determine the positions, the syllable structure formula can be presented as follows: III – II – I – V – I – II – III

In this formula, which is primarily valid for English, V is a vowel, and III, II, and I are conventional indicators for consonants located in the anlaut, mid-word, and auslaut, respectively, with respect to the vowel. Of course, the number of positions depends on the number of consonants in the clusters. The distribution of phonemes by position is a function of their valency, that is, the factor that depends on whether other consonants can be realized before or after them. In consonant clusters, phonemes with "left" valency occupy the first position (I) in the cluster; phonemes that allow only one consonant to be pronounced to their right occupy the second position (II); and consonants that allow two phonemes to be pronounced occupy the third position (III). In three-member consonant clusters, it is more

accurate to explain the absolute initial realization of the palatal affricate /s/ solely by its own specific articulatory features.

In English, consonant clusters at the beginning of a word can be described according to the following models:

1) three-membered consonant clusters: S + voiceless-plosive + sonor consonant;

2) two-membered consonant clusters: fricative + sonorant consonant.

In the Azerbaijani language, syllables formed according to this model are also found in borrowed words. In Azerbaijani, these formulas are more widespread: I – V – I, I – V – I – II, II – I – V – I, I – V, V-I.

An experimental-phonetic analysis of the combinatorial, distributional, statistical, and temporal characteristics of consonant clusters in the contrastive languages allows us to draw the following conclusions:

1. At the phonological level in typological studies, not only the similarities and differences in the phoneme inventories of the contrasted languages, but also it is also important to focus on the principles of the phonological system's organization in those languages, because when we compare whole, syntagmatically taken combinations, rather than isolated phonemes, we reveal the individuality and uniqueness of each language's phonological system. There are certain constraints in the syllable structures of every language, which necessitates distinguishing between universal and specific features. In phonemes, the syllable, as the unit at the segmental level, is the primary function of coarticulation. Thus, the syllable is the minimal pronunciation unit in which vowels and consonants "lose" their phonetic independence and are realized with a unified pronunciation program: For example, in the Azerbaijani language, vowels influence the acoustic quality of the consonants that follow them, while in English, vowels in closed syllables "signal" which consonants will come after them.

2. Combinatorial rules are as important as the determination of phonemic composition in the description and explanation of a language's phonological system, because the determination of the

phoneme inventory reveals the system and structural subtleties of the language (the number of phonemes, the ratio of vowels to consonants, the nature of positions, the variability of phonemes in phonetic positions, the specific 'behavioral' characteristics of phonemes in various variations, etc.) to reveal the system and structural nuances of the language (the number of phonemes, the ratio of vowels to consonants, the nature of positions, the variability of phonemes in phonetic positions, the specific 'behavioral' characteristics of phonemes in various variations, etc.), while the second, the study of the combinatorial possibilities of phonemes, serves to solve the problems of syntagmatic phonology.

3. A syllable is a structure that is formed on the basis of the substantial phonetic-phonological base of a given language and is functionally situated at the intersection of semantic (e.g., phoneme, morpheme) and non-semantic (allomorphs, sound combinations) scales. From the perspective of horizontal determination, the syllable is a relatively stable structure in the speech stream that is influenced by segmental units of the same level; from the perspective of vertical determination, the syllable is a relatively stable speech structure that is influenced by other levels of the language.

4. The results of the study revealed that in English, phonological constructions beginning with consonant initials (KVK, KKVK, KVKK, KV, KKVKK, KKV, KKKVK, KVKKK, KKKVKK, KVKKKK) and those beginning with vowels (VKK, VK, VKKK) are more functional. The syllable models overlapping in both languages are: 1) V, 2) CVC, 3) CVCC, 4) CV, 5) KVC, 6) VC, 7) VCC. The phonotactic structure dominant in the syntax (dynamics) of both languages is the three-component combination of CVC and CV.

5. In the English KVKK syllable model, a separate analysis of K+K and KVK phoneme combinations determined that the consonant+vowel combinations in these constructions overlap with the results of the independent phonological syllable model KVK. For example, from the combination of two initial non-syllabic consonant phonemes, the following conclusions can be drawn:

-the same consonant cannot be used in the 1st and 2nd initial

consonant positions;

-the consonant /ŋ/ does not occur at the beginning of a word in English;

-in English, the consonants /v/, /ð/, /z/, /ʧ/, /ʤ/, /j/ are not used in the 1st consonant position in the syllable structure;

-In English, both voiced and voiceless consonants are used in the 1st consonant position: /b/, /d/, /f/, /g/, /h/, /k/, /p/, /s/, /ʃ/, /t/, /θ/.

-In English, a restriction is observed in the 2nd consonant position. In this position, /m,/p/, /w/, and in some cases /k/ and /v/ are used, while /b/, /d/, /f/, /g/, /ʤ/, /ʒ/, /h/, /ŋ/, /ʧ/, /ʃ/, /θ/, /ð/, and /z/ are generally not used. In the 2nd consonant position, the sonants /l/ and /r/ are more frequently used. If the consonant /s/ is used in the 1st consonant position, it is followed by one of the consonants /f/, /k/, /m/, /n/, /p/, or /t/;

In English syllable patterns, the most productive vowels are: /e/, /i:/, /i/, /a/. In the Azerbaijani language, the most frequent consonants are /a/, /ə/, /i/, /ı/. Compared to these vowels, the frequency of use of /ü/, /o/, /u/, /e/, and /ö/ is significantly lower.

-In English, the most frequent consonant clusters at the beginning of a word are: /br/, /bl/, /cl/, /cr/, /fl/, /fr/, /qr/, /ql/, /sl/, /sn/, /sm/, /sp/, /st/, /sw/. The maximum frequency of occurrence is observed in the /r/ sonorant. In English, the most productive final consonant clusters are: /st/, /nd/, /ft/, /lt/, /ŋk/, /tl/, /dl/, /lk/, /nt/, /lf/, /lm/, /lp/, /lθ/, /lv/, /sk/, /sl/, /sn/, /sp/ etc. In Azerbaijani, the most common consonant clusters at the end of a word are: /nd, /ng/, /rd/, /rt/, /rk/, /rs/, /rq/, /rf/, /rz/, /rb/, /rş/, /rk/, /rc/, /lk/, /ld/, /lt/, /nc/, /nt/, /mn/, /mt/, /md/, /mr/, /lm/, /st/, /ks/, /hv/, sb/, /sd/, /xt/, /bz/, /sk/, /şk/ etc.

6. Syllable patterns such as KS (consonant + vowel), KSK, KKSV, KSKK, KKSKK, which are not found in Azerbaijani, are a source of persistent pronunciation errors for learners. In English, KKVKK, KKKVK, KKVKKK, KKKVKK, KVKKKK, KKVKKKK, KKKKVKKK, KVKKKKK syllable patterns present particular difficulties for Azerbaijani students' pronunciation. However, it is possible to optimally master the pronunciation norms of the target language and the correct temporal structure of syllable

chains based on dynamic models of syllable structures. For example, consonant clusters consisting of three consonants in the pre-vocalic position in English – When pronouncing consonant clusters in the prevocalic position—such as 7. While English has 24 syllable types, only the 6th type is native to Azerbaijani; the others are found in borrowed words. Azerbaijani students also insert the /e/ diphthong between consonants when pronouncing consonant clusters in the postvocalic position—such as "str, skr, skl, blw" and "mpt, mts, lfe, lkt, ltt."

7. While English has 24 syllable types, in Azerbaijani, syllable types are found only in native words (6 types), with the others occurring in loanwords. While in English, besides vowels, sonants can also form the syllable nucleus, in Azerbaijani, only vowels perform this function in the word structure. While English has syllable models where three, three, four, and five consonants combine in prepositions, postpositions, and other words, respectively, in Azerbaijani, no syllable types are observed where two or more consonants cluster in prepositions.

8. The factors that affect the acoustic parameters of consonant clusters are: the presence of a vowel (voiced or voiceless), the manner of articulation, and finally, the place of articulation. The realization of consonant clusters in different positions within the syllable structure (prevocalic or postvocalic) has a significant impact on their duration values.

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1.The main theses of the dissertation are reflected in the following published articles and abstracts by the author:Fonem anlayışının yaranmasına dair // Azərbaycan Milli Elmlər Akademiyası M.Füzuli adına Əlyazmalar İnstitutu, Filologiya məsələləri. – Bakı: "Elm və təhsil" nəşriyyatı, – 2017. №18, – s.99-105.

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