*МРНТИ 16.21.37*

**Z.M. Bazarbaeva**

Institute of Linguistics named after A.Baitursynuly, Doctor of Philological Sciences, professor
Almaty, Kazakhstan

## INTONATION COMPONENTS OF THE KAZAKH LANGUAGE

**Annotation**. The article discusses the intonational components of the Kazakh language. The role of separate components such as melodics, tempo, intensity, voice-frequency range, interval has been revealed. Their acoustic characteristics by means of the computer program have been described.

**Keywords**: melodics, tempo, intensity, range, interval.

**З.М. Базарбаева**

А. Байтұрсынұлы атындағы Тіл білімі институты, филология ғылымдарының докторы, профессор
Алматы қаласы, Қазақстан

## ҚАЗАҚ ТІЛІНІҢ ИНТОНАЦИЯЛЫҚ КОМПОНЕНТТЕРІ

**Аннотация**. Мақалада қазақ тілі интонациялық компоненттерінің қызметі қарастырылады. Әуен, қарқын, үдемелік, реңк, тональды диапазон, интервалдардың сөйлеу тіліндегі рөлі анықталады. Олардың акустикалық ерекшеліктері компьютерлік бағдарлама арқылы сипатталады.

**Тірек сөздер**: Әуен, қарқын, үдемелік, реңк, диапазон, интервал.

**З.М. Базарбаева**

Институт языкознания имени А. Байтурсынулы,
доктор филологических наук, профессор
Алматы, Казахстан

## ИНТОНАЦИОННЫЕ КОМПОНЕНТЫ КАЗАХСКОГО ЯЗЫКА

**Аннотация**. В статье рассматривается функция интонационных компонентов казахского языка. Определяется роль мелодики, темпа, интенсивности, тона, тонального диапазона, интервалов в речи. Описываются их акустические характеристики посредством компьютерной программы.

**Ключевые слова:** мелодика, темп, интенсивность, тон, диапазон, интервал.

**Introduction.** Connected sounding speech cannot be imagined without quite a number of its inherent properties: *change in melodics (nuclear voice tone) andin duration, tempo, pause, intensity and timbre.* Not all of these constant features areequally perceived by the human being, and not all of them play the equal role in the speech flow arrangement.The intonation components, or prosodic features, as they are called, act in the oral speech in close interconnection and cohesion, and their various combinations serve for the presentation of an utterance, or a text [1].

**Melodics** is deemed to be the main and universal intonation component in the most different

languages. “The universality of a pitch intonation component makesitself evident also in the fact that melodics is used as the most important intonational means in the most different languages, and that within one language the melodics performs different fun-ctions of intonation. It is facilitated not only by the lowd egree of the availability of melodics at a segmental level but also by a great deal of distinctive capabilities in the said intonation component”[2, p. 36]

The peculiarity ofeachlanguagemakesitselfevident to a greater degree inmelodics (change in the pitch of a voice), and it is no mere chance that there is an expression «language melodics». The melodics can perform different functions [3]. Along with a pause, itis used for the division of speech and for the linking of its parts as well. To-getherwithlexicaland grammatical means, it participates in the conveying of the meaning. The melodics is the mos timportant means to distinguish communicative types of utterances (story, order, question, exclamation). Along with a syntagmatic emphasis and timbre, it is used for the exact conveying of a logical aspect of oral speech and its emotional colors. The melodics may change depending on individual peculiarities of or al speech of individual speakers thereof, but there are basic forms of melodics, which are typical of people speaking one language. If these melodic models are not adhered to, speech may be incomprehensible.

**Methods.**A method of structural analysis of intonationis widely applied in present-day experimental and phonetic works. This method providing for the integral analysis of all interrelated components of intonation, the study and description of distribution of physical characteristics (nuclear tone frequency, intensity and duration) was developed and introduced by Russian scientists. Auditing and instrumental methods of research as well as computer processing of data have been used in the work.

**Mainpart.** Acoustically melodic features of speech are correlated with the time-varying *nuclear tone frequency* (NTF). Whentalking, constantchanges in the NTF value occur. The primary indicators of the NTF value depend, first of all, on the individual pitch of the speaker’s voice. Sexualdifferenceof vocal chords maynotbedeemedtobea distinctive feature (voices of men having longer vocal chords are on the average low-er than feminine voices) as just secondary (relative) indicators are important in the intonation. Incaseof emotional excitement ofthespeaker, a certain increase in the NTF values can be observed that does not affect the results of the research too. Thegeneral intonation contour is impacted by the segmental composition of an utterance still to a lesser extent.The NTF values may unessentially change subject to individual sounds and sound combinations since the own physical features are peculiar to speech sounds, which depend on their spectral characteristics[4]. In different languages, the tone contour may change under the influence of syntagmatic and logical emphases, i.e. of the most important word accentuated by the meaning. The direction of the NTF contour often acts as a distinctive feature of an utterance, which may be *rising, falling, rising & falling, falling & rising and even.*

In addition to the generald irection of th emaintone, the acoustic (secondary) parameters such as melodic (tone) *intervals, ranges*, and registers (levels) may act as a relevant characteristic. [5].

In the linguistic literature, the*interval* meansavalueof downturn orupturnina syllable and between the syllables and should be defined by the ratio between the maximum and minimum values of the nuclear tone frequency in this part. The interval is characterized by the direction, which may be rising, failing and even.Forexample, theintonationof sto-ry-telling indifferent languages, incaseof the similarity of direction of moving the nuclear tone frequency differs in minor tone intervals from the intonation of order or exclamation.

*Positive and negative frequency intervals* are distinguished. The frequency interval is called positive if the first measurable value of the nuclear tone frequency is lower than the second one. Otherwise, i.e., ifthefirstofthe comparable values is higher than the second one, the frequency interval should be deemed to be negative. For example, it was proved by the experimental and phonetic method that the intonation of interposition parenthetic units in the Kazakh and French languages is characterized by the negative tone intervals on both junctures with the principal

sentence. IntheRussianlanguage, in most cases the first juncture is presented due to the negative tone intervals, and the second one – due to the positive tone intervals.

Akey role in the determination of the extent of importance of syntagms is played by the frequency *ranges*. Arange should be determined by the difference between the maximum and minimum NTF values in the part being analyzed. Mean, extended and narrowed range sare distinguished. Thee motionally saturate dutterances are usually characterized by the extended frequency ranges. Forexample, inmanylanguages, exclamatory sentences as well as imperative sentences with the meaning of an order have more extended tone ranges as compared to other communicative types. Subject to the value, the frequency ranges may to be indicative of the basic or secondary idea in sentences with parenthetic units. Thus, parenthetic structures in different languages are, irrespective of their positions, characterized by the narrowed tone ranges in comparison with the principal composition of a sentence.

Int he intonation characteristic of the segment being analyzed, a substantial role is played by the *tone* (midfrequency)*level or register*. Forexample, if melodic contour sare similar, imperative sentences are realized on higher tone levels than narrative ones. In the French, Kazakh and Russian languages, parentheticunits in the interposition and the postposition are characterized by the lower tone levels than the principal composition of a sentence. The higher mid frequency level sare indicative of the semantic importance of the segments analyzed, and the lower tone levels are indicative of the lower meaning.

One of the necessary conditions of theexistence of speech segments is their extension in time, i.e. **duration** -definite time to pronounce different speech segments: syntagms, phrases, larger-than-thesentence unities, and a text. Any speech segmentis characterized by the definite extension in time required for the segment's pronouncing articulation andfurther perception by the listener. It has been established that the physical duration of as egmentina direct dependence on a large variety of factors such as the own duration of a sound segment, and the degree of its prominence that depends on the presence of various emphases (phrasal, logical, and emphatic), the type of a syllable, the position held etc. The own sound duration is determined by the articulation specifics: the high degree of an upturn specifies a decrease in the own duration of a vocal, and the presence of labialisation, on the contrary, leads to the increase. The broad vowels of alow upturn have the maximum own duration, and the maximum narrow vowels of an upper upturn have the minimum own duration. The dependence of duration on the articulatory characteristics is noted in consonants as well. In many languages, the fricatives have the longer own duration than the stops that may be regarded as a universal feature.

One of the factors affecting the distribution of duration inside a syntagm, or a phrase is place of localization of a logical emphasis. An emphasized syllable, as a rule, has the longer duration than a non-emphasized one.To perceive speech, a not insignificant role is played by the ratio of the durations of syllables in a word, of words in a syntagm, syntagms in a phrase, phrases in larger-than-thesentence unities that is connected with the speech tempo. Usually **the tempo** is determined by the ratio of the general duration of a segment to the number of syllables.

Be in garelative value, the tempo has a certain linguistic meaning. It may indicatea degree of importance of a speech segment for the listener: the one, which bears the larger informative load, is pronounced in the slower tempo than the in significant information. Such universal trend is noted and experimentally proved in many languages where syntagms with a large notional weight require much time for the pronunciation. Forexample, itisfoundthat parenthetic units in the French, Kazakh and Russian languages in the preposition are pronounced in the slower tempo that is indicative of their maximum notionalload in this position, and in the interposition and the postposition they are characterized by the quicker tempo that is indicative of their secondary load in the composition of a sentence. Imperative sentences in the languages so researched as compared to the declarative ones are most often characterized by the slow tempo of pronunciation, since it is important for the speaker that his willingness should be executed, and it especially relates to

sentences with the meaning of an order. Some exclamatory sentences are also pronounced in the slower tempo, and in the relatively quickened tempo interrogative sentences may be realized. This points to the fact thatthere is a certain link between the time parameter and the communicative type of a sentence. In the emotional speech, the tempo acts differently subject to the character of emotions. Most often it accelerates if joy isexpressed, and slows down in a state of depression and in case of declamation. Thus, the intonational tempovalueis, firstofall, connected with the degree of importance of the contents of an utterance, to some extent with the communicative type of a sentence, and also with the psycho-emotional state of the speaker.

Sometimes the degree of importance of syntagms may be equal, then each syntagm is characterized by the equal pronunciation tempo, and such things occur most often in utterances with homogeneous parts, in case of enumeration. One of the important intonational components is **apause**. The pause is a temporary stop, an interruption in the sounding and at the same time it is semiotic means performing a certain semiological function. According to their purpose, pauses may be physiological, emotive, intellectual, situational etc. [6, p.p.74-75.]. The linguisticfunction of apause consists in the division of a text into phrases, syntagms, rhythmic groups, words, and also in the expression of additional notional and emotional relations in combination with other intonational components. The absolute value of pauses depends on the tempo of colloquial speech and is, as a rule, directly proportional there to. And a pause between the inter-phraseunities is much longer than inter-phrasepauses, and inter-phrasepausesare longer than inter-syntagm ones. According to N.D. Svetozarova, apause between the words performs language functions being 1) means of division of speech into intonational and notional units; 2) means of expression of the character of a link between the parts of an utterance; 3) means of notional and emotional accentuationof a word, or a syntagm [7, p. 369].

L.K. Tseplitis distinguishes a semantic and semantic pauses [6, p.p. 73-74]. The a semantic pauses include constitutive, emphatic, situational, individual and physiological ones. The constitutive pauses are those pauses, whichare referred to the basic acoustic order of a speech signal as more or less obligatory elements. The emphatic pauses are before, or behind aword bearing a logical emphasis, and is one of acoustic means of increase in intensity of a logical emphasis. According toTseplitis, the situational pauses include those ones, which slow down a text pronounced, during the reading of dictations, or in order that the listeners could prepare for the execution of an order. The individual pauses are connected with different uses of pronunciation, for example, there are those speakers, in whose speech pauses appear almost nearly behind each word. The physiological pauses are caused by the air shortage in lungs, for example in case of shortness of breath or by the delays in the processes of the central nervous system.

In addition to theactualand supposed pauses, therearevoiced *pauses of hesitation,* which may be regarded as means of the current control of to avoid errors in speech, to think over the next following phrase. Ithasbeenestablishedthattheprosodyexertsadirect influence on the semiological function of voiced pauses. Thus, forexample, ifthetoneislow-falling, thevoicedpauseexpresses consent, and if it falls from the higher initial pitch, then the consent acquires an emotive colour, and if sounds are pronounced in a rising tone, then a question is meant [8, p.116] etc.

It is noted that the respiratory pause as an indicator of a speech product – a text, a discourse, and a pause in the sounding is also a sign of the disturbed semantic, grammatical, or other (semiotic) coherence of elements of the complex notional whole. When analyzing the syntactic environment of pauses, the following regularities are identified, which are, from our point of view, universal for many languages: the respiratory pauses may divide 1) a subject and a predicate of the communicative unit, 2) homogeneous predicates, or parts of the composite predicate, 3) a predicate and an object, 4) a predicate and an adverbial, 5) a predicate and an adjective, 6) there is also a frequency usage of a certain kind of lexico-semantic localizers, which positionally present the said pauses. In relation to the lexico-semantic environment of pauses, it is found that in the post position the pauses may include various, often grammatically desemantized, lexical

elements called lexico-semantic localizers (signs) of the communicative (communicativetasks and intentions), lexical (lexical meanings of the syntagm elements), grammatical and logical and semantic (extra-syntactic organization and semantics of grammatical relations and logical interrelations between the syntagm elements) levels. Such localizers may includea) co-ordinating conjunctions, b) subordinating conjunctions, c) desemantizedelements and particles, d) personal pronouns [9, p.p. 228-238].

The study of the pausing in the automatic speech synthesis is deemed to be promising and interesting. The intonation limits localization in a text articulated is one of the main objectives of an accentual-intonational transcriptor, which is the compulsory block in any automatic speech synthesis system. In the block, foreach intonation limit, aquestion is to besolve dabout the presentation of a physical pause limit, and in cases where it is deemed to be necessary, a categorical duration is attributed to a pause [10].

For today, the objective to generatea neutral variant of intonation division and the related physical pausing fore achsentencein a text is of current interest first of all. For this purpose, one should be able to find those situations in a text, in which a physical pause appears on the intonation limit, by definition correlating with syntax, and should be able to operate its duration. In the long run, it is necessary to let the synthesis system arrange such intonation limits in a written text as always accompanied, or over whelmingly (when read by different people) accompanied by the physical pauses, and one should be able to set their duration. Those specialists, who are engaged in the automatic speech synthesis, note that the interaction of factors affecting the pausing is poorly studied. There is no sufficiently formal description of textual situations, which characteristics could have served as keys for the automatic arrangement of intonation limits and pauses. There is also no statistical data allowingthe separation of the normative reading from the admissible, or erroneous one. The practice of establishing automatic speech synthesis systems for an arbitrary text shows that to determine into nation limits in the sounding of a text, one may rely on punctuation marks, which could be the basis for the syntactic analysis, which has been still not fully realized even for the Russian language. At the same time, the development of specific synthesizers for different languages testifies that to arrange intonation limits and the pausing there of, it is not necessary to recover the full syntactic structure of a sentence. It is recognized that the arrangement of prosodic elements is easier than syntactic dependences associated there with. In other words, the prosodic structure of a sentence turns to be not as deep as a syntactic one: there are those aspects of the syntactic structure, which are irrelevant, or insufficiently relevant for the prosody [11, p.p. 71-78).

As is known, in many languages, the intonationally substantial limits turn to be unmarked punctuation marks, and many punctuation marks are put where there are no intonation limits.

**Intensity** as an intonation component is usually considered in combination with other intonational means. Along with the nuclear tone frequency and duration, the intensity is concerned in the accentuation of a word in an utterance. Individual elements of the speech circuit are accentuated by the increase in intensity. Variations of intensity aurally are perceived as changes in the volume. But it should be noted that the volume depends not only the intensity but also on the pitch of the nuclear tone. Incase of the equal intensity, a segment with the higher pitch is perceived louder.

The important factor, which defines the absolute value of the intensity of a vowel, is its quality. It has beene stablished thatt he down turn vowels have the higher intensity than upturn ones. There is a link between the sound volume and the timbre, for example, in the French language the palatalized sounds are characterized by the higher volume than the non-palatalized ones.

Another factor– the position of a vowel in the speech unit is equally important. When studying the sound intensity in syntagms of different types, it is found that the beginning of any syntagm is characterized by the higher intensity than the end there of: the intensity always goes down by the end of a syntagm. That enables to suggest the falling contour of the intensity, against the background of which those dynamic peaks are positioned that correspond to the accentuated syllables.

There is a close link between the emphasis and the intensity. Syllables bearing a logical emphasishave, as a rule, the greater intensity value though the intensity is not the single emphasis component. The stress of a syllable is also ensured by the other phonetic means: the pitch and the duration.

According toT.M. Nikolayeva, the "logical emphasis" is meant to bean accentual embodiment of the latent presuppositional category, and an ability to create a special context aura and an organizing utterance in general. The lo gical emphasis is considered by Nikolayeva inconnection with the theory of accentuation, the same being realized in the question-answer unity, in the actual division, in the certainty-uncertainty category, and in the idea of contrast and importance, which are presented by the prosodic means, among which the dynamic parameters are of paramount importance [12, p. 13].

Differences in the formofadynamic contour may convey information on the semantic weight of a syntactic structure in the composition of a sentence. Thus, it is parenthetic structures that are usually characterized by the decrease in the general level of the intensity that is deemed to be a universal feature for the most languages. The intensity in all languages rises with increase in the general emotional colour. As a rule, positive and active emotions are characterized by the increase of the general level of the intensity, and negative and passive emotions – by the decrease thereof. Exclamatory utterances expressing joy and surprise are characterized by the higher intensity level. There is also a high intensity level inthe imperative utterances, where the more active volitive processes, the higher the intensity level. In the designation of syntagms in order of importance, a not insignificant part is assigned to the intensity range. The notional relatedness of the analyzed segments in different languages may become apparent in various sizes of the intensity range. So, insertionsand additions of every kind have the narrower intensity ranges, which is indicative of their related secondary semantic load in the composition of an utterance. Thus, in the experimental and phonetic research, dynamic parameters such as an average intensity level, localization of the maximum intensity value, and intensity range are used most frequently.

One of the intonation components conveying human emotions is a prosodic **timbre**. Due to th etimbre, emotional shades are distinguished such as joy, anger, tenderness, contempt, discontent, irony,sadness and others.

L.K. Tseplitis distinguishes the following two types of timbre: individual and intonation ones. "The intonation timbre layers on the individual one, or is added there to as in any emotional state of the speaker, his voice can be recognized due to the individual timbre. It is probable that the individual timbresolely depends on the anatomical organization of the said person's organs of articulation, and the intonation one is generated by the change in the form of some resonators, and it is evident that they are common for the native-speaker group, other wise one cannot explain the fact that emotional states of speakers can be recognized due to the speech",– notes Tseplitis [6, p.150].

Being superfix means, the timbre is applied in the description of individual speech sounds. At the acoustic level, the timbre is corresponded by thespectrum. As regards linguistic functions of the timbre, they are studied insufficiently. However, the timbre has been the object of special attention in the stage andpublic speech. Forexample, in the field of dramatic reading, N.V. Cheremisina notes the two main classifications of timbres: 1) metal timbre (the head resonator functions) – timbre of slogans, appeals typical of the meeting speech and the reading of heroic verses; 2) velvet timbre (the chesty resonator functions) – timbre of intimate, sweet speech, and of confessionary lyrics etc. according to the second classification, on the back of the middle timbre, the following is distinguished: а) dark timbre – timbre indicative of the melancholic even hypohondriac mood intonationally conveying regret, discontent etc.); б) light timbre – timbre of exhilaration intonationally conveying joy even admiration of the speaker [13, p. 17].

Being the means to convey emotive meanings of an utterance, the prosodic timbre may have a meaning too. In case of the equal verbal composition ofan utterance, the timbre colour may differentiate the utterance's positive or negative meaning [14]. For example, any utterance can

be pronounced with admiration, love, or delight, then it expresses a positive meaning, and if pronounced with contempt, mockery, or irony, it conveys a negative meaning. In these examples along with the prosodic timbre, one should also note a different tone register where utterances are realized. So, positive emotions are usually connected with an upturn, and negative emotions – with a down turn. Thus, along with other prosodic means, the intonation timbreis concerned with the expression of the semantic and emotional intonation function.

In the expression of intonation categories, prosodic means in different languages act in various combinations. The intonational specificity of a language makes itself evident in the choice of prosodic means and in their inter relationship [15]. Inter relations of intonation components may be universal for all languages and specific for a language. Aquestion of the presence of prosodic universals in a language has been discussed for a long time. Already V.N.Vsevolodsky-Herngross wrote that "in all individualization, there is something between all intonations that allows us to understand each other even when we do not understand a foreign language"[16, p.8].

Accordingto L.A. Kanter, "The building of a contrastive-comparative and typological model of prosodic systems of the languages under consideration is based on the results of modeling speech intonation of each of the languages so compared. In this respect, one should bring to the fore front the task to compile inventory and classification of phrasal intonemes (prosodemes) of a language and their variants being that initial material, which needs to be compared, or, as is common to say, to be measured in the linguistic and metrological meaning of a word"[17, p.84]. I.G.Torsuyeva points to the fact that the typological classification of the language group intonation (kindred and non-kindred languages) is a part of general typology. According to Torsuyeva, the typological intonation analysis includes the following stages:

1. To choose inventory of units subject to their functions.
2. To chooserelevant features to characterize units.
3. To describe the rules for interrelation and functioning of units in the formation of structures.
4. To describe the rules for the realization of units and structures.

Having emphasized these four stages, I.G.Torsuyeva thinks that in case of the current state of intonation research, it is early to put a question of the world's languages classification as per the intonation system types, and it is also early to draw up a list of the universals with regard to the intonation ... One may imply application of typological research methods with a view to develop a typological net for the further interpretation of a specific language material. The purpose of the typological intonation analysis is to build such classification, in which each language could take its place according to the chosen features in series of other languages so as it would be clear in what direction its development may progress[18, p. 93].

At the same time, a question of the presence of prosodic universals in a language is widely discussed in the modern linguistics. The universality of the prosodic level is stated in the D. Bolinger's works "All the world's languages usevoice modulations – there are no languages where one whispers more often than he speaks. It may turn out that in a number of languages, which are still to be analyzed, melodic fluctuations may be casual in principle. However, alanguage of such type will generally turn out to be so exclusive that it will be even not able to testify against the universality, which is understood widely ‹...›. Thus, it is difficult to doubt in the intonation universality"[19, p.p. 214-223].

**Conclusion.** The study of the speech intonation in different languages testifies that many established facts increase the sphere of the universal notion, and a growing number of intonation facts transfer from the private language notion to the common language notion. Prosodic features of languages are transparent, and the language contact may result in the impact of one language system on the other and in the prosodic field. There fore, the intonologists think that facts perceived as specific so far, being organized into the system may lose their aura of specifity, whereby it will become possible to build a general model of intonation types not attached to some specific language.

**Summary.**1. As the experimental data show on the basis of material from different languages, a set of prosodic features (nuclear tone frequency, duration, intensity) that differentiate sentences according to the purpose of an utterance, is universal.

2. An increase in the intensity is often related to the automatic increase in the nuclear tone frequency, since both features are conditioned by the general physiological mechanism – the increase in the subligamentous pressure. The intonation universality is caused by the general physiological reasons, and the properties of the human organs of articulation.

3. A set of prosodic features (melodics, tempo, pause) may be deemed to be universal to convey sense relations between syntagms as well as a downturn on the last word of a syntagm for the closing melodics, and an upturn at the end of a phrase for the uncompleted one.

4. The accelerated tempo in many languages conveys information of less importance, and the slow tempo – more important information.

5. In many languages, there are intonation meanings such as opposition, introduction, explanation, enumeration, logical accentuation, which are conveyed by the same prosodic means but only in various combinations thereof.

6. The universality of emotional colours appears in general intonation characteristics of positive and negative emotions.

7. Positive emotions are, as a rule, characterized by the higher tone registers unlike the negative ones, which have the lower tone level. Those words, which bear emotional load, are pronounced with the higher melodic melodic tone.

## REFERENCES:

[1] Hart J.T. A Perceptual Study of Intonation. ambridge Academ, 2006. 102 s.

[2] Svetozarova N.D. Intonational System of the Russian Language. L., 1982. 112 s.

[3] Alkon P.K. Joshua Steele and the melody of speech // Language and Speech. 1959. – Vol. 2. 115 s.

[4] Bolinger D. Relative height Prosodic Feature Analysis // Analyse des faits prosodiques. Studia Phonetica. 1970/3. 78 s.

[5] Danesh F. Sentence intonation from a functional point of view // Word. 1960. № 16.

[6] Tseplitis L.K.Speech Intonation Analysis. Riga, 1974. 121 s.

[7] Svetozarova N.D. Pause // Linguistic Encyclopaedic Dictionary. M., 1993. 150 s.

[8] Dolgova O.V. Halting Speech Semiotics. M., 1974. 12 s.

[9] Krivnova O.V. Perceptual and semantic meaning of prosodic seams in a connected text // Problems of Phonetics/ Executive Editor L.L. Kasatkin. M., 1995. 14 s.

[10] Krivnova O.V. Automatic synthesis of the Russian speech for an arbitrary text// Works of international seminar for computer linguistics and its applications. Tarusa, 1998. 26 s.

[11] Monaghan A.I. Rhythmandstressshift // ComputerSpeechandLanguage, 4. 1990. 12 s.

[12] Nikolayeva T.M.Accentuation Semantics. M., «Science», 1982. 162 s.

[13] Cheremisina-Yenikolopova N.V. Laws and Rules of the Russian Intonation. Study Guide. M., «Flinta», 1999. 72 s.

[14] Fries C. On the intonation of «Yes-No» question in English // In honor of Daniel Jones. London, 1964. 54 s.

[15] Romportl M. Intonological typology // Studies in Phonetics. Prague, 1973. 41 s.

[16] Vsevolodsky-Herngross V.N.Theory of Russian Speech Intonation. Pg., 1922. 24 s.

[17] Kanter L.A.System Analysis of Speech Intonation. M., 1988. 102-105 ss.

[18] Torsuyeva I.G. Intonation and meaning of an utterance. M., 1979. 95 s.

[19] Bolinger D. Intonation as a universal // Principles of typological analysis of languages referred to different order: Collected works under the editorship ofB.A.Uspensky. M., 1972. 68-72 ss.