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**Investigation of the pitch accent
of declarative statements of the
kazakh language (on the basis of
Praat programme)**

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**Қазақ тілінің хабарлы
сөйленімдеріндегі тоналды
акценттің зерттелуі (Praat
фонетикалық бағдарламасы
бойынша)**

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**Исследование тонального
акцента повествовательных
высказываний казахского
языка (при помощи
фонетической программы
Praat)**

In this article the pitch accent of spontaneous statements in the Kazakh language is considered. Here the phonetic analysis which is carried out on the rate of the main tone in intonational contours of statements is described. For research of intonation of the Kazakh language the computer programs such as Praat, Doing Phonetics by Computer for development and analysis of speech signals were for the first time used. Using the Praat program, the spontaneous narrative statements in the Kazakh language of the speakers the volume of an interval of pitch accent of the narrative sentences and the main types of tone in this pitch accent were determined. This program can be used to research the sound system of any language at the segment and supersegment level.

Key words: pitch accent, intonation, computer programmes, statement, phonetic analysis.

Мақалада қазақ тіліндегі дайындықсыз жазылған сөйленістердің тоналды акценті қарастырылған. Мақала аясында сөйленістердің интонациялық контурларындағы негізгі тонның жиілігіне жасалынған фонетикалық талдау сипатталған. Қазақ тілінің интонациясын зерттеуге алғаш рет сөйлеу сигналдарын өңдеуге, талдауға арналған Praat атты компьютерлік бағдарлама қолданылған. Praat бағдарламасын қолдана отырып, дикторларға дайындықсыз берілген хабарлы сөйленімдері жазылды, хабарлы сөйленімдерінің тоналды акценттің интервал көлемі, аталмыш тоналды акценттегі негізгі тон түрлері анықталды. Бұл бағдарламаны сегменттік және суперсегменттік деңгейдегі кез келген тілдердің дыбыстық жүйесін зерттеуге пайдалануға болады.

Түйін сөздер: тоналды акцент, интонация, компьютерлік бағдарлама, сөйленім, фонетикалық талдау.

В данной статье рассматривается тональный акцент спонтанных высказываний казахского языка. В статье описывается фонетический анализ, проведенный на частотность основного тона в интонационных контурах высказываний. Для исследования интонации впервые была использована компьютерная программа Praat для анализа речевых сигналов. Используя программу Praat были записаны повествовательные высказывания, предложенные дикторам прочитать без подготовки, были определены объем интервала тонального акцента повествовательных высказываний и основные виды тона в данном тональном акценте. Эту программу можно использовать для исследования звуковой системы любого языка на сегментном и суперсегментном уровне.

Ключевые слова: тональный акцент, интонация, компьютерная программа, высказывание, фонетический анализ.

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e-mail: danel.karagoish@mail.ru, magulsim@mail.ru, ajtmuxanbetova83@mail.ru**INVESTIGATION OF
THE PITCH ACCENT
OF DECLARATIVE
STATEMENTS OF THE
KAZAKH LANGUAGE
(on the basis of Praat
programme)**

Today it is known that there is a good number of theoretical materials devoted to the investigation of intonation in Kazakhstani and foreign Linguistics. During the investigations of the phenomena two ways of explanations of intonation usages in a broad sense and a narrow sense are identified. Namely in a broad (complex, multicomponent) definition intonation is defined as a combination of heterogeneous prosodic phenomena (intonema), so each parameter has its units and definitions (toneme, chroneme, accent and etc.) and tone, temp, intensity, rhyme structures are referred to prosodic phenomena. The representatives of the direction are: A.A. Abduazizov, V.A. Artemov, Sh. Atenov, Z.M. Bazarbaeva, I.A. Baimuratova, V.A. Bogoroditzki, V.A. Vasilev, D. Jones, V.N.Vsevolodski-Gerngross, Zh.K. Kaliev, M.G. Kasparova and Zh.A. Aralbaev, T. Kenshinbaev, J. Oconnor, D. Kristal, B.K. Murzalina, A.N. Nurmakhanova, A.M. Peshkovski, G.P. Torsuev, N.U. Turkenbaev, Zh.M. Utesbaeva, A.M. Fazylzhanova, L.K. Zeplitis and etc. In a narrow sense, intonation is a melody consisting of tonemes, according to K.Zhubanov, A.Khasenov, R.Syzdyk *pronunciation/voice/ melody of speech and here we would like to stress that the word tune*, being used widely today, can be associated with the phenomena. The scientists, whom these ideas belong to are S. Amanzholov, L. Armstrong, A. Baitursynov, M. Balakaev, N.A. Baskakov, D. Bolindger, K. Zhubanov, A. Zhunisbek, S.K. Kenesbaev, S.V. Kodzasov, M.I. Matusevich, K. Paik, G.E. Palmer, C. Ode, I. Word, L.V. Sherba and etc.

There are other ways of describing intonation in the foreign works. Intonation is found not being practical phenomena and intensity, longitude and timbre are considered to be its components. One of the schools is Golland school, that is to say that intonation is defined as *speaking in tune* (pitch accent) [1, 9; 2, 218] and while characterizing the phenomena, they are investigating applying computer programs in order to put the experimental method into effect. Tune or melody is considered the main component of intonation because the way how the sentence varies in tune, defines its reception and interpretation: The speaker makes focus on the fragments (words, syntagma) in a sentence and divides them to bring the vital data to the minds' of recipients. For instance, pitch accent is reached by rising and falling intonation tones. It was D. Bolinger who used the

term *pitch accent*, so the *pitch accent* means: if the stress on syllables occurs by rising tone, rising tone will have two functions. Firstly, it gives us a signal about the stress on a syllable. Secondly, its rising, falling tones and the levels of its direction make the melody. By the movement of the circuit, melody can be created. C.Ode studying the pitch accent of D.Bolinger, focused his attention on: «Pitch accent is not only reached by differentiating the only one vital word from the vast amount of words but it can be seen when the speech melody is fulfilled.» [3].

C. Ode, «Intonation – a change in rising tone of a speech. The variation of rising tone – it is the movement of tone, rising, falling, rising and falling leap in the rising diapason and various types of tone movement can be found. *Perceptual prominence* is given to the particular movement of tone or the tone configuration, a syllable in a word. If perceptual prominence is achieved by rising tone, *pitch accent* is given to the syllable. So compared with the others, words are stressed by pitch accent and have an immense prominence. The speaker fulfills pitch accent in the particular words and conveys the word containing the vital data to the recipient, shows the connection between the words, and the words that describe emotion and feeling. One cannot say that the function is carried out by pitch accent itself. Other prosodic parameters, for instance, intensity or voice duration, variations and rhythm in speech fluency can give prominence to a word or a group of words» [4, 210], [5; 6].

Computer programmes like Praat, Doing phonetics by computer analyzing and processing speech signals are for the first time used to investigate intonation of the Kazakh language. Using the program Praat, Kazakh sentences are prepared in advance for speakers and the intonation of Kazakh sentences is investigated through phonetic methods. This programme can be used to investigate the sound system of any segmental and suprasegmental language units. And additionally with the help of this programme, on the basis of dissertation research and intonation unit of the Kazakh language were described [7].

The workers from Phonetic Institute of Amsterdam University Paul Boersma and David Weenink (2006) invented the programme. The practical use of the program *Praat* is that it can be updated and downloaded from the internet. (The Netherlands; www.fon.hum.uva.nl/praat). *Praat offers various possibilities:*

Praat – created for investigating, measuring, modification and processing speech signals. it enables to measure rising tone of any language and investigate intonation.

Praat can be downloaded *free of charge* from the internet.

Praat can be used by *any type* of the computers.

Praat can be used in science and academic process for academic purposes.

To characterize the form of pitch accent, rising tone is measured, the distance of tone movement in the accent fragment between the highest and the lowest points. It was identified that pitch accent consists of one or several tone movement.

«Semitone» is gained as a unit of the distance (interval) in the logarithmic scale (in English. *semitone*, abbreviation for semitone is ST). The tone movement is measured with hertz; the distance is measured by semitone because man's ability to hear can be obtained not in the pattern scale of a rising tone but logarithmic scale.

So, we described the distance between melody through semitone, draw the circuit with the help of the program *Praat* in the logarithmic scale.

The measurements measured through a semitone which is for measuring the distance between the various registers of speakers make the description easy. For instance, a woman's distance perception is 12 semitones in the register coincides with 12 semitones in a man's register. And distance perception in a woman's register (for instance, from 200 till 300 hertz) 100 hertz in a man's register (for instance, from 100 till 200 hertz) doesn't coincide with the length of the distance (see various scale description from the experience of Ode C., [5]).

So there are drawings which show the distance between the syllables in each utterance. All texts are given in the pictures, that's why one can see the place of the segment of each sentence and intonation circuit in the pictures (see the below pictures).

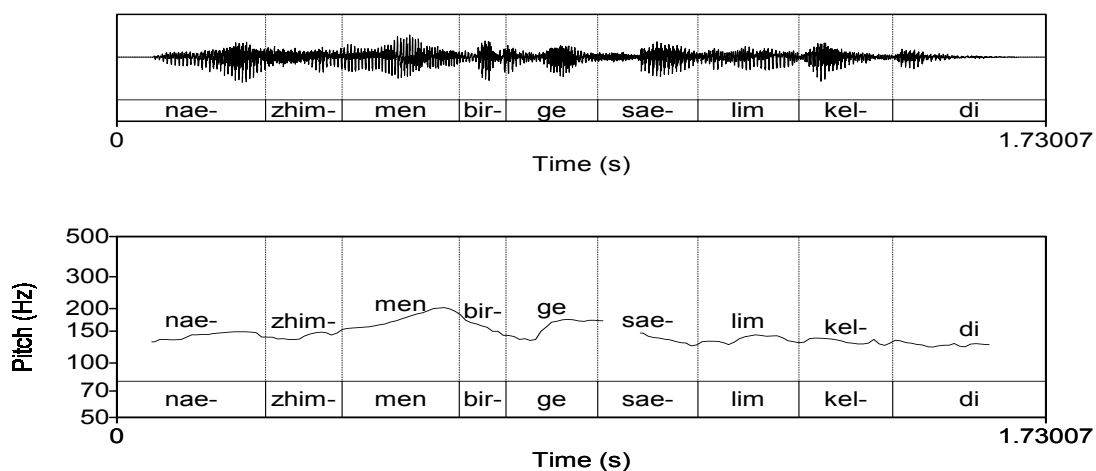
So, we can observe the analysis of Kazakh declarative sentences through the programme in question. The purpose of this study is to identify the place and function of the pitch accent in the written sentences and indicate its function between the sender and receiver

Focus on the analysis of next declarative sentences.

For D6 rising pitch accent is reached in the last syllable of the word *Na-zhim-men*. For D6 the fact that *Nazhimmen birge* Salim (Salim's coming together with Nazhim) is important.

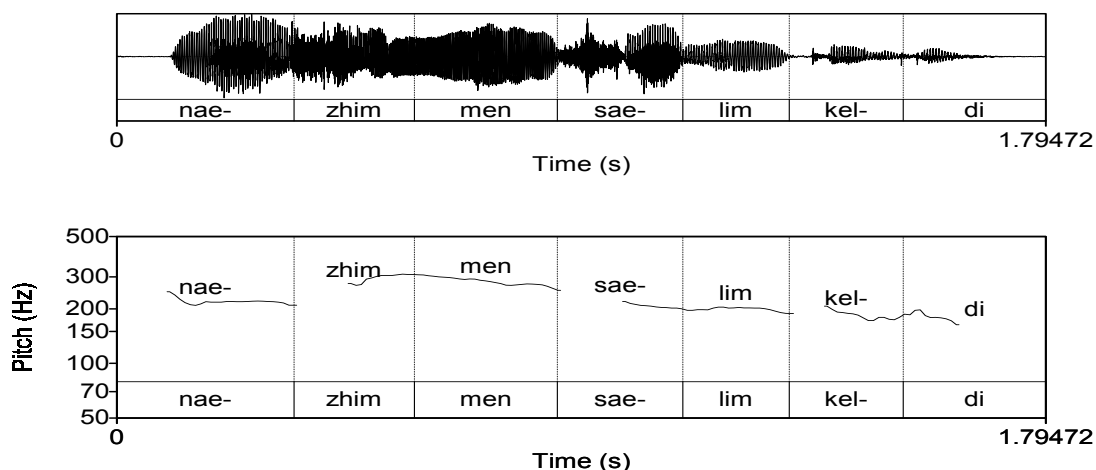
– The interval in the syllable *Men* rose from 155 hertz to 201 hertz; the distance between two points is – 5ST. These examples takes place in the rising pitch accent of the declarative sentence, the sentence itself shows that it falls down or ends with rising tone.

1. Nazhimmen birge Salim keldi
Salim has come with Nazhim
nāzhimmen bīrge sālim keldī



Picture 1 – Narrative statement *Nazhimmen birge Salim keldi* is in implementation of (D6-41) a male voice. The upper figure shows the waveform of the utterance. Vertical lines indicate the boundaries between syllables. On the below figure horizontally time is indicated in seconds, vertically – fundamental frequency in hertz on a logarithmic scale

2. Nazhim men Salim keldi.
Nazhim and Salim have come
nāzhīm men sālim keldī



Picture 2 – Narrative statement *Nazhim men Salim keldi* is in implementation of (D3-42) a female voice. The upper figure shows the waveform of the utterance. Vertical lines indicate the boundaries between syllables. On the below figure horizontally time is indicated in seconds, vertically – fundamental frequency in hertz on a logarithmic scale

Let us compare the pitch accent in two differently uttered sentences by two different speakers, so D6 (picture 2. Nazhimmen birge Salim keldi) and D3 (picture 3. Nazhim men Salim keldi (Nazhim and Salim have come)):

There is the same truth in two sentences: *Two men have come*. In the first sentence D6 pitch accent is reached in the word *birge* (*together*), here the fact that Salim has come **together** with Nazhim is very important. In the second sentence on the contrary

other data is hidden, that is *Nazhim and Salim have come*. There is hidden data in the first sentence, perhaps Nazhim made Salim come with him because Salim did not want to. And in the second sentence they both have come together, and there is no hidden information, both characters are independent here, there is no link, the narrator gives the data about both having come. The pitch accent shows where the vital data is.

Pitch accent is reached in the last syllable of the sentence *Na-zhim-men* in both sentences, the tone in the syllable *-men* rose from 155 hertz to 201 hertz; the distance between two points and semitone – 5ST. In the D3 – the distance between the syllable *zhim* and the word *Na-zhim* rose from 209 hertz to 309 hertz; the distance between two points and semitone – 7ST. The description of two sentences can be a good example of traditional Kazakh declarative sentences.

Pitch accent is reached at the beginning of the sentence, in case of D6-it is a straight line, in case of D3 the intonation tone is falling as it is characteristics of the declarative sentences of the Kazakh language.

As a result of our study of pitch accent in declarative sentences of the Kazakh language we have come to the following conclusion:

The pitch accent is reached at beginning of declarative sentences (frequently in the last syllable of the first word) and the end of the sentence falls or reaches a straight line;

The volume of an interval of the rising pitch accent is from 1ST to 3ST (minimum volume), from 4ST to 6ST (average volume), from 7ST to 12ST (maximum volume). The volume of an interval identifies the place of the pitch accent which comprises vital information;

There was not a significant distinction while identifying the pitch accent of narrative sentences.

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