ANALYSIS OF THE INTONATION OF DIOLOGICAL TEXT

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Abstract: Intonation decode is the basis of speech, reveals the core word. Intonation allows people to understand each other in the spoken language. Intonation and its components together with linguistic means, participates in the formation of the texts external structure. It reveals author's communicative intention of the information and also the course of the formation of thought in the language consciousness. In other words, intonation interacts with other semantic means - grammatical and lexical – in parallel with the emergence and perception of the meaning layer of the text. Here, along with the explanation of the theoretical issues of text, intonation and experimental-phonetic analysis are performed. The purpose of both experiments is to analyze the intonation of the text (dialogic text). The purpose of the experimental-phonetic analysis is to determine the text intonation on 3 parameters – frequency, strength and time of the main tone, by using *Win Cecil, PRAAT, Mac Speech Lab* programs. The texts in British English (RP) based on materials from the London Linguistic Institute are vocalized by native speakers, one is male and other – female.

Keywords: Coherence, Dialogic text, Experimental-phonetic, Perception, Tone.

1 Introduction

Any information is transmitted through this or the other material carrier. This means the text must contain factors that provide the transmittion of the additional information. In language, the quality of such factors is the coherence of units of different levels. We consider that the addressee's adequate perception of the text depends on the correct placement of the 'communicative-meaningful parts' of the text, i.e. the individual must be able to follow the development of the thought and determine the relationship between the each part and the whole text that expresses a particular element of meaning. As it is known from the applied theoretical sources, the perception of any text represents a structural hierarchy of different levels - the lexical (word recognition), the syntactic (sentence recognition) and the meaning levels, through which the recipient goes through several stages.

"Experimental phonetics at the initial stage of its development started with the study of neurophysiological mechanisms. In Kazan linguistic school in accordance with the results of studies of that time there were obtained the results important for our time: speech zones in the context of the human brain; the nature of linguistic thinking; the causes of individual speech phenomena such as slips of the tongue etc." [4, p. 2946-2949].

"As we shall see, experimental phonology and phonetics are an important part of linguistics precisely because of their constant contact with the real world data we collect in the laboratory. This is a difficult part of linguistics, though, because it needs you to develop a feeling for experimental procedures which are somewhat different from the way you treat other areas of linguistics. But, as you will see, it is interesting because we constantly have to deal with difficult questions concerning the interaction between the abstract (or mental) and real (or physical) worlds" [14, p. 4].

It is known that the tone, as the category of intonation, is perceived by the listener and repeated in speech. In addition, in English, the tone forms a well-developed, relatively independent subsystem of intonation.The interest in the study of the tone features of intonation is explained by the fact that it can be consciously realized by the speaker in important segments in terms of the meaning, which form the center of the syntagma and where the other parts are located around it.

The study of the semantic structure of the tone within the constituent functions of intonation allows revealing the deep meaning realized in the dialogic text. The movement of the tone within the discourse provides the basis to determine the main content of the texts and discover the initial motive of the information, as well as creates a basis to distinguish the degree of importance of the individual components in the speaker's mind. Accordingly, the listener is able to adequately decode the information transmitted by the speaker through specially identified components in terms of intonation.

Communication is one of the most important aspects of our everyday activity. In fact, most things we do are directly or indirectly connected with communication. Even "talking" silently to oneself is a form of communication, called "intrapersonal" (inner) communication.

The components of the communication process:

- Thought: First, information exists in the mind of the sender. This can be a concept, idea, information, or feelings.
- Encoding: Next, a message is sent to a receiver in words or other symbols.
- Decoding: Lastly, the receiver "translates" the words or symbols into a concept or information that he or she can understand [13, p. 198].

2 Literature Review

Main features of modern experimental-phonetic research are their speech perception that is, conducting experiments in the direction of perception. Problems of perception of live speech are studied in psychology and physiology, as well as it is also an integral part of the experimental-phonetic research. The instrumental study of the language material is one of the distinguishing features of the most modern methods of analysis. This fact allows linguists-experimenters to get detailed objective information, mainly to study the acoustic parameters of the live speech in dynamics. In contrast to the statistics of the written text in which the language structures are recorded, the description of the dynamics of the monologue or the dialogic speech is accompanied by the certain difficulties.

"The acoustic parameters of the syllable are the frequency of the pitch on the border areas, the intensity curve, the duration – all this also contributes to the development of listening skills, correction and coordination of sounding / pronunciation and understanding techniques, thereby achieving success in developing skills and skills in working with phonetic material of varying degrees in semantic and communicative complexity" [4, p. 2946-2949].

As audio and telecommunication technologies develop, there is an increasing need to evaluate the technical and perceptual performance of these innovations. This means that the auditory quality of such systems cannot be measured by traditional physical measures (such as distortion, frequency response etc.), but only by perceptual evaluations in the form of listening tests [1, p. 346].

"There are four main reasons for studying experimental phonetics. The first of these is that speech is interesting in itself. The ability to produce and understand speech is a fundamental part of our identity, as individuals, as members of larger communities, and as human beings. However, many aspects of speaking and hearing are inaccessible without the aid of instruments. The second reason for studying experimental phonetics is that it expands the range of contexts in which we can study speech. To give but two examples, speech is a highly skilled motor activity, which can be studied as part of the general study of movement. Speech is also a type of sound which can be compared with other types of sound from the perspective of general acoustics. Each of these contexts has its own theoretical perspective, to which the study of speech can contribute. A third reason is provided by the numerous practical applications of experimental phonetics. Obvious examples are medical applications such as helping patients with disordered speech, applications in the fields of telecommunications and man-

machine communication, and the development of audio-visual aids for improving pronunciation in language teaching. The fourth reason, and the one which underlies this book, is the relevance of speech for the study of language in general" [7, p. 32-34].

"The intonation of a sentence is its pattern of pitch changes. This syllable, which carries the tonic accent, will be marked in this section by an asterisk. Sometimes, there are two or more intonational phrases within an utterance. When this happens, the first one ends in a small rise, which we may call a continuation rise. It indicates that there is more to come and the speaker has not yet completed the utterance. The intonation is also considerably affected by the speaker's style. When speaking slowly in a formal style, a speaker may choose to break a sentence up" [10, p. 120].

Lomtev T.M. "Speech perception in the experimental and the general phonetics is a set of mechanisms that enables the transition from the initial phonetic description of a sound or sequence of sounds to its interpretation as certain units of the language system. In this connection, the perceptual correlations of super-segment units (stress and intonation) used in the perception of units of different levels of language are investigated" [11, p. 4-16].

Zlautoustova notes: "The perception and the interpretation of speech is based only in part on the sound signal received by the auditory receptors. Therefore, the acoustic signals act as one of the components that serve to perceive linguistic structures. The process of interpreting the audio text is not limited to physical signals (acoustic, optical). The speaker's goals and motivations based on the previous knowledge, are also important for the accurate interpretation of the information" [20, p. 267].

"The acoustic signals, which have been electrically transduced, are constantly varying in time. The slowest and fastest varying elements of the signal denote the frequency range which is being transduced. Recording systems also have their own intrinsic frequency ranges — that is, a range between the slowest and fastest electrical signals to which they can respond accurately. Beyond the frequency range of a tape recorder no signal, even if present in the incoming signal, can be properly recorded. Clearly we must make certain that the frequency range of the recorder matches, or is wider than the signal we want to record" [14, p. 7].

The membership, which is conditioned by the speaker's attitude toward the discourse is variable and varies within the individual speakers within the same sentence.

L.R. Zinder notes: "The close connection between the intonation and the meaning of a sentence makes it one of the most important factors in communication. ...it is not necessary to recognize all the words in a sentence to understand it. The context allows for the restoration of an unheard word, and even if the "recovery" does not occur, it is possible that the meaning of the sentence is understood [...] in this case, intonation plays an important role" [19, p. 312].

"Sometimes tone languages are contrasted with intonation languages. But they should not be tone languages also have intonation. One common intonation effect found in many register tone languages is tone terracing. Terracing involves several related phenomena: downdrift, downstep and upstep. Upstep is the converse of downstep. It is the raising of the pitch of a tone so that it is phonetically a step higher in pitch than the preceding token of the same tone. upstep produces rising intonation over part of the utterance" [9, p. 205].

"Prosodic contrasts are argued to be an important mechanism for communicating implicit emotional and intentional information in speech—and a means to understanding traditional notions of an ironic tone" [3, p. 545–566].

McMahon writes that, "The main contribution a phonologist can make is to produce a classification of types of differences between accents, which can then be used in distinguishing any set of systems; and that is the goal of this chapter. In the next three sections, then, we shall introduce a three-way classification of accent differences, and illustrate these using examples involving both consonants and vowels. First, the systems of two accents may contain different numbers of phonemes, so different phonemic oppositions can be established for them: these are systemic differences. Second, the same phonemes may have different allophones: these are realization differences. Finally, there are distributional differences, whereby the same lexical item may have different phonemes in two different varieties; or alternatively, the same phoneme may have a phonological restriction on its distribution in one variety but not another" [12, p. 93].

"A difference in the relative amplitude of the high- and low-frequency regions of the spectrum can indicate either an increase in the high-frequency range and/or a decrease in the low-frequency range. If recordings are not calibrated for intensity, it is meaningless to compare the absolute intensity of spectra between vowels. Instead, an indication of spectral tilt is inferred from the net difference between different regions of the spectrum. This measure complements the low-frequency spectral measures in the previous section, since the effects of increased low-frequency amplitude and of steeper spectral slope, expected of breathier phonation type, are mutually enhancing" [17, p. 182].

Zhinkin notes that the initial analytical breakdown of the synthetic acoustic complexes of the sound into the separate signs in the auditory receptor and the transition of these signs into the signal-bearing nerve impulses; besides the storage of the received signals during the reception of the separate simple information (phrase); the introduction of the mechanism of constant differentiators, the separation of the main frequency from the spectrum, the separation of speech forms and the initial synthesis of the words on timbre; recognition of the words from the structure of the learned lexicon on the individual and the categorical features and the complete synthesis of the separate word in this connection; the word synthesis in the information system according to the learned rules of the logic and grammar; the differentiation of various stages of the utterances according to the signs of rise, height and length, and the re-interpretation of the word complexes in relation to the situation; understanding the meaning of the individual information and storing it through any substitute [18, p. 109].

As Mary Ellen Grunke and David B. Pisoni note, "In natural speech, a single phonetic segment may have many different acoustic representations, depending on the context in which it is spoken. An extensive body of research over the last 30 years has been directed towards trying to identify acoustically invariant properties of phonemes that can mediate speech perception" [5].

According to Conz, there are special devices that compare the sounds in English with the sounds in other languages and study and show their differences. This research is carried out by a special branch of the phonetics, the "instrumental" and the "experimental" phonetics. The experimental phonetics studies the correct pronunciation of a foreign word in speech [5].

"The experimental phonetics, in general, characterizes the melody in intonation and its main component in the perception and the clarity of information by the listener in a live speech" [7, p. 58].

F.Y.Veysalli writes: "The most difficult point in the spectrographic and the oscillographic analysis is the segmentation of the speech act, because there are no regular curves for this or that sound. However, the accuracy of the results of the analysis depends on the exact delimitation of the sounds, because when we define the boundaries, we distinguish one sound from the other, and thus determine the calculation of the values of the parameters. The oscillograms and the

pectrograms vary from the sound to sound, from the individual to individual, depending on their position in the speech chain" [16, p. 126].

The movement of the tone within the syntagma – rising or falling – creates the pattern of speech, shows its syntactic structure and the semantic capacity. The study of the expression of emotion in the text through the intonation is also reflected in L.V.Sherba's work: "We can express the various affects in the most subtle shades: hatred, anger, indifference, irony, caress, elegance, tenderness, distrust, excitement, and so on" [15, p. 327].

Taking into consideration above all, we applied to the experimental-phonetic analysis to determine the characteristics of intonation in the perception of the dialogic text.

3 Materials and Methods

The questionnaires have special columns to indicate the intonation features of individual texts.The texts presented to the recipients were read by 2 English speakers (one female and one male). The text was pronounced in British English (RP) and the pronunciation of the announcers fully meets the norms of literary pronunciation. The International Phonetic Alphabet [6, p. 204] was used in the transcription of language material.

The details of phonetic acoustic information can be obtained through the use of experimental phonetics technologies (currently it is available through computer programs Win Cecil, PRAAT, Mac Speech Lab PRAAT and Speech Analyzer). The programs provide acoustic characteristics of the speech signal in one complex; on the screen you can simultaneously see oscillograms, intensity curves, melodies, spectral contours [4, p. 2946-2949].

"Since experimental phonetics is defined primarily by its methodology rather than by its subject matter, it is somewhat misleading to suggest that a clear-cut distinction can be drawn between experimental phonetics with non-experimental phonetics. Nevertheless, we shall assume such a division here" [7, p. 32-34].

"In the acoustic analysis of speech signals "PRAAT" computer program, which has been created by the professors of Amsterdam University Paul Boersman and David Veenik to hold special experiments, has been widely used. "PRAAT" computer program has wide opportunities, such as to hold ossillographic and spectographic analysis of language materials, to get indicators of tonal frequency intensity, and length of language materials, etc.

The given computer program provides learners with the chance of learning speech fragments which have the recording time from several m/sec to 12 hours" [5, p. 229-240].

fʊtbɔ:l||

– ðɪs ˈɑ:ftənu:n aɪm ˈteɪkɪŋ maɪ ˈkʌzn̩ ənd maɪ ˈʌŋkl̩ tʊ ə ˌfʊtbɔ:l mæʧ|| ˈsaɪmənz ˈnevə si:n ə prəˌ feʃənl̩ ˌ geɪm||ʌŋkl̩ ˈgaɪ ˈhæzn̩t si:n ˈwʌn fɔ·ˌ jɪəz||tə̩deɪz ˌmaʧ| ɪz bʊtwi:n ˈɑ:sənl ənd ˌlɪvəpu:l|| ˌboʊθ əv ði:z ˌti:mz| ɑ·ˈverɪ ˌgʊdˌ ðɪs ˌ si:zn̩|| aɪ ˈhævnt ˌsi:n ˌlɪvəpu:l | ðɪs ˌsi:zn̩|| ðeərˌ ˌpfɳ ˈwʌn əv ðə ˈbest ˈti:mz ɪn ˌðə ˈfɜ:st ˌdɪˌvɪʒn|| aɪ ˌpfɳ goʊ tə ˌfʊtbɔ:l ˌmæʧɪz|| aɪ ˈju:ʒəlɪ ˈgoʊ tə ˈhaɪberɪ tə si: ˌɑ:sənl|| ðeə ˈgeɪmz ɑ·rˌ ˌɔ:lweɪz gʊd|| aɪ ˈsʌmtaɪmz ˈgoʊ tə ˈsi: ˌʧelsɪ|| ˌsʌm əv ðeə geɪmz ɑ· ˌgʊd | ˈʌðərˌ ɑ· ˌbæd|| ˈrʌgbɪz əɱʌðə ɪksaɪtɪŋ ˌspɔ:t | bət aɪ ˈdoʊnt ˈju:ʒʊəlɪ ˌgoʊ tə rʌgbɪ ˌgeɪmz || ðə ˈbest ˈspɔ:ts fʊtbɔ:l|| [6, p. 203].

4 Results

In the English text *fʊtbɔ:l//*(Football)", the speaker gives information it is about which team the hero is a fan of. At the end of the dialogue, it is noted that football is the best game. At the beginning of the text, the acoustic parameters are expressed by the following indicators: /ðɪsˈɑ:ftənu:n/aɪmˈteɪkɪŋ maɪˈkʌzn̩ ənd maɪ ˈʌŋkl̩ tʊ ə ˌfʊtbɔ:l mæʧ// (This afternoon I'm taking my cousin and my uncle to a football match).

The Progrediens syntagm:

- The base tone frequency: V_1f –187 hs, V_2f –258 hs, V_3f – 240 hs, V_4f –143 hs;
- The intensity parameter: V_1i – 66 db, V_2f – 74 db, V_3i – 68 db, V_4i – 66 db;
- The time parameter: V_1t-60 m/sec, V_2t-130 m/sec, V_3t-72 m/sec, V_4t – 113 m/sec. (Figure 1).

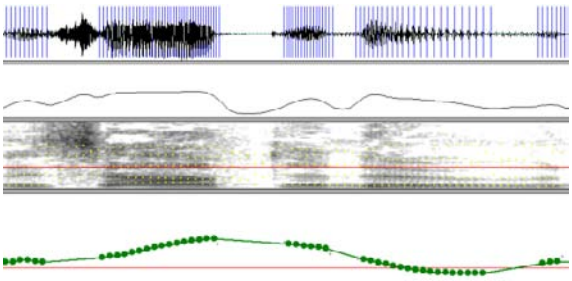

Figure 1 – The oscillogram and the spectrogram of the syntagm /ðɪsˈɑ:ftənu:n/

In the dialog, the terminal syntagm / aɪmˈteɪkɪŋ maɪˈkʌzn̩ and mai ˈʌŋkl̩ tʊ ə ˌfʊtbɔ: l mæʧ // acoustic parameters:

- The frequency of the main tone: V_1f –149 hs, V_2f –173 hs, V_3f –147 hs, V_4f –138 hs, V_5f –233 hs, V_6f –183 hs, V_7f –142 hs, V_8f –180 hs, V_9f –191 hs, V_{10}f –246 hs, V_{11}f –138 hs, V_{12}f –127 hs, V_{13}f - 116;
- The intensity parameter: V_1i -68 db, V_2f -72 db, V_3i -61 db, V_4i -69 db, V_5i -70 db, V_6i -63 db, V_7i -69 db, V_8i - 65 db, V_9i -63 db, V_{10}i -67 db, V_{11}i -64 db, V_{12}i -68db, V_{13}i – 64 db;
- The time parameter: V_1t – 137 m/sec, V_2t – 123 m/sec, V_3t – 60 m/sec, V_4t – 126 m/sec, V_5t – 102 m/sec, V_6t – 61 m/sec, V_7t – 130 m/sec, V_8t – 81 m/sec, V_9t – 129 m/sec, V_{10}t – 76 m/sec, V_{11}t – 107 m/sec, V_{12}t – 81 m/sec, V_{13}t – 76 m/sec (Figure 2).

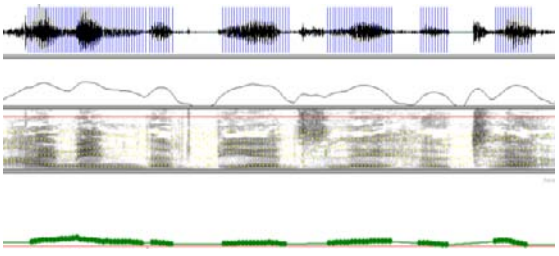

Figure 2 – The oscillogram and spectrogram of the syntagm of the / aɪmˈteɪkɪŋ maɪˈkʌzn̩ and mai ˈʌŋkl̩ tʊ ə ˌfʊtbɔ: l mæʧ //

The acoustic parameters of the text in the middle position / ðeə ˈgeɪmz ɑ • rˌɔ: lweɪz gʊd // (Their game is always good) are as follows:

- The frequency of the main tone: V_1f –270 hs, V_2f –177 hs, V_3f –160 hs, V_4f –190 hs, V_5f –172 hs, V_6f –131 hs;
- The intensity parameter: V_1i – 70 db, V_2f – 72 db, V_3i – 69 db, V_4i – 69 db, V_5i – 66 db, V_6i – 58 db;
- The time parameter: V_1t – 169 m/sec, V_2t – 137 m/sec, V_3t – 90 m/sec, V_4t – 110 m/sec, V_5t – 130 m/sec, V_6t – 90 m/sec. (Figure 3).

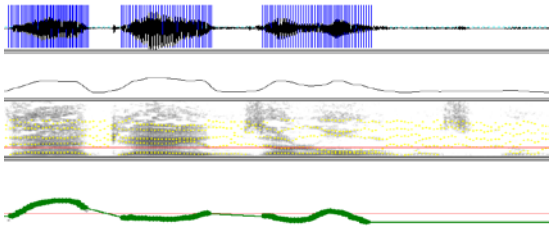

Figure 3 – The oscillogram and the spectrogram of the syntagm / ðeə ˈgeɪmz ɑ • rˌɔ: lweɪz gʊd //

The acoustic parameters at the end of the text / ðə ˈbest ˈspɔ: ts ʃʊtbɔ: l // (The best sport is football) are as follows:

- The frequency of the main tone: V_1f-124 hs, V_2f-204 hs, V_3f-219 hs, V_4f- 305 hs, V_5f-124 hs;
- The intensity parameter: V_1i-59 db, V_2f -71 db, V_3i -75 db, V_4i -68 db, V_5i-59 db;
- The time parameter: V_1t – 75 m/sec, V_2t – 93 m/sec, V_3t – 137 m/sec, V_4t – 79 m/sec, V_5t – 116 m/sec (Figure 4, Table 1, 2, 3, 4).

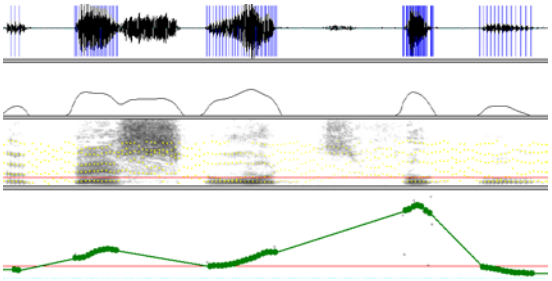

Figure 4 – The oscillogram and the spectrogram of the syntagm/ðə ˈbest ˈspɔ:ts ʃʊtbɔ:l//

Table 1: The average acoustic performance of the sentence by syntagms

	Acoustic parameter	1	2	3	4	5	6	7	8	9	10	11	12	13
I discourse	frequency of main tone (hs)	187	258	240	143									
	intensity (db)	66	74	68	66									
	time (t)	60	130	72	113									
Iı discourse	frequency of main tone (hs)	149	173	147	138	233	183	142	180	191	246	138	127	116
	intensity (db)	68	72	61	69	70	63	69	65	63	67	64	68	64
	zaman (t)	137	123	60	126	102	61	130	81	129	76	107	81	76
Iıı discourse	frequency of main tone (hs)	270	177	160	190	172	131							
	intensity (db)	70	72	69	69	66	58							
	time (t)	169	137	90	110	130	90							
Iv discourse	frequency of main tone (hs)	124	204	219	305	124								
	intensity (db)	59	71	75	68	59								
	time(t)	75	93	137	79	116								

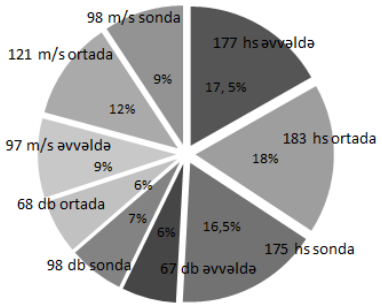

Figure 6 –The average acoustic performance of the text by syntagms (%)

Note: əvvəldə - at the beginning, ortada - in the middle, sonda - at the end.

Table 2: The variation of the main tone frequency within the discourse

Variation of the main tone frequency	Speaker 1	Speaker 2
Rising	27	25
Falling	86	90
Continuous tone	17	19

Table 3: The variation of the intensity value within the discourse

Variation of intensity	Speaker 1	Speaker 2
Rising	31	28
Falling	83	87
Straight intensity	22	20

Table 4: The variation of time value within the discourse

Variation of time values	Speaker 1	Speaker 2
Increasing	90	95
Decreasing	33	33
Equal time	11	7

5 Conclusion

The following was obtained from the experiment: absolute values of the main tone frequency, the level of the main tone frequency in the dialogic text, the localization of the minimum and maximum indicators of the main tone frequency in the analyzed structures, the range of the main tone frequency; total length of phrases in the text; direction of intensity movement, determination of maximum and minimum intensity values, range of intensity in the analyzed structures.

When studying the prosodic indicators of the text, the interrelation of intonation and syntactic units and the centers of meaning of the sentence were identified.

Based on the results of the analysis of the acoustic parameters in the study determined the frequency level of the beginning of the discourse, the level of the frequency at the end of the discourse in English and the values of syllables with discourse stress, as the relevant fields for intonation information. With reference to the acoustic results, it can be said that the discources in English have different intonation contours depending on the communicative type, the assignment, the purpose, the number of syntagms and their place inside the discources - pre, post and middle positions, and the subjective attitude of the speaker;

As a result of the experiment, the average range of dynamics of syntagms was determined to be around 60-73 dB. It was noted that in the analyzed segments (syntagms) the pronunciation rate in the nuclear syllables is prolonged. In English, the short and the medium intervals between the syntagms of the text (dialogical text) - are observed in 180-240 m/sec. In English, the length of the emphatic-emotional interval between the syntagms of the text (dialogical text) was noted relatively high compared to the neutral interval - in the range of 255-680 m/sec.

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