

# QUANTITATIVE EVALUATION OF THE UTTERANCE'S EMOTIONAL-AND-PRAGMATIC POTENTIAL

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It is a feature of contemporary linguistics to renovate its paradigms through interdisciplinary methods and approaches. Within phonetics, this can be exemplified by the introduction of speech energetics theory (Kalyta 2015), which substantiates a psycho-energetic nature of speech production and perception. It is worth mentioning that speech energetics theory views and describes phonetic phenomena as outcomes of stochastic speech generation, driven by the individual's psycho-physiological energy redistributed between their consciousness (responsible for the speaker's choice of verbal means) and the spheres of their subconscious and unconscious (shaping non-verbal communication).

In view of this, there is a demand for special experimental-phonetic tools or techniques capable of measuring, or evaluating, speech energetic potential, thus enhancing the effectiveness of the interdisciplinary study of oral communication. The aim of this theoretical search is to substantiate a new objective method or criterion for differentiating the levels of the utterance's emotional-and-pragmatic potential (hereinafter EPP).

This search is based on the assumption that the speech flow, conveying the speaker's feelings, emotions and intentions, is fundamentally similar in its physical and energetic essence to the flows of liquids or gases. In this case, materialisation of the speech flow should be formally described by the similarity criteria known in physics (Lebediev 1989, pp. 63-92), making it possible to quantitatively evaluate the level of the utterance's EPP since speech production is a physical phenomenon, generated by psychophysiological processes.

Having at our disposal speech analysing software as instrumental means of obtaining quantitative indicators of the utterance's physical parameters we could make a search for quantitative dimensionless criterion differentiating EPP levels.

For this purpose, we applied a well-known method of dimensional analysis (Lebediev 1989, pp. 72-105). In line with its methodology, the initial criterion equation included only those prosodic parameters which, according to the experimental data, have a significant influence on the level of the utterance's EPP, namely: fundamental frequency ( $F_0$ ), duration of the analysed unit ( $t$ ), intensity of the fundamental frequency ( $I_0$ ), intensity of the third formant ( $I_3$ ).

Considering abovementioned, we theoretically substantiated the dimensionless quantitative K-criterion defining the levels of the utterance's emotional-and-pragmatic potential, presented as the

following formula: 
$$K = \frac{F_0 \times t \times I_0}{1000 \times I_3}$$

Legend:  $K$  – criterion of the level of the utterance emotional-and-pragmatic potential;

$F_0$  – fundamental frequency (Hz);

$t$  – syllable duration (ms.);

$I_0$  – amplitude of  $F_0$  (dB);

$I_3$  – amplitude of  $F_3$  (dB);

1000 – milliseconds to seconds conversion factor.

At the next stage of the analysis, we experimentally established the intervals of the K-criterion values, which determine the levels of utterance's emotional-and-pragmatic potential. They were conventionally classed into the low (up to 30 points), medium ( $K = 30-105$  points) and high (higher than  $>105$  points) levels of the utterance's EPP.

We believe that the obtained K-criterion can allow solving the problem of automatic objective identification of the level of emotional-and-pragmatic potential of any speech fragment.

## References:

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