ON AN ALGORITHMIC STUDY OF ENGLISH INTONATION

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This paper represents the first attempt to apply an algorithmic method to the study of English intonation. The method involves a new computer-assisted technique of acoustic analysis. It advantageously replaces the heuristic method, hitherto in extensive use. The algorithmic method makes it feasible to take into account the correlation of initial parameters and to give a quantitative estimate of their significance for differentiation of opposed intonation types.

The purpose of this investigation is a computerized search for one optimal acoustic distinctive feature with reference to a general linguistic dichotomy - statement/question. The experiment was designed to analyze fundamental frequency (F_o) in the utterance "You knew [.] ≠ You knew [?]". Each test phrase was pronounced in an appropriate context by 13 subjects, all speakers of British English. 26 pitch contours were obtained (13 statements and 13 questions, respectively). 25 of these, correctly identified by listeners, were used for further intonographic analysis. 8 initial parameters of the experimental material were analyzed: maximal and minimal F_o values within each syllable, F_o at the starting point, F_o at the end point, F_o at the last turning point, maximal F_o value between the starting point and the last turning point.

The acoustic distinctive feature conception as a linear combination (weighted sum) of all the initial parameters makes it possible to regard it as vector $\theta = \langle P_1, \ldots P_T \rangle$, where T represents the number of initial parameters, $P_1, \ldots P_T$ are weight coefficients. If vector θ differentiates the opposed pitch contours it can be considered as a distinctive feature, while each $|Pi|$ $(1 \leqslant i \leqslant T)$ value can be viewed as estimates of the initial parameters' significance. Vector θ was computer determined in a manner whereby all the pitch curves' values of statements in reference to θ were positive and question pitch values were negative.

Conclusion

For the first time a linear combination of the initial parameters, ensuring optimal statement/question differentiation in English, was found.