

A Note on Temporal Compensation

Richard Gregorski and Linda Shockey

In "Word-Unit Temporal Compensation," (O. S. U. Working Papers in Linguistics No. 9, 1971) and "Implications of Temporal Compensation for Speech Production Models," (Proceedings of the VII International Congress of Phonetic Sciences. Mouton, in press) we presented some conclusions about the higher-level programming of speech based on negative correlation coefficients between speech units in words and short phrases. In the second of these papers, we expressed some reservations about the methodology we used. Since some interest has been shown in this method of investigating temporal programming, we feel we should discuss the problems that we have encountered.

First, the problem of speech rate. There has been, as far as we know, little research on what characteristics determine different rates of speech, if indeed there is a predominant strategy for changing tempo, and on whether the concept of speech rate should be viewed as absolute or relative; as a series of quantal steps or as a continuum. Even if we were able to distinguish speech rates accurately, we have very little information on how changes in rate affect correlations between segments in an utterance (this is discussed briefly in Kozhevnikov and Chistovich, Speech: Articulation and Perception. Moscow-Leningrad. Translated by J.P.R.S. No. 30, 543, pp. 99 ff.). We tried to solve this problem by 'normalization', which was our term for choosing for examination out of our total data set a subset the members of which were nearly identical in duration (as suggested by John Ohala in his dissertation, Aspects of the Control and Production of Speech, U.S.L.A. Working Papers in Phonetics 15, 1970. He was not working with correlation coefficients, however). Ohala has since pointed out (personal communication) that this procedure introduces negative correlations between elements. (When we tested our non-normalized corpus for negative correlations, we found few, but attributed it to rate mixing.)

Second, the problem of 'complementary halves'. If the normalization procedure mentioned above is applied to a set of utterances and any two mutually exclusive portions tested for correlation, the coefficient will always be very near 1, by definition. It was a mistake on our part to attach any further significance to this fact.

Third, 'correlations at a distance.' Similar correlation coefficients are found between, for example, segments A and B

(adjacent segments) and segments A and F (separated by several intervening elements). It seems that if one considers the A-B case significant, one must attribute a similar significance to the A-F case. But it is not clear to us what these correlations, taken at equal value, tell us about language programming.

Since we have not found solutions to these problems, we feel that it is too early to make any conclusions about temporal patterning of language based on the technique described in our 1971 papers.

Note

In "Word-Unit Temporal Compensation" (p. 153) we incorrectly attributed to John Ohala the notion that the mechanism for isochrony may be part of the linguistic competence of the speaker of English. The reference should have been to George Allen's "The Place of Rhythm in a Theory of Language," U.C.L.A. Working Papers in Phonetics No. 10, 1968.