

Inertial and non-inertial lenition processes

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Adherents of Natural Phonology maintain that the communicative needs of speakers have to be fulfilled within the limits imposed on them by the anatomy of the speech apparatus. When a sound sequence constitutes an articulatory difficulty, speakers make use of one of the phonological processes at their disposal to replace the difficult element of the sequence with one that is identical but lacks the difficult property (Stampe 1973: 1). Since the vocal tract can be thought of as a biomechanical system whose active articulators, as any other physical objects, are subject to inertia, it is logical to assume that CVC and VCV sequences, in the realisation of which the active articulator has to produce abrupt changes in direction, constitute a difficulty provided that the speech rate is sufficiently fast. As far as interconsonantal vowels are concerned, it can be hypothesised that in fast speech such vowels will undergo phonetically conditioned reduction and will be replaced with a more central sound. In the case of intervocalic consonants, particularly plosives, the active articulator may not reach the target, which results in the production of a homorganic fricative. Needless to say, the cost of each undershot gesture appears to be lower than that of a full gesture due to the shorter articulatory movements.

Since all humans are equipped with the same vocal apparatus, the influence of inertia on lenition processes can be regarded as one of the mechanistic universals. In order to test the hypotheses formulated above, four native speakers of English, Polish, Russian and Spanish were asked to read a number of short sentences at three self-determined speaking rates: slow, natural and fast. The sentences contained sound sequences that necessitated the application of various lenition processes.

The results of the study strongly suggest that lenition processes fall into two distinct categories, namely inertial and non-inertial ones. The major reason for proposing this dichotomy is the fact that only while realising a CVC or VCV sequence can the active articulator reach a velocity that is high enough for the inertia of the organ to exert a significant influence on the realisation of an articulatory gesture. Most importantly, the sounds undergoing a phonetically conditioned process form a cross-linguistic hierarchy of susceptibility to inertia. On the other hand, processes affecting consonant clusters do not seem to be motivated exclusively by vocal tract inertia. The results indicate that inertia exerts an insignificant, if any, influence on place assimilation or consonant deletion, which is consistent with Berg's (1998) claim that the shorter the linear distance between two sounds, the more likely they are to interact. Even though the alveolar/dental nasal /n/ place assimilates, to a lesser or greater extent, to bilabial and velar segments in the four languages, the plosives /t, d/ do so only in English. The inertial motivation of place assimilation has been excluded on the grounds that in Russian and Polish /t, d/ never undergo the process even in the fast speech condition. Similarly, the analysis of consonant deletion has revealed that a coda segment flanked by two homorganic consonants constitutes by far the best candidate for deletion; when the adjacent sounds are heterorganic, deletion seems less likely to occur. In the light of data, the acoustic similarity of the constituents of a cluster should be considered as a possible motivation behind the processes, especially as far as sequences of fricatives are concerned.

Bibliography

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