

# **Speech Melody as Articulatorily Implemented Communicative Functions**

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The understanding of speech melody, i.e., pitch variations related to both tone and intonation, can be improved by simultaneously taking into consideration two basic facts: that the melody conveys communicative meanings, and that it is produced by human articulators. Communicative meanings are conveyed through a set of separate functions which are realized by an articulatory system that has various biophysical properties. These properties make it unlikely that the functions are encoded directly in terms of invariant surface acoustic forms. Rather, the encoding is likely done through the manipulation of a limited number of articulatorily operable parameters that may be considered as the melodic primitives. Four such primitives can be recognized: local pitch targets, pitch range, articulatory strength and duration. The values of the melodic primitives are specified by a set of encoding schemes each associated with a particular communicative function. The encoding schemes are distinct from each other in the manner of controlling the melodic primitives. This allows multiple communicative functions to be conveyed in parallel through speech melody. The communicative functions are ultimately converted to continuous, detailed surface acoustic patterns through an articulatory process of syllable-synchronized sequential target approximation, which takes as its control parameters the melodic primitives specified by the encoding schemes. This view of speech melody is summarized into a comprehensive model of tone and intonation, namely, the Parallel Encoding and Target Approximation (PENTA) model.