

# **Biological Speech Codes and the Communication of Affect in Music**

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Gussenhoven proposes two biological speech codes governing the projection of speaker affect through prosodic contour. 1) The 'effort code' posits that speakers use wide pitch contours to convey states such as confidence, assertion, helpfulness and enthusiasm, and that the physical effort in executing such contours is naturally indicative of these states. Conversely, narrow contours are used to project lack of confidence, interest or enthusiasm. 2) The 'production code' derives from the gradual drop in F0 during the utterance of a single phrase as a result of the lowering of subglottal breath pressure: a process of 'declination'. Thus descending terminal contours suggest closure as they imply the utterance has come to an end. Conversely, ascending contours suggest continuation. A variety of empirical sources from the phonological domain support the assertions of these codes.

Music and language are thought to be intimately related in respect of formal hierarchic structures, the expression of emotion and a common origin in the human voice. In view of this connection, we examine whether the predictions of Gussenhoven's speech codes hold for music. Can music communicate affective states as a function of the global features of melodic contour? Do descending terminal contours convey closure in musical phrases more definitively than ascending contours? While empirical and anecdotal evidence suggests this is likely, the precise effects of the codes in music have yet to be fully examined.

We present findings from work in progress in which the effects of the effort and production codes are systematically explored in music perception, focusing initially on the effort code. Listeners were asked to rate how well short sentences expressing affective states accorded with a given melodic stimuli. Sentences were pre-tested for their ability to convey unambiguously each of three contrasting pairs of affect (assertive-unassertive, helpful-unhelpful, enthusiastic-unenthusiastic). Melodic stimuli were varied according to interval size in accordance with the criteria of the effort code.

The implications of this research are considered within the context of Cross's socio-intentional dimension of music communication. We contend that melodic contours provide trace evidence of performers' affective and intentional states within the context of music as a medium for social interaction.