

# Automaticity vs. feature-enhancement in the control of segmental F0

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Several phonological oppositions are typically accompanied by F0 differences. F0 is higher following voiceless consonants than voiced; it is also higher for high than low vowels. Analysis of cricothyroid activity aimed to determine whether these F0 differences are automatic effects contingent on the basic articulatory manoeuvres required for the oppositions of voicing and vowel height, or whether the differences reflect active enhancement strategies. Results for both oppositions suggest a hybrid model: The articulatory contingency is at the heart of the F0 differences, but these differences may be reinforced by active laryngeal adjustments. Additional analysis focused on German tense vs. lax vowels. Higher cricothyroid activity in lax vowels could explain why these vowels do not follow typical intrinsic F0 patterns. Tentative support was found.

## 1. Introduction

It has long been known that some linguistic distinctions involve consistent differences in fundamental frequency, even though the basic distinctions are not prosodic in nature. This applies to consonant voicing, where F0 is typically higher following voiceless than voiced consonants, and also to vowel height, where F0 is typically somewhat higher in high than low vowels. The latter is often referred to as intrinsic F0 (abbreviated in the following to IF0). It is by no means clear, however, what the cognitive status of these F0 differences is. Are they simply contingent on the articulatory manoeuvres required for the basic linguistic contrasts (e.g. control of offset and onset of voicing for consonants, control of tongue height for vowels), and thus automatic and not directly planned by the speaker? Or do they represent strategies that speakers can use to actively enhance these distinctions? An example of an enhancement that is clearly not contingent on the basic lingual articulatory distinction is that of lip-rounding for /ʃ/ vs. /s/ in English (and other languages). As discussed by Keyser & Stevens (2006) as part of their extensive consideration of enhancement mechanisms, this use of lip position ensures