Restructuring the Melodic Content of Feet

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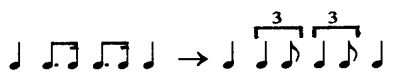
The topic of our presentation is how rhythmic variability is to be accounted for within the framework of Optimality Theory (hence: OT) (Prince & Smolensky, 1993). The main question is whether the influence of a higher speech rate leads to adjustment of the phonological structure, or just to 'phonetic compression', i.e. shortening and merging of vowels and consonants, with preservation of the phonological structure. If the phonological structure is adjusted, however, this implies that every speech rate has its own register, in OT terms its own ranking of constraints.

In our presentation we will compare variability in language and music. As we will show, OT owes a lot to the constraint-based music theory of Lerdahl & Jackendoff (1983). Based on the great similarities between language and music we claim that musical knowledge can help in solving linguistic issues. Since restructuring based on different tempi is a well-known phenomenon in music, we claim that a difference in tempo also triggers restructuring of the melodic content of prosodic units, such as feet, in language.

(1a) shows a dotted notes rhythm in andante tempo which is often played as triplets in allegro tempo. The same preference for triplets can be found in the allegro pattern of e.g. Dutch *zuidafrikaans* 'South African' in (1b) (English data: *blueberry hill, strawberry fields*).

(1) a. Restructuring in music: andante allegro



b. Restructuring in language:

zuidafrikaans	→	*zuidafrikaans*
s s w s	→	*s w w s*

We claim that the allegro patterns in both music and language are caused by clash avoidance; the distance between beats is enlarged. The result for the example in (1b) is that the number of strong beats, or the number of feet, is changed from three into two. Evidence for this restructuring can also be found by looking at the place of reduction possibilities. Generally, reduction of a vowel to schwa is only possible in weak syllables. In the *s s w s*-structure of *zuidafrikaans* (andante), the vowel in the second syllable, *-a-*, cannot be reduced. In allegro speech, however, the second syllable occupies a weak position, which allows for reduction.

The allegro data were obtained by means of a multiple-choice quiz in which two subjects competed each other in answering simple questions as quickly as possible. The questions included 'What is the biggest hit by Fats Domino?' and 'Which Beatles single never reached #1 in the polls?'. The data were phonetically analysed in PRAAT.

In terms of OT, we describe the different structures as a conflict between markedness constraints, such as 'foot repulsion' (Kager, 1994), and 'output-output correspondence' constraints (Burzio, 1998). Whereas the normal patterns in andante speech satisfy correspondence, the preference for triplet patterns in fast speech is accounted for by means of dominance of the markedness constraints.

References:

Burzio, L. (1998). Multiple Correspondence. In: *Lingua* 104: 79-109.

Kager, R. (1994). *Ternary rhythm in alignment theory*, ROA-35.

Lerdahl, F. & R. Jackendoff (1983). *A Generative Theory of Tonal Music.* The MIT Press, Cambridge, Massachusetts, London, England.

Prince, A. & P. Smolensky (1993). *Optimality Theory: constraint interaction in generative grammar*. Ms., Rutgers Optimality Archive.