

Speech Cycling Tasks for Polish

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The principle of entrainment demands that salient events happen at attractor points of an oscillatory cycle, according to Dynamical Systems Theory (Port and van Gelder eds. 1995). Speech is attracted to simple harmonic phases, most natural being 2:1 (two beats each) or 3:1 (three beats each). Such attracting structures are the product of a real-time oscillatory process that manifests metre. A neurocognitive basis for the oscillations is hypothesised (Barbosa 2001).

Experiments in speech cycling were devised to expose the tendency of speech to entrain to metre, in other words, to elicit the timed coupling of events to the phase fractions of an oscillatory cycle. In Port, Tajima and Cummins (1998) the timing of repetitive speech was investigated when coupled with auditory pulses of an external metronome. The considered variable, the relative phase, provided a quantitative method to investigate timing relations between spoken phrases and a rhythmic skeleton.

The assumption of a universal basis of rhythmic phenomena in the form of mapping of segmental material on a basic rhythmic pattern is shared by the functional approach of Natural Phonology. Stampe and Donegan claim that speech is mapped onto an inner rhythmic pattern based on simple harmonic fractions such as 4/4. To explain the hypothesis, they conclude that there is a pacer-maker, a neural metronome that emits flexible but regular pattern in real time onto which we map intended words and phrases for articulation (1993:7) and so appoint the release of a basic pulse to neuronal oscillations. As does Natural Phonology, DST applies the neurocognitive explanation of rhythmical behaviour in terms of neuronal pulses or cognitive oscillations.

In generative tradition, the rules of eurythmy as developed by Hayes (1984) correspond to the principle of entrainment. With the difference that the evaluation procedure for stress patterning in Metrical Phonology was constructed according to principles of UG and was necessarily placed

within grammar. Dogil (1984), Hayes and Puppel (1984) and others noted however, that eurythmic constraints have to be non-linguistic.

Thus, in the domain of phonological theory, the aim of the paper will be to provide an integrative account of the universal rhythmic constraint on speech, an account based on extragrammatical evidence. The experimental part will establish, using Speech Cycling Tasks for Polish, which type of a unit is aligned with the attractor pattern of a metre provided by an external beat. Entrainment of linguistic text to an external beat at harmonic phases is able to select prominence carriers, in other words, to demonstrate the prosodic units that count as prominent in a given language.

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