

Feet and their combination.
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A traditional idea of foot is a sequence of 2 morae which can be manifested in various ways, such as: (C)VC, (C)VCV, (C)VV, (C)VCC. We first argue that this construct can be derived from the theory in [1]-[6], henceforth the *Coupling Theory of Syllabic Structure (CT)*. CT provides an account of the planning of speech gestures within which the timing of the initiation of a gesture G_i is identified with the phase ϕ_i of an associated oscillator/clock. Given a pair of coupled gestures G_i and G_j with associated phases ϕ_i and ϕ_j , respectively, there are two possibilities and only two at the planning level: either $\phi_j = \phi_i$ or $\phi_j = \phi_i + \pi$. To illustrate, the onset and vowel in CVC are synchronous (in phase) at the planning level, while the vowel and the coda are sequential (in opposition of phase); cf. [2]. The V clock is a kind of “master clock” here, with the various gestures in CVC phased in relation to it (see Figure 1). At the planning level, then, a constituent can be no longer than two timing slots, corresponding to a pair $(\phi_i, \phi_i + \pi)$.

While this model defines the traditional foot as a constituent, it cannot account for the merging of feet into larger units, by definition. We propose to generalize the model so as to encompass such combinations. Specifically, we argue that the merging of feet arises within an independent component of the linguistic planning, endowed with its proprietary system of oscillators/clocks. For example, the form (CVCV)(CVCV) will be generated by coupling the master V clocks of the two CVCV feet with an independent clock (see Figure 2). As in the case of the syllable, though, at most two units (timing slots) can be merged into a constituent by such a coupling. So, multiple dimensions of combination must be postulated. We propose that these dimensions can be identified as those which govern the combination of morphemes into words, each foot then being a morpheme, albeit one possibly devoid of meaning. Thus, a word such as *catamaran* is polymorphemic within this theory. Words that would be monomorphemic within this theory, but semantically polymorphemic appear not to exist. We then interpret word minimality effects as purely morphological, rather than as prosodic. Numerous problems immediately arise, in particular in the case of cyclically determined foot structure. We consider particular cases and propose solutions.

The concatenation of morphemes is a syntactic computation, in the same sense as the derivation of sentences. We will revisit some arguments about the specificity of phonology from this standpoint. We note, in particular, that the organization of forms into feet is not found outside HL, with contrary claims in the literature revealing a fundamental confusion concerning the nature of repetition in animal communication systems. Samuels (2008), citing examples from Slater (2000), demonstrates that the motif of a bird song typically involves repetition of the following form: $((a^x)(b^y)(c^z))^w$ where a , b , and c represent “syllables” which are repeated in order. Samuels suggests this pattern resembles reduplication. However, it is important to distinguish the planning level from the execution level, as CT indeed does. Grammatical reduplication (copy) is reduplication at the planning level. Grammatical reduplication and other iterations in words or sentences are meaning building, contributing meanings related to quantification such as *salad-salad* (emphatic/focus), *they pillaged [village after village (=many villages)]*; or: *gugoogle* (‘googling:’ progressive form of “to google” in Kapampangan). Moreover, one observes as the hallmark of grammatical copying that there can be a deletion of part of the copy, as in the reduplication of words or sentences. This stands in stark contrast to reduplication at the level of execution alone, as in bird songs. The following sequence does not count as a grammatical repetition of “John is an idiot.” (1) *John is an idiot. John is an idiot.* However, the following does: (2) *John is an idiot. John is!* Indeed one has never heard songbirds producing a pattern such as: *CDE, C, C* to “mean” *CDE, CDE, CDE*.

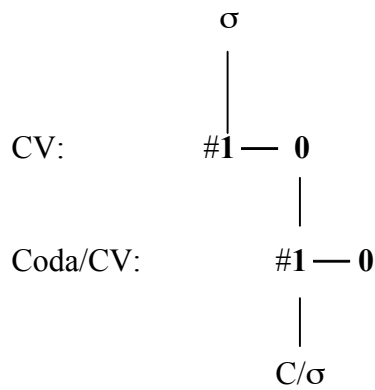


Figure1

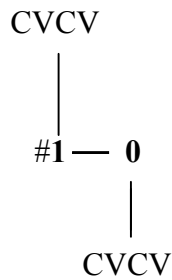


Figure2

References.

- [1] Browman, C. P., Goldstein, L. 1988. Some notes on syllable structure in articulatory phonology. *Phonetica* 45, 140-155.
- [2] Browman, C.P., Goldstein, L. 2000 Competing constraints on intergestural coordination and selforganization of phonological structures, *Les Cahiers de l'ICP, Bulletin de la Communication Parlée* 5, 25-34.
- [3] Byrd, D. 1995. C-Centers revisited. *Phonetica* 52, 263-282.
- [4] Saltzman, E., & Byrd, D. (2000). Task-dynamics of gestural timing: Phase windows and multifrequency rhythms. *Human Movement Science*, 19, 499-526.
- [5] Nam, H., Saltzman, E. 2003. A competitive, coupled oscillator of syllable structure. *Proceedings of the XIIth International Congress of Phonetic Sciences*, 2253-2256.
- [6] Saltzman, E., Nam, H., Krivokapic, J., & Goldstein, L. 2008. A task-dynamic toolkit for modeling the effects of prosodic structure on articulation. In P. A. Barbosa, S. Madureira, & C. Reis, (Eds.).(2008). *Proceedings of the Speech Prosody 2008 Conference*, Campinas, Brazil.
- [7] Samuels, B. 2008. *Animal Phonology* ms. Harvard University.
- [8] Slater, P. 2000. Birdsong repertoires: their origins and use. In *The origins of music*, ed. N. Wallin, B. Merker, And S. Brown, 49-64. Cambridge, MA: MIT Press.