Consonantal syllable nuclei in Tashlhiyt Berber
(examples from Rachid Ridouane)
Acoustic waveform and spectrogram of one repetition of `[tftXtstt] «fadeaway» by E_M.`
Any segment may appear as nucleus in Tashlhiyt Berber (Dell & Elmedlaoui, 1985).

- [tu.da] ‘suffice’
- [tb.da] ‘begin’

Expected graphs?
To illustrate this point, consider an example from Tashlhiyt Berber (spoken in Morocco), a language that allows long strings of consonant gestures; words can even consist entirely of consonants. The Berber words /tuda/ "suffice" and /tbda/ "begin" are quite similar, differing primarily in the constriction degree of the lip gesture that follows the initial tongue tip closure and its duration—the lip gesture for /u/ is much less narrow than that for /b/ and is longer. As the kinematic data in Fig. 7.11 show, the speaker produces the tongue tip and lip gestures in-phase (synchronous at onset) in /tuda/ (top part of figure), but not in /tbda/ (bottom part), where the production of the lip closure is initiated at the release of the [t]’s tongue tip gesture—anti-phase coordination.

Vowel gestures and consonant gestures are typically produced in-phase, as in this example and as in Fig. 7.8, but for multiple consonant gestures, this kind of coordination does not readily occur. Thus, the distinguishing properties of vowel and consonant gestures, together with the stability of in-phase coupling gives rise to their valence—they combine freely with each other in onset relations. Other reasons also support the

These data were collected in collaboration with Catherine Browman, Lisa Selkirk, and Abdelkrim Jabbour.
CC syllables

- C gestures are not in-phase
- If they were, they might not be able to contrast in order
- Alternative graphs:
Tentative Conclusions

- Possible to develop a theory in which syllable structure is built out of pairwise dynamical coupling.

- Types of coupling are qualitatively distinct and their properties are known outside of phonology.

- Several (superficially unrelated) properties of syllable structure can be understood as arising from the topology of these coupling structures (graphs).

- Because dynamical laws make predictions about both the qualitative and quantitative states of a system (and the relation between them), it is possible (in some cases) to test abstract structures using quantitative data (or modeling).