Deriving the sonority scale

Many phonologists have proposed that a formal model of syllable structure (and some other phonological patterns) must include a **sonority scale**. This is a nearly-universal scale of segment types that ranges from **high** sonority ("really good as a syllable nucleus") to **low** sonority ("really good as a syllable onset"). Exercises (1)-(4) provide evidence about how the sonority scale is arranged. What can you figure out about the scale?

(1) What are the possible syllabic nuclei in English? (Not only vowels...)

(2) Stress assignment in the Mokshan dialect of Mordwin (Finno-Ugric)
(Kenstowicz 1994, based on Tsygankin & Debaev 1975:32-33)

- Only vowels can be syllable nuclei
- Whenever possible, stress is assigned to syllables with [e o ɑ a] nuclei
- Syllables with [i u] nuclei are stressed only when there is no other choice
  (Also true of [ə], but reduced vowels introduce additional factors; we'll disregard this for now.)

Note: When different syllable nuclei are more and less likely to attract stress, it is the more preferred nucleus options that attract stress more strongly.

(3) Kwakwala (Zec 1988, based on Boas 1947) [Glides are not discussed by Zec.]

Syllables are *heavy* (=attract stress) if they are:
- CVV
- CVC, where C is a nasal or a liquid (and is not glottalized)

Syllables are *not heavy* if they are:
- CV
- CVC, where C is a stop, a fricative, or an affricate (or a glottalized nasal or liquid)

Note: When different codas are more/less likely to help attract stress, it is usually the codas that are more like possible nuclei that attract stress more strongly.

(4) Reduplication in Sanskrit perfective verb forms (Steriade 1988): The /Ca-/ perfective prefix copies its C from the onset of the first syllable of the root it is attached to. Which consonant types are preferred as copied onsets in the reduplicative prefix?

a.	ka - skand-a	'leap'	d.	ta - stamb^{h}-a	'prop'
b.	pa - prat^{h}-a	'spread'	e.	sa - swar	'sound'
c.	da - d^{h}wans-a	'scatter'			

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(5) Can we describe the steps on the sonority scale as natural classes using features?

(6) What are the possible types of onset or coda CC clusters in English? Does the scale you have proposed shed any light on this question?

References

Kenstowicz, Michael. 1994. Sonority-driven stress. Ms., MIT. ROA #33.
Steriade, Donca. 1988. Reduplication and syllable transfer in Sanskrit and elsewhere. *Phonology* 5:73-155.
Zec, Draga. 1988. *Sonority Constraints on Prosodic Structure.* Doctoral dissertation, Stanford University. [New York: Garland, 1994.]