



STRINGS OR SYLLABLES?



Bridget Samuels
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OUTLINE

1. Early treatments of syllables in generative phonology
2. Remaining questions
3. A tentative proposal
4. Conclusions??



- References: <http://bridgetsamuels.com> or QR above

EARLY ARGUMENTS

A BRIEF HISTORY

- Saussure 1916; Lepsius & Whitney 1965: peak-trough sonority profile
- Stetson 1928: the syllable is a “motor unit”
- Pike 1947: syllable is a single sonority peak and a single “chest pulse” (the latter debunked by Ladefoged 1971)
- Kurylowicz 1948: Codas and word-final consonants often form an environment for phonological rules, have similar phonetic realizations, tend to be lost over time
- Vennemann 1972; Hooper 1972; Kahn 1976: *SPE* missed the mark

UNIFIED EXPLANATIONS

“The success of syllables derives not just from their ability to answer an individual question — more than one answer can be imagined sometimes — but from the fact that they deliver unified explanations for disparate phenomena.... And they’re units intuitively accessible to speakers.” -Steriade 2011

Putative Loss of Generalization argument: Embick 2011

VENNEMANN 1972

- “My contention is... that in numerous cases, such a formulation [i.e., without the use of syllable boundaries] would miss the point, would obscure the motivation of the process rather than reveal it.”
- SPE: adjectives like *repúgnant*, *fratérnal* stressed on penult because it's followed by a cluster of two consonants, the 2nd of which is not /r/ or /w/
- Mysteriously, this distinction also plays a role in tensing rules and the auxiliary reduction rule, so it must be clumsily repeated.
- “CHOMSKY and HALLE's rules are so cluttered with other defects and at the same time so complex that it would be hard for me to separate important points from irrelevant details.”
- Syllabification rules are persistent: they apply after each phonological rule

KAHN 1976

- Environment of non-rhoticity, allophonic distribution of flapping/aspiration, some types of assimilation; phonotactics
 - Ex: /p,t,k/ are aspirated iff they are both syllable-initial and non-syllable-final (i.e., not ambisyllabic)
- $_ \{C, \#\}$ is not a natural class; “syllable-finally” unifies this environment
- Syllabification applies before phonological rules

A COUNTERARGUMENT

- Syllabification is never contrastive
 - It is always predictable in a given language
 - So rules can always be re-written without syllables, by including that information
 - “All phonological processes which can be stated... with the use of syllable boundaries can also be stated without them” -Vennemann 1972

WHEN ARE SYLLABLES USED?

- Stress systems
- Define the length of lines in poetic meter
- Distribution of segments: sonority sequencing, contrasts neutralized only in coda, etc.
- Reduplication, infixation, games, hypocoristics
- Allomorphy (even- vs. odd-numbered bases, disyllabic or shorter bases...)

ALLEN 2012

A syllable:

1. Contains a nuclear element which corresponds to the articulatory period during which prosodic information (e.g., stress/pitch accent or tone) is expressed.
 - This is a property of nuclei, not of syllables. Duration and weight could be a property of intervals (Steriade 2011 et seq.) instead.
2. Constitutes one half of a binary foot for the purposes of footing-based phenomena.
 - Moot if we define feet without reference to syllables
3. Forms the parts which speakers tasked with decomposing a word will provide.
 - Steriade alternative hypothesis: speakers are providing minimal prosodic words

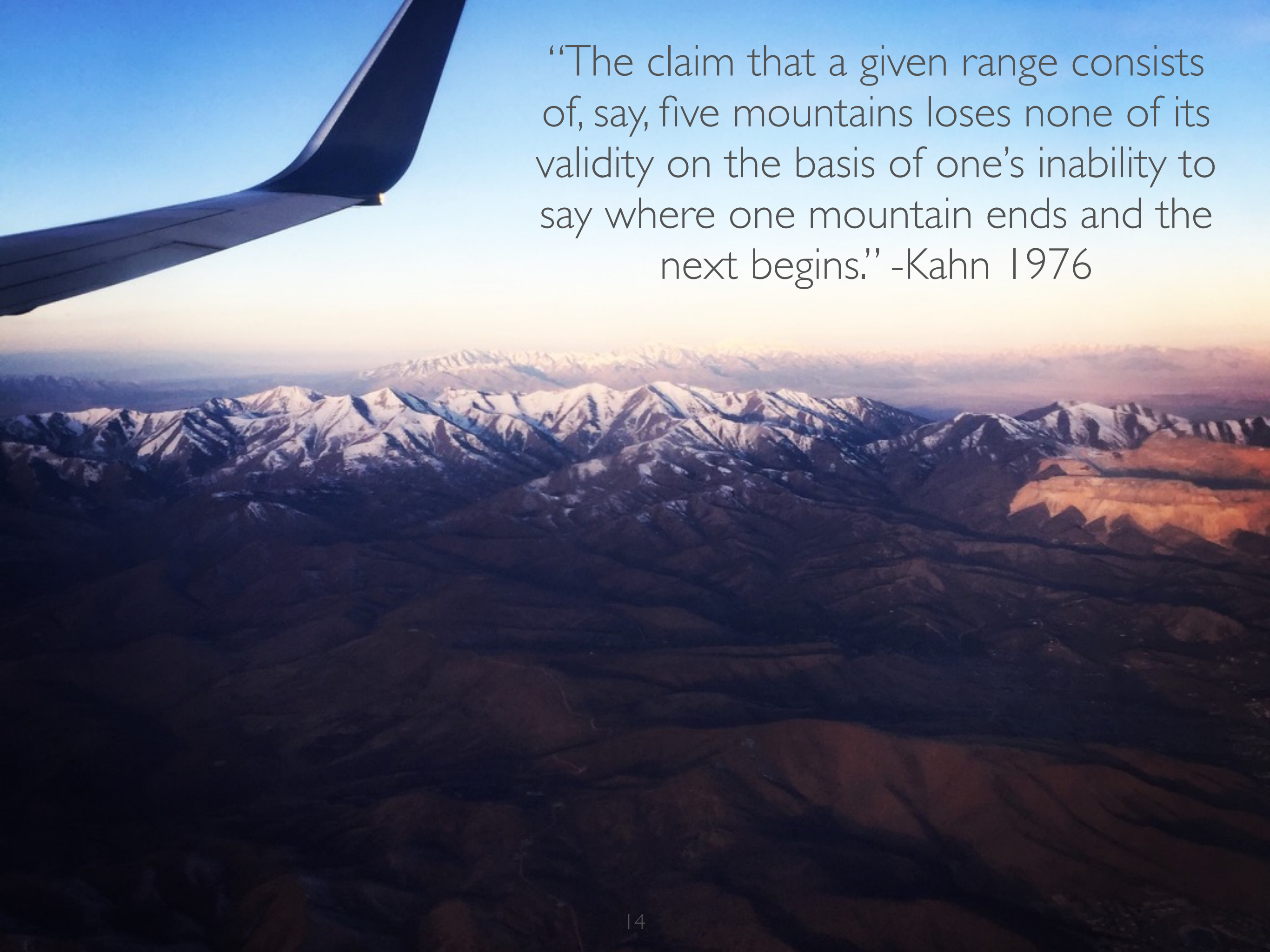
REMAINING QUESTIONS

REMAINING QUESTIONS

1. **Boundaries:** Why are judgments clearer on phonotactics than on syllable boundaries?
2. **Underuse:** Why don't infixation, reduplication, speech errors, writing systems, etc. use syllables?
3. **Universality:** Can there be a language without syllables? Must all material be syllabified in a language with syllables?
4. **Constituents:** Can sub-syllabic constituents and/or super-syllabic constituents replace syllables?

I. BOUNDARIES

- Smalley 1968, Anderson & Jones 1974: peaks are easier to identify than troughs
- Kahn 1976: “There need not correspond to every pair of adjacent syllables a well-defined syllable boundary... it makes sense to speak of hammer as consisting of two syllables even though there is no neat break in the segment string that will serve to define independent first and second syllables.”
 - Each [+syllabic] segment is associated with exactly one syllable; each [-syllabic] segment is associated with at least one syllable
- Is this ambiguity of parsing primarily a problem in English?

An aerial photograph of a vast mountain range, likely the Himalayas, with snow-capped peaks and deep valleys. The sky is a clear, pale blue. In the upper left corner, the dark, curved wing of an aircraft is visible, suggesting the photo was taken from a plane. The lighting is soft, indicating either dawn or dusk.

“The claim that a given range consists of, say, five mountains loses none of its validity on the basis of one’s inability to say where one mountain ends and the next begins.” -Kahn 1976

2. UNDERUSE

- Samuels 2010, Moravcsik 1978, Yu 2007 & Raimy 2008: there are virtually no cases of infixation or reduplication that *unambiguously* refer to a syllable boundary. Many refer instead to fixed shapes like CV or CVC that may not correspond to how the string would be syllabified.

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*Evidence for infixation after the first syllable : data from a Papuan language**

Jennifer Wilson

University at Buffalo and Max Planck Institute for Evolutionary Anthropology, Leipzig

- Poser 2004: Most purported syllabaries are really mora-based or hybrids.
- Shattuck-Hufnagel 2008: “currently available data fails to support the view that the syllable plays a role in the early stages of production planning”
- Fougeron et al. 2003, Strycharczuk & Kohlberger 2013: Phonetic evidence for purported phrase-level resyllabification missing in Spanish & French

3. UNIVERSALITY

- Hyman 2011: it is logically impossible to prove that a language has no syllables. The question is whether it can be insightfully analyzed without them.

(2)	<i>claim</i>	<i>alleged counterexample</i>
a.	All languages have syllables.	Gokana (Hyman 1983, 1985)
b.	All languages have CV syllables.	Western Arrernte (Breen & Pensalfini 1999)
c.	All segments belong to a syllable.	Bella Coola (Bagemihl 1991) Piro (Lin 1997)
d.	Syllabification is always predictable.	Barra Gaelic (Kenstowicz & Kisseberth 1979) English (Bloomfield 1933, Blevins 1995)

Bloomfield: pattern vs. patron

Blevins: Ida vs. Aïda

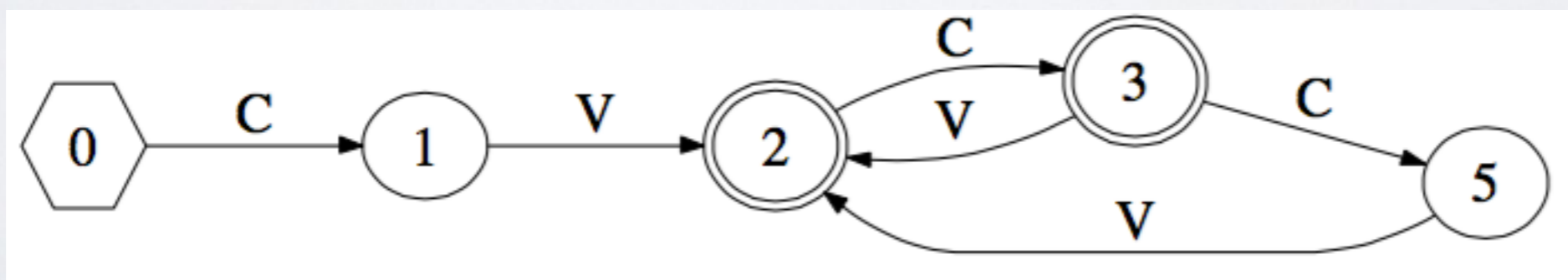
- Continued controversy over SSP-violating clusters

4. CONSTITUENTS

- Aoun 1979, Harris 1994, Government Phonology: Can smaller constituents replace the syllabic node entirely?
 - Aoun: “When one considers the various phonological analyses referring to the syllable, one notices that they don’t crucially refer to the syllable. They may be reformulated in terms of rime or onset. This observation can be accounted for if it is assumed that the syllable doesn’t have any status with respect to competence; it may at best have a status with respect to performance. This idea was first suggested by E. Williams and is explored by J.R. Vergnaud and M. Halle.” fn: “The status of the syllable is in a way similar to the status of relational notions such as subject of, object of... which have no theoretical status.”

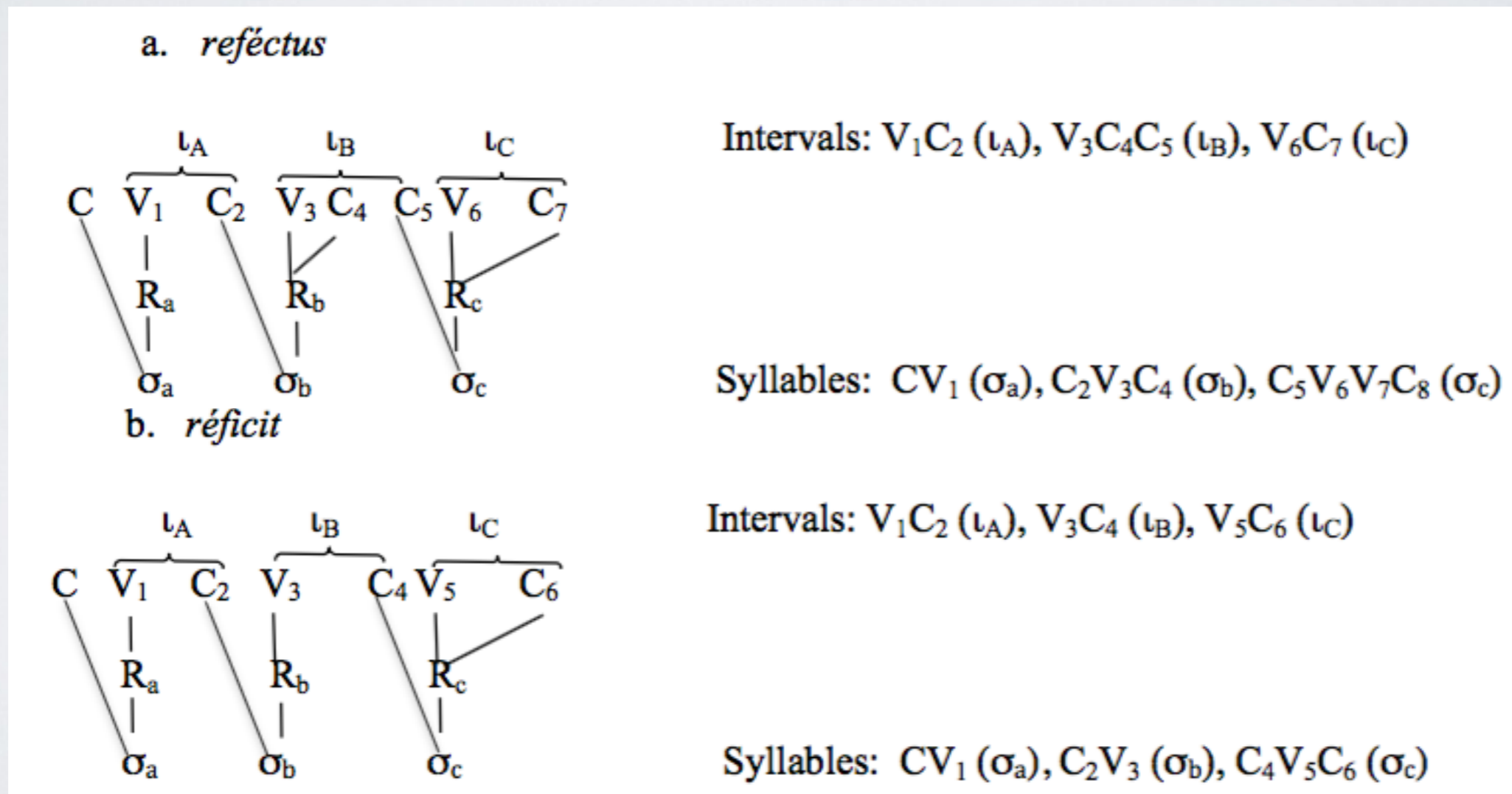
4. CONSTITUENTS (OR NOT)

- Foot-based analyses can capture some of the same insights, e.g., for English tapping (Davis mfm 23)
- Steriade 1999, Blevins 2003: linear phonotactics
- Heinz 2007 *n*-gram model (window of *n* consecutive segments)
If language has CV, CVC syllables: {#CV, CVC, VCV, VCC, CCV, CV#, VC#}



4. CONSTITUENTS: INTERVALS

- Steriade 2011 et seq. presents an alternative dating back to Sturtevant 1922: the V-to-V interval.



4. CONSTITUENTS: INTERVALS

- Intervals have no internal constituents. The entire interval counts for purposes of metrical weight. Only duration, not sonority, considered for now.
- The count of intervals & syllables is the same
- “Compressible” clusters like /br/ in *algebra* lend less weight than ones like /kt/ in *refectus* - cf. Ulfsbjorninn 2015 on “bogus clusters”
- Meter *always* reflects “resyllabified” parse of VC#V as V#CV in Greek, Latin, Sanskrit, Berber...
- Onset-coda asymmetries explained through perception & production rather than structural means
- Mismatch between CV units (reduplication, truncation) and syllables remains for intervals

A TENTATIVE PROPOSAL

BACK TO BASICS

- A wavelike sonority profile is an inevitable consequence of differentiating the acoustic signal (Lepsius & Whitney 1865, Saussure 1916)
- “Just by virtue of seeking detectable changes in the acoustic signal one would create as an epiphenomenon, i.e., automatically, a sequence showing local maxima and minima in vocal tract opening or loudness.” -Ohala & Kawasaki-Fukumori 1997
- Upshot: sonority comes for free; let’s build on this property

SONORITY & ACQUISITION

- Like any wave, we can break the sonority wave into periods. (Pike 1947 minus the “chest pulses”)
- This can help with identification of word boundaries.
- Assume one word = one period. Then word boundary identification = finding local minima.
- Helpful strategy: make word ends very different from word middles. Sonority sequencing generalization then follows.
- Finding minima is harder than finding maxima (Smalley 1968, Kahn 1976). Peaks are a “closed class” of segments with sonority $>n$ where n is determined on a language-specific basis.

WORD-FINDING STRATEGIES

- One can imagine several ways to facilitate word boundary identification.
 - Allow only CV. (More generally: “tag” every word end)
 - Allow CVC, with beginning and ending C from disjoint sets.
 - Fixed placement of stress (if words have > 1 stressable element). Only stress counting from the *end* of the word, not the beginning, facilitates this.
 - Make word beginnings and ending mirror images. Cut (retroactively) when you hit the local minimum. This is not always unambiguous, but is the situation many languages find themselves in.

LONGER WORDS

- The number & sequence of segments in a period self-organizes based on a number of articulatory and perceptual factors plus memory limitations (Walter 2007; Redford 1999, 2001; Ohala 1990; Côté 2000; Blevins & Garrett 2004; Miller 1956)
- When a word is long enough to subsume >1 period of the sonority wave, strategies that pick out word boundaries find “extra” units - syllables!
- Similarities between word ends and syllable ends: a 2,000-year-old observation supported by modern evidence (Cairns et al. 1997, Gambell & Yang 2004, Swingley 2005)
- This parsing happens automatically when it can, but may be left unresolved when ambiguities exist. Variability in judgments is a result of failure to parse syllables.
- Phonological processes may therefore not be able to depend on accurate identification of local minima, and when they can, this fact may be obscured

CONCLUSIONS??