Is the domain for weight computation the syllable or the interval?
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1. Two ways of defining the weight domain. The goal of this paper is to experimentally arbitrate between two approaches to defining the rhythmic domain over which weight is computed. The first is the traditional approach which links weight to syllable structure, with weight computed over the syllable rime (possibly with limited onset-sensitivity, cf. Kelly 2004, Topintzi 2010, Ryan 2011/2013, i.a.). The alternative is a non-syllable-based approach, which computes weight over the total vowel-to-vowel interval (Steriade 2012). The interval is the distance from the beginning of one vowel to the beginning of the next vowel (VCVCCV > VC*VCC*V, using * to mark interval boundaries); weight over the interval is computed gradiently by duration – the longer the interval, the heavier the interval. (Cf. Gordon 1999 for a syllable-based defense of the assumption of gradient weight.) Intervals have no internal constituency so all component segments contribute weight commensurate with their duration.

2. Dissociating syllable theory and interval theory. Syllable theory and interval theory dissociate in how they treat certain inter-vocalic consonants. In syllable parsing, inter-vocalic consonants are preferentially parsed in the onset of the syllable headed by the following vowel. In interval parsing, all inter-vocalic consonants are parsed in the interval with the preceding vowel. Comparing VCV (aka) and VCCV (akra) sequences, on a syllable parse, they are divided V.CV (a.ka) and V.CCV (a.kra), assuming that CC forms a licit onset; on an interval parse, they are divided VC*V (ak*a) and VCC*V (akr*a). The weight contribution C/CC make is accordingly different in the two parses. On a syllabic parse, C/CC are in the final onset, so if weight computation is rime-based, they add no weight; if weight computation is onset-sensitive, C/CC contribute weight to the final syllable. On an interval parse of aka, akra, C/CC contribute weight to the initial interval.

To arbitrate between the theories, we use stress in the production of nonce VCV vs. VCCV sequences as a diagnostic for whether, and, if so, where C/CC contribute weight. Stress is more strongly attracted to heavier rhythmic units. Since onset C/CC contribute no weight in a rime-based syllabic parse, all syllables should be of equivalent weight in V.CV and in V.CCV (a = a; ka = kra, rime a). Stress should be attracted to the same extent to the initial or final vowel in V.CV as in V.CCV. No effect of C vs. CC on stress is predicted. If C/CC contribute weight finally by enhancing onset prominence, there is an equivalent initial syllable in V.CV and V.CCV and a heavier final in V.CCV (a = a, ka < kra); stress should more strongly be attracted to the final vowel in CC than in C. If C/CC contribute weight initially as on an interval parse, there is a heavier initial interval in VCC*V than in VC*V, and an equivalent final interval (ak < akr; a = a); stress should more strongly be attracted to the initial vowel in CC than in C. We have participants produce different VC,V sequences, and test whether the syllable or interval prediction is borne out: is stress equally or more strongly attracted finally with medial CC than C (syllable), or is stress more strongly attracted initially with CC than C (interval)?

3. Experiment. Items We constructed 18 minimal pairs of nonce words according to the profile: (C)V:C1 VX (keefoo) in the C condition, and (C)V:C1C2 VX (keefroo) in the CC condition. C1 is obstruent, and C1C2 forms a cluster licit word-initially. In 6 items, C1C2 was an obstruent-liquid (OL) cluster where C1 ≠ [s]; in 6 items, C1C2 was an [s]-sonorant (sS) cluster; and in 6 items, C1C2 was an [s]-stop (sT) cluster. Nonce words were presented to participants as the last word in a carrier sentence, introduced as a verb by infinitival to.

(1) Fred appeared to keefoo. C
Fred appeared to keefroo. CC
Primary task: production Participants were presented with one of the two conditions (C or CC) from each item in a Latin Square design, and were recorded reading the sentence aloud. An annotator listened to participants’ productions, and perceptually coded whether they heard primary stress in the nonce word on the initial or final vowel. Secondary tasks: syllabification judgment, complexity judgment Supposing that the overall results show an effect consistent with interval theory, i.e. more initial stress in CC than in C, we need to control for two alternative non-interval-based explanations for such an effect. (i) Suppose that not all CC clusters licit word-initially are syllabified medially as complex onsets (Trieman et al. 1996). If, on a syllable parse, some medial CCs are heterosyllabic, syllable theory will converge with interval theory in predicting more initial stress in CC than in C, since VC.CV has a heavier initial syllable than V.CV. Exp. 2 includes as part of each trial a syllabification judgment task. After producing the target sentence containing the nonce word, participants are shown two or three alternative syllabifications of the nonce word, and asked which sounds to them more natural. In the CC condition, participants choose between V.CCV, VC.CV, and VCC.V. Any clusters for which participants predominantly intuit VC.CV syllabification are excluded from the stress analysis. This leaves in the stress analysis only those clusters that are both tautosyllabic according to standard theories of English syllabification, and tautosyllabic by intuition — a maximally conservative criterion for tautosyllabicity. (ii) Suppose that participants sometimes construe the nonce word as a compound, rather than a simple word. The vast majority of English compounds are stressed initially, so if a compound construal were more likely in CC than in C, this could account for the greater occurrence of initial stress in CC than in C, independent of whether rhythmic parsing is by syllable or by interval. Exp. 2 also includes as part of each trial a complexity judgment task. Participants are asked if the nonce word is more likely as a compound or as a simple word (cf. Hay 2003). We identify a subset of the data in which a compound response is equally likely in C and CC and test for whether the C vs. CC effect holds in that subset. Results (1) Preliminary results show an overall effect in the production data of C vs. CC such that participants are more likely to produce the nonce word with initial stress in CC than in C (see plot). This replicates results of a previous experiment we conducted manipulating C vs. CC in post-sonorant inter-vocalic context, i.e. VSCV (emflos) vs. VSCCV (emfllos). That experiment has been run on a full complement of participants (n = 15), and shows a statistically significant C vs. CC effect (|z| = 2.77 in a mixed model controlling for item and participant as random effects), with more initial stress in CC. Convergent results from both experiments are consistent with interval theory. Crucially, the C vs. CC effect holds when syllabification and compounding are controlled. (2) Results of the syllabification task show that participants intuit OL and sS clusters in CC to be parsed as a complex onset, but sT clusters to be parsed heterosyllabically. (3) Results of the compounding task show that a compound construal of the nonce word is equally likely in C and CC in OL items, but not in sS and sT items. Taking (2) and (3) together, OL items are unconfounded. Including only OL items in the stress analysis, the C vs. CC effect holds unchanged: there is more initial stress in CC than in C. Conclusion: preliminary results are supportive of the interval-based theory of weight. Results from a full complement of participants will be reported in the talk.