

Syllabification and the Weight-Stress Principle
CUNY Foot Conference, Jan 2009
San Duanmu
University of Michigan

A fundamental consideration in metrical analysis is the Weight-Stress Principle (WSP), whose ideal version is given in (1). But the WSP has many apparent exceptions, as illustrated in (2), where we see a lot of stressed light syllables, violating (1b), and a significant number of unstressed heavy syllables, violating (1a). I argue that the source of the problem lies in a popular view that syllabification and stress assignment are two separate processes, a view that originates from a derivational perspective. If instead we treat syllabification and stress assignment as one and the same process, we can achieve a better WSP and improve syllabification.

Kahn (1976) proposes that syllabification is based on the Onset First rule, but he added a condition to ensure that a stress syllable is heavy. Specifically, CVCV is syllabified as CV.CV first but adjusted to CVCV if the first V has stress, where the C is ‘ambisyllabic’ to ensure that the first syllable is heavy. Selkirk (1982) adopts the same analysis but without ambisyllabic C; thus, CVCV is CV.CV initially but CVC.V if the first V has stress. However, many other scholars dropped the stress-based adjustment and assume the Onset First rule only (e.g. Steriade 1982, Halle and Vergnaud 1987, Baayen et al 1993, Blevins 1995, Hayes 1995); thus, CVCV is always CV.CV regardless of stress. The cost is not only a weakened WSP, but less satisfactory syllabification.

The alternative I argue for is to treat syllabification and the location of stress as the same process, both governed by the WSP, as illustrated in (3). As in previous analyses, syllabification and stress are not completely predictable in languages like English but must be indicated in the lexicon. I illustrate the analysis with a quantitative study of all simplex words in English. I show that most unstressed heavy syllables (a challenge for all analyses) are either realized as light (e.g. [ən] as [ə̃] or [n], and [i:] as [i]) or contain word-final consonants that need not be part of the syllable (e.g. *cactus* [kæk.tə.<s>]). In addition, apparent stressed light syllables only occur before C, where the C should be the coda of the stressed V.

I also show that the WSP yields better syllabification with regard to allophonic variations (e.g. aspiration and flapping in American English), the commonness of CV syllables, and word-edge effects (e.g. a glottal onset for V-initial words and the lack of final lax vowels). In particular, syllabification based on the WSP satisfies both the Law of Initials and the Law of Finals (Vennemann 1988, restated in (4)), whereas syllabification based on the Onset First rule often violates the Law of Finals (by having a lax V in an open syllable).

If the present analysis is correct, feet are not always superordinate to syllables. Instead, some feet (those at the lowest level of metrical structure) *are* syllables, i.e. a heavy syllable is a bimoraic foot.

Data and illustrations:

- (1) The Weight-Stress Principle
 - a. Heavy syllables are stressed.
 - b. Light syllables are unstressed.
- (2) Initial syllables in disyllabic simplex English morphemes, based on the CELEX English lexicon (Baayen et al 1993). Stress includes both primary and secondary.

Type	Count
Stressed heavy	1388
Unstressed heavy	126
Stressed light	938
Unstressed light	267
Total	2719

- (3) Syllabification based on the WSP, where V is a stressed short vowel and v an unstressed short vowel (offending syllables underlined)

Good forms	Bad forms	Violations of bad forms
CVC.v.Cv	*CVC. <u>v</u> C.v, * <u>CV</u> .Cv.Cv	(1a), (1b)
Cv.CVC.v	* <u>Cv</u> C.VC.v, *Cv. <u>CV</u> .Cv	(1a), (1b)
CVC.v.<C>	*CVC. <u>v</u> C, * <u>CV</u> .Cv.<C>	(1a), (1b)
Cv.CVC	* <u>Cv</u> C.VC, *Cv. <u>CV</u> .<C>	(1a), (1b)
VC.v.<C>	*VC. <u>Cv</u> C, * <u>V</u> .Cv.<C>	(1a), (1b)
v.CVC	*v. <u>CV</u> .<C>	(1b)

- (4) Word-edge laws (Vennemann 1988)
 - a. Law of Initials: Word-medial syllable onsets are the more preferred, the less they differ from possible word-initial syllable onsets of the language system.
 - b. Law of Finals: Word-medial syllable codas are the more preferred, the less they differ from possible word-final syllable codas of the language system.

References:

- Baayen, R. Harald, Richard Piepenbrock, and L. Gulikers. 1993. The CELEX lexical database (CD-ROM). Philadelphia, PA: Linguistic Data Consortium, University of Pennsylvania.
- Blevins, Juliette. 1995. The syllable in phonological theory. In *The handbook of phonological theory*, ed. John Goldsmith, 206-244. Cambridge, MA: Blackwell.
- Duanmu, San. 2009. *Syllable structure: the limits of variation*. Oxford University Press.
- Halle, Morris, and Jean-Roger Vergnaud. 1987. *An essay on stress*. MIT Press.
- Hayes, Bruce. 1995. *Metrical stress theory*. University of Chicago Press.
- Kahn, Daniel. 1976. *Syllable-based generalizations in English phonology*. PhD dissertation, MIT.
- Prince, Alan. 1990. Quantitative consequences of rhythmic organization. *CLS* 26: 355-398. Chicago Linguistic Society, 1992.
- Selkirk, Elisabeth. 1982. The syllable. In *The structure of phonological representations (Part II)*, ed. Harry van der Hulst and Norval Smith, 337-83. *Linguistic Models* 2. Dordrecht: Foris.
- Steriade, Donca. 1982. *Greek prosodies and the nature of syllabification*. PhD dissertation, MIT.
- Vennemann, Theo. 1988. *Preference laws for syllable structure and the explanation of sound change*. Berlin and New York: Mouton de Gruyter.