

The Syllable in Spoken, Sign, Written, and Visual Languages

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In this presentation, we argue that the theoretical notion of syllable is not limited to spoken language but rather applicable across modalities. It is a concept valid to all known modalities of human language, namely spoken, sign, written, and visual narrative languages. In the modality-neutral sense, syllabification is defined as the cognitive segmentation of continuous language input. The human language, regardless of modality, is produced as a continuum of signals, which is then understood as a series of categorical unit of symbols. It through this transition from continuity to segmentality that syllables emerge in any type of human language.

In spoken language, syllable is a widely accepted theoretical basis shared by a large spectrum of phonological theories (Hulst and Ritter 1999; Goldsmith 2011). From the neurological perspective, the processing of the syllable has been consistently reported to be associated with the superior temporal gyrus (Yu et al. 2015; Oganian and Chang 2019; Yi, Leonard, and Chang 2019). More recently, the syllabicity of the sign language has gained favor in research on sign phonology (Malaia and R. B. Wilbur 2020; R. Wilbur 2011), suggesting that the syllable may not be limited to the spoken modality but rather a cross-modal universal.

The novelty of our theoretical framework lies in arguing for the syllabicity of two additional modalities previously undiscussed in the literature, namely the syllabicity of the written language and the visual narrative language. The premise of our claim is that written and visual languages use the graphic modality in ways that also facilitate syllables. While far from the mainstream perspective, some linguists have argued that written language is not a mere reflection of the spoken language but a modality in its own right (Wrolstad 1976; Harris 2009). Visual languages have been extensively studied in the context of visual narratives, which are a sequence of two-dimensional visual expressions, as commonly employed in comics (Groensteen 2007; Cohn 2013). We argue that, given that the syllable exists in the two uncontroversial modalities, spoken and signed, it also exists in the two relatively controversial modalities of written and visual languages.

The universal characteristics of the syllable across modalities include linearity and peakedness. First, every syllable, regardless of modality, must be linearly produced and perceived as such. As for peakedness, every syllable, by definition, bears one peak, also known as the nucleus in the spoken language. Other peripheral elements, such as the onset and the coda in the spoken language, can be distributed around its peak, but the peak remains the most perceptually salient element of the syllable. In sign language, this peak is the movement of each sign (R. Wilbur 2011). We argue that the *figure*, as opposed to the *ground* in the context of Gestalt psychology, forms the peak of a syllable in both written and visual narrative modalities, as they both use the human vision as the medium. The perceptual salience of the figure in visual language has also been experimentally demonstrated (Foulsham and Cohn 2020). Other characters of the syllable may not be universal but rather modality-specific, however, such as recursivity: While a syllable cannot embed other syllables in spoken language, it is certainly possible in visual language.

Based on previous psychological, neurological, typological, and developmental literature, we will provide robust arguments for the validity of the syllable as a cross-modal concept. Our argument raises the importance of the syllable from mere acoustic property of the human speech into a more general cognitive strategy of dissecting continuous linguistic stimuli into digestible parts. This enlarged view on the syllable may provide us insight into the essence of human language and its evolution.

References

- Cohn, Neil (2013). *The visual language of comics: Introduction to the structure and cognition of sequential images*. Bloomsbury.
- Foulsham, Tom and Neil Cohn (2020). “Zooming in on visual narrative comprehension”. In: *Memory & Cognition* 49.3, pp. 451–466. DOI: 10.3758/s13421-020-01101-w.
- Goldsmith, John (2011). “The syllable”. In: ed. by John Goldsmith, Jason Riggle, and Alan C. L. Yu. Wiley, pp. 164–196. DOI: 10.1002/9781444343069.ch6.
- Groensteen, Thierry (2007). *The system of comics*. Trans. by Bart Beaty and Nick Nguyen. University Press of Mississippi.
- Harris, Roy (2009). “Speech and writing”. In: *The Cambridge handbook of literacy*. Ed. by David R. Olson and Nancy Torrance. Cambridge University Press, pp. 46–58.
- Hulst, Harry van der and Nancy A Ritter (1999). “Theories of the syllable”. In: *The syllable: Views and facts*. Ed. by Harry van der Hulst and Nancy A Ritter. De Gruyter Mouton, pp. 13–52. DOI: 10.1515/9783110806793.13.
- Malaia, Evie A. and Ronnie B. Wilbur (2020). “Syllable as a unit of information transfer in linguistic communication: The entropy syllable parsing model”. In: *Wiley Interdisciplinary Reviews: Cognitive Science* 11.1, e1518.
- Oganian, Yulia and Edward F. Chang (2019). “A speech envelope landmark for syllable encoding in human superior temporal gyrus”. In: *Science Advances* 5.11, eaay6279. DOI: 10.1126/sciadv.aay6279.
- Wilbur, Ronnie (2011). “Sign Syllables”. In: *The Blackwell companion to phonology*. Ed. by Marc van Oostendorp et al. John Wiley & Sons, Ltd, pp. 1–26. DOI: 10.1002/9781444335262.wbctp0056.
- Wrolstad, Merald E. (1976). “A manifesto for visible language”. In: *Visible Language* 10.1, pp. 5–40.
- Yi, Han Gyol, Matthew K. Leonard, and Edward F. Chang (2019). “The encoding of speech sounds in the superior temporal gyrus”. In: *Neuron* 102.6, pp. 1096–1110.
- Yu, Mengxia et al. (2015). “Distinct representations of syllables and phonemes in Chinese production: Evidence from fMRI adaptation”. In: *Neuropsychologia* 77, pp. 253–259.