

Experimental evidence for prosodic word structures

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In the present talk, we will provide an overview over a number of studies that aimed to address theoretical controversies about word prosodic structures in German and other languages. Metrical theory (Hayes 1995; Nespors & Vogel 2007) of stress assignment suggests a hierarchical ordering of prosodic entities that can be described by means of prominence relations. Accordingly, in a string of two syllables, one syllable is stronger than the other, and in a string of two feet, one foot is stronger than the other. Strong positions bear either primary or secondary stress. Such prosodic gradation is, however, not always phonetically measurable. For instance, in prosodic words the strong syllable within a strong foot bears main stress and the strong syllable of a weak foot secondary stress. Yet, the acoustic difference between syllables bearing secondary stress and unstressed syllables is rather vague. Hence, in polysyllabic words, the boundaries between feet are difficult to identify. In addition, factors like weight sensitivity and direction of stress assignment are challenging for the analysis of languages like German or English, in which stress positions are variable and not always predictable. In the present talk, we will present psycho- and neurolinguistic evidence for the type and the boundary of metrical feet involved, the role of syllable weight, extrametricality and the direction of stress assignment.

In a series of studies using event-related potentials (ERPs), different groups of participants were confronted with correctly and incorrectly stressed words in languages like German and Turkish, and their task was to evaluate the stress patterns of the presented words (Domahs et al. 2008; Domahs et al. 2013). This way, we could identify language specific sensitivity to prosodic structures. For instance, listeners of German showed ERPs that point to a quantity-sensitive trochaic stress system, while electrophysiological responses of Turkish listeners didn't provide evidence for parsing of syllables into feet in Turkish, but rather suggested asymmetrical sensitivity to default and lexicalized stress. Further evidence for prosodic structure emerges from pseudoword reading tasks with patients diagnosed with surface dyslexia, who have difficulties to retrieve lexical stress information. In particular, for languages with unclear default stress position, regularization errors can provide insight into the prosodically unmarked option of a language. Stress error patterns and changes of syllable structure in German strongly suggest that the weight of the final syllable determines the parsing of syllables into feet and that stressed syllables tend to be heavy (Janssen & Domahs 2008) whereas in Russian regularizations depend on stress neighborhood and the stem final segment (Mołczanow et al. to appear).

In the debate on extrametricality of final syllables in prosodic parsing, a comparative pseudoword reading study with German, Dutch and English participants revealed a very similar result for foot structure building in the three languages (Domahs, Plag, Carroll 2014). In all three languages, production patterns prefer a final heavy syllable to construct a foot on its own. Such a finding is not compatible with the assumption that the final syllable is left unparsed in foot structure building. However, the three Germanic languages differ insofar as the non-finality, that avoids final word stress, is less strict in German compared to Dutch and English.

Finally, a controversial question regarding the processing of stress positions in German is whether stress placement is calculated from the left or the right word edge. The etymology of

German word shape and the frequency distribution of initial and final stress in German words speak in favor of the parsing direction from left to right (Wurzel 1980; Levelt et al. 1999), while the restriction of word stress to the final three syllables in polysyllabic words supports rather the leftward parsing hypothesis (Giegerich, 1985). Production patterns obtained in pseudoword reading experiments (Domahs, Grande, Huber, Domahs 2014) strongly suggest that the position of word stress is right aligned. The production data is complemented by correlations of stress positions with working memory capacities suggesting that stress assignment to the left requires more WM capacities than final stress, i.e. the processing costs in stress assignment increase from right to left.

Taken together, the studies discussed in the present talk uncover language specific word stress processing that is based on foot structure (e.g. in German), the predictability of word stress (e.g. in Turkish), or on lexical properties (e.g. in Russian).

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