

# Statistical evidence for the role of phonology in the distribution and motivation of the linking element -s- in German

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It has been shown that the linking element -s- has morphological functions when attached to complex nouns by opening derivatives with “closing” suffixes for further word formation (*Prüfung-s-note* 'exam mark') (Fuhrhop (2000), by indicating the structure of multipartite compounds (*Nacht-zeit* vs *Weihnacht-s-zeit* 'night time' vs 'holy night time', 'Christmas time'): ((AB)C), not (A(BC))), or by indicating the nominal character of deverbal nouns (*Essen-s-marke* 'meal ticket'). By contrast, it is not clear what is the function of -s- when attached to simplex nouns as left constituents. Here, in contrast to the syllabic linking elements whose main function is to provide the left constituent with a “better”, usually trochaic, form (Fuhrhop 1998: 194), the nonsyllabic -s- does not improve the syllable structure of the left constituent, it actually worsens it, presents a burden on its final syllable, makes its coda harder to articulate: *Ort-s-angabe* 'name of place'.

The question arises why German uses a linking element that worsens the word structure. What is the motivation for the nonsyllabic LE -s- in simplex compounds? Its presence could be an idiosyncratic relic of the genitive case suffix from which it originates, -s- could thus depend completely on the frequency of the compound, its lexicalisation, or dialectal and stylistic factors. Its distribution should then be arbitrary and of no interest for synchronic morphology.

The paper analyses the distribution of the linking -s- when attached to simplex nouns. The analysis starts from the hypothesis “The lower the sonority of the final segment of the left constituent, the higher the likeliness of a linking -s-”. If confirmed, this distribution would suggest a functional motivation of the linking -s- and give us a functional explanation of its presence even on simplex nouns: Compounds may become opaque by phonological instead of morphological syllabication (*junc-herr* > *Jun.ker* 'young nobleman', *arm-uoti* > *Ar.mut* 'poverty', *Heb-amme* > *He.-bamme* 'midwife'), a process that according to the Contact Law (Vennemann 1988) depends on the Consonantal Strength of the coda segment. The greater the Consonantal Strength of the coda segment of the left constituent, the higher the risk of

onset maximization in the right constituent and, as a consequence, of false syllabication of the compound.

In order to examine this hypothesis the totality of strong masculines and neuters found in a reverse dictionary was investigated, the nouns being classified following their final segment. The paper will present the results of this empirical investigation of nouns ending in plosives, sonorants and full vowels. The statistical findings prove that the linking -s- really depends on the sonority of the coda of the left constituent: *Bootsfahrt* - *\*Autosfahrt*, *Ortstemperatur* - *\*Raumtemperatur* ('boat trip' - 'car trip', 'local temperature' - 'room temperature').

Table 1: Occurrence of -s- in relation to the final segment of the left constituent

| final segment | with -s- | examples   |
|---------------|----------|--|
| -p/-b:        | 20 %     | <i>Kalbsbraten</i> 'roast veal', <i>Stabschef</i> 'chief of staff' |
| -t/-d:        | 17,6 %   | <i>Ortstarif</i> 'local rates', <i>Hemdsärmel</i> 'shirtsleeve'    |
| -k/-g:        | 15,1 %   | <i>Glückskind</i> 'lucky person', <i>Kriegsende</i> 'end of war'   |
| -n:           | 4,7 %    | <i>Schweinsbraten</i> 'roast pork'                                 |
| -m:           | 2,4 %    | <i>Lammsgeduld</i> 'patience of a lamb'                            |
| -l:           | 1,8 %    | <i>Heilslehre</i> 'doctrine of salvation'                          |
| -V:           | 0 %      | <i>Kniegelenk</i> 'knee joint', <i>Taxistand</i> 'taxi rank'       |

The findings likewise corroborate the hypothesis of a functional motivation. I will argue that the linking -s- serves to separate the two constituents by preventing the fusion of the left constituent's final consonant with the onset of the right constituent (*\*Orttarif* / *Ort-s-tarif*) or onset maximization (*\*Ortangabe* / *Ort-s-angabe*) and so to protect the compound against opacification. Thus, the linking -s- appears to be a means against loss of transparency, a kind of acoustic hyphen: *Kalb-s-braten* - *\*Kalbbraten* 'roast veal'.

The paper will then demonstrate the varying functional need of a linking -s- for left constituents ending in plosives, sonorants and full vowels. Third it will show that the functional motivation of the linking (in fact: separating) -s- is in conflict with the formal complexity that results from its attachment, which explains its absence in *Auto-bahn* (lit. 'car way', 'high way') on the one hand, *Arzt-rechnung* ('doctor's bill') on the other: since left constituents ending in a full vowel are not in danger of being falsely syllabified they do not need a linking -s-, and nouns ending in a consonant cluster exclude it for formal complexity. Thus the need of a separating element is counterbalanced by phonological constraints that draw an upper limit for coda consonants (*\*Arztspraxis* 'medical practice', *\*Obststag* 'fruit-only day'). The results demonstrate the relevance of the syllable structure for the morphological process of compounding in German.

At the same time the results contradict the assumption of Generative Morphology, especially the Level Ordering Model of Lexical Phonology which claims that plural -s excludes linking -s-. The relevant factor is the sonority of the final segment as shown by *Kuckuckspaar* versus *\*Uhuspaar* ('pair of cuckoos' - 'pair of eagle owls'), both onomatopoeia take the s-plural but only the noun with final plosive can take the linking -s-. Since vowel final nouns are the main domain of the s-plural in MSG, its non-appearance on these nouns as a separating element in contrast to the rare nouns ending in a consonant which apply it as plural suffix and as linking element (*die Kuckucks*, *Kuckuckspaar*, but *die Uhus*, *\*Uhuspaar*) has led to the false assumption that plural -s and linking -s- exclude each other. The reason for the asymmetric distribution of the linking -s- is its functional motivation and the Coda Law.

The findings are likewise significant for acquisition theory, in that they call into doubt the 'continuity hypothesis' of Clahsen et al. (1996), who claim that syntactic and morphological principles are innately given. The explanation for the fact that children who overgeneralize the plural -s omit the linking -s- in compounds is much simpler: the children place importance on the fundamental constraints for syllable structure and avoid superheavy syllables in compounds. The proof of a phonologically conditioned distribution gives a more natural explanation of the children's formations and manages without speculative assumptions.

According to the topic of the conference the main attention will be paid to the empirical evidence resulting from the statistical investigation of possible simplex left constituents, i.e. strong masculines and neuters.

## References

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