

## The influence of rhythm on placing the German object pronoun

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A phenomenon that received considerable attention is the propensity for an alternating rhythm in speech (Principle of Rhythmic Alternation, Selkirk, 1984). Rhythmic influences on word order are on record (see, e.g. Anttila, 2016 for a review), but they appear to be rather limited in scope (Kentner & Franz, 2019). Apart from the well-known trochaic pattern in English and German, there is also evidence that dactylic rhythm is considered well-formed in German and is therefore promoted (Eisenberg, 1991; Noel, 2003). In a pilot questionnaire study with written stimuli, we showed that a non-canonical order of object pronouns is more accepted when rhythmically well-formed. With the study we are currently conducting, we want to find out whether this effect also holds for sentence production. A positive result would strengthen a bidirectional account of syntactic and phonological processing in speech production.

*Materials:* Stimuli pictures are 64 black and white drawings (designed by a professional illustrator). Each picture (see Figure 1) consists of a left part symbolizing a matrix sentence ('der Junge sagt', *the boy says*) and a right part symbolizing the embedded sentence ('dass Markus ihn auslacht', *that Markus is laughing at him*) as shown in (1) and (2). The right parts of the pictures were mirrored (yielding 128 stimuli) to control for word order effects due to spatial order. Factors that are varied are the stress pattern of the embedded subject (iambic, trochaic) and of the embedded verb (initial stress, no initial stress). Additionally, animacy varies as a between items factor with the matrix-sentence subject being human or non-human (see Figure 1).

(1a) Der Júnge ságt, dass ihn Márkus/Marcél belúgt. (OS)

(1b) Der Júnge ságt, dass Márkus/Marcél ihn belúgt. (SO)

*The boy says that Markus/Marcel is lying to him.*

(2a) Der Júnge ságt, dass ihn Márkus/Marcél áuslacht. (OS)

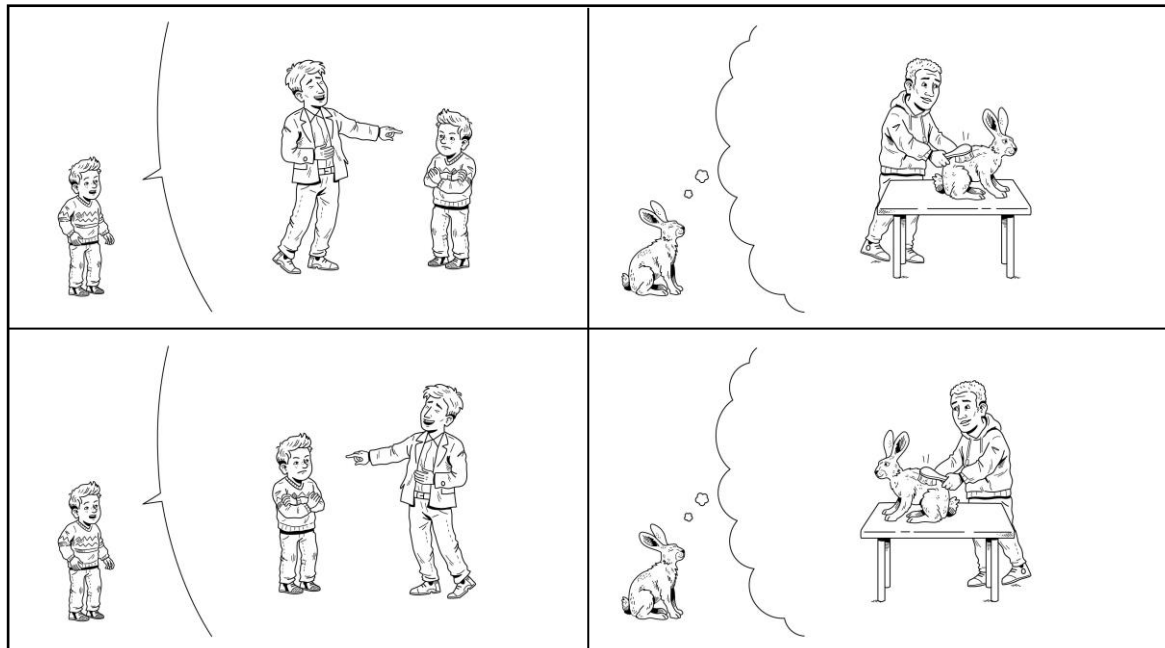
(2b) Der Júnge ságt, dass Márkus/Marcél ihn áuslacht. (SO)

*The boy says that Markus/Marcel is laughing at him.*

The examples in (1) and (2) show that, with the iambic subject (*Marcél*), the fronted pronoun 'ihn', *him*, (underlined) yields a rhythmically less balanced structure than with the trochaic subject in (*Márkus*). Further, the embedded verb with no initial stress, as in (1) promotes a fronted unstressed pronoun (1a) in order to achieve a balanced rhythm. Thus, we predict that trochaic embedded subjects and verbs with no initial stress promote sentences with a fronted pronoun. Additionally, a combination of a trochaic embedded subject and a verb with final stress, which yields three unstressed syllables in the SO order (1b), might lead to a higher prominence of the object pronoun compared to the other conditions.

*Procedure:* After familiarization with the names of the characters and the target structures (matrix-complement-clause structure), 50 German adults will be shown the pictures one by one on a screen and asked to describe the depicted scene. After naming, participants progress to the next stimulus (self-paced). Each response is recorded while the picture is presented.

*Analysis:* Data will be analysed using general linear mixed effects models. The dichotomous response variable is the word order produced (SO vs OS). Predictor variables are the stress patterns of embedded subject and embedded verb, and animacy of the matrix subject. Naming latency will be included as a covariate. In the phonetic analysis, we will analyze syllable duration, pitch and intensity (see Vogel et al., 2015, who showed such an effect, arguably provoked by the Rhythm Rule, for the unstressed neuter pronoun 'es', *it*, in German). Finally, the variation in the degree of animacy, which is realized by exchanging 'Der Junge', *the boy*, in the examples above with a non-human referent 'der Hase', *the rabbit*, will shed some light on whether, in speech production, the degree of a referent's animacy influences the position of the pronoun referring to it and whether this interacts with the impact of rhythm. To our knowledge, there are no studies addressing this issue.



**Figure 1.** Left Panel: stimulus example for a target sentence with a human matrix subject: 'Der Junge sagt, dass Markus ihn auslacht. / Der Junge sagt, dass ihn Markus auslacht', *The boy says that Markus is laughing at him.* Right Panel: stimulus example for a target sentence with a non-human matrix subject: 'Der Hase träumt, dass Marcel ihn bürstet. / Der Hase träumt, dass ihn Marcel bürstet'., *The rabbit dreams that Marcel is brushing him.* The upper and lower panels show the stimuli in their mirrored versions.

## References

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