Pronoun vs. preposition – where is stress assigned in German prepositional phrases?

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Abstract

It has been assumed that function words do not carry phrasal stress unless they are focused or phrased separately. The results from recent studies on German, however, suggest that unfocused function words optionally bear phrasal stress, depending on their phonological size and aspects of grammatical structure. The present study investigates the phrasal stress patterns of pronouns and prepositions in German prepositional phrases (PPs). In a controlled production study with nine participants, we tested for an impact of the phonological size of the pronoun (mono- vs. disyllabic) and the functional type of the PP (directional vs. non-directional) on the presence and location of phrasal stress. The non-directional PPs involved the preposition von (‘by’) whereas the directional PPs involved the preposition zu (‘to’). The results suggest that stress is regularly realised on function words in German PPs with a pronominal complement. Disyllabic pronouns were found to bear phrasal stress more frequently than monosyllabic pronouns. In non-directional PPs, the pronominal complement received stress in the majority of instances. In directional PPs, phrasal stress was mostly assigned to the preposition (and not to the pronoun). We propose that this pattern results from the relative informativeness of the preposition.

Index Terms: function words, stressed pronouns, prepositional phrases, stress assignment, prominence, German

1. Introduction

1.1. The prosody of function words

Function words, such as pronouns and prepositions, are considered prosodically weak elements and are restricted with regard to stress assignment. That is, they usually do not carry word stress and, therefore, are not assigned phrasal stress (e.g. [1, 2]; phrasal stress positions are underlined in (1)). Information structurally, pronouns are connected to given referents which are often stressed [3]. However, function words are usually stressed if they occur in isolation, i.e. phrased separately [2], or if they are in focus [3].

(1) a. Emma ist von Erik beeindruckt.
    Emma is by Erik impressed
b. Emma ist von ihm beeindruckt.
    Emma is by him impressed
c. (Q: By whom is Emma impressed?)
   Emma ist von [ihm] festlich beeindruckt.
   ‘Emma is impressed by Erik/him.'

Following STRESS-XP [4], each lexical XP (nominal, verbal etc.) carries a beat of phrasal stress. Prepositional phrases (PPs) are functional projections with stress realisations on the lexical constituent. In the sentence in (1a), we thus expect stress on the subject (Emma), the complement (Erik) of the PP adjunct, and the infinite verb (beeindruckt ‘impressed’). In a PP with a pronominal complement, as in (1b), we expect no stress realisation, since pronouns are unaccented as given constituents. Of course, function words can be stressed if they are in focus [2], as is the pronoun (ihm ‘him’) in (1c). That is, pronouns and prepositions usually do not carry phrasal stress. Yet, there is recent evidence for optional stress on pronouns that are not narrowly focused in German.

1.2. Optional stress on pronouns in German

More recent work looking at read and spontaneous German speech has shown that there are other factors affecting stress assignment on non-focused pronouns. In a study on read German productions, [5] found that stress on non-focused pronouns is related to phonological weight and syntactic position. There were 20 percent more stress realisations on disyllabic pronouns (e.g. ihnen ‘them’) than on monosyllabic pronouns (e.g. ihm ‘him’). Stress realisations on pronouns preceding the infinite verb were also more frequent and had stronger prominence in comparison to stress realisations on pronouns following the infinite verb.

In a study on adults’ and children’s spontaneous narrations, [6] found differences in spontaneous intonation from reading intonation. In her data, given constituents were frequently accentuated in spontaneous speech of adults and children.

This difference between read and spontaneous speech with regard to the realisation of stressed pronouns was taken up by [7] in a study on semi-spontaneous speech. They found variability in stress assignment in intonation phrases comprising one or more function words. Pronouns were stressed in short intonation phrases as the only constituent or accompanied by another function word. Pronouns were also found stressed as complement in PPs of location (bei ‘near’) or direction (zu ‘to’) in the same position as a full lexical noun phrase (similar to example (1)).

So aspects of both syntactic structure and prosodic phrasing influence the realisation of stress on pronouns in German on top of focus marking.

This study takes up this idea and follows up on the question to what extent stress assignment in a PP depends on the type of preposition and the type of complement. Since [7] found stressed pronouns as complements in PPs of direction, we compare sentences with directional and non-directional prepositions followed by pronominal complements or lexical complements.
2. Method

Following the methods in [5], we conducted a production study that elicited directional PPs (with *zu* ‘to’) and non-directional PPs (with *von* ‘by’). The PPs were positioned between a finite auxiliary and a sentence-final infinite verb. The PP complement was controlled with regard to lexical category (proper noun vs. pronoun) and phonological size (di- vs. monosyllabic pronoun). There were five different scenarios, providing a broad focus context. An example of the stimuli is given in (2), where (2a) presents a non-directional phrase and (2b) presents a directional PP.

\[(2)\]
\[
\begin{align*}
\text{a. Die Intendantin ist [von ihm/ihnen/Igor]PP beeindruckt.} \\
\text{‘The director is impressed by him/them/Igor.’} \\
\text{b. Die Intendantin ist [zu ihm/ihnen/Igor]PP gegangen.} \\
\text{‘The director went to him/them/Igor.’}
\end{align*}
\]

2.1. Data recordings

We recorded nine native speakers of German (5 female, 20-30 years old) in a sound-attenuated booth at the University of Stuttgart. All participants were enrolled as students and were living in the larger Stuttgart area at the time of recording. The speakers were presented with one context and target sentence at a time on a display screen. They were asked to read the context sentences silently first and then produce the given target sentence. The presentation included 16 filler tokens, resulting in 46 presented sentence pairs. All sentences were pseudo-randomized. The presentation flow was self-controlled by the participants. In cases of hesitations or false starts, participants were allowed to repeat the recording. Only the last recording of each token was used for analysis. The recording session took approximately 10 minutes. The setup resulted in 270 recorded target sentences (9 speakers x 5 items x 2 PP-types x 3 complement types). Two productions were excluded due to technical issues during one of the sessions. The remaining 268 sentences were analysed as to the placement and relative prominence of stress.

2.1.1. Data analysis

The recorded data was annotated by the first author following the DIMA guidelines [8]. The sentences were annotated for the presence of sentence level stress. The DIMA annotation system, additionally distinguishes four levels of relative prominence: no prominence (unstressed), weak prominence (e.g. reduced stress, rhythmically conditioned stress), strong prominence (e.g. co-occurring with tonal events, i.e. pitch accents) and emphatic prominence. To support the annotation, the maximum fundamental frequency (F0) on each preposition and following pronoun was extracted from the acoustic signal by an automated procedure using Praat [9].

3. Results

Overall, we found a tendency for stress realisation on the complement: Lexical complements were always stressed (n=89, 100%) and pronominal complements were stressed in the majority of instances (n=110, 62%). Prepositions were also often found stressed (n=66, 37%). In all but one case, the stressed prepositions were followed by a pronominal complement.
The analysis of stress realization on function words is supported by the F0 analysis of the individual constituents (see Figure 1 for illustration): Prepositions showed higher maximum F0 when stressed. Disyllabic pronouns showed a similar tendency. This supports an analysis of these instances of stress as pitch accents, i.e. prominence co-occurring with tonal events. For monosyllabic pronouns, no such difference was observed, which is compatible with an analysis of these instances as weak stress.

3.1. Stress assignment in non-directional PPs

The stress pattern in non-directional PPs follows the overall tendency for the complement to be stressed in German PPs, as is illustrated in Figure 2. The blue portions in the bars indicate strong prominence while the grey portions indicate weak prominence. While all lexical complements are stressed (n=44, 100%), pronouns, too, are frequently stressed (n=77, 88%). There is a tendency for disyllabic pronouns to be more frequently stressed than monosyllabic pronouns (disyllabic: n=41, 93%; monosyllabic: n=36, 82%). Function words in our data frequently carry weak stress while the lexical constituents carry strong stress in almost all instances.

3.2. Stress assignment in directional PPs

The stress pattern in directional PPs differs from the one in non-directional PPs and the overall tendency for the complement to be stressed in German PPs. Stress assignment in these PPs depends on the type of complement, as can be seen in Figure 3. Directional prepositions followed by a nominal complement are rarely stressed. This results in stress on the lexical complement (there was only one case with an additional stress realised on the lexical complement). Directional prepositions followed by a monosyllabic pronoun are frequently stressed (n=32, 71%). In PPs with a disyllabic pronoun, stress assignment varies, with both prepositions and pronouns frequently being stressed (preposition: n=25, 57%; disyllabic pronoun: n=20, 47%). Function words frequently carry strong stress in directional scenarios. This tendency is most evident for the prepositions.

3.3. Sentence stress pattern

The differences in stress assignment that emerged within the different PPs are also reflected in the overall sentence stress patterns. This is illustrated in Figure 4 for non-directional scenarios and in Figure 5 for directional scenarios. In this analysis, only stress with strong prominence, i.e. level 2 or higher, were considered and analysed as instances of pitch accents.

In sentences with non-directional PPs, verbs are frequently accented. Additionally, the phonological weight of the complement influences verb accentuation with a tendency for more accented verbs following monosyllabic pronouns, less accented verbs following disyllabic pronouns, and even less accented verbs following a lexical complement. That is, the nuclear accent is realised on the verb or lexical complement.

In sentences with directional PPs, verbs are less frequently accented, independent of the complement. The nuclear accent is then realised within the PP: on the complement in case of a nominal complement and on the preposition in case of pronominal complement. In these contexts the accentuation of the verb does not vary depending on the preceding PP-complement. This is in line with an analysis of postnuclear deaccentuation.

4. Discussion

This study investigated the stress assignment on function words, addressing the question which aspects determine stress assignment in prepositional phrases with a pronominal complement in German.

In our data, stress was realised on either of the function words (i.e. preposition or pronoun) in almost all cases. This provides evidence for the general possibility to stress these constituents even in cases without narrow focus. The target sentences in our study involved a rather long sequence of function words between the lexical constituents of the subject and the sentence-final infinite verb. In order to keep a well-formed rhythmic pattern, the speakers might have chosen to realise stress on one of the function words (which would otherwise be unstressed, unless they are focused). In a prior study on German, rhythm has been found to also influence the position of object pronouns [10]. In our case word order was fixed since the participants read out the sentences. In non-directional PPs, the rhythmic stress is realised on the pronominal complement, as in the instance of a a lexical complement. This is in line
with previous findings on stressed pronouns in German [5, 7]. In directional PPs, however, stress is realised on the preposition. This shift of stress can be explained by the relative informativeness of the constituents (see also [11]). Both pronouns and prepositions are function words with high frequency, which makes them less informative in comparison to lexical constituents. The directional preposition zu ‘to’ encodes PATH and is semantically specific in the context of a MOTION event (see, e.g., [12]). That is, the preposition zu ‘to’ involves possible alternatives of direction/location, such as von ‘from’ and bei ‘with’. The non-directional preposition von ‘by’ is, however, predictable, as it is presumably stored in the lexicon in connection with the main verb.

It is important to note that the verbs in the sentences tested here differ semantically, which influences the overall stress assignment in the sentence. The non-directional PPs are adjuncts while the directional PPs are arguments. Only the latter are obligatorily stressed in compliance with STRESS-XP [4]. This is reflected in the results on the sentence stress patterns including the verb. Pronominal complements in non-directional constructions are frequently stressed, but not accentuated, and the nuclear pitch accent is realised on the following verb. This is in line with an analysis of optional stress realisations on these pronouns in a prenuclear position. In directional constructions, the argument PP is obligatorily stressed. The position of this stress then depends on the type of complement. Based on our observations for directional PPs with disyllabic pronouns, we assume two parallel processes: First, stress assignment is sensitive to the phonological weight (mono- vs. disyllabic pronouns); and, second, a shift in stress assignment occurs due to the relative informativeness of directional prepositions.

Our observations are based on a limited number of items involving two different prepositions. There are, therefore, some questions that remain open. Both prepositions in our material are monosyllabic. The influence of phonologically heavier prepositions (e.g. hinter ihm ‘behind him’, wegen ihr ‘because of her’) could not be tested based on the given data set. The prediction would be to find similar effects of stress more frequently realised on disyllabic prepositions, similar to disyllabic pronouns. A closer look at combinations of two phonologically heavy constituents (e.g. wegen ihnen ‘because of them’) and an investigation of prepositions with both a directional and a non-directional use would be especially insightful. There is first evidence from a corpus of semi-spontaneous speech supporting the findings of this study. [13] found different stress assignment patterns in different types of PPs in a first analysis of the German data within the RUEG corpus [14]. In this data too, prepositions were stressed in directional and pronouns were stressed in non-directional PPs. Further explorations of corpora including different types and forms of prepositions and pronouns are still necessary to verify the conclusions drawn from the observations in this study.

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6. References