



Competing prominence requirements in verb-first exclamatives with contrastive and given information

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Abstract

Contrast and givenness are reliably marked prosodically in assertions in German. The current prosodic production study explores if this generalizes to exclamatives, a sentence type that has been argued to be less sensitive to information structure (IS) than assertions. The results show that givenness is not marked to the same extent as in assertions: deaccentuation is virtually absent. Contrast is marked reliably, both through an increase of prosodic prominence on the contrastively focused word and through a decrease of prominence on an element that, in the absence of contrast, typically carries the exclamative accent. We propose that IS and speech act marking have competing requirements in exclamatives that are resolved by implementing the requirement for high prominence imposed by the speech act in a flexible way. The requirements of IS, on the other hand, are only realized if compatible with the speech act requirements.

Index Terms: information structure, prosodic prominence, exclamatives, contrast, givenness

1. Introduction

The present study investigates the prosodic marking of information structure (IS) in German verb-first exclamatives, a sentence type that is string-identical to polar questions, e.g. *Hat* *has* *der* *he* *leckere* *delicious* *Kekse* *biscuits* *gebacken* *baked!* ('(Boy), did he bake delicious biscuits!'). In the theoretical literature on German, exclamatives with different syntactic structures have been claimed to be information-structurally inert, i.e. it has been suggested that IS is not marked prosodically in exclamatives, unlike in assertions [1], [2]. However, this matter is debated [3], [4]. Recent experimental investigations have shed more light on this topic. [5] found that in *wh*-exclamatives with a transitive structure speakers do not deaccent given information whereas in string-identical *wh*-questions they do. [6] investigated the default prosody of intransitive verb-first-exclamatives and string-identical verb-first-questions with a pronoun in subject position. They found that speakers frequently accent this pronoun in verb-first exclamatives but not in verb-first questions, even though the pronominal referent was always given in the context. Other information-structural notions, such as contrastive focus (CF), have not been investigated experimentally in exclamatives.

The current study explores the prosodic marking of CF, given information and new information in verb-first exclamatives. We use the following definitions for these notions. An element is CONTRASTIVELY focused whenever the preceding context in a discourse provides an explicit alternative to the referent denoted by the focus expression. We are only considering discourses where the *discourse relation* is non-contrastive, that is we are not considering corrections or rejections (cf. [7] for a discussion of different kinds of contrast).

The target sentences in the present study are in an *evidence* or an *elaboration* relation with the preceding utterance [8]. For NEW information we are making the standard assumption that it has not been mentioned in the preceding discourse, and that there is no explicit alternative in the context. GIVEN information is information that is lexically given (see [9] for a distinction between lexically and referentially given information).

The influence of IS on prosody has almost exclusively been investigated in assertions, with some work on focus marking in questions. With respect to the three notions above, the general findings for assertions are the following. Given information tends to be deaccented. The accents that do occur tend to be less prominent, e.g. L* and H* accents occur but L+H* accents do not, and the duration of the expressions tends to be shorter, while the reverse is true for new information, e.g. [9], [10]. Contrastively focused expressions in non-contrastive discourses tend to be more prosodically prominent than new expressions. For instance, they are more likely than new expressions to carry an upstepped H* accent or an L+H* accent, their syllable duration tends to be longer, and their pitch maxima tend to be higher [11]. In short, for German assertions there appears to be a scale of prosodic prominence such that GIVEN < NEW < CONTRAST.

As already mentioned, this picture may be different in exclamatives: given expressions tend to *not* be deaccented, and very often, there is a prominent accent on an expression that is lexically given and non-contrastive. For instance, in transitive *wh*-exclamatives, given objects very reliably are accented [5]. To account for this lack of givenness marking, [5] argues that object accentuation is part of a rather rigid prosodic contour that speakers produce for exclamatives. The speech act exclamation seems to require high prosodic prominence of certain elements in the clause [1]–[6], [12], and this requirement overwrites the requirement of given information to be marked by low prosodic prominence to a considerable extent.

Similarly, [6] propose a prosodic constructional default for German verb-first exclamatives with a pronominal, i.e. given subject (cf. [13] on prosodic constructions). The pronoun at issue is a so-called *d*-pronoun, which is form-identical with the definite determiner in German, and which is used as a regular pronoun in exclamative sentence types of all kinds, as well as in other speech acts in colloquial register. The proposed prosodic default includes high prosodic prominence of the *d*-pronoun, a slow speaking rate and a certain inertness to IS. Support for a *d*-pronoun serving as attractor of prosodic prominence in exclamatives also comes from [5], who found that in *wh*-exclamatives speakers very reliably accent subject *d*-pronouns. However, there was some inter-individual variation in that study: a non-negligible number of speakers did not accent the *d*-pronoun but the finite auxiliary verb, at least in verb-second structures, where the auxiliary occurs towards the beginning of the sentence, before the *d*-pronoun. The speaker

dependency of this choice of accent placement ties in well with the findings on verb-first exclamatives [6], where in exclamatives with a full noun phrase subject, half of the participants never or rarely accented the clause-initial auxiliary, while the other half accented it often or always. Thus, for some speakers, an accented finite auxiliary rather than an accented *d*-pronoun might be part of the prosodic constructional default.

The goal of the present study is two-fold. First, it tests whether the previous findings for virtually non-existent prosodic givenness marking can be replicated for transitive verb-first exclamatives. Second, it explores what happens to the proposed constructional default if the object in a verb-first exclamative is contrastively focused. Considering that in assertions, CF is marked with very high prosodic prominence, it might well be the case that CF objects in exclamatives interfere with the constructional default because they are a serious competitor for maximum prosodic prominence. Alternatively, it might also be the case that, since objects in (*wh*-)exclamatives are highly prominent anyway, the degree of prominence is not increased further for contrast because some kind of ceiling has been reached. The study also contributes to the question of speaker variability in the accentuation of the *d*-pronoun vs. the finite auxiliary as part of a constructional default.

2. Method

To explore the above research questions, we conducted a production experiment. The target structures were transitive verb-first exclamatives with a clause-initial finite auxiliary verb followed by a subject *d*-pronoun, an object noun phrase with a modifying adjective or quantifier, and a lexical verb in the past participle form (see below for an example). All target structures were embedded in dialogues in colloquial register. The dialogue context introduced information in such a way that the object in the target sentence was given, new or contrastively focused, i.e. there were three experimental conditions. In the GIVEN condition, the context introduced the object noun with the same lexical item. In the NEW condition, which served as a baseline for the other conditions, the context introduced a hyperonym of the object noun (e.g. *seafood* – *lobsters*), which set the theme for what the exclamative could plausibly exclaim about. In the CONTRASTIVE condition, the context introduced a focus alternative (e.g. *crabs* – *lobster*). The meaning of the adjective or quantifier was always quasi-given: the context prepared for it. Importantly, the objects in the target sentences were typical for the situations described in the dialogues, i.e. they were not more remarkable or surprising than potentially alternative objects. This way we avoided that focus alternatives would be triggered on the basis of a scale of remarkability/surprise – independently of our contextual manipulation of IS.

Speaker A:

Last night, there was a proper food orgy at Maria's sea party. Unbelievable, the amount of {seafood_{NEW}, lobsters_{GIVEN}, crabs_{CONTRAST}} that people devoured.

Speaker B:

NEW & GIVEN: *Indeed. Fritz, for instance.*

CONTRAST: *Yeah, OK. But his helping of crabs wasn't the worst.*

Hat der viele Hummer verschlungen!
has he many lobsters devoured
'The many lobsters that he devoured!'

Pure madness!

The contribution of speaker A was presented both auditorily through headphones and visually on a computer screen. The participants took the role of speaker B. They read the text of B before they recorded it. The recordings were made in a soundproof booth with a lavalier microphone. There were nine items with three conditions each. Each participant produced all items in all conditions ($n = 27$) plus 27 filler items. The participants were 27 female native speakers of German. Most of them were students of the University of Cologne. They were either paid or received course credit.

3. Data preparation

Of the 729 recordings we excluded items that contained slips of the tongue or deviations from the written material (4.1%), leaving 699 recordings for analysis. The target sentences were annotated for syllable boundaries, accents (following the GToBI model [14]), and utterance-final fall/rise. The syllable boundary between the auxiliary verb and the *d*-pronoun, i.e. /hat.deʊ/, where most speakers only realized one alveolar closure, was annotated as follows: if there was a complete loss of voicing during the alveolar closure, this was taken to mark the beginning of the (voiceless lenis) plosive in the onset of the *d*-pronoun. If the alveolar consonant was voiced for its entire duration, the syllable boundary was annotated immediately before its release. The latter case only occurred if both the auxiliary and the *d*-pronoun were unaccented.

For accented syllables with the same GToBI accent, we investigated duration, intensity, maximum F0, F0 range and the temporal alignment of the pitch peak. On the utterance level, we investigated F0 range, intensity range, mean F0, mean intensity, and speaking rate (syllables per second). Large outliers in any of the measures were investigated individually – if they represented real measurements, we left them in the data. Otherwise, we corrected them manually.

4. Results

The exclamatives of this experiment overwhelmingly ended in a final fall: only 10 out of 699 utterances ended in a rise. The distribution of accent placement on the individual syllables of the target sentences is shown in Figure 1. The figure indicates that (i) given objects are not deaccented relative to new objects; (ii) in the NEW and GIVEN conditions, there is usually a second accent on the *d*-pronoun, while in the CONTRASTIVE condition this was the case in only ~40% of the productions.

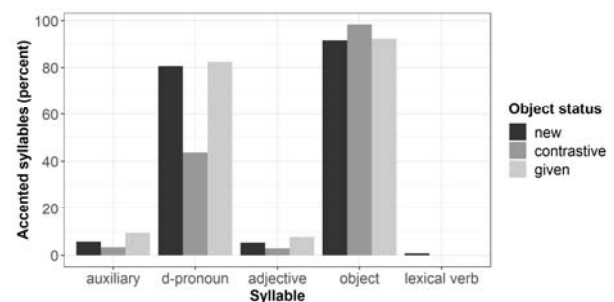


Figure 1: *Accented syllables by speech act (percent)*

For the statistical analysis, we fitted (generalized, if applicable) linear mixed models using R package lme4 [15]. Contrasts were treatment-coded with NEW as baseline. All models contained the information-structural status of the object as the predictor, random intercepts for participants and items, and a random by-subject slope for the predictor. The random slope usually

caused singular fits, but unless the model was *exactly* singular, we left the slope in the model. We will note the one model without random slopes below. P-values from the linear mixed models are based on the Kenward-Roger approximation using package lmerTest [16].

To analyse the effect of IS on accent placement, we fitted generalized linear mixed models with a logit link. This was only possible for *d*-pronouns and objects: all other syllables were accented so rarely that the models showed signs of complete separation. The analysis revealed that *d*-pronouns were accented significantly less often in sentences with a CONTRASTIVE object than in sentences with a NEW object ($b = -2.9$, $SE = 0.4$, $z = -6.5$, $p < 0.001$). Sentences with NEW objects and sentences with GIVEN objects did not show a difference. The model for accent placement on the object only converges to sensible estimates without random slopes. Here we find that CONTRASTIVE objects were accented significantly more often than NEW objects ($b = 1.76$, $SE = 0.6$, $z = 3.1$, $p < 0.01$). There was no significant difference between NEW and GIVEN objects.

We investigated the choice of accent type on the object using logistic regression. There were seven realizations of L* accents, which we excluded from the analysis, leaving 651 accented objects carrying either a H* or a L+H* accent. The analysis of the occurrence of L+H* (as opposed to H*) reveals statistically significant differences between all conditions: L+H* accents are much more common on CONTRASTIVE objects than on NEW objects ($b = 3.1$, $SE = 0.45$, $z = 6.8$, $p < 0.001$) and somewhat less common on GIVEN objects than on NEW objects ($b = -0.76$, $SE = 0.3$, $z = -2.5$, $p < 0.05$). In raw percentages, 34% of the accented NEW objects carried a L+H* accent rather than H*, 80% of the CONTRASTIVE objects did, and 25% of the GIVEN objects did.

For the continuous acoustic measures, we fitted linear mixed models. Syllable durations were log-transformed. All F0 measures are in semitones relative to 1 Hz. Table 1 gives the model parameters for the comparison of the NEW and CONTRASTIVE conditions; the estimates are in *semitones* (pitch), *dB* (intensity), and *log(ms)* (duration). We do not report the comparison of the NEW and GIVEN conditions because none of the differences in the acoustic measures were significant.

Table 1: Model parameters for the acoustic measures of accented syllables by accent types for sentences with new vs. CF objects (baseline: new objects). Abbreviations for significance levels: *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$

		Subject <i>d</i> -pronoun			Object		
		<i>b</i>	<i>SE</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>p</i>
F0_{exc}	H*	-0.21	0.17	n.s.	0.81	0.44	n.s.
	L+H*	-0.48	0.32	n.s.	3.12	0.52	***
F0_{max}	H*	-0.76	0.37	n.s.	0.67	0.52	n.s.
	L+H*	-1.06	0.38	*	1.34	0.42	**
F0_{min}	H*	-0.57	0.33	n.s.	0.06	0.32	n.s.
	L+H*	-0.49	0.28	n.s.	-1.89	0.28	***
Dur	H*	-0.17	0.05	**	0.04	0.04	n.s.
	L+H*	-0.11	0.05	n.s.	0.12	0.03	***
Int	H*	-0.72	0.67	n.s.	1.17	0.55	n.s.
	L+H*	-0.10	0.38	n.s.	0.79	0.39	n.s.

Generally, for both subjects and objects, the differences between the information-structural conditions went in the same direction for H* and L+H* accents. However, the differences

tended to be larger for L+H* accents, except for the duration of accented *d*-pronouns and the intensity measures.

Accented subject *d*-pronouns showed the following differences between the CONTRASTIVE and NEW conditions: duration was shorter (significant only for H* accents) and maximum F0 was lower (only for L+H* accents). There were no significant differences with respect to intensity, F0 range or minimum F0. Accented objects showed the following differences between the CONTRASTIVE and NEW conditions, all of which for L+H* accents only: pitch excursion was larger, duration was longer, maximum F0 was higher, and minimum F0 was lower. There were no differences with respect to intensity. For pitch peak alignment, we only compared identical accent types and found no significant differences.

At the utterance level, we observed the following effects. In comparison to sentences with NEW objects, sentences with a CONTRASTIVE object were characterized by a larger F0 range ($b = 2.2$, $SE = 0.3$, $t = 6.5$, $p < 0.001$), larger intensity range ($b = 1$, $SE = 0.36$, $t = 2.8$, $p < 0.05$), and lower mean F0 ($b = -0.37$, $SE = 0.12$, $t = -3$, $p < 0.01$). Speaking rate and mean intensity did not show an effect of IS.

5. Discussion

The results of the experiment are informative with respect to both research goals of the current study. The first goal was to find out if previous findings about German exclamatives concerning virtually non-existent prosodic givenness marking ([5], [6]) can be replicated for transitive verb-first exclamatives. The current study indeed largely replicates these findings both for the subject *d*-pronoun, which was given in all conditions, and for given objects. We discuss the subject *d*-pronoun further below because its prosodic characteristics showed effects of contrastiveness of the object. For given vs. new objects, our results show that these exhibit only very rudimentary effects of givenness marking. First, they do not differ in the absence or presence of an accent. Both types of object carry an accent in over 90 percent of the utterances. Second, they do not differ significantly in any of the acoustic measures. The one difference that we found is that the proportion of L+H* vs. H* accents on given objects is significantly lower than on new objects. However, the drop is only nine percent. Moreover – and this is truly unexpected in view of earlier results about assertions – given objects still carried the prominent L+H* accent in 25 percent of the exclamatives. For assertions, [10] found that given objects carried an L+H* accent only very rarely: one percent. In that study, over 43 percent of given expressions were unaccented, compared to only two percent of new objects. Even if we compare our given objects with [10]’s given-displaced expressions (i.e. expressions that were mentioned not in the immediately preceding sentence but more than five sentences or intonation phrases ago), we find that given-displaced words were unaccented in 37 percent of the assertions. Conversely, none of the accented given-displaced words in [10]’s study carried an L+H* accent.

Turning to the second research goal, the marking of CF in exclamatives, also in relation to an arguably construction-specific prosodic default [5], [6], the results indicate that CF on the one hand has effects on the prominence of the CF expression itself, and on the other hand, it influences the prominence of the subject *d*-pronoun, which by constructional default should be prominent. Starting with the CF expression, i.e. the object, the results suggest that CF is characterized by both categorical and gradient increases in prosodic prominence. CF objects occur

with the prominent L+H* accent more often than new or given objects do. Furthermore, L+H* accents on CF objects are acoustically more prominent than L+H* accents on new or given objects. Finally, even the arguably less prominent H* accents tend to be acoustically more prominent when they occur on CF objects than when they occur on new or given objects, even if the differences are a little smaller than for the L+H* accents.

As for the prosodic prominence of the subject *d*-pronoun, we already mentioned that the current study replicates the findings of the earlier studies: *d*-pronouns – although they are given themselves – are very frequent carriers of an accent ([5], [6]). Yet our findings also indicate that the prosodic prominence of the *d*-pronoun is not independent of the information status of the object. There is a steep drop in the number of accented *d*-pronouns in sentences with a CF object. Furthermore, the *d*-pronouns that are accented in the CONTRASTIVE condition have lower pitch maxima (if carrying an L+H* accent) and are shorter (if carrying an H* accent) than accented *d*-pronouns in the NEW condition. In other words, there is both a reduced number of accented *d*-pronouns in the CONTRASTIVE condition, and those accents are prosodically less prominent. It seems, thus, that the information-structural requirement to make a CF object a very prominent element of the clause may override the speech-act requirement to make the *d*-pronoun a very prominent element as its default accentuation pattern, at least to a certain extent. To be sure, reducing the prosodic prominence of the *d*-pronoun is one way of making the CF object more prominent.

It is interesting to note that while there is a reduction of prosodic prominence of the *d*-pronoun in the CONTRASTIVE condition, there is no corresponding increase of its prosodic prominence in the GIVEN condition. Such an increase would make a given object less prominent, which is what would be desirable if givenness generally must be marked by low prosodic prominence (as in assertions). Thus, just as given objects do not lose prosodic prominence relative to new objects, *d*-pronouns in sentences with given objects do not gain prosodic prominence. Not even accent choice, which is the only aspect where given and new objects showed a slight difference, played a role for *d*-pronouns: L+H* accents constituted ~50% of the accents on *d*-pronouns regardless of condition.

With regard to the global measures that we explored, the lower global mean F0 of utterances with CF objects most plausibly either is a consequence of the overall lower F0 across the non-object syllables in the CONTRASTIVE condition, or of the greatly reduced prosodic prominence of the *d*-pronoun in that condition. In other words, a second strong prosodic prominence on the *d*-pronoun in the NEW and GIVEN conditions may do more to raise the global mean F0 than the increase of prosodic prominence of accented objects in the CONTRASTIVE condition coupled with the reduction of prosodic prominence on *d*-pronouns.

Turning once more to the issue of the constructional default, specifically to the finite auxiliary as a speaker-dependent candidate for being part of the constructional default, the results suggest that finite auxiliaries do not reliably attract prosodic prominence. In fact, accented auxiliaries were very rare, unlike in the earlier studies ([5], [6]). However, like in the earlier studies, inter-individual variation seemed to play a role. One participant accented every finite auxiliary verb in the GIVEN and NEW conditions, and four out of nine did so in the CONTRASTIVE condition. This choice of accentuation mirrors reduced

prominence of the subject *d*-pronoun in the CONTRASTIVE condition for the other speakers. In conjunction with the previous findings, we take the current results to indicate that different speakers have different default accentuation patterns for verb-first exclamatives, and that a default accent on a *d*-pronoun is more common than one on a finite auxiliary verb.

In sum, we take the results of the current study to suggest that in German, verb-first exclamatives differ from assertions in that givenness is marked to a much lower degree, i.e. prosodic prominence is not reduced in a comparable way. Contrast, on the other hand, is marked prosodically in a very prominent fashion, and it seems to be able to override what earlier research has suggested to be constructional default(s).

In consequence, this means that the status of the constructional default needs to be reconsidered. Essentially it must be weakened to a default in the sense of an *else* condition. We suggest that exclamatives come with the requirement to have *at least one* prosodically *highly* prominent element in the clause. If there is an element in the clause that attracts prosodic prominence for independent reasons – like contrast – that element can simultaneously mark the speech-act related prosodic prominence. If there is no such element – for instance in sentences with a given object – the default is applied, which for most speakers is an accented *d*-pronoun, and for a minority an accented finite auxiliary. Therefore, *d*-pronouns are more prominent in sentences with given objects than in sentences with CF objects.

As for the lack of low prosodic prominence of given objects in exclamatives, we tentatively propose that givenness marking does not have the same function in exclamatives as for instance in assertions. Exclamatives presuppose their content [17], that is the content is assumed to be given anyway. It might be the case that this renders additional prosodic marking less important in comparison to the tendency of exclamatives to be generally marked with acoustic features that are associated with high prominence. Recall that exclamatives generally seem to be characterized by a lower speaking rate [3], [5], [6], which [5] argued might make them more prominent as a speech act. This speech act prominence might be a consequence of the expressive character of exclamatives, i.e. a greater speaker investment or emotional arousal (e.g. [18]-[22]), which in fact might not be restricted to exclamatives. This latter option must be explored in future research.

There is another potential alternative explanation for the starkly reduced givenness marking, which has to do with the experimental design. Most work on deaccentuation of given information in German assertions used monological data, while we used dialogues. In our and previous work on exclamatives, it was not the participant but the first speaker who spoke the context that rendered the object given. It is possible that a previous mention of an expression by the *same* speaker leads to a larger increase in givenness than an *across-speaker* repetition. However, we do not think that a turn-take reduces givenness marking to the extent observed here. For instance, [23] show that the mere mention of a word by a third-party speaker that was not part of the conversation led to prosodic reduction. [24] show that in discourses with a similar experimental setup as ours, there is deaccentuation across speaker turns.

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7. References

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