



Giverness perception in declaratives vs. exclamatives

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Abstract

In intonation languages like German, there typically is an inverse relationship between prosodic and discourse prominence. Given referents, whose discourse prominence is high, are marked with low prosodic prominence while new referents, whose discourse prominence is low, are marked with high prosodic prominence, with gradual differences along the given-new scale. Recent production studies on non-assertive speech acts show systematic deviations from this inverse relationship. In German exclamations, given referents regularly are produced with prominent accents, and overall are prosodically as prominent as new referents. In this paper, we study the perception of prosodic prominence in sentence types expressing different speech acts. In a rating study testing exclamatives and declaratives, participants rated the discourse prominence of an object referent with different degrees of prosodic prominence (deaccentuation, H* and L+H* accents) on a given-new scale. The results show an inverse relation of prosodic and discourse prominence for declaratives and exclamatives but the differences between accentuation and deaccentuation are significantly smaller for exclamatives than for declaratives. Thus, there is some decoupling of prosodic prominence and discourse prominence in exclamatives but not to the same degree as has been observed in production. We discuss potential reasons for this difference.

Index Terms: information status, newness/giverness, exclamatives, perception, prosodic prominence

1. Introduction

It is commonly assumed that there is a fairly direct relationship between information structure and prosodic prominence: Focus marking and accent placement are intimately related in many languages (cf. [1]), but also the more graded notions of (discourse) newness and giverness have a relationship to prosodic prominence. New referents, which are low in discourse prominence, tend to be realized with high and rising accents in languages like German, and thus high prosodic prominence, while given referents, which are high in discourse prominence, tend to be realized with low accents or no accents, and thus low prosodic prominence (e.g. [2], [3], [4], [5], [6], [7] for German). Previous research has found these ‘inverse’ associations between prosodic and discourse prominence in the investigation of assertions.

Another research strand has investigated the marking of information structure in speech acts other than assertions, like questions and exclamations, and finds deviations from the above associations [8], [9], [10], [11], [12]. For German exclamations, production studies reliably find that very prominent accents occur on elements that are fully discourse-given. This holds for lexical elements carrying the so-called *exclamative accent* [13], [14], [15] as well as for other elements in the clause [16], [12]. These findings, which suggest a decoupling of prosodic prominence from discourse prominence in exclamations, has been in-

terpreted as being the result of a constructional prosodic default for exclamatives. The default comprises the presence of a highly prominent accent, a falling contour, a slower speaking rate than assertions and questions, and a certain inertness to information structure [16], [12]. In this study, we explore whether the decoupling of prosodic prominence and discourse prominence observed for exclamations in production is also found in perception.

2. Background and hypotheses

In assertions, discourse-new (unmentioned) discourse referents are marked with accents in languages like German and English, while discourse-given (previously mentioned or contextually activated) referents are preferentially deaccented [2], [3], [4], [5], [6], [7]. The gradedness of information status, with notions like new – inferrable – given (distant) – given (near) (cf. [17], [18], [19], [20], [3]) is additionally marked by the choice of different pitch accent *types*. In German, accents with high starred tones are associated with new referents, while downstepped or low accents are associated with inferrable and also given (distant) referents [6]. Finally, there are phonetic (\approx continuous) differences in the marking of referents with different information statuses, such as pitch peak location (earlier for more given referents) and syllable duration (shorter for more given referents) [2], [3], [4], [5], [6], [7]. Thus, overall, we find for assertions that the more discourse-prominent a referent is, the less prominent its prosodic marking is, and vice versa. These findings are mirrored in perception such that listeners interpret high prosodic prominence as signalling low discourse prominence [7].

As already mentioned, this inverse relation of prosodic and discourse prominence has been observed to be disturbed in exclamations, which overall show a preference for high prosodic prominence even of given referents. Production studies [9], [10] report for different types of exclamative sentence types that given referents show almost no sign of prosodic reduction. For instance, *wh*-exclamatives with a transitive structure reliably have prominent accents on the (given) subject pronoun (which is typically viewed as being an instance of the ‘exclamative accent’), and on the object of the clause. The accentuation rate for given objects was well above 90%, which is the same as for new objects. The object accents phonetically show only tiny differences for given vs. new objects [9]. In verb-first exclamatives with a transitive structure, given objects also are accented as often as new objects (also above 90%), and carry a H* or L+H* accent both when new and when given. There is no statistically reliable phonetic reduction. The given subject pronoun in verb-first exclamatives also carries H* or L+H* [12]. As mentioned above, the lack of giverness marking in exclamations has been argued to be due to a constructional prosodic default. The default arguably serves to signal the expressivity of the exclamation speech act by requiring overall high prosodic prominence. This requirement overwrites the requirement of

givenness marking, viz. low prosodic prominence.

It is an open question whether the constructional prosodic default also impacts perception. If given referents in exclamations are not produced with low prosodic prominence, listeners should interpret high prosodic prominence of a referent as being fully compatible with that referent being given, and not necessarily assume that the referent is new. Yet, it is an open question if listeners interpret accentuation and/or the choice of accent type differently in exclamations vs. assertions.

To explore this issue, we conducted a perception study using the methodology of a perception study for German assertions that examined the inverse relationship of information status and prosodic prominence: Baumann, Röhr & Grice (2015) ([6]; previously reported in [5], [21]) presented transitive declaratives without context. The object of each sentence was either unaccented, carried a pre-nuclear accent, or one of five accent types (L*, H+L*, !H*, H+!H*, H*). Participants judged on a continuous scale whether the object sounded “known” or “new”. Objects with pre-nuclear accents or no accent received higher givenness ratings, while objects with accents formed two sub-groups: Accents with low starred tones and H+!H* received intermediate givenness ratings; H* and !H* received the lowest ratings. [6] analyze the sub-groups as predominantly falling accents (more associated with givenness) and predominantly rising accents (more associated with newness).

In our study, we compared the perception of givenness in verb-first exclamatives and declaratives with a transitive structure, which typically express exclamations and assertions resp., but note that declaratives in principle can also express exclamation speech acts. The object was deaccented or carried one of two accent types: H* or L+H*. Based on the previous findings, we had the following hypotheses. For declaratives, we expected to replicate the earlier findings: listeners’ givenness ratings should be highest for deaccentuation and lowest for L+H*, with H* intermediate. While [6] did not include L+H* in their study on perceived givenness, it was included in the study on perceived prominence by [7] and received higher prominence ratings than H*. For exclamatives, we expected a similar cline, but with scale differences: The givenness rating for L+H* should be higher than for declaratives, as givenness is compatible with high prosodic prominence in exclamations. Also, objects with the less prominent H* accent should get higher givenness ratings than in declaratives. We should not observe a difference between accent types because they both occur both on given and on new objects in exclamatives [10], [12]. For deaccented objects in exclamatives – which, recall, are hardly ever produced in verb-first or *wh*-exclamatives – we expect the highest givenness ratings, on the assumption that low prosodic prominence marks givenness in other speech acts, and there is no reason to assume another function for it in exclamations (despite the fact that exclamations with deaccented objects might not be encountered in natural language with any regularity). In sum, we thus expect exclamatives to incur a smaller givenness “penalty” as a result of high prosodic prominence than declaratives.

3. Method

3.1. Design and materials

The experiment had a 2x3 design with the two factors SENTENCE TYPE and PROSODY. The target sentences were German transitive sentences which were either declaratives or verb-first exclamatives, see example (1). Thus, there was a difference in the order of subject and verb, and in the final punctuation (a

period for declaratives and an exclamation mark for exclamatives). The subject in both sentence types was a demonstrative pronoun (*d*-pronoun), which is very common in German exclamatives but also occurs regularly in other speech acts in casual language (cf. [22]). All the objects were bare plurals modified by gradable adjectives. The adjectives were gradable because verb-first exclamatives in German are only felicitous if they can receive a gradable reading, i.e. the speaker’s expectation must be exceeded by a certain degree. The prosodic realization of the object of the target sentence was a three-level factor. The object either carried a L+H* accent, a H* accent, or it was deaccented.

- (1) a. Der hat harte Steine gemeißelt.
D-PRON has hard stones chiseled
“He has chiseled hard stones.”
- b. Hat der harte Steine gemeißelt!
has D-PRON hard stones chiseled
“[Boy!] Has he chiseled hard stones!”

All stimuli also had an accent on the subject *d*-pronoun. As we saw above, exclamations typically are realized with an accent on that element. The subject accent in our materials was not very prominent to avoid cross differences with the declaratives, where a very prominent accent might get a contrastive reading. The default position of the nuclear accent in transitive sentences with broad focus is on the target object. If the object was deaccented, the accent on the *d*-pronoun was the nuclear accent. The target stimuli were spoken by a phonologically-trained research assistant. We did not employ cross-splicing, i.e. all stimuli were recorded separately.

There were 36 target sentences in six conditions each. In addition, there were 36 filler sentences, which consisted of other types of exclamative sentence types (verb-second and verb-final *wh*-exclamatives, *dass*-exclamatives) and polar questions (both verb-first and verb-second). The prosody of the fillers varied. The material was assigned to six lists in a Latin Square design. The order of stimuli was pseudorandomized for each list.

3.2. Participants and procedure

The experiment was conducted on SoSci Survey (<https://www.sosicisurvey.de>). Participants were acquired via Prolific (<https://www.prolific.com>) and were paid for participation. Only native speakers of German who lived in Germany at the time of the experiment and who reported no hearing difficulties could participate. There were 36 participants (11 female, ages 23–71, mean age: 36.7), of which we excluded two (one male, one female) because they reported that they did not understand the task correctly (and responded to most stimuli with similar or identical ratings). The experiment took on average 13 minutes to complete.

Target sentences were presented both in auditory and written form.¹ The syntactic objects of the target sentences were underlined. Participants were asked to imagine that each sentence had been plucked from a longer conversation, and to judge how likely they thought it was that the underlined word had been mentioned before in this conversation or that it was used for the first time. For the judgment, participants used a sliding scale whose end points were labeled *bekannt* (“known”) and *neu* (“new”), with the following prompt above the scale: “The underlined word sounds as if it was...”. The slider started in the

¹The presentation of a written sentence is a departure from the methodology in [6], who only presented audio in order to prevent “visual priming effects”.

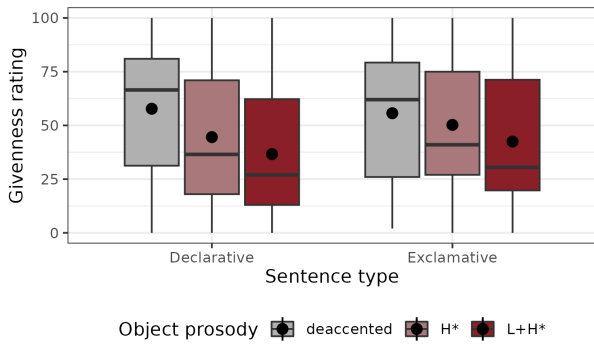


Figure 1: *Givenness ratings by sentence type and object prosody. Mean ratings are shown by black dots.*

middle of the scale but had to be moved before it was possible to proceed to the next stimulus. For the statistical analysis, the slider was mapped onto numbers from 0 (new end of the scale) to 100 (given end of the scale), i.e. the participants did not see any numbers.

4. Results

4.1. Main results

An overview of the mean ratings and standard deviations in each condition is given in Table 1. Plots of the main results are shown in Figures 1 and 2. It can be seen that there was a givenness cline related to object prosody in both sentence types. Deaccented objects were judged to be most likely to be discourse-given and objects with L+H* accents to be least likely to be discourse-given, with H* accents in between. Regarding differences in this pattern between the two sentence types, exclamatives had overall higher givenness ratings and the differences between the prosodic conditions were smaller than in declaratives.

Table 1: *Mean givenness ratings (with standard deviations) in each condition*

	deaccented	H*	L+H*
Declarative	57.7 (29.0)	44.6 (30.2)	36.6 (30.2)
Exclamative	55.7 (29.7)	50.2 (28.2)	42.5 (29.9)

For the statistical analysis, we fitted linear mixed models using R package `lmerTest` [23]. We sum-coded the factor sentence type and Helmert-coded the factor prosodic realization, such that the first comparison for prosodic realization was between the accent types H* and L+H*, while the second comparison was between deaccentuation and the mean of H* and L+H*, i.e. between deaccentuation and accentuation. There was a main effect of accent type. Objects with a L+H* accent received lower givenness ratings than objects with a H* accent, irrespective of sentence type ($b = -3.8$, $SE = 0.9$, $t = -4.3$, $p < 0.001$). There also was a main effect of deaccentuation ($b = 4.4$, $SE = 0.5$, $t = 8.5$, $p < 0.001$), and an interaction of deaccentuation and sentence type ($b = -1.3$, $SE = 0.5$, $t = -2.5$, $p < 0.05$). Overall, deaccented objects received higher givenness ratings than accented objects, and in exclamatives this difference was smaller than in declaratives.

Figure 2 shows a density plot of the distribution of given-

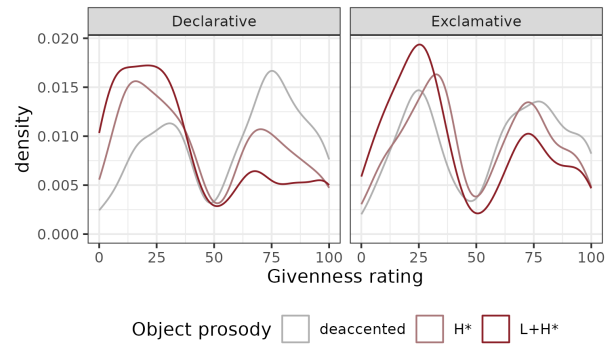


Figure 2: *Distribution of givenness ratings*

ness ratings in each condition, illustrating the bimodal distributions of the ratings. In declaratives, accents led to rating peaks near the new end of the scale, while in exclamatives, the corresponding peaks are closer to the mid point of the scale, particularly in the case of H* accents. Conversely, deaccentuation led to a clear rating peak towards the given end of the scale in declaratives, but not in exclamatives, where ratings are more evenly distributed across the two modes. Overall, declaratives show a clear prosodic order within each mode, while there is more overlap in exclamatives.

4.2. Object acoustics and givenness ratings

To explore the potential influence of gradient phonetic acoustic cues on the the givenness ratings beyond accent type, and to control for potential phonetic differences between the sentence types, we investigated correlations between phonetic properties of the objects in the target stimuli and givenness ratings. Fig. 3 shows mean givenness ratings in relation to F0 excursion on the object, split up by accent type and sentence type. We see the expected differences in excursion between accent types: deaccented objects have smaller F0 excursion than objects with H*, and those have smaller F0 excursion than objects with L+H*. F0 excursion is comparable across sentence types, although the negative correlation between excursion and mean givenness ratings is less steep for exclamatives. However, this difference is not significant. Fig. 4 shows the mean duration by accent type and sentence type. Again, we see the expected difference between accent types. And again, the slope for exclamatives is less steep but this difference between sentence types is not significant. Intensity (not illustrated) shows the same pattern.

5. Discussion

The results of the perception study confirm the hypothesized information-structural inertness of exclamations to some extent, but they also indicate that listeners to some extent adhere to the inverse association of prosodic and discourse prominence that is familiar from assertions. The information-structural inertness of exclamations is reflected in our finding that the difference in givenness perception for accented vs. deaccented objects is smaller in exclamatives than in declaratives. Accented objects receive higher givenness ratings in exclamatives than in declaratives, whereas deaccented objects do not show different ratings in the two sentence types. Listeners' adherence to the inverse prosody-discourse prominence association is reflected in our finding that the givenness ratings for objects with more

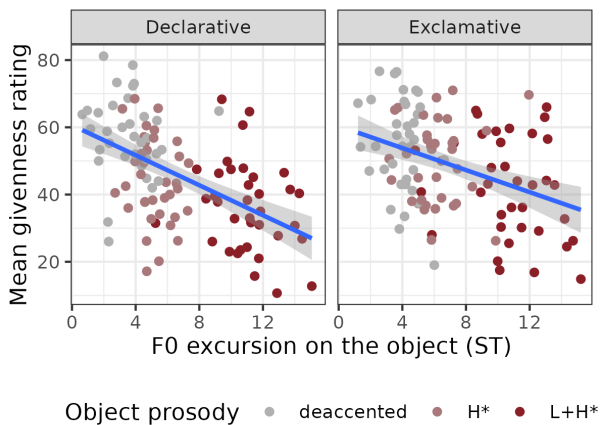


Figure 3: Correlation between object excursion and mean givenness ratings

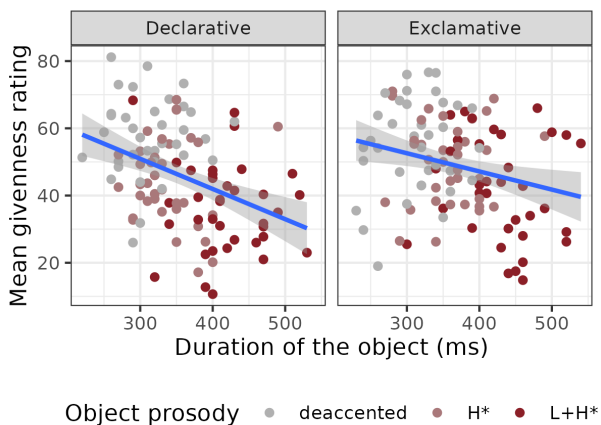


Figure 4: Correlation between object duration and mean givenness ratings

prominent accents (L+H*) vs. less prominent accents (H*) do not differ between exclamatives and declaratives: In both sentence types, a more prominent accent is judged to be less likely to mark given information than a less prominent accent is.

Thus, listeners interpret prosodic prominence according to the inverse prosody-discourse prominence association familiar from assertions but they also are sensitive to the sentence type: In exclamatives, high prosodic prominence is less associated with givenness than it is in declaratives. We take this result to reflect the impact of the constructional prosodic default for exclamations [16], according to which speech act marking has priority over givenness marking in exclamations. Nevertheless, the difference between the sentence types are more subtle than we had expected on the basis of the findings from production, where givenness marking is virtually absent in exclamations. There might be several reasons for this. Overall, the task of judging discourse prominence without context involves a fair amount of guessing because information status is not the only information-structural category that is marked by a modulation of prosodic prominence. A prominent accent may also mark narrow focus or contrast, which are orthogonal to the given-new distinction [24], and there is evidence that contrast is marked

both in declaratives and in exclamatives [10], [12]. Furthermore, in a task where listeners are presented with objects that have different degrees of prosodic prominence, their attention will be drawn to these degrees of prominence and they will try to make sense of them, even if they would not normally produce exclamations where they mark information status prosodically.

Another aspect that might play a role is that the speech act exclamation can be realized by many different sentence types in German (e.g. [25]), and declaratives can also be used as exclamations, as mentioned above. Thus, we cannot be sure that participants always interpreted the declaratives as assertions. A comparison with the givenness ratings for the fillers, which included structures that were unambiguously marked as questions, suggests that this aspect might have contributed to the rather small difference: In the filler questions, givenness ratings overall are considerably higher: between 70% and 75% for deaccented objects vs. 56% and 58% for the experimental items.

Regarding the absolute height of the givenness ratings for our experimental items, it is also worth comparing them with those from Baumann et al.'s perception study [6]. In that experiment, the ratings were overall higher (mean givenness rating for H*: 53.5%; for deaccentuation: 76.1%; i.e., 9 resp. 18 points higher than in our study). There might be two reasons for this difference, one of which was already suggested in [6]. The target words in [6] were preceded by definite articles, which might have implied givenness. Our target words were bare plurals, i.e. indefinite, and thus more likely to have been judged as discourse-new. The other potential reason for the difference is that deaccented target words in [6] were *followed* by accents, while deaccented target words in our study were *preceded* by an accent (on the subject *d*-pronoun). If participants were to (erroneously) perceive an accent on deaccented target words, this would be a pre-nuclear accent in the paradigm in [6], but a nuclear accent in our paradigm. This would in turn predict on average lower givenness ratings in our paradigm (recall that the target words would be the default carriers of the nuclear accent in broad focus).

6. Conclusion

We have shown that the relationship between information status and prosodic prominence is mediated by sentence type also in perception, thus corroborating earlier findings in production. Differences in prosodic prominence that in assertions are used to mark differences in information status show a looser association in exclamations. We have argued that this partial decoupling of prosodic and discourse prominence is due to the requirements of prosodic speech act marking, which for exclamations include an overall high prosodic prominence, resulting in reduced givenness marking, as captured by the notion of the constructional prosodic default [16]. Future research must show if the results that we obtained in a context-free judgement study can be confirmed for contextually embedded sentences. Furthermore, more work is required on the mapping between sentence types and speech acts, as well as on the comparison with other non-assertive speech acts.

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