

Prosodic disambiguation of German case ambiguity

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Syntactically ambiguous sentences can be made explicit by phonetic means such as intonation (Lehiste, 1973). Yet, syntactic and prosodic structure is not consistently isomorphic. Therefore it is not always clear whether speakers and listeners make use of prosodic information to distinguish between different readings of syntactically ambiguous structures. Evidence suggests that this is in fact the case for major syntactic breaks as in subject-object-ambiguities in sentences like *The workers considered the last offer from the management of the factory / was a real insult* (Marslen-Wilson et al., 1992). We conducted two experiments to investigate (i) whether such disambiguation strategies will be observable for German structures with minor syntactic breaks (i.e. ambiguous genitive- and dative-NPs) and if so (ii) whether these prosodic cues are used in comprehension to distinguish between equally plausible alternatives.

In a production experiment, we examined speakers' use of prosody to disambiguate syntactic structure. The critical sentences (1) are locally ambiguous with respect to the NP1-NP2 complex. In (1a) NP2 is a genitive attribute modifying NP1. In (1b) NP2 represents a dative object. Sentences are disambiguated on encountering the verb. To test speakers' ability to disambiguate the sentences prior to the verb, we calculated maximum F0, minimum F0 and duration of NP1 up to NP3. Additionally, pause duration between NP1 and NP2 in both conditions was measured.

Eighteen female native speakers of German participated in the experiment. The critical sentences (interspersed with fillers) were presented as question-answer-pairs on the computer screen. Participants were asked to produce the sentence as response to the question.

The results of the production study show that speakers distinguish the ambiguous NP1-NP2 complex prosodically. NP1 in the dative construction (1b) is realized with a significantly higher F0-excursion, its prefinal syllable and the pause immediately following it are significantly lengthened compared to NP1 in the genitive condition (1a). Pitch excursion and durational differences indicate that speakers successfully produce a different intonational phrasing: In (1a) the NP1-NP2 complex is realized as an Intonational Phrase (IPh) (Selkirk, 1984) on its own while in (1b) an IPh boundary separates NP1 from NP2.

For the perception experiment 20 sentences of each case condition were recorded by a trained speaker incorporating the prevalent intonational patterns. These sentences were taken to test the extent to which listeners use the information in auditorily parsed sentence fragments to predict upcoming entities. In a forced choice task stimulus sentences were presented up to NP3 and participants completed the fragments by choosing the better fitting of two possible continuations in a questionnaire. The results show that listeners select the correct sentence continuation significantly more often, confirming the actual use of prosodic cues to identify the intended syntactic structure.

Both, production and comprehension data suggest that prosody has the potential to disambiguate syntactic structure early on in sentence processing. Thus, phonological and intonational cues are used in combination to mark syntactic structure in German case ambiguities even if the differences in syntactic structure are more subtle than differences between direct object and clause complement continuations.

Examples

(1) a. genitive:

Neulich hat [der Bruder_{NP1} der Bäuerin_{NP2}] ein Haus_{NP3} entdeckt, das zerfallen war.
Recently has the brother-Nom the farmer-Gen/Dat a house-Acc discover-Perf.3sg.m that decaying was
“Recently, the brother of the farmer discovered a house that was decaying.”

b. dative:

Neulich hat [der Bruder_{NP1}] [der Bäuerin_{NP2}] ein Haus_{NP3} vererbt, das zerfallen war.
Recently has the brother-Nom the farmer-Gen/Dat a house-Acc leave-Perf.3sg.m that decaying was.
“Recently, the brother left the farmer a house that was decaying.”

References

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