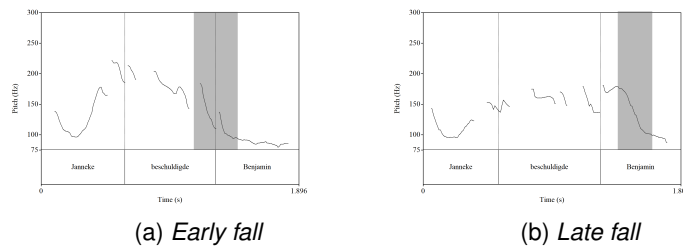


Hat Contour in Dutch: Form and Function

Introduction

The hat contour in German and Dutch refers to an intonation pattern which starts with a rise, stays high and eventually falls over the course of an utterance. A lot has been written about the hat contour, but very little consensus has been reached about its exact form and meaning. Part of the problem lies in the fact that there is no established and uniform phonological form. This creates problems for arriving at a uniform meaning for the hat contour. In order to get a better idea of intonation patterns, we will look into one specific hat contour in Dutch which will be referred to as the early-fall hat contour: An early fall refers to the timing of the fall, in this case the fall is timed early relative to the accented syllable (see Figures 1a and 1b).



Early vs. Late fall

Caspers [2] looked into the pragmatic differences between an early fall and late fall. In a rating experiment, subjects were asked to assess different contexts and contours on a ten-point scale. Based on the results, it was concluded that the early fall sounded more detached, more irritated, more final and less acceptable than the late fall in general. In addition, Caspers found that the early fall did not go well with new information compared to the late fall.

Alternative Propositions

Büring [1] regards the hat-contour in German as consisting of two phonological units: the initial rise and the final fall. The rise indicates the sentence internal topic (S-topic) and the fall indicates the focus of the sentence. Whichever element in the sentence receives Focus will be part of the set of propositions that are considered well-formed alternatives, this is what Büring calls the *Focus value*. In a *wh*-question in which the object is questioned, the focus alternatives to the sentence are formed by varying the object.

The S-topic is very similar to Focus: They both induce alternatives. These alternatives though are part of a set containing different Focus values (Topic Value). In other words it is a set of sets of propositions. According to Büring, S-Topics carry a so-called disputability implicature. This implicature is formulated as: "Given a sentence A, containing an S-Topic, there is an element Q in $[[A]]^t$ such that Q is still under consideration after uttering A". A question is said to be disputable if there are informative but non-absurd answers to it. Consequently, if there is no disputability the hat contour should be less acceptable.

In contrast to Büring, Ludwig and Wagner [4, 3, 5, 6] claim that the hat contour does not carry such an implicature, rather, the hat contour indicates that there is at least one true alternative proposition. This means that the hat contour should be acceptable even when there are no disputable alternatives as long as at least one alternative is true. Wagner ascribes the semantics of the hat contour specifically to the early fall. The current research tests the hypothesis that the early fall hat contour conveys that a contextually alternative proposition is true besides the proposition expressed bearing the hat contour.

Experiment

An online experiment was set up in the form of an acceptability judgment task. The participants were presented with a number of stimuli, after which they were asked to score the stimuli on a scale from 1 to 8 (in which 1 meant completely unnatural and 8 meant completely natural). Each stimuli set is manipulated for the timing of the fall (early vs. late) and the existence of alternative propositions. An example of such a stimulus set is provided below:

- (1) **Question:** Who had seen who? Had Isabel seen Willem-Jan?
- (2) a. **Affirmative answer:** 'Yes and Wilem-Jan had seen Isabel.'
- b. **Negative Answer:** 'No, Wilem-Jan had seen Isabel.'

The idea here is that in case of an affirmative answer, there exists an alternative proposition, whereas in case of a negative answer this alternative proposition is absent. For instance, the affirmative answer in (2a) conveys that besides the event “*Willem-Jan had seen Isabel*” another alternative event is true, namely “*Isabel had seen Willem-Jan*”. This condition should be less compatible with a hat contour according to Büring since there is no disputability. The negative answer on the other hand (see 2b), conveys that only the situation in which “*Willem-Jan had seen Isabel*” is true and that the alternative event “*Isabel had seen Willem-Jan*” is not true. All previous accounts would predict this condition to be less acceptable.

The stimuli were recorded in a sound-attenuated booth (16 bit, 44100 Hz) by two native speakers of Dutch. The stimuli are presented in a latin-square design to the participants.

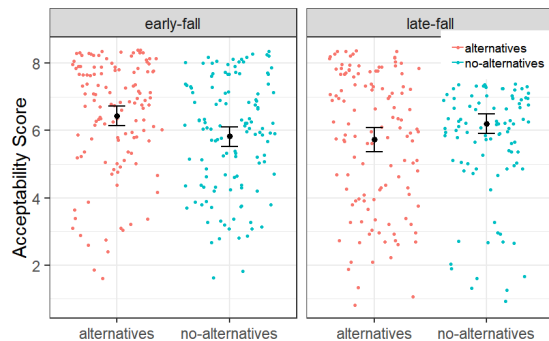


Figure 2: Acceptability score per context

Results

As predicted by our hypothesis there seems to be a clear contrast between having alternative propositions or not with regard to the early-fall (see Figure 2). The statistical analysis tells us that the interaction between context (i.e. *alternatives* vs. *no alternatives*) and endings is highly significant ($z = -3.693$, $SE = 0.3404$, $p < .001$).

More specifically, within the early fall there is a significant difference across the different context: The *alternatives* condition is significantly more acceptable with an early fall than the *no alternatives* ($Z = 2.607$, $SE = 0.3873$, $p < 0.01$). For the late-fall contours on the other hand, no such significant difference was observed ($z = -1.408$, $SE = 0.252$, $p > 0.05$). The results seem to support the hypothesis.

Discussion

The current research tested the hypothesis that the early fall in a hat contour indicates that an alternative proposition must be true besides the proposition expressed bearing the hat contour. This hypothesis is supported by the results of our online experiment: For the early fall, the *alternatives* condition is significantly more acceptable than the *no-alternatives condition*. No such difference was found for the late fall. Also, contrary to Büring the results show that the hat contour can be used even when there is no disputability but there is a true alternative. We have thus found evidence supporting Ludwig’s and Wagner’s analysis [3, 6].

It is important to note that the effects are rather small: the difference between the *alternatives* and *no alternatives* conditions seems to be no more than 0.5 on a Likert scale from 1-8. This could either be because the hypothesis describes a trend rather than a categorical effect of the meaning of the contour, or it could be that listeners are just easily willing to disregard prosody. Notice also that even though it was predicted that the *no alternatives* condition would be significantly worse than the *alternatives* condition for contours with an early-fall, the *no alternatives* condition is relatively good. In fact, it is as acceptable as the ones with a late-fall. All this seems to point towards a trend rather than a categorical difference.

The same experiment is currently being run on German and the results show a similar effect as observed in Dutch. Despite the small effect sizes it seems that it is a robust effect that is found in Dutch and replicated in German. More future research is needed to understand this small but robust effect.

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