Interface between information structure and intonation in Dutch WH-questions

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Abstract

This study set out to investigate how accent placement is pragmatically governed in WH-questions. Central to this issue are questions such as whether the intonation of the WH-word depends on the information structure of the non-WH word part, whether topical constituents can be accented, and whether constituents in the non-WH word part can be non-topical and accented. Previous approaches, based either on carefully composed examples or on read speech, differ in their treatments of these questions and consequently make opposing claims on the intonation of WH-questions. We addressed these questions by examining a corpus of 90 naturally occurring WH-questions, selected from the Spoken Dutch Corpus. Results show that the intonation of the WH-word is related to the information structure of the non-WH word part. Further, topical constituents can get accented and the accents are not necessarily phonetically reduced. Additionally, certain adverbs, which have no topical relation to the presupposition of the WH-questions, also get accented. They appear to function as a device for enhancing speaker engagement.

1. Introduction

Research of the interface between information structure and intonation has primarily concerned pragmatic principles of accent placement in statements [9], whereby WH-questions (questions that contain an interrogative proform such as when, where, who, what, why and how, also known as information questions) often served as context utterances. The issue of how accent placement is pragmatically governed in WH-questions is an intriguing one [9, 10], and has only been addressed to a limited extent [6, 9, 10]. Central to this issue are questions such as whether there is an inherent relationship between accent and focus, when the WH-word is accented, and what is the nature of the pitch accents in the part following the WH-word (the Open Sentence or OS, following [10]). Earlier approaches [1, 2, 6, 10, 12] often differ in their views on these questions. Most of the approaches heavily relied on carefully composed WH-questions in made-up contexts. Two opposing views can be identified on the basis of the predicted unmarked intonation of WH-questions. We may call them the 'right-asymmetry' view and the 'left-asymmetry' view. The 'right asymmetry' view [10] holds that, in English, the WH-word is the focus of the WH-question but its focal status is not marked prosodically. Pitch accents are assigned to the OS to signal meanings other than focus. The 'left asymmetry' view [6] claims that, in Dutch WH-questions, the WH-word is focal and always accented, independent of the information structure of the OS. Constituents in the OS can be either nonfocal and unaccented, or focal and receive reduced accents. Considering the similarity in intonation and structural principles that govern accent placement in English and Dutch [3], differences between approaches that lead to conflicting views on the unmarked intonation of WH-questions need to be explained. To this end, we investigated a corpus of 90 naturally occurring Dutch WH-questions. The abovementioned questions will be addressed in the light of data obtained from this corpus. In what follows, we will first consider the 'right-asymmetry' view and the 'left-asymmetry' view in some detail, and then review previous studies on intonation of WH-questions.

1.1 The 'right-asymmetry' view

The pragmatic principles that are used in [10] include four pairs of contrasts: pragmatic assertion vs. pragmatic presupposition, focus vs. topic, active referent vs. ratified topic, and knowledge presupposition vs. topicality presupposition. A sentence can be divided into pragmatic assertion and pragmatic presupposition. Pragmatic assertion refers to 'the proposition expressed by a sentence that the hearer is expected to know or believe or take for granted as a result of hearing the sentence uttered'. It is largely comparable to concepts like new information and comment. The focus is the unpredictable element of a proposition, which makes a sentence into an assertion. Pragmatic presupposition refers to 'the set of lexico-grammatically evoked propositions that the speaker assumes the hearer already knows or believes or is ready to take for granted' at utterance time. It corresponds closely with concepts like given information or shared background. The referent that such a proposition is construed to be about is the topic. It can be either an active referent or a topical referent. An active referent is one that is being 'lit up' among the inventory of referents known to the speaker and the hearer at utterance time. A topical referent is one that is already salient in the discourse at utterance time and represents a predictable argument of a predication for the hearer. It becomes a ratified topic when its topic role in the predication is 'considered predictable to the point of being taken for granted by the hearer' (e.g. a referent that is under discussion throughout the conversation). The presupposition to which an active referent or a topical referent has a topical relation is knowledge presupposition (KP); the presupposition with which a ratified topic is associated is topicality presupposition (TP).

It is assumed that there is no inherent relationship between accent and focus. Focus is not necessarily signaled via accenting; a pitch accent can be either focal or topical. A topical accent is assigned to a constituent of which the topical status is yet to be ratified at utterance time.

Turning to WH-questions, the assertion is the fact that the speaker wants to find out the identity of the referent required via the WH-word. The focus is the WH-word. Its focal status is marked constructionally (i.e. by its form and its position) but not prosodically, because WH-words are considered 'inherently unaccentable'. The unaccentability of WH-words is motivated by the semantic and pragmatic links between them and SM-words (i.e. indefinite expressions involving the morpheme 'some', such as someone, sometime, etc.), which are normally not accented. Semantically, like SM-words, the WH-words do not have a referent for the hearer to identify at the time of utterance. Pragmatically, in both cases, there is no commitment on the part of the speaker to the effect that he

knows the identity of the referent of the expression. The semantico-pragmatic links between WH-words and SM-words are grammatically reflected in many languages in the sense that the same set of proforms is used for both WH-words and SM-words.

The set of propositions in the OS is claimed to be mutually known by the speaker and the hearer, that is, knowledge-presupposed. Within the KP, some topical constituents may be already ratified at utterance time and hence form the TP, while others still need to be ratified via a topical accent. Any ratified topical constituent will be unaccented. It follows that the unmarked intonation of WH-questions is right-asymmetric. The left-asymmetric pattern will arise only if the entire KP is a ratified topic at utterance time (i.e. if the KP and the TP are identical) and the sentence accent falls on the WH-word by default.

1.2. The 'left-asymmetry' view

The pragmatic concepts that are crucial in [6]'s analysis are topic and comment. A sentence can be divided into the topic part and the comment part. The topic part refers to the person or thing about which something is said. The comment part is what is said about the topic. The comment is always semantically central and in focus. The focus type is focus of addition in statements but focus of contrast in questions because in the latter case the speaker is assumed to have presupposed a set of possible comments. The topic is not necessarily out of focus. That is, 'although the topic is already part of the interlocutor's background, the speaker may yet have reason to assume that it has to be explicitly (re)introduced into the discourse'. In this case, the focus is called focus of introduction. Focus is assumed to be signaled via accenting.

In a WH-question, the WH-word is the comment and the OS is the topic. The WH-word is always accented, independent of the information structure of the OS. The accent on the WH-word is expected to be expanded because it signals contrastiveness. The accents in the OS are expected to be reduced, because contrastiveness is typically enhanced by reduction of neighboring accents. When the topic is not in focus, only the WH-word is accented. When the topic is in focus, a reduced accent is assigned to the topic, in addition to an expanded accent on the WH-word. In both cases, left-asymmetric patterns are predicted.

1.3. Previous investigations

Two studies have come to our attention. [6] reported a corpus-based study testing the 'left-asymmetry' view. The corpus consisted of 200 tokens of two WH-questions recorded by ten native speakers of Dutch. Each question was read both with a context utterance preceding it and with a context utterance following it. In total, 186 tokens were included for analyses. The WH-word was accented in all questions, creating a left-asymmetric pattern. In 71% of the questions, the WH-word was the only accented constituent; in 29% of the questions, the H* of the WH-word formed a high plateau with the peak of the object accent. However, these results need to be taken with caution. In [6], the speakers were put into a reading-out situation, where they received the recording scripts in advance and were encouraged to repeat unsatisfactory readings during the recording. Consequently, the information structure may not have played a role in shaping the intonation of the WH-questions as they would in natural discourse.

In a study on distribution of accent types in English questions, [7] analysed a corpus of 35 WH-questions. The questions were videotaped from television shows. It was found that the WH-word was accented in 34 of the WH-questions.

However, little was said about the information structure of the OS. This makes it difficult to interpret [7]'s finding in the context of the present study.

The questions that remain to be answered are thus as follows:

Question 1: How frequently is the WH-word accented?
Question 2: Is there a relationship between the intonation of the WH-word and the information structure of the OS?
Question 3: Can ratified topic constituents be accented?
Question 4: Are accents in the OS by definition topical?
Question 5: Are the accents in the OS reduced in comparison to the accent on the WH-word?

2. Method

2.1. A corpus of Dutch WH-questions

Our corpus consists of 90 WH-questions. They were selected from the Spoken Dutch Corpus (Corpus Gesproken Nederlands or CGN), which is a corpus of contemporary Dutch as spoken by adults in Flanders and the Netherlands [11]. In our selection of questions, the following criteria were applied. First, the corpus should have a balanced representation of different types of WH-questions. We decided to include three types of WH-questions and 30 tokens each: *wat* 'what', *wanneer* 'when', and *waarom* 'why'. These three types of questions were chosen because their assertions have scope over different syntactic constituents, namely, object/subject, adverbial phrase, and adverbial clause. The effect of WH-question type has not been given any attention in the literature. We felt that including WH-question type as a variable in our corpus would give us the opportunity to see whether it would play a role in accent placement. Second, the speakers should speak a variety of Dutch that is very close to the standard variety spoken in the Netherlands. This led to the decision that only questions uttered by speakers from the core regions were to be used, including West Utrecht, Northern Holland and Southern Holland. Third, the questions must be uttered in a type of discourse in which sufficient contextual information is available for reliable analysis of information structure. The most suitable discourse types were believed to be broadcast interviews, discussion and debates. When there was a shortage of certain WH-questions meeting criteria 2 and 3, questions produced in spontaneous face-to-face or telephone conversations by speakers from the areas just outside the above mentioned regions were included. Fourth, the speech signal should be clean and must not be contaminated by speech signals from other speakers or background noise. Finally, each selected question must be a real question, i.e. a question that is used to require information from the hearer(s).

2.2. Annotating information structure and intonation

The 90 WH-questions were annotated for intonation and information structure. To maximise the independence of the two kinds of annotation and thus minimise the circularity in our interpretation of the data, the annotation was conducted in three stages with an interval of two weeks. In the first stage, the WH-questions were heard without the context and the intonation contour of each WH-question was annotated in the ToDI notation [5]. The labels were then checked a few days after the labeling was finished and adjustments were made in a small number of cases. In the second stage, each WH-question was heard in its original context and the information structure was annotated in terms of the pragmatic concepts in [10]. The main task here was to decide which constituents in the OS were ratified topic constituents and thus formed the TP, and which constituents were yet to be ratified and thus formed the KP, and whether there were constituents that had no topical

relation to the presupposition. In the third stage, the annotations of intonation and information structure were brought together to decide on the nature of the accents, topical or focal.

To assess the reliability of our annotation, a second annotator, who was not fully aware of the purpose of this study, labeled the intonation of the WH-word and the constituents in the OS in terms of 'KP constituents', 'TP constituents' and 'neither TP nor KP', after having received a short tutorial and supplementary readings on ToDI and the pragmatic principles in [10]. The inter-annotator agreement reached 87% for presence vs. absence of pitch accent on the WH-word, and 73% for the 'presupposition' labels. These results show that overall our annotation is reliable.

3. Results and Discussion

To answer the five questions raised in section 1.3, frequencies were obtained for different properties. Corresponding percentage scores were calculated and are referred to in the text.

Question 1: How frequently is the WH-word accented?

Table 1. The frequency of WH-questions with and without an accent on the WH-word.

	accented WH-word	unaccented WH-word	*total*
waarom	27(90%)	3 (10%)	30
wanneer	23 (77%)	7 (23%)	30
wat	19 (63%)	11 (37%)	30
total	69 (77%)	21 (23%)	90

As shown in Table 1, the WH-word is accented in 77% of the WH-questions, contra both the claim of [6] that the WH-word is always accented, and the prediction derived from [10] that the WH-word would be infrequently accented because it is 'inherently unaccentable'. Further, the frequency of accented WH-words differs in the three types of WH-questions, with the highest frequency in the why-questions (90%).

Question 2: Is there a relationship between the intonation of the WH-word and the information structure of the OS?

This question can be broken down to two sub-questions: A. Does the sameness of the KP and the TP make it more likely for the WH-word to be accented than unaccented? B. Does discrepancy between the KP and the TP make it more likely for the WH-word to be unaccented than accented?

As regards sub-question A, we counted the frequency of WH-questions with an accented WH-word and the frequency of WH-questions with an unaccented WH-word while the KP and the TP are identical. As can be seen in Table 2, the WH-word is accented in 93% of the WH-questions on average.

Table 2. The frequency of WH-questions with and without an accent on the WH-word when the KP and the TP are identical in the OS.

KP=TP	accented WH-word	unaccented WH-word	*total*
waarom	18 (90%)	2 (10%)	20
wanneer	11 (100%)	0	11
wat	8 (89%)	1 (11%)	9
total	37 (93%)	3 (7%)	40

To address sub-question B, we counted the frequency of WH-questions with an accented WH-word and the frequency of WH-questions with an unaccented WH-word while the KP and the TP are not identical. As shown in Table 3, the WH-word is noticeably more frequently accented (64%) than unaccented (38%) across the three types of WH-questions; this trend is strongest in the why-questions. This is a surprising result, because [10] predicts that the WH-word will not be accented at all in this case and [6] claims that the WH-word is always accented. Clearly, discrepancy between the KP and the TP does not prevent the WH-word from being more often accented than unaccented.

Table 3. The frequency of WH-questions with and without an accent on the WH-word when the KP and the TP are different in the OS.

KP≠TP	accented WH-word	unaccented WH-word	*total*
waarom	9 (90%)	1 (10%)	10
wanneer	12 (63%)	7 (37%)	19
wat	11 (52%)	10 (48%)	21
total	32 (64%)	18 (36%)	50

Together the results from Tables 2 and 3 show that the intonation of the WH-word is not independent of the information structure of the OS as suggested in [6]. When the KP and TP are identical, the WH-word is nearly always accented, in line with the claim in [10]. However, the sameness between the KP and the TP is not the only condition in which the WH-word gets accented as argued in [10]. The fact that the WH-word is more frequently accented independent of the information structure of the OS suggests that there may be communicative motivation for the speaker to accent the WH-word in addition to pragmatic motivation. For example, the speaker may accent the WH-word to signal a high degree of engagement and/or a strong desire to obtain the information required via the WH-word. If this were true, we would expect other devices for enhancing speaker engagement to co-occur more frequently with accented WH-words than with unaccented WH-words. We will come back to this speculation in our discussion centering on question 4.

Question 3: Can ratified topic constituents be accented?

In our data, ratified topic constituents are accented in 34% of the WH-questions. This is interpreted to support [6]'s view that the speaker can choose to reintroduce a topic that is already part of the background of the hearer but not [10]'s claim that ratified topic constituents are not accented.

Question 4: Are accents in the OS by definition topical?

In 13% of the WH-questions, an accent is assigned to an adverb that has no topical relation to the presupposition in the OS and introduces a new meaning element to the discourse. The adverbs include *wel* 'well', *toch* 'nevertheless', *nou* 'now', *juist* 'exactly', *specifiek* 'specifically', *zo* 'so', *eigenlijk* 'actually' and *precies* 'precisely'. They seem to have the following functions: to affirm the truth value of the proposition as in (1), like the verum focus [8], to intensify the contrast between the current proposition and the set of possible propositions as in (2), or to highlight a shift of attention from the topic at utterance time to a different one as in (3). Obviously the speculated functions need to be tested in a larger set of WH-questions with such accented adverbs. It is nevertheless clear at this stage that not all accents in the OS are topical, contra [10]. A common effect that these accented

adverbs seem to have on the hearer is that the speaker sounds more engaged and more interested in finding out the answer than otherwise. Note that 83% of accented adverbs co-occur with an accented WH-word. This lends support to our earlier speculation that the speaker may choose to accent the WH-word to signal a higher degree of engagement .

(1) Context: The interviewer asked a retired journalist waiting for the MPs to come out after a Parliament debate whether the debate would be very exciting. The retired journalist replied that it would not be really exciting. The interviewer than asked him the following question:

%L H*   H*   L%
Wanneer is dan wel echt   spannend?
When   is then well really exciting

(2) Context: Reverend Hans Visser had decided to replace a few Christian holidays with non-Christian holidays in his church community, namely, Hindu and Islamic holidays. The interviewer asked him the following question:

%L   H*L   H*L
Waarom specifiek   de keuze voor de Hindoeïstische en de
why   specifically   the choice for de Hindu   and the

            L*H   H%
Islamitische feestdagen?
Islamic   holidays

(3) Context: Speaker A expressed to Speaker B her wish to meet up during the Whitsun holiday. Speaker B liked the idea and made suggestions for what they could do. She went on to ask the following question:

%L H*   H*L   L*H   H%
Wanneer is Pinksteren eigenlijk?
When   is Whitsun   actually

Question 5: Are the accents in the OS reduced in comparison to the accent on the WH-word?

The accents are reduced in only 14% of the WH-questions with an accented WH-word, contra [6]. Interestingly, we noted that the pitch peak of the H* and H*L accent in the OS is higher than the pitch peak of the accent on the WH-word, which is H* mostly, in 17% of the WH-questions with an accented WH-word. Assuming a direct relationship between pitch prominence and semantic significance [4], this result suggests that the semantic significance of components in the OS may not be of a secondary nature.

4. Conclusions

In this study, we investigated the interface between intonation and information structure in Dutch WH-questions by analysing 90 naturally occurring WH-questions selected from the Spoken Dutch Corpus. We have concerned ourselves mainly with questions that are approached in conflicting ways in two earlier analyses [6, 10]. Our results show that the intonation of the WH-word is related to the information structure of the OS, contrary to views in [6]. When the entire KP is a ratified topic at utterance time, the WH-word is nearly always accented, according with [10]. However, the WH-word is also frequently accented in particular in the why-questions when some portion of the KP is not yet a ratified topic, contra [10]. The overall higher frequency of accented WH-words independent of the information structure of the OS is interpreted to suggest that the speaker may have communicative motivation to accent the WH-word in addition to pragmatic motivation. Possibly, an accent on the WH-word signals a high degree of engagement or a strong desire to obtain the information required via the WH-word. Our data also show that ratified topic constituents can be accented, in accordance with [6], and that accents in the OS are not necessarily phonetically reduced in comparison to the accent on the WH-word, different from what was found in read speech [6]. In addition, we have observed that accents are assigned to a group of adverbs in the OS that have no topical relation to the presupposition. The use of these accented adverbs in WH-questions may function as another device for enhancing speaker engagement in addition to accenting the WH-word.

The findings suggested a number of topics for future research. First, there is a noticeable difference in the frequency of WH-questions with an accented WH-word among the three types of WH-questions in our corpus (Tables 1 and 3). More work is needed to shed light on how accent placement differs as an effect of WH-question type. Second, future work can be directed to investigations of the role of accented WH-words and accented adverbs in the perception of affective meanings such as 'engaged' and 'interested'. Finally, this study covered what-, when-, and why-questions, it will be useful to extend the investigation to other types of WH-questions in Dutch and to WH-questions in other languages.

5. Acknowledgements

6. References

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