It is not the Obvious Question that a Cleft Addresses

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Abstract. I take a new perspective on *es*-clefts in German, that focuses on how an *es*-cleft contributes to the discourse structure and how it does this differently than its canonical counterpart. My analysis is inspired by naturally occurring examples from German novels. It combines an adapted version of Roberts' (2012) QUD stack and Velleman et al.'s (2012) approach to clefts. In particular, I present a model that includes implicit and potential questions into the QUD stack and I introduce the concept of expectedness, that I argue is crucial for the acceptability of clefts. I propose that the cleft addresses a question that came up in the preceding context but that is not as expected for the addressee to be answered at that point in the discourse compared to other questions. Those question that are more expected are answered with a canonical sentence. This approach is compatible with other functions that have been proposed for clefts, such as marking exhaustivity, maximality, or contrast. However, it can also account for examples where the cleft serves to establish discourse coherence.

Keywords: German *es*-clefts · QUD · Discourse expectations

1 Introduction

In German, cleft structures are not very frequent (especially in spoken German) and one could wonder why an author would even use an *es*-cleft, such as (1-a)[1], instead of the the much less complex canonical equivalent in (1-b).

(1) a. Es ist die Ungewissheit, die mir keine Ruhe lässt.
It is the uncertainty that me no quiet let.
'It is the uncertainty that bothers me.'

I thank Edgar Onea, Lea Fricke, Maya Cortez Espinoza, the reviewers, and the audience of TbiLLC 2019 for valuable feedback and comments. The analysis of German *es*-clefts presented in this paper is based on my dissertation, Tönnis (2021), which includes a much more detailed version of this analysis.

[1] Taken from the novel *Herzenhören* (Sendker (2012). *Herzenhören*. Heyne, München, p. 21.)

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b. Die Ungewissheit lässt mir keine Ruhe.
The uncertainty let me no quiet.
'The uncertainty bothers me.'

A preliminary corpus search, based on data from German novels, revealed some interesting occurrences of *es*-clefts, that seemed much more natural than those examples found in a corpus study that mainly investigated newspaper texts, such as Tönnis et al. (2016). As Wedgwood et al. (2006) pointed out, clefts have often been analyzed in unnatural contexts (or even without a context), which failed to capture the effect of clefts as part of a discourse. The preliminary corpus search showed that it does make a difference when the cleft is replaced with its canonical equivalent, which was not so obvious in the newspaper texts. The difference has to do with discourse coherence, but is not easily explicated precisely. Intuitively, the *es*-cleft in German seems to pick up a question that is less prominent at the moment it is uttered. However, in many occurrences of clefts in novels, it was still only a small degradation of acceptability when it was replaced with a canonical sentence.

In order to get to the core of the cleft's discourse function, I constructed an example, inspired by several examples from novels, which clearly favors the cleft over the canonical sentence. Example (2) presents a context in which the cleft is more appropriate than its canonical equivalent.[2]

(2) Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. Dann ist Lena glücklich nach Hause gefahren.
'Yesterday at the party, Lena talked to some guy$_1$. The two of them laughed a lot and they agreed to meet again the next evening. Then, Lena went home happily.'

a. Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
'It was Peter$_1$ she talked to.'

b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
'She talked to Peter$_1$.'

The *es*-cleft in (2-a) can easily be interpreted as referring back to the discourse referent introduced by *einem Typen* ('*some guy*'), which establishes discourse coherence and which makes it an appropriate continuation. The canonical sentence in (2-b), in contrast, seems to be incapable of referring back to that discourse referent and leaves the reader a bit puzzled. The canonical sentence in (2-b) does not seem relevant in this context, which makes it an inappropriate discourse continuation.

In this paper, I will be concerned with the question that a cleft addresses in comparison to the question a canonical sentence addresses. Example (2) suggests

[2] The judgments for this example, as well as for examples (3)–(5), are confirmed by a couple of speakers but still have to be tested empirically.

that the cleft addresses a less expected question than the canonical sentence, here *Which guy did Lena talk to?*. The canonical sentence can only address more expected questions and can, thus, not refer back to the discourse referent introduced in the very first sentence by *einem Typen* (‘*some guy*’).

A cleft can, however, not address a question that is extremely unexpected. More precisely, the appropriateness of the cleft decreases when a pressing question arises between the cleft and the question it addresses[3], as in (3).

(3) Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. **Lena hat ihm sogar ein Geheimnis verraten.**
‘Yesterday at the party, Lena talked to some guy$_1$. The two of them laughed a lot and they agreed to meet again the next evening. ***Lena even told him a secret.’***

a. ?Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
‘It was Peter$_1$ she talked to.’

b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
‘She talked to Peter$_1$.’

In example (3), the sentence in bold evokes the question *‘What was the secret?’*. This seems to make the cleft and the canonical sentence equally inappropriate.

However, if a sentence interferes between the second pressing question and the cleft/canonical sentence, such as the bold sentence in (4), the situation is similar to (2). The cleft is again better than the canonical sentence.

(4) Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. Lena hat ihm sogar ein Geheimnis verraten. **Dann ist Lena glücklich nach Hause gefahren.**
‘Yesterday at the party, Lena talked to some guy$_1$. The two of them laughed a lot and they agreed to meet again the next evening. Lena even told him a secret. ***Then, Lena went home happily.’***

a. Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
‘It was Peter$_1$ she talked to.’

b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
‘She talked to Peter$_1$.’

[3] Thanks to Edgar Onea (p.c.) for raising this issue.

Example (5) provides another context in which the cleft and the canonical sentence are equally degraded.[4]

(5) **Lena ist gestern Abend bei der Party angekommen und hat erstmal einen leckeren Cocktail getrunken.** Danach hat sie mit ihrer Freundin Andrea getanzt und die beiden hatten sehr viel Spaß. Dann ist Lena glücklich nach Hause gefahren.
'Lena arrived at the party yesterday and first of all she had a tasty cocktail. *Thereafter, she danced with her friend Andrea and the two of them had a lot of fun. Then, Lena went home happily.'*

a. ?Es war ein Bloody Mary, den sie getrunken hat.
it was a Bloody Mary that she drunk has
'It was a Bloody Mary she drank.'

b. ?Sie hat einen Bloody Mary getrunken.
She has a Bloody Mary drunk
'She drank a Bloody Mary.'

Here, the sentence in bold raises the question Q: *'Which cocktail did Lena drink?'*. Moreover, the subsequent context does not give rise to any other pressing question. Nevertheless, the cleft is again as inappropriate as the canonical sentence, just like in (3). It seems that the cleft, even without a pressing question interfering, still cannot address a question that is too unexpected to be addressed at that point in the discourse.

I approach these puzzles by providing a discourse model that makes different predictions about the discourse behavior of clefts and canonical sentences. I argue that existing approaches, which focus on the exhaustivity/maximality or contrastivity of clefts, cannot account for the effect of discourse (in-)coherence of clefts or canonical sentences, respectively. My approach takes a new perspective on clefts, while still being compatible with those cases of clefts that mark exhaustivity/maximality or contrast.

In Sect. 2, I briefly present previous approaches to different features of clefts. In Sect. 3, I develop an adapted discourse model, which introduces a QUD set, based on Roberts' (2012) QUD stack, including implicit questions and discourse expectations. In Sect. 4, I present an application of the proposed model to the examples presented above. Finally, Sect. 5 concludes.

2 Background

Several features of clefts are discussed in the literature, and different approaches tend to focus on one feature that determines the function of the cleft. In this section, I will briefly introduce those features and the most important approaches to analyzing the semantics and pragmatics of cleft structures.

[4] An anonymous reviewer questions the proposed judgments for examples (3) and (5), suggesting that the cleft is still more acceptable than the canonical sentence, as in the other examples. If this was the case, it would still need to be explained why the clefts in (3) and (5) are less acceptable than the clefts in (2) and (4).

The cleft in (6) has the EXISTENCE PRESUPPOSITION in (6-a), which is rather uncontroversial.

(6) It is Peter Lena talked to.
   a. **Existence presupposition:** Lena talked to somebody.
   b. **Exhaustivity inference:** Lena talked to nobody else than Peter.
   c. **Canonical inference:** Lena talked to Peter.

Furthermore, it has the EXHAUSTIVITY INFERENCE in (6-b). It is still a point of debate what status this inference has (see Onea (2019) for an overview of exhaustivity in *it*-clefts). Furthermore, the cleft in (6) is assumed to have the at-issue content in (6-c), which is called the CANONICAL INFERENCE or the PREJACENT.

In this paper, I address the question of what function the cleft has, especially when compared to its canonical form. Why would the author of a text use a cleft instead of the structurally much simpler canonical form in German?

Horn (1981), Büring and Križ (2013) and others argued that clefts are used to mark exhaustivity. Others, e.g., Destruel and Velleman (2014), consider clefts to mark contrast or to correct a previous statement. A third approach analyzes clefts as marking focus unambiguously or marking prominence of the clefted element (cf. De Veaugh-Geiss et al. 2015; Tönnis et al. 2016).

My analysis, to be presented in Sect. 3 and Sect. 4, is closely related to a fourth approach by Velleman et al. (2012). They take a discourse-oriented approach by treating clefts as inquiry terminating (IT) constructions. They show that the exhaustivity inference of clefts is focus sensitive. Compare (7-a) and (7-b), where the inference changes depending on the focus in the cleft pivot.

(7) a. It was PETER's$_F$ eldest daughter that Lena talked to.
   → Lena did not talk to anybody else's eldest daughter.
   b. It was Peter's ELDEST$_F$ daughter that Lena talked to.
   → Lena talked to no other daughter of Peter's.

Hence, Velleman et al. (2012) argue that clefts contain a focus sensitive operator in the sense of Beaver and Clark (2008). This operator refers to the CURRENT QUESTION (CQ).[5] More precisely, Velleman et al. argue that clefts provide a maximal answer to the CQ and, thereby, terminate the ongoing inquiry about CQ. They predict the cleft in (6) to maximally answer the question *Who did Lena talk to?*. The focus sensitive cleft operator is composed of $\text{MIN}_S(p)$ and $\text{MAX}_S(p)$, where p is the prejacent and S is the context, that contains the current question CQ: "$\text{MIN}_S(p)$, which ensures that there is a true answer to the CQ which is at least as strong as the prejacent p, and $\text{MAX}_S(p)$, which ensures that no true answer is strictly stronger than p." (Velleman et al. 2012:450) While the cleft marks $\text{MIN}_S(p)$ as at-issue content, it presupposes $\text{MAX}_S(p)$.

[5] I will later adopt a different version of CQ based on Simons et al. (2017).

Velleman et al. (2012) point out a problematic example for their own approach, which is illustrated in (8) and (9) (a slightly adapted version of Velleman et al. 2012:449).

(8) A: What did Mary eat?
B: ?It was a PIZZA that Mary ate.

(9) A: What did Mary eat?
B: I thought she said she was gonna get a pasta dish, but I might be wrong.
A: And did she also order a salad?
C: Guys, I was there and actually paid attention. It was a PIZZA that Mary ate.

While the cleft is odd as a direct answer to a question as in (8), it is felicitous once other material intervenes between the question and the answer, as in (9). The approach of Velleman et al., however, incorrectly predicts B's answer to be felicitous as long as it is a maximal answer to A's question, for both (8) and (9).

Velleman et al. (2012) argue that it is not necessary to mark the end of the inquiry in (8), since it is not an extended inquiry. Accordingly, no special cleft marking is needed and that is why the cleft is infelicitous. This argument does not seem very convincing. Strictly speaking, one could even argue that an extended inquiry is more likely to terminate than a short one and, therefore, the latter needs more marking than the former. This would predict the cleft in (8) to be felicitous. Thus, the extent of the inquiry per se cannot be the crucial factor, neither can maximality.

Destruel et al. (2019) also take an approach that is related to the discourse function of the cleft, but from a different perspective. They provide empirical evidence for the hypothesis that the acceptability of French *c'est*-clefts improves the more they indicate that an utterance runs contrary to a doxastic commitment of the interlocutor. Destruel et al. focus on examples of clefts that express a contrast or, more precisely, correction. However, as the data in Sect. 1 shows, not all clefts are contrastive. The referent of *Peter* in example (2) to (5) does not contrast with another alternative in the presented context.

In my analysis, I will adopt the approach of Velleman et al. (2012) by analyzing what kind of question the cleft addresses and how it addresses this question. I will argue that not maximality is crucial, but the expectedness of the question addressed by the cleft (see Definition 1 in the next section).

3 Analysis

I focus on how an *es*-cleft in German contributes to the discourse structure and, in particular, how it does this differently than its canonical counterpart. In a nutshell, I propose that an *es*-cleft addresses a question that came up in the preceding context, but that is not as expected for the addressee to be answered at that point in the discourse as other questions. Those questions that are more expected are answered with a canonical sentence.

In order to provide a formal analysis of *es*-clefts, I first describe the discourse model that I am using. I further develop Roberts' (2012) Question Under Discussion stack. She assumes that, in the course of a conversation, several questions under discussion (QUDs) are piled up on a QUD stack one after the other. Whenever a question is accepted by the interlocutors, it is added to the stack as the top-most element. The top-most question is the one that is supposed to be addressed first. In the following, I will spell out what exactly needs to be on the QUD stack in order to explain the discourse function of a cleft and other sentences. Furthermore, I will argue that the discourse is better represented by assuming a QUD set instead of a QUD stack. I, first, discuss different kinds of questions, that will play a role for my approach. Based on Roberts, Simons et al. (2017) define the notion of the CURRENT QUESTION as opposed to the DISCOURSE QUESTION.

CURRENT QUESTION

The current question (CQ) is directly associated with a corresponding utterance, in particular, it is dependent on the focus of that utterance. Accordingly, the CQ of (10-a) is (10-b).

(10) a. LENA$_F$ talked to Peter.
b. **CQ:** Who talked to Peter?

Simons et al. (2017) analyze the CQ as the domain-restricted subset of the focus alternatives of the utterance. I will adopt this definition of CQ (which differs from Velleman et al.'s (2012) version). For the cleft, I take the CQ to be associated with the cleft pivot, as (11) indicates.[6]

(11) a. It was Lena who talked to Peter.
b. **CQ:** Who talked to Peter?[7]

This definition of CQ is independent of the discourse function of its corresponding utterance. This means that the identification of the CQ of an utterance is independent of whether that utterance is later accepted or not. In order to model

[6] Even with narrow focus inside of the pivot, as in (i), I assume that the CQ is associated with the entire pivot. This is still a point of debate that I will not be able to solve in this paper (see Velleman et al. (2012) and É. Kiss (1998) among others for discussion).

(i) a. It is LENA'S$_F$ boyfriend who talked to Peter.
b. **CQ:** Who talked to Peter?

[7] I intentionally do not assume the cleft question *Who is it who talked to Peter?* as the CQ of the cleft. It is possible that the cleft question would be more adequate as the CQ of the cleft. However, the semantics and pragmatics of cleft questions are even less understood than of cleft assertions. Therefore, the predictions made on the basis of a clefted CQ would be unclear. For reasons of feasibility, I assume an unclefted CQ, which is well understood. Hopefully, the insights about cleft assertions from this paper can contribute to the investigation of cleft questions in future research.

the acceptability of an utterance in a discourse, Simons et al. (2017) introduce the notion of a DISCOURSE QUESTION.

DISCOURSE QUESTION
The discourse question (DQ) is a discourse-segment relative notion and can intuitively be interpreted as the topic of a (sub-)inquiry (*inquiry* in the sense of Roberts 2012). This concept can also be found in van Kuppevelt (1995) who calls it the question that corresponds to the discourse topic. Admittedly, the DQ is not always unambiguously identifiable, which is also pointed out by Tonhauser et al. (2018:footnote 7). I make the simplifying assumption that it is given by the linguistic context. Importantly, it does not depend on the continuation, i.e. cleft versus canonical sentence.

According to Roberts (2012) and Simons et al. (2017), a discourse move realized by utterance U is accepted if the CQ of U is identical to the DQ or if its CQ contributes to the ongoing inquiry about DQ. If either of these conditions is fulfilled for U, it is accepted as a valid discourse move and the CQ of U is added to the QUD stack as the top-most element. Whether a CQ contributes to an inquiry, is subject to relevance constraints. The more relevant the CQ is, given the preceding context, the higher its probability to be accepted.

Example (2) from the introduction, however, cannot be explained relying only on the CQ and the DQ. The *es*-cleft and the canonical sentence in (2) have the same CQ: *Who did Lena talk to?*, and whatever the DQ is, it is also identical for both sentences (because they occur in the same linguistic context). Hence, they are either both acceptable or both unacceptable, based on the relation between CQ and DQ. More precisely, it seems that both sentences do not contribute to the DQ, assuming that the DQ is *What did Lena do after the party.* Given that the cleft is still acceptable, I assume that other kinds of questions must be relevant for the acceptability of an *es*-cleft in German, such as sub-questions and implicit questions.

IMPLICIT/POTENTIAL QUESTIONS
My analysis refers to van Kuppevelt (1995) and Onea (2016), who use the concept of IMPLICIT QUESTIONS (van Kuppevelt 1995) or POTENTIAL QUESTIONS (PQs) (Onea 2016). Van Kuppevelt notices that discourses contain many questions that are not formulated explicitly, but arise implicitly, especially in monologues. He characterizes implicit questions as questions "which the speaker anticipates to have arisen with the addressee as the result of the preceding context." (van Kuppevelt 1995:110) He also includes sub-questions of explicit or implicit questions and follow-up questions, if the answer to a preceding question was unsatisfactory, into his discourse model. He concludes that many implicit questions arise due to unsatisfactoriness of the provided answer to a previous question. I will make use of van Kuppevelt's concept of satisfactoriness.

Onea (2016) focuses on potential questions, which are evoked by the immediately preceding utterance, and which are explicitly not sub-questions of preceding questions. An example of a PQ is given in (12-b).

(12) a. My boss called me an idiot today.
b. **PQ:** Why did he call you an idiot?

Most of the examples I analyze in this paper are narratives which do not include explicit questions. Accordingly, I use a model that focuses on the questions that the author anticipates the addressee to have, based on the previous text. I assume that those questions are not all equally expected to be addressed from the perspective of the addressee. Consider example (13).

(13) Lena told Andrea a secret.

The author of this example would anticipate the addressee to wonder what the secret was, but also why Lena told the secret to Andrea. However, intuitively, the first question has a higher expectedness than the second. Whether a question arises and how expected it is, depends on many factors such as the addressee, the situation, and the common ground. The latter is illustrated by (14-a) and (14-b). In (14-a), the potential question *Why did he call you an idiot?* arises. In (14-b), in contrast, the answer to that question is already in the common ground and the question does not arise.

(14) a. Yesterday, I came to the meeting. My boss called me an idiot.
b. Yesterday, I forgot about the meeting. My boss called me an idiot.

In order to account for this difference, I need to include the common ground into my analysis. My definition of the common ground follows Cohen and Krifka (2014) and Krifka (2015), who introduce *Commitment Space Semantics*. Intuitively, a *commitment space* C subsumes all sets of propositions that contain the shared information and any number of continuations that are consistent with that shared information. Furthermore, Krifka (2015:329) defines the *update* of a commitment space C, $C + p$, where p is an assertion. Moreover, in Kamali and Krifka (2020), the update of C with a question is defined. My approach does not rely on this specific definition of common ground. Any other system that incorporates the concept of an update with a proposition or a question would serve the same purpose.

Having introduced all the preliminaries, I will now adapt Roberts' QUD stack. First of all, I introduce the concept of EXPECTEDNESS. I assume that the author of a text can anticipate how strongly the addressee expects a certain question to be addressed, given the provided information (recall example (13)). This understanding of expectedness is based on Zimmermann (2011), who assumes that unexpected discourse developments need extra linguistic marking. I interpret these discourse expectations as expectations with respect to questions. I assume that the addressee has expectations about whether a question will be asked or answered in the next discourse move, and those expectations differ depending on the kind of question and on the previous discourse, hence on the commitment space.[8]

[8] Note that expectedness is formulated from the addressee's perspective. The speaker comes into play when s/he anticipates the expectations of the addressee and chooses her/his next discourse move accordingly.

In order to formalize expectedness, I define the expectedness function f_e, which takes a commitment space C and a possible question q as its input and yields the respective expectedness value e between 0 and 1. Expectedness values (EVs) can also be seen as probabilities for the addressee to expect q to be addressed in a commitment space C. It is a recursive function that evaluates expectedness of a question by describing the difference between the current commitment space and the previous commitment space. This way, each update of the commitment space incrementally changes the EVs of the questions. The formal definition is provided in the following, and will be explained step by step below.

Definition 1 (Expectedness function). *The expectedness function* $f_e : \mathcal{CS} \times \mathcal{Q} \rightarrow \mathcal{E}$ *is a recursive function, where*

- $\mathcal{CS}$ *is the set of all possible commitment spaces,*
- $\mathcal{Q}$ *is the set of all possible questions,*[9]
- $\mathcal{E}$ *is the set of expectedness values from 0 to 1,*

such that for a given $C \in \mathcal{CS}$

$$\sum_{x \in \mathcal{Q}} f_e(C)(x) = 1.$$

f_e *is defined recursively as follows:*

i. For any $q \in \mathcal{Q}$ *and for* $C_0 \in \mathcal{CS}$ *such that* C_0 *is the commitment space at the beginning of a conversation,* $f_e(C_0)(q)$ *assigns a prior EV to* q.[10]

ii. For any $q \in \mathcal{Q}$, *any* $C \in \mathcal{CS}$, *and any update* p:

$$f_e(C+p)(q) \propto \begin{cases} f_e(C)(q) + \alpha & \textit{iff } q \textit{ is a subquestion of } p \quad \text{SUB.Q} \\ f_e(C)(q) + \beta & \textit{iff } q \textit{ is a PQ of } p \quad \text{PQ} \\ max((f_e(C)(q) - \gamma), 0) & \textit{iff } q \textit{ is the CQ of } p.\gamma \textit{ differs} \quad \text{CQ} \\ \quad \textit{with respect to completeness of } p \textit{ as answer to CQ.} & \\ f_e(C)(q) + \alpha + \beta + \delta & \textit{iff } q = p. \quad \text{EXPL.Q} \\ f_e(C)(q) & \textit{otherwise.} \quad \text{OTHER} \end{cases}$$

(*For all conditions, it holds that* q *has not been answered yet. If* q *has already been answered in* $C + p$, *then* $f_e(C + p)(q) = 0$.)

The condition that the EVs have to add up to 1 (for the range of f_e) expresses the similarity of EVs and probabilities. Hence, it implies that once an EV is raised, others must decrease.[11] The function f_e is defined recursively, which means that not only the current update but each former update has an effect on the expectedness of all the questions.

[9] The term *question* refers to the discourse move of asking a question.

[10] I am not concerned with those priors here and will just assume them to be well-defined.

[11] Empirically, the EVs would probably not exactly add up to 1. This needs to be considered if this model is tested empirically.

Step *i.* of the recursion provides the prior EVs at the beginning of a conversation, given that we never start a conversation without any shared information. Based on this common ground, some questions are a priori more expected than others. Step *ii.* defines the effect of an update on the expectedness of different kinds of questions in relation to the previous commitment space.[12] The effect is modeled by adding α, β, or δ, or subtracting γ to/from the EV of q in the commitment space before the update.[13] Those variables are context-dependent, hence, no constants. As we will see in the application of the model, some of the cases must be further subcategorized leading to α_1, ..., α_n, β_1, ..., β_n, etc. The conditions of SUB.Q, PQ, CQ, and EXPL.Q are not at all an exhaustive list of effects on expectedness, but rather a first approach to provide an idea of what can affect expectedness. I will now explain each of the conditions of step *ii.* of f_e.

Condition SUB.Q: This condition describes the strategy of asking a sub-question when one cannot answer the super-question, as in example (15).

(15) $\underbrace{\text{Peter celebrated his birthday.}}_{C}\ \underbrace{\text{I wonder who had a present for him?}}_{C+p}$

Here, a sub-question of the broader super-question *Who had a present for him?* would be *Did Nina have a present for him?*, which would have a higher expectedness in $C + p$ as compared to C, if we do not know anything specific about Nina's and Peter's relationship.

Condition PQ: If a commitment space C is updated with a proposition p and q is a PQ of p, then the expectedness is higher after the update (in the commitment space $C + p$) than before in C. An example for this situation would be (14-a), repeated in (16-a).

(16) a. $\underbrace{\text{Yesterday, I came to the meeting.}}_{C}\ \underbrace{\text{My boss called me an idiot.}}_{C+p}$

b. $\underbrace{\text{Yesterday, I forgot about the meeting.}}_{C}\ \underbrace{\text{My boss called me an idiot.}}_{C+p}$

After the first sentence in (16-a), the question of why the speaker's boss called him/her an idiot is not very expected. After the second sentence, however, it is expected, given that it is a potential question of the second sentence. The addition in brackets in Definition 1 explains why, in (16-b), $f_e(C + p)(PQ)$ is not higher than $f_e(C)(PQ)$ for the PQ *Why did he call you an idiot?*, namely because that PQ is already answered.

[12] The definition uses '+' for two different operations: an update as in $C + p$ and for adding a variable to an EV.

[13] Strictly speaking, those variables should not be added or subtracted, but α, β and $(\alpha + \beta + \delta)$ should be increasing functions and γ should be a decreasing function, that take $f_e(C)(q)$ as their argument.

Condition CQ: If a commitment space C is updated with a proposition p and q is the CQ of p, the expectedness of q is lower in $C+p$ than in C. The CQ of p in (17) is *Who did Lena talk to?*, which is very expected at C. At $C+p$, however, this question is addressed and has, thus, a reduced expectedness.

(17) $\underbrace{\text{Who did Lena talk to?}}_{\text{C}}$ $\underbrace{\text{Lena talked to PETER.}}_{\text{C+p}}$

This example also shows how γ could differ depending on whether we take p to be an exhaustive answer, a partial answer or a mention-some answer. If we had expected that Lena would talk to many people, the expectedness would be reduced less than if we had expected her to talk to just one person. In the terminology of van Kuppevelt (1995), this describes that the more satisfactorily a question is addressed, the more its EV is reduced.

The function *max* in CQ makes sure that there will be no negative EVs and will yield 0 in case $f_e(C)(q) - \gamma$ would be negative. Otherwise it yields $f_e(C)(q) - \gamma$.

Condition EXPL.Q: For an explicit question q, the expectedness is forced to be high. By taking the sum of α and β plus an additional constant δ, it is guaranteed that an explicit question will always have the highest EV. This means that an explicit question will reduce the expectedness of all questions in $C+q$ compared to C, except for q itself of course.

The actual prior EVs, as well as the actual values for α, β, γ and δ must be determined empirically. One preliminary approach to do this is presented in Westera and Rohde (2019). They presented snippets of texts to participants and asked them which questions are evoked. The EV of a question could be calculated from the relative frequency of that question.

Based on the expectedness function, I now define an adapted version of Roberts' (2012) QUD stack. It is actually not a stack anymore but a set of pairs of questions and their EVs, hence it is called the QUD SET. This set depends on the commitment space, since each update changes the EVs of questions.

Definition 2 (QUD set). *For a $C \in \mathcal{CS}$, the QUD set is defined as the set $\mathcal{S}_C = \{\langle q, e_i\rangle \mid q \in \mathcal{Q}\}$, such that $e_i = f_e(C, q)$.*

My definition of the QUD set differs from earlier versions, like Roberts' (2012), with respect to including also implicit questions. Actually, it includes all possible questions paired with their EVs. The consequence is that accepting a discourse move never implies adding a new question since all questions are already included in the set. Furthermore, the top-most question in the stack looses importance. The model I am proposing allows, in principle, to address any question in the QUD set. Acceptance conditions are modeled via expectedness. Accepting a discourse move means identifying its CQ with a question in the QUD set which has a sufficiently high EV. This is defined as follows for the default case.

Definition 3 (Accepting a sentence – default case). *A sentence p_n is acceptable iff for a given $C \in \mathcal{CS}$ and cq_n being the CQ of p_n*

$$f_e(C, cq_n) > e_{def}$$

where e_{def} is the EV that is necessary for a sentence to be accepted by default.

The value e_{def} is most likely not a constant value, but depends on the context and must again be determined empirically. Turning back to the difference between clefts and canonical sentences, I assume the canonical sentence to be a default case which is covered by Definition 3. The cleft, however, is a non-default case resulting in additional requirements for acceptability, as defined below.

Definition 4 (Accepting a cleft sentence – non-default case). *A cleft sentence p_{cl} is acceptable iff for a given $C \in \mathcal{CS}$ and cq_{cl} being the CQ of p_{cl}*

$$e_{def} > f_e(C, cq_{cl}) > e_{cl}$$

where e_{cl} is the EV that is necessary for a cleft sentence to be accepted.

What Definition 4 says, is that the EV for an acceptable cleft has to exceed the threshold e_{cl} for an acceptable cleft. Furthermore, the EV of an acceptable cleft has to fall below the threshold for the EV of an acceptable sentence in the default case. In other words, clefts address less expected questions than other sentences do in most of the default cases.[14] Still, also the cleft needs a minimum value of expectedness e_{cl} in order to be acceptable. It cannot address just any question with an EV below e_{def}.[15]

4 Applying the Model

I will now apply the proposed model to the examples mentioned before, which showed a difference in acceptability of the canonical sentence and the cleft. First of all, I will provide a different explanation for the example of Velleman et al. (2012), repeated in (18).

(18) A: What did Mary eat?
B: ?It was a PIZZA that Mary ate.

[14] An anonymous reviewer pointed out that there are other non-default cases, besides clefts, that impose additional restrictions on acceptability, and that could be grouped with clefts. One such example is a sentence including the phrase *by the way*. I argue that we still need to assume different thresholds for each of these non-default cases, since *by the way*-sentences can address even less expected questions than clefts. Even in examples (3) and (5), in which the cleft in unacceptable, a *by the way*-sentence would be acceptable.

[15] In order to account for those cases where both a cleft and canonical sentence are acceptable, one would have to introduce a variable m, that is added to e_{def} in Definition 4. This would make sure that there is an interval of EVs $(e_{def}, e_{def} + m)$ where both the cleft and the canonical sentence are acceptable. For presentational purposes in Sect. 4, I will use the simpler definition in this paper.

According to Definition 1:EXCL.Q, the CQ of the cleft will have the highest EV in the QUD set in the commitment space C_0+q:*What did Mary eat?*. The highest EV will exceed the threshold e_{def} for default cases and, therefore, the cleft is not acceptable in (18) (Definition 4), but a canonical sentence would be acceptable (Definition 3). My approach can also explain why the acceptability of the cleft improves in (9), repeated in (19).

(19) A: What did Mary eat?
B: I thought she said she was gonna get a pasta dish, but I might be wrong.
A: And did she also order a salad?
C: Guys, I was there and actually paid attention. It was a PIZZA that Mary ate.

The difference between (18) and (19) is not only the extendedness of the inquiry but also the amount and the kind of questions that are evoked. B's answer evokes the question *Did Mary get a pasta dish?*, and A's second statement evokes the question *Did Mary order a salad?*. The EVs of both questions increase after the updates, the former is a sub-question of the first question and the latter is an explicit question. This means that they push down the EV of the CQ of the cleft, which is the more general question *What did Mary eat?*. It is plausible that the value is pushed below or at least close to e_{def}. If it is pushed below e_{def}, the cleft is predicted to be acceptable in (19) (Definition 4). Example (19) could also be a case for which both the canonical sentence and the cleft are acceptable.

Also example (2), repeated in (20), can now be explained by analyzing the anticipated questions and their EVs. I indicated the commitment spaces C_0 – C_3 in the example.

(20) (C_0)Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. (C_1) Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. (C_2) Dann ist Lena glücklich nach Hause gefahren.(C_3)
'(C_0)Yesterday at the party, Lena talked to some guy$_1$. (C_1)The two of them laughed a lot and they agreed to meet again the next evening. (C_2)Then, Lena went home happily.(C_3)'

a. Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
'It was Peter$_1$ she talked to.'

b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
'She talked to Peter$_1$.'

I will discuss this example in a bit more detail, also in order to illustrate how the proposed model works. For simplicity, I assume a very reduced set of possible questions $\mathcal{Q} = \{q_1, q_2, q_3, q_4, q_5\}$. The questions are explicated in (21).

(21) $S_{C_0} = \{$
$\langle q_1$*:What did Lena do after the party?*, $0\rangle$,

$\langle q_2$*:What happened to Lena and the guy after the party?*, $0\rangle$,
$\langle q_3$*:Which guy did Lena talk to?*, $0\rangle$,
$\langle q_4$*:What happened to Lena at the party?*, $1\rangle$,
$\langle q_5$*:How was the conversation?*, $0\rangle\}$

If (20) took place in a context where it is common knowledge that we are talking about Lena and yesterday's party, the QUD set S_{C_0} at C_0 would look like (21). Accordingly, only q_4 will be an a priori expected question in C_0.

Table 1 presents how $f_e(C)(q)$ changes for each question progressing from C_0 to C_3. For the variables from Definition 1, I stipulate values that will make the correct predictions for the purpose of illustration. As mentioned before, the real values would have to be determined empirically. For a strong PQ, I take $\beta_1 = 0.5$ and, for a weaker PQ, I take $\beta_2 = 0.3$. Furthermore, I assume $\gamma = 0.8$ for a rather satisfactory answer (in van Kuppevelt's (1995) sense of satisfactoriness).

Table 1. Application of the model for example (20) for commitment spaces C_0–C_3 and $\beta_1 = 0.5$, $\beta_2 = 0.3$, and $\gamma = 0.8$.

q	$f_e(C_0)(q)$	$f_e(C_1)(q)$	$f_e(C_2)(q)$	normalized
q_1	0	$f_e(C_0)(q_1) = 0$	$f_e(C_1)(q_1) + \beta_2 = 0.3$	0.23
q_2	0	$f_e(C_0)(q_2) = 0$	$f_e(C_1)(q_2) + \beta_1 = 0.5$	0.38
q_3	0	$f_e(C_0)(q_3) + \beta_1 = 0.5$	$f_e(C_1)(q_3) = 0.5$	0.38
q_4	1	$max(f_e(C_0)(q_4) - \gamma) = 0.2$	$max(f_e(C_1)(q_4) - \gamma) = 0$	0
q_5	0	$f_e(C_0)(q_5) + \beta_2 = 0.3$	0 (answered)	0

q	$f_e(C_3)(q)$	normalized
q_1	$f_e(C_2)(q_1) + \beta_1 = 0.73$	0.41
q_2	$f_e(C_2)(q_2) + \beta_2 = 0.68$	0.38
q_3	$f_e(C_2)(q_3) = 0.38$	0.21
q_4	$f_e(C_2)(q_4) = 0$	0
q_5	$f_e(C_2)(q_5) = 0$	0

In C1, after the update with the first sentence, q_1 and q_2 do not change their EV, they fall under the OTHER-condition of Definition 1. I interpret q_3 as a strong PQ of the first sentence and, thus, 0.5 is added to its EV, while q_5 is a weak PQ of the first sentence and 0.3 is added. The question q_4 is the CQ of the first sentence and it is answered rather satisfactory, though not complete. Therefore, 0.8 is subtracted from the EV of q_4.

In C2, after the update with the second sentence, q_1 is interpreted as a weak PQ of the second sentence (probably triggered by the expression *the next evening*) and q_2 as a strong PQ. According to the Definition 1:PQ, 0.3 and 0.5, respectively, are added to their EVs. The EV of q_3 falls under the OTHER-condition and does not change. The EV of q_4 is further reduced since it addresses

again the CQ of the second sentence. The value of q_5 is set to 0 since the second sentence fully answers q_5. After the application of f_e, the values are normalized for them to still sum up to 1.

In C3, both EVs of q_1 and q_2 increase, triggered by the discourse progressive element *then* (I treat them as PQs of the third sentence triggered by *then*). I take q_1 to be a stronger PQ than q_2. However, as long as they increase, it would not change the outcome with respect to the acceptability of the cleft if they were switched or if they both received +0.5. Question q_3, q_4 and q_5 fall under the OTHER-condition and keep their EV. Again, the values are normalized.

Now, we could assume $e_{def} = 0.25$ and $e_{cl} = 0.1$ and the model would predict the cleft in (20-a) to be acceptable (Definition 4), since the EV of the CQ cq_{cl} of the cleft falls below e_{def} and above e_{cl}:

$$e_{def} > f_e(C_3)(cq_{cl}) = f_e(C_3)(q_3) > e_{cl}$$

The canonical sentence in (20-b), on the other hand, has the same CQ as the cleft ($cq_{can} = cq_{cl}$), but its EV still does not exceed e_{def}:

$$f_e(C_3)(cq_{can}) = f_e(C_3)(q_3) < e_{def}$$

Hence, the canonical sentence, as a default case, is predicted to be unacceptable.

The most important message to take away from this example is that the EV of q_3, which is later identified with the CQ of the cleft, decreases from update to update just because the EVs of other questions (q_1 and q_2) increase. This is how the length of the inquiry is naturally incorporated as a predictor of acceptability of the cleft. It is, however, not the length per se, but also the relative expectedness of other questions after each update. If the new questions had a low EV or were already answered, the cleft would be predicted to be less acceptable and the canonical sentence might be preferred.

Contra Velleman et al. (2012), my model does not require the cleft to provide a maximal answer to the question it addresses. The model can, therefore, account for examples like (20), where the answer does not mean that Lena did not talk to anybody else. Nevertheless, it does allow the cleft to be exhaustive or provide a maximal answer. Maximality might be a side effect of the discourse function of clefts. My admittedly speculative explanation is that the reader/hearer might pragmatically infer the following: Given that the author/speaker bothered to pick up a question that was already settled or decreasing in expectedness, she probably has a complete/satisfactory answer to it, which would justify addressing it even though it is not expected.

I will discuss the example (3) and (5), repeated in (22) and (23), from the introduction in less detail, but will provide the gist of it.

(22) Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. **Lena hat ihm sogar ein Geheimnis verraten.**
'Yesterday at the party, Lena talked to some guy$_1$. The two of them laughed a lot and they agreed to meet again the next evening. ***Lena even told him a secret.'***

a. ?Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
'It was Peter$_1$ she talked to.'
b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
'She talked to Peter$_1$.'

Example (22) is predicted by the model, given that the update *Lena even told him a secret* evokes the PQ *What was the secret?* with a very high EV. This would mean that the EV of the PQ *Which guy did Lena talk to?* would be pushed below the cleft threshold e_{cl} and the cleft would be predicted to be an unacceptable discourse move, as well as the canonical sentence of course. Finally, example (23) is easy to explain.

(23) **Lena ist gestern Abend bei der Party angekommen und hat erstmal einen leckeren Cocktail getrunken.** Danach hat sie mit ihrer Freundin Andrea getanzt und die beiden hatten sehr viel Spaß. Dann ist Lena glücklich nach Hause gefahren.
'Lena arrived at the party yesterday and first of all she had a tasty cocktail. *Thereafter, she danced with her friend Andrea and the two of them had a lot of fun. Then, Lena went home happily.'*

a. ?Es war ein Bloody Mary, den sie getrunken hat.
it was a Bloody Mary that she drunk has
'It was a Bloody Mary she drank.'
b. ?Sie hat einen Bloody Mary getrunken.
She has a Bloody Mary drunk
'She drank a Bloody Mary.'

The PQ *Which cocktail did Lena drink?*, which is evoked by the first sentence, can be assumed to be a rather weak PQ. Hence, it receives a low EV. Given the intervening material, that again raises new questions, this already low value will be pushed down further, most likely below the cleft threshold e_{cl}. Therefore, both the canonical sentence and the cleft are inappropriate discourse moves.

5 Conclusion

In this paper, I presented an approach to German *es*-clefts that analyzes them embedded in a broader discourse context and discusses how they structure the discourse. The analysis was based on four constructed examples, that were inspired by examples of clefts from novels, some of which constituted the rare case of the cleft being acceptable while the canonical sentence was not.

In order to describe the discourse function of the cleft, I presented a discourse model that is based on the QUD stack, as assumed by Roberts (2012). My model departed from the original by assuming a QUD set that does not only include current questions but also implicit or potential questions that were evoked by the preceding text. Furthermore, I added the concept of expectedness, which

describes for each possible question in a given commitment space how strongly the reader/hearer expects that question to be addressed.

This model is capable of predicting why *es*-clefts in German can be used to refer back to questions that are not particularly pressing at that point in the conversation. And it explains why canonical sentences cannot be used if the question they address is not expected enough. And most importantly, it incorporates the progression of discourse updates and how that affects the acceptability of clefts. To my knowledge, previous approaches had not captured that. Moreover, the model provides an alternative explanation for existing puzzles in the literature, in particular, example (18) and (19) by Velleman et al. (2012).

Previous approaches struggle to account for the differences between the cleft and its canonical equivalent, presented in example (20), (22) and (23), since they cannot be explained by the need to mark exhaustivity, focus, or correction. Even though my approach does not focus on exhaustivity, it is compatible with the observation that clefts do quite frequently express exhaustivity. I analyze exhaustivity as a side effect of the discourse function of the cleft. I suggested that exhaustivity could be a pragmatic inference of the discourse function of the cleft, namely that an author/speaker would only address an unexpected question if she/he had a satisfying answer to it. The fact that the exhaustivity inference was shown to be cancelable (e.g., by Horn 1981) speaks in favor of it being a pragmatic inference anyway. This issue needs further investigations on the interaction of the expectedness of addressed questions and exhaustivity.

Another open issue is correction, which is frequently expressed by a cleft (Destruel and Velleman 2014; Destruel et al. 2019). This is problematic for my account because in corrections the cleft addresses a question that has already been answered and, thus, received the EV 0. My model would, therefore, incorrectly predict that a cleft cannot address that question. However, this seems to be a more general problem of incorporating revisions of a statement made by one of the discourse participants into the discourse model, which exceeds the scope of this paper. It is a promising extension to be investigated in future research, though.

Furthermore, example (4), repeated in (24), remains to be explained.

(24) Lena hat gestern auf der Party mit einem Typen$_1$ gesprochen. Die beiden haben viel gelacht und sich direkt für den nächsten Abend verabredet. Lena hat ihm sogar ein Geheimnis verraten. **Dann ist Lena glücklich nach Hause gefahren.**
'Yesterday at the party, Lena talked to some guy$_1$. The two of them laughed a lot and they agreed to meet again the next evening. Lena even told him a secret. ***Then, Lena went home happily.****'*

a. Es war Peter$_1$, mit dem sie gesprochen hat.
it was Peter$_1$ with whom she talked has
'It was Peter$_1$ she talked to.'

b. ?Sie hat mit Peter$_1$ gesprochen.
She has with Peter$_1$ talked
'She talked to Peter$_1$.'

In this example, there is a pressing question Q: *What was the secret?* intervening between the cleft and the question that the cleft addresses. My model would predict Q to have very high EV that pushes the value of the CQ of the cleft below the cleft threshold and would make the cleft unacceptable. The sentence in bold, however, seems to raise the EV of Q making the cleft acceptable again. As pointed out by a reviewer, the sentence in bold causes the feeling that the speaker is ignoring Q. Hence, the explanation of the cleft's acceptability is rather based on the relation between Q and the sentence in bold than on the relation between Q and the cleft. In order to capture this example, one would probably have to incorporate the effect of a topic shift into the model, following, e.g., van Kuppevelt (1995).

Furthermore, a reviewer pointed out the following example of an acceptable cleft in the context of a cleft question.

(25) A: Who is it that Lena talked to?
B: It is Peter that she talked to.

My model would incorrectly predict the cleft to be degraded given that its CQ (*Who did Lena talk to?*) is very expected to be addressed in the context of the cleft question. I assume that the acceptability of the cleft in this example arises from its interaction with the cleft question. Thus, we first need to understand the discourse effect of a cleft question before modeling the interaction of a cleft and a cleft question. I leave this for future research.

Finally, an important next step would be to determine the variables of the model by conducting a series of suitable experiments, that could be inspired by Westera and Rohde (2019). Once those values are approximated, the model makes testable predictions.

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