Of Trees and Birds

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On uninterpretable features

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One of my favorite topics over the last decade has been the functioning of Discourse Particles (DiPs) in grammar. According to a leading observation, DiPs are root phenomena. Why? The answer is as simple as it might be partially wrong: DiPs modify speech acts rather than propositions. And since speech acts are utterances that involve a speaker, an addressee, a communicative intention on the side of the speaker, and a common ground with the addressee as assumed by the speaker, the root clause has a privilege. This can be seen in question-dependent DiPs like German *denn* (lit. 'then') as in

(1) Wo   nistet **denn** der Steinschmätzer?
     where nests DENN the northern wheatear

     'Where does the northern wheatear nest after all?'

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(2) *Wer kam nicht auf den Ausflug mit, obwohl der
who came not on the excursion along although the
Trompetergimpel **denn** in Hermannswerder nistet?
Eurasian bullfinch DENN in Hermannswerder nests?

(3) *Wer weiß, wo die Knäkente **denn** nistet?
who knows where the garganey DENN nests

(1) is a question. In this question, the speaker asks the addressee where the northern wheatear nests with reference to some common ground between speaker and addressee that must have been established in previous discourse or can be assumed anyway. As indicated by the addition of *after all*, the particle *denn* is in a sense anaphoric to established relevant circumstances under which the question is asked. The adverbial clause in (2) clearly does not count as a question. If anything it may be an assertion which the speaker smuggles in by way of using the proposition that the Eurasian bullfinch nests in Hermannswerder. The clause is embedded in a question, but this fact does not act as a cure. The DiP is in an adjunct island from which there is no escape.[1]

The clause in which *denn* occurs in (3) isn't a question either. Formally, it looks like a question because it is initiated by a *wh*-word, but it isn't a question. The matrix predicate *know* determines that the complement is a factive clause for which the matrix clause subject's referent guarantees he/she can supply the list of places which make the open proposition $[\lambda x| \ x$ a place, the garganey nests in $x]$ true. Things change when the matrix predicate is a predicate that signals that there is a desire of the subject's referent to obtain knowledge from the addressee as to how the variable should be filled.

(4) Gisbert fragte, wo die Knäkente **denn** nistet.
Gisbert asked where the garganey DENN nests

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1. The DiP cannot be moved out of its clause. We can be close to sure that it can never move. According to Bayer (2012) and following work, it is a functional head and as such part of the clause's functional skeleton. As such, it is not a mobile part of speech and cannot be moved anywhere.

(5) Gisbert möchte wissen, wo   die Knäkente denn nistet.
    Gisbert wants   know   where the garganey DENN nests

As a shorthand, we can say that the embedded clause in (4) and (5) is semantically like an embedded speech act.[2]

So far so good. We start with a central observation that goes back to Bayer & Obenauer (2016), Bayer (2012) and Bayer et al. (2016). The observation is that embedded clauses which by no means count as questions, can nevertheless host Q-sensitive DiPs under the condition that a *wh*-element has been extracted from them. Consider (6) in contrast to (7).[3]

(6) Wo   glaubt Gisbert, dass der Trompetergimpel **denn**
    where believes Gisbert that the Eurasian bullfinch DENN

    nistet?
    nests

    'Where does Gisbert believe that the Eurasian bullfinch nests after all?'

(7) *Welcher Ornithologe glaubt, dass der Trompetergimpel
    which   ornithologist believes the the Eurasian bullfinch

    denn in Hermannswerder nistet?
    DENN in Hermannswerder nests

Syntactic theory has a convincing answer for this contrast: (7) is bad because the DiP is contained in an embedded clause that does not count as a question. In fact, it should be on a par with (2). However, (6) should be good and in fact IS good because *wo* originates in the embedded CP and moves to its ultimate position in the root clause only via an intermediate position in SpecCP.

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2. See Krifka (2014) and relevant references to previous work.

3. The deviation in (7) may strike some readers to be subtle but Bayer et al. (2016) have shown that it rests on empirically solid ground. Grammaticality judgments get sharper when *denn* is replaced by the clitic element *'n* as it arises in spoken language, s. Bayer (2017). Rather clear evidence also comes from the ambiguity of *schon* between its reading as a temporal adverb and a Q-dependent DiP that is typical in rhetorical questions, s. Bayer (2018).

(8) Wo glaubt Gisbert
   [$_{CP}$ ~~wo~~ dass der Trompetergimpel **denn** ~~wo~~ nistet]?

How does this contrast come about? In (8), the Q-dependet DiP *denn* appears to be licensed by the abstract intermediate occurrence of the *wh*-element and not by its matrix appearance. If the matrix appearance were relevant, (7) should be equally well-formed. In (7), the root clause hosts a *wh*-phrase by which it is interpreted as a question. But this dos not suffice. The *wh*-phrase originates in the matrix clause and has no touch with the embedded CP, i.e. the minimal domain in which the Q-dependent DiP can potentially reach an interpretation.

(9) *Welcher Ornithologe glaubt ~~welcher Ornithologe~~
   [$_{CP}$ dass der Trompetergimpel denn in Hermannswerder nistet]?[4]

Alright. The problem is, however, in which sense the CP in (6)/(8) should be an interrogative licenser. Its embedding verb is strictly incompatible with interrogativity as seen in the ill-formedness of *glauben wo der Steinschmätzer nistet* ('to believe where the northern wheatear nests'), *glauben ob der Wachtelkönig in Hermannswerder nistet* ('to believe whether the corn crake nests in Hermannswerder'). Nevertheless, precisely this seems to be required for a local license of the Q-DiP.

At first blush, the constellation looks paradoxical: On the one hand, the embedded CP in (6)/(8) must be an interrogative in order to license the DiP locally. On the other hand, due to the semantic properties of the matrix verb *believe* it cannot be an interrogative.

For syntacticians, it is intuitively rather clear where the solution to this paradoxical constellation must be searched for. The embedded CP in (6)/(8) is derivationally speaking an interrogative clause only in the step of *wh*-movement to SpecCP. After that, the interrogative interpretation vanishes and is transferred to the root-CP. The root's interpretation as an interrogative is crucial. Example (10) shows that without the *wh*-operator in the root clause, the DiP cannot be interpreted and the derivation breaks down.[5]

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4. See footnote 3 on the subtlety of this deviation.
5. The basis of (10) cannot be an embedded *wh*-CP with a somehow deleted *wh*-operator,

(10) *Gisbert glaubt [$_{CP}$ dass der Trompetergimpel **denn** in
Gisbert believes   that the Eurasian bullfinch DENN in
Hermannswerder nistet].
Hermannswerder nests

The paradoxon, I would like to argue, should be resolved with the concept of *uninterpretable feature*. Uninterpretable features were suggested in the Minimalist Program (s. Chomsky 2000: 123), as the driving force that makes a linguistic target of movemet "active". The target uF is "deactivated" and ultimately deleted by entering an agreement relation with an interpretable counterpart iF. Agreement is achieved either by visible movement (pre-spellout) or by invisible movement (post-spellout) which can also be seen as agreement without movement, so-called *probe-goal* agreement.[6] Adopting the feature sharing version of this theory as proposed by Pesetsky & Torrego (2007), feature interpretability and feature valuation/agreement are independent of each other. An interpretable (i) feature can be unvalued, signaled by empty square brackets [ ], and an uninterpretable (u) feature can be valued, signaled by some arbitrary number in square brackets, e.g. [**7**]. Assume now that the dependency of the Q-DiP *denn* on interrogative force is an agreement relation between a force-probe and a particle-goal. Intuitively, it is clear that the particle itself is not interrogative but rather modifies a certain interrogative meaning. Then, (1) works as shown in (11).

(11) a.   [$_{FORCEP}$ wo$_{iQ[\ ]}$ [nistet ... [$_{PRTP}$ **denn**$_{uQ[\ ]}$

                             [$_{vP}$ der Steinschmätzer]]]]

         $\Rightarrow$ AGREE $\Rightarrow$

   b.   [$_{FORCEP}$ wo$_{iQ[7]}$ [nistet ... [$_{PRTP}$ **denn**$_{uQ[7]}$

                             [$_{vP}$ der Steinschmätzer ...]]]]

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for example the element *warum* ('why'). The deletion would not be recoverable, and therefore the structure would not cease to violate semantic selection by the *believe* predicate.

6. As Koeneman & Zeijlstra (2017: 116) put it, "any clause in which some element carries an uninterpretable feature [uF] requires the presence of a matching interpretable feature [F]; otherwise the clause is ungrammatical".

Assuming the long-distance dependency in (8), the embedded CP provides the locally accessible probe for the Q-dependent DiP. Beyond this, however, the relevant fact is that the Q-force in CP must be uninterpretable. If it were interpretable, the CP would be a +*wh* CP, and this would disqualify it as a target of semantic selection by the *believe*-predicate *glauben*. Thus, the DiP's relevant probe must be Force $\mathbf{wo}_{uQ[\ ]}$. After agreement with the goal, the output is (12).

(12)   [$_{\text{FORCEP}}$ $\mathbf{wo}_{uQ[7]}$ dass [der Trompetergimpel [$_{\text{PRTP}}$ $\mathbf{denn}_{uQ[7]}$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ [$_{vP}$ . . . nistet]]]]

This CP, alias ForceP, is a proper semantic target for the attitude verb *glauben*. At first sight, this may look irritating, but it should not be irritating. Although the CP is typed as a *wh*-clause, this label does not do any harm to the semantics. Why not? The label lacks a Q-interpretation. The uninterpretable feature $uQ[7]$ in the specifier of ForceP cannot simply be deleted. It is needed for the local licensing of the DiP, and it must be accessible for continued probe-goal agreement in the next cycle.[7]
We can assume that the ABSENCE of such an interpretation is simply compatible with whatever label qualifies for semantic selection by the verb *glauben*.[8] As (8) shows, the derivation continues in such a way that the element $\mathbf{wo}_{uQ[7]}$ is only an intermediate link in a larger A-bar chain

(13) $\mathbf{Wo}_{uQ[7]}$ glaubt Gisbert [$_{\text{FORCEP}}$ $\mathbf{wo}_{uQ[7]}$ dass

$\qquad\qquad$ [der Trompetergimpel [$_{\text{PRTP}}$ $\mathbf{denn}_{uQ[7]}$ [$_{vP}$ . . . nistet]]]]

By virtue of the intermediate licenser, the Q-DiP can enter into a quasi local relation to the highest operator that has a proper illocutionary Q-interpretation. It is important that the Q-DiP is ultimately linked to a

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7. When the *v*P-cycle is reached, the edge of the CP-cycle must still be available. The timing of deletion is a complicated issue which I cannot touch here.

8. The usual answer is it must be assertive/declarative. I think this would be at best confusing. These labels are categories from the realm of speech acts. But the CP in question is not a speech act. As such, we can well say that the absence of an interpretable Q-feature yields a propositional default type which does not do any harm to semantic selection by *glauben*.

real Q-operator. As (3) shows, the pure presence of a *wh*-licenser is not sufficient. The *wh*-licenser must ultimately have interrogative force. Munsat (1986) argues that this is not the case in complements of *know*. According to Munsat, there are two complementizers, *Wh*-Q and *wh-that*. *Wh*-Q combines with an information-seeking predicate like *ask*, *wonder*, *want to know* etc. Examples (4) and (5) support this. The factive verb *know* combines with *wh-that* this does not suffice to license a Q-dependent DiP.[9] In Munsat's proposal, *believe* never embeds an interrogative complement and is therefore automatically −Q. Given what we have seen about the licensing of an embedded Q-DiP, we may be inclined to expand his feature system along the lines of *Wh*-Q versus *wh-that*. The complementizer of a *believe* verb can well be +*wh* as long as it is guaranteed that it is uninterpretable. To build on Munsat's proposal, we can suggest the following remodeling:[10]

(14)   a. ask   +Q, +*wh*
       b. know   −Q, ±*wh*
       c. believe   −Q, ±*wh*, if *wh* is uninterpretable

Examples like (8)/(13), in which the complement of *believe* hosts a Q-dependent DiP suggest that such a complement must – in some sense – be a *wh*-clause after all.

Syntactic skeptics may deny the existence of intermediate traces altogether. Others may be inclined to deny the relevance of the CP-cycle in long movement for theory-internal reasons.[11] If so, my proposal would

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9. Munsat does not write about German DiPs, but a relevant observation by him is that *wh-that* does not license NPIs either. One of his examples is **I know why anybody bothers to listen to him* in comparison with the Q-force based *Why does anybody bothers to listen to him?* NPIs and DiPs are both dependents, and their grammars overlap to some extent. It is a relevant research question how to predict their differences. Speaking of "verbs" and their selection may be misleading because selection may change if the verb enters semantic composition. Munsat (1986: 192) points this out with the verb *know* in combination with negation and interrogativity.

10. The feature *wh* must be understood as embracing the operator of polar and alternative questions etc. The distinction does not play a role in Munsat's system.

11. Den Dikken (2009) argues that *wh*-movement to SpecCP is always terminal and cannot be transient. Assuming that *v*P is a phase, den Dikken's proposal is that the *wh*-phrase passes through the *v*P-phase but not through the CP-phase. With this proposal,

certainly benefit from independent support in favor of (14c). Fortunately, there is such support. It comes from WH COPY MOVEMENT. In this construction, a word-size copy of the *wh*-element to be moved is visibly retained in SpecCP.[12]

(15) a. Wo glaubt Gisbert, wo der Wachtelkönig nistet?
    where believes Gisbert where the corn crake nests
    'Where does Gisbert believe that the corncrake nests?'

   b. Wo glaubt Gisbert, wo die Ornithologen meinen,
    where believes Gisbert where the ornithologists think

    wo der Wachtelkönig nistet?
    where the corn crake nests

Here, it can hardly be denied that the complement of the verbs *glauben* and *meinen* is formally a *wh*-CP. It is, of course, equally undeniable that in this case the *wh*-complement escapes semantic interpretation of *wh*. The semantic selection requirement of the *believe* predicate remains, of course, what it is. As before, *believe* rejects a semantically interpreted +*wh* CP. This is captured by (14c). Nevertheless, we are not surprised to see that the *wh* copy construction licenses an embedded Q-dependent DiP in exactly the same way as in the long movement construction.[13]

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the licensing of a Q-dependent DiP would need a completely new explanation. The reason is that DiPs rely on Force, and Force is located in C-projection and not in the *v*-projection.

12. So-called *partial movement* is superficially similar. I leave it aside not only for reasons of space but also because its has given rise to rather controversial analyses (see Fanselow 2006, 2017, Fanselow & Mahajan 2000). For differences between partial movement and copy movement, see Schippers (2010) and Pankau (2013). Copy movement resembles conventional cyclic movement more than partial movement does. Thanks to Andreas Pankau (p.c.) for some clarification with respect to copy movement.

13. A tiny but nevertheless interesting difference is that the overt complementizer *dass* prefers to be missing here. There is an explanation, but for reasons of space, I have to refer the interested readers to Bayer & Brandner (2008), Bayer (2014) and Bayer (2015).

(16) a. Wo   glaubt   Gisbert, wo   der Wachtelkönig **denn**
where believes Gisbert where the corn crake   DENN

nistet?
nests

b. Wo   glaubt   Gisbert, wo   die Ornithologen meinen,
where believes Gisbert where the ornithologists think

wo   der Wachtekönig **denn** nistet?
where the corn crake   DENN nests

c. Wo   glaubt   Gisbert, wo   die Ornithologen **denn**
where believes Gisbert where the ornithologists DENN

meinen, wo   der Wachtelkönig nistet?
think   where the corn crake   nests

The examples show that the Q-DiP can be licensed anywhere along the copy path. Although, the embedded CP is formally a *wh*-clause and can locally license the Q-DiP via probe-goal agreement, it can do this only on the basis of the uninterpretable *wh*-feature, a formal features that does no harm to the CP's semantic interpretation.

Beyond the observations about uninterpretable features above and agreement in a narrow sense, let me add that grammar is full of stuff that is uninterpretable in systematic ways. In my view, this points to a primacy of form over meaning, see Koster (1988) and Bayer (2017). Mainstream minimalism assumes that uninterpretable material is deleted on the way to the CI-interface. Occasionally it is unclear what that means exactly. A slightly different view may see uninterpretable material as staying because it does not do any harm.

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