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1. Functions of German *denn*

The German word *denn* derives from Old High German *thanne* ('then') (cf. Abraham 1991, Wauchope 1991, Wegener 2002). According to Abraham (1991), it was first a local adverb which later on could also serve as a temporal adverb. Afterwards it acquired the more abstract function of marking a causal antecedent (*post hoc, ergo propter hoc*). This reduction to a higher level of abstraction is iconically related to the weakening of the vowel /a/ to /e/, phonetically corresponding to [ɛ] or even [ə]. *Dann* as a temporal adverb as well as *denn* as a clause linker for a logical antecedent¹ in the sense of *because* are still part of contemporary German. The point of interest for the present purpose is that already in Old High German *denn* had developed also into a discourse particle (DiP) that is confined to questions, polar as well as *wh*-questions.²

- (1) a. Hast du denn Zwiebeln gekauft?
have you DENN onions bought
'Did you happen to have bought onions?'

* Comments by Yvonne Viesel, Clemens Mayr and Edwin Williams as well as by an anonymous reviewer were very helpful. Thanks to a large number of fellow linguists who provided judgements that greatly enhanced my confidence in the present story, and to Marc Meisezahl for technical help. This work was supported by DFG-grant BA 1178/9-1. It is devoted to Martin Prinzhorn, without whose work the world would have missed some of its finest linguistics.

- (i) Karl kam nicht zu der Versammlung denn er hatte Zahnschmerzen
Karl came not to the meeting because he had tooth.pain

²For many speakers, (1c) is out, but not for all. We will return to this fact which gains importance in the present contribution.

- b. Wer hat denn Zwiebeln gekauft?
 who has DENN onions bought
 ‘Who bought onions? (I’m wondering)’
- c. *Gerlinde hat denn Zwiebeln gekauft.
 Gerlinde has DENN onions bought

The DiP’s semantic contribution to questions is a rather vague contextualization that links the interrogative meaning to some common ground shared (or believed to be shared) by the speaker and the interlocutor. This was already seen by Otto Behaghel, see Behaghel 1928: 115, who provides for the disapproval question *Wo bleibst du denn so lange?* (‘where stay you DENN so long?’) the paraphrase “Unter den **so benannten Umständen** (emphasis, JB) solltest du längst da sein“ (‘Under such and such circumstances, you should long be back’). The DiP *denn* shares with other *d*-words the property of being a deictic expression. Thus, (1a) is close to ‘Did you buy onions under these circumstances (that I, the speaker, assume are known to both of us)?’, and (1b) is close to ‘Who under these circumstances (that ... are known to both of us) bought onions?’ with possible further interpretations of various sorts such as ‘Who {on earth / the hell / to my surprise} bought onions?’ What is informally referred to as ‘these circumstances’ is supposed to be known to the addressee as part of the common ground, a fact that explains why *denn* is not felicitous in true out-of-the-blue questions, see König 1977.

Denn is fine in polar and constituent questions but – for many speakers including myself – must not be used in assertives as in (1c). Why is this so? Perhaps the grammaticalization of *denn* has developed asymmetrically. Its more progressive development took place in the syntax of questions but not in the syntax of assertives. Such clause-type dependent diachronic developments occur frequently.

In spoken German, *denn* as a DiP, but not in its other functions, can undergo reduction to a clitic. This enclitic element, *-dn* or *-n*, and its syntactic role has been described by Grosz (2005), Weiß (2002), Bayer (2012) and others. Weiß (2002) and Bayer (2010, 2012, 2013) claim that in Bavarian, *-n* has become obligatory in genuine *wh*-questions but remains optional in polar questions.³ Once it is obligatory, it stops making a semantic contribution to sentence meaning and shifts toward a pure question marker.

(2) *Bavarian*

- a. Wo wohnst-n du?
 Where live-N you
 ‘Where do you live?’
- b. ??Wo wohnst du?

³See Lehmann 2002: 124 for the process of “obligatorification”. Hack (2009) finds in her study of Rhetoromance questions close particle correspondences between Bavarian *-n* and *pa* (derived from Latin *post*) in Northern Italian dialects; *pa* is obligatory in *wh*-questions in Badiot, Marèo and in Gherdëina, with a concomitant loss of its original meaning. In Gherdëina, the grammaticalization of *pa* is more advanced than in the other dialects. Here *pa* is obligatory in *all* questions, i.e. also in polar questions. Pankau (2017) identifies, on the basis of dialect grammars, Thuringian *enn* as an obligatory question particle in both *wh*- and polar questions.

(2a) lacks the contextualization effect noted above. Clear evidence for this is that *-n* is (i) obligatory and (ii) semantically empty. Thus in Bavarian, *-n* may also occur in out-of-the-blue-questions. (2b) is more or less ungrammatical, unless the question is used in special functions such as echo questions, which are arguably not “real” questions. Bayer (2010) identifies the Bavarian clitic *-n* as a *wh*-agreement marker. This would explain why Bavarian shows the phenomenon of *wh*-drop. For details see Bayer 2010, 2012, 2013.

Let me emphasize that the present article excludes these special properties of clitic *denn* in Bavarian. What we are dealing with here is the optional and semantically stable clitic form *-n* that occurs in run-of-the-mill colloquial German.

Confusions often arise from the fact that there are speakers of German for whom *denn* is still an adverb close to the temporal adverb *dann* but with a tendency towards *schließlich* (‘finally’ ‘consequentially’).⁴ The language of these speakers is usually of a northern variety. For them, *denn* can appear also in assertives. Here are some examples.⁵

- (3) und **dann** bin ich noch mal reingegangen und diese stellen
 and then am I yet once returned and these parts
 wurden knallrot, sonnenbrand und nach ein paar tagen
 became flaming.red sun.burn and after a few days
 ging es weg das rote und die flecken blieben
 went it away the red.one and the spots remained
 sehr weiss bin sofort zum dermatologen gegangen und
 very white am immediately to.the dermatologist gone and
 er hat **denn** die weißfleckenkrankheit diagnostiziert.
 he has DENN the white.spot.illness diagnosed
 ‘... and then finally he diagnosed vitiligo.’
<http://www.hautarztzentrum-kiel.de/dermatologie/vitiligo/>
 27-04-2017

- (4) als er **denn** endlich Kenntnis erlangte.
 once he DENN finally knowledge obtained
 ‘... once he was finally informed.’
<https://www.welt.de/politik/deutschland/article118444403/Projekt-Ruecktritt-Wann-muss-ein-Minister-gehen.html>

- (5) So, ich bin **denn** mal weg.
 Ok I am DENN once away
 ‘Ok, I’m gone for a while.’
<http://www.ariva.de/forum/so-ich-bin-denn-mal-weg-300763>
 27-04-2017

⁴See also the use of *denn* in conditional clauses studied in Csipak & Zobel 2015.

⁵(3) is quite revealing because it shows that the writer has command over both *dann* and *denn*; this confirms to the suspicion that there is a subtle albeit real semantic difference between the two.

- (6) Im Frühjahr, als er **denn** endlich fand, dass er gar nichts ...
 in.the spring when he DENN finally found that he at.all nothing
 ‘In spring, as he finally realized the he could not ... anything ...’
 G. Willard (1852), Die Geschichte der Vereinigten Staaten von Nordamerika.
- (7) Nachdem ihr **denn** die Voraussetzungen für die Trophäe
 after you DENN the prerequisites for the trophy
 oder den Erfolg erfüllt habt, ...
 or the success fulfilled have
 ‘After you have finally fulfilled the prerequisites ...’
<http://www.easyguide.de/xbox360/red-deadredemption/guides/komplettloesung/111/>
 27-04-2017

We will shortly return to this role of *denn*. Before doing so, however, we will discuss the role of *denn* as a Q(uestion)-sensitive discourse particle.

2. *Denn* as a question sensitive discourse particle

In its function as a Q-sensitive DiP, *denn* appears naturally in root-clauses, i.e. in genuine utterances. In theories of clause structure that opt for a syntactization of illocutionary force, the highest CP-layer contains information about clause type and illocutionary force. Assuming that this layer licenses the DiP, it has been proposed by Bayer & Obenauer (2011) that Force probes a clause-type related feature of the DiP and thus integrates the DiP semantically into the expression of illocutionary force. The result is that the basic semantic function of a *wh*-question can, in addition to *denn*, be systematically modified by application of different Q-sensitive DiPs such as *nur* (lit. ‘only’), *schon* (lit. ‘already’) and *wohl* (lit. ‘well’). They trigger an elaborate fine-tuning of the *wh*-question.

A challenge is that *denn* can arise in embedded clauses which are clearly not interrogative.

- (8) Welches Bild glaubst du dass er denn von mir haben könnte?
 which picture believe you that he denn of me have could
 ‘Which picture/impression do you believe he could have of me?’
http://www.marsvenus.de/search.php?search_author=Lola&sid=0fe369faf60ccfd8c76eee167638b51f
 17-11-2011

The example is interrogative but the clause in which *denn* appears is not. If it were, it would be incompatible with the verb *glauben*. One conclusion could be that the DiP can be licensed unboundedly. As Bayer & Obenauer (2011) have argued, this conclusion is likely to be unwarranted. The problem is the status of constructed examples like (9). It is also telling that such examples have so far not been found in corpora.

- (9) (*)Welche Leute glauben, dass er denn ein falsches
 which people believe that he DENN a wrong
 Bild von mir haben könnte?
 image of me have could
 ‘Which people believe that he could have a wrong impression of me?’

The reason could be that they are ungrammatical. But if they are, their ill-formedness is subtle. In my early stages of this research, I frequently came across speakers who claimed that questions of type (9) were fine. Bayer et al. (2016) present an experimental investigation, their experiment I, that demonstrates a significant difference between examples of type (8) and of type (9). The explanation follows from the theory of cyclic *wh*-movement by which the *wh*-phrase in (8) moves first to the left edge of the *dass*-clause before it moves on to the matrix clause.⁶ In this case, the intermediate copy of the *wh*-phrase can act as the local licenser of the Q-sensitive DiP in the embedded clause. This local licenser connects to the force layer of the root clause by virtue of the A-bar chain formed with the *wh*-phrase terminating in the root clause. In (9), this is not possible because the *wh*-phrase has been moved from the matrix clause and not at all from the embedded clause. Thus, the DiP in the embedded clause remains without a local licenser. But if the explanation is as straightforward as this, why should the difference between type (8) and type (9) be so “subtle” that it requires an elaborate Magnitude Estimation (ME) investigation? One reason could be that the speaker/hearer resorts to the independent adverbial interpretation of *denn* that is distinct from a Q-sensitive DiP as shown in (3) through (7) of the last section. Even if a speaker does not use the northern variety of German, his/her competence may still embrace the possibility of the more liberal interpretation of *denn*.⁷ In this case, (9) could have a completely different syntactic analysis with *denn* being interpreted as the adverb we saw in the examples in (3) through (7). The occurrence of *denn* in the embedded clause would then have no relevance for the composition of the interrogative meaning at all. The following section will show how the interpretation can be narrowed down to the intended DiP-reading in a more efficient way.

⁶For structural representations of these two cases see (17) below.

⁷German has more Q-sensitive DiPs than *denn*. Bayer et al. (2016, 2.2.3) show that the interpretation of the ambiguous particles *schon* and *nur* varies systematically with long versus short *wh*-movement. This suggests that the interpretational subtlety connected with *denn* could be rooted in this particular lexical item.

3. *Denn* as a clitic⁸

As we have already indicated in section 1, *denn* may in the spoken language undergo reduction to the allegro form *-dn* with the deletion of the vowel or to the genuine clitic form *-n* that is found in Bavarian and adopts extra properties there (see Bayer 2010, 2012, 2013). The following examples are visibly not from Bavarian speakers. Throughout, *-n* is semantically the same as the standard German non-clitic DiP *denn*.

- (10) Wieso is'n das eigentlich so'n Drama?
 why is-N this actually such-a drama
 'Why is this actually such an affair?'
<https://forum.golem.de/read.php?28013,1469050>
 01-05-2017
- (11) Wann kommt'n nochma n Freetrack, Du kleiner Sittenstrolch?
 when comes-N again a freetrack you little molester
 'When will there be another freetrack, you little molester?'
<https://www.facebook.com/kollegah/posts/653617284678075>
 01-05-2017
- (12) Schahatz? wo hast'n dit LSD hinjepackt?
 treasure where have.2SG-N this LSD away.packed
 'Honey, where did you store away this LSD?'
<https://www.mixcloud.com/HousePirat/schahatz-wo-hast-n-dit-lsd-hinjepackt/>

In sharp contrast to the DiP *denn*, the adverbs *dann* and *denn* do not undergo reduction/cliticization.

- (13) Er is dann/*-n bergsteigen gegangen.
 he is then -N hiking gone
 'Then he went hiking.'

⁸There is an old debate about the syntactic status of particles as XPs or heads. Zwicky (1985) argues from the side of morphology that there is universally no category "particle", and that what has been called "particles" in German are adverbial words and never clitics. Grosz (2005) partially follows this line but takes the Viennese reduced form *dn* to be a phonological or prosodic clitic that is like the full form *denn* but nevertheless undergoes some movement to the left. I have argued against this view in various places giving arguments in favor of the head status of particles and the possibility that some of them may turn into clitics; *denn* is the prime candidate in this respect. In Bayer 2010, 2012, 2013, I have argued that in Bavarian *-n* may even turn into an agreement marker. A theory that takes DiPs to be adverbs, i.e. XPs, can hardly explain its grammaticalization path. Zwicky's counterargument is that German DiPs can be accented. However, this argument misses the important point that DiPs are historically derived from sources which usually coexist with their innovative off-spring. The most familiar example is *ja* as in *dass du JA deine Hausaufgabe machst!* ('Watch out that you do your homework!'). Here *ja* equals the adverbial "at any rate". A parallel alternation can be found with the element *doch*, the accented version of which is clearly adversative and is by all means distributed like a phrasal constituent. In their function as DiPs, these elements have a far more abstract meaning and are never accented. Thus, invoking accentuation is likely to lead to a wrong generalization about DiPs.

Since *-n* is sharply excluded as a clitic form of non-interrogative *denn* (or *dann*), one can be sure that the clitic form *-n* is unambiguously a representative of *denn* in its reading as a Q-sensitive DiP. Confusion with *denn* as an adverb similar to *dann* can be safely excluded. The next section will show what this insight can gain us for the study of DiPs in the dependent clause.

4. A mini-replication of Bayer, Häussler & Bader 2016

In Bayer et al. 2016, 97 students served as experimental subjects to judge questions with the DiP *denn* in the embedded clause under the conditions of long versus short *wh*-movement. The method was ME, see Bard, Robertson & Sorace 1996. The result of their Experiment 1 was a statistically significant difference between long and short extraction as previously exemplified by (8) and (9).⁹ Although there is the widely known stylistic disadvantage of long *wh*-movement, the values for short *wh*-movement were significantly worse than those for long *wh*-movement. Let us now see how the clitic form *-n* fares in the relevant test sentences.

- (14) Wo meinst du, dass'n dein Nachbar so viel Geld her hat?
 where think you that-N your neighbour so much money from has
 ‘Where do you think that your neighbour has so much money from?’
- (15) *Wer meint, dass'n dein Nachbar so viel Geld hat?
 who thinks that-N your neighbor so much money has
 ‘Who thinks that your neighbour has so much money?’

The judgments are built on responses from 50 native speaker linguists who were asked whether they detect a grammaticality difference between (14) and (15). The result is seen in (16).

(16) *Judgments of 50 subjects (raw scores)*

(14) better than (15)	(15) better than (14)	no difference
44	1	5

⁹Their Experiment 2 avoids the difficulty that some German speakers have with long-extraction by using so-called “partial movement”. In this version, (8) comes out as (i).

- (i) Was glaubst du welches Bild er den von mir haben könnte?
 what believe you which picture he DENN of me have could
 ‘Which picture/impression do you believe he could have of me?’

The semantic effect is very close to the version with literal long movement, and the licitness of *denn* was equally proven in this case.

The result is clear enough. For those speakers who find (14) and (15) equally deviant, the explanation is that they do not tolerate *-n* in the embedded clause at all.

For them, *-n* can only appear in the matrix clause (*Wo meinst'n du, dass ...? Wer meint'n, dass ...?*). This is, of course, the unmarked case. It does not need to be debated here. Thus, these speakers do not count here because they show a ceiling effect. Importantly, only one speaker preferred (15) over (14). As I found out after asking him, for him the ban on long-distance extraction was obviously ranked far higher than any other constraint. The placement of *-n* was in this case too weak a signal to play any role.

The result is noteworthy because speakers are unlikely to have directly experienced constructions like (14). In fact, various speakers – all linguists – expressed their surprise about the relative well-formedness of the example. We can conclude that the contrast is real, and that most speakers have robust intuitions about it in the absence of conscious experience. Here are the standard syntactic representations of these examples:

- (17) a. *Wo meinst du* [_{CP} ~~*wo*~~ *dass'n dein Nachbar* ~~*wo*~~ *so viel Geld her hat*]?
 b. *Wer meint* ~~*wer*~~ [_{CP} *dass'n dein Nachbar so viel Geld hat*]?

The (relative) acceptability of *-n* in the dependent CP is obviously related to the fact that a *wh*-item has been moved out of the CP in which it was a clause-mate of *-n*. According to standard assumptions in generative syntax, the *wh*-element moves cyclically via the left edge (“*wh*-specifier”) of the CP-phase. No representation of the *wh*-phrase appears in the dependent CP of (17b). The *wh*-phrase is the subject of the matrix-clause. Thus, the *dass*-CP is non-interrogative throughout the derivation, and *-n* remains without a local licenser. Bayer & Obenauer (2011) as well as Bayer, Häussler & Bader (2016) argue that the Q-sensitive DiP must be probed by a feature of interrogativity in its minimal phase, which, given that the DiP is outside *v*P, must be CP. (17b) evades this restriction. The feature of interrogativity is too far away from *-n* to probe its corresponding feature. But how can (17a) succeed? The *dass*-CP is equally non-interrogative. If it were interrogative, it would clash with the selecting matrix predicate *meinen* (‘to be of the opinion’): **Du meinst* [_{CP} *wo (dass) dein Nachbar* ~~*wo*~~ *so viel Geld her hat*]. Nevertheless, the licensing of *-n* must come from the intermediate position that the *wh*-element *wo* has passed through according to standard assumptions and much independent evidence. As contradictory as it may look at first sight, the answer must be that the *dass*-CP is in a technical sense a *wh*-CP, albeit one whose *wh*-copy is uninterpretable. As Bayer & Obenauer (2011) and Bayer et al. (2016) argue, following Pesetsky & Torrego (2007), agreement must be disconnected from interpretability. If so, the *wh*-item *wo* can type the dependent CP as *+wh*, and the related uninterpretable clause type feature can probe the equally uninterpretable interrogative sub-feature inherent in the clitic *-n* (or the DiP *denn*). This local licensing is established in the derivation before the *wh*-item moves on to its ultimate landing site where it is interpretable (or in other words related to an interpretable *wh*-feature). The Q-sensitive DiP, here *-n*, is properly connected in the resulting *wh*-chain.

The technical details of the formal licensing of the DiP by means of probe-goal agreement cannot be presented here in more detail; they may, however, be looked up in Bayer, Häussler & Bader 2016. The important point is that the clitic version of *denn* offers a new look at the data on the distribution of the DiP *denn* in complex questions that

have been detected some years ago. Even a pilot experiment as the one presented here seems to be sufficient to convince us that experiment 1 of Bayer, Häussler & Bader 2016 can be replicated when we use the clitic *-n* instead of the full form *denn*. As we have seen, the full form *denn* has an adverbial competitor that is more or less neutral with respect to clause type and certainly neutral with respect to the root/non-root distinction. In addition, it cannot always be excluded that even speakers who do not use *denn* as an adverb have access to related grammars in which *denn* can be an adverb of this kind. With the clitic version *-n* that occurs in spoken German, we have found a way to exclude this artifact.

It would be a bit harder to replicate Bayer, Häussler & Bader's experiment 2, i.e. the one which is built on partial movement. Since *-n* can cliticize only to a functional head like *dass*, a genuine *wh*-phrase is not a proper host category. (8) would come out as (18), which is to my ears impossible.

- (18) *Was glaubst du [was für ein Bild'n der von mir haben könnte]?
 what believe you what for a picture-N he of me have could

Notice, however, that the deviance of this example comes from the morphosyntax of cliticization and has nothing to do with the semantic licensing of *-n*. This can be seen when we are allowed to resort to so-called “doubly filled COMP” as it is known from Bavarian. In Bavarian, there is the option of using *dass* in addition to the *wh*-phrase. Insertion of *dass* removes the morphosyntactic problem, and the example of partial movement returns to well-formedness.¹⁰

- (19) Was glaubst du [was für ein Bild [dass'n der
 what believe you what for a picture that-N he
 von mir haben könnte]]?
 of me have could

This shows that the option of the licensing of *-n* exists also under so-called partial movement, and it also shows that *-n* is a genuine clitic. As such, it can only cliticize to a functional head such as the complementizer but not to a phrase such as the *wh*-phrase *welches Bild*.

5. Conclusion

We started the current investigation with a recapitulation of the syntax and semantics of the German discourse particle *denn* as it occurs in questions. Bayer & Obenauer (2011), Bayer (2012), Bayer, Häussler & Bader (2016) and related work could demonstrate that *denn* as a Q-sensitive DiP can occur in embedded non-interrogative CPs under the condition that this CP hosts a local licenser which acts as a local probe of the DiP. This is the case in trans-clausal *wh*-movement. A potential problem of the data in the work mentioned could be that for certain groups of speakers the lexical item *denn* may also be used

¹⁰Clemens Mayr (p.c.) prefers (18) over (19). I suspect his idiolect excludes doubly filled comp and allows *-n* as a non-clitic allegro form.

as an adverb in non-interrogatives. It cannot be excluded that this possibility contaminates grammaticality judgements. As we were able to show here, there is a simple trick to escape such potential contamination: the clitic version of *denn*, 'n, as it occurs in quasi all varieties of colloquial spoken German is unambiguously derived from the Q-sensitive DiP *denn* and cannot at all be confused with the adverbial *denn*. Clitic versions of adverbial *denn* and likewise *dann* are thoroughly ungrammatical. It could be shown that native speakers have robust intuitions about the occurrence of the clitic 'n in embedded CPs. Although 'n is always a marked option in such a context (in comparison with its occurrence in root-questions), 'n is acceptable under the condition of trans-clausal *wh*-movement whereas it is consistently unacceptable in *wh*-questions whose *wh*-phrase originates in the root-clause.¹¹ We can conclude that the present results replicate those of Bayer, Häussler & Bader 2016 and strengthen their conclusion that *denn* in embedded clauses is novel evidence for cyclic *wh*-movement via SpecCP.

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¹¹It goes without saying that the clitic 'n would also be out in all other non-interrogatives. We show this with versions in (i). Since 'n cannot be interpreted here as the clitic version of the accusative pronoun *ihn* ('him'), these versions are unavailable and not even comprehensible:

- (i)
- a. *und er hat'n die weißfleckenkrankheit diagnostiziert.
 - b. *als er'n endlich Kenntnis erlangte.
 - c. *So, ich bin'n mal weg.
 - d. *Im Frühjahr, als er'n endlich fand, daß er gar nichts ...
 - e. *Nachdem ihr'n die Voraussetzungen für die Trophäe oder den Erfolg erfüllt habt, ...

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