

The precondition particle: A unified analysis of German *denn*

CSSP 2017, Paris
November 23, 2017

Nadine Theiler (University of Amsterdam)

nadine.theiler@uva.nl

I Introduction

- German discourse particles have received a lot of attention in the literature (for an overview see, e.g., [Zimmermann, 2011](#)).
- But with few exceptions ([Rojas-Esponda, 2014](#); [Csipak and Zobel, 2014](#); [Gutzmann, 2015](#)), the formal semantic literature has focused those particles that occur in **declarative sentences**.
- These particles are commonly treated as indicating something about the **status of the information** conveyed by the declarative ([McCready, 2012](#)).
- **A prominent example:** by using the particle *ja* in a sentence with truth-conditional content *p*, the speaker indicates that *p* is either common knowledge of speaker and hearer or is verifiable on the spot ([Kratzer, 2004](#)).
- This perspective doesn't straightforwardly extend to particles that appear, either predominantly or exclusively, in **interrogative clauses**, since questions don't primarily convey information.
- *Denn* is one such particle. It is licensed in **polar interrogatives** like (1) and in ***wh*-interrogatives** like (2) ([König, 1977](#); [Thurmair, 1989](#)):

(1) a. Kann Tim denn schwimmen?
Does Tim DENN know how to swim?

b. Ist dir denn gar nicht kalt?
Are you DENN not cold at all?

(2) a. Warum lachst du denn?
Why are you DENN laughing?

b. Wie schaltet man dieses Ding denn aus?
How do I DENN switch off this thing?

- Moreover, *denn* can appear in a **conditional antecedent**, preferably if the antecedent comes after the consequent and certain other conditions are met ([Brauß, 1994](#); [Csipak and Zobel, 2016](#)):

(3) a. Kritik ist willkommen, wenn sie denn konstruktiv ist.
Criticism is welcome if it DENN is constructive.

b. Die Veranstaltung zeigte, dass Literatur politisch sein kann, wenn sie das denn will.
The event has shown that literature can be political if it DENN wants to be.

- I will try to account for these uses of *denn* in a **unified way**.

Outline

§2–4 *denn* in questions (polar questions, *wh*-questions)

§5 *denn* in conditional antecedents

2 *denn* in questions

2.1 Previous work

- There is **little agreement**, either in the descriptive or in the formal literature, about what exactly *denn* contributes to the meaning of a question.
- A common assumption, however, seems to be that the contribution of *denn* is so **bleached out** that it is licensed in virtually **any information-seeking question** (e.g., [Thurmair, 1991](#); [Bayer, 2012](#); [Csipak and Zobel, 2014](#)).
- But this is not what we find! There *are* in fact infelicitous uses of *denn*.

2.2 Data: infelicitous uses of *denn*

2.2.1 König (1977)

- As already observed by [König \(1977\)](#), if *A* wakes *B* in the middle of the night, it is **infelicitous** for *A* to follow this up by asking (4).

(4) [A wakes B in the middle of the night.]

A: Wie spät ist es (#denn)?

A: *What is the time* (#DENN)?

- By contrast, it is **felicitous** here for *B* to react to being woken up by asking (4) ([König, 1977](#)).
- König takes (4) to show that *denn* cannot appear in a totally **out-of-the-blue context**.
- However, the described scenario is **not** a totally out-of-the-blue context. Rather, the **waking action** has taken place prior to the utterance of (4), and we can consider this waking action a **discourse move**.

2.2.2 Sensitivity to highlighted content

- A clearly non-discourse-initial, information-seeking polar question that **doesn't license** *denn*:

(5) [Peter is very fond of Sophie but not so fond of parties: usually, he only goes to a party if she goes as well. Peter's feelings aren't returned by Sophie, though. So, she won't go to a party just because Peter is there. All of this is commonly known. *A* and *B* are talking at a party, wondering which of their friends are there.]

A: *Sophie is over there!*

B: Ist (#denn) Peter auch hier?

B: *Is* (#DENN) *Peter also here?*

- Also note that if the **roles were reversed** (if Sophie was very fond of Peter), *denn* would be **acceptable** in (5).
- **NB:** In contrast, using *dann* 'then' instead of *denn* is **acceptable** here, just as it would be in English (for an account of English *then*, see [Biezma, 2014](#)):

(6) B: Ist dann Peter auch hier?

B: *Is Peter also here, then?/So, is Peter also here?*

Preview of the account I will give below:

- *denn* is sensitive not only to the question as a whole, but to the proposition that gets highlighted by the question (pace Csipak and Zobel, 2014).¹
- Here: the proposition p that Peter is at the party.
- By using *denn* in (5), B conveys that she needs p confirmed before she can “make sense of” the fact that Sophie is there.
- However, Sophie’s going to parties doesn’t depend on p . So, it’s not clear why B would need p confirmed to make sense of Sophie’s being at the party.
- Therefore, the *denn*-question in (5) is infelicitous.
- On the other hand, if the roles were reversed, Peter’s presence would be a precondition for Sophie’s presence.

- It is easy to find more examples in which *denn* is infelicitous because the highlighted proposition does not stand in a precondition relation to some piece of contextual information:

- (7) [A really likes ice skating, and B knows this. A and B are walking together by a lake that usually doesn’t freeze. A notices the lake is frozen.]
- a. A : Schau mal! War es denn diesen Winter kälter als normalerweise?
 A : Look! Was this winter *DENN* colder than usual?
 - b. A : Schau mal! Sollen wir (#denn) Schlittschuh laufen gehen?
 A : Look! Shall we (#DENN) go ice skating?

3 Proposal

- We have now seen how *denn* behaves in polar questions. Let us use these observations to formulate a felicity condition for *denn*. Afterwards we will see how this condition holds up for other sentence types, i.e., *wh*-questions and conditional clauses.

3.1 Auxiliary notions

3.1.1 Highlighting

- The notion of highlighting is used to capture the semantic objects that a sentence makes salient (see Roelofsen and Farkas 2015). For example:

- (8)
- | | | | |
|----|-----------------------|---|------------------|
| a. | Ann watched Psycho. | $\rightsquigarrow \lambda w.W(p)(a)(w)$ | o-place property |
| b. | Did Ann watch Psycho? | $\rightsquigarrow \lambda w.W(p)(a)(w)$ | o-place property |
| c. | What did Ann watch? | $\rightsquigarrow \lambda x.\lambda w.W(x)(a)(w)$ | 1-place property |
| d. | Who watched what? | $\rightsquigarrow \lambda y.\lambda x.\lambda w.W(x)(y)(w)$ | 2-place property |

- To generalize over these different cases, we view propositions as o-place properties. A sentence then highlights an n -place property, where $n \geq 0$ is the number of *wh*-elements in the sentence.

3.1.2 Discourse events

- Essentially, the notion of a discourse event gives us a wider notion of a discourse move.

¹I use the term *highlighting* in the sense of Roelofsen and Farkas (2015). It will be defined in Sec. 3.1

²That *denn* establishes a “necessary precondition” relationship has also been suggested by Csipak and Zobel (2016), but only for conditional *denn*, not for *denn* in questions, and without exploring the predictions that this approach makes.

- A discourse event can be an **utterance**, i.e. an assertion, question or imperative, or any **other event** through which a piece of contextual evidence becomes salient (e.g., a interlocutor pointing at an object, thereby making it salient; or a bus driving by, thereby becoming salient).

3.1.3 Proceeding in discourse

- Intuitively, for A to **proceed in discourse** is for A to act in line with:
 - (a) what the **previous discourse event** has indicated would be a preferred action, or
 - (b) with the **plans** that A is publicly entertaining.
- For instance:
 - if the previous discourse event E was an **imperative**, A has to accept this imperative and carry out the given instructions;
 - if E was an **assertion** or the presentation of **contextual evidence**, A has to accept both E and the new information;
 - if E was a **question**, A has to accept this question and answer it; and
 - if A announces or otherwise indicates that she wants to **perform some action**, then, to proceed in the above sense, she has to actually perform this action.
- In all the above cases, *accepting* information goes **beyond a mere belief update**: it also includes **integrating** the new information with existing beliefs, ideally even being able to **explain** the new information.

3.2 A felicity condition for *denn*

It is felicitous for a speaker c_S to use *denn* in a sentence with highlighted property f iff c_S considers learning an instantiation of f a necessary precondition for herself to proceed in the discourse.

- This condition allows f to be one of several things. For example:
 - a precondition that is based on **world knowledge**:
 - (9) *A: Anton signed up for a ballroom dancing course.*
B: Hat er denn Rhythmusgefühl?
B: Does he DENN have a sense of rhythm?
 - a **presupposition** of the previous assertion:
 - (10) *A: I can't see Peter's car anywhere.*
B: Hat Peter denn ein Auto?
B: Does Peter DENN have a car?
 - a piece of information that is missing in order to even **interpret** the previous utterance:
 - (11) [*A and B know two Anna's, one from Hamburg and one from Munich.*]
A: Earlier today, Anna called!
B: Welche Anna meinst du denn?
B: Which Anna do you DENN mean?
 - a piece of information that is missing in order to **carry out the given instructions**:
 - (12) *A: When you next go to the supermarket, could you get me some biscuits?*
B: Ja, klar. Was für Kekse möchtest du denn?
B: Yeah, sure. What kind of biscuits do you DENN want?

4 Predictions

4.1 Predictions for polar questions

4.1.1 Basic predictions

For polar questions, the highlighted property f is a \circ -place property, i.e., a proposition. Learning an instantiation of this proposition thus amounts to **learning the proposition itself**.

- For example, in (13), f is the proposition that the door is open. B is conveying that she first has to learn that the door is open before she can follow A 's instruction to go ahead.

(13) *A: You go ahead! I'm coming in a minute.*
B: Ist die Tür denn offen?
B: Is the door DENN open?

4.1.2 Further predictions: disjunctions and conjunctions of questions

A further prediction: *denn* not is acceptable in **disjoined** questions.

(14) *A: Did you hear? Sarah is going on a world trip next week!*
B: #Hat sie denn im Lotto gewonnen oder hat sie denn reich geerbt?
B: #Has she DENN won the lottery or has she DENN come into a big inheritance?

- *denn* marks learning f as **necessary** for the speaker to proceed.
- But by **disjoining** two questions with highlighted propositions f_1 and f_2 , a speaker signals that **answering either** of them is **sufficient**.
- If answering either question is sufficient, though, this means that neither learning f_1 nor learning f_2 can be **necessary**. So, the felicity condition of *denn* cannot be satisfied.
- What is predicted to be acceptable on the other hand:

- just one of the *denn*-marked disjuncts **individually**:

(15) *B: Hat sie denn im Lotto gewonnen?*
B: Has she DENN won the lottery?

- *denn* in **conjoined** questions (as there can of course be **several necessary preconditions**):

(16) *B: Hat sie denn schon eine Route geplant und hat sie die Flüge denn schon gebucht?*
B: Has she DENN planned the route yet and has she DENN booked the flights yet?

4.1.3 Disjunctive polar questions and alternative questions

We find that *denn* can appear both in **disjunctive polar questions** (final-rise intonation), and in **alternative questions** (falling intonation on final disjunct).

(17) *B: Hat sie denn im Lotto gewonnen oder reich geerbt?* [disjunctive PQ]
B: Has she DENN won the lottery or come into a big inheritance?

- A disjunctive PQ is taken to highlight one (disjunctive) property (Roelofsen and Farkas, 2015). So, that *denn* can be acceptable in these questions is not surprising.

(18) *A: Can you pick me up from the station?* [alternative question]
B: Kommst du denn am Montag[↑] oder am Dienstag[↓]?
B: Are you DENN coming on Monday[↑] or Tuesday[↓]?

4.2.3 The ease of accommodating *denn* in *wh*-questions

- A **comment** is in order here. *Denn* in *wh*-questions is much more permissive than in polar questions: it is difficult to find infelicitous examples of *denn*-marked *wh*-questions.
- Speakers often ask *denn*-marked *wh*-questions **out of the blue**, and when they do, the hearer is usually able to **accommodate** that the speaker needs the inquired information to proceed with what she is trying to do:

(21) [Someone asking a passerby:]
Wie komme ich denn von hier zum Bahnhof?
How do I DENN get to the station from here?

- Here we might say that learning the way to the station is a necessary precondition for the speaker to proceed with their (either publicly entertained or deducible) plans of going to the station.
- In other cases, it is possible to deduce which plans someone is entertaining from certain social protocols, e.g., during a dinner:

(22) Welchen Wein möchtest du denn?
Which wine would you DENN like?

- Why I believe our analysis is on the right track, even given the almost universal permissibility of *denn* in *wh*-questions:
 - There are contexts in which *denn*-marked *wh*-questions are clearly infelicitous, namely very **sparse, unambiguous contexts** that allow for little accommodation such as König's middle-of-the-night example;
 - The **asymmetry** between polar and *wh*-questions mentioned above might **help explain** why *wh*-questions are so much easier to accommodate than polar questions: request for information (*wh*-questions) vs. marking a proposition as a necessary precondition (polar questions)...

5 *denn* in conditional antecedents

5.1 Data

- **Recall:** *denn* can also appear in certain conditional antecedents.

(23) Kritik ist willkommen, wenn sie denn konstruktiv ist.
Criticism is welcome if it DENN is constructive.

- More specifically, [Csipak and Zobel \(2016\)](#) observe that:

- *denn* is licensed in **hypothetical conditionals**, but not in **temporal conditionals** like (24) or **factual conditionals** like (25):

(24) Wir fangen an, wenn es (#denn) dunkel wird.
We'll start when it (#DENN) gets dark.

(25) A: Peter kommt auch.
B: Ah, ok. Wir sollten mehr Spaghetti kochen, wenn (?denn) Peter auch kommt.
A: *Peter is coming too.*
B: *Ah, okay. We should make more spaghetti if (?DENN) Peter is coming too.*

- antecedents containing *denn* usually **follow** the consequent and **don't precede** it

5.2 Predictions for conditional *denn*

5.2.1 Basic predictions

- If *denn* appears in a conditional antecedent, the **highlighted property** *f* is a proposition, namely the **proposition expressed by the antecedent**.
- Since *denn*-marked antecedents usually **follow** their consequents and not **precede** them, I will assume that the consequent acts as the **previous discourse event**. I will leave *denn*-marked antecedents that don't follow this pattern for future work.

Our felicity condition predicts conditional *denn* to be felicitous just in case the speaker considers the proposition expressed by the antecedent a **necessary precondition** for (accepting) the consequent.³

5.2.2 Further predictions: conditional perfection

Denn conventionalizes **conditional perfection**: since it marks the antecedent as **necessary**, it turns its containing conditional into a **biconditional**.

- This prediction seems to be borne out:
 - (26) Kritik ist willkommen, wenn sie (#denn) konstruktiv ist—und auch wenn sie nicht konstruktiv ist.
Criticism is welcome if it (#DENN) is constructive—and also if it isn't constructive.
 - (27) Wir gehen morgen Squash spielen, wenn (?denn) Court 1 frei ist oder wenn (#denn) Court 2 frei ist.
We'll play squash tomorrow if (?DENN) court 1 is free or if (#DENN) court 2 is free.
- Note that the biconditional interpretations of (26) and (27) stem from a **non-truth-conditional meaning contribution**, though. The infelicity of (26) and (27) is **less pronounced** than that of a corresponding *only if* conditional like (28).
 - (28) Kritik ist (#nur) willkommen, wenn sie konstruktiv ist—und auch wenn sie nicht konstruktiv ist.
Criticism is welcome (#only) if it is constructive—and also if it isn't constructive.

6 Conclusion

- I have proposed a unified account of **discourse particle** *denn* in polar questions, *wh*-questions and conditional antecedents.
- Although some details remain to be worked out, I have argued that *denn* **connects** the **highlighted content** of its containing clause to the **preceding discourse** by expressing a **precondition-like relationship**.
- There are numerous loose ends for future work, e.g.:
 - nonstandard questions: rhetorical questions, biased questions
 - *denn* in counterfactual antecedents
 - relation to other particles (*überhaupt*)
 - relation to the homonymous causal conjunction

³This is very much in the spirit of one of the further felicity conditions that Csipak and Zobel (2016) give for conditional *denn*. They don't consider the further predictions resulting from this condition, though.

A Causal conjunction *denn*

- Discourse particles often lead **double lives** as members of other word classes. For instance, the discourse particle *ja* is homonymous with a polar particle, the discourse particle *etwa* is homonymous with an adverb meaning *approximately*, and so on.
- Discourse particle *denn* is homonymous with a **conjunction** that expresses, roughly, a causal or precondition-like relationship between two sentences (Pasch *et al.*, 2003). The closest English equivalent is (archaic) *for*.

A.1 Data

- In many contexts, *denn* is synonymous with *weil* ‘because’, but it can express a **wider range of semantic relationships** than the latter. In particular, *denn*-clauses but not *weil*-clauses can be used to provide **justifications for speech acts**:

(29) a. Es hat geregnet, denn die Straße ist ganz nass.
b. #Es hat geregnet, weil die Straße ganz nass ist.
It rained DENN/#WEIL the street is wet. (Scheffler, 2005)

(30) a. Die Straße ist ganz nass, denn es hat geregnet.
b. Die Straße ist ganz nass, weil es geregnet hat.
The street is wet DENN/WEIL it rained.

(31) a. Peter muss zuhause sein, denn das Licht in seiner Wohnung ist an.
b. #Peter muss zuhause sein, weil das Licht in seiner Wohnung an ist.
Peter must be home DENN/#WEIL the light in his flat is on.

(32) a. Ist vom Mittag noch etwas übrig? Denn ich habe schon wieder Hunger.
b. ?#Ist vom Mittag noch etwas übrig? Weil ich schon wieder Hunger habe.
Are there lunch leftovers? DENN/#WEIL I'm already hungry again. (Scheffler, 2005)

- Also, and this is relevant for us, *denn* can be used to express a **precondition relationship**, whereas *weil* can't:

(33) a. Das Streichholz ist angegangen, denn es ist genügend Sauerstoff in der Luft.
b. #Das Streichholz ist angegangen, weil genügend Sauerstoff in der Luft ist.
The match lit DENN/#WEIL there is enough oxygen in the air.

- Moreover, different from *weil*-clauses, *denn*-clauses can't be used to answer *why*-questions:

(34) *Why is Sophie relieved?*
a. Weil sie ihre letzte Prüfung hinter sich hat.
b. *Denn sie hat ihre letzte Prüfung hinter sich.
*WEIL/*DENN she is done with her last exam.*

- Scheffler (2005) explains this last contrast by treating the causal relationships conveyed by *denn* as a **conventional implicature** and that expressed by *weil* as asserted.¹

A.2 Predictions for causal conjunction *denn*

- We have already made some headway towards a unified account of particle *denn* and causal conjunction *denn*.
- Particle *denn* contributes the condition that the speaker has to consider learning *f* a necessary **precondition for proceeding in discourse**.

¹For a similar observation and treatment of English *since*, see Charnavel (2017).

- Among other things, this can mean that f is an **explanation** for the preceding discourse event: in this case, by using a *denn*-question, a speaker demands an explanation before she is willing to proceed.
- The most general **example** of this:

(35) Warum denn?
Why DENN?
- This seems to fit well with the fact that causal conjunction *denn* can also convey that its prejacent is an **explanation/cause** for the content expressed by the preceding sentence.
- But there are still a number of issues.

A.3 Issue I: evidential flip

- Recall that in questions and conditional antecedents, the speaker considers learning an instantiation of the highlighted property f a precondition **for herself** to proceed.
- With causal conjunction *denn*, however, the speaker doesn't ask the hearer for information that will help her (i.e., the speaker) proceed. Rather, she herself **provides information for the hearer**, in the hope that it will convince the hearer.
- To capture this in the felicity condition of *denn*, we will need a certain kind of **flip**.
- **Background:** in a discourse, there are several ways of assigning roles to interlocutors. If we assign them based on who makes a discourse move, the roles are those of **speaker and hearer**. But if we take a more evidential perspective, we arrive at the roles of **interrogator and witness**:

| move | speaker | hearer |
|-------------------------|--------------|--------------|
| question | interrogator | witness |
| assertion | witness | interrogator |
| antecedent ² | either? | either? |

- **Perspective shifts** that depend on illocutionary force are not uncommon: many perspective-dependent expressions make the **speaker** the relevant perspective-holder when they occur in **assertions**, and make the **hearer** the relevant perspective-holder when they occur in **questions**.
- For example, **illocutionary adverbs** are anchored to the speaker in assertions, while in questions they are anchored to the hearer (Faller, 2006).

- (36) a. Honestly, it was Mary who ate the biscuits.
b. Honestly, who has eaten the biscuits?

- This phenomenon is sometimes called **interrogative flip** or **evidential flip** (Fillmore, 1975; Mitchell, 1986).
- If we adopt the distinction between interrogator and witness, our felicity condition for *denn* is the following:

It is felicitous for a speaker c_S to use *denn* in a sentence with highlighted property f iff c_S considers learning an instantiation of f a necessary precondition for **the interrogator** to proceed in the discourse.

- That is, in questions, it is the speaker who has to learn, while in assertions it is the hearer.

²Bylinina *et al.* (2014, 2015) note, albeit in a slightly different context, that in conditional antecedents perspective shifting is optional.

A.4 Issue 2: necessary precondition vs. possible explanation

A.4.1 The problem

- If discourse particle *denn* makes the **same meaning contribution** as causal conjunction *denn*, we would expect them to accept the **same prejacent**.
- However, this is not always the case: the *denn*-assertion (37) is **acceptable**, but the corresponding *denn*-question (38) is **not acceptable**:

(37) Karl muss ins Gefängnis, denn er hat Drogen verkauft.
Karl has to go to jail, DENN he sold drugs.

(38) A: *Karl has to go to jail.*
 B: #*Hat er denn Drogen verkauft?*
 B: #*Did he DENN sell drugs?*

- This is because Karl having sold drugs is not **necessary** in the relevant sense; there **could have been other reasons** for him going to jail.
 - In contrast, him having committed a crime is necessary:
- (39) B: *Hat er denn ein Verbrechen begangen?*
B: Did he DENN commit a crime?
- So, the problem is: particle *denn* marks learning *f* as **necessary**, but the explanations that conjunction *denn* introduces are typically **not necessary**.

A.4.2 A possible fix

- We introduce one more level of modality into the felicity condition:

It is felicitous for a speaker c_S to use *denn* in a sentence with highlighted property f iff c_S **considers it possible** that learning an instantiation of f is a necessary precondition for the interrogator to proceed in the discourse. ($\diamond_S \Box_I$)

- **In questions: interrogator = speaker** ($\diamond_S \Box_S \varphi \Leftrightarrow \Box_S \varphi$)
 ...the speaker **considers it possible** that learning an instantiation of f is a necessary precondition **for herself** to proceed in the discourse.
- We assume that agents are fully **introspective** w.r.t. what preconditions they have for proceeding.
- Then, considering it possible that f is a precondition for oneself simply **boils down** to considering f a precondition.
- That means, for questions, the new felicity condition just boils down to **the old one**.
- **In assertions: interrogator = hearer** ($\diamond_S \Box_H \varphi \not\Leftrightarrow \Box_H \varphi$)
 ...the speaker **considers it possible** that learning an instantiation of f is a necessary precondition **for the hearer** to proceed in the discourse.

Intuitively, we can think of this as the speaker **preemptively answering** a *denn*-marked polar question that she thinks the hearer might ask.

References

- Bayer, J. (2012). *From modal particle to interrogative marker: a study of German denn*. Bibliothek der Universität Konstanz.
- Biezma, M. (2014). The grammar of discourse: The case of *then*. In *Semantics and Linguistic Theory*, volume 24, pages 373–394.
- Brauße, U. (1994). *Lexikalische Funktionen der Synsemantika*. Gunter Narr Verlag.
- Bylinina, L., McCready, E., and Sudo, Y. (2014). The landscape of perspective shifting. Talk given at ‘Pronouns in Embedded Contexts at the Syntax-Semantics Interface’, Tübingen.
- Bylinina, L., McCready, E., and Sudo, Y. (2015). Notes on perspective-sensitivity. In *DONVM SEMANTICVM*.
- Charnavel, I. (2017). Non-at-issueness of *since*-clauses. To appear in Proceedings of SALT 27.
- Csipak, E. and Zobel, S. (2014). A condition on the distribution of discourse particles across types of questions. In *Proceedings of NELS 44*, pages 83–94.
- Csipak, E. and Zobel, S. (2016). Discourse particle *denn* in the antecedent of conditionals. In *Empirical Issues in Syntax and Semantics (CSSP 11)*.
- Faller, M. (2006). Evidentiality and epistemic modality at the semantics/pragmatics interface. Manuscript.
- Fillmore, C. J. (1975). Santa cruz lectures on deixis. Indiana University Linguistics Club, Bloomington, Indiana.
- Gutzmann, D. (2015). *Use-conditional meaning. Studies in multidimensional semantics*. Oxford University Press.
- König, E. (1977). *Modalpartikeln in Fragesätzen*, pages 115–130. Tübingen: Niemeyer.
- Kratzer, A. (2004). Interpreting focus: Presupposed or expressive meanings? A comment on Geurts and van der Sandt. *Theoretical Linguistics*, 30, 123–136.
- McCready, E. (2012). Formal approaches to particle meaning. *Language and Linguistics Compass*, 6(12), 777–795.
- Mitchell, J. E. (1986). *The Formal Semantics of Point of View*. Ph.D. thesis, University of Massachusetts.
- Pasch, R., Brauße, U., Breindl, E., and Waßner, U. H. (2003). *Handbuch der deutschen Konnektoren*. Walter de Gruyter.
- Roelofsen, F. and Farkas, D. F. (2015). Polarity particle responses as a window onto the interpretation of questions and assertions. *Language*, 91(2), 359–414.
- Rojas-Esponda, T. (2014). A discourse model for *überhaupt*. *Semantics and Pragmatics*, 7(1), 1–45.
- Scheffler, T. (2005). Syntax and semantics of causal *denn* in German. In *Proceedings of the 15th Amsterdam Colloquium*, pages 215–220.
- Thurmair, M. (1989). *Modalpartikeln und ihre Kombinationen*, volume 223. Walter de Gruyter.
- Thurmair, M. (1991). Zum Gebrauch der Modalpartikel ‘denn’ in Fragesätzen. Eine korpusbasierte Untersuchung. *Linguistische Arbeiten*, 290, 377–387.
- Zimmermann, M. (2011). Discourse particles. *Semantics: An international handbook of natural language meaning*, 2, 2012–2038.