

On the interpretation of epistemic operators in event related adverbial clauses

Jakob Maché

jakob.mache@letras.ulisboa.pt

Faculdade de Letras
Centro de Linguística da Universidade de Lisboa
Universidade de Lisboa

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Overview

Objective Epistemic Modality

Conditionals with logophoric operators?

Causal V1-clauses in German

Analysis

In a nutshell

Argument realisation with adjectives and adverbs

Lexicon entries for epistemic operators

Lexicon entries for event related causal complementizer

weil/because

Implementation of the *Locality Requirement for Deictic Centres*

Phrase structures



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Epistemic operators in event related causal clauses

Eg. Stephenson (2007, pp. 505–508), Maché (2013), Charnavel (2018, pp. 394) event related *because*-clauses can contain epistemic modal operators:

- (1) Ann is hiding in the bushes [because I might be on that bus.]
- (2) Airplanes frighten John [because they might crash.]
- (3) Liz left the party [because things might have spiraled out of control.]

- ▶ **causal judge** *j* anchored to some argument referent of the matrix attitude predicate
- ▶ **attitude holder of embedded clause** epistemic operator is evaluated with respect to this arguments knowledge
- ▶ (event related) causal clauses adjoin at VP level, matrix arguments can bind into them



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Different epistemic operators in causal clauses?

Lang (1979, pp. 209–211), Nuyts (2001, pp. 72–78):
„epistemic ADJ anchored to matrix attitude holder,
epistemic ADV always anchored to speaker”

- (4) a. Peter trinkt noch einen Schnaps, weil es es
Peter drinks more one schnaps because it
wahrscheinlich ist, daß er süchtig ist.
probable is that he addicted is
'Peter drinks another schnaps, (he decided to do so)
because it is probable that he is addicted'
- b. Peter trinkt noch einen Schnaps, weil er er
Peter drinks more one schnaps because he
wahrscheinlich süchtig ist.
probably addicted is
'Peter drinks another schnaps (I assume so) because he
is probably addicted'



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Similar contrast: epistemic operators in event related conditionals

Likewise such a contrast is discussed for the occurrence within the antecedents of conditionals (cf. Lyons 1977, pp. 805–806 ex. 5, Hengeveld 1988, pp. 236–240 ex. 6).¹

- (5) a. If it may be raining, you should take your umbrella.
b. If it is possible that it will rain, you should take your umbrella.
c. If there is a possibility of rain you should take your umbrella.
- (6) a. If it is possible that John will come, I am going home.
b. * If possibly John will come, I am going home.

¹Once again Lyons is not very explicit. He does not provide any ungrammatical example for epistemic adverbs.

Aims of this talk

Address questions:

- Q1 How to account for the different behaviour of different epistemic operators in (event related) adverbial clauses?
- Q2 Are conditional clauses anchored to some logophoric operator too (cf. Charnavel 2018, pp. 421)?

Similar contrasts: epistemic operators in information seeking question

Contrast between acceptability of epistemic ADJ and ADV in questions, as observed since Greenbaum (1969, pp. 111, 153), Jackendoff (1972, pp. 344–345) (cf. 7), Bellert (1977, pp. 344–345) (cf. 8), Lyons (1977, pp. 799), Hengeveld (1988, pp. 236–240) and Nuyts (2001, pp. 58–59) (9).²

- (7) a. Is it probable that Frank beat all his opponents?
b. * Did Frank probably beat all his opponents?
- (8) a. Is it possible/probable that John will come?
b. * Will John possibly/probably come?
- (9) a. Is it probable that they run out of fuel?
b. * Did/Have they probably run out of fuel?
c. * Probably they have run out of fuel?

²Lyons is not explicit about this contrasts but they follow from his claims (cf. 805–806.)

Popular solution for Q1: Two types of epistemic modality

Lyons (1977, pp. 787–809), Hengeveld (1988, pp. 236–240), Nuyts (2001)

- ▶ there are two distinct types of epistemic modality associated with two distinct scope positions in the clause, (cf. Lyons 1977, pp. 804)
 - ▶ **objective epistemic modality (ObjEM)**: assertion of a possibility/necessity, everybody is epistemic judge
 - ▶ **subjective epistemic modality (SubjEM)**: entirely independent illocutionary force with reduced speaker commitment to the truth, in opposition to assertive operator and question operator, only speaker is epistemic judge
- ▶ **epistemic adverbs**: express subjective epistemic modality, speaker weakens truth commitment
- ▶ **epistemic adjectives**: express objective epistemic modality, statement of a (logical) possibility or necessity
- ▶ **epistemic modal verbs**: depending on lexical item express both or only one epistemic modality

Challenges for the assumption of objective epistemic modality

1. No agreement which modal verbs are ObjEM
2. Till date it remains to be shown that there are modal verbs which are grammatical in all the environments which are typical for ObjEM
3. ObjEM is considered to be derived from SubjEM – this claim is at odds with two observations
 - 3.1 ObjEMV developed before SubjEMV counterparts developed
 - 3.2 Adverbs are commonly assumed to be derived from adjectives



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Some syntactic types of conditionals

Eg. Kratzer (1986, pp. 8 1995, pp. 130), Sweetser (1990, pp. 116), Haegeman (2002, pp. 125):

1. **Event related/central conditionals:** if event e_1 happens, event e_2 happens
2. **Epistemic/peripheral conditionals:** if proposition p is true, then I assume that proposition q
 - 2.1 often 'echoic', proposition of antecedent p already part of common ground/shared beliefs
 - 2.2 antecedent often precedes matrix clause (but: *You must be rich by now, if you bought a house in the center in the 80s*)
 - 2.3 consequent/matrix clause always an epistemic assumption (often without explicit epistemic operator)
3. **Speech Act** if p is true/applicable, then you may accept utterance q
 - 3.1 often 'echoic', proposition of antecedent p already part of common ground/shared beliefs
 - 3.2 antecedent often precedes matrix clause (but: *Call me, if you need help! Who is this girl, if I may ask?*)



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Epistemic operators in (?event related conditionals I

German *könnte* considered to be only SubjEM, but yet found in antecedents of (?event related) conditionals:

- (10) Es besagt, dass eine in die Schweiz geflüchtete
it says that a in the Switzerland fled
Person nicht in ihr Ursprungsland zurückgeschafft
person NEG in his origin.country back.delivered
werden darf, wenn sie dort an Leib und Leben
PASS.AUX-INF may if she there at body and life
bedroht sein könnte.³
threaten-PPP be-INF could
'It says that a person who has fled to Switzerland must not be returned to his original country if they could be physically threatened there.'



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Epistemic operators in (?event related conditionals II

1. Quantified matrix subjects can bind variables in *wenn*-clause with epistemic *könnte* (cf. tests by Charnavel 2018, pp. 404–408):

- (11) Keine_i geflüchtete Person darf in ihr Ursprungsland
no fled person may in his origin.country
zurückgeschafft werden, wenn ihr_i Leib und
back.delivered PASS.AUX-INF if their body and
Leben bedroht sein könnte.
life threaten-PPP be-INF could
'No person who has fled to Switzerland must be returned to their country of origin if their life could be threatened there.'



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³DeReKo: A09/FEB.06666 St. Galler Tagblatt, 24/02/2009.

Epistemic operators in (?)event related conditionals III

2. Principle C effects hold in *wenn*-clause with epistemic *könnte* (cf. tests by Charnavel 2018, pp. 404–408):

- (12) ?? Sie_i darf nicht in ihr Ursprungsland zurückgeschafft werden, wenn die Person_i dort an Leib und Leben bedroht sein könnte.
she may NEG in her origin.country back.delivered PASS.AUX-INF if the person there at body and life threaten-PPP be-INF could
Intended 'They_i must not be returned to their country of origin if the person could be physically threatened there.'

Epistemic operators in (?)event related conditionals IV

VP-adverbials such as *oft* 'often' may take scope over *wenn*-clause with epistemic *könnte*:

- (13) Oft werden geflüchtete Person_i nur in das erste Eintrittsland zurückgeschoben, wenn ihr_i Leib und Leben im Herkunftsland bedroht sein könnte.⁴
often PASS.AUX fled person only in the first entry.country back.delivered-PPP if their body and life in.the origin.country threaten-PPP be-INF could
'Often refugees are only returned to the first country if their life is threatened in their country of origin.'
oft > *wenn*...*könnte*

- ▶ These sentences are event-related/central/VP-adjoined conditionals
- ▶ They can contain SubjEM

Epistemic operators in event related conditionals VI

Same is possible if epistemic operator is ADJ (*möglich* 'possibly') or ADV (*möglicherweise* 'possibly') but not with PRT *wohl*

- (14) ... wenn es möglich ist, dass sie dort möglicherweise an Leib und Leben bedroht ist
(15) ... wenn sie dort möglicherweise an Leib und Leben bedroht ist
(16) * ... wenn sie dort wohl an Leib und Leben bedroht ist

Epistemic operators in event related conditionals VI

Which attitude holder referent is the conditional judge?

- (17) a. the judge_i must not return any person who fled if he_i considers it possible that that person is physically threatened in their country of origin, (even if everybody else believes that refugee would be save)
b. the judge must not return any person who fled if everybody (#else) considers it possible that that person is physically threatened in their country of origin
c. # the judge must not return any person who fled if that refugee considers it possible that they is physically threatened in their country of origin

Epistemic operators in event related conditionals VII

But speech act conditionals may result in similar interpretation....

- (18) Wenn (ihr;) Leib und Leben im Herkunftsland
if her body and life in.the origin.country
bedroht sein könnte, dann schieb die
threaten-PPP be-INF could then return.IMP the
Person; nicht ab.
person NEG away
'If a person's life is threatened in their country of origin,
then don't return them.'

SubjEM in conditionals – example 3

- (20) Wenn in einem Unfall die Trunkenheit eine Rolle
if in an accident the drunkenness a role
gespielt haben könnte, so sind Folgen
play-PPP have-INF could so are consequences
auch bei einem Alkoholgehalt von unter 0,5
also with a alcohol.percentage of less 0.5
Promille möglich.⁶
promille possible
'If it is possible that the cause for an accident was
drunkenness, then it is possible that there will be
consequences even if the percentage of alcohol was less
than 0.5 promille.'

⁶DeReKo:WPD/TTT.07396, Wikipedia, 2005.

SubjEM in conditionals – example 2

- (19) Wenn der Täter bewaffnet sein könnte, würde
if the offender armed be-INF could would
ich jedoch dringend abraten.⁵
I but strongly disadvise-INF
'If the offender could be armed, I would strongly advise
against it.'

⁵DeReKo: RHZ96/OKT.04492 Rhein-Zeitung, 08/10/1996.

SubjEM in conditionals – example 4

- (21) "Wir nehmen den Hilferuf sehr ernst", betonte
we take the distress.call very serious stressed
Polizeipräsident Wolfgang Fromm. "Es ist das einzig
police.president Wolfgang Fromm it is the only
richtige Verhalten, wenn ein Menschenleben in
correct behaviour if a human.life in
Gefahr sein könnte."⁷
danger be-INF could
'"We take the distress call very seriously"the police
president Wolfgang Fromm stressed. "This is the only right
behaviour if a human life could be in danger.'

⁷DeReKo: M07/APR.05325 Mannheimer Morgen, 25/04/2007

SubjEM in conditionals – example 5

- (22) Am Ende könnte die Linkspartei über solche Bündnisse ein starker Faktor im Bundesrat werden – und dies wäre vor allem von Gewicht, wenn die Bundesregierung nach der Bundestagswahl schwarz-gelb geprägt sein könnte.⁸
at.the end can-SBJV.PST the Linkspartei by such alliances a strong factor in.the Federal.Council become and this be-SBJV.PST of all of weight if the government after the election black-yellow coin-INF be-INF can-SBJV.PST

‘Finally, the Leftwing-party could become a strong factor in the federal council due to such alliances – this would become important if after the next elections the government could be lead by a black-yellow coalition.’

⁸DeReKo: HAZ09/AUG.02799 Hannoversche Allgemeine. 18/08/2009.



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Epistemic operators in epistemic causal V1-clauses I

Pittner (2011), Pittner (2016): German has complementizerless peripheral causal clauses with V1-order.

- (23) Eine amphibische Landungsoperation im Gebiet der Hafenstadt Odessa hält Hofbauer damit in nächster Zeit für ausgeschlossen – dürften die Ukrainer doch auch einen Minengürtel in Küstennähe verlegt haben.⁹
an amphibious debarkation in.the region the.GEN seaport.GEN Odessa considers Hofbauer therefore in near time for rule.out-PPP be.probable the Ukrainians PRT also a mine.belt in deploy have-INF
- ‘Therefore, Hofbauer considers an amphibious debarkation in the region [as Ukrainians may have deployed a belt of sea mines inshore].’

⁹Österreichischer Rundfunk 15.4. 2022.

<https://orf.at/#/stories/3260240/>



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Epistemic operators in epistemic causal V1-clauses II

- ▶ **Causal judge *j***: Charnavel (2018, pp. 401): speaker always is the causal judge or at least the causal judgement of a matrix attitude holder argument referent
- ▶ Example (23) Causal judge: speaker + matrix attitude holder (Case #2 is ruled out with peripheral clauses)
- ▶ Charnavel’s prediction holds



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Epistemic operators in epistemic causal V1-clauses II

- ▶ Charnavel (2018, pp. 408–412): peripheral/speech act oriented causal (*since*-)clauses can neither present the attitude expressed in causal clause
 - ▶ as attitude of a matrix attitude holder argument
 - ▶ nor as the attitude of both the speaker+matrix attitude holder
- ▶ Example (23) challenges Charnavel’s claim: speaker and matrix attitude holder argument referent required to hold belief that Ukrainians deployed mines.

- (24) a. # But I think the Ukrainian Navy do not have any sea mines that could harm a Russian ship.
b. # But HE thinks that there won’t be any disembarkment because the Russian Navy lacks motivation and training



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Epistemic operators in epistemic causal V1-clauses III

- ▶ Epistemic modal verb can be replacement with other epistemic operators (ADJ, ADV, ?PRT *wohl*)
- (25)
- a. – ist es doch wahrscheinlich, dass die Ukrainer einen Seemengürtel verlegt haben
 - b. – haben doch die Ukrainer wahrscheinlich einen Minengürtel verlegt
 - c. ? – haben doch die Ukrainer wohl einen Minengürtel verlegt

Adjectives have potential to realise arguments

- ▶ **Main assumption here:** adjectives and adverbs differ with respect whether they can syntactically realise their arguments
 - ▶ adjectives have potential to syntactically realise arguments
 - ▶ adverbs do not have potential to syntactically realise arguments
- ▶ but they are both 'subjective' epistemic
- ▶ epistemic operators introduce variables for a judge/deictic centre which must be bound locally
- ▶ epistemic adjectives introduce an attitude holder argument which locally binds the DC-variable
- ▶ epistemic adverbs do not, they remain unbound
- ▶ Many operators (circumstantial operators) fail to embed epistemic operators whose DC-variable is not locally bound yet

Generalisation based on corpus data

Condition on Deictic Centres (CoDeC)

The use of an epistemic operator indicates that the embedded proposition is not part of the DEICTIC CENTRE's knowledge. (cf. Maché 2013, pp. 415)

Locality Requirement for Deictic Centres

The variable of the DEICTIC CENTRE is bound by...

1. ... the experiencer arguments of the predicate which introduce the epistemic modal operator
2. ... a logophoric operator within the same clause (eg. if epistemic operator in causal clause)
3. ... the experiencer argument of an attitude predicate in the superordinate clause
4. ... the most salient referent of the speech act

(cf. Maché 2013, pp. 422)

Argument realisation with different uses of adjectives

There are restrictions on argument realisation depending on the type of adjective use, depending on the language:

1. predicative uses (facilitated by copula)
2. attributive uses (embedded with in modified NP)
3. adverbial uses

Argument realisation with adjectives: German I

- (26) Der Diener ist [NP_{dat} seiner Herrin] treu.
 the servant COP his-DAT mistress.DAT loyal
 'The servant is loyal to his mistress.'
- (27) [der [AdjP [NP_{dat} seiner Herrin] treue] Diener].
 the his-DAT mistress.DAT loyal servant
 'The servant loyal to his mistress.'
- (28) Der Diener verhält sich (*[NP_{dat} seiner Herrin])
 the servant behaves REFL his mistress
 treu.
 loyal
 'The servant behaves in a loyal (*to the mistress) way.'
- (29) Der Diener verhält sich treu [PP gegenüber seiner
 the servant behaves REFL loyal towards his
 Herrin]).
 mistress
 'The servant behaves in way a loyal to the mistress'



Argument realisation with adjectives: German I – realisation as adjunct

- (30) Der Diener verhält sich treu [PP gegenüber seiner
 the servant behaves REFL loyal towards his
 Herrin]).
 mistress
 'The servant behaves in way a loyal to the mistress.'

► Similar to agentive *von*-PP/*by*-PP in passive sentences



Argument realisation with adjectives: German II

- (31) Die Mathematikerin ist [NP_{dat} ihrer Kollegin]
 the mathematician COP her-DAT colleague.DAT
 ähnlich.
 similar
 'Mathematician resembles her colleague.'
- (32) [NP die [AdjP [NP_{dat} ihrer Kollegin] ähnliche]
 the her-DAT colleague.DAT similar
 Mathematikerin].
 mathematician
 'The mathematician akin to her colleague'
- (33) Die Mathematikerin geht (*[NP_{dat} ihrer
 the mathematician goes her-DAT
 Kollegin]) ähnlich an das Problem heran.
 colleague.DAT similar at the problem towards
 'The mathematician tackles the problem in a similar way
 (than her colleague)'



Argument realisation with adjectives: German III

- (34) Das Mädchen war [PP_{zu} zu ihrer Lehrerin]
 the girl COP.PST to her-DAT teacher.DAT
 frech.
 cheeky
 'The girl was cheeky to her teacher.'
- (35) [NP das [AdjP [PP_{zu} zu ihrer Lehrerin] freche]
 the to her-DAT teacher.DAT cheeky
 Mädchen].
 girl
 'The girl cheeky to her teacher'
- (36) Das Mädchen hat (*[PP_{zu} zu ihrer Lehrerin])
 the girl has to her-DAT teacher.DAT
 frech im Klassenzimmer einen Joint geraucht.
 cheeky in.the classroom a joint smoke
 'The girl smoked cheekily (*to her teacher) a joint inside the
 class room.'



Lexicon entry of an epistemic modal verb

(42) *dürfte* 'be.probable'

CAT	HEAD	<i>verb</i>
	ARG-ST	$\{ \text{[1] } \oplus \text{ [2] } \oplus \langle \text{V[} bse, \text{LEX +, SUBJ[1], COMPS[2]]}_i \rangle \}$
CONT	SOA	<i>i</i>
	DC	<i>ind</i>
		<i>epistemic-soa</i>

- ▶ Raising analysis cf. Müller (2013, pp. 243, 277)
- ▶ no restriction on IC: they can be embedded under non-factives
- ▶ no restriction on VFORM: they can be nonfinite when embedded under non-factives

Lexicon entry *because*-clause

(43) *weil*-clause

PHON	<i>/vaɪl/</i>							
SYNSEM	LOC	CAT	HEAD	MOD	LOC	CAT	HEAD	<i>verb</i>
			JUDGE	JUDGE		CONT	CONT	<i>soa_i</i>
			IC	IC				
			COMPS	COMPS				
			ARG-ST	ARG-ST				
				$\{ \text{[1] } \text{S[DC } m, \text{VL+}] \}$				
				<i>complementizer</i>				
				SOA	<i>causal-soa</i>			
				EXP	<i>k</i>			
				DC	<i>m</i>			
					<i>causal-soa</i>			

Lexicon entry *because*-clause – notes

- ▶ based on entries for sentence adverbs as suggested by Müller (2020, pp. 223) or Kim (2021, pp. vii)
- ▶ value CONT in MOD determines whether causal clause is VP/event modifier or propositional modifier
- ▶ IC– signals that it is an embedded clause (cf. Ginzburg and Sag 2000, pp. 45)
- ▶ JUDGE involves always the speaker, some times also event participant
- ▶ if JUDGE involves event participant, latter may also bind deictic center of *because*
- ▶ only restricted set of adverbial clauses have logophoric operator/deictic center (causal clauses, conditionals, purpose clauses)
- ▶ this deictic center is able to bind deictic center of embedded modal operators

Formalisation of LRDC 1

Clause 1

the variable of the DEICTIC CENTRE is identified by the EXPERIENCER argument of the predicate which introduce the epistemic modal operator:

CAT	HEAD	<i>verb</i>	→	CONT	EXP	<i>i</i>
	ARG	$\text{list } \oplus \langle \text{NP/PP}_i \rangle \oplus \text{list}$			DC	<i>i</i>
CONT	EXP	<i>i</i>			CLOSED	<i>+</i>
		<i>epistemic-soa</i>				

- ▶ When ever a predicate of the type *verb* introduces an epistemic operator with DEICTIC CENTRE and has an EXPERIENCER on its COMP-list: the DEICTIC CENTRE is locally bound by the EXPERIENCER argument
- ▶ applies to reportative modal verbs and copulas with predicative epistemic adjectives

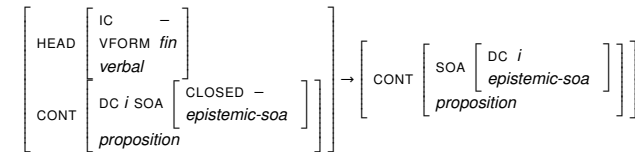
Formalisation of LRDC 1 – Comments

- ▶ LRDC 1 does apply to VPs modified by epistemic adverbs
- ▶ mother node does not have appropriate attitude holder on ARG-ST list
- ▶ LRDC does not apply to epistemic adverb as it is not of the category *verb*

Formalisation of LRDC 2

Clause 4a

a logophoric operator DC in an adverbial clause



- ▶ IC– indicates that the clause containing the epistemic operator is an embedded clause (Ginzburg and Sag 2000, pp. 26, 42–46)
- ▶ states that an adverbial clause which contains an epistemic operator whose DC is not locally bound, has to be bound by the DC of the adverbial clause (= ‘logophoric operator’)
- ▶ corresponds roughly to the analysis suggested by Charnavel (2018)

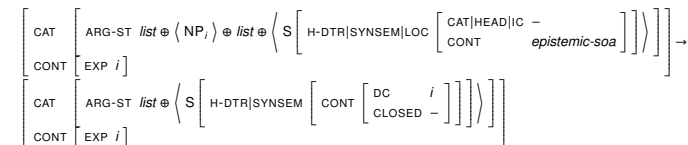
Formalisation of LRDC 4a Comments

- ▶ only declarative clause have CONT value specified for message-type *proposition*
- ▶ the feature CLOSED– signals that there is no more local binder between the root-level node and the DC-variable contributed by the epistemic operator
- ▶ in such environments the DC is identified with the speaker

Formalisation of LRDC 3

Clause 3

the variable of the DEICTIC CENTRE is bound by the EXPERIENCER argument of an attitude predicate in the superordinate clause

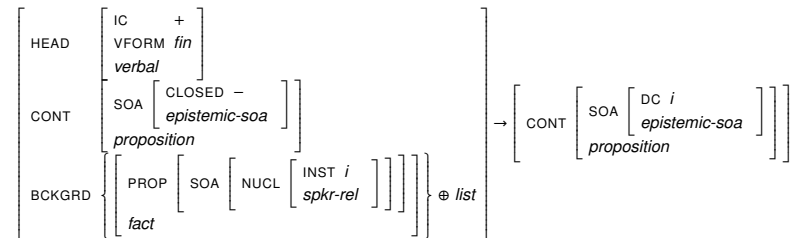


- ▶ IC– signals that clause is embedded (cf. Ginzburg and Sag 2000, pp. 45)
- ▶ the feature VFORM of the embedded verb remains unspecified, because embedded clause can be non-finite too in German
- ▶ CLOSED– signals that deictic centre in the clause is not bound yet

Formalisation of LRDC 4a

Clause 4a

the most salient referent of the speech act (declaratives)



- ▶ CLOSED– indicates that there is no potential binder which is more local than speaker
- ▶ root clause constraint according to Ginzburg and Sag (2000, pp. 26, 42–46)
- ▶ representation of the speaker inspired by Ginzburg and Sag (2000, pp. 120–124)

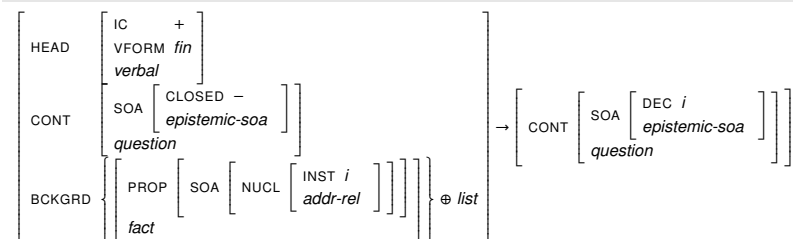
Formalisation of LRDC 4a Comments

- ▶ only declarative clause have CONT value specified for message-type *proposition*
- ▶ the feature CLOSED– signals that there is no more local binder between the root-level node and the DC-variable contributed by the epistemic operator
- ▶ in such environments the DC is identified with the speaker

Formalisation of LRDC 4b

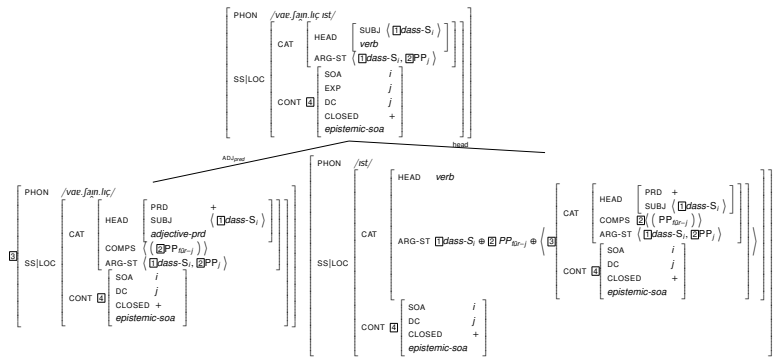
Clause 4b

the most salient referent of the speech act (information seeking interrogatives)



- ▶ only interrogative clause have CONT value specified for message-type *question*
- ▶ the feature CLOSED– signals that there is no more local binder between the root-level node and the DC-variable contributed by the epistemic operator
- ▶ in such environments the DC is identified with the addressee

Copula with predicative epistemic adjective

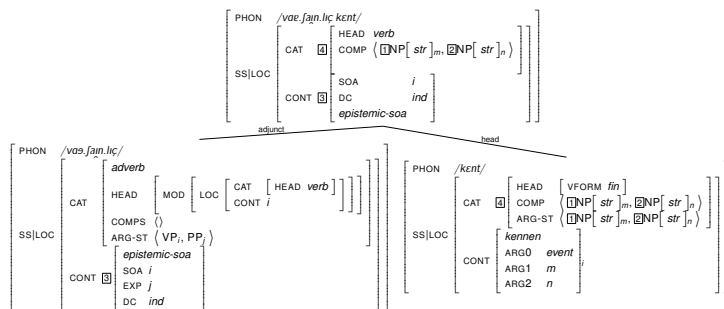


- ▶ The arguments [1], [2] of the ADJ will end up in the predicate's ARG-ST-list
- ▶ By virtue of argument attraction in cluster formation the copula attracts the arguments of the embedded predicative adjective

Binding of DC in predicative epistemic adjectives

- ▶ There is constituent with a head of the category *verb*
 - ▶ that has an EXP on its ARG-st
 - ▶ and that a DC in its content:
- ▶ Controversial? ARG-ST at a phrasal-level (contra Sag and Wasow 1999, pp. 152–154) But: predicate complex formation

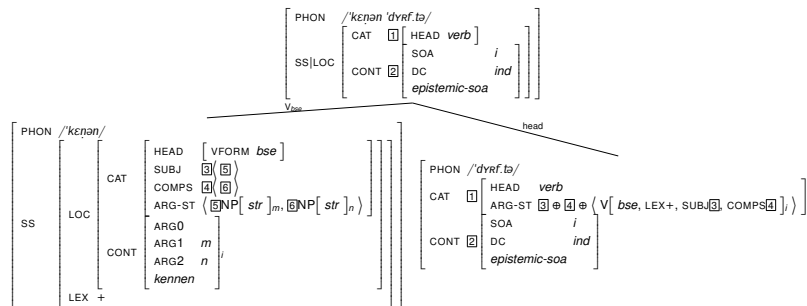
Epistemic adverbs with VP



- ▶ Arguments of the ADV will not end up in the predicates ARG-ST-list
- ▶ Clause 1 of LRDC cannot apply:

Binding of DC in epistemic adverbs

- ▶ There is no AVM with a head of the category *verb*
 - ▶ that has an EXP on its ARG-st
 - ▶ and that a DC in its content:
- ▶ consequence: clause 1 cannot apply
- ▶ consequence: DC-variable left be unbound.
- ▶ consequence: DC-variable can only be bound by the top most binder



- ▶ CONTENT of epistemic modal verb is *epistemic-soa*
- ▶ If in matrix clauses LRDC 4 applies
- ▶ If embedded in clause LRDC 3 applies

- ▶ The different behaviour of epistemic adverbs and epistemic adjectives in Westgermanic languages is caused by a difference in argument structure and binding behaviour
 - ▶ epistemic operators introduce a variable for a DEICTIC CENTRE
 - ▶ depending on the context different binding behaviour
 - ▶ if DC-variable is not bound locally subject to strict conditions on context
 - ▶ argument position in predicates can be locally bound by EXPERIENCER arguments
 - ▶ epistemic adverbs do not participate in predicate complex formation, DC cannot be bound locally
 - ▶ predicative epistemic adjectives are part of the predicate complex, DC is bound locally

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