

Semantics of Evidentials: German Reportative Modals

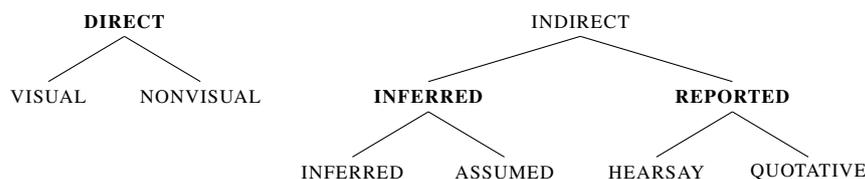
1 Introduction

What are evidentials? Two competing functional definitions:

- Narrow concept (e.g. [Aikhenvald \(2004\)](#), [de Haan \(2001\)](#)):
Evidentials indicate (the type of) the source of evidence for the proposition expressed
- Wide concept (e.g. [Ifantidou \(2001\)](#), [Rooryck \(2001\)](#)):
Evidentials indicate (the type of) the source of evidence for the proposition expressed *and/or* the degree of its reliability/probability/certainty

Three main **types of sources** for a state of affairs (SoA):

- **DIRECT**: the speaker has directly perceived/experienced the SoA
- **REPORTED**: the speaker has heard that the SoA holds
- **INFERRED**: the speaker has inferred from other information that the SoA holds



Obligatory evidential marking in Tariana ([Aikhenvald 2004](#)): VIS, NONVIS, INFR, ASSUM, REP

- (1) a. Juse irida di-manika-**ka**
 José football 3SGNF-play-REC.P.VIS
 ‘José has played football (we saw it)’
- b. Juse irida di-manika-**pidaka** (REC.P.REP)
 ‘José has played football (we were told)’

(Stereo-)Typical properties of evidentials:

- Evidentials operate at the speech act level and do not affect the propositional content
- Evidentials cannot be (syntactically or semantically) embedded

Evidentials in German? Two German modals systematically have evidential (reportative) readings:

- *sollen* ‘should’: subject-external source
- *wollen* ‘want’: subject-internal source

- | | |
|--|---|
| <p>(2) Anna soll in Paris sein
Anna should in Paris be</p> <p>a. ‘Anna should be in Paris’
b. ‘Anna is said to be in Paris’</p> | <p>(3) Anna will in Paris sein
Anna want in Paris be</p> <p>a. ‘Anna wants to be in Paris’
b. ‘Anna claims to be in Paris’</p> |
|--|---|

The following discussion will focus on reportative *sollen* (henceforth, *sollen*_{REP}).

Ultimate goal:

- Lexical entries for *sollen/wollen* (cf. sec. 2 and 4)

Questions on the way:

- Are *sollen/wollen* evidentials in the narrow sense? (cf. sec. 3.2)
- Do *sollen/wollen* contribute to the proposition expressed? (cf. sec. 3.1)
- Can *sollen/wollen* occur in embedded contexts? (cf. sec. 3.3)

2 A standard modal semantics

Reportative uses of *sollen/wollen* did not receive much attention in formal semantics (just like evidentials more generally). Ehrich (2001, 168) offers a modal analysis within the possible worlds framework of Kratzer (1991); roughly like this:

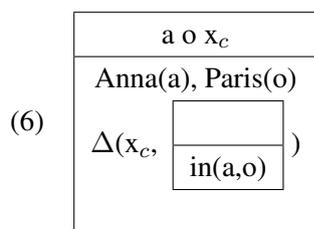
- (4) $\llbracket \textit{soll} \rrbracket^w = \lambda p. [\text{for every world } w' R w \text{ in which the claims of } x_c \text{ in } w \text{ are true, it holds that } w' \in p]$
(where x_c is understood as the contextually supplied source of the relevant claims)

This entry gives us the following **truth conditions for (2)**:

- (5) a. (2) is true in w iff Anna is in Paris in every world $w' R w$ in which the claims of x_c in w are true
b. (2) is true in w iff the claims of x_c entail that Anna is in Paris

One problem for the entry in (4) is that *sollen*_{REP} can be used even if there is no »contextually supplied source«. However, suitably restricted existential quantification over x_c might be a solution for such cases.

The idea behind (4) seems to be that $\llbracket \textit{soll}(\phi) \rrbracket$ is roughly equivalent to $\llbracket x_c \textit{said that } \phi \rrbracket$. In the following the reportative component of *sollen*_{REP} will be represented by an abstract utterance predicate ‘ $\Delta(x_c, p)$ ’ (x_c said that p). Using the formalism of Discourse Representation Theory (DRT) (Kamp and Reyle 1993), we get the following Discourse Representation Structure (DRS) for (2):



Predicted properties of *sollen*_{REP}:

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ truth-conditional ▪ embedding is grammatical ▪ embedded occurrences receive embedded interpretation | <p style="text-align: right;"><i>in all uses?</i></p> <p style="text-align: right;"><i>unrestrictedly?</i></p> <p style="text-align: right;"><i>always?</i></p> |
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3 Data and generalizations

3.1 Truth-conditionality

The issue:

- Given an evidentiality marker EV in a language L, is EV truth-conditional?

Some tests for truth-conditionality:

- Embeddability: in the antecedent of conditionals, under factive verbs
- Challengability (assent/dissent)
- Scope interaction: with propositional-level operators, e.g. negation

Evidentials do not form a homogeneous class cross-linguistically:

- Semantic accounts of evidentials (modal, presuppositional):
e.g. Izvorski (1997), McCready and Ogata (2007), Matthewson *et al.* (2007)
- Pragmatic accounts of evidentials (illocutionary force modifiers):
e.g. Faller (2002, 2006)

Embedding test: *sollen*_{REP} has both truth-conditional (cf. (7a)) and non-truth-conditional uses (cf. (7b)).

- (7) a. Wenn es morgen regnen *soll*, müssen wir die Fahrräder abdecken
'If *it is said that* it is going to rain tomorrow, we have to cover the bicycles'
- b. Die Dame müsste mindestens um zehn Jahre älter sein als sie tatsächlich ist,
wenn sie zu dem Bilde Modell gestanden haben *soll*
'The woman would have to be at least ten years older than she actually is,
if she had acted as a model for this painting (*as it is alleged*)'

However, it can be argued that the use in (7b) is not *non-truth-conditional* but rather *parenthetical*.

Parentheticals can be handled in truth-conditional semantics (cf. e.g. Asher (2000), Potts (2005)).

Conclusion:

- *sollen*_{REP} is truth-conditional, but has assertive and parenthetical uses
(More on these readings in sec. 3.3.2 and 4.)

3.2 Speaker commitment

The issue:

- Given an evidentiality marker EV in a language L,
does EV lexically encode a modification of the degree of speaker commitment?

Background:

- Evidentials are often taken to not only indicate the type of source of evidence,
but also a certain (increased or decreased) degree of speaker commitment
- Evidential hierarchies, e.g.:
 - DIRECT > INFERRED > REPORTED

- These hierarchies are best conceived of as partial orders (Faller 2002) and context-dependent (Davis et al. 2007)
- Modeling change of speaker commitment (Davis et al. 2007)
 - Every context c has a quality threshold $c_\tau \in [0, 1]$
 - Principle of Quality:
An agent A can felicitously assert p in context c only if $P(p \mid \text{Dox}_{A,c}) \geq c_\tau$.
 - An evidential **ev** changes c_τ to $\mu_c(\mathbf{ev})$, where
 $\mu_c(\mathbf{ev}) = P(\phi_{\mathbf{ev}} \mid c_{CG})$, and
 $\phi_{\mathbf{ev}}$ is the proposition that a situation in which an agent obtains **ev**-type evidence for p is also a situation in which p is true
 - e.g. if I use a reportative evidential, the quality threshold is changed to the probability that, given the current common ground, if I was told that p it is true that p

*sollen*_{REP} and speaker commitment:

- *sollen*_{REP} is often taken to indicate a reduced speaker commitment, doubt or skepticism
- Does *sollen*_{REP} lexically encode speaker doubt?
- Mortelmans (2000, 136), results of corpus study:
 - *sollen*_{REP} is compatible with speaker skepticism
 - but in practice this usage is rare (5/137, 1 declarative)
 - the speaker's skepticism is usually explicitly marked
- **Conclusion:**
 - *sollen*_{REP} **does not lexically encode speaker doubt**. Skeptic overtones are pragmatic effects.
 - *sollen*_{REP} conveys a shift of responsibility (as part of the reportative meaning)
Speaker is not committed to the truth of the reported proposition, but to the existence of a report

3.3 Embedding evidentials

The issue:

- Given an evidentiality marker EV in language L,
(under what circumstances) can EV occur in clausal complements?

Evidentials do not form a homogeneous class cross-linguistically:

- Evidentials cannot be embedded at all:
Abkhaz, Eastern Pomo, Turkic languages, Baniwa, Fasu, Quechua, Panare (Aikhenvald 2004, 8.1.3)
- Evidentials can be embedded in restricted contexts:
Tibetan (Garrett 2001), Bulgarian (Sauerland and Schenner 2007), German

Embedding *sollen*_{REP}:

- Distribution: Which embedding predicates license *sollen*_{REP} in their clausal complements? (→ 3.3.1)
- Interpretation: How is embedded *sollen*_{REP} interpreted? (→ 3.3.2)

3.3.1 The distribution of embedded *sollen*_{REP}

Three basic groups of embedding predicates that license *sollen*_{REP} in their complements (Schenner 2007):

- (8) Predicates that allow *sollen*_{REP} in their complement clause
 - a. **communication predicates**
 - i. speech/text production (utterance) predicates:
e.g. *behaupten* ('to claim'), *erzählen* ('to tell') *berichten* ('to report')
 - ii. speech/text perception predicates: e.g. *hören* ('to hear'), *lesen* ('to read')
 - b. **(semi-)factive predicates**
 - i. epistemic (semi-)factives: e.g. *wissen* ('to know'), *bekannt sein/werden* ('to be/become known'), *erfahren* ('to find out'), *erinnern* ('to remember')
 - ii. emotive (semi-)factives: *interessant sein* ('to be interesting'), *seltsam sein* ('to be odd'), *bedauern* ('to regret')
 - c. **negative (denial/doubt) predicates**
 - i. negative utterance (denial) predicates: e.g. *abstreiten* ('to deny'), *leugnen* ('to deny')
 - ii. negative epistemic predicates: e.g. *kaum/schwer zu glauben* ('hard to believe'), *nicht glauben können* ('to cannot believe'), *bezweifeln* ('to doubt')
- (9) Predicates that do not (or only marginally) allow *sollen*_{REP} in their complement clause
 - a. direct perception predicates: e.g. *beobachten* ('to observe'), *fühlen* ('to feel')
 - b. desire predicates: e.g. *wünschen* ('to wish'), *hoffen* ('to hope')
 - c. (non-factive, positive) epistemic predicates: e.g. *glauben* ('to believe'), *vermuten* ('to suppose'), *überzeugt sein* ('to be convinced')
 - d. (non-factive) emotive predicates: e.g. *befürchten* ('to fear')
 - e. predicates of (low positive) likelihood: e.g. *möglich sein* ('to be possible')

*sollen*_{REP} does not seem to pose restrictions on the *tense* or *aspect* of the embedding predicate (although the reported proposition is typically imperfective, cf. Abraham (2005)).

3.3.2 The meanings of embedded *sollen*_{REP}

Three readings of *sollen*_{REP} (based on Schenner (2007)):

- **E type: embedded/assertive reading** as in (10)
 $sollen_{REP}(\phi) \approx \lceil \text{it is said that } \phi \rceil$
- **G type: global/non-truth-conditional reading** as in (11)
 $sollen_{REP}(\phi) \approx \lceil \phi, \text{ as it is alleged} \rceil$
- **C type: concord reading** as in (12)
 $sollen_{REP}(\phi) \approx \lceil \phi \rceil$, provided that it is embedded under a communication predicate

- (10) 90 mal 190 Zentimeter: Das waren die Abmessungen von Goethes bescheidenem Bett. Auf den Betrachter wirkt es heute ziemlich kurz, vor allem wenn er weiß, dass Goethe groß von Statur gewesen sein soll. [Die ZEIT 11/2004]
'90 x 190 cm: That was the size of Goethe's humble bed. To the beholder it seems quite short today, especially if they know that *it is said that* Goethe had been tall'

- (11) a. Daß er dem Schüler auch auf den Kopf geschlagen haben *soll*,
streitet der Lehrer entschieden **ab**.
‘The teacher resolutely **denies** that he hit the pupil also on the head (*as it is alleged*)’
- b. Daß Legrenzi sein Lehrer gewesen sein *soll*, ist **unwahrscheinlich**;
auch Studienjahre bei Corelli in Rom sind bloße Vermutung.
‘That Legrenzi had been his teacher (*as it is alleged*), is **unlikely**; ...’
- (12) Es ist irgendwie kindisch, daß gleich **behauptet wird**, daß MS dahinterstecken *soll*
‘It is somehow childish that it is immediately **claimed** that MS is behind it’

Overview: Readings of $CTP(sollen_{REP}(\phi))$:

- (13) E (assertive) $CTP(\Delta(\phi))$
G (global) $\Delta(\phi) \wedge CTP(\phi)$
C (concord) $CTP(\phi)$

There are tentative correlations between the environment of $sollen_{REP}$ and its preferred reading:

(14) <i>environment</i>	<i>typical type of reading</i>
unembedded, under (semi-)factives	E (assertive)
under negative (doubt/denial) predicates	G (global)
under communication predicates	C (concord)

4 Analysis revisited

The purely modal semantics of $sollen_{REP}$ introduced in section 2 wrongly assigns the E type (assertive/embedded) reading to all occurrences of $sollen_{REP}$. The analysis from section 2 has to be revised – two options:

- Ambiguity analysis: $sollen_{REP}$ is lexically ambiguous between E/G/C readings (cf. sec. 4.1)
- Non-ambiguity analysis: The various readings of $sollen_{REP}$ can be derived from a single lexical entry (cf. the presuppositional analysis in sec. 4.2)

4.1 Ambiguity analysis

One way to account for the additional readings of embedded $sollen_{REP}$ is to argue that it is ambiguous between the standard semantics stated in section 2 and a parenthetical (supplemental) reading. In the parenthetical reading, the reportative component is not added to the local context/DRS, but to the global context/DRS (cf. e.g. Asher (2000)).

We get two entries for $sollen_{REP}$:

- $sollen_{REP:1}(p)$: add the condition ‘ $\Delta(x_c, p)$ ’ to the local DRS
- $sollen_{REP:2}(p)$: add the condition p to the local DRS and the condition $\Delta(x_c, p)$ to the global DRS

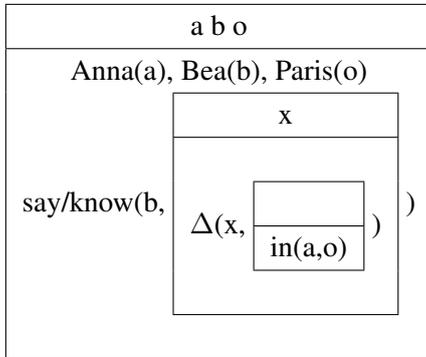
Or, more elegantly, in the multidimensional framework of Potts (2005):

- $sollen_{REP:1} \rightsquigarrow \lambda p \lambda w. [\Delta(p, w)] : \langle \langle s^a, t^a \rangle, \langle s^a, t^a \rangle \rangle$ (assertive, contributes to at-issue content)
- $sollen_{REP:2} \rightsquigarrow \lambda p \lambda w. [\Delta(p, w)] : \langle \langle s^a, t^a \rangle, \langle s^a, t^c \rangle \rangle$ (parenthetical, contributes a conventional implicature)

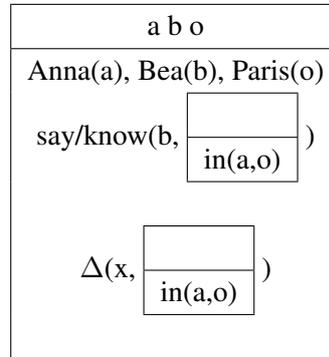
Example:

- (15) Bea sagt/weiß, dass Anna in Paris sein *soll*
 Bea says/knows that Anna in Paris be should

E reading, using $sollen_{REP:1}$:



G/C reading, using $sollen_{REP:2}$:



Problems:

- no explanation why $sollen_{REP:1}$ cannot be embedded in many (non-factive) contexts
- no explanation why $sollen_{REP:2}$ cannot be used in matrix clauses
- unnecessary duplication of lexical entries (cf. section 4.2)

4.2 Presuppositional analysis

If we want a single entry for $sollen_{REP}$, its meaning has to be positionally flexible. This is familiar from the projection behavior of presuppositions.

Binding theory of presupposition (van der Sandt 1992; Geurts 1999):

- (16) a. **Binding:** If Anna owns a cat, Anna's cat is black
 b. **Global accommodation:** If Anna's cat is black, she must be happy
 c. **Local accommodation:** Either Anna doesn't have a cat or Anna's cat is in hiding

Presuppositional DRT: DRSEs are constructed in two steps:

- Preliminary DRS: lexical meaning, presuppositions explicitly represented where they are triggered
- Final DRS: meaning of the sentence in context, presuppositions are resolved

Analysis of $sollen_{REP}$:

Basic idea:

- $sollen_{REP}$ triggers a reportative presupposition $\Delta(x_c, p)$.
- The various readings of $sollen_{REP}$ correspond to the projection possibilities of this presupposition:

type of reading	resolution	configuration	typical environments
E (assertive)	local accommodation	$[CTP](\Delta(x_c, p))$	unembedded, under <i>know</i>
G (global)	global accommodation	$\Delta(x_c, p) \wedge CTP(p)$	under <i>doubt</i>
C (concord)	binding	$CTP(p)$	under <i>say</i>

There is one complication: In the G reading of $sollen_{REP}(p)$, p plays a double role, i.e. it is used twice in the semantic representation.¹ This has to be reflected in the lexical entry.

¹This double usage is typical for supplemental expressions; cf. Potts (2005) for discussion.

The proposed semantics of $sollen_{REP}$ (somewhat simplified: extensional and ignoring tense) is stated in (17). It consists of two parts: (a) a reportative presupposition, (b) an assertive part that is only activated if the resolution of the reportative presupposition violates local informativity. (The second part is required for deriving the G reading, as shown below.)

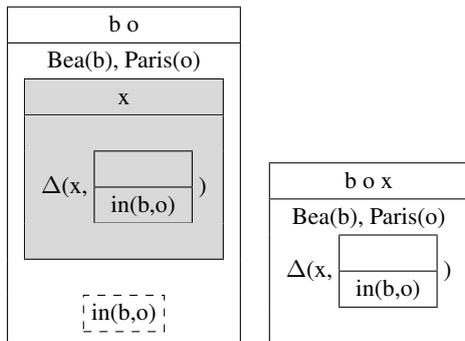
- (17) $sollen_{REP}(p)$: (a) $\partial[x_c \mid \Delta(x_c, p)]$
 (b) p , if the resolution of (a) violates local informativity

In the following examples, presupposed material like in (a) is shaded, conditionally activated material like in (b) is put in dashed boxes.

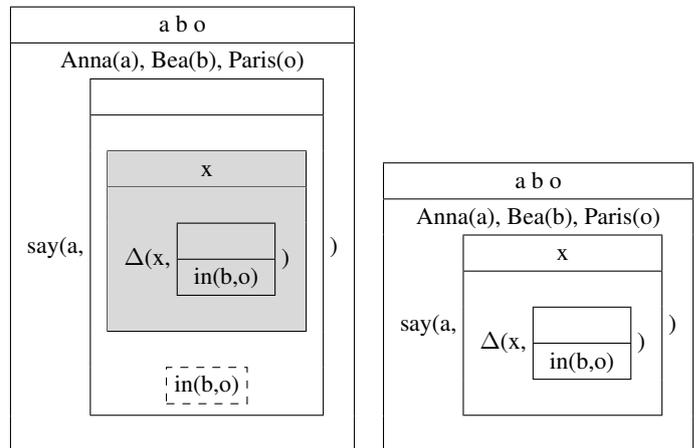
Some applications:

- Local accommodation of unembedded $sollen_{REP}$
- Local accommodation of embedded $sollen_{REP}$

(18) Bea soll in Paris sein
 Bea soll in Paris be

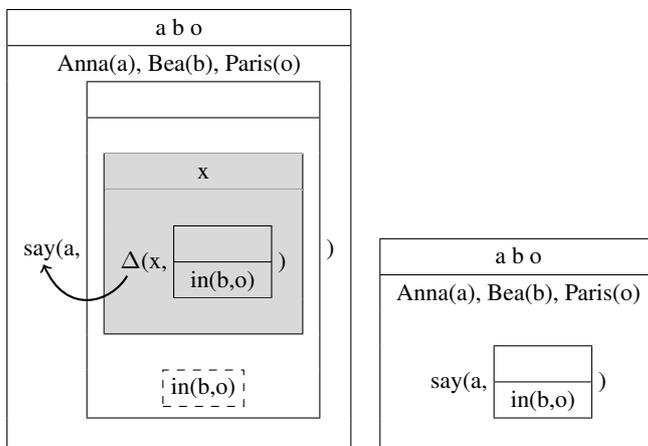


(19) Anna sagt dass Bea in Paris sein soll
 Anna says that Bea in Paris be soll



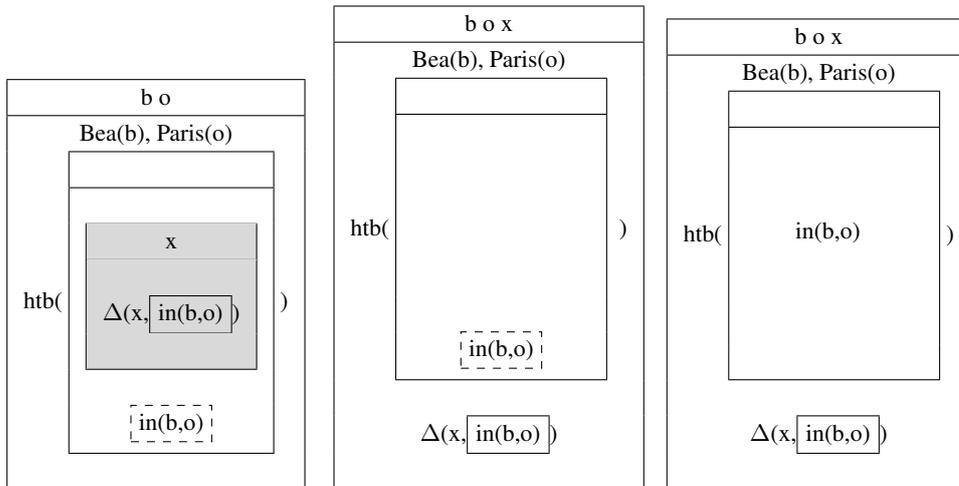
- Binding

(20) Anna sagt dass Bea in Paris sein soll
 Anna says that Bea in Paris be soll



■ Global accommodation

- (21) Es ist schwer zu glauben dass Bea in Paris sein soll
 It is hard to believe that Bea in Paris be soll



5 Conclusion

Main points:

- The German modals *sollen* ‘should’ and *wollen* ‘want’ have evidential (reportative) uses
- *sollen*_{REP} is truth-conditional, i.e. it contributes to the proposition(s) expressed
- *sollen*_{REP} does not lexically encode a reduced degree of speaker commitment
- *sollen*_{REP} can be embedded in complement clauses of three classes of predicates: communication predicates, (semi-)factive predicates, negative (denial/doubt) predicates (cf. (8))
- *sollen*_{REP} has three readings (in embedded contexts) (cf. (13)) that are (weakly) correlated with its linguistic environment (cf. (14))
- The various readings of *sollen*_{REP} can be derived from the single lexical entry given in (17)

Some open issues:

- What exactly are the principles that guide the resolution of the reportative presupposition and are they different from standard projection principles? Do they explain the restrictions on embeddability?
- Are there evidentials in languages with obligatory evidential marking and/or full evidentiality systems that behave similar to *sollen*_{REP} (e.g. truth-conditional, embeddable)?

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