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# Double Face Evidentials in German: Reportative ‘sollen’ and ‘wollen’ in Embedded Contexts

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## Abstract

The evidential (reportative) uses of the German modals *sollen* ‘should’ and *wollen* ‘want’ are typically given a purely modal analysis that yields correct predictions for unembedded cases, but fails to account for many embedded occurrences. Based on a corpus and a questionnaire study it is argued that these modals can receive three distinct kinds of interpretation when they occur embedded in clausal complements (partly dependent on the embedding predicate). A revised analysis of reportative *sollen* is offered that involves a reportative presupposition and a conditionally activated assertive component.

## 1 Introduction

German modal verbs are polyfunctional: They systematically allow for both a circumstantial and an epistemic interpretation. The modals *sollen* ‘should’ and *wollen* ‘want’ are special in that they give rise to evidential instead of epistemic readings, in addition to their circumstantial readings. Both indicate that there is reportative evidence for (the truth of) the prejacent proposition. In the case of *sollen* the source of the report is subject-external (as is the source of the obligation in the circumstantial reading), cf. (1). In the case of *wollen* the source is the sentential subject itself (as is the source of the volition in the circumstantial reading), cf. (2).

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| (1) Anna soll in Oslo sein<br>Anna should in Oslo be<br>a. ‘Anna should be in Oslo<br>(in view of her obligations)’<br>b. ‘Anna is said to be in Oslo’ | (2) Anna will in Oslo sein<br>Anna want in Oslo be<br>a. ‘Anna wants to be in Oslo’<br>b. ‘Anna claims to be in Oslo’ |
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In the following, I will concentrate on the reportative use of *sollen* ‘should’ (henceforth,  $sollen_{\text{REP}}$ ) as illustrated in (1). Almost all of the findings for  $sollen_{\text{REP}}$  hold for (the much less frequent)  $wollen_{\text{REP}}$  as well, but space restrictions prevent a more detailed discussion here.

## 2 A standard modal analysis

Intuitively, by uttering  $sollen_{\text{REP}}(p)$  a speaker conveys that there is reportative evidence for  $p$ . But what does this exactly mean? In order to make this intuition more precise, the following questions are addressed in this section: (a) What exactly is the content of the reportative component? (b) What is the semantic status of this component: truth-conditional or illocutionary? (c) Are additional meaning components conveyed, e.g. reduction or suspension of speaker commitment? The first question is taken up in sec. 2.1, the second in sec. 2.2, the third in sec. 2.3. The discussion results in a preliminary lexical entry for  $sollen_{\text{REP}}$  in the final subsection 2.4.

### 2.1 Characterizing the reportative component

There are various ways to think about and to formally analyze utterances and reports. In a simple case (sufficient for our purposes), an event of reporting involves a speaker, an addressee and a proposition that is conveyed. Like any event, a report is located at some spatiotemporal location (in some possible world). In our simplified setting, a report can be construed as a four-place relation, as in (3-a), abbreviated in (3-b) (‘ $\Delta$ ’ for ‘dicendi’).

- (3) General form of a report:
- a.  $x$  tells  $y$  in  $e$  that  $p$
  - b.  $\Delta(e, x, y, p)$

Reports about reports differ in whether both the speaker and the addressee of the reported report are specified as in ‘Anna told me that  $p$ ’, or only the addressee as in ‘I’ve heard that  $p$ ’, or only the speaker as in ‘Anna said that  $p$ ’. There are also reports about reports where neither the speaker nor the addressee of the original report is explicitly expressed.<sup>1</sup> A special case are reports about *rumors*, as in ‘It is said that  $p$ ’ or ‘There are rumors that  $p$ ’. These are not reports about specific reports, but involve quantification over report events – very roughly, ‘There are report events (in some contextually salient spatiotemporal region) that involve members of some (contextually salient) speech community and convey that the proposition  $p$  is true’.

This rumor reading seems to be the default interpretation of  $sollen_{\text{REP}}$ , e.g. in (1). But the reportative component conveyed by  $sollen_{\text{REP}}$  is compatible with many other kinds of reports. For example, it can be used to report a specific utterance whose producer

<sup>1</sup>There are many more complex cases conceivable that will not be considered here, e.g. if the current reporter only overheard the original report.

(and/or recipient) is explicitly mentioned, e.g. by an adverbial *laut X* ‘according to X’, as in (4-a), or anaphorically inferred, as in (4-b).

- (4) a. Bea *soll<sup>i</sup>* laut Anna<sub>*i*</sub> in Oslo sein  
 Bea should according to Anna in Oslo be  
 ‘Anna said that Bea is in Oslo’  
 b. Anna<sub>*i*</sub> hat uns von Bea erzählt. Bea *soll<sup>i</sup>* in Oslo sein.  
 ‘Anna<sub>*i*</sub> told us about Bea. She<sub>*i*</sub> said that Bea is in Oslo.’

This being said, I will not be concerned with distinguishing the various types of reported reports in the following. The simplified abstract utterance predicate  $\Delta(x, p)$  (roughly, ‘*x* said that *p*’) is sufficient for the purposes of this paper and will be uniformly used to represent the reportative component of *sollen*<sub>REP</sub>.

## 2.2 Truth-conditionality

There is a long-lasting and still unresolved debate on whether epistemic modals are truth-conditional, i.e. contribute to the proposition expressed (cf. e.g. Papafragou (2006)). For evidentials like *sollen*<sub>REP</sub> the same issue arises. One standard test for truth-conditionality is the so-called »embedding test«, according to which an item is truth-conditional iff it can be semantically embedded in the antecedent of a conditional. When we try to apply the test to *sollen*<sub>REP</sub>, we find both cases where *sollen*<sub>REP</sub> falls within the scope of *wenn* ‘if’ and hence is truth-conditional, e.g. in (5), and cases where it does not fall within the scope of *wenn* and hence qualifies as »non-truth-conditional«, e.g. in (6) (cf. Faller (2006) for similar examples). In the consulted corpora (cf. sec. 3.1), the latter cases are much more frequent, but there are also many cases that allow for both a truth-conditional and a non-truth-conditional reading.

- (5) 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. Ich habe es nicht gerne, wenn es hinterher nur einer gewesen sein *soll*<sup>2</sup>  
 ‘I don’t like it, if afterwards *it is said that* it has been only one’  
 (6) a. Wenn Herr Schröder das gesagt haben *soll*, dann müßte er die Konsequenz  
 daraus ziehen und sagen ...<sup>3</sup>  
 ‘If Mr. Schröder said this (*as it is alleged*), he should draw the consequence  
 and say ...’  
 b. Die Dame müßte mindestens um zehn Jahre älter sein, als sie [tatsächlich]  
 ist, wenn sie zu dem Bilde Modell gestanden haben *soll*.<sup>4</sup>  
 ‘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*)’

<sup>2</sup> *Berliner Zeitung*, 02.07.2003, p.23.

<sup>3</sup> *Die ZEIT* 32/1985.

<sup>4</sup> *Vossische Zeitung (Morgen-Ausgabe)*, 03.03.1903, p.5-6.

According to the embedding test, *sollen*<sub>REP</sub> has both truth-conditional and non-truth-conditional uses.<sup>5</sup> However, it can be argued that the seemingly non-truth-conditional uses in (6) are rather *parenthetical* uses, as their English translation by means of *as*-parentheticals also suggests. Parentheticals fail the embedding test, but they can nevertheless be handled in truth-conditional semantics (cf. e.g. Asher (2000), Potts (2005)). The conclusion is that *sollen*<sub>REP</sub> is truth-conditional, but has assertive (non-parenthetical) and parenthetical uses (more on these in section 3.2).

### 2.3 Speaker commitment

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. Scalar hierarchies have been built that order evidentials according to their strength, i.e. the degree of speaker commitment they convey. A typical example would be ‘DIRECT > INFERRED > REPORTED’. Given such a scale, by using a DIRECT evidential marker a speaker indicates a high degree of commitment, whereas using a REPORTED evidential marker would indicate a low degree of commitment. However, these hierarchies are best conceived of as partial orders and as context-dependent, as reflected in the formal model of speaker commitment (changes) recently proposed by Davis et al. (2007).

Turning to *sollen*<sub>REP</sub>, does it indicate (as part of its lexical meaning) a reduced degree of speaker commitment, or even doubt or skepticism, as is sometimes suggested? Here we can rely on Mortelmans (2000, 136), who showed in a corpus study that, while *sollen*<sub>REP</sub> is compatible with speaker skepticism, this usage is in practice very rare (in 5 out of 137 considered cases, only one of which was a declarative clause). In addition, the speaker’s skepticism is usually explicitly marked.

We conclude that *sollen*<sub>REP</sub> does not lexically encode speaker doubt. Skeptic overtones are pragmatic effects. The shift of responsibility conveyed by *sollen*<sub>REP</sub> arises as part of the truth-conditional reportative meaning: The speaker is not committed to the reported proposition, but to the existence of a report of the embedded proposition.

### 2.4 A standard modal account

There are surprisingly few formal accounts of the evidential readings of German modals, a notable exception being Ehrich (2001). She proposes roughly the following lexical entry for *sollen*<sub>REP</sub> (cf. Ehrich (2001, 168)):

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

<sup>5</sup>The type of conditional clause may influence the preferred reading; cf. the distinction between central and peripheral adverbial clauses in Haegeman (2006).

The basic idea behind (7) seems to be that ‘ $sollen_{\text{REP}}(p)$ ’ is equivalent to ‘ $x_c$  said that  $p$ ’ or, using the abstract utterance predicate introduced in section 2.1, ‘ $\Delta(x_c, p)$ ’. Framing the analysis in Discourse Representation Theory (DRT), we get the Discourse Representation Structure (DRS) in (8-b) for (8-a), where  $\Delta$  is understood as a relation between an individual and a DRS. Reportative *wollen* receives a parallel treatment, with the minimal difference that the source of the reported speech act is not a contextually supplied individual or group but rather the sentential subject itself.

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|-----|----|---|-----|----|---|
| (8) | a. | Anna soll in Oslo sein<br>‘Anna is said to be in Oslo’        | (9) | a. | Anna will in Oslo sein<br>‘Anna claims to be in Oslo’       |
|     | b. | [a o x: Anna(a), Oslo(o),<br>$\Delta(x, [: \text{in}(a,o)])]$ |     | b. | [a o: Anna(a), Oslo(o),<br>$\Delta(a, [: \text{in}(a,o)])]$ |

This analysis of German reportative modals correctly captures that  $sollen_{\text{REP}}$  and  $wollen_{\text{REP}}$  are truth-conditional (as noted in section 2.2) and do not indicate a reduced degree of speaker commitment (as noted in section 2.3). Without further assumptions, it predicts that embedded occurrences of  $sollen_{\text{REP}}$  are grammatical and receive the same modal interpretation as unembedded occurrences. These predictions will be tested in the following section.

### 3 Embedded evidentials: Data and generalizations

Evidentials are typically considered to operate at the speech act level and hence to be unembeddable (cf. e.g. Aikhenvald (2004, 8.1.3) for a list of languages that do not allow their evidentials to occur in embedded contexts). However, there are exceptions to this cross-linguistic tendency. Evidentials are embeddable in complement clauses in Tibetan (Garrett, 2001), in Bulgarian (Sauerland and Schenner, 2007) and in German, as shown below. In all of these languages, the embeddability of evidentials is subject to certain restrictions. Reportative evidentials occur most naturally under verba dicendi, but there are additional types of embedding predicates that license evidentials in their complements.

Two questions will guide our investigation of the distribution of embedded  $sollen_{\text{REP}}$  in German. First (in sec. 3.1), which embedding predicates license  $sollen_{\text{REP}}$  in their complement clauses? Second (in sec. 3.2), how is embedded  $sollen_{\text{REP}}$  interpreted?

#### 3.1 The distribution of embedded $sollen_{\text{REP}}$

In order to determine whether  $sollen_{\text{REP}}$  can occur in complement clauses, two strategies have been deployed: (a) a corpus study and (b) a questionnaire study. In the corpus study, occurrences of embedded  $sollen_{\text{REP}}$  in the IDS and DWDS corpora<sup>6</sup> of written German were identified and collected. In total, about 300 corpus examples of  $sollen_{\text{REP}}$

<sup>6</sup>For the IDS corpora (DeReKo) cf. <http://www.ids-mannheim.de/kl/projekte/korpora/>, for the DWDS corpora cf. <http://www.dwds.de/>.

in complement clauses of 160 different complement-taking predicates were considered. Some typical matrix predicates are listed in (10) in order of decreasing frequency:

- (10) *bekannt sein* ('to be known') (9%), *kaum/schwer (zu) glauben* ('hard to believe') and *nicht glauben können* ('cannot believe') (7%), *berichten* ('to report') (6,5%), *es heißt* ('they say') (3%), *schwer vorzustellen* ('hard to imagine') (3%), *behaupten* ('to claim') (2,5%), *erfahren* ('to find out') (2,5%), *hören* ('to hear') (2,5%), *abstreiten* ('to deny') and *leugnen* ('to deny') (2,5%), *dementieren* ('to deny') (2%), *wissen* ('to know') (2%), *kolportieren* ('to hawk') (1,5%), *erzählen* ('to tell') (1,5%), *lesen* ('to read') (1%), *sagen* ('to say') (1%), *bezweifeln* ('to doubt') (1%), *unwahrscheinlich sein* ('to be unlikely') (1%)

In addition, a questionnaire study was conducted. 18 native speakers of German were asked to rank the acceptability of a total of 25 test sentences on a scale ranging from 1 (totally unacceptable) to 5 (perfect). The main goals were to confirm the results of the corpus study and to identify matrix predicates that do *not* allow for embedded *sollen*<sub>REP</sub>. The main results are summarized in (11), where the matrix predicates are grouped according to the mean acceptability value of sentences with *sollen*<sub>REP</sub> in their complement clauses.

- (11) a. 5-4: *hören* ('to hear'), *seltsam sein* ('to be odd'), *sagen* ('to say'), *lesen* ('to read'), *erzählen* ('to tell'), *erinnern* ('to remember'), *entdecken* ('to discover')
- b. 4-3: *interessant sein* ('to be interesting'), *wissen* ('to know'), *bedauern* ('to regret')
- c. 3-2: *glauben* ('to believe'), *träumen* ('to dream'), *fühlen* ('to feel'), *Hinweise geben* ('there be indications'), *bezweifeln* ('to doubt'), *lügen* ('to lie')
- d. 2-1: *möglich sein* ('to be possible'), *überzeugt sein* ('to be convinced'), *wünschen* ('to wish'), *vermuten* ('to suppose'), *hoffen* ('to hope'), *befürchten* ('to fear'), *beobachten* ('to observe')

The results of the corpus study and the questionnaire study match in the following sense: The predicates that frequently occurred with embedded *sollen*<sub>REP</sub> in the corpora received a high acceptability rank in the questionnaire study (e.g. *hören* 'to hear'), while low ranked predicates did not occur in the corpora at all (e.g. *hoffen* 'to hope'). The lists in (12) and (13) summarize and tentatively systematize these findings by grouping the relevant predicates.

- (12) Predicates that allow *sollen*<sub>REP</sub> in their complement clause
- a. speech/text production (utterance) predicates: e.g. *behaupten* ('to claim'), *erzählen* ('to tell'), *berichten* ('to report'), *kolportieren* ('to hawk')
- b. speech/text perception predicates: e.g. *hören* ('to hear'), *lesen* ('to read')
- c. epistemic (semi-)factives: e.g. *wissen* ('to know'), *bekannt sein/werden* ('to be/become known'), *erfahren* ('to find out'), *erinnern* ('to remember')

- d. emotive (semi-)factives: *interessant sein* ('to be interesting'), *seltsam sein* ('to be odd'), *bedauern* ('to regret')
  - e. negative utterance (denial) predicates: e.g. *abstreiten* ('to deny'), *leugnen* ('to deny')
  - f. negative epistemic predicates: e.g. *kaum/schwer zu glauben* ('hard to believe'), *nicht glauben können* ('to cannot believe'), *bezweifeln* ('to doubt')
- (13) Predicates that do not (or only marginally) allow *sollen*<sub>REP</sub> 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')

It is a non-trivial task to identify necessary and sufficient conditions for the embeddability of *sollen*<sub>REP</sub>, given the heterogeneity of the licensing predicates in (12). However, we can identify three main groups that might allow embedded *sollen*<sub>REP</sub> for different reasons (see below):

- (14)
- a. communication predicates
  - b. (semi-)factive predicates
  - c. negative (denial/doubt) predicates

It is clear that the set of predicates that license embedded *sollen*<sub>REP</sub> is distinct from the set of predicates that license embedded root phenomena, e.g. verb-second (V2) complement clauses in German. There are both predicates that allow embedded V2 but not *sollen*<sub>REP</sub> (e.g. *befürchten* 'to fear') and predicates that allow embedded *sollen*<sub>REP</sub> but not V2 (e.g. *interessant sein* 'to be interesting'). However, there is some kind of interaction. It has been argued that an embedded clause can have V2 order if and only if the containing sentence can be used in such a way that the embedded clause constitutes the main point of utterance (cf. Bentzen et al. (2007)). In such cases, where the embedding predicate is used parenthetically, *sollen*<sub>REP</sub> can even occur in complement clauses of predicates in (13), especially non-factive epistemic and emotive predicates like *glauben* 'to believe' or *befürchten* 'to fear', as illustrated in (15-a) and (15-b).

- (15) (Anna does not want to meet Charly at the party today, and Bea knows this. Anna asks Bea, whether Charly will come. Bea answers:)
- a. Ich glaube/befürchte, Charly *soll* kommen  
I think/fear Charly should come
  - b. Charly *soll* kommen, glaube/befürchte ich  
Charly should come think/fear I  
'I think / I'm afraid *it is said that* Charly will come'



This does not show that we should add these predicates to the list of *sollen*<sub>REP</sub> licensers. It rather shows that *sollen*<sub>REP</sub> occurs in (15-a) and (15-b) essentially unembedded. To conclude, the parenthetical use of matrix clauses can render *sollen*<sub>REP</sub> acceptable under certain predicates in (13) that allow for such a use.

### 3.2 The meanings of embedded *sollen*<sub>REP</sub>

In the previous subsection it was shown that *sollen*<sub>REP</sub> can occur in complement clauses of a number of embedding predicates. But how is embedded *sollen*<sub>REP</sub> interpreted? In order to answer this question, all of the corpus examples were semantically evaluated and categorized, which often required a closer inspection of the broader linguistic context. As a result, the following three kinds of reading have been identified:

- (16)
- a. A type reading: assertive (non-parenthetical, truth-conditional)
  - b. G type reading: global (parenthetical, non-truth-conditional)
  - c. C type reading: concord

The *A type reading* (*assertive*) is the one that the standard semantics for *sollen*<sub>REP</sub> in section 2.4 predicts: *sollen*<sub>REP</sub>(*p*) simply means ‘it is said that *p*’. However, in embedded contexts this reading is surprisingly infrequent. While, by introspection, many corpus examples are in principle compatible with an assertive reading, this interpretation is in most cases contextually clearly dispreferred. There are three factors that seem to favor an assertive reading: (a) if the embedding predicate is used parenthetically (cf. (15) above), (b) if the embedding predicate is factive and/or the embedded clause discourse-old or even echoic (cf. (17-a)), and (c) if the embedded clause is an indirect question (cf. (17-b)). A real life example is given in (18).

- (17)
- a. A: Anna *soll* in Oslo sein  
‘It is said that Anna is in Oslo’  
B: Ich weiß, dass Anna in Oslo sein *soll*  
‘I know that it is said that Anna is in Oslo’
  - b. Anna fragte, ob Charly zur Party kommen *soll*  
‘Anna asked whether it is said that Charly is coming to the party’

- (18) 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*.<sup>7</sup>  
‘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’

The *C type reading* (*concord*) of *sollen*<sub>REP</sub>(*p*) is simply *p*, provided that it is embedded under a communication predicate. The existence of this very frequent reading, illustrated

<sup>7</sup>Die ZEIT 11/2004: »Wie man in Deutschland schläft und träumt«.



in (19), has been noted before by Letnes (1997). While an A type reading is in principle available for these sentences, it is contextually strongly dispreferred. For example, the author of (19-a) clearly didn't intend to express that the newspaper had wrongly claimed that *it was said that* the princess gained her peerage dishonestly.

- (19) a. Die Zeitschrift hatte fälschlicherweise behauptet, daß sich die Prinzessin ihren Adelstitel unredlich erworben haben *soll*<sup>8</sup>  
 'The newspaper had wrongly claimed that the princess gained her peerage dishonestly'  
 b. Es ist irgendwie kindisch, daß gleich behauptet wird, daß MS dahinterstecken *soll*<sup>9</sup>  
 'It is somehow childish that it is immediately claimed that MS is behind it'

The *G type reading (global)* of embedded *sollen*<sub>REP</sub>(*p*) can best be paraphrased by a parenthetical construction: '*p*, as it is alleged'. Albeit its availability is somewhat unexpected, this type of reading is quite pervasive in all of the corpora that have been looked at. Some examples are given in (20). The term 'non-truth-conditional' for this reading is somewhat misleading and will be avoided in the following, but has been mentioned, because *sollen*<sub>REP</sub> in the G type reading fails the well-known embedding test for truth-conditionality, as mentioned in sec. 2.2.

- (20) a. Daß er dem Schüler auch auf den Kopf geschlagen haben *soll*, streitet der Lehrer entschieden ab.<sup>10</sup>  
 'The teacher resolutely denies that he hit the pupil also on the head (*as it is alleged*)'  
 b. Daß es in ganz China im Vorjahr "nur" etwas mehr als 60.000 Verkehrstote gegeben haben *soll*, erscheint angesichts dieser rauen Sitten wie ein Wunder.<sup>11</sup>  
 'In view of these tough customs it seems like a miracle that there were "only" slightly more than 60.000 traffic deaths in China last year (*as it is alleged*)'  
 c. Daß Legrenzi sein Lehrer gewesen sein *soll*, ist unwahrscheinlich<sup>12</sup>  
 'That Legrenzi had been his teacher (*as it is alleged*), is unlikely'  
 d. Es ist schwer zu glauben, dass ich der Vater Deines Kindes sein *soll*.<sup>13</sup>  
 'It is hard to believe that I am the father of your child (*as it is alleged*)'

To summarize, embedded *sollen*<sub>REP</sub> can be used in the following three ways (where 'CTP' stands for the complement taking predicate that embeds *sollen*<sub>REP</sub>):<sup>14</sup>

<sup>8</sup>Die Presse, 19.12.1992.

<sup>9</sup><http://www.pro-linux.de/news/2002/4353.html>, accessed 04.04.2007.

<sup>10</sup>Salzburger Nachrichten, 18.01.1997.

<sup>11</sup>Salzburger Nachrichten, 26.11.1994.

<sup>12</sup>Salzburger Nachrichten, 27.07.1991.

<sup>13</sup>Berliner Zeitung, 07.06.2005, p.17.

<sup>14</sup>If 'CTP(*p*)' entails ' $\Delta$ (*p*)', the G and C readings coincide. However, C readings cannot be reduced to G readings in general. The C reading of the following example (Uli Sauerland, p.c.) does not entail that somebody claimed or wrote that the princess is a fraud: *Keine Zeitung hat geschrieben, dass die*

(21)	Readings of $CTP(sollen_{REP}(p))$		typical environment
a.	A (assertive)	$CTP(\Delta(p))$	unembedded, under (semi-)factives
b.	G (global)	$\Delta(p) \wedge CTP(p)$	under negative (doubt/denial) predicates
c.	C (concord)	$CTP(p)$	under communication predicates

The contextually preferred type of reading depends on a variety of factors, the probably most important being the type of the embedding predicate. Even the few examples given above suggest that there are correlations between the type of the matrix predicate and the available readings of embedded  $sollen_{REP}$ . The three main types of  $sollen_{REP}$  licensing predicates listed in (14) seem to be associated with the three types of reading distinguished in (16) as indicated in (21). The unembedded use of  $sollen_{REP}$  patterns with the embedding under (semi-)factives.

## 4 Analysis revisited

The semantics of  $sollen_{REP}$  introduced in section 2.4 wrongly assigns the A type (assertive) reading to all occurrences of  $sollen_{REP}$ . There are two main options for revising the analysis: (a) an *ambiguity* analysis that treats  $sollen_{REP}$  as lexically ambiguous between A/G/C readings, and (b) a *non-ambiguity* analysis where the various readings of  $sollen_{REP}$  are derived from a single lexical entry. These two options are explored in the following subsections.

### 4.1 Ambiguity analysis

One way to account for the additional readings of embedded  $sollen_{REP}$  is to argue that it is lexically ambiguous between the standard semantics stated in section 2.4, a concord and a parenthetical reading. In the latter reading, the reportative component is not added to the local DRS, but to the global DRS. Informally stated and ignoring concord readings for the moment, we get the following two entries for  $sollen_{REP}$ :

- (22)
- a.  $sollen_{REP:1}(p)$ : add the condition ‘ $\Delta(x_c, p)$ ’ to the local DRS
  - b.  $sollen_{REP:2}(p)$ : add the condition  $p$  to the local DRS and the condition  $\Delta(x_c, p)$  to the global DRS

For example, using  $sollen_{REP:1}$  we can derive the A reading of (23-a), shown in (23-b), and using  $sollen_{REP:2}$  we can derive the G reading, shown in (23-c).

- (23)
- a. Bea sagt/weiß, dass Anna in Oslo sein *soll*  
Bea says/knows that Anna in Oslo be should
  - b. [a b o: Anna(a), Bea(b), Oslo(o), say/know(b,[x:  $\Delta(x, [ : in(a, o) ] ] ) ) ] ]$
  - c. [a b o x: Anna(a), Bea(b), Oslo(o), say/know(b,[ : in(a, o) ]),  $\Delta(x, [ : in(a, o) ] ) ]$

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*Prinzessin eine Betrügerin sein soll* ‘No newspaper wrote that the princess is a fraud’.

There are other ways of implementing the basic idea that  $sollen_{\text{REP}}$  has a non-parenthetical and a parenthetical reading, depending on one's favorite theory of supplements. For example, using the multidimensional framework of Potts (2005), we could replace (22) by (24).

$$(24) \quad \begin{array}{l} \text{a. } sollen_{\text{REP}:1} \rightsquigarrow \lambda p \lambda x_c \lambda w. [\Delta(p)(x_c)(w)] : \langle \langle s^a, t^a \rangle, \langle e^a, \langle s^a, t^a \rangle \rangle \rangle \\ \text{b. } sollen_{\text{REP}:2} \rightsquigarrow \lambda p \lambda x_c \lambda w. [\Delta(p)(x_c)(w)] : \langle \langle s^a, t^a \rangle, \langle e^a, \langle s^a, t^c \rangle \rangle \rangle \end{array}$$

The difference between (24-a) and (24-b) is that the assertive (non-parenthetical) entry (24-a) contributes the reportative component to the at-issue content, while the parenthetical entry (24-b) contributes it as a conventional implicature in the sense of Potts (2005).

No matter what version, the ambiguity approach suffers from several problems. Without further assumptions, it radically overgenerates in two cases. First, it does not predict that (and hence cannot explain why)  $sollen_{\text{REP}:1}$  cannot be embedded in many (especially non-factive) contexts. Second, it does not predict that  $sollen_{\text{REP}:2}$  cannot be used in matrix clauses. Of course, we could come up with some principles that restrict possible disambiguations of  $sollen_{\text{REP}}$ , e.g. along the lines in (25).

$$(25) \quad \begin{array}{l} \text{a. } \text{Do not commit the speaker to } p, \text{ if she uttered '... } sollen_{\text{REP}}(p)\text{...}' \\ \text{b. } \text{Prefer the strongest meaning, i.e. prefer } sollen_{\text{REP}:2} \text{ to } sollen_{\text{REP}:1} \end{array}$$

However, this line of thought will not be pursued in this paper, since there is an additional reason to disfavor the ambiguity approach. By economy considerations, a non-ambiguity approach that does not require a duplication of lexical entries is to be preferred over the ambiguity approach. Hence we shift our endeavors to developing a non-ambiguity account of  $sollen_{\text{REP}}$  in section 4.2.

## 4.2 Non-ambiguity analysis: A presuppositional account

If we want a single entry for  $sollen_{\text{REP}}$ , its meaning has to be, in a sense, positionally flexible, since the reportative component conveyed by  $sollen_{\text{REP}}$  sometimes seems to be contributed to the local DRS, sometimes to the global DRS. This kind of flexibility is reminiscent of the projection behavior of presuppositions, »agile creatures eager to leave their homes« (Geurts, 1999, 114). In presuppositional DRT, DRSEs are constructed in two steps. First, a *preliminary DRS* for a sentence is built based on the lexical meanings of its parts. Presuppositions are explicitly represented where they are triggered. Second, the sentence is put in context, its presuppositions are resolved, ultimately leading to the *final DRS* of the sentence. There are two basic options for the resolution of presuppositions: Binding, as in (26-a), and accommodation, where we can further (minimally) distinguish between global (non-local) accommodation as in (26-b) and local (non-global) accommodation as in (26-c) (cf. e.g. Geurts (1999)).

- (26) a. If Anna owns a cat, Anna's cat is black  
 b. If Anna's cat is black, she must be happy  
 c. Either Anna doesn't have a cat or Anna's cat is in hiding

The basic idea of our non-ambiguity analysis of *sollen*<sub>REP</sub> is that it triggers a reportative presupposition ' $\Delta(x_c, p)$ '. It turns out that the three readings of (embedded) *sollen*<sub>REP</sub> correspond to the three basic projection possibilities of this presupposition:

(27) type of reading	resolution	configuration	typical environments
A (assertive)	local accomm.	[CTP]( $\Delta(x_c, p)$ )	unembedded, under <i>know</i>
G (global)	global accomm.	$\Delta(x_c, p) \wedge \text{CTP}(p)$	under <i>doubt</i>
C (concord)	binding	CTP( $p$ )	under <i>say</i>

There is one complication: In the G reading of *sollen*<sub>REP</sub>( $p$ ), the proposition  $p$  plays a double role, i.e. it is used twice in the semantic representation.<sup>15</sup> The proposed semantics of *sollen*<sub>REP</sub> (somewhat simplified: extensional and ignoring tense) is stated in (28). 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.)

- (28) *sollen*<sub>REP</sub>( $p$ ): (a)  $\partial[x_c \mid \Delta(x_c, p)]$   
 (b)  $p$ , if the resolution of (a) violates local informativity

The idea that evidential expressions contribute a presupposition is not new (cf. e.g. [Izvorski \(1997\)](#)).<sup>16</sup> However, as will become clear in a moment, the presupposition of *sollen*<sub>REP</sub> in (a) does not behave exactly like a run-of-the-mill presupposition (if there is such a thing). More specifically, the projection profile of the *sollen*<sub>REP</sub> presupposition features a *low accommodation threshold* (thus the possibility of binding does not strictly exclude the possibility of accommodation). The second component in the semantics of *sollen*<sub>REP</sub> in (28) is an instantiation of the idea that an expression has to have some effect on its local DRS (local informativity). This condition is violated, for example, if the reportative presupposition of *sollen*<sub>REP</sub>( $p$ ) is non-locally accommodated. In such a case, local informativity is rescued by adding  $p$  to the local DRS (stripping off *sollen*<sub>REP</sub>).

Let's look at some applications.<sup>17</sup> The simplest cases are occurrences of unembedded *sollen*<sub>REP</sub>, as in (29-a). Since binding is not an option here, the reportative component has to be accommodated in the local (= global) DRS, satisfying local informativity.

<sup>15</sup>This double usage is typical for supplemental expressions; cf. [Potts \(2005\)](#) for discussion.

<sup>16</sup>There is a conceptual problem with this idea: A core characteristic of presuppositions is that they are »taken for granted« – but evidential presuppositions typically are not (cf. [Matthewson et al. \(2007, 36\)](#) for discussion). We will stick to the term 'presupposition' here, but use it in a technical sense for elements that can project.

<sup>17</sup>In the following examples, presupposed material is underlined, conditionally activated material is in italics.

- (29) a. Bea *soll* in Oslo sein  
 Bea should in Oslo be  
 ‘It is said that Bea is in Oslo’  
 b. [b o  $\underline{x}$ : Bea(b), Oslo(o),  $\Delta(x, [ \text{in}(b,o) ])$ ,  $\text{in}(b,o)$ ]  
 c. [b o x: Bea(b), Oslo(o),  $\Delta(x, [ \text{in}(b,o) ])$ ]

If *sollen*<sub>REP</sub> is embedded under an utterance predicate, as in (30-a), its reportative presupposition can be bound to it. The presence of the conditionally activated complement of *sollen*<sub>REP</sub> might facilitate this process which results in the concord interpretation in (30-c).

- (30) a. Anna sagt dass Bea in Oslo sein *soll*  
 Anna says that Bea in Oslo be should  
 ‘Anna says that Bea is in Oslo’  
 b. [a b o: Anna(a), Bea(b), Oslo(o), say(a, [ $\underline{x}$ :  $\Delta(x, [ \text{in}(b,o) ])$ ],  $\text{in}(b,o)$ )]  
 c. [a b o: Anna(a), Bea(b), Oslo(o), say(a, [  $\text{in}(b,o)$  ])]

If the reportative presupposition cannot be bound, global accommodation is the preferred option, as illustrated in (31-a). Since global accommodation is non-local here (in contrast to (29-a)), local informativity is violated in (31-c), which triggers the (b) component in (28). The resulting DRS in (31-d) correctly captures the interpretation of (31-a).

- (31) a. Es ist schwer zu glauben dass Bea in Oslo sein *soll*  
 It is hard to believe that Bea in Oslo be should  
 ‘It is hard to believe that Bea is in Oslo (as it is alleged)’  
 b. [b o: Bea(b), Oslo(o), hard-to-believe([ $\underline{x}$ :  $\Delta(x, [ \text{in}(b,o) ])$ ],  $\text{in}(b,o)$ )]  
 c. [b o x: Bea(b), Oslo(o), hard-to-believe([  $\text{in}(b,o)$  ],  $\Delta(x, [ \text{in}(b,o) ])$ )]  
 d. [b o x: Bea(b), Oslo(o), hard-to-believe([  $\text{in}(b,o)$  ],  $\Delta(x, [ \text{in}(b,o) ])$ )]

If *sollen*<sub>REP</sub> occurs in embedded contexts, local accommodation is also an option, albeit usually a dispreferred one (cf. section 3.2). For example, (30-a), repeated as (32-a), can get the interpretation in (32-c), if local accommodation is enforced.

- (32) a. Anna sagt dass Bea in Oslo sein *soll*  
 Anna says that Bea in Oslo be should  
 ‘Anna says that *it is said that* Bea is in Oslo’  
 b. [a b o: Anna(a), Bea(b), Oslo(o), say(a, [ $\underline{x}$ :  $\Delta(x, [ \text{in}(b,o) ])$ ],  $\text{in}(b,o)$ )]  
 c. [a b o: Anna(a), Bea(b), Oslo(o), say(a, [ $\underline{x}$ :  $\Delta(x, [ \text{in}(b,o) ])$  ])]

In section 3.2 it was noted that (semi-)factive predicates seem to favor local accommodation readings. If we assume that presuppositions are resolved bottom-up, i.e. presuppositions of deeper embedded triggers are resolved prior to presuppositions of higher triggers, then we might be able to explain this finding. For example, semifactive *wissen* ‘know’ presupposes that its clausal complement is true. But the content of its complement in

(33-a) depends (assuming bottom-up resolution) on the resolution of the presupposition of *sollen*<sub>REP</sub>. If the presupposition of *sollen*<sub>REP</sub>(*p*) were accommodated globally, the complement of *wissen* and hence a presupposition of the sentence would be *p*, as shown in (33-b). But this would render the contribution of *sollen*<sub>REP</sub> superfluous. By contrast, if the presupposition of *sollen*<sub>REP</sub> is accommodated locally, we get the sensible interpretation in (33-c): »It is said that Bea is in Oslo and Anna knows that«.

- (33) a. Anna weiß dass Bea in Oslo sein *soll*  
 Anna knows that Bea in Oslo be should  
 b. [a b o x: A.(a), B.(b), O.(o), know(a,[: in(b,o)]), Δ(x,[: in(b,o)]), in(b,o)]  
 c. [a b o x: A.(a), B.(b), O.(o), know(a,[y: Δ(y,[: in(b,o)])]), Δ(x,[: in(b,o)])]

## 5 Conclusion

The German modal *sollen* ‘should’ in its reportative use is truth-conditional (cf. sec. 2.2) and does not lexically encode a reduced degree of speaker commitment (cf. sec. 2.3). It has been shown that *sollen*<sub>REP</sub> can be embedded in complement clauses of at least three classes of embedding predicates: communication predicates, (semi-)factive predicates and certain negative (denial/doubt) predicates. Embedded occurrences of *sollen*<sub>REP</sub> can have one of three readings that have been labeled A (assertive), G (global) and C (concord).

The availability of G and C readings are problematic for standard accounts of *sollen*<sub>REP</sub> and necessitate a more fine-grained analysis. In section 4, two proposals have been considered that are capable of deriving the additional readings. While the non-ambiguity approach in section 4.2 is to be favored on conceptual grounds, a further elaboration of both accounts is required before a final decision between them can be made. Two topics that bear on this issue are discussed in Schenner (2008): First, a comparative analysis of the reportative subjunctive, another grammaticalized reportative strategy in German (cf. Fabricius-Hansen and Sæbø (2004)), that accounts for both the similarities and the differences to *sollen*<sub>REP</sub>. Second, an analysis of the interaction of multiple reportative strategies in a single sentence that is capable of correctly predicting the availability of evidential concord readings.

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