

# Reportative deontic modality in English and German<sup>1</sup>

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**Abstract.** We discuss the dual uses of the English adjectival modal *be supposed to* and the German modal auxiliary *sollen* under their deontic and evidential readings. While deontic modality is a familiar category, we discuss novel data on the expression of reportative evidentiality in English. We argue for a truly unified analysis for both *be supposed to* and *sollen*, which are specified for a reportative informational conversational background. The apparent difference in “flavours” (reportative vs. deontic) is an illusion, caused by differences in the types of reports that feed the ordering source. Although we assign *be supposed to* and *sollen* an identical semantics, their distributions are not identical. We hypothesize that this is due to the fact that in German, *sollen* competes with the quotative modal *wollen*, which carries a stronger presupposition, triggering Maximize Presupposition effects which are absent in English.

**Keywords:** modality, deontic, reportative, *be supposed to*, *sollen*, *wollen*

## 1. Introduction

In this paper, we discuss the dual uses of the English adjectival modal construction *be supposed to* and the German modal auxiliary *sollen*. In both languages, these modal expressions display both deontic and evidential readings. Specifically, the evidential reading has a reportative flavour, whereby the source of evidence for a claim is a prior report. As shown in (1), sentences containing *be supposed to* and *sollen* are compatible with contexts favouring either a deontic or reportative interpretation.

(1) **Deontic context:** A student asks the department administrator when Professor Plum will be in the office. The university’s rules state that professors must have office hours between 10-11am every day. The administrator says:

**Reportative context:** A student asks the department administrator when Professor Plum will be in the office. Earlier that day, Professor Plum’s partner called the administrator and said that they are running late but will come in at 10am. The administrator says:

- a. Professor Plum **is supposed to** be here at 10.
- b. Professor Plum **soll** um 10 hier sein.  
Professor Plum **SOLL** at 10 here be

While the reportative use of *sollen* has received some attention in the literature (Faller, 2006, 2012; Hinterwimmer, 2013; Kratzer, 1981, 2012; Schenner, 2008), we show here that reportative evidentiality is also lexicalized in English in *be supposed to*. This observation complements the work of von Stechow and Gillies (2010), who argue that the epistemic modal *must* in English

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lexicalizes an indirect inferential evidential component.

Furthermore, although deontic modality is a familiar category, we show that the deontic flavour of these modal expressions is narrower than the deontic uses of *must* or *have to*. Specifically, *be supposed to* and *sollen* cannot be used performatively, i.e., they can only describe obligations that already exist, and cannot be used to place new obligations. We make use of this fact to argue for a unified analysis of the reportative and deontic uses of these modals. Specifically, we reduce the deontic use to the reportative one, arguing that these apparently different “flavours” are both derived from a circumstantial modal base and a reportative informational ordering source within a Kratzerian framework. We furthermore argue that our account fares better than recent analyses for *sollen* invoking intentional acts (Hinterwimmer, 2013) or external bouletic ordering sources (Matthewson and Truckenbrodt, 2017).

This paper proceeds as follows. We first discuss the deontic use of *be supposed to* and *sollen* in section 2. Section 3 discusses the reportative use. We present our unified analysis for both uses in section 4. Section 5 focuses on German *sollen* and its competitor, the reportative modal *wollen*, while section 6 discusses previous accounts. Section 7 concludes.

## 2. Non-performative deontic use

We first discuss the deontic use of *be supposed to* and *sollen* in more detail, as already shown in (1). Like other deontic modals, these can be used in different contexts to convey different flavours of deontic necessities. For instance in (2) they can be used to talk about laws, while in (3) they are used to talk about rules.

- (2) Context: Your friend has just parked in front of a fire hydrant. You say:
- a. You're not **supposed to** park there.
  - b. Du **sollst** hier nicht parken.  
you SOLL here not park (reports a law)
- (3) Context: Your friend has just landed on a community chest in Monopoly. You say:
- a. You're **supposed to** pick up a card.
  - b. Du **sollst** eine Karte nehmen.  
you SOLL a card take (reports a rule)

However, an important feature of *be supposed to* and *sollen* is that they cannot be used performatively. Rather, they can only be used to report on existing laws or rules. This can be shown in (4), where the context provides that the rules of the game Calvinball are not pre-determined, but made up on the spot. In such a context, *be supposed to* and *sollen* cannot be used, whereas other deontic modals such as *must*, *have to* or *müssen* ‘must’ can be.

- (4) Context: You are playing Calvinball, a game where the rules are made up on the spot, and no rule can be re-used. The players shout out the rules as they make them up.
- a. Now you {**have to/must/#are supposed to**} throw the ball across the field.
  - b. Jetzt {**musst/#sollst**} du den Ball über das Feld werfen.  
now must/SOLL you the ball across the field throw



(*Calvin and Hobbes*, Bill Watterson, originally published 26.08.1990)

Note that the problem with (4) is not that the speaker is the source of the rule. As shown in (5) and (6), the speaker can serve as the deontic authority.

- (5) Context: Parent to child:
- You're **supposed to** go to bed by 9pm.
  - Du **sollst** um 9 im Bett sein.  
you SOLL at 9 in.the bed be
- (6) Context: The speaker made a New Year's resolution to smoke less this year. On January 2, she is offered a cigarette.
- I'm **supposed to** smoke less this year.
  - Ich **soll** dieses Jahr weniger rauchen.  
I SOLL this year less smoke

Lauer (2015) discusses “anti-performative” modals, and argues that the restrictions on performativity can be derived from the temporal profile of such expressions. Lauer argues that anti-performative modals are simple stative predicates. Like other statives, they are required to be true throughout the reference time interval. In the case of present-tense modals, this means the modal statement is required to be true throughout the speech time. We can schematize this restriction in the case of *be supposed to* and *sollen* as in (7). In prose: for all moments  $m$  contained within the speech time  $\tau(u)$ , it is necessary at  $m$  that  $p$ .

$$(7) \quad \llbracket \text{be supposed to/sollen}(p) \rrbracket^u = 1 \text{ iff } \forall m \in \tau(u) : \Box_m(p) \quad (\text{sketch})$$

Performativity clashes with these temporal requirements on stative modals. Intuitively, an event of imposing an obligation will result in a state of an obligation holding. Let us assume with Lauer that if a state  $s$  is the result of an event  $e$ , then  $s$  will not obtain before the final moment of  $\tau(e)$ . It follows then, that if an obligation is created as a result of uttering a modal sentence, then a present tense stative modal statement will never be true at speech time, since the condition in (7) that the requirement that  $p$  hold throughout the speech time would be violated. Following this chain of reasoning, for a sentence containing present tense *be supposed to* or *sollen* to be

true, it must be the case that the obligation already exists before the speech time. A performative use of these modals is thus ruled out.<sup>2</sup>

The upshot of this discussion is that although *be supposed to* and *sollen* can take on a deontic flavour, they behave differently from other deontic modals in being anti-performative. That is, they require a preceding event that brings the obligation into existence. We now turn to describe the reportative use in more detail, which also requires an antecedent event, namely a report.

### 3. Reportative use

Cross-linguistic research in the last decade or so has shown that modals can encode a speaker's evidence type, and in some languages, evidence type restrictions are grammaticalized in evidential modals (e.g., Faller 2012; Matthewson et al. 2007). Even for English, it has been argued by von Stechow and Gillies (2010) that epistemic *must* lexicalizes an inferential evidential component. Whereas the reportative use of *sollen* has been discussed in the literature already (e.g., Faller 2006, 2012; Hinterwimmer 2013; Kratzer 1981, 2012; Schenner 2008), we add here novel data from English that the modal construction *be supposed to* also has a reportative use, cf. (1).

Adapting the diagnostics from von Stechow and Gillies (2010), we show that the indirect evidence component of *be supposed to* and *sollen* does not have an inferential flavour. While *must* and *müssen* are acceptable in the inferential context in (8), *be supposed to* and *sollen* are not. Meanwhile, like *must* and *müssen*, *be supposed to* and *sollen* are unacceptable when direct evidence for the prejacent proposition is available, as shown in (9).

- (8) Context: The ball is either under cup A, cup B, or cup C. It's not under A, and it's not under B.
- a. The ball must be under cup C. / Die Kugel muss unter Becher C sein.
  - b. #It's **supposed to** be under cup C. / #Sie **soll** unter Becher C sein.
- (9) Context: You look out the window and see that it is raining.
- a. It is raining. / Es regnet.
  - b. #It must be raining. / #Es muss regnen.
  - c. #It's **supposed to** be raining. / #Es **soll** regnen.

We wish to also highlight two additional properties of *be supposed to* and *sollen* in connection with the literature on modal evidentials (e.g., Faller 2012; Matthewson et al. 2007; Schenner 2008). First, note that *be supposed to* and *sollen* can be embedded.<sup>3</sup> This is shown in (10), where *be supposed to* and *sollen* occur in the antecedent of a conditional. We note that the modals are interpreted within the antecedent, and do not take scope over the entire conditional.

<sup>2</sup>On Lauer's view, there are no truly performative uses of deontic modals – rather, these are actually bouletic modals tracking speaker preferences, uttered by a speaker who has deontic authority. There is a possibly interesting connection here to the proposal by Matthewson and Truckenbrodt (2017), which we discuss further in section 6.2.

<sup>3</sup>See Schenner (2008) for discussion of the embedding possibilities for *sollen* based on corpus data.

- (10) Context: You and a friend are planning to go sightseeing in Edinburgh. Your friend asks if you should bring umbrellas. You don't know what the weather will be like, so you say:
- a. If it's **supposed to** rain, we will bring umbrellas.  
 = 'If it is reported that it will rain, we will bring umbrellas.'  
 ≠ 'It is reported that if it will rain, we will bring umbrellas.'
  - b. Wenn es regnen **soll**, bringen wir Schirme mit.  
 = 'Wenn berichtet wird, dass es regnen wird, bringen wir Schirme mit.'  
 ≠ 'Es wird berichtet, dass wenn es regnet, wir Schirme mitbringen.'

Second, note that the reportative component projects out of negation. For instance in (11), the reportative component of *be supposed to* or *sollen* is not what is being denied. It appears then that the reportative component *be supposed to* and *sollen* is presuppositional, as has been claimed for evidential modals in other languages (e.g., Matthewson et al. 2007).

- (11) Context: You and a friend are planning to go sightseeing in Edinburgh. Your friend asks if you should bring umbrellas. You say:
- a. It's not **supposed to** rain.  
 = 'It is reported that it won't rain.'  
 ≠ 'There is no reportative evidence that it will rain.'  
 ≠ 'The evidence that it will rain is not reportative.'
  - b. Es **soll** nicht regnen.  
 = 'Es wird berichtet, dass es nicht regnen wird.'  
 ≠ 'Es gibt keine Berichte darüber, dass es regnen wird.'  
 ≠ 'Die Evidenz dafür, dass es regnen wird, ist nicht reportativ.'

In sum, the projection behaviour of *be supposed to* and *sollen* is similar to what has been described for other reportative evidential modals.

We now turn to which sources for reports can serve to license *be supposed to* and *sollen*. As illustrated in (10) and (11), speakers can use information they got from a specific definite entity, such as a weather report website. The reportative context in (1) showed that a speaker's utterance can also serve as a source for a report. Below we discuss some cases where identifying the source is more difficult.

The source of a report may be indefinite or unknown. As illustrated in (12), the precise identity, and in turn the reliability of the report, may be unknown.

- (12) Context: A and B are newspaper reporters working on a story about a corrupt politician. A receives an anonymous phone call from an individual claiming that the politician accepted a bribe from a construction company. B asks what the phone call was about, and A replies:
- a. The politician is **supposed to** have accepted a bribe from the construction company on August 15.
  - b. Der Politiker **soll** am 15. August Schmiergeld von der  
the politician SOLL on 15 August bribe from the  
Baufirma angenommen haben.  
construction.company accepted have

Here, the identity of the anonymous caller is unknown to A, but nevertheless serves as a source for a report made by *be supposed to/sollen*. When asked later, A is able to pick out the time of the report: namely when the call happened. However, A is not able to pick out the source of the report as A's acquaintance relation to the source does not allow this.

In some cases, speakers can use *be supposed to* and *sollen* reportatively even when they are not able to pick the individual who is the source of the report or even the exact time the report was made. Consider the following context in (13).

- (13) Context: A goes to dinner with a group of people. The conversation turns to ways to avoid sunburn. B says he has started to drink carrot juice.
- B: Carrot juice is **supposed to** protect the skin from sunburn.  
B: Möhrensaft **soll** vor Sonnenbrand schützen.  
carrot.juice SOLL before sunburn protect  
A: Oh, where did you hear that?  
B: I don't remember.

In this context, speaker B can use *sollen* to indicate that he has reportative evidence for his statement, even though he cannot remember the exact source of the information.

In a context where the speaker is the source of the prejacent *p* and has complete control over *p*, this may be reported using *be supposed to/sollen(p)*.<sup>4</sup> As shown in (14), a modified version of (6), the speaker may not have even said anything aloud to anyone.

- (14) Context: The speaker spent New Year's at home by herself, but made a resolution to smoke less this year. On January 2, she is offered a cigarette.
- a. I'm **supposed to** smoke less this year.
  - b. Ich **soll** dieses Jahr weniger rauchen.  
I SOLL this year less smoke

We also note that *be supposed to/sollen(p)* can be licensed even if a report was not literally of *p*, but where *p* is entailed or conversationally follows from a report in context.

<sup>4</sup>In terms of a public commitment, which we will make reference to in our analysis in the next section, a commitment counts as public as soon as the speaker has formed a conscious thought about it.

- (15) Context: A goes to dinner with a group of people who are discussing how to avoid sunburn. B says he has started drinking carrot juice. Then A comes home and reports what she learned.
- a. Carrot juice is **supposed to** help avoid sunburn.
  - b. Möhrensaft **soll** vor Sonnenbrand schützen.  
carrot.juice SOLL against sunburn protect

#### 4. Towards a unified analysis

Given the similarities we have observed between the deontic and reportative uses of *be supposed to* and *sollen*, we wish to provide a unified analysis for these modal expressions. We will make use of a standard Kratzerian framework (Kratzer, 1981, 1991, 2012), whereby modals quantify over possible worlds. We propose that both *be supposed to* and *sollen* are necessity modal expressions, which lexically specify a circumstantial modal base and a reportative informational ordering source. We discuss each of these ingredients in turn.

Given a circumstantial modal base, *be supposed to* and *sollen* quantify over worlds where salient facts in the evaluation world also hold (Kratzer, 2012; Portner, 2009). Crucially, one of the salient facts will be that a report of some kind has been made. This seems to be what we need for the reportative use, but for the deontic use it is possibly too strong. Specifically, what counts as a deontic report for *be supposed to* and *sollen*? It seems that someone need not have actually said anything at all. In (2), for instance, the parking prohibition may be indicated by a sign; in (3), it is likely the instruction booklet written by the creators of Monopoly that serves as the source of the rule. And even for true reportatives, the speaker may not be able to identify the individual or exact time of the relevant report, only that there was one. For these reasons, we leave fairly vague what counts as a relevant report in the circumstantial modal base, and state this “reportative” restriction on the circumstantial modal base as one where some agent  $\alpha$  has some public commitment(s) from with the prejacent proposition  $p$  follows, as in (16):

- (16) “Reportative” restriction on circumstantial modal base:  
 $\exists \alpha : p$  follows from  $\alpha$ 's public commitments

We assume that entities such as the city councillors responsible for parking laws or the creators of Monopoly count as relevant agents  $\alpha$  for this purpose. Note that given cases like (15), it is too strong to say that  $\alpha$ 's public commitments entail  $p$ ; in at least some cases, such as (15) above,  $p$  follows conversationally from  $\alpha$ 's public commitments. Nevertheless, in some cases entailment will turn out to follow, as in (17).

- (17) Context: The weather report predicts rain every day next week.
- a. It's **supposed to** rain on Wednesday.
  - b. Es **soll** am Mittwoch regnen.  
it SOLL on Wednesday rain

Note also that if it is already part of the circumstances that  $p$  follows from  $\alpha$ 's existing public commitments, this means that the temporal condition in (7) holds. That is,  $\Box p$  holds throughout the reference time  $t$ , since  $\alpha$ 's commitment to  $p$  already holds at  $t$ .

As for the ordering source, we adapt the notion of a reportative informational conversational background developed by Kratzer (2012) for evidential modals. Our proposed ordering source is stated as in (18); although we maintain the terminology “reportative”, this notion is here relativized to  $\alpha$ 's public commitments, and not literally a report.

- (18) “Reportative” informational ordering source:  
 a function  $g_{\alpha,t}$  such that for any  $w$  in the domain of  $g_{\alpha,t}$ ,  $g_{\alpha,t}(w)$  represents the propositional content of  $\alpha$ 's public commitments in  $w$  at a time  $t$

Putting this all together, *be supposed to* and *sollen* take as a modal base a set of worlds where a set of relevant circumstances are true, and in particular where there is some  $\alpha$  from whose public commitments  $p$  follows. These worlds are then ordered by the ordering source. Worlds where the content of  $\alpha$ 's public commitments are true are ranked higher than worlds where this content is not true. Both *be supposed to* and *sollen* then universally quantify over the best worlds of the modal base as ranked by the ordering source. We assume that the lexical specification of the modal base and ordering source is treated as a presupposition on available conversational backgrounds in the context (cf. Matthewson et al. 2007). This is summarized in (19).

- (19)  $\llbracket be\ supposed\ to/sollen \rrbracket^{c,w,t}$   
 $= \lambda P \lambda x [\forall m \in t [\forall w' \in \max_{g_m(w)} (\bigcap f_m(w)) : P(x)(w') = 1]]$   
 defined only if the context  $c$  provides a circumstantial modal base  $f_m$  and reportative informational ordering source  $g_{\alpha,m}$

One last comment is in order regarding our semantics in (19). We follow Hinterwimmer (2013) in treating the subject as an external argument of *sollen*, and by extension *be supposed to*. In other words, we treat *be supposed to* and *sollen* as control predicates rather than raising predicates.<sup>5</sup> There is some debate over the status of (non-epistemic) modals as raising or control predicates (see von Stechow and Iatridou 2009 for discussion). We have no new syntactic tests to bear on this issue, and applying the standard tests yields unclear results. Since the reportative reading of *be supposed to* and *sollen* is plausibly epistemic, while the deontic reading is root, and our analysis merges the two, it is not clear what behaviour we would predict. As we will see in the next section, we will need the semantics to make reference to the grammatical subject when we compare *sollen* with *wollen*, another German modal with a reportative flavour. We turn to this now.

## 5. Comparing German *sollen* and *wollen*

It is quite well-known that *sollen* is dispreferred when the issuer of the report is identical with its grammatical subject (Hinterwimmer, 2013; Kratzer, 1981; Schenner, 2008). In such a case,

<sup>5</sup>This means that technically we don't have a preadjacent *proposition*, but we will ignore this issue in this paper.



the quotative modal *wollen* ‘want’ is typically used in order to convey that its subject is the source of a report of the prejacent proposition. This contrast is shown in (20)-(22).

- (20) a. Anna **soll** in Oslo sein.  
Anna SOLL in Oslo be  
‘Anna is said to be in Oslo.’ (someone other than Anna is the source)
- b. Anna **will** in Oslo sein.  
Anna want in Oslo be  
‘Anna claims to be in Oslo.’ (Anna herself is the source)
- (adapted from Schenner 2008)
- (21) Context: Julia has overheard Max saying that he climbed Mount Everest.  
Max **will** den Mount Everest bestiegen haben.  
Max want the.ACC Mount Everest climbed have  
‘Max claims to have climbed Mount Everest.’  
(adapted from Gärtner 2012)
- (22) Context: You’re at a party, and at 8pm someone asks when Maria will arrive. Earlier today, she told you she would arrive at 9pm.
- a. Maria is **supposed to** be here at 9pm.
- b. Maria {**will/#soll**} um 9 hier sein.  
Maria want/SOLL at 9 here be

It would seem that our analysis as it stands now cannot account for these facts. Our analysis simply requires that the fact that some agent  $\alpha$  has a public commitment to  $p$  be part of the circumstantial ordering source associated with *sollen* (and *be supposed to*). It is thus mysterious why *sollen* is infelicitous in (22).

Our proposal to account for this data is the following. We maintain our semantics for *sollen* and *be supposed to* as in (19). However, we argue that *sollen* is infelicitous in (22) due to pragmatic competition with *wollen*. The main idea is that the quotative use of *wollen* has the same semantics as *sollen*, but with the extra presupposition that the source of the report is the same as the subject of the sentence (cf. Gärtner 2012; Schenner 2008). In such a setup, *sollen* and *wollen* compete via Maximize Presupposition (e.g., Percus 2006; Schlenker 2012; cf. Heim 1991), defined in (23).

- (23) *Maximize Presupposition:*  
If a sentence  $S$  is a presuppositional alternative of a sentence  $S'$ , and the context  $C$  is such that
- a. the presuppositions of  $S$  and  $S'$  are satisfied within  $C$
- b.  $S$  and  $S'$  have the same assertive component relative to  $C$
- c.  $S$  carries a stronger presupposition than  $S'$
- then  $S$  should be preferred to  $S'$ . (adapted from Schlenker 2012)

Under our analysis, *sollen* and *wollen* have the same assertive component, but *wollen* carries a stronger presupposition. Namely, *wollen* is associated with the presupposition that its subject

has the public commitment to the prejacent, whereas *sollen* carries no presupposition about the identity of the agent who has a public commitment. Therefore, by (23) sentences containing *sollen* and *wollen* are presuppositional alternatives for a Maximize Presupposition competition, and *wollen* must be used whenever its presuppositions are supported in the context. In such contexts, the use of *sollen* is blocked, leading to the contrast in (22).

An analysis along these lines makes the prediction that in cases where it is not known by the speaker whether the subject carries the relevant public commitment, *sollen* can be used. This prediction is borne out, as illustrated in (24). In the context provided, the source of the public commitment could very well be the subject, but could also be someone else. The judgment here is that A's utterance with *sollen* is neutral with respect to whether A thinks that Chris or someone else is the source of the report, whereas the response in A' strongly implies that A' believes that Ben's knowledge comes directly from Chris as the source of the report.<sup>6</sup>

- (24) Context: Alex and Ben are planning a party. Their flaky friend Chris only sometimes RSVPs to parties, and one might only hear about Chris's attendance through rumours.
- A: **Soll** Chris zur Party kommen?  
 SOLL Chris to.the party come  
 'Is Chris coming to the party?'  
 (A doesn't know whether B heard from Chris or someone else)
- A': **Will** Chris zur Party kommen?  
 want Chris to.the party come  
 'Is Chris coming to the party?'  
 (only: A' believes Chris is the source)

In sum, we maintain an identical analysis for *sollen* and *be supposed to*. The apparent restriction of *sollen* to cases where the subject is not identical to the source of the report is due to a Maximize Presupposition competition with *wollen*. Since English *be supposed to* does not have a competitor akin to *wollen*, we observe differences in the distribution of *be supposed to* and *sollen* despite their identical semantics.

## 6. Comparison to other analyses

We have claimed that the modal expressions *be supposed to* and *sollen* both have uses that place a restriction that there exists an agent  $\alpha$  who has a public commitment towards the prejacent. We have also argued that apparently deontic uses of these modal expressions should be assimilated to reportative uses as well. In such a case, a pre-existing law or rule can count as a report to license *be supposed to* and *sollen*. In this section, we would like to defend our analysis by comparing it to two recent proposals for *sollen*, both of which deny that *sollen* is reportative per se: Hinterwimmer (2013), which invokes intentional acts rather than reports, and Matthewson and Truckenbrodt (2017), who argue for an external bouletic ordering source for *sollen*.

<sup>6</sup>Note that this example involves so-called "interrogative flip," whereby A expects B to base their answer on reportative evidence. This use of reportatives is quite common cross-linguistically (e.g., Davis et al. 2007; Faller 2002; Garrett 2001; Matthewson et al. 2007).

## 6.1. Hinterwimmer (2013)

As we have already seen, it seems too strong to say that it is strictly antecedent reports that license *be supposed to* and *sollen*. We need to at least allow pre-existing laws and rules under the umbrella of licensors. Hinterwimmer (2013) also argues that reports are strictly speaking too narrow a category to account for the uses of German *sollen*. He argues that *sollen* requires an antecedent **intentional act**, which is not necessarily a speech act. He takes cases like (25) as evidence for this claim.

- (25) Context: Peter is singing *Yesterday* to his baby daughter.  
 A: Why is he doing that?  
 B: Das **soll** das Baby beruhigen.  
 it SOLL the baby calm.down  
 ‘It’s supposed to calm the baby down.’ (Hinterwimmer, 2013)

The idea is that in this context, there is no prior report (or rule or law for that matter) that Peter should sing in order to calm the baby down; rather, Peter is just trying anything he can think of to calm the baby down. In such a context, what licenses B’s use of *sollen* is thus not a report of any kind, but rather the singing itself. That is, the singing itself serves as an antecedent intentional act for B’s use of *sollen* in (25) – Peter’s intentional act of singing is enough to license *sollen*. Thus, Hinterwimmer claims, *sollen* requires any sort of antecedent intentional act, even if it is not strictly speaking a speech act.

We believe Hinterwimmer’s analysis is not on the right track for at least two reasons. First, native speakers we have consulted seem to agree that there is a prior report in (25) that is accommodated in contexts where it is not explicitly mentioned. This is what is predicted by our account. Under our analysis, that an agent  $\alpha$  has  $p$  as a public commitment is part of the content of the circumstantial modal base, which under our analysis is a presupposition associated with *be supposed to* and *sollen*. This means that an antecedent report (or rule/law) must be retrievable to the interlocutors. In cases where this fails, we predict that a report must be accommodated by the hearer for the use of *be supposed to* or *sollen* to be felicitous. Second, even when the context is such that no prior report can be accommodated because the interlocutors have never met each other or Peter, there is a world knowledge rule ‘singing calms the baby down’ that could in principle serve as the ‘source of the report’ and thus as a possible confound. Consider (26) which avoids this confound.

- (26) Context: Peter is stirring ketchup into his coffee.  
 A: Why is he doing that?  
 B: Das **soll** gut schmecken. = ‘It’s supposed to taste good.’  
 A: Oh. Where did you hear that?  
 B: I don’t remember, I think I read it in some magazine a while ago.  
 B’: #He’s doing it right now.

We assume that there is no world knowledge rule stating that adding ketchup to coffee will make it taste better. A’s continuation of B’s use of *sollen* is very natural here. We take this to show

that while A interprets B's utterance as referring to a prior report, but is unable to accommodate the existence of a source for such a report. It is important to note that the response of B' that 'He's doing it right now' is not a felicitous continuation of the exchange. This is unexpected if we assume the action of stirring ketchup to be an antecedent intentional act in the sense of Hinterwimmer. *Sollen* should be able to pick up Peter's intentional act.

## 6.2. Matthewson and Truckenbrodt (2017)

We next turn to a recent proposal by Matthewson and Truckenbrodt (2017), who distinguish between root and evidential *sollen* and argue that root *sollen* is 'externally bouletic', i.e., the modal flavour of root *sollen* is always bouletic, and the subject of the clause cannot be the holder of the desire. What they mean by this is illustrated in (27), their own example.

- (27) A: Why have you put on loud and unpleasant music in the basement?  
 B: It is **supposed to** chase away the mice.  
 Das **soll** die Mäuse verjagen.  
 that SOLL the mice chase.away

The context for this example is similar to, though slightly different<sup>7</sup> from, the earlier example (25) from Hinterwimmer about calming down the baby. Similar to (25), we disagree with the judgment regarding B's use of *be supposed to/sollen* in (27). In particular, we find the continuation in (27') to be the most natural follow-up to B's utterance in (27). Like in (26), A's response here seems to be a variety of a "Hey wait a minute" response (see von Stechow 2004) that challenges the presupposition of B's utterance, namely the presupposition that there is some agent from whose public commitments the prejacent follows.

- (27') A: Where did you hear that?  
 Wo hast du das gehört?

Additionally, we believe that the restriction that the subject of the clause not be equal to the holder of a desire does not quite capture all the relevant facts. This condition is both too weak and too strong. First, it is too weak because it predicts that *sollen* should be licensed whenever there is an inanimate or expletive subject, so long as there is some holder of a desire in the context. Although Matthewson and Truckenbrodt's (27) appears to show this prediction is upheld, we have already indicated that our judgments in this case do not match theirs. In (28) with an expletive subject, we see that *sollen* cannot take on the bouletic reading; only a reportative reading is available here.

- (28) Context: A and B hear that Peter, an author, has started writing another story.  
 A: In seiner Geschichte soll es um Pferde gehen.  
 in his story SOLL it about horses go  
 'His story is supposed to be about horses.' (reportative only)  
 ≠ 'Peter (or someone) wants his story to be about horses.'

<sup>7</sup>It is different in that the speaker is the bouletic source in (27).

Matthewson and Truckenbrodt predict that an externally bouletic interpretation should be available, either such that the speaker desires Peter to write his next story about horses, or that Peter has that desire himself, since Peter is not the subject of (28). Despite the availability of two plausible sources for the bouletic desire, such an interpretation of (28) is not available. The only available interpretation is a reportative one: A has heard a report that Peter's new story will be about horses and is sharing this information with B by uttering (28).

Second, the restriction that the subject be distinct from the holder of a desire also seems to be too strong in certain cases. We have already seen in (24) that in ignorance contexts, the use of *sollen* is compatible with the subject being the holder of a desire. That is, by uttering *Soll Chris zur Party kommen?* ('Is Chris coming to the party?'), the speaker is not committed to Chris not being the source of a bouletic attitude towards coming to the party. We have also seen in (6) and (14) more cases where the speaker is source of the report.<sup>8</sup>

Matthewson and Truckenbrodt could perhaps not consider these as counterexamples if they treat them as purely reportative uses of *sollen*, which they treat as distinct from their root bouletic use. Under a Kratzerian framework, this amounts to leaving underspecified the types of modal bases and ordering sources that *sollen* can take, just like other modals that can take on several modal flavours. However, given the similarities we have observed between the deontic and reportative uses of *be supposed to* and *sollen*, we believe our unified analysis provides an explanation for the lexicalization of the reportative and non-performative deontic readings together in the same modal expressions: these two readings are in essence one and the same.

Even allowing that in an example such as (1), Professor Plum's presence is bouletically desired by the university rather than mandated, it is not clear how this extends to, e.g., the city parking laws as discussed in example (2), repeated here as (29).

- (29) Context: Your friend has just parked in front of a fire hydrant. You say:
- a. You're not **supposed to** park there.
  - b. Du **sollst** hier nicht parken.  
you SOLL here not park

Here it seems like a stretch to argue that the city is an agent with desires, so assuming a bouletic flavour seems impossible. On Matthewson and Truckenbrodt's account, (29) would have a purely reportative reading with no deontic flavour. On our account, both are present.

There are some cases where Matthewson and Truckenbrodt's analysis makes different predictions than ours. First, they observe a case where the judgments come apart for *be supposed to* and *sollen* in a deontic context, namely (30). Matthewson and Truckenbrodt take this as evidence that *sollen* can not take on a deontic flavour, although *be supposed to* can.

<sup>8</sup>Note that *wollen* is also acceptable in these cases.

- (30) Context: Nobody said anything to A about locking the building. However, there is a rule that you lock the building when you are the last to leave.
- a. A to B: I'm **supposed to** lock the door.
  - b. A to B: #Ich **soll** noch das Gebäude abschließen.  
I SOLL still the building lock  
(Matthewson and Truckenbrodt, 2017)

We agree with the judgment here and have no explanation for this. We would, however, like to point out two additional factors that may influence the judgments here. The German particle *noch* 'still' seems to play a crucial role in making (30) unacceptable. Without *noch*, the utterance with *sollen* is fine. Additionally, we also observe that adding *auch* 'also' improves acceptability.

- (30') Ich **soll** (auch noch) das Gebäude abschließen.  
I SOLL also still the bulding lock  
'I'm also supposed to still lock the building.'

While Matthewson and Truckenbrodt's account does not predict the acceptability of (30'), ours does not predict why (30) is unacceptable. Another possible factor causing the inacceptability of (30) is competition with *müssen*. A version of this sentence with *müssen* as in (30'') can convey both deontic necessity and inferential reasoning and thus captures both the fact that A is following a rule, and that A had to deduce that the rule applies to him.

- (30'') Ich muss noch das Gebäude abschließen.  
I must still the building lock  
'I still have to lock the building.'

A case that Matthewson and Truckenbrodt can deal with easily, but which causes problems for our account, are examples like (31). In this bouletic context, *be supposed to* is unacceptable, as we predict. However, *sollen* is (marginally) acceptable here. (Note that our English translation for (31b) is not intended as an analysis of the German sentence; we simply offer this as a paraphrase that is colloquially appropriate in the given context.)

- (31) Context: I haven't yet looked at what the cafeteria is offering for lunch, but I really hope they are serving pasta.
- a. #They are **supposed to** have pasta today!
  - b. Sie **sollen** heute Nudeln haben!  
they SOLL today noodles have  
≈ 'I hope they have pasta today!'

This stands in contrast to (32), where both *be supposed to* and *sollen* are unacceptable. Here, there is a report in the context that the prejacent of *be supposed to* and *sollen* is in fact false.

- (32) Context: I just checked the cafeteria's lunch offers for the day and saw that they are not offering pasta, my first choice.
- a. #They are **supposed to** have pasta today!
  - b. #Sie **sollen** aber heute Nudeln haben!  
they SOLL but today noodles have

It seems to us that the speaker of the German sentence in (31) appears to be childish or irrational. We take this to be an effect caused by using an expression expressing deontic modality where bouletic modality would be appropriate. It is our intuition that the speaker is attempting to make the desire more 'objectively necessary' by using an expression that is only compatible with deontic modality – the speaker is exploiting the fact that only deontic modality, but not bouletic modality, is available for *sollen*.

We would like to make one final comment here about the relation between bouletic and deontic modality. Lauer (2015) suggests that performative deontic modals actually convey speaker preferences. When the speaker is a deontic authority, a statement about speaker preferences can take on the force of placing an obligation on the hearer via pragmatics. Thus, there may be an important connection between deontic and bouletic modality that could go some way towards unifying our account with that of Matthewson and Truckenbrodt. However, note that Lauer's idea is about *performative* uses of deontic modals, and we have argued in this paper that the deontic uses of *be supposed to* and *sollen* are crucially anti-performative.

## 7. Conclusion

We have proposed a unified analysis for the deontic and reportative readings of *be supposed to* and *sollen*: both readings are derived from a circumstantial modal base and a reportative informational ordering source. This accounts for the fact that even the deontic use of these modals still have a reportative flavour in that they cannot be used performatively to issue an obligation on the hearer. Despite the open questions that remain, we hope to have made a contribution to the enterprise of making more precise the properties of the modal flavours associated with *be supposed to* and *sollen*.

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