non-final version, submitted to Hartmann, Jutta M. & Angelika Wöllstein (Hrsg.) *Propositionale Argumente im Sprachvergleich: Theorie und Empirie. /Propositional Arguments in Cross-Linguistic Research: Theoretical and Empirical Issues.* [Studien zur Deutschen Sprache] Gunter Narr Verlag. Please consult the original for citation. Version: August 6, 2020.

Layers of Assertive Clauses: Propositions, Judgements, Commitments, Acts

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Abstract. The present article proposes a refined syntactic and semantic analysis of assertive clauses that comprises their truth-conditional aspects and their speech act potential in communication. What is commonly called "illocutionary force" is differentiated into three structurally and functionally distinct layers: a judgement phrase, representing subjective epistemic and evidential attitudes; a commitment phrase, representing the social commitment related to assertions; and an act phrase, representing the relation to the common ground of the conversation. The article provides several pieces of evidence for this structure: from the interpretation and syntactic position of various classes of epistemic, evidential, affirmative and speech act-related operators, from clausal complements embedded by different types of predicates, from embedded root clauses, and from anaphora referring to different clausal projections. The syntactic assumptions are phrased within X-bar theory, and the semantic interpretation makes use of dynamic update of common ground, differentiating between informative and performative updates. The object language is German, with particular reference to verb final and verb second structure.

[1] This work is supported by ERC Advanced Grant 787929 SPAGAD (Speech Acts in Grammar and Discourse). I thank audiences at University of Oslo, University of British Columbia, Chicago University, University of Massachusetts at Amherst, Leibniz-Institut für Deutsche Sprache (IDS) in Mannheim, University of Tübingen, University of Bonn, University of Leipzig, the conference Semantics and Philosophy in Europe at University Pompeu Fabra in Barcelona, the workshop "Assertions and its Norms" at EHESS Paris, the DGfS Summer Schools "Experimental Pragmatics: Theories, Methods, Interfaces" in Berlin, the summer school of Aristoteles University Thessaloniki "Language comparison and typology: German and the Mediterranean languages" in Kalandra, at the University of Amsterdam, at the conference "From T to C: Grammatical Representations of Tense and Speech Acts" at the Vietnam Institute of Linguistics in Hanoi as well as ZAS Berlin for constructive and important input to the development of thoughts related to this paper. In particular, In particular, I would like to thank Katrin Axel-Tober, Werner Frey, Hans-Martin Gärtner, Martin Haspelmath, André Meinunger, François Recanati, Marga Reis, Hubert Truckenbrodt and Ilse Zimmermann, as well as an anonymous reviewer, for important comments.

I dedicate this article to the memory of Ilse Zimmermann, who passed away in March 2020. Her personal and scientific standards were exemplary.

1 Assertions and Judgements

What does it mean to assert a proposition? There is an intense debate in linguistic semantics and the philosophy of language concerning the nature of the speech act of assertion. In an influential overview article, MacFarlane (2011) distinguishes four families of theories.

According to one theory, assertions are moves in rule-governed social behavior, like the rule to utter only propositions that one thinks or knows to be true (cf. Stenius 1967, Grice 1975, Williamson 1996). In this view, propositions are structural linguistic entities, but assertions belong to a distinct realm. It is a challenge for this view how speech act adverbials like *frankly*, are to be interpreted, as they relate to the social aspects of asserting a proposition, not to the proposition itself. Such expressions show that assertions should be conceived of as linguistic objects as well.

Following the second theory, assertions are ways to change the common ground, the assumptions that the interlocutors of a conversation assumed to be shared and that are increased in the course of conversation (cf. Stalnaker 1978). This change can be expressed as the conjunction of the information contained in the current common ground and the asserted proposition. Such update functions can perhaps conceived more easily as being able to be modified by linguistic material. But as Lauer (2013) has argued, this leaves open how assertions exactly achieve that – how come the verbal noises of one speaker can change the assumptions of the other?.

The third theory assumes that assertions consist in the expression of intentional attitudes of the speaker (cf. Bach & Harnish 1979, Zaefferer 2001, Truckenbrodt 2006). When asserting a proposition, the speaker communicates that he or she believes this proposition, and wants that the other speaker comes to believe it as well. This works in most cases because the second speaker recognizes the intentions of the first, and this is a reason to oblige. One problem of this view mentioned by MacFarlane (2011) is that it is possible to retract an assertion without ceasing to believe the asserted proposition. Another problem, pointed out by Searle (1969: 46; 2001), is that the speaker can refrain from the intention to make believe and assert a sentence out of an act of duty. Assertions can start with *I don't care whether you believe it, but…* or *Believe it or not, …* which would result in contradiction under the view that assertions express intentions to make the hearer believe a proposition.

The fourth theory, the one that MacFarlane (2011) subscribes to, states that with asserting a proposition the speaker undergoes a public commitment that the proposition is true, accepting a liability for the truth of the proposition. This corresponds to the essential condition for assertions in Searle (1969) and was argued for by Brandom (1983), Alston (e.g, 2000); cf. the overview of Shapiro (to appear). Assertions whose propositions turn out to be false are like checks that are not covered by one's bank account: They lead to sanctions, one has to pay a fine or is put into jail. In the case of assertions, the speaker runs the risk of being branded as a non-trustworthy person, losing social capital.[2] The addressee knows that the speaker is aware of that risk and will try to avoid it, and it is this knowledge that constitutes the reason for the addressee to come to believe the proposition. This means that the intended effect (that the addressee believes the asserted proposition) can be worked out from the meaning of the assertion (that the speaker undergoes liability for its truth) and general rules of conversation (knowledge that this liability is backed up by sanctions, which the speaker wants to avoid). Hence by asserting a proposition φ the speaker can communicate φ by conversational implicature.

[2] I admit that this sounds like a quaint, conservative description of how things have been and should be, considering the insincerity we currently witness in public and political communication. I also should point out that the nature of the sanctions are very much dependent on the context and purpose of the interchange, and that in the case of soliloquy the public is identical to the speaker.

This view of assertions goes back to Charles Sanders Peirce. In his notes, published decades after they were written, we find the following characterization of assertions, where the social capital that is put at risk with an assertion is called "esteem" (cited after Peirce 1994).

> "[A]n act of assertion supposes that, a proposition being formulated, a person performs an act which renders him liable to the penalties of the social law (or, at any rate, those of the moral law) in case it should not be true, unless he has a definite and sufficient excuse." [CP 2.315].

> "(...) the assuming of responsibility, which is so prominent in solemn assertion, must be present in every genuine assertion. For clearly, every assertion involves an effort to make the intended interpreter believe what is asserted, to which end a reason for believing it must be furnished. But if a lie would not endanger the esteem in which the utterer was held, nor otherwise be apt to entail such real effects as he would avoid, the interpreter would have no reason to believe the assertion," |CP 5.546]

The second quote shows that Peirce does not deny that with an assertion a speaker intends to make the addressee believe a proposition. But this goal is achieved by the commitment of the speaker to the proposition, which is seen as the essential property of assertion.

There is a related view in which the speaker that asserts a proposition is committed to come up with reasons for the truth of the proposition when challenged (cf. Brandom 1983). I see this as a natural consequence of Peirce's commitment view, and not as a constitutive rule of assertion in its own right: A speaker committed to a proposition will naturally try to defend this proposition if it draws attacks by others because he or she wants to avoid the sanctions (cf. the distinction by Watson 2004 on primary and secondary commitments).

As noticed by Searle (1969), the commitment view can explain why it is not contradictory to officially declare disinterest in whether the addressee believes the proposition, as in (1), as the speaker may be interested in committing to a proposition just for the record.

(1) *Es ist mir egal, ob du mir glaubst, aber du bist mein Bruder*.[3]
'I don't care whether you believe me, but you are my brother.'

The commitment view can explain the oddity of (2), which does not follow from the intentional view in a straightforward way.

(2) *#Du bist mein Bruder, aber beklage dich nicht bei mir, wenn das nicht stimmt.*
'You are my brother, but don't complain in case this is not true.'

Another argument for the commitment theory is put forward by Geurts (2019), who points out that the intentional view leads to the assumption of cognitively implausible highly recursive intentions, whereas commitments may easily be highly recursive, as they are not cognitive but legal in nature. The intention-based view of assertion also has to explain lying in a more indirect way – "Do not intend to make other people believe what you believe to be false." This leaves the addressee with less security than the simple rule that the speaker undergoes social sanctions if the proposition is false.

Now, Peirce discusses another, private act that he distinguishes from the public act of an assertion (cf. Tuzet 2006 for an overview).

> "(…) an act of assent is an act of the mind by which one endeavors to impress the meanings of the proposition upon his disposition, so that it shall

[3] The example is from the novel of Colleen Hoover and Tarynn Fisher, *Never Never*. dtv 2018.

> govern his conduct, this habit being ready to be broken in case reasons should appear for breaking it." [CP 2.315]

This describes the private act of coming to believe a proposition – precisely the attitude that the intentional theories of assertion focus on. Interestingly, Frege (1918), in *Der Gedanke*, appears to make a similar distinction between a private judgement and the public announcement of this judgement, elaborating on the earlier distinction in Frege (1879) between a proposition and the statement that the proposition is true.

> "In einem Behauptungssatz ist also zweierlei zu unterscheiden: der Inhalt, den er mit der entsprechenden Satzfrage gemein hat, und die Behauptung. (…) In einem Behauptungssatze ist beides so verbunden, daß man die Zerlegbarkeit leicht übersieht. Wir unterscheiden demnach
>
> 1. das Fassen des Gedankens -- das Denken,
> 2. die Anerkennung der Wahrheit eines Gedankens – das Urteilen
> 3. die Kundgebung dieses Urteils -- das Behaupten." (Frege 1918)[4].

Notice the surprising dissonance between *two* aspects to be distinguished in the text (which mentions the proposition and the public claim that the proposition is true) and the list of *three* items, which mentions in addition, in (2), the private acknowledgment of the proposition. Also, notice that Frege talks of the "assertion sentence", which I take the liberty to interpret as saying that we can identify aspects of the private judgment and the public commitment in the syntactic and lexical form of the sentence itself.

Now, observe that it is possible that a speaker publicly commits to a privately held belief. Consider the following assertions:

(3) a. *Max schnarcht laut.*
'Max snores loudly.'

b. *Ich glaube, Max schnarcht laut.*
'I believe Max snores loudly.'

(3)(a) expresses a commitment by the speaker to the proposition that Max snores loudly. Under normal circumstances, the speaker has come to believe that this proposition is true, which provides a good reason to commit to the proposition. But in (a), this belief of the speaker is not represented. In (3)(b), the speaker commits to a different proposition, namely to the proposition that he or she believes that Max snores loudly. With (b), the speaker can also convey the meaning that Max snores loudly, albeit in a different and somehow safer way: It is less easy for the addressee to attack the commitment of the speaker, because they are now to the speaker's own mind, and they are not directly accessible to the inspection by other minds.

[4] In the translation of this passage in *Mind* 65 (1956), 289-311"[…] two things must be distinguished in an indicative sentence: the content, which it has in common with the corresponding sentence-question, and the assertion. The former is the thought, or at least contains the thought. So it is possible to express the thought without laying it down as true. Both are so closely joined in an indicative sentence that it is easy to overlook their separability. Consequently we may distinguish: (1) the apprehension of a thought—thinking, (2) the recognition of the truth of a thought—judgement, (3) the manifestation of this judgement—assertion". Frege first developed these ideas in the posthumously edited manuscript *Logik* from 1897, where he states: "Wenn wir einen Gedanken innerlich als wahr anerkennen, so urteilen wir; wenn wir eine solche Anerkennung kundgeben, so behaupten wir" – "When we acknowledge a thought as true, then we judge; when we announce this acknowledgement, we assert". In a footnote, Frege (1918) remarks: "[…] that something is asserted lies rather in the form of the indicative. We have the advantage in German that main and subordinate clauses are distinguished by the word-order", alluding to verb-second vs. verb-final order." In this article, I will account for precisely this feature of German. Frege also states that "[…] a subordinate clause can also contain an assertion", a point that will be discussed in Section 4 on embedded clauses.

The current approach differs from belief-based theories of assertions such as Bach & Harnish (1979), Lauer (2013) and Sode & Truckenbrodt (2018), who assume that in asserting a proposition, the speaker necessarily expresses a belief that this proposition is true. One piece of evidence for that is Moore's Paradox, the pragmatic contradiction expressed in (4):

(4) *#Max schnarcht laut, ich glaube es aber nicht.*
'Max is snoring, but I don't believe it.'

However, the pragmatic oddity of (4) can also be explained in the commitment view. In order to communicate a proposition by public commitment to it, one better believes that the proposition is true, otherwise one runs the risk of sanctions if the proposition is proven false. Hence we can have a plausible inference rule from public commitment to belief, one that is obviously related to Grice's maxim of Quality:

(5) If the speaker publicly commits to a proposition,
then it can be assumed that the speaker believes that this proposition is true.

In any case, asserting both the proposition and that one does not believe it to be true would be conversationally dysfunctional, hence a pragmatic paradox.

One piece of evidence that the expression of speaker's belief in a proposition is not essential of the assertion, are interactions of the following type:

(6) S_1: *Max hat noch nie vor etwas Angst gehabt.*
'Max never was afraid of anything.'
S_2: *Das glaubst du doch nicht einmal selbst!*
'You don't even believe that yourself!'

If the assertion of S_1 consists essentially in the proposition that S_1 believes that Max never was afraid of anything, then the emphasis in the reaction, which is typical for addressing a more basic issue than the one put on the table, would be surprising.

Another point in favor for the commitment view is that it can express the difference between (3)(a) and (b) in a straightforward way:

(7) a. 'Speaker is committed to: Max snores loudly.'
b. 'Speaker is committed to: Speaker believes that Max snores loudly.'

As argued above, in (b), the speaker commits to his or her own belief. This makes it less easy that the speaker is proven false, hence the impression that (b) makes be a weaker assertion than (a), cf. Wolf (2015). In the expressed-belief view of assertions, this explanation is difficult to defend, as the two interpretations would amount to the following:

(8) a. 'Speaker believes that Max snores loudly.'
b. 'Speaker believes that Speaker believes that Max snores loudly.'

If we assume the plausible law of positive accessibility (Smithies 2012), then (a) and (b) are justified under the same circumstances, and hence (b) cannot be weaker than (a)[5]. It is perhaps possible that rendering the belief that is expressed by the speaker by the English term *believe* is inappropriate, and we would require a more general epistemic relation like 'belief with

[5] More specifically, with Jp for "speaker is justified to believe p", we have Jp ↔ JJp. Wit Bp for "speaker believes p" we have Bp ↔ BBp only if Jp → Bp and BJp → BBp. However, in case of a controversy the discussion will revolve around whether a belief was justified, and then the equivalence Jp ↔ JJp is relevant. (Thanks to Hans-Martin Gärtner for making me aware of additional intricacies).

certainty' (Truckenbrodt, pers. comm.). But with strengthened beliefs we also get weakened assertions, as in (9), which can be more easily defended than the simple assertion.

(9) *Ich bin mir absolut sicher dass Max laut schnarcht.*
'I am absolutely certain that Max snores loudly.'

So I take it that the assertion operator should not be analyzed as "speaker believes the proposition", but rather as "speaker publicly commits to the proposition". From this, one can infer by default that the speaker believes that the proposition is true, by (5). But we also have to take care of cases in which the speaker commits to a belief, as in (3)(b).

In this paper I will argue that the distinctions drawn by Peirce and Frege are relevant for the analysis of the semantic and morphosyntactic form of assertive sentences. In particular, I will propose a syntactic structure that accommodates the distinctions between proposition, private judgement and public commitment. This structure will be motivated by observations concerning linguistic material that affects the proposition, the judgment, and the commitment, and by showing that these three kinds of meanings can be embedded under different predicates. In addition, I will assume a level of acts that incorporates the update potential of the sentence; this level distinguishes assertions from questions.

2 Commitment Phrase, Judge Phrase and Act Phrase

I assume that public assertions are expressed in a Commitment Phrase ComP with a head that turns a proposition φ into the propositional function that the speaker x is publicly committed in world i to φ. I express this as "$x \vdash_i \varphi$" (cf. Krifka 2015), and I use the turnstile "⊢" also to mark the head of the ComP.[6] I assume that private judgements are expressed in a Judge Phrase JP with a syntactic head that turns a proposition φ into the propositional function that a judger x judges the proposition φ to be true. I express this as "x J– φ", using the symbol "J–" also to mark the head of the JP. The asserted and judged proposition φ itself, Frege's "Gedanke", will be represented by a Tense Phrase, TP.

In addition, I assume yet another level of syntactic representation, one which distinguishes assertions from questions. The underlying idea is the following (cf. Krifka 2015): In an assertion, a speaker makes public a commitment to a proposition, whereas in a question, the speaker restricts the possible continuations of a conversation so that the addressee makes a public commitment to a proposition. Hence, both assertions and questions are based on commitments, and consequently, on ComPs. For the distinction between assertions and questions I will assume an ActPhrase, ActP, and use the dot symbol "•" as assertion operator and the question mark "**?**" as the question operator in the semantic representation and also as the syntactic heads of the ActP.

The syntactic structure I assume for assertion clauses is illustrated in (10). The arguments in this paper will be developed generally with German as an object language, and some points, like the ones related to verb-second phenomena, are specific to German. In particular, I assume that the highest phrase, ActPhrase or ActP, typically precedes its complement in German, whereas the other phrases have final heads.[7]

[6] As a historical note, the turnstile symbol goes back to Frege (1879), as a combination of the vertical "Urtheilstrich" | and the dash — that marks a proposition. The turnstile is commonly used to express provability, e.g. $\{\varphi_1,\ldots, \varphi_n\} \vdash \varphi$ stands for: φ can be proven from $\{\varphi_1,\ldots, \varphi_n\}$.

[7] Head finality of JP and ComP are motivated by data discussed in section 4.1 on *dass*-clauses, where it is shown that non-empty operators in these positions occur clause-finally. It is also argued in this section that the head of ActP can occur clause-finally if the initial position is occupied by the complementizer *dass.*

(10) [ActP [Act' [Act° •] [ComP [Com′ [JP [J′ [TP *Max laut schnarcht*] [J° J–]] [Com° ⊢]]]]
'Max snores / is snoring loudly.'

In regular assertive clauses, the specifier and the head of the ActP has to be lexically filled. The specifier, the prefield ("Vorfeld") can be filled by movement of a lower XP constituent (or alternatively by an expletive pronominal *es*) and the head can be filled by movement of the finite verb.

(11) [ActP *Max*1 [Act' [Act° *schnarcht*0 •] [ComP t1 [Com′ [JP t1 [J′ [TP t1 *laut* t0] [J° t0 J–]] [Com° t0 ⊢]]]]

In the case of a question ActP with head **?**, the specifier position of ActP either remains empty or is filled by a wh constituent, leading to the surface order characteristic for questions.

(12) [ActP __ [Act' [Act° *schnarcht*0 **?**] [ComP *Max*1 [Com′ [JP t1 [J′ [TP t1 *laut* t0] [J° t0 J–]] [Com° t0 ⊢]]]]
'Is Max snoring loudely?', 'Does Max snore loudely?'

(13) [ActP *Wer*1 [Act' [Act° *schnarcht*0 **?**] [ComP t1 [Com′ [JP t1 [J′ [TP t1 *laut* t0] [J° t0 J–]] [Com° t0 ⊢]]]]
'Who is snoring / snores loudely?'

The current proposal stands in contrast to proposals like Jacobs (2018) and Lohnstein (2020), who argue against a representation of illocutionary force in syntactic representation. It belongs to the tradition of work that assumes a richer structure at the level above the TP. The first attempts, the performative hypothesis in the versions of Ross (1970) and Lewis (1970), met with criticism, partly because the lack of a categorial distinction between lower and higher syntactic categories. Later, distinct categories were stipulated, e.g. in functional grammar the distinction between representational level modifiers and interpersonal level modifiers in Foley & Van Valin (1984) and Hengeveld (1989), and in generative grammar the distinction between TP / CP and ForcP by Rizzi (1997). In particular, Cinque (1998) introduced four Mood levels for Speech Act, Evaluation, Evidentiality, and Epistemics. Speas & Tenny (2003) and Speas (2004) proposed categories like the SpeechAct Phrase SAP that have speakers and listeners as values. Another proposal of this type is Wiltschko & Heim (2017), who assume syntactic projections related to the speaker and the addressee. The current proposal does not assume projections for participants. In the present volume, Blühdorn (2020) deals with non-propositional Aspects of sentences. The current proposal is most closely related to the notion of Illocutionary Act Phrase IAP by Woods (2016). Here, I will follow the terminology of Krifka (2015) and call the highest category ActP; the ComP appears to be a proposal not made in previous work, whereas the JP corresponds to projections of evidentials and epistemics.

The current proposal is also inspired by Wechsler (1991), Truckenbrodt (2006) and Julien (2007, 2015), who assume that the movement of the verb into the second position in Scandinavian languages and in German and Dutch have an illocutionary meaning. Here we will only be concerned with assertions; for questions, cf. Krifka (2015), where a more general representational framework is developed that accommodates both assertions and questions. Also, the idea that head movement into the clause-second position expresses illocutionary force should not be taken that all illocutionary forces are expressed in this way. There are well-known cases of verb-final structures, or even verbless structures, in which specific syntactic structures, prosody, and particles express rather specific illocutionary meanings (cf. Altmann 1993 and articles in Meibauer et al. (eds.) 2016).

The rationale for assuming a JudgeP and a ComP, to be developed in section 3, comes from certain modifiers that affect the private judgement or the public commitment, respectively:

(14) [ActP *Jemand*1 [Act' [Act° *hat*0 •] [ComP t1 [Com′ [JP t1 [J′ *sicherlich* [J′ [TP t1 *laut geschnarcht* t0] [J° t0 J–]]] [Com° t0 ⊢]]]]
'Somebody certainly snored loudly.'

(15) [ActP *Jemand*1 [Act' [Act° *hat*0 •] [ComP t1 [Com' *ehrlich* [Com' [JP t1 [J' [TP t1 *laut geschnarcht* t0] [J° t0 J–]] [Com° t0 ⊢]]]]
'Somebody truly snored loudly.'

Another rationale, developed in section 4.1, is that different clause-embedding predicates embed different clausal projections:

(16) *Unsere Nachtruhe hängt davon ab, dass* [TP *niemand *ehrlich / *sicherlich laut schnarcht*].
'Our good night's sleep depends on that nobody truly/certainly snores loudly.'

(17) *Anna glaubt, dass* [JP *jemand* ??*ehrlich / sicherlich laut geschnarcht hat*].
'Anna believes that somebody truly / certainly snored loudly.'[8]

(18) *Anna sagte, dass* [ComP *jemand ehrlich / sicherlich laut geschnarcht hat*].
'Anna said that somebody truly / certainly snored loudly.'

I will illustrate the semantic interpretation of each level by example, without giving general interpretation rules; also, I will assume a rather rudimentary interpretation format, without attempting to model anaphora, which would require a dynamic framework. I assume that interpretation is relevant to certain parameters, which includes the speaker s, the addressee a and also the judge j that often is identical to s but may be shifted. The TP denotes a proposition, a function from world-time indices i to truth values. Example (19) illustrates the role of the judge, as it contains an adverb *laut*, 'loudly', a vague predicate that is judge-dependent (cf. Lasersohn 2005)[9].

(19) ⟦[TP *Max laut schnarcht*]⟧s,a,j
= λi[Max snores loudly, according to j, in i][10]

The basic role of the JP is to make the judge parameter j available for linguistic operators, resulting in the propositional function illustrated in (20).

(20) ⟦[J' [TP *Max laut schnarcht*][J° J–]]⟧s,a
= λj⟦[TP *Max laut schnarcht*]⟧s,a,j
= λjλi[Max snores loudly, according to j, in i]

By turning the context parameter j into a lambda-bound variable it becomes accessible to binding and shifting, i.e. to operations that would be considered "monstrous" (Kaplan 1989). In the current framework there is no genuine parameter shift; rather, the parameter j in (19) is undetermined, and has to be fixed by some operator even if it is identified with the speaker.

The role of ComP is to change the propositional function into a public commitment that involves the judge parameter j. This results in a propositional function that j, the judger, is responsible for the truth of the proposition, the TP meaning. I will write λi[x ⊢i φ] for the proposition that x is publicly responsible for the truth of φ with respect to i.

[8] The modifier *ehrlich* appears borderline acceptable but then the complement is interpreted as an interior monologue (suggestion by H.-M. Gärtner).

[9] The adverb *laut* allows for so-called faultless disagreement, e.g. speaker A might assert *Max schnarcht laut*, and speaker B might react with *Nein, ich finde das nicht, dass Max laut schnarcht* ('No, for me, Max doesn't snore loudely').

[10] In an event semantics, the proposition could be rendered as λi∃e[happen(i)(e) ∧ snore(i)(e)(max) ∧ consider(i)(e)(loud)(j)], i.e. a mapping from indices i to truth iff there is an event e that happens at i, that is a snoring event by Max at i, and that j considers loud at i.

(21) ⟦[$_{Com'}$ [$_{JP}$ [$_{J'}$ [$_{TP}$ *Max laut schnarcht*][$_{J^o}$ J–]] [$_{Com^o}$ ⊢]]⟧$_{s,a}$
= λjλi[j ⊢$_i$ ⟦[$_{J'}$ [$_{TP}$ *Max laut schnarcht*][$_{J^o}$ J–]]⟧$_{s,a}$(j)]
= λjλi[j ⊢$_i$ λi[Max snores loudly, according to j, in i]]

Finally, the assertive ActP adds this propositional function to the common ground, where the judger is identified with the speaker. Here, common grounds are modelled as information states or as context sets (Stalnaker 1978), that is, sets of indices that the interlocutors mutually consider to be compatible with the information exchanged so far.[11]

The classical picture is that the common ground is updated by a restriction imposed by the speaker. Let us call this "informative" update; it can be defined as follows:

(22) Informative update: $c + \cdot\varphi = \{i \mid i \in c \wedge \varphi(i)\}$

However, as Lauer (2013) remarked, the speaker cannot just force the common ground to contain a proposition; rather, there must be some reason for the hearer to go along with this move. I have argued that the commitment of the speaker to the truth of a proposition is that reason, and so the initial update consists in declaring that commitment. Now, this declaration of commitment cannot be expressed by an informative update of the common ground, as it does not just try to inform what the world is like, but rather changes the world: Before, the speaker did not have the commitment, now the speaker has it. Szabolcsi (1982), working on promises, has proposed an update type that does precisely that. In Krifka (2014), I have elaborated this proposal using formulas of the form "$i \multimap\!\bullet\, i'[\varphi]$" to express that index i' immediately follows i and differs from i only insofar as the proposition φ is true at i'.[12] This leads to the definition of performative updates, represented by the bold dot:

(23) Performative update: $c + \bullet\varphi = \{i' \mid \exists i \in c[i \multimap\!\bullet\, i'[\varphi]]\}$

Notice that performative update does not reduce the common ground like informative update. Rather, it changes the indices of a common round so that the expressed proposition is true. But just as informative updates, performative updates change the common ground, c. I propose that ActP, like other speech acts, express performative updates. In the case of assertions, it also applies the meaning of the commitment phrase to the speaker.

(24) S_1 to S_2: ⟦[$_{Act'}$ [$_{Act'}$ [$_{Act^o}$ •] [$_{ComP}$ [$_{Com'}$ [$_{JP}$ [$_{J'}$ [$_{TP}$ *Max laut schnarcht*][$_{J^o}$ J–]] [$_{Com^o}$ ⊢]]]]⟧$_{s,a}$
= λc[c + •⟦[$_{ComP}$ [$_{Com'}$ [$_{JP}$ [$_{J'}$ [$_{TP}$ *Max laut schnarcht*][$_{J^o}$ J–]] [$_{Com^o}$ ⊢]]]]⟧$_{S_1,S_2}$(S_1)]
= λc{i′ | ∃i∈c[i⊸•i′ [λi[S_1 ⊢$_i$ λi[Max snores loudly, according to S_1, in i]]]}

When applied to a context set c_0, this leads to the change of the indices i in c_0 so that after update, it is true for i that the speaker S_1 is committed to the truth of the proposition that Max snores loudly, according to S_1.[13] As argued for in Section 1, this triggers the conversational implicature that the proposition that the speaker commits to is true as well. I will call this enrichment of meaning "commitment closure"; it is defined in (25).

[11] In Krifka (2015) I argued for the representation by sets of propositions instead; I use context sets here for reasons of simpler exposition.

[12] This is couched in a branching structure of indices: If $i \multimap\!\bullet\, i'[\varphi]$ and $i \multimap\!\bullet\, i''[\psi]$, then i' and i'' immediately follow i but may be distinct, $i' \neq i''$.

[13] This assumes that the speaker S_1 is committed to the truth of the proposition in general, and not just to the addressee S_2. This is different from promises, where the speaker undergoes a specific commitment to the addressee. The reason is that propositions are true or false in general, not just for particular persons. The distinction is similar to criminal law, regulating obligations between individuals and society, and private law, regulating obligations between individuals.

(25) Commitment Closure of c:
If s is a participant in the conversation that is trustworthy,
and φ is a (recently expressed) proposition such that ∀i∈c: [s $\vdash_i$ φ],
and the other participants in conversation do not object:
c + CCl(φ) = {i | i∈c ∧ φ(i)}

Notice that the formation of the meaning (24) is part of recursive semantics, understood in a broader sense than usual, which is often confined to the level of truth conditions, the TP. (25), in contrast, is a pragmatic rule that can be derived by rational principles, essentially by the abductive inference[14] that the proposition φ is true if the speaker is committed to it and there are no reasons to assume that φ is not true. The overall architecture is similar to Murray & Starr (2020), who distinguish between a semantic "sentence force", and a pragmatic "utterance force," with substantial differences in detail. Combining these two changes into one for the sake of illustration, the semantic-pragmatic effect can be rendered in the following way:[15]

(26) S_1 to S_2: $[\![[_{ActP}\ [\ \bullet\ [_{ComP}\ s \vdash [_{JP}\ \ldots]]]]]\!] = \lambda c\ [\ [c + \bullet\ [_{ComP}\ \ldots]] + CCl([_{JP}\ \ldots])]$

For our example, the meaning of (24) assigned to c after assertive closure is as in (27), where the second line represents the communicated meaning:

(27) {i′ | ∃i∈c[i⊸•i′ [λi[$S_1 \vdash_i$ λi[Max snores loudly, according to S_1, in i]]
∧ [Max snores loudly, according to S_1, in i]}

However, one should keep in mind that the proposition that Max snores loudly is only added to the common ground under the conditions spelled out in (25), in particular, if the participants of the conversation indicate understanding and do not object (cf. Clark & Schaefer 1989 for the collaborative effort of maintaining common ground). Farkas & Bruce (2010) proposed a particular implementation of this requirement involving a structure of common ground update with a negotiation table. The current proposal has certain features in common with this model, in particular it entails that even if the proposition of an assertion is rejected, the information that the proposition was asserted sticks to the common ground. In Farkas & Bruce (2010), the common ground contains areas for the private beliefs of the participants; here, the proposition that the speaker is committed to a proposition, the first line in (27), remains in the common ground. The current framework also allows in case the proposition is accepted to trace back its origin to the speaker who is committed to it, hence who is to blame if it turns out to be false.

3 Judgement, Commitment and Act Modifiers

Why should we assume that the two levels of assertions assumed by Peirce and Frege are represented in syntax, and in this order? The reason is that certain specifications and modifications of speech acts are hosted by the assumed projections of JudgePhrase, CommitPhrase, and ActPhrase, in precisely that order.

[14] Abductive inference is from an observation (here: s commits to the proposition φ) to the most likely explanation for the observation (here: φ is true and s wants φ to become part of the common ground).

[15] It has been observed before that by assertion of a proposition the common ground is also updated by the proposition that the speaker made this assertion (cf. Stalnaker 1978). However, here this is not treated as a mere "side effect" (cf. Farkas & Bruce 2010: 93), but rather the primary or main effect that triggers the introduction of the proposition (cf. also Lauer 2013).

3.1 Judgement Modifiers: Epistemics and Evidentials

In the representation of an assertion in (20), the judge phrase did not play a role beyond making the judge parameter accessible. This represents one aspect of the theory of assertion presented here: With an assertion of a simple proposition φ, the speaker does not state (or commit to) that he or she believes φ, but rather commits to φ directly. We will normally be able to conclude that the speaker also believes that proposition, cf. (5), without this being part of the semantic representation.

But the JP can be semantically specified in various ways. I assume that operators in the JP relate to the epistemic and evidential modifications of the proposition that the speaker is committed to. I understand evidentiality as relating to the source of evidence for a proposition, and epistemicity as relating to the level of certainty (cf. de Haan 1999, Boye 2016, Wiemer 2018).

3.1.1 Epistemics

As for epistemic modifiers, consider epistemic modal adverbs like English *certainly*, *probably* and *possibly* and their German counterparts *sicherlich*, *wahrscheinlich*, *möglicherweise* and also *vielleicht* 'perhaps'. It has been claimed that these adverbials express a subjective modality, in contrast to the objective modality expressed by modal adjectives like *certain, probable* and *possible* and German *sicher, wahrscheinlich* and *möglich* (cf. Papafragou 2006, Ernst 2009, Wolf 2012; for German, cf. Lang 1979, Doherty 1987, Diewald 1999, Müller 2019b). One piece of evidence for this is that the protasis of conditionals, which is naturally interpreted as referring to a proposition, hence a TP, does not easily allow for epistemic adverbials, in contrast to epistemic adjectives:

(28) a. *Wenn Max* ??*sicherlich /* ??*vielleicht /* ?*möglicherweise /* ?*wahrscheinlich /* ?*sicher schnarcht, sollten wir Ohrstöpsel mitnehmen.*[16]
'if Max is certainly / perhaps / possibly / probably / for sure snoring, we should bring earplugs'
b. *Wenn es sicher / wahrscheinlich / möglich ist, dass Max schnarcht, sollten wir Ohrstöpsel mitnehmen*.

Sentences like (28)(a) are degraded. They are possible in case the qualified judgement has been uttered before or is taken to be true (cf. Müller 2019a), as in (29).

(29) S_1: *Max schnarcht sicherlich.*
S_2: *Wenn (wie du sagst) Max sicherlich schnarcht, müssen wir Ohrstöpsel mitnehmen.*

Furthermore, propositional operators like negation cannot scope over epistemic adverbs, in contrast to epistemic adjectives (cf. Bellert 1977, Nuyts 1993):[17]

(30) a. *Max schnarcht *nicht sicherlich / *unsicherlich laut.*
b. *Es ist nicht sicher / unsicher, ob Max laut schnarcht.*

[16] Forms like *möglicherweise, wahrscheinlich* and *sicher* appear to be better, presumably because they can be more easily forced into an objective reading within the TP, for unknown reasons.

[17] The forms *unwahrscheinlich* and *unmöglich* is a potential counterexample. But while, as adjective, they are negated modal operators, they are degree modifier, as adverbial it is a degree modifier; cf. *Es ist unwahrscheinlich / unmöglich, dass Max laut schnarcht* 'it is improbable / impossible that Max snores loudly' vs. *Max schnarcht unwahrscheinlich / unmöglich laut* 'Max snores incredibly / outrageously loudly'.

Epistemic adverbs also do not easily occur in questions, again in contrast to epistemic adjectives:[18]

(31) a. **Schnarcht Max sicherlich laut?*
b. *Ist es sicher, dass Max laut schnarcht?*

I would like to propose that subjective epistemic modifiers (adverbials) are hosted in the JP whereas objective epistemic modifiers (adjectives) are part of the TP,[19] as in (32) and (33):

(32) [ActP *Max*1 [Act' [Act° *schnarcht*0 •] [ComP t1 [Com′ [JP t1 [J′ *sicherlich* [J′ [TP t1 *laut* t0] [J° t0 J–]] [Com° t0 ⊢]]]]

(33) [ActP *Es*1 [Act' [Act° *ist*0 •] [ComP t1 [Com′ [JP t1 [J′ [TP t1 *sicher* t2 t0] [J° t0 J–]] [Com° t0 ⊢]]] [CP *dass Max laut schnarcht*]2]

The epistemic adverbial is assumed to be generated above the TP. However, TP-internal material can scramble over it, giving the impression of a syntactically lower realization. Assuming that scrambling is adjunction to Com′ this can be illustrated as follows:[20]

(34) [ActP [*nach diesem Gelage*]2 [Act′ [Act° *schnarcht*0 •] [ComP t2 [Com′ *Max*1 [Com′ *heute*3 [Com′ [JP t2 [J′ *sicherlich* [J′ [TP t1 t2 t3 *laut* t0] [J° t0 J–]] [Com° t0 ⊢]]]]]]
'After this banquet Max will certainly snore loudly today.'

Generally, constituents do not scramble over in-situ wh-items with indefinite interpretation, and this is borne out under the hypothesis (for parenthetical readings of *sicherlich,* see below).

(35) *Nach diesem Gelage schnarcht heute sicherlich wer laut / heute* ??*wer sicherlich laut.*

Notice that subjective and objective modal markers may be combined, as in (36):

(36) a. *It certainly is improbable that Max will win the race.*
b. *Es ist sicherlich unwahrscheinlich, dass Max das Rennen gewinnt.*

In such sentences, the speaker expresses a private judgement of high certainty about a low objective probability.

Now, in (32) the adverbial *sicherlich* is part of the JP, whereas in (33) the adjective *sicher* is part of the TP, and its extraposed complement clause is adjoined to Act′. What does this difference mean? I would like to suggest the following: In a subjective epistemic sentence, it is the TP proposition that the speaker really intends to communicate; the epistemic modifications expressed within the JP just provides a way to indicate how certain the judge, here the speaker, is about that proposition. Hence the contribution of the subjective epistemic operator is not part of the at-issue meaning (cf. Müller 2019a).[21] But even if the speaker intends to communicate the TP, it is the judgement expressed in the JP that the speaker actually is committing to and what he or she has to be held responsible for. In (33), the speaker communicates that it is certain

[18] This is different from the particle *wohl*, which apparently can flip to the addressee in questions, as in *Ist Hein wohl auf See?* 'Is Hein PART at see?', cf. Zimmermann (2004). Questions and discourse particles deserve detailed treatment and will not be discussed here.

[19] The form *sicher* also occurs as an epistemic adverb, as in *Max schnarcht sicher laut.* The preferred interpretation is just like *sicherlich* as a JP modifier, but a TP-related interpretation appears possible as well; e.g. we find it in the scope of negation, as in *Es stimmt nicht, dass Max sicher /* ??*sicherlich schnarcht* 'It is not true that Max snores certainly'.

[20] Thanks to H.-M. Gärtner for the example.

[21] This does not mean that subjective epistemic operators cannot be focused, cf. *Max (most) CERTAINLY snored* or *Max MUST have snored because the neighbors complained about it.*

that Max is snoring loudly, referring to some objective measure of certainty, whereas in (32) the speaker communicates that Max is snoring loudly, and does this by way of committing to the proposition that he or she is certain about it. Why should the speaker do this? This commitment is easier to defend than the one to the proposition that Max snores loudly because it refers to the private epistemic state of the speaker, which is difficult to challenge by others. The overall effect is that the assertion seems "weakened", but in fact it is not a weaker commitment that is expressed, but a commitment to a different proposition, one that may feel safer to defend.

Notice that in order for (32) to be a convincing conversational move, the subjective certainty of the speaker must be high and should not express any doubt; this explains why subjective epistemic modifiers cannot be negated, cf. (30).[22] This corresponds to the observation by Nilsen (2004) that epistemic adjectives, but not epistemic adverbials are consistent with low likelihood ratings by the speaker:

(37) *It is possible that Le Pen will win / # Le Pen will possibly win, even though she certainly won't.*

The resistance of JPs to occur in the protasis of conditionals, cf. (28)(a), can be explained as well: Conditionals need an objective description of the antecedent condition in order to be informative.

The proposal that speakers want to communicate the TP proposition has to be somewhat modified in view of the fact that subjective epistemic modals can also be weak, like *möglicherweise* and *vielleicht.* I would like to propose that the speaker wants, at the very least, to introduce the proposition into the common ground as a proposition to be taken into consideration. This is compatible with cases that introduce a proposition and its negation under weak subjective epistemic modals (cf. Müller 2019a).

(38) *Vielleicht schnarcht Max, vielleicht schnarcht er nicht.*
'Perhaps Max snores, perhaps he doesn't snore.'

Weak subjective modals are sufficient for that, as an argumentative move in which also more remote possibilities are considered. But even in this case we do not expect that such sentences can be negated, as this would take away any support for the introduction of the TP proposition for argumentative purposes.

The general unavailability of negated modal adverbials argues for the JP as a separate projection with a specific semantic function, namely to express a judgement in favor of the complement TP proposition in order to communicate that proposition as a viable epistemic option that should be considered. If this is the meaning of the JP, it is predicted that negation of epistemic modals and negated epistemic modals are ungrammatical, as they would systematically contradict the meaning of the JP projection (cf. Gajewski 2002 and Abrusán 2019 for the principle that systematic contradictions lead to ungrammaticality).

Epistemic modal verbs arguably also have a subjective and an objective interpretation (cf. Lyons 1977, De Haan 1999, 2009, Drubig 2001, Verstraete 2002, Radden 2009, Rett 2012). We illustrate this with German *müssen*, expressing epistemic necessity, and its subjunctive (Konjunktiv II) form *müsste*, expressing a "weakened" form of necessity (cf. Zifonun e.a. 1997:

[22] Notice that negation in sentences expressing beliefs is possible, even when the embedded proposition should be communicated, but then they show NEG raising: *I don't believe that Max snores* is interpreted as: 'Speaker believes that Max doesn't snore' putting forward the proposition 'Max doesn't snore'. It is unclear why epistemic adverbials do not exhibit neg raising, that is, why **it will not certainly rain* does not achieve the interpretation *it will certainly not rain.*

1270; Matthewson & Truckenbrodt 2018). The former can be under the scope of negation, in contrast to the latter:

(39) a. *Max muss* / *müsste zuhause sein, weil das Licht in seiner Wohnung an ist.*
b. *Max muss* / **müsste nicht zuhause sein, er könnte das Licht angelassen haben*.

Also, *muss* can be tensed, expressing an epistemic modality that holds in the past or the future, whereas *müsste* cannot express tense in spite of being formally related to past tense (cf. Karawani 2014), and hence is restricted to modal evidence at the time of utterance.

(40) *Das Licht war letzten Samstag an. Max musste* / **müsste also zuhause sein*.

Consequently, we assume that *müsste* only has a subjective, TP-external reading, whereas *muss* can also have an objective, TP-internal reading. The subjective interpretation should form the head of the JP whereas the objective interpretation should originate from within the TP. In either case, the complement is an infinitival phrase, InfP.

(41) a. [JP *Max* [J′ [InfP PRO *zuhause sein*] [J° *müsste*]]]
b. [JP [J′ [TP *Max* [InfP PRO *zuhause sein*] [T° *muss / musste*]] [J–]]]

Subjective and objective epistemic modality can be modeled by modal operators that refer to an epistemic source, where in subjective modality the source is the judge, and in objective modality the source is some contextually salient entity that may be different from the judge (cf. von Fintel & Gillies 2009). For example, assume that epistemic near-certainty is expressed by an operator CERT with arguments x for the epistemic authority, i for the index of interpretation and p for the proposition, and a contextually relevant judge j* that may be different from j. Subjective and objective modality then can be modeled as illustrated by the following examples:

(42) ⟦[J′ *sicherlich* [J′ [TP *Max laut schnarcht*][J° J–]]]⟧$_{s,a}$
= ⟦*sicherlich*⟧(⟦[TP *Max laut schnarcht*]⟧$_{s,a,\mathbf{j}}$)
= λ**j**λi[CERT(**j** ,i)(λi[Max snores loudly, according to **j**, in i])]

(43) ⟦[TP *es sicher ist* [CP*dass Max laut schnarcht*]]⟧$_{s,a,j,j^*}$
= ⟦*sicher*⟧(⟦[CP *dass Max laut schnarcht*]⟧$_{s,a,j,j^*}$)
= λi[CERT(**j***,i)(λi[Max snores loudly, according to **j***, in i])][23]

This does not capture the other observed property of subjective epistemics, that they are used to put the proposition of the epistemic attitude into the common ground, even with some hedging by the speaker. We have modelled the communication of a proposition via a commitment by Commitment Closure in (25), which showed how the common ground can be enriched by a proposition φ from the commitment of a trustworthy participant to φ. Now, in case φ consists of a judgement of a proposition φ′, then a similar kind of closure allows for the enrichment of the common ground by φ′ as well. We will call this "judgement closure":

(44) Judgement Closure of c:
If φ′ is a (recently expressed) proposition such that it holds for a trustworthy person x that ∀i∈c: [x has a positive epistemic attitude towards φ′],
and the participants in conversation do not object:
c + JCl(φ′) = {i | i∈c ∧ φ′(i)}

[23] The representation predicts that the source for epistemic operators and for predicates of personal taste are the same. See Stephenson (2007) for this observation and also for a refinement that allows for personal taste predicates to be interpreted with respect to another salient evaluative perspective, to handle cases like S_1: *How is the new cat food?* S_2: *It's tasty. / It is certainly tasty / Bill thinks it is tasty*, where tastiness may be judged from the perspective of the cat, not from the perspective of S_2 or from Bill.

We can now give the following refined analysis of the act of assertion, extending (26):

(45) S_1 to S_2: $[\![[_{ActP}\ [\ \bullet\ [_{ComP}\ s \vdash [_{JP}\ [_{TP}\ \ldots]]]]]]\!] =$
$\lambda c\ [\ [\ [c + \bullet\ [_{ComP}\ \ldots]] + CCl([_{JP}\ \ldots])] + JCl([_{TP}\ \ldots\ ])]$

Consider the assertion of the JudgePhrase (42); it will lead to the following result:

(46) S_1 to S_2: $[\![[_{ActP}\ [_{Act'}\ [_{Act^o}\ \bullet\ ]\ [_{ComP}\ [_{Com'}$
$[_{JP}\ [_{J'}$ *sicherlich* $[_{J'}\ [_{TP}$ *Max laut schnarcht* $][_{J^o}$ J– $]]]][_{Com^o} \vdash]]]]\!]_{s,a}$
$= \lambda c\{i' | \exists i \in c[i \multimap_\bullet i'[\lambda i[S_1 \vdash_i \lambda i[CERT(S_1,i)(\lambda i[Max\ snores\ loudly,\ acc.\ to\ S_1,\ in\ i])]]$
$\wedge\ CERT(S_1,i')(\lambda i[Max\ snores\ loudly,\ according\ to\ S_1,\ in\ i])$
$\wedge\ [Max\ snores\ loudly,\ according\ to\ S_1,\ in\ i]\}$

The first step expresses the commitment of the speaker. Commitment closure (25) leads to updating the common ground that the speaker considers it certain that Max snores loudly, and judgment closure (44) then introduces in addition the proposition that Max snores loudly. Judgment closure forces the epistemic relation to be a positive one, ruling out epistemic adverbials like **unsicherlich*, otherwise it would not be applicable because the epistemic attitude of the speaker would not give the necessary support to the proposition.

The overall effect of epistemic hedging as in (46) in contrast to the assertion of a simple proposition as in (24) is that S_1 is only responsible for the proposition that S_1 considers it certain that Max is snoring loudly, not for the proposition that Max is snoring loudly. In case a speaker expresses commitment for a proposition φ one can assume that the speaker also has a positive attitude towards that proposition, but in this case JCl would not add anything new to what was present already by CCl.

Consider, in contrast, the assertion of epistemic adjectives as in (47):

(47) a. *Es ist (nicht) sicher, dass Max laut schnarcht.*
b. *Ich halte es (nicht) für sicher, dass Max laut schnarcht.*
'I (do not) consider it certain that Max snores loudly.'

Here, the assertion rule (45) does not lead to an automatic acceptance of the complement propositions, not even if the judger is the speaker, as in (47)(b). The TP is interpreted as follows:

(48) $[\![[_{TP}$ *ich es für sicher halte, dass Max laut schnarcht*$]]\!]_{s,a,j}$
$= \lambda i[CERT(S_1,i)(\lambda i[Max\ snores\ loudly,\ according\ to\ S_1,\ in\ i])]$

The assertion of this sentence by S_1 leads to the following results:

(49) S_1 to S_2: $[\![[_{ActP}\ [_{Act'}\ [_{Act^o}\ \bullet\ ]\ [_{ComP}\ [_{C'}\ [_{JP}\ [_{TP}$ *ich es … schnarcht* $]\ [_{J^o}$ J-]] $[_{C^o} \vdash]]]]]\!]_{s,a}$
$= \lambda c\ [[[c + \bullet\ [_{ComP}\ \ldots]] + CCl([_{JP}\ \ldots\ ])] + JCl([_{TP}\ \ldots])]$
$= \lambda c\{i' | \exists i \in c[i \multimap_\bullet i'[\lambda i[S_1 \vdash_i \lambda i[CERT(S_1,i)(\lambda i[Max\ snores\ loudly,\ acc.\ to\ S_1,\ in\ i])]]$
$\wedge\ CERT(S_1,i')(\lambda i[Max\ snores\ loudly,\ according\ to\ S_1,\ in\ i])\}$

As we draw inferences on the TP proposition as well, additional inference can lead to the acceptance of the embedded proposition by an additional abductive inference step: A good explanation why a reasonable person is certain that a proposition is true is that this proposition is, in fact, true.

3.1.2 Evidentials

We now turn to evidential operators, which we generally understand as specifying not the strength but the source of an epistemic attitude (cf. De Haan 1999 for this distinction; cf. Wiemer 2018 for a recent survey). For example, there are languages that have evidentials as part of the verbal inflection that refer to the sensory channel of the information. One example is Euchee (Yuchi) in Oklahoma for auditory evidence (cf. Aikhenvald 2004):

(50) *'ahe i-gō-ke*
here 3PL-come-AUDIT
'They are coming, I hear them.'

⟦[$_{JP}$ [J– AUDIT [$_{TP}$ *'ahe i-gō*]]]⟧ = λ**j**λi[hear$_i$(**j**, 'they are coming')],
where hear$_i$(j, φ): in i, judge j has auditory evidence for the truth of φ

We can deal with such evidentials as specifications of the JP head, which in the case at hand specifies that the source for the proposition for the judge was hearing. When asserted under the assertion rule (45) the speaker will commit to the proposition that he or she is hearing that they are coming, which will make this proposition part of the common ground via commitment closure, and the proposition that they are coming via judgement closure.

Another type of evidentials mark the evidential source as inferential reasoning, in contrast to direct observation. One example is the particle *wohl* in German (cf. Zimmermann 2004).

(51) [$_{ActP}$ *Max* [• *schnarcht* [$_{ComP}$ [$_{JP}$ [$_{J'}$ *wohl* [$_{J'}$ [$_{TP}$ *Max laut schnarcht*] J–]]] ⊢]]

⟦[$_{J'}$ INFER [$_{J'}$ [$_{TP}$ *Max schnarcht laut*][$_{J^0}$ J-]]]⟧$_{s,a}$
= λ**j**λi[infer$_i$(**j**, 'Max is snoring loudly')],
where infer$_i$(j, φ); in i, the judge j has inferential evidence for the truth of φ.

When asserted, these two types of evidentials are related to the speaker as the epistemic authority. But the epistemic authority can also be shifted to another source in the case of reportative evidentials, which express reliance on some previous public commitment by another speaker.

Clear examples of this type of commitment are expressions like *according to X* or German *laut X*[24] or *nach X*, as in the following example:

(52) *Laut Eva schnarcht Max laut.*

Reportative evidentials rely on the information by another person. This feature can be captured if reportative evidentials express public commitments by another authority, illustrated in (53):

(53) ⟦[$_{J'}$ [*laut Eva*] [$_{J'}$ [$_{TP}$ *Max laut schnarcht*] [$_{J^0}$ J–]]]⟧$_{s,a}$
= λjλi[Eva ⊢$_i$ λi[Max snores loudly, according to Eva, in i]]

Assertion of (53) commits the speaker to the proposition that Eva is committed to Max snoring loudly, which will introduce this proposition into the common ground by commitment closure. If Eva is a trustworthy person, and if there is no contradictory move, then judgement closure will introduce the proposition that Max snores loudly (according to Eva's judgement).

However, if there is contradictory evidence, this last step will be blocked, for example if the speaker adds *Ich glaube das aber nicht* 'I don't believe that.', or *Aber das ist nicht wahr.* 'But that is not true'. The fact that reportative evidentials in particular can be denied is well-known, cf. e.g. Murray (2010, example 3.17) for Cheyenne, and AnderBois (2014) in general. In particular, Faller (2019) suggests that a reportative evidential proposition can be used by the speaker to put the proposition in the scope of the evidential into the common ground. By this, the speaker S commits to the existence of another authority X that is committed to the proposition, which the speaker considers relevant for the question under discussion, whether φ is true or not (cf. also the notion of "proxy speech act" in Krifka 2014). Faller (2019) appeals

[24] The preposition *laut* is etymologically related to the manner adverbial *laut* 'loudly' via the noun *Laut* 'sound'. The preposition became grammaticalized in this function already in the 15th century, from an earlier *nach dem (Brief-, Wort-)laut von X* 'according to the letter, the words of X'. Expressions with similar functions are *Eva zufolge* and *Evas Meinung nach.*

to the general Collaborative Principle of Walker (1996), according to which discourse participants have to voice any disagreement about the truth of a proposition with other participants as soon as possible; this is a plausible general rule of maintaining the common ground.[25]

Another type of expressions that could be analyzed in a similar way as (53) are sentences with reportative verbs. As Hooper & Thompson (1973: 475) pointed out, a sentence like *Bill said that it's just started to rain* has two readings, one in which it is asserted what Bill said, and one in which it is the proposition that it's just started to rain "whose truth is at stake in the discourse" This ambiguity can be expressed as follows (using a German example, with the clausal argument in a postverbal position):

(54) a. [JP [J′ [TP *Eva* [[T° *sagte*] [CP *dass* [TP *Max laut schnarcht*]]]] [J′ J–]]]
b. [JP *Eva* [J′ [J° *sagt(e)*] [CP *dass* [TP *Max laut schnarcht*]]]]

(54)(a) is the reading in which the proposition that Eva said that Max snores loudly is the communicated message. In (b), it is the proposition that Max snores loudly, and the information that Eva said this is just an evidential, resulting in a reading similar to (53). The verb *sagen* fills the head of the JP. It easily occurs in a generic present tense, indicating the atemporal nature of the commitment, but it also can occur in the past tense, referring to a particular occasion at which this commitment was expressed. Reading (b) is the only reading in parenthetical uses, as in *It's just started to rain, he said*, where the root syntax of the embedded clause makes it obvious that this is the main message (cf. also Urmson 1962, Bolinger 1968, and Ross 1973). These are the circumstances in which we find, in German, the verb in the second position, characteristic of assertions (cf. Section 4.2 for discussion). Interestingly, Hooper & Thompson (1973) also point out that in the parenthetical case in which only reading (b) is available the main predicate cannot be negated: *It's just started to rain, *he didn't say.* The reason is the same why adverbial judgement modifiers cannot be negated: Material in the JP should support the TP, and this is not possible when the reportative verb is negated.

There are also evidential adverbials like *anscheinend* 'apparently', *scheinbar* 'seemingly', *offensichtlich* and *augenscheinlich* 'evidently, by visual evidence' and *vermutlich* 'presumably' (cf. Axel-Tober & Müller 2017) as well as *scheint's* derived from *es scheint* 'it appears' (cf. Axel-Tober 2016). Another one is *angeblich* 'allegedly', which indicates an evidential source that is different from the speaker and is bound existentially.

(55) ⟦[JP [J' *angeblich* [J′ [TP *Max laut schnarcht*] [J° J–]]]]⟧s,a
= λjλi∃x[x ⊢i λi[Max snores loudly, according to x, in i]]

Evidential modality can also be expressed by head features, for example in German by the modals *sollen* and *wollen* (cf. Schenner 2009) as well as by Konjunktiv I (cf. Sode & Truckenbrodt 2018). This is illustrated here with *wollen* in (56),

(56) ⟦[JP *Max*1 [J′ [InfP PRO *laut schnarchen*] [J° *will*]]]⟧s,a
= λjλi[Max ⊢i λi[Max snores loudly, according to Max, in i]]

With *wollen*, the evidential source is the subject of the sentence. This is clearly derived from volitional *wollen* 'want', where the source is also the subject.[26] With *sollen*, the evidential

[25] In a discourse like *Max schnarcht laut Eva laut, aber ich glaube das nicht* one can assume that the first clause contributes the proposition that Eva is committed to the proposition that Max snores loudly, but the second clause triggers a retraction of this contribution; cf. Krifka 2017 for the proposal of such a rejection mechanism.

[26] The representation of reportative *wollen* as a judgement head can explain its use even in cases in which the subject, Max, did never intend to communicate the proposition that he snores loudly to anyone else but just said it to himself, cf. Gärtner (2012) in an argument against the make-belief account of assertions of Zaefferer (2001) and its modified form, Zaefferer (2006).

source is at least distinct from the speaker, a feature that it shares with the authority of deontic *sollen* 'should' in its non-performative use. However, the source can be specified more narrowly, e.g. by a *laut X* phrase (the "concord" reading in Schenner 2009). This means that *sollen* introduces an evidential source that is distinct from the speaker; as a free variable, it is bound by an existential quantifier or by an evidential source provided by the context.

(57) ⟦[$_{JP}$ *Max*$_1$ [$_{J'}$ [$_{InfP}$ PRO *laut schnarchen*] [$_{J^0}$ *soll*]]]⟧$_{s,a}$
= λjλi:x≠s[x ⊢$_i$ λi[Max snores loudly, according to x, in i]]

As a free variable, it x can be specified further, e.g. by a *laut X* phrase; this is the "concord" reading of Schenner (2009).

(58) ⟦[$_{JP}$ *Max*$_1$ [$_{J'}$ [*laut Eva*] [$_{I'}$ [$_{InfP}$ PRO *laut schnarchen*] [$_{J^0}$ *soll*]]]]]⟧$_{s,a}$
= λjλi:x≠s[x=Eva ∧ x ⊢$_i$ λi[Max snores loudly, according to x, in i]]

In the current setup, the semantic contributions in the JudgeP are not part of the main proposition that is to be communicated, the TP. Modifications in the JudgeP only serve to back up that proposition. We have seen that one reason why the speaker employs epistemic and evidential modifications is to change the type of commitment to the proposition; it is safer to commit to one's own estimation of likelihood of a proposition, or commit to the inference of a proposition from assumptions that one holds true, than to commit to the proposition directly. It is also safer to publicly support that proposition follows from someone else's commitments, expressing a dependent commitment in the sense of Gunlogson (2008), as then the original source is to be blamed in case the proposition turns out to be false.

The current approach does not need to stipulate a difference in the type of speech acts between straight assertions and assertions by reportative evidence, as in Faller (2002) in her treatment of reportatives in Quechua, who suggested that reportatives express a speech act of "presentation" of an assertion of the proposition by someone else (cf. ex. 165). In the current approach, a speaker commits to the proposition that someone else asserted the TP proposition, but it is this TP proposition that is offered to be admitted to the common ground.

Also, it should be noted that there are a number of proposals that subjective modifiers do not relate to the expressed proposition but to the speech act (cf. Drubig 2001). The current proposal obviously belongs to this approach, with a twist: The subjective modifier belongs to the content that the speaker commits to (it is part of the JP), but not to what the speaker intends to communicate (the TP proposition).

3.2 Commitment Modifiers

We now turn to expressions that affect the nature of the commitment, and hence should be interpreted as part of the CommitmentPhrase. They increase the strength of the commitment, and hence may be called "affirmatives". Strength has been proposed as a parameter of speech acts by Searle & Vanderveken (1986) and by Vanderveken (1990), mostly used to classify speech-act denoting verbs (e.g., *suggest*, *assert* and *swear*). But this notion of strength was not clearly defined by Vanderveken, and it is doubtful that it there are discrete values in a single dimension. Here, I understand strength-related expressions in assertions as specifying the type of commitment of the speaker. As commitments are backed up by the sanctions that will take effect in case the commitment cannot be honored (i.e., the asserted proposition turns out to be false, and there is no excuse for the committer), one plausible way of describing different commitment levels is by the type of sanctions. In a legal context, the level is raised in the case of an oath, often requiring a dedicated manual gesture. In certain interrogation situations, the threat of torture is considered a suitable technique to raise commitment levels. The idea is that raising the levels of possible sanctions leads to a more trustworthy assertion. This is similar in business; a company that is liable with the private property of the owners is considered more trustworthy than one that limits the risk to a fixed maximal amount of money.

Commitment modifiers can be used in situations that require special support because a regular commitment may be seen to be too weak to do the job of convincing the addressee. They can also mark the commitment as a serious one, not belonging to playful communication or to "bullshit" (Frankfurt 1986).[27] Hence, they occur when the speaker fears that the proposition to be communicated may hard to believe. In this way, commitment modifiers convey a sense of emphasis, perhaps even an implicature that the proposition expressed is controversial. It appears that there are few, if any, cases of commitment modifiers that weaken the commitment of the speaker. If a speaker wants to reduce the commitment level, the typical method will be to qualify the judgment by epistemic or evidential modifications which, as argued, do not actually reduce the commitment itself but commit the speaker to a different proposition that is easier to defend.

The most obvious commitment raisers are those that call on the authority that may inflict the sanctions, e.g. *bei Gott* 'by God'. The following example illustrate the positional options of a full XP commitment modifier:

(59) *(Bei Gott), ich habe (bei Gott) das Geld (bei Gott) nicht gestohlen.*
'By God, I didn't steal the money.'

Such appeals to authorities can be expressed in other ways, e.g. by parenthetical constructions as in *Gott sei mein Zeuge* 'let God be my witness'. Commitment modifiers like *bei meiner Mutter!* can be seen as putting the reputation of a respected family member at state, and *bei meiner Seele / Mutter* 'at my soul / mother' as involving some kind of bet. Commitment levels can be raised by explicit performatives, like *ich schwöre* 'I swear'; in modern urban German ("Kiezdeutsch"), the commitment modifier *ischwör* has developed from the parenthetical use of this expression. Another type of commitment modifiers express that the commitment is serious, as *im Ernst, allen Ernstes, ernsthaft* 'in earnest', 'seriously', *wahrlich, wahrhaftig* and 'truthfully', *wirklich* 'really' and *in Wirklichkeit* 'in reality' and the more colloquial *echt* 'seriously'.[28] There are commitment modifiers that express exclusion of non-serious assertions, in particular *ungelogen* literally 'not lyingly' and colloquially *kein / ohne Scheiß* 'no/without shit (nonsense)' and Bavarian *ohne Schmarrn* 'without nonsense'. There are expressions for which it is not clear whether they affect commitments or rather, as epistemic modifiers, the proposition to which the commitment is expressed, like *nach bestem Wissen und Gewissen* 'to the best of my knowledge and conscience' which expresses the speaker scrutinized the own knowledge (this is the epistemic part) and is aware of the moral involvement (this is the commitment part). It is not always clear how to distinguish commitment modifiers from epistemic modifiers. The adverb *unglaublich* 'unbelievably' is etymologically related to belief, and hence appears to be an epistemic modifier, but rather appears to modify commitments; it expresses that the commitment is made in spite of epistemic background assumptions. The distinction between epistemic modifiers and commitment modifiers will be taken up below.[29]

We have argued for a commitment view of assertions, and at least some of the commitment modifiers have a literal meaning that fits well to this conception, such as *by God* 'by God', *im Ernst* 'seriously' and *ungelogen* 'without lying'. We do not find sentence adverbials that relate to beliefs, such as *fest* 'strongly', or to wishes, such as *bitte* 'please' in assertions. This can be

[27] Of course, just as a poker player with a losing hand might want to impress the opponents by being especially confident, the use of commitment raisers is no guarantee that the proposition asserted actually is true!

[28] *Echt* often appears in assertions of extreme and emotionally charged assertions, as in *Das hat echt wahnsinnig Spaß gemacht* 'this was truly great fun'. This development is pragmatically well motivated because such assertions are prima facie less believable, and hence benefit from an increased commitment level.

[29] It is interesting that words modifying wishes and commands like 'please' do not occur in this function. They would be expected following the intentional theory of Bach & Harnish (1979), for which assertions express a wish or command by the speaker that the addressee believes the proposition.

seen as another piece of evidence for the commitment view, and against the belief-base views discussed at the beginning of Section 1.

Commitment modifiers have not found the same attention as judgement modifiers (epistemic and evidentials) in linguistic research. The strengthening function of oath formulas in Egyptian Arabic is discussed by Mughazi (2003) with examples like *wallaah* 'by God', *winnabi* 'by the Prophet', *wiʔingiil* 'by the Bible'. For Swedish, Stroh-Wollin (2011) and Julien (2007, 2015) discuss oath formulas and, in particular, swear words as markers of assertions and other speech acts.[30]

As to their semantics, commitment modifiers and judgment modifiers may not easy to be distinguished because they may have a similar overall effect. For example, we can describe a sentence like *Max perhaps will snore* either as an assertion of a subjective-epistemically modified proposition, or as a weak assertion of an epistemically non-modified proposition. (cf. Wolf 2015, and Incurvati & Schlöder 2019, who develop a logic of weak assertion as marked by *perhaps*). It is not straightforward to argue for one or the other view, and it might well be that an operator can be used ambiguously, or undergo a historical change from one class (e.g., subjective epistemic adverbial) to another (e.g., commitment or assertive strength marker). There also may be syntactic differences; cf. discussion of (71) that subjective epistemic markers, but not commitment markers, occur in the prefield of the clause in German.

In cases in which commitment modifiers and judgement modifier occur together, it appears that they scope over judgement modifiers, if the linear order is taken as evidence for scope order (as argued for by Ernst 2009).

(60) [$_{\text{ActP}}$ *Max* [$_{\text{Act'}}$ *hat*$_0$ [$_{\text{ComP}}$ *bei Gott* [$_{\text{JP}}$ *ganz sicher* [$_{\text{TP}}$ t$_1$ *das Geld nicht gestohlen* t$_0$]]]]]
(* *Max hat ganz sicher bei Gott das Geld nicht gestohlen*).

(61) *Dieses Buch ist wahrlich mit Sicherheit ein Meisterwerk.*
'This book is truly with certainty a masterpiece.'
(**Dieses Buch ist mit Sicherheit wahrlich ein Meisterwerk.*)

This suggests the indicated order of ComP over JP, and is an argument for the syntactification of commitment modifier and judgement modifier.

Many combinations of commitment and judgement modifiers are odd. In (60), the judgment modifier *ganz sicher* expresses very high certainty of the speaker in the proposition, and this is compatible with the raising of the commitment level by the commitment specifier *bei Gott.* However, the combination of commitment modifiers and judgement modifiers often have conflicting pragmatic effects: While commitment modifiers raise the commitment level, judgment modifiers are used if the speaker does not want to commit to the core TP proposition directly, typically because of lack of evidence for it. For this reason, simultaneous use of the commitment modifier *echt* and the subjective epistemic adverbial *möglicherweise* 'possibly' is odd, cf. (62)(a). There is no conflict with objective epistemic adjectives, as in (b).

(62) a. *#Max hat echt möglicherweise das Geld gestohlen.*
'Max truly possibly stole the money.'

b. *Es ist echt möglich, dass Max das Geld gestohlen hat.*
'It is truly possible that Max stole the money.'

[30] In addition to such adverbial modifiers, there are other ways to modify the strength of commitments, e.g. by question tags and rising prosody (cf. Krifka 2015, Malamud & Stephenson 2015) and explicit performatives using verbal predicates denoting speech acts like *schwören*, cf. (68). One common way of downtoning commitment levels are explicit performatives like *Ich sag mal…*, roughly 'I guess', where *mal* refers to the current occasion and stresses that the assertion is in some way preliminary.

Commitment modifiers differ from judgement modifiers in the context of the literary style of Free Indirect Discourse. Banfield (1992) observed that adverbials like *certainly* can occur in a shifted interpretation, but *honestly* cannot (cf. also Woods 2016). For example in *Mary was disappointed. Certainly, she could have done better!* the interpretation of *certainly* can be from Mary's perspective, but this shift is absent for *Honestly, she could have done better!*, where *honestly* must be interpreted from the perspective of the speaker.

As for the semantic representation of commitment modifiers, there is no established body of research, quite different to epistemics and evidentials. I would like to suggest the following representation format here. Commitment modifiers identify commitments by the judger that are of the specified type, e.g. commitments with God as witness in the case of *by God*, or serious commitments in case of *ernsthaft* and *echt*.

(63) $[\![[_{\text{Com}'}$ *echt* $[_{\text{Com}'}\ [_{\text{JP}}\ [_{\text{TP}}$ *Max laut schnarcht* $]\ [_{\text{J}^{\text{o}}}$ J– $]]\ [_{\text{Com}^{\text{o}}} \vdash]]]]\!]_{s,a}$
= λjλi[SERIOUS_COMMITM(i,j)
(λjλi[j $\vdash_i$ λi[Max snores loudly, according to j, in i])]

When asserted by a speaker S_1, the indices of the common ground are changed minimally such that it now belongs to the serious commitments of S_1 that Max snores loudly.

(64) S_1 to S_2: $[\![[_{\text{ActP}}$ *Max*$_1$ $[_{\text{Act}'}\ [_{\text{Act}^{\text{o}}}$ *schnarcht*$_0$ • $]$
$[_{\text{ComP}}\ [_{\text{C}'}$ *echt* $[_{\text{C}'}\ [_{\text{JP}}\ [_{\text{TP}}$ t$_1$ *laut* t$_0$] $[_{\text{J}^{\text{o}}}$ J– $]]\ [_{\text{C}^{\text{o}}} \vdash]]]]]]\!]_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ λi[SERIOUS_COMMITM(S_1,i)
(λjλi[j $\vdash_i$ λi[Max snores loudly, according to S_1, in i])]

The net effect is that the speaker puts greater weight behind putting the proposition 'Max snores loudly' into the common ground. Moves like this are to be expected if the addressee is likely to object. This effect of commitment level raisers would have to be spelled out in a game-theoretic pragmatic framework; the representation in (64) only gives a suggestion of the semantic input for such a theory.

With judgment modifiers we have observed that they can also be expressed by head operators, like subjective epistemic verbs, cf. (41), or reportative evidential verbs, cf. (57). Are there also commitment operators that can be expressed as head features? There are occasional reports of grammatical markers of different assertion strength, as in Meithei (Tibeto-Burman, India; Chellia 1997). In German, there is a special interpretation of the subjunctive (Konjunktiv II) that arguably is interpreted at the commitment level; this is the "free factive subjunctive" discussed in Csipak (2015) and illustrated in (65):

(65) Cook in a restaurant: *Ich hätte da eine schöne Dorade*.
lit. 'I would have a nice sea bream.', meant as a suggestion.

This use of Konjunktiv II indicates assertions that are less dominant than regular assertions, and hence often signal politeness. Csipak (2015) models this use as presupposing the existence of a decision problem (for (65): what to order for a meal) for which the asserted sentence provides a one solution, among others. This is a rather specific meaning. I suggest that the free factive subjunctive at a given index i expresses that it is possible for the judger to make the indicated commitment; that the commitment is not made outright (by *Ich habe da eine schöne Dorade*) signals that the speaker is not certain that this commitment fits the pragmatic requirements of a relevant assertion. This corresponds to the general meaning of the subjunctive that we also find in descriptive environments, that the index of interpretation is not the actual index.

(66) S_1 to S_2: $[\![[_{\text{ActP}}$ *ich*$_1$ $[_{\text{Act}'}\ [_{\text{Act}^{\text{o}}}$ *hätte*$_2$ •$]$
$[_{\text{ComP}}\ [_{\text{Com}'}$ t$_1$ $[_{\text{JP}}$ t$_1$ $[_{\text{TP}}$ t$_1$ *da eine Dorade* t$_0$] $[_{\text{J}^{\text{o}}}$ J–$]$ $[_{\text{Com}^{\text{o}}}$ [*hab*-$_0$ + KonjII]$_2$ $\vdash]]]\!]_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ λi[POSS(S_1,i)(λjλi[j $\vdash_i$ λi∃x[seabream(i)(x) ∧ have(i)(s)(x)])]}

This is to be understood as an offer by the speaker to commit to a proposition that can be taken up by the speaker, hence the "factive" nature of such assertions. – There are other cases of such proposed assertions, as in (67).

(67) *Ich würde sagen, das ist eine Dorade.*
'I would say, this is a sea bream.'

In this case the assertion is implicitly conditionalized by a condition like 'if you ask me' or 'if I had to make a decision'. This indicates that the assertion is dependent on conditions that might supersede the ordinary precondition for undergoing an assertive commitment, namely a firm belief that the proposition is true.[31]

In (67) the verbal predicate of the main verb, *sagen*, is used in a performative, not in an informative (descriptive) way. In the current setup, it is a natural assumption that verbs that are used performatively do not originate in the TP, but as heads of the ComP, where they express a specific type of assertive commitment. Explicitly performative assertions can be analyzed in the following way:

(68) *Ich schwöre (hiermit), dass Max laut schnarcht.*
'I swear (hereby) that Max snores loudly.'
S_1 to S_2: ⟦[$_{ActP}$ *ich*$_1$ [$_{Act'}$ [$_{Act^o}$ • *schwöre*$_0$] [$_{ComP}$ t_1 [$_{Com'}$ *(hiermit)*
[$_{Com'}$ [$_{CP}$ *dass Max laut schnarcht*] [$_{Com^o}$ t_0]]]]]]⟧$_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ [λi[S_1 swears in i: λi[Max snores in i ∧ S_1 consid. it loud in i]]}

By this move, the input index i is minimally changed to i′ such that in i′ it holds that S_1 swears that the proposition 'Max snores loudly' is true. That is, i′ differs from i insofar as in i′, the speaker S_1 has undergone the strict assertive commitments that come with swearing, again raising the stakes that the proposition actually is accepted by the addressee. The verb *schwören* is part of the performative, not of the informative update. In the current theory, the main verb originates in the head of the ComP; this means that there is no TP and no semantic tense (they carry present tense but are lacking the possible future interpretation of present tense in German) and also no JP (hence explicit performatives cannot house epistemic or evidential operators). Explicit performatives often come with the adverb *hiermit* 'hereby'; I assume that this refers to the locutionary event that comes with the index change i⊶•i′, not modelled in the present paper (cf. Eckardt 2012 for a theory that assumes reference to speech act events). Explicit performatives that introduce non-assertive commitments can be analyzed along similar lines, as illustrated in (69); here the VP headed by the verb *ernennen* 'appoint' is not a complement of a TP, but the complement of a ComP; as a result, the sentence does does not lead to an informative but to a performative update:

(69) ⟦[$_{ActP}$ *Ich* [$_{Act'}$ [$_{Act^o}$ • *ernenne*] [$_{ComP}$ t_1 [$_{Com'}$ *(hiermit)*
[$_{Com'}$ [$_{vP}$ *Max zum Feldwebel* t_0] [$_{Com^o}$ t_0]]]]]⟧$_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ λi[S_1 appoints, in i, Max to the position of sergeant]]}

Performative updates can also be performed by simple declarative sentences in present tense (cf. Recanati 1987); they can be analyzed as in (70) as involving no separate commitment phrase at all, but only a TP.

[31] Other cases of head features marking the speech act type in German include imperatives, with a special form in the singular (cf. *Nimm den Bleistift* 'take the pencil' with the verb *nehmen* 'to take', where SpecActP can only be filled by expressions in contrastive topics), and a sentence type expressing general general rules, so called "Heischesätze", with Konjunktiv I, otherwise used as a reportative (*Einer trage des Anderen Last* 'One should carry the burden of the other person', *Es sei n eine Primzahl, dann…* 'Let n be a prime number, then…').

(70) [ActP [*Die Sitzung*]1 [Act′ [Actº • *ist*0] [TP t1 *eröffnet* t0]]]
= λc{i′|∃i∈c[i⊶•i′ λi[the meeting is opened in i]}

I close this section with a discussion of an interesting syntactic difference between commitment modifiers and judgment modifiers.[32] Judgement modifiers can move to the specifier position of the ActP, the prefield, while commitment modifiers do not occur in this position as easily (cf. also Frey, to appear):

(71) [ActP *sicherlich / möglicherweise / vielleicht / offenbar / laut Eva*1
[[Actº *schnarcht*0 •] [ComP [JP [J′ t1 [J′ [TP *Max laut* t0] [Jº J–]] [Comº ⊢]]]]]]

(72) ?[ActP *bei Gott / echt / im Ernst / wirklich / wahrlich / ungelogen / unglaublich*1
[[Actº *schnarchte*0 •] [ComP [Com′ t1 [Com′ [JP [TP *Max laut* t0] [Jº J–]] [Comº ⊢]]]]]]

Not all commitment specifiers are the same. For example, *ungelogen* and *wirklich* do occur sometimes in the prefield, but this is rare (e.g. in the DWDS Web corpus there were 9 instances of *ungelogen hab-* compared to 79 instances of *hab- ungelogen*, and 10 instances of *wirklich hab-* vs. 783 instances of *hab- wirklich*, as compared to 4103 instances of *sicherlich hab-* and 6821 instances of *hab- sicherlich*, a much more balanced distribution. Some commitment specifiers are ambiguous and show their other, descriptive interpretation when in the prefield, such as *bei Gott, ernst* and *im Ernst.*

The criterion of restricted occurrence in the prefield can be used to argue that *tatsächlich* and *in der Tat* 'indeed', 'in fact' are not commitment modifiers, as they often occur in this position (*tatsächlich hab-*: 10229, *hab tatsächlich* 9400 instances).[33] These expressions appear to be judgement modifiers, contrasting factuality with mere epistemic possibility. Stressed *tatsächlich* could also be analyzed as the head of a polarity phrase at the TP level that introduces a contrast between the proposition and its negation, similar to cases of verum focus. The adverbial *in Wirklichkeit* 'in reality' can also occur in the prefield, in contrast to *wirklich* 'really'[34], indicating a structurally different meaning.

Why do commitment and judgement modifiers not behave the same as to movement into the prefield? Frey (to appear) suggests that commitment specifiers are necessarily parentheticals, and parentheticals in general cannot appear in the prefield. However, commitment specifiers do not have to be pronounced as prosodically separated from the main clause. I would like to suggest the following reason: Judgement modifiers belong to the semantic material that is part of the proposition that the speaker is committing to, hence part of what is communicated, even if they are not part of the main message, the TP proposition. In contrast, commitment modifiers specify the nature of the commitment itself, hence they are not communicated at all but rather belong to the tools for communication.[35] Why should movement into the prefield be restricted to expressions that are communicated? One plausible reason is that the prefield typically serves an information-structural function, like aboutness topic, frame setting, and emphatic focus, and only expressions that are part of what is communicated can have such functions. Now, it is well-known that the prefield can be targeted by information-structurally inert expressions, if there is no other plausible candidate.[36] However, we may assume that the movements into the

[32] Cf. discussion of anaphoric uptake in (144) for another distinctive property of commitment specifiers.

[33] The colloquial adverb *tatsache* appears to be a commitment modifier following this criterion, as it does not occur in the prefield (cf. as example *er hat tatsache die ganze Zeit mehr zahlen können als er gemacht hat*, https://www.eltern.de/foren/alleinerziehend/781460-grund-fuer-alleiniges-sorgerecht.html).

[34] Except after a conjunction like *und*, cf. *Und wirklich hat Max laut geschnarcht.* 'And indeed Max snored loudly'.

[35] As they are not part of the proposition that is communicated, they can easily be seen as similar to parenthetical items, which could explain the impression that they are parentheticals.

[36] Frey 2006 assumes a "formal movement" of the highest constituent in the middle field, which often but not necessarily has an information-structural function.

prefield are restricted to subexpressions of the communicated part of the sentence, which includes judgement specifiers like *sicherlich* but disfavors commitment specifiers like *wirklich.* This does not preclude expressions that are based-generated in the prefield that can never have an information-structural function, such as the expletive pronoun *es* as in *es schnarchte ein Mann* 'there was a man snoring'.

The ban on movement of non-communicated material into the prefield is evident from other observations. For example, the prefield does not host discourse particles like *ja, doch, halt, eben* (cf. Döring 2016). They relate the clause to the situation of utterance, i.e. the input commitment state, but clearly are not part of the content that is communicated; for example, *ja* and *doch* express that the proposition is known to be true.

3.3 Act Modifiers

There are modifiers that appear to target the ActP and specify certain aspects about the speech act not treated so far. Some examples: *offen gesagt* 'frankly speaking' and *mit Verlaub gesagt* 'if I may say so' that indicate a possible breach of norms of politeness, for which a commitment modifier analysis may still be feasible, but also expressions that indicate a rhetorical relation with respect to other parts of conversation such as *übrigens* 'by the way', *mit anderen Worten* 'in other words', *am Rande bemerkt* 'as a marginal note', *erstens / zweitens* 'firstly' / 'secondly' and *jedoch* 'however'. Such expressions naturally occur in the prefield, as observed by Meiunger (2004) and Frey (2006), different from commitment specifiers as observed in (72); in the current theoretical setup this means that they occur as specifier of the ActP:

(73) [$_{\text{ActP}}$ *offen gesagt / übrigens* [$_{\text{Act}'}$ [$_{\text{Act}^{\circ}}$ *schnarcht*$_0$] [$_{\text{ComP}}$ *Max sehr laut* t$_0$]]]
'Frankly speaking / By the way, Max snores very loudly.'

The only theoretical option for these act modifiers in the current theoretical setup is that they are base-generated in the specifier position of ActP. In this they differ from ComP modifiers like *ungelogen*, which would have move into this position. Therefore we should not expect any resistance of Act modifiers against being realized in the prefield.

However, the analysis in (73) does not predict that they may occur postverbally as well, as in *Max schnarcht offen gesagt / übrigens / jedoch / mit anderen Worten sehr laut.* It is not evident that the adverbials are parenthetical in these cases – for parentheticals, see discussion of (82) below. One option to deal with this is to assume a recursive ActP structure as in (74).

(74) [$_{\text{ActP}}$ *Max*$_1$ [$_{\text{Act}'}$ [$_{\text{Act}^{\circ}}$ *schnarcht*$_0$] [$_{\text{Act}'}$ *übrigens* [$_{\text{Act}'}$ [$_{\text{Act}^{\circ}}$ t$_0$] [$_{\text{ComP}}$ t$_1$ *sehr laut* t$_0$]]]]]]

This structure may be licensed in cases in which the prefield is used for other informational-structural purposes, such as housing the aboutness topic of the sentence. However, I do not see independent evidence for the assumption of recursive Act′ structures like (74).

As for the relation to other adverbials, we find that what we analyze here as Act modifiers have to precede, and c-command, commitment and judgement modifiers, which is consonant with the structure proposed in (74).

(75) a. *Max schnarcht übrigens ungelogen* / **ungelogen übrigens sehr laut.*
b. *Max schnarcht offen gesagt mit Sicherheit* / **mit Sicherheit offen gesagt sehr laut*.

Constituents of the communicated proposition can precede Act modifiers, which can be captures by assuming that Act′ is an adjunction site for scrambling:

(76) [$_{\text{ActP}}$ *Max*$_1$ [$_{\text{Act}'}$ [$_{\text{Act}^{\circ}}$ *schnarchte*$_0$] [$_{\text{Act}'}$ *gestern*$_2$ [$_{\text{Act}'}$ *übrigens* [$_{\text{Act}'}$ [$_{\text{Act}^{\circ}}$ t$_0$]
[$_{\text{ComP}}$ [$_{\text{JP}}$ [$_{\text{TP}}$ t$_1$ t$_2$ *sehr laut* t$_0$]]]]]]]]
'Max snored by the way yesterday very loudly.'

Let us turn to the interpretation of Act modifiers. As specifications of the enacted index change, they can be formally modelled as illustrated in (77), for *offen gesagt* 'frankly':

(77) S_1 to S_2: $[\![(73)]\!]_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ [λi[S_1 ⊢$_i$ λi[Max snores loudly, according to S_1, in i]]
∧ FRANK(S_1, c, λiλi′[i⊶•i′ [λi[S_1⊢$_i$ λi[Max snores loudly, acc. to S_1, in i]]]])}

With this speech act, the speaker S_1 changes the indices i of the common ground c by adding a commitment that Max snores loudly, as before. In addition, this change carries the information that in performing this restriction at the common ground c, S_1 performed a frank act, that is, an act that might violate certain social norms of politeness. Notice that the information that this is a frank act is not communicated (it is not part of the communicated proposition) but rather is introduced as a property of the speech act itself. Just as the introduction of the commitment of the speaker, the proposition that this is a frank act is a performative update, not an informative update, and hence cannot be targeted easily by the other speaker.

In the interpretation format of (77) the interpretation of the Act modifier FRANK refers to the commitment space c, that is, to the current conversation. This makes it plausible that expressions that specify the rhetorical relation of the current speech act, such as *übrigens*, *am Rande bemerkt* and *jedoch*, occur in this position.

It is plausible to analyze the discourse particles *ja* and *doch* as Act modifiers, in contrast to the judgement particle *wohl*, cf. As Zimmermann (2004) has pointed out, the distribution of *wohl* and *ja* is different; he suggests that *ja* is a modifier of an assertion operator. I would like to suggest, more specifically, that *ja* and also *doch* are interpreted with respect to the ActP, as they refer to information present in the commitment state: *ja* indicates that the expressed information is already present in the commitment state and uncontroversial, whereas *doch* indicates a commitment state in which the other participant presupposes information that the speaker does not accept. The interpretation of *ja*, for example, can be rendered as JA(c, λiλi′[…]), which holds if update of c with the update function λiλi′[…] is redundant, that is, {i′ | ∃i∈c[...]} = c. The discourse particle *ja* does not occur in the specifier of ActP, and hence has to be generated in a structure like (74). The analysis predicts that *ja* can c-command, and precede, *wohl* but not vice versa:

(78) [$_{ActP}$ *Max*$_1$ [$_{Act'}$ [$_{Act^o}$ *schnarcht*$_0$ [$_{Act'}$ *ja* [$_{Act'}$ [$_{Act^o}$ t$_0$]
[$_{ComP}$ [$_{Com'}$ [$_{JP}$ *wohl* [$_{J'}$ [$_{TP}$ t$_1$ t$_2$ *sehr laut* t$_0$][$_{J^o}$ J–]][$_{Com^o}$ ⊢]]]]]]]

Meinunger (2004, 2009) observed that adverbials base-generated in the prefield have to be clearly identified as related to the speech act; for example, *ehrlich* can occur in the middle field but not in the prefield, which does allow *ehrlich gesagt*, cf. (79).

(79) a. *Ehrlich gesagt schnarcht Max sehr laut.*
b. **Ehrlich schnarcht Max sehr laut.* / *Max schnarcht ehrlich sehr laut.*

I would like to propose that *ehrlich* is a commitment modifier expressing that the commitment is one appealing to principles of honesty, as in (80), whereas *ehrlich gesagt* is an act specifier indicating that the speech act is an honest one. This is illustrated in (81), under the assumption that the Act′ is a function from input indices i to output indices i′.

(80) S_1 to S_2: [[[$_{ActP}$ *Max*$_1$ [$_{Act'}$ [$_{Act^o}$ *schnarcht*$_0$ •]
[$_{ComP}$ [$_{C'}$ *ehrlich* [$_{C'}$ [$_{JP}$ [$_{TP}$ t$_1$ *laut* t$_0$] [$_{J^o}$ J–]] [$_{C^o}$ ⊢]]]]]]$_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ λi[HONEST_COMMITMENT(S_1,i)
(λjλi[j ⊢$_i$ λi[Max snores loudly, according to j, in i])]}

(81) S_1 to S_2: ⟦[$_{ActP}$ *ehrlich gesagt* [$_{Act'}$ [$_{Act^o}$ *schnarcht*$_0$ •]
[$_{ComP}$ [$_{C'}$ [$_{JP}$ [$_{TP}$ *Max laut* t$_0$] [$_{J^o}$ J–]] [$_{C^o}$ ⊢]]]]⟧$_{s,a}$
= λc{i′|∃i∈c[i⊶•i′ λi[S_1 ⊢$_i$ λi[Max snores loudly, according to S_1, in i])]
∧ HONEST_ACT(S_1, c, λiλi′[i⊶•i′ [λi[S_1⊢$_i$
λi[Max snores loudly, according to S_1, in i])}

The overall result are nearly identical, hence (79)(a) and (c) appear as nearly synonymous. But in general, the claim can be upheld that SpecActP can either be occupied by expressions that are part of the asserted proposition, or that are base generated in this position.

Being generated at the level of speech acts, ActP specifiers can easily be expressed parenthetically, as illustrated in (82).

(82) a. *Ehrlich gesagt, Max schnarcht sehr laut.*
b. *Max schnarcht, ehrlich gesagt, sehr laut.*
c. *Max schnarcht sehr laut, ehrlich gesagt.*

Such parenthetical constructions can be analyzed as adjuncts to ActP. ActPs are functions from commitment states to commitment states; the ActP modifier restricts such functions. This suggests the following interpretation, where HONEST_ACT is a property of the relation between the input and output commitment state.[37]

(83) S_1 to S_2: ⟦[$_{ActP}$ *ehrlich gesagt* [$_{ActP}$ *Max*$_1$ [$_{Act'}$ [$_{Act^o}$ *schnarcht*$_0$ •]
[$_{ComP}$ [$_{C'}$ [$_{JP}$ [$_{TP}$ t$_1$ *laut* t$_0$] [$_{J^o}$ J–]] [$_{C^o}$ ⊢]]]]⟧$_{s,a}$
= λc[ιc′[c′ = ⟦[$_{ActP}$ *Max schnarcht laut*]⟧^{S_1,S_2}(c) ∧ HONEST_ACT(S_1,c,c′)]

We also find that commitment specifiers, cf. (84), and even judgement specifiers, cf. (85), occur as parentheticals. I assume that such uses can also be analyzed as variants of true commitment and judgement specifier uses that are interpreted on the level of the ActP.

(84) a. *Ungelogen / Bei Gott, ich habe das Geld nicht gestohlen.*
b. *Ich habe das Geld, bei Gott / ungelogen, nicht gestohlen.*
c. *Ich habe das Geld nicht gestohlen, bei Gott / ungelogen.*

(85) a. *Sicherlich, Max schnarcht laut.*
b. *Max schnarcht laut, sicherlich.*

The ActP-modifying use of *ungelogen* and *bei Gott* can be understood as expressing that the common ground transition did not involve a lie or invokes God as a witness, respectively. This would lead to a similar overall effect as with commitment specifiers. The ActP-modifying use of judgement operators is more restricted, and has clearly different semantic effects; in (85), the assertion expresses consent to a proposition of the other speaker, and *sicherlich* appears to have a meaning similar to a response particle like *ja*.

The main ActP operator considered so far is •, interpreted by i⊶•i′[φ], expressing a minimal change of the index i to i′ such that the proposition φ is true at i′. This is the change characteristic for assertions, declarations and perhaps some other speech act types. With questions, as argued in Krifka (2015), the speaker does not actually change the commitments but restricts the direction that the conversation can take in such a way that it leads to a commitment by the addressee that is an answer to the question. There are other conversational moves that do not result in commitments but in restrictions for future moves, like concessions or grants, as argued for by Cohen & Krifka 2014. I would like to point out one such marker because it illustrates the variation we might find in sentence structures once we consider the level of speech act

[37] Such restrictions are "subsidiary" conversational moves that evaluate the main speech act, cf. Pittner (2011). They can be fully separated, as in *Ich sag dir das ganz ehrlich* 'I am telling you that in all truth.'

seriously. This is the modal verb *mögen / mag* as in (86) which expresses a concession to entertain a possibility.

(86) S_1: *Max schnarcht laut.*
S_2: *Max mag laut schnarchen, das stört mich aber nicht.*
'Max may snore loudly, but this doesn't bother me.'

S_2 does not undergo a commitment that Max snores loudly, not even a commitment that it is possible that Max snores loudly. It just acknowledges that the common ground is such that it contains this possibility. This is captured by the following representation, which does not contain a commitment phrase:

(87) S_1 to S_2: $[\![[_{\text{ActP}}\ \textit{Max}\ [_{\text{Act}'}\ [_{\text{Act}^0}\ \textit{mag}\ ]\ [_{\text{vP}}\ t_1\ \textit{laut schnarchen}]]]]\!]_{s,a}$
$= \lambda c\{i' | \exists i \in c[\text{Max snores loudly, according to } S_1, \text{ in } i]\}$

The possibility is typically introduced by the another speaker, hence the concessive nature of *mag* (cf. Diewald 1999, who assumes that *mag* has a "textphoric" interpretation). Being thus related to aspects of the unfolding conversation, it appears natural that *mag* is located at a place that relates to the dynamics of communication, the ActP.

3.4 The syntactic layers above TP

The sections in this chapter have argued for a range of syntactic layers above the TP. The three layers are illustrated in (88).

(88) $[_{\text{ActP}}\ \textit{offen gesagt}\ [_{\text{Act}'}\ [_{\text{Act}^0}\ \textit{schnarcht}_0\ ]\ [_{\text{ComP}}\ \textit{Max}_1\ [_{\text{Com}'}\ \textit{wirklich}\ [_{\text{Com}'}$
$[_{\text{JP}}\ t_1\ [_{\text{J}'}\ \textit{ganz sicher}\ [_{\text{J}'}\ [_{\text{TP}}\ t_1\ \textit{sehr laut}\ t_0]\ [\text{J}-\ t_0\ ]][\vdash t_0]]]$

Different levels of operators outside the TP have been proposed by various authors. One proposal, Hengeveld (1989), distinguishes two layers on the "interpersonal" level: Propositional operators that include subjective epistemics and evidentials, and illocution operators that express mitigation and reinforcement of speech acts. The propositional level corresponds to the JudgeP, as for the type of expressions that are said to occur at this point. However, Hengeveld characterizes operators at this level as "means through which the speaker expresses his commitment with regard to the truth of a proposition" (p. 138); according to the view developed here, this related only to the private judement of a proposition, not to the public commitment. The illocutionary level relates to social issues around politeness and loss of face; in the current view, these operators are applied at the ComP and ActP level.

Another proposal, Cinque (1999), distinguished different layers for mood and modality adverbials:

(89) speech act (*frankly*) < evaluative (*fortunately*) < evidential (*allegedly*)
< epistemic (*probably*).

This is quite similar to the present proposal. However, Cinque did not consider commitment modifiers like *wirklich*, *ungelogen*, *im Ernst*, or English *truly*. On the other hand, we have ignored evaluative adverbials; this is mainly due to our point of departure, the notion of assertion by Peirce and Frege. Evaluative adverbials certainly would have to be added into the framework. Just as evidential and epistemic modification, evaluative comes in a TP-external and a TP-internal version (e.g. *leider* 'unfortunately' vs. *schade* 'be a pity')[38]. As adverbials,

[38] Evaluative phrases within assertions have to be kept apart from sentences that just express a preference without any assertion. For example, the adverbial use of *besser* 'better' as in *Du setzt dich besser hin* 'you better sit down' appears to occur only in optatives, cf. Grosz 2011.

their order appears to be less fixed with respect to commitment, evidential and epistemic adverbials, and so do not seem to be adjoined to a particular layer, like an "Evaluation Phrase". The following orders are all possible:

(90) a. *Max schnarcht leider offen gesagt* / *offen gesagt leider sehr laut.*
b. *Max schnarcht leider wirklich* / *wirklich leider sehr laut.*
c. *Max schnarcht leider anscheinend* / *anscheinend leider sehr laut.*
d. *Max schnarcht leider wahrscheinlich* / *wahrscheinlich leider sehr laut.*

The current proposal does not make a structural distinction between evidential and epistemic adverbials, which both occur as modifiers of JudgeP, one expressing the source of the judgement and the other the strength. In the semantically interpreted theory developed here, evidential adverbials bind the judge parameter, and so have to scope over epistemic adverbials that then indicate the judgement strength for that judge, as in (91)(a). In certain cases, the other order appears possible as well, but then the epistemic adverbial appears to scope over the evidential, as in (91)(b).

(91) a. *Offen gesagt schnarcht Max laut Eva wahrscheinlich sehr laut.*
'Frankly speaking, according to Eva, Max probably snores very loudly.'
b. *Offen gesagt schnarcht Max wahrscheinlich laut Eva sehr laut.*
'Frankly speaking, it is probable that according to Eva, Max snores very loudly.'

I analyze adverbials as modifiers, not specifiers of their respective phrase. This choice is motivated by the specific modeling of XP movement and realizations of constituents, as e.g. Max_1 in (88).

I have assumed a rather specific syntactic implementation of operators outside the TP level within the architecture of X-bar syntax; the basic semantic insights of the current proposal could have been integrated in other syntactic frameworks as well. What is important, however, is that the various modifiers outside of the proposition to be communicated come in two forms: As full words or syntactic constituents, in particular as adverbials or adverbial phrases, such as the subjective epistemic *sicherlich* and the reportative evidential *laut Eva*, and as heads or morphological features of heads, such as the subjective epistemic *müsste* or the reportative evidential *soll*. X-bar syntax provides for these two cases the category of specifiers or modifiers, XPs, and the category of heads, X^o. X-bar syntax also provides for the relevant movements, movement of syntactic constituents, and movement of heads, with their scopal properties. In this sense it is well-suited to capture the phenomena discussed here.

In the current proposal, the expressed commitment to a proposition by the speaker causes a proposition to become part of the common ground. However, this proposition may contain evaluative, evidential and epistemic meaning components that is not part of the main message that is to be communicated, but only play an ancillary role in the communicated. This distinction between what is communicated and the means how it is communicated had been made before, e.g. by Hooper & Thompson (1973), who pointed out that a sentence like *He said it's just started to rain* has a reading in which it is the complement clause "whose truth is at stake in the discourse". This is the only reading in parenthetical uses as in

with reference to parenthetical uses of reportative verbs. According to them

by Simons (2007), who points out that a question like *Why isn't Louise coming to our meetings these days?* can be answered by *Henry thinks she's left town*, where the proposition 'Louise has left town' is suggested as answer, and is the main point of the utterance. We can express this distinction by an assumption that the TP introduces a propositional discourse referent in a

prominent way that is particularly salient for the addressee (cf. Krifka 2013 for the role such propositional discourse referents play for response particles like *yes* and *no*).

The proposal here differs from the way non-propositional meaning is handled by Gutzmann (2015), who uses the modeling of expressive meanings by Kaplan (1999), Potts (2005) and McCready (2010) to distinguish between a "truth-conditional" and a "use-conditional" interpretation. In this spirit, we could represent our example by a so-called "*u*-propositions" (Gutzmann 2015: 115), where the truth-conditional part is a proposition and the use-conditional part is an update of a common ground, as in the representation (92), with the use-conditional part on top and the truth-conditional on bottom:

(92) $[\![[_{\text{ActP}}\ \textit{Max schnarcht laut.}]]\!]_{s,a} = \frac{\lambda c[c \cup \{\lambda i[s \vdash_i \lambda i[\text{Max snores loudly, according to s, in i}]]\}]}{\lambda i[\text{Max snores loudly, according to s, in i}]}$

To arrive at this representation compositionally, we can assume that with the interpretation of the JP, the truth-conditional content is completed, and the use-conditional meaning is constructed out of that truth-conditional content. This case is called "shunting", as with the term *this damn driver*, where *damn* takes the truth-conditional meaning of *driver* and adds the use-conditional meaning expressing a negative attitude towards the person that *this driver* refers to.

In the current framework, two-dimensional representation is not necessary to distinguish between the proposition to be communicated and the way by which it is communicated. Furthermore, a one-dimensional treatment of the different layers is advantageous when it comes to embedded clauses and to anaphoric reference to different layers, as discussed in the next sections. However, the two-dimensional analysis might be on the right track for the treatment of evaluative adverbials like *leider* discussed in (90) that appear to convey an expressive attitude towards the communicated proposition.

4 Embedded Clauses

In the last section we proposed different layers of clausal projection. In particular, we argued that tense phrases (TPs) should be distinguished from judge phrases (JPs), commitment phrases (ComPs) and finally, act phrases (ActPs) that can host different kinds of modifiers and heads, and have different interpretations. We have looked at root clauses so far; in this section we will turn to embedded clauses. We will argue that the independently established clausal layers are actually selected by different kinds of embedding predicates (cf. Hengeveld 1989 and Speas 2004 for similar arguments).

As the contributions of the embedded clause to the truth conditions of the main clause must be semantic in nature, the fact that embedded clauses may have evidence for containing semantic material beyond simple truth conditions provides an argument that the semantic material related to illocutionary force rather than to the proposition to be communicated – that is, material that is interpreted in the judge phrase, the commitment phrase, and even the act phrase – is to be treated in semantics proper, and not as part of pragmatics (cf. Murray & Starr 2020 for a similar argument).

4.1 Complement *dass* clauses

We will first consider dependent clauses marked by the complementizer *dass*. Such clauses are traditionally identified as being of the category CP (complementizer phrase); however, this uniform categorization glosses over details of the inner syntactic and semantic nature of the clause headed by *dass.*

There are predicates that, for semantic reasons, can just embed a simple proposition, a TP. One example is *abhängen* 'to depend on'. In the following, I am concentrating on the embedded clause, not on the embedding clause; it is generated in an argument position or co-indexed by

a correlate (here underlined) and then extraposed and adjoined to some projection of the embedded clause.

(93) *Unsere Nachtruhe hängt davon ab,* [CP [C′ [C° *dass*] [TP *Max nicht schnarcht*]]].
'Our good night's sleep depends on that Max doesn't snore.'

Notice that neither judgement specifiers nor commitment or act specifiers can occur in such clauses:

(94) a. **Unsere Nachtruhe hängt davon ab,*
dass Max echt / ungelogen / sicherlich / laut Eva / nicht schnarcht.
b. **Unsere Nachtruhe hängt davon ab, dass ehrlich gesagt Max nicht schnarcht.*

Semantically, *abhängen* expresses a factual causal connection; if the proposition 'Max doesn't snore' is not true, then the proposition 'we have a good night's sleep' is not true either. There is no room for subjective epistemic, evidential, committal or speech-act related qualifications. In our semantic reconstruction, TPs are of the type of simple propositions λi[…]; hence we can assume that predicates like *abhängen* take such simple propositions as argument.[39] The following gives an idea of its interpretation:

(95) ⟦*abhängen*⟧$_{s,a,j}$ = λiλpλp′[for worlds i′ epistemically accessible from i: p(i′) → p(i)],
p, p′: type of propositions.

We predict that *abhängen* can embed sentences with objective epistemics because they are part of the proposition itself. This appears to be the case:[40]

(96) *Ob ich das Los kaufe oder nicht hängt davon ab,*
'whether I buy the lottery ticket or not depends on
a. **ob es wahrscheinlich gewinnt.*
'whether it will likely win'
b. *ob es wahrscheinlich ist, dass es gewinnt.*
'whether it is likely that it will win.'

The following example uses a different verb, *folgen* 'be a consequence of', and contrasts objective *müssen* with subjective *müsste*.

(97) *Dass Winkel α rechteckig ist folgt daraus, dass β rechteckig sein muss / *müsste.*
'That angle α is rectangular follows from (the fact that) β is rectangular.'

Mental attitude verbs like *glauben* 'to believe' and *vermuten* 'to presume' subcategorize for judgement phrases. Their complement clauses can house judgement phrases like subjective epistemics[41], but not commitment phrases:

(98) *Eva glaubt,* [CP [C′ [C° *dass*] [JP *Max*$_1$ [J′ *sicherlich* [J′ [TP t$_1$ *laut schnarcht*][J° J–]]]]]].

[39] The predicate *abhängen* also embeds *ob*-clauses and generally embedded questions; it belongs to verbs of depency of Karttunen (1977).

[40] Another type of predicate that does not allow for judgement phrases is desideratives like *wollen* 'want', as in *Eva will, dass Max *echt / *ungelogen / *sicherlich / *laut Eva nicht schnarcht* 'Eva wants that Max … doesn't snore'. However, we probably should not assume that desideratives subcategorize for bare propositions, as they are fine with clauses marked by *lieber* 'rather', as in *Eva will, dass Max lieber nicht schnarcht.* Arguably, *lieber* occurs in optative clauses as in *Max soll lieber nicht scharchen, Ich schnarche lieber nicht* and imperative *Schnarch lieber nicht*, and hence mark a category that we can name 'preference phrases'.

[41] Vgl. zu einer ähnlichen Beobachtung für das Japanische Larm (2005).

(99) *Eva glaubt / vermutet dass Max *echt / *ungelogen / *wirklich*[42] */ wahrscheinlich / sicherlich / zweifellos laut schnarcht.*

The semantic interpretation of a judgement phrase is of the type of a function from a judge to a proposition, λjλj[…]. Mental attitude verbs like *glauben* 'to believe' take such meanings as arguments and identify the judge of the complement clause with the subject of the attitude verb, here *Eva.* This is illustrated with the interpretation of *glauben*:

(100) $[\![glauben]\!]_{s,a,j}$ = λiλPλx[x believes P(x) in i],
P a function from judgers to propositions.

We predict that other instances of subjective modality can occur in the complement clause of mental attitude verbs, for example the subjective epistemic modal verb *müsste*:

(101) *Eva dachte, dass ihr Ausweis noch im Auto sein müsste.*
'Eva thought that her identity card must still be in the car.'

We also predict that mental attitude verbs should allow for evidential modification of the embedded clause, which is indeed the case for reportative evidentials:

(102) *Eva vermutet, dass es laut Wetterbericht regnen wird.*
'Eva assumes that, according to the weather report, it will rain.'

Modifiers of visual evidentials need appropriate embedding verbs that refer to sensory experience, as in (103):

(103) *Eva hatte den Eindruck, dass Max offensichtlich gehen wollte*.
'Eva had the impression that Max apparently wanted to leave.'

Interestingly, factive predicates like *bedauern* 'regret' and *wissen* 'know'[43] also allow for judgement specifiers, but not generally for commitment specifiers:

(104) *Eva weiß, dass Max *ungelogen / *im Ernst / wahrscheinlich / laut Eva schnarcht.*

If *wissen* expresses belief of the subject that is shared with the speaker, then *Eva weiß, dass Max wahrscheinlich schnarcht* expresses that both Eva and the speaker have the subjective judgement that it is probable that Max snores.

However, *wissen* can also embed clauses containing certain expressions that we classified as commitment specifiers, like *wahrlich, wirklich, beileibe* and *bei Gott*, contrary to our expectation that *wissen* embeds a JP.[44]

(105) *Eva weiß, dass Max wahrlich / wirklich / beileibe / bei Gott kein Unschuldslamm ist.*
'Eva knows that Max truly / by God is not innocent.'

These modifiers have an emphasizing function, and they tend to align with the speaker than with the subject of the sentence (Eva). So they appear to be part of how the speaker wants to

[42] Stressed *echt* and *wirklich* are possible in this position, but then expressing intensity of the snoring.

[43] The verb *wissen*, just like *know*, also embeds questions. Embedded questions have a verb-final syntax and can be analyzed as in *Eva weiß,* [CP [C′ [C° *ob*] [TP *Max laut schnarcht*]]] 'Eva knows whether Max snores loudly' and in *Eva weiß,* [CP *wer*1 [C′ [C° %*dass*] [TP t1 *laut schnarcht*]]] 'Eva knows who snores loudly' (with empty determiner in Standard German, *dass* in southern varieties). As questions embedded under *know* they do not involve the **?** operator but denote multiple propositions; cf. Hamblin (1973). However, as argued by Woods (2016), there are cases in which interrogative illocutionary act phrases can occur as embedded clauses.

[44] Thanks to Marga Reis, who made me aware of such sentences.

communicate the proposition, that Max is not innocent. Commitment modifiers may also occur in clauses expressing mere belief or opinion:

(106) *Eva glaubt / ist der Meinung, dass Max wahrlich / bei Gott kein Unschuldslamm ist.*
'Eva believes / has the opinion that Max truly / by God is not innocent.

In my impression, such clauses report a third-person belief by expressing what the person would have said to express that belief. In this use, the predicates subcategorize for Commitment or Act Phrases, just like *say* discussed below, and commitment modifiers interpreted from the perspective of the subject are licensed.

We have argued with examples like (86) that the modal verb *mag* is not a judge phrase modifier, but rather modifies the act phrase itself. Hence we expect that clauses with this verb do not embed under predicates that normally can embed judge phrases. This is borne out, as the following examples shows (it could only be interpreted with *mag* expressing volitional modality, expressing a wish; this is part of the TP).

(107) *Eva glaubt / vermutet, dass Max laut schnarchen könnte / *mag*. (non-volitional)

We now turn to communicative verbs like *sagen* 'to say' and *behaupten* 'to claim' has happened. We expect that their complement clauses can embed both commitment specifiers and judgement specifiers, and we are not disappointed (cf. also Frey to appear for the different selectional properties of believe-type verbs and say-type verbs):

(108) *Eva sagte,* [$_{CP}$ [$_{C'}$ [$_{C^o}$ *dass*]
[$_{ComP}$ *Max*$_1$ [$_{C'}$ *echt* [$_{C'}$ [$_{JP}$ [$_{TP}$ t$_1$ *laut schnarcht*][$_{J^o}$ J–]]][$_{ComP}$ ⊢]]]]].

(109) a. *Eva sagte, dass Max echt / ungelogen / wirklich / bei Gott sehr laut schnarcht.*
b. *Eva sagte, dass Max sicherlich / wahrscheinlich / laut Eva schnarcht.*

We have represented commitment phrases as being functions from persons to propositions that express that the person undergoes a commitment, where we have concentrated on assertive commitments for a proposition like λjλi[j $\vdash_i$ φ]. While the semantic type is similar to judgement phrases, the sort is different, as judgement phrases do not express a public commitment. We assume that verbs of communication subcategorize for relations of the type λjλi[…] in which the person j stands in some speech-act related commitment in i, where embedding verbs like *sagen* 'to say', *fragen* 'to ask' or *befehlen* 'to order' subcategorize for more specific sorts of commitment relations. As an example lexical meaning, consider (110):

(110) $[\![sagen]\!]_{s,a,j}$ = λiλPλx[x says that P(x) in i],
P a function from committers to propositions

The question arises whether it is also possible to embed ActPs. At first, this might appear to ruled out as a matter of principle, as speech acts are events that certainly cannot be embedded (cf. Green 2000). However, in our reconstruction a speech act is a functions from common grounds to common grounds, λc{i | …c…i…} – and this is a semantic object. It results in an actual speech act only when applied to a particular common ground. As semantic functions, the meanings of ActPs could well be embedded by speech act verbs like *sagen*, which then would report that a common ground was modified in a certain way. They are acceptable as related to the subject, Max, in the following constructed examples

(111) *Max teilte uns mit, dass er offen gestanden / ehrlich gesagt keinen Rotwein trinkt.*
'Max said that he frankly does not drink red wine.'

(112) *Max räumte ein, dass es sich um ein Versehen gehandelt haben mag.*
'Max granted that it might have been a mistake.'

There are corpus data that make it plausible that ActP specifiers can occur in embedded clauses, as in the following examples from internet blogs:[45]

(113) *als erstes möchte ich sagen, dass ich offengestanden auf dem Gebiet Solar total neu bin*
'right from the start I want to say that I frankly am new concerning solar (power)'[46]

(114) *da hat er gesagt, dass er offengestanden keine Ahnung hat, weil du und der Junge euch ständig irgendwo zurückzieht.*
'then he said that he frankly speaking does not have a clue because you and the boy keep hiding somewhere'[47]

(115) *dann meinte er auf einmal, dass er ehrlich gesagt nur eine sexbeziehung sucht*.
'then he suddenly said that he truly speaking is only looking for a sexual relationship'[48]

(116) *Yoske fuhr ihn an, dass er, mit Verlaub, der Oberkommandant des Etzel sei*
'Yoske attacked him that he, by permission, is the main commander of Etzel'[49]

(117) *... antwortet der Patient, er habe nur einen Wunsch, nämlich, daß er in alle Zusammenhänge im Leben Einblick habe, daß er, kurz gesagt, Erleuchtung wolle*
'... the patient answers he has only one wish, namely, that he has insight in all aspects of life, that he, in short, wants illumination'[50]

(118) *Da steht auch, dass Heiner Backhaus noch keinen offiziellen Vertrag hat und in dem Zusammenhang hat Anel dann gesagt, dass er übrigens auch noch keinen hätte*.
'There one can read that Heiner Backhaus has no official contract yet, and in this connection Anel said that he by the way does not have one either'[51]

(119) *Der Grenzbeamte an der Peruanischen Station hatte uns zuvor aber gesagt, daß er erstens so einen Stempel nicht besitze und der zweitens auch gar nicht nötig sei.*
'The border officer at the Peruvian station, however, had told us before that he first does not own such a stamp and secondly it is also not required.'[52]

These examples differ in one systematic aspect: In (113), the embedded clause is actually the one that the speaker wants to communicate, an explicit performative, whereas the other examples are speech reports about another communicative acts. Notice in particular that modifiers like *übrigens, kurz gesagt* and *erstens / zweitens* clearly refer to aspects of the reported conversation.

We have analyzed the discourse particles *wohl* and *ja* as related to JP and ActP, respectively, cf. (51), (78). This predicts their occurrence with respect to embedding predicates. In particular,

45 Stroh-Wollin (2011) takes the presence of oath formulas and swear words in embedded CPs in Swedish as evidence that such clauses can be understood as embedded assertions, where Julien (2009) only considered embedded V2 clauses (as discussed in the next session) as evidence for speech act embedding.

46 www.photovoltaikforum.com/thread/96600-bypass-blocking-schottky-dioden-wie-wo-und-woher/ Notice that *als erstes* is an ActP modifier here.

47 https://www.fanfiktion.de/s/5b39ac4f00091fbae83f08a/62/Verwaltungsfehler-auf-hoeherer-Ebene

48 https://beziehung.gofeminin.de/forum/nach-6-wochen-schluss-fd595311

49 http://www.derkichererbsenblog.com/2016/04/21/yoske/

50 A. P. Herrmann, *Das Vaterbild psychosomatisch Kranker*. Springer 1986. S. 119.

51 https://www.tus-koblenz-forum.de/threads/449-Die-aktuelle-Situation-der-TuS-Koblenz/page500

52 https://sudile.com/fahrawayamerika/index.php/2015/11/22/alles-wie-in-peru-nur-schlechter/

wohl can occur under mental attitude verbs but *ja* cannot; it needs verbs of communication, showing that it is either hosted by ComP or ActP.

(120) a. *Eva vermutet, dass Max wohl / *ja laut schnarcht.*
b. *Eva hat uns daran erinnert, dass Max ja / wohl laut schnarcht.*
'Eva reminded us that Max snores, as generally known, loudly.'[53]

If adverbs like *offengestanden* can only occur in ActPs, it is plausible to assume for the embedded clauses structures as illustrated in (121). The complementizer *dass* forces a head-final complement clause structure, so consequently the head of the embedded ActP occurs in a final position.[54] The CP is interpreted in the same way as its ActPhrase complement.

(121) ⟦[$_{CP}$ *dass* [$_{ActP}$ *Max*$_1$ [$_{Act'}$ *(offen gestanden)* [$_{Act'}$
[$_{ComP}$ [$_{JP}$ t$_1$ *laut schnarcht* J–] ⊢] •]]]⟧$_{s,a,j}$
λjλc{i | ∃i′∈c[i′⊸•i [j⊢$_i$ λi[Max snores loudly, according to j, in i]]]}

The embedding verb, e.g. *sagen* 'say', can refer to a communication situation with its commitment state, either the current one as in (113), or some other as in (114). In the latter case, this situation might be unspecific, hence bound existentially, or it might be a specific one that is reported on, and hence be anaphoric to this situation. The current framework does not handle anaphora, and so we will illustrate reference to the current conversation or to an existentially bound conversation. This suggests the following alternative meaning of *sagen* as a predicate that embeds updates commitment state updates:

(122) ⟦*sagen*⟧$_{s,a,j}$ = λiλUλx∃c[x causes update of c to U(x)(c) by saying in i],
U a function from committers to updates of commitment states

Reports of commitment state updates as in (114) then are interpreted as follows:

(123) [$_{ActP}$ *Eva*$_1$ [$_{Act'}$ [$_{Act^o}$ *sagte*$_0$ •] [$_{ComP}$ [$_{JP}$ [[$_{TP}$ t$_1$ [$_{T'}$ ① [$_{T^o}$ t$_0$]]][$_{J^o}$ J–]][$_{Com^o}$ ⊢]]]],
① = [$_{CP}$ *dass* [$_{ActP}$ *Max*$_1$ [$_{Act'}$ *(offen gestanden)* [$_{Act'}$
[$_{ComP}$ [$_{JP}$ t$_1$ *laut schnarcht* J–] ⊢] •]], uttered by S$_1$

= λc{i | ∃i′∈c[i′⊸•i[S$_1$⊢$_i$ λi∃c′[Eva caused update of c′ to
{i″ | ∃i‴∈c′[i‴⊸•i″[Eva ⊢$_{i''}$
λi⁗[Max snores loudly, according to Eva, in i⁗]]} in i]]]}

This states that the speaker S$_1$ introduces into the input commitment state c a commitment to the proposition that Eva caused an update of some commitment state c′ so that that the current commitment state now contains the information that Max snored, and that Eva considers the snoring loud.

As for the explicit performative update in (113) we assume interpretations as follows:

(124) [$_{ActP}$ *ich*$_1$ [$_{Act'}$ [$_{Act^o}$ *sage*$_0$ •] [$_{ComP}$ t$_1$ [$_{Com'}$ ① [$_{Com^o}$ t$_0$]]]]]

Now the embedding verb *sagen* has to be interpreted with respect to the current commitment state c, which will be expressed here in a preliminary way by omitting the existential quantifier

[53] It is well-known that *wohl* occurs in restrictive relative clauses but *ja* only in appositive relative clauses, cf. Zimmermann (2004). This shows that restrictive relative clauses can house JP but not an ActP (or a ComP), whereas appositive relative clauses form a separate, embedded speech act.

[54] As Freywald (2009) points out, there are cases of verb second in *dass* clauses, in which the complementizer *dass* appears to be reanalyzed as a paratactic conjunction.

∃c in (122), thus anaphorically binding its commitment state to the current commitment state.

(125) λc{i | ∃i′∈c[i′⊸•i[λi[S_1 causes, by saying, update of c to
{i″ | ∃i‴∈c[i‴⊸•i″[S_1 ⊢$_{i″}$ λi⁗[Max snores loudly, acc. to S_1, in i⁗]]} in i]]]}

The resulting commitment state contains those indices i that develop from the indices of the input commitment state c so that it holds that S_1 causes by saying that c is updated so that S_1 is committed to the proposition that Max snores loudly. Hence the resulting commitment state now contains this commitment by S_1.

In addition to a report about a commitment by another speaker that was undergone in another conversation as in (123) and the explicit performative update by the speaker as in (125), there are cases in which the commitment of another speaker is treated as relevant for the current conversation, the phenomenon called "proxy speech acts" in Krifka (2014). In this case, the embedded update in (123) would have to be interpreted with respect to the current commitment state c (i.e., ∃i‴∈c′ is to be replaced by ∃i‴∈c). This is warranted if the speaker considers Eva's past commitment in another conversation relevant for the current conversation as well. One piece of evidence for this interpretations are so-called "double access" readings of present tense, where the present tense is interpreted with respect to the time of the current conversation, as in *Max hat vor drei Wochen gesagt, dass Eva schwanger ist* 'Max said three weeks ago that Eva is pregnant' (cf. Ogihara 1995, Giorgi 2010). Yet another case in point are cases like *Eva sagt dass Max laut schnarcht* 'Eva says that Max snores loudly', which can be analyzed as explicit performative updates as in (125) but invoking another speaker, in this case Eva. The current speaker S_1 is justified in doing so if he or she has evidence from past commitments that Eva indeed would undergo this commitment in the current conversation as well.

Frey (to appear) objects against the idea of embedded ActPs, pointing out that there are features of sentences that cannot be embedded ("strong root phenomena") such as interjections like *Mann!*, interactional expressions like *von Mann zu Mann* 'from one man to the other' and also vocatives. If we assume that expressions like *offen gesagt* are Act modifiers we would have to explain why those expressions behave differently. One option is that they are not modifiers of speech acts but express speech acts in their own right that modify an input common ground to prepare it for a consequent speech act. For example, *Mann!* restricts the common ground for a speech act expressing an emotion, *von Mann zu Mann* restricts it to speech acts from males to males, and a vocative like *Anna!* declares Anna the addressee of the following acts.

4.2 Complement V2 clauses

We have seen that the conversational effect that speakers want to achieve with embedded *dass* clauses often is to get the proposition of the complement clause into the common ground by a commitment that is different from the direct commitment to that proposition itself. This is managed by commitment closure (25), which leads from a commitment of the speaker to a proposition to assume that proposition itself, and by judgement closure (44), which allows to proceed from the information that a trustworthy authority (the speaker or also some other person) judges a proposition to be likely enough to assume that proposition. Thus, sentences like (126) actually can be taken to communicate their embedded propositions, that there will be a thunderstorm.

(126) a. *Ich glaube, dass es ein Gewitter geben wird.*
'I believe that there will be a thunderstorm.'
b. *Der Wetterbericht hat gemeldet, dass es ein Gewitter geben wird.*
'The weather report announced that there will be a thunderstorm.'

In addition to verb-final *dass* clauses, German also allows for embedded verb second clauses:

(127) a. *Ich glaube, es wird ein Gewitter geben.*
b. *Der Wetterbericht hat gemeldet, es wird ein Gewitter geben.*

The predicates that allow for embedded verb second clauses are restricted to those that make it plausible that the embedded clause is the main predication. Reis (1997) calls these predicates "vermittelte Assertionen" (relayed assertions), Auer (1998) identifies them as non-presupposing and asserting by relation ("relativ assertierend"), Meinunger (2007) lists verbs of saying, evidential verbs and verbs of thinking:[55]

(128) a. verbs of saying: *sagen* 'to say', *antworten* 'to answer' *behaupten* 'to claim', *bemerken* 'to remark', *berichten* 'to report', *erzählen* 'to tell', *angeben* 'to indicate' …
b. evidential verbs: *hören* 'to hear', *merken* 'to realize', *spüren* 'to sense', *sehen* 'to see', *auffallen* 'to strike as remarkable', *klar sein* 'to be evident', *fest stehen* 'to be accepted'
c. verbs of thinking: *annehmen* 'to assume', *denken* 'to think', *einsehen* 'to recognize' *fürchten* 'to be afraid', *glauben* 'to believe', *meinen* 'to be of the opinion'

English lacks V2 as a grammatical signal but also has embedded root phenomena under similar predicates (cf. Hooper & Thompson 1973 and much subsequent work). As Reis, Auer and Meinunger observe, such predicates resist being negated and do not include predicates expressing doubt, like *bezweifeln.*

(129) *Der Wetterbericht hat nicht gemeldet,*
*dass es ein Gewitter geben wird / *es wird ein Gewitter geben.*[56]

(130) *Ich bezweifle, dass es ein Gewitter geben wird / *es wird ein Gewitter geben.*

There are two principled options for modeling embedded V2 clauses: Either they denote propositions (including JPs and ComPs) with some property that makes it clear that this proposition is to be communicated. For example, propositions expressed by embedded V2 clauses could be structurally more salient than propositions embedded by *dass* + verb final clauses. This option would have to explain why V2 has this saliency effect. Alternatively, embedded V2 clauses denote ActPs, which would explain that their V2 property and also that they are meant to update some commitment state. According to this latter view, they would be similar to cases of *dass*-clauses that embed ActPs, except that their V2 feature makes it obvious that they are ActPs whereas *dass*-clauses usually allow for a simpler analysis in which they subcategorize for TPs, JPs or ComPs. Frey (to appear) presents arguments for the first approach,

[55] In addition, Reis mentions predicates like *hoffen* 'to hope', *wünschen* 'to wish' and *besser sein* 'to be better' that express preferences. The current article focuses on assertive clauses that deal with factual information of the common ground, but the common ground contains other types of information, like what should be preferred, which is targeted by sentences with these embedding predicates. In a case like *Ich hoffe, Max schnarcht nicht* 'I hope Max doesn't snore', the embedded V2 clause could not be an ActP with a ComP, as the speaker does not commit to the truth of the proposition. Under the default assumption that V2 signals performative update in such cases as well we may assume as structure for the embedded clause [$_{\text{ActP}}$ *Max* [$_{\text{Act}'}$ [$_{\text{Act}^{0}}$ •] [$_{\text{TP}}$ t_1 *schnarcht nicht* t_0]]]. This could not be applied directly to the commitment state, as it magically would make the proposition true. However, the embedding predicate can express that a preference is introduced for which this proposition is true. Such preferences can also be introduced adverbially by *lieber* and *besser*, as in *Du bleibst lieber / besser hier* 'You rather stay here' that suggest a "preference phrase". Such cases should obviously be on the future research agenda of the current framework, as well as V2 dependent clauses as adjuncts as discussed in Gärtner (2002) and Frey (2012).

[56] Such sentences improve with focused negation and reportative subjunctive (Konjunktiv I) on the embedded verb, cf. Auer (1998). In such cases, the proposition of the embedded clause appears to have been just introduced into the conversation. Also, there is a tendency towards verb second in spoken language in general, but still observing semantic and pragmatic constraints, cf. Auer (1998).

in particular objections against the notion of embedded speech act and the apparent lack of ActP modifiers. This holds for parenthetical modifiers as in (131)(a), which could be explained by a preference of parentheticals to be interpreted with respect to the main clause. But it also seems to hold for modifiers in the SpecActP position as in (131)(b).

(131) a. *Max sagte, am Rande bemerkt, er ist enttäuscht von Paul.* (o.k. w.r.t. main clause)
'Max said, as a side, he is somewhat disappointed by Paul'
b. **Max sagte, am Rande bemerkt ist er enttäuscht von Paul*. (judgement W. Frey)

However, it appears that ActP-modifiers are not excluded by principle:

(132) *Wenn Barbara Hirt sagt, übrigens hat der folgende Text nichts mit Esoterik zu tun, ...*[57]
'When B. H. says, the following text has by the way nothing to do with esoterics'

The reason why ActP modifiers like *übrigens* in such embedded clauses are rare is that it is unusual to give information about aspects like the rhetorical relation that an assertion had in another conversation. When reporting about another conversation, the main points of interests are the content that was said, together with the commitment strength by which it was backed up, not the particular rhetorical relation in which the speech act stood to other parts of that conversation.

I do not consider the proper analysis of embedded V2 as settled, but I will develop here an analysis in terms of embedded speech acts, in the same way as I assumed embedded complementizer clauses of the type of ActPs. Just as in those cases, embedded V2 clauses can contribute to the current conversation, or report on some other conversation. We can analyze such cases in a similar way as examples (113) and (124), with an embedded ActP that is realized as usual with its head in the second position (cf. also Julien 2015).

(133) [$_{\text{ActP}}$ *ich* [$_{\text{Act'}}$ [$_{\text{Act}^{\text{o}}}$ *glaube* •] [$_{\text{ComP}}$ [t_1 [$_{\text{Com'}}$ ② [$_{\text{Com}^{\text{o}}}$ t_0]]]]]]
② = [$_{\text{ActP}}$ *Max*$_1$ [$_{\text{Act'}}$ [$_{\text{Act}^{\text{o}}}$ *schnarcht*$_0$ •] [$_{\text{ComP}}$ [$_{\text{Com'}}$ [$_{\text{JP}}$[$_{\text{J'}}$ [$_{\text{TP}}$ t_1 *laut* t_0][$_{\text{J}^{\text{o}}}$ J–]]][$_{\text{Com}^{\text{o}}}$ ⊢]]]]]

Example (133) illustrates a case in which the matrix verb *glauben* that normally would otherwise be analyzed as embedding a judgement phrase, not an ActP. However, it can be used to express a public commitment when used performatively, as it is in (133), where it originates as the head of a ComP. We can assume the following interpretation for the performative reading:

(134) $[\![\textit{glauben}]\!]_{s,a,j}$ = λiλUλx[x causes, by expressing a belief in i, update of c to U(x)(c)]

This results in the following interpretation of (133) when uttered by S_1, which is similar as in the case of a CP with ActP complement in (125).

(135) λc{i | ∃i′∈c[i′⊸•i[λi[S_1 causes, by expressing a belief in i, update of c to
{i″ | ∃i‴∈c[i‴⊸•i″[S_1 $\vdash_{i''}$ λi‴[Max snores loudly, acc. to S_1, in i‴]]} in i]]]}

Such an update could not be expressed with a verb like *bezweifeln* 'doubt', as expressing a doubt in the matter is pragmatically at odds with causing a commitment. Also, negation of the main clause leads typically to an unacceptable result as it would not express an effect on the input commitment state, and disbelief in a proposition could be more easily be expressed with a propositional object, realized by a *dass* clause. Cases with negated embedding verb typically

[57] https://www.intuition-management.ch/fileadmin/global/PDF/Zuericher_Wirtschaft_Barbara_Hirt.pdf

have embedded clauses in the subjunctive as a marker that prevents an interpretation as a direct update (cf. Ulvestad 1955; for subjunctives cf. Sode & Truckenbrodt 2018).[58]

The notion of introduction of a proposition into the commitment state is not to be understood as a claim by the speaker that the proposition actually is true. This becomes obvious when the subject of the embedding clause differs from the speaker, as in (136).

(136) [ActP *Eva*$_1$ [Act' [Act^o *sagt*$_0$ •] [ComP [t$_1$ [Com' ② [Com^o t$_0$]]]]]]

In this way, the speaker can add the information that Max snores very loudly to the common ground, e.g. when the question under discussion is who should share a room with Max. In typical uses, the speaker agrees with that proposition (see Meinunger 2006), adding it to the common ground by shifting responsibility to another person, Eva. But this does not have to be the case, as (136) can be continued with *aber ich glaube das nicht* 'but I don't believe that'. As there is one relevant agent in the conversation, the speaker, for which it holds that this agent does not believe the proposition, the proposition itself will not become part of the common ground. Similar to cases of evidentials, cf. (52), the proposition becomes part of the common ground if there is no contradictory information by the speech participants. But even if contradicted, (136) can be seen as a contribution to a question under discussion – the speaker points out an opinion that should be considered in the way how the question is to be resolved.

Example (136) illustrated a performative update of the speaker by attributing a commitment about the actual commitment state of another person. We also find embedded V2 clauses with reportative updates, which would exhibit the following structure:

(137) [ActP *Eva*$_1$ [Act' [Act^o *sagte*$_0$ •] [ComP [Com' [JP [J' [TP t$_1$ ② t$_0$][J^o J–]][Com^o ⊢]]]]]

This can be understood as affecting the commitment state of some other conversation, but it also can be understood as a contribution to the current conversation. Obviously, Eva does not have to be a real participant of the current conversation, but the speaker uses the commitment that she expressed at some other occasion as a relevant contribution to the conversation that is going on here and now.

It should be pointed out that in addition to ActPs, which denote an illocutionary act potential in the sense of an update function on common grounds, we also have to consider the case of direct quotes, as in *Max sagte:"Ich schnarche laut"* 'Max said: "I snore loudly"' Such cases can be seen as embedding a locutionary act potential (cf. Krifka 2014).

In the previous section it was argued that *dass*-clauses can host TPs, JPs, ComPs and even ActPs, depending on the selectional properties of the embedding predicate. There is some evidence that these selectional properties are not fixed, in contrast to embedded ActPs with V2 as discussed in the present section. For example, verbs like *glauben* 'believe' may also subcategorize TPs, and verbs like *sagen* 'say' may subcategorize ActPs, ComPs, JPs and TPs (cf. also Frey, to appear). This flexibility possibly shows up in the perspective shift behavior. It was observed by Woods (2016) with regular embedded questions and embedded root questions that the latter induce an obligatory perspective shift whereas the former are ambiguous.

(138) *Eva meint, dass sie diesen Trottel (# sicherlich) heiraten will.*
'Eva thinks that she (certainly) will marry this jerk.'

[58] Negation is sometimes possible with indicative embedded predicates. There are cases like *Ich behaupte nicht es ist einfach* 'I don't claim it is simple' (http://www.puechl.org/Selbst.htm) that appear to be denegations of assertions, i.e. the speaker rules out a commitment to the proposition cf. Cohen & Krifka 2014, Krifka 2015 for denegations. Reis (2013) mentions cases with prohibitives like *Glaub nicht, er ist der Mann deines Lebens* 'Don't think he is the man of your life'; this can be analyzed as a command to rule out assertions as expressed by the embedded V2 clause.

Without the JP modifier the epithet of *Trottel* 'jerk' can be interpreted from Eva's perspective and from the speaker's perspective, where the first reading is pragmatically odd. The interpretation from the speaker's perspective can be modelled by assuming that *meinen* embeds the TP, and hence the judge parameter j is only bound at the level of the main clause, and consequently set by the speaker. With the JP modifier *sicherlich*, the embedded clause must be a JP, which makes accessible the judge parameter for semantic operators, and consequently it has to be bound by the subject, Eva, leading to the pragmatically odd reading as the only one that is available.

As for the position of embedded clauses with respect to the matrix clause, we have assumed so far that they occur as arguments of the embedded predicate, regardless of their syntactic category. As clausal categories they have a strong tendency to be right-dislocated. However, there are known differences between *dass*-clauses, which don't have to be right-dislocated, cf. (139)(a), and V2 clauses, for which this seems to be necessary, cf. (139)(b), see Frey (to appear).

(139) a. *Eva hat doch, dass Max laut schnarcht, schon immer vermutet / mehrfach gesagt.*
'But Eva always suspected / said several times that Max snores loudly.'
b. **Eva hat doch, Max schnarcht laut, schon mehrfach gesagt.*

It appears that embedded JPs and ComPs can occur clause-medially, cf. (140)(a,b) but embedded ActPs cannot, even as complementizer clauses, cf. (140)(c).

(140) a. *Eva hat doch, dass Max sicherlich laut schnarcht, schon immer vermutet.*
b. *Eva hat doch, dass Max echt laut schnarcht, schon mehrfach gesagt.*
c. **Eva hat doch, dass Max offen gestanden laut schnarcht, schon mehrfach gesagt.*

Data judgements are tricky because there is a general tendency for extraposing clauses that is even stronger for more complex clauses. If corroborated by experiment, the underlying factor could be the categorical distinction between propositional arguments in the case of TPs, JPs and ComPs, and updates in the case of ActPs.

4.3 Clausal Anaphora

The various predicates that can have complement *dass* clauses also allow for sentential anaphora that refer back to antecedents that are of the same meaning as corresponding spelled-out *that* clauses. Clausal anaphora is expressed by the neuter personal pronoun *es* or by the *d*-pronoun *das* in German. But as argued for in Krifka (2013), clausal discourse referents can also be picked up by response particles like *ja*, *nein* and *doch.*

Let us consider a case in which the antecedent clause has a judge phrase that is distinguished from the TP by a judge modifier, *sicherlich.*

(141) S_1 to S_2: *Max schnarcht sicherlich laut.*
S_2 to S_1: *Das stimmt.* / *Das glaube ich auch.* / *Ich glaube es auch.* / *Ja.*
'That's right.' / 'I believe this too.' / 'Yes.'

The responses are ambiguous between 'It is certain that Max snores loudly' and 'Max snores loudly'. We can achieve this ambiguity if we assume that the antecedent clause introduces two propositional discourse referents, one for the TP and one for the JP:

(142) [$_{JP}$ [$_{J'}$ *sicherlich* [$_{J'}$ [$_{TP}$ *Max laut schnarcht*] [$_{J^0}$ J–]]]
↳p_1 ↳p_2
p_2: λi[Max snores loudly, according to j, in i]
p_1: λjλi[CERT(j,i, λi[Max snores loudly, according to j, in i])]

When the anaphoric expression picks up p_2, then this results in a commitment of the second speaker S_2 to the proposition that Max snores loudly (where the judge parameter j is naturally set to the second speaker, a phenomenon not accounted for in the current representation). If the anaphoric expression picks up p_1, then the second speaker commits to the proposition that it is certain that Max snores loudly. We can generally expect that the discourse referent of the larger constituent, p_1, is more salient than p_2 (cf. for response particles Claus et al. 2017).

Sicherlich is an epistemic modifier. We find a similar ambiguity with evidential modifiers, as in the following case:

(143) S_1 to S_2: *Max schnarcht laut Eva laut.*
S_2 to S_1: *Das stimmt.* / *Das glaube ich auch.* / *Ja.*
'That's right.' / 'I believe this too.' / 'Yes.'

The responses are ambiguous between 'Max snores loudly' and 'according to Eva, Max snores loudly'. This ambiguity can be dealt with in the same way, by assuming that propositional discourse referents are introduced at the level of the TP and at the level of the JP.

When we turn to commitment specifiers, we find that they are not anaphorically accessible. In the response of S_2 in (144), reference is to the proposition 'Max snores very loudly' and does not include the commitment specifiers (cf. also Frey, to appear). This even holds for the last reply 'I would say this as well' in which the anaphor is an argument of *sagen* 'say' that arguably subcategorizes for a commitment phrase.

(144) S_1 to S_2: *Max schnarcht echt* / *ungelogen sehr laut.*
S_2 to S_1: *Das stimmt.* / *Das glaube ich auch.* / *Ja.* / *Das würde ich auch sagen.*

This is evidence that the commitment phrase does not introduce a propositional discourse referent on its own. This special behavior corresponds to our observation that commitment modifiers do not occur in the prefield, which we have explained by saying that this position can be targeted only by expressions that are part of the communicated proposition. We have argued that the commitment phrase is not communicated, in the sense that it restricts the common ground, but rather it is used to specify the nature of the asserted act itself. This is a plausible reason why the commitment phrase does not introduce a discourse referent: Not adding any information to the common ground itself entails that a discourse referent cannot be added either.

Given our observations about the anaphoric potential of commitment modifiers we do not expect that act phrases can be taken up by anaphora. When we consider antecedents with act phrase modifiers we find that this is indeed the case.

(145) S_1 to S_2: *Offen gestanden schnarcht Max ziemlich laut.*
S_2 to S_1: *Das stimmt.* / *Das würde ich auch sagen.*

In the response of S_2, the anaphoric expression *das* clearly only takes up the proposition that Max snores rather loudly, not that that this is a frank assertion.

However, we do find responses of the following kind:

(146) S_1 to S_2: *Max schnarcht sehr laut.*
S_2 to S_1: *Das ist nicht nett von dir.*
'That's not nice of you.'

Here, the anaphor refers to the speech act performed by the first speaker (cf. Krifka 2013 for mentioning such speech-act anaphora). Should we then assume that the Act Phrase introduces a discourse referent? I would say that the anaphoric reference in (146) is of a quite different nature. When S_1 applies [$_{ActP}$ *Max schnarcht sehr laut*] with meaning $\lambda c\{i' | \exists i \in c[i \multimap\bullet i'[\ldots]\}$ to the current input common ground c, the world component itself is changed from i to i′. Like

any change, this is materialized in an event e, the speech act that S_1 realized when applying the ActP meaning to the current common ground c. Now, this is not a discourse referent that is introduced by the use of this ActP, but rather an event in the world in which the conversation happens. It is as if S_1 had performed another, non-linguistic act, like to kick a dog that is present in the situation, which S_2 then comments by *Das ist nicht net von dir.* Hence, the anaphor *das* does not pick up a discourse referent, but refers to an event in the situation.

The anaphoric expression in (146) picks up the event that consists in the change of the actual index from not containing the speaker's commitment to the proposition that Max snores very loudly, to containing it. This is an abstract change in social commitments that we can identify with the "illocutionary act" in Austin (1961). There is a concrete, physical event that causes this abstract change, the utterance of the sentence by the speaker, called "locutionary act" by Austin (1962). This event can also be targeted by anaphora:

(147) S_1 to S_2: *Max schnarcht sehr laut.*
S_2 to S_1: *Das will ich nicht gehört haben.*
'I prefer that I haven't heard that.'

Again, the antecedent of *das* is not a discourse referent that was introduced by the preceding sentence. Rather, it is an entity in the world, the speech act event created by S_1's assertion.

5 Conclusion

This concludes the exposition of a theory of clause layers. There is a long-standing conviction that a speech act, including the speech act of assertion, is not just a proposition, but is created from a proposition by an illocutionary force operator (see e.g. Searle 1969). I have tried to identify this illocutionary force operator more closely, and have argued that it consists of several layers: There is the layer of the judgement phrase that expresses evidential and subjective epistemic modifications. Judgements are still proposition-like, but their modifiers are not part of the proposition that is to be communicated. Then there is the layer of commitment phrases in which it is recorded that the judging authority is committed to the proposition; commitment modifiers are clearly not related to the proposition to be communicated. The same holds for the layer of Act Phrases. Hence, we have seen a more differentiated view of what commonly is meant by illocutionary force. The main argument adduced for this view were the distribution of layer-specific modifiers and head features, the subcategorization properties of predicates that embed clauses, the interpretation of responses to assertions, and the anaphoric uptakes of relating to the different layers.

As for modeling, we have seen that a syntax based on principles of X-bar-theory works reasonably well for the upper layers of the clause. We have also seen how the crucial difference between informative descriptive propositional meanings and performative illocutionary meaning can be captured, namely by restricting the set of indices in the first case, and extending the indices so that they represent the change enacted by the speech act in the second.

I take the proposals and findings of this article as providing evidence for illocutionary operators in syntax, against arguments that such operators do not exist (cf. Jacobs 2018). One problem Jacobs sees is that expressions that are dependent on illocutionary operators do not have the same distribution. This is answered by the more differentiated view presented here that distinguishes between different kinds of operators that are responsible for licensing of different constituents, e.g. the particle *ja* is hosted by the ActP and *wohl* is hosted by the JP, as suggested in this paper. The c-command relationship between adverbial operators as well as the embedding behavior under different clausal predicates are suggestive for the ideas presented here.

However, the presented analysis is preliminary in many aspects. It only touched issues of compositionality, and it provided only a few exemplary in-depth analyses of adverbial

modifiers and embedding predicates. It did not go into the topic of sub-DP uses of speech-act related operators, cf Viesel (2016), and it was largely silent about the issue of non-complement clauses or of interrogative clauses or other speech acts.

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