

Comments on Faller's paper*

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November 4, 2006

1 Overview

I have two skeptical questions and thoughts on other ways to formalize some of Faller's most important ideas:

1. Is classical speech act theory (F cites Searle (1969) and Searle and Vanderveken (1985) in particular) the best option for thinking about evidentials as operating on a different 'speech act level' of meaning from modals?
2. Can SDRT be modified in the way F wishes?
3. Suggestion: We should try to express F's proposal that there is such a speech act as PUTTING FORTH a proposition in a more direct way. It is possible to do so in terms of a dynamic semantics theory of conversational update by making the common ground a special case of a more general model of what's been communicated in a discourse.

The skeptical questions are just meant to loosen up the terms of the discussion. Here are my answers to the skeptical questions:

1. We have other theories of the phenomena F uses to motivate her use of classical speech act theory: a well-developed theory of certain speech acts as conversational updates, and a promising theory of utterance modifiers as Conventional Implicatures. We should not take for granted that classical speech act theory is our only option.

*This handout is a commentary on Faller (2006) presented at the Workshop on Philosophy and Linguistics at the University of Michigan, November 3-5, 2006. I thank Rich Thomason and the other organizers for inviting me, and Martina Faller for providing such an interesting paper. This document has been slightly revised based on discussion at the workshop; each substantive revision is noted with a footnote.

2. Once SDRT is modified so as to model weaker speech acts than assertion through new kinds of sincerity conditions, it's no longer clear what the DRSs represent. In particular, the truth conditional semantics for the DRS no longer corresponds to the truth conditions of the discourse.

Assuming that the discussion has then been loosened up sufficiently, I'll make some suggestions based on one of F's key ideas:

- There is a type of speech act with fewer commitments than assertion described as PRESENTING (Faller (2002)) or putting-forth (PUT-ing: von Stechow (2003), Faller (2006)) a proposition.

What if we express this idea directly in our model of conversation? I'll spend some time discussing how a formal modal might look. Then, if time permits, I'll discuss the links to epistemic modality which are on F's mind (and probably everyone else's).

2 Faller's main ideas

To begin with, let me summarize what I take to be the most important points made in this paper. Some of them are derived from F's previous work, while others are novel here.

1. CQ evidentials only mark the source of information.
2. They do not contribute a modal semantics to the sentence. No matter which evidential is employed, the proposition expressed by a declarative remains the same as that of the phrase with which the evidential combines.
3. They do not directly mark degree of certainty, though there are correlations:
 - (a) *-mi* normally establishes a high degree of certainty.
 - (b) *-chá* normally establishes a minimal degree of certainty (=the proposition is at least possible).
 - (c) *-si* has no uniform correlation with a degree of certainty.
4. A declarative sentence does not necessarily fully assert the proposition expressed.
 - (a) *-mi* results in full assertion.
 - (b) *-chá* results in a weakened assertion.

- (c) *-si* results in the presentation (putting-forth) of a proposition. It's not completely clear what this amounts to, since no Competence axiom is proposed. F says that "In the case of the Reportative, Competence is attributed to someone else" (p. 27) and then goes on to discuss how such a proposition can meet Gricean standards.
5. In SDRT, the analysis of assertion is embedded in relational speech acts like Narration, Explanation, etc. Therefore, in CQ each relational speech act can be modified by the presence of an evidential to weaker or modified versions which we could call 'Weakly-Assertional-Narration', 'Presentational-Narration', etc.

The main point of my commentary is that we can give a simpler model of the notion of presenting a proposition, including what it is for a presented proposition to be Relevant to the conversation.

3 The skeptical questions

3.1 Is classical speech act theory our best option?

I'm not sure that "It is fairly standard to assume that a speech act consists of an illocutionary level of meaning, F, and a separate level of propositional content, p, such that F takes p as its argument, F(p)" (p.1). This 'classical speech act theory' (F cites Searle (1969) and Searle and Vanderveken (1985) in particular) may be a philosophically interesting way of talking about communication even while not corresponding to a linguistically relevant level of analysis. Many interesting results have been developed by thinking of the conversational function of assertions, questions, and directives in simpler terms as conversational updates. These speech acts are the most relevant to semantic theory because they correspond to the universal morphosyntactic categories of declaratives, interrogatives, and imperatives. Indeed, it's a weakness of classical speech act theory that it doesn't explain the special status of the SENTENTIAL FORCES which are encoded through clause type (=sentence mood).

What are sentential forces?

- o The conversational update view:¹

1. The sentential force of declaratives is assertion: the proposition expressed is added to the Common Ground.

¹See for example Stalnaker (1974), etc., Ginzburg (1995a), Ginzburg (1995b), Roberts (1996), Roberts (2004), Han (1998), Zanuttini and Portner (2003), Portner (2004), and Pak et al. (2006). Note that Portner (2004) analyzes the semantic value of imperatives as properties, but this point isn't important here.

2. The sentential force of interrogatives is asking: the question expressed is added to the Question Set.
3. The sentential force of imperatives is requiring: the property (or proposition) expressed is added to the addressee's To-do List.
4. Minor sentence types including exclamatives and promissives have also been discussed.

F uses utterance modifiers like *alas* to motivate a class of illocutionary modifiers integrated into classical speech act theory. She sees these as similar to evidentials, but we have other options for how to look at these as well. In particular, I have in mind the treatment of utterance modifiers in Potts (2003). Potts approach is attractive because it treats the contribution of utterance modifiers as falling within a general class of conventional implicatures (CIs). He views CIs in general as making speaker-oriented comments on the at-issue core of a sentence's meaning.

I'm skeptical of the idea that evidentials should be analyzed along the lines that Potts treats utterance modifiers (contra Potts (2006a)).

1. Potts proposes that CIs may be thought of as independent performatives (Potts et al. (2004), Potts (2006a), Potts (2006b)). Moreover, he proposes that a chief attribute of CIs is their independence from at-issue meaning, and so the expectation is that a declarative with an evidential marker will assert the proposition expressed by the sentence (minus the evidential). Thus, it may be difficult to use this theory to model F's findings that a proposition expressed by means of a sentence with an evidential is not in general fully asserted. (This problem is pointed out by von Stechow (2003).)
2. Potts also discuss the dynamic nature of CIs like *truthfully* and *honestly* as raising the contextual threshold for confidence (Potts (2006a), Potts (2006b)), and this may connect to descriptions of modals and evidentials as describing the speaker's level of confidence in the proposition expressed.

F says that the evidentials do not mark degree of certainty: "The evidentials themselves do not directly encode anything about the degree of certainty with which the speaker believes the embedded proposition" (p. 3), and so it seems that Potts' analysis of *truthfully* and *honestly* may not be useful. However, I'm not sure how to interpret the belief sincerity axioms for *-chá* except as marking the degree of certainty (it implies 'weak belief', p. 25). Therefore, the relevance of the CI theory seems still open.

Conclusions:

1. Classical speech act theory:
 - (a) is not the best way to analyze the linguistically relevant notion of sentential force, and

- (b) may also not be the best way to analyze utterance modifiers.
- 2. We should see whether the contribution of evidentials can be modeled in terms of the analysis of sentential forces as types of conversational update.
- 3. Evidentials have similarities to utterance modifiers, but it's not clear whether they should be analyzed in the same terms.

3.2 Can SDRT be modified in the way F wishes?

I don't think it makes sense to describe the meanings of evidentials solely in terms of the cognitive modeling language.

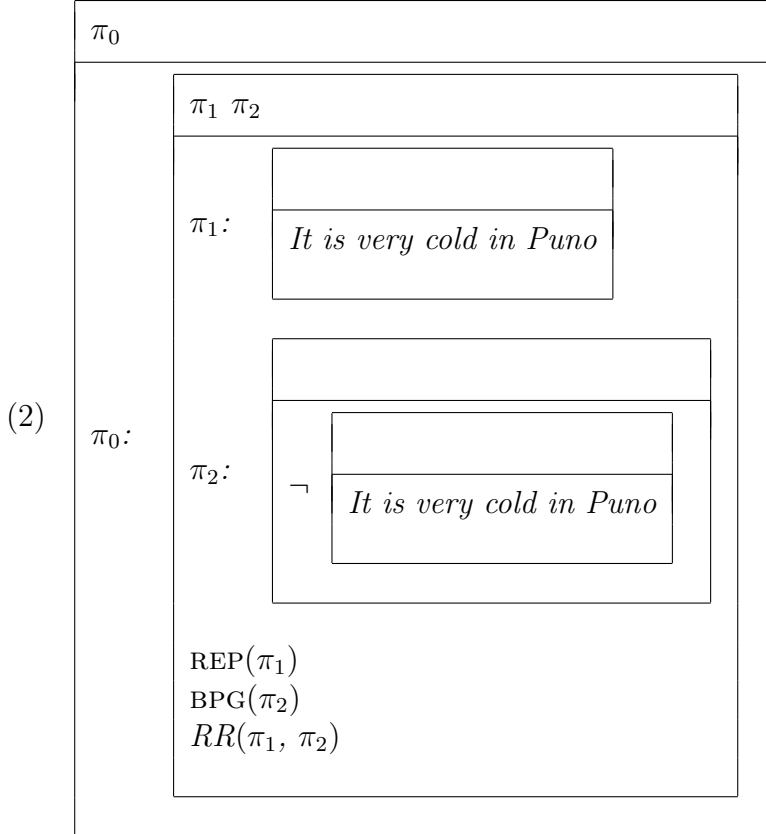
1. According to F, the DRS for a simple sentence with a reportative suffix is as follows (p. 20):

$$(1) \quad \begin{array}{|c|} \hline \pi_1 \\ \hline \pi_1 : K_{\pi_1} \\ \text{REP}(\pi_1) \\ \hline \end{array}$$

π_1 is a 'speech act discourse referent' and K_{π_1} is a DRS representing its content. The predicate REP does not contribute to the truth conditions of the overall DRS, so that the condition $\text{REP}(\pi_1)$ has the same truth conditions as π_1 (p. 21). REP only feeds the cognitive modeling component of SDRT.

2. This way of thinking of the contribution of REP (and the DR-conditions introduced by the other evidentials) seems to undermine the basic role that the DRS is supposed to play, namely providing a representation of the truth conditions of the discourse. F makes clear that the speaker does not necessarily represent the content of a sentence expressed with a reportative as true, and there is nothing wrong with a discourse resulting in a DRS like the following, where RR is whatever rhetorical relation is appropriate:²

²In the workshop, I gave this example with both π_1 and π_2 being reported. However, Faller (p.c.) suggested to me that such a discourse is probably not felicitous. She thinks that a discourse in which one proposition is reported and the other is presented as having the best possible grounds is more likely to be felicitous. Further research on the ways in which sentences with different evidential markers can continue or contradict one another is likely to be extremely helpful in understanding the kind of discourse theory in which an analysis of evidentiality should be couched.



However, the theory predicts that such a discourse should be judged contradictory. More precisely, though the theory does not predict that the speaker has represented herself as having contradictory beliefs (due to the modifications F makes to the cognitive modeling component), it does nonetheless predict that she has made the discourse into one that cannot be true. So long as (S)DRT is meant to give us a truth-conditional semantic theory (albeit among other things), this is not an appropriate result.

3. The informal description of PUT in F's section 4.2, like the discussion of presenting a proposition in Faller (2002), makes it seem like putting forth a proposition should be no more complex than asserting one:

That is the current speaker's speech act is one of presentation of another speaker's assertion. The context will then specify what illocutionary point the speaker intends to make beyond presentation, that is, this illocutionary point would be made indirectly. Under this view, the meaning of the sentence It is raining with *-si* can now be represented as in (165=19).

- (165) *Para-sha-n-si*.
rain-prog-3-si
 p ='It is raining.'
 $ILL=PRESENT(p)$
 $sinc=\{\exists s_2[Assert(s_2, p) \wedge s_2 \in \{h, s\}]\}$

The sincerity condition associated with *-si* states that there is some speaker s_2 who asserted p , and that this speaker is neither the hearer nor the cur-

rent speaker. There is no condition that the speaker believes p , and the illocutionary act is that of present.

(Faller (2002), p. 199)

However, in the fragment developed in this paper, presenting/putting forth a proposition is much more complicated than asserting it. In particular, because the assertive nature of a speech act π is handled through the rhetorical relations like narration, explanation, etc., into which π figures, we end up with complex sincerity axioms like F's (41) and (47).

The reason that presenting a proposition is a complex affair in this theory is connected to the previous point. Because (S)DRT was developed to model the truth conditions of a discourse, it is designed to model assertion in all its aspects. The original DRT of Kamp (1981) modeled only the truth conditional and discourse referential contributions of assertions. Questions and such can be added by introducing operators which relate non-assertive speech acts to assertive ones in a kind of performative analysis. To this, SDRT adds information about the beliefs and intentions of the conversational participants.

Conclusion: There are problems with using SDRT in the way F wishes, and they have to do with the fact that presentation/putting forth is not treated as a simple speech act type. It is made from assertion by weakening assertion. We should find a way to treat presentation either as parallel to assertion in terms of our conception of speech acts (as in Faller (2002)), or as even simpler than assertion.³

³As I will note below, I suspect that (S)DRT could be modified so as to provide a good theory of presenting, since an idea developed in any dynamic semantics model typically can be given an excellent translation in any other. But I don't think that the cognitive modeling component of SDRT is where the crucial changes will be made. Of course if we have cognitive modeling, changes will need to be made there, but the question of whether we're better off with a more classical DRT or a new-style DRT (now with cognitive modeling!) is probably an independent question.

4 The common ground is not every proposition's home

I think F's ideas can be developed more effectively if we go back to $t - 1$ in the development of dynamic theories, and build in a modal of 'presenting' at the foundation.

Presenting (or putting forth) a proposition should be modeled in a simple and direct way.

Let's describe a theory of conversational update in which 'presenting' is the most basic kind of update.

4.1 Sketch of the idea

1. Instead of the common ground as our basic construct, we have a wider set: the presented set.⁴
 - (3) The presented set ps is the set of propositions of which the participants are mutually aware.

A proposition may be in ps either because it has been explicitly presented and understood, or because other knowledge allows the participants to know that everyone is mutually aware of it. For example, an unstated member of the common ground (e.g., 'All of us here are interested in modality') is also a member of ps . Likewise, if we are both aware that the other suspects that a common acquaintance is being deceitful, then this suspicion ('So-and-so is being deceitful') is a member of ps (but in this case not a member of the common ground).

2. The common ground is a crucial subset of ps , but so are other subsets. We must keep track of subsets of ps representing propositions which belong to cognitively or communicatively important categories. For example, we keep track of the propositions to which we have made additional commitments (e.g., the common ground) and about which we have additional informations (e.g., those for which the speaker had direct evidence).
3. These subsets may of course be overlapping, and in principle they need not cover ps .

⁴In the workshop, I defined the presented set as the set of propositions which have been put forth and understood in the conversation. However, as pointed out by Barbara Abbott (p.c.), then the common ground could not be a subset of this set, since propositions which have never been explicitly asserted can be in the common ground.

Participants are mutually aware of a proposition if each is aware of it, each is aware that the other is aware of it, etc.

4. I assert p . Then p has been presented, so $p \in ps$. But we know more: p is part of a privileged subset of ps , $cg(ps)$, the propositions which the participants in the conversation mutually agree to count as true for the purposes of the exchange. So:
 - (a) To put forth p as an assertion is to present it with the intention that it be added to $cg(ps)$.
 - (b) To assert p successfully is to add it to $cg(ps)$ (and hence ps as well).
5. I utter a sentence with a reportative suffix, and this sentence expresses the proposition r . Let's accept F's demonstration that r is the same proposition as would be expressed by a sentence with a different evidential, or no evidential at all. Obviously r has been presented, so $r \in ps$. Moreover, though we don't want r to automatically become a member of cg , we do want to keep track of its reportative status. Let $report(ps)$ be the subset of ps which was put forth on the basis of a report to the speaker. (The paper contains a precise description of the range of cases covered by this.) Thus, to put forth r successfully as a report results in its being added to $report(ps)$.

4.2 Some more details

1. A model of discourse ds is a pair $\langle ps, F \rangle$ of a set of propositions ps and a tuple of selection functions F from ps to subsets of ps : $F = \langle f_1, \dots, f_n \rangle$. Each f represents a cognitively and linguistically real way of categorizing a proposition which has been presented and accepted.
2. To present (put forth) p in ds is to add it to ps
3. In addition, one or more f may be modified so that $p \in f(ps)$.
4. There may be constraints (axioms) constraining ps and the f 's.
5. The linguistic system of a language may have one or more grammaticized ways of indicating which f to update with a given sentence.
 - (a) Evidential systems are one such way.
 - (b) Epistemic modals may be another.
 - (c) Every language has cg as an available f and in every language cg is the default f for propositions that are presented.
6. When we PUT a proposition into ps , we may also modify F .⁵
 - (4) Simple PUT:
For any discourse structure $ds = \langle ps, F \rangle$, $PUT(ds, p) = \langle ps', F' \rangle$, where
 - (a) $ps' = ps \cup \{p\}$, and

⁵Definition (4) has been corrected since the version presented at the workshop.

- (b) F' is that sequence such that, for each f which is a component of F , f is replaced by f' , where $\text{Dom}(f') = \{ps \cup \{p\}\}$ and $f'(ps \cup \{p\}) = f(ps)$.
- (5) PUT which changes a member of F :
 For any discourse structure $ds = \langle ps, F \rangle$ and any f which is a component of F , there is a variety of PUT, PUT_f , such that $\text{PUT}_f(ds, p) = ds'$ as follows:
 Let α' be the discourse component in ds' corresponding to α in ds . Then, ds' is the minimal expansion of ds such that all of the following are satisfied:
 (i) $p \in ps'$
 (ii) for all selection functions g which are components of F' , $\text{Dom}(g) = \{ps'\}$
 (iii) $p \in f'(ps')$
 (iv) Any further constraints imposed on discourse structures are satisfied.
 (Compare to Faller (2006), p. 26.)

7. Evidentials correspond to varieties of PUT.

- (6) For language L , a valid discourse structure has the form $ds_L = \langle ps_L, \langle cg_L, bpg_L, report_L, conj_L \rangle \rangle$
- (7) Constraints on ds_L :
 (a) $bpg_L(ps) \subseteq cg_L(ps)$
 (b) $\{\{w : \exists x[\text{Say}(x, p, w)]\} : p \in report_L(ps)\} \subseteq cg_L(ps)$
 (c) $\{\diamond p : p \in conj_L(ps)\} \subseteq cg_L(ps)$
 [Or: $\{hunch(\text{speaker}, p) : p \in conj_L(ps)\} \subseteq cg_L(ps)$]
- (8) Meanings of the evidentials as update functions:⁶
 (a) $\llbracket mi \rrbracket = [\lambda p \lambda ds . \text{PUT}_{bpg_L}(ds, p)]$
 (b) $\llbracket si \rrbracket = [\lambda p \lambda ds . \text{PUT}_{report_L}(ds, p)]$
 (c) $\llbracket chá \rrbracket = [\lambda p \lambda ds . \text{PUT}_{conj_L}(ds, p)]$
- (9) The absence of an evidential gives simple assertion:
 ◦ If S is a root node which denotes a proposition p , shift p to $[\lambda ds . \text{PUT}_{cg_L}(ds, p)]$

Comments:

1. Language L is like CQ in having cg , bpg , $report$, and $conj$. However, CQ might make use of other selection functions as well. Or it might make use of more finely-grained selection functions, with the evidential suffixes representing classes of similar ones. Are the set of such functions universal, so that English speakers for example keep track of the reported propositions, the propositions they have direct evidence for, etc? Or can the discourse structure used by speakers of a particular language be read off of its grammar?

⁶The fascinating data which F discusses concerning evidentials in interrogatives obviously shows that these meaning are not adequate as they stand.

2. Given this grammar, PUT is never used; we only use the various PUT_f 's. That is, in L we never add a proposition only to ps . Whenever we add it to ps , we also modify one of the selection functions f so that the proposition is in $f(ps)$. (I will sometimes sloppily describe this by saying that the proposition is 'added to f ', or as a result 'in f '.) Maybe some language has a grammaticalized way of merely presenting a proposition – of making one's interlocutors aware of this proposition, without saying anything more about it
3. In L , adding a proposition to any f also results in something being added to $cg(ps)$. Maybe some language has a way of incorporating a proposition into the discourse structure without connecting it to the common ground.⁷
4. F's discussion of her examples (51)-(53) shows that we need to say something more about what it is to put forth a proposition. Here is her example (51):

- (10) A: *Apay-man-chu punchu-y-ta.*
 take-1-cond-pol poncho-1-acc
 'Should I take my poncho?'
 B: *Nishu-ta-s chiri-mu-n Punu-pi.*
 a.lot-acc-rep be.cold-cisl-3 Puno-loc
 p='It is very cold in Puno.'
 ev: s was told that p

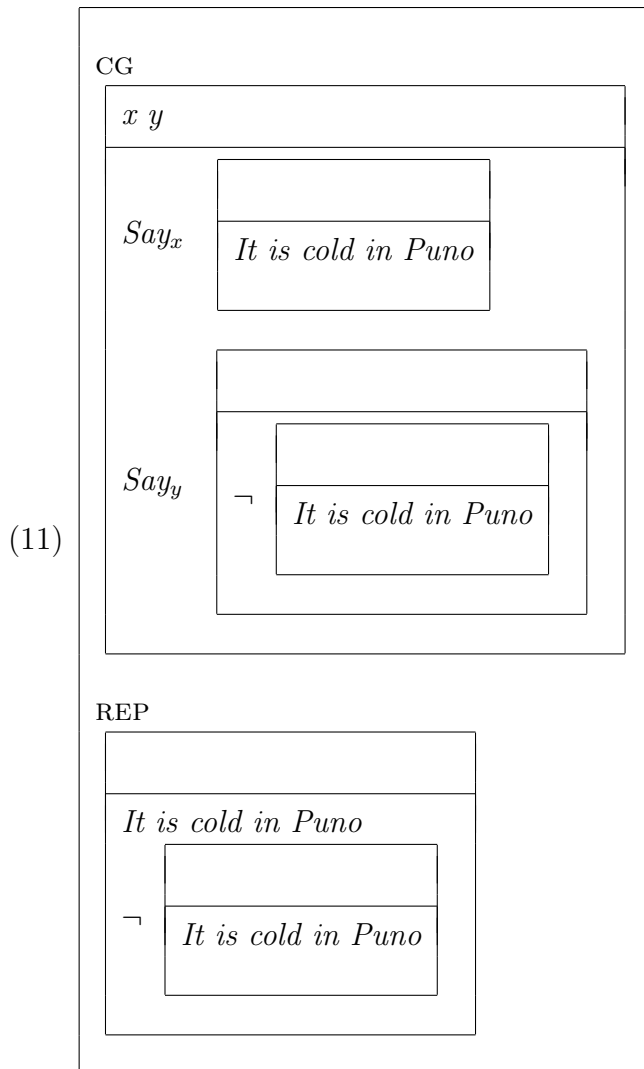
Speaker B presents 'it is very cold in Puno' as being relevant to the conversational exchange, even though s/he may not believe it to be true. This is reminiscent of Papafragou's (to appear) idea that the proposition which serves as the argument to an epistemic modal is often the 'main point' of the utterance.

Roberts (1996) definition of Relevance is useful here. She says that an assertion is relevant iff it provides an at-least-partial answer to the current question under discussion, and a question is relevant iff it is part of a strategy to answer the current question under discussion. In the simple narrative (10), the QUD is 'should I take my Poncho?', and 'it is very cold in Puno', in combination with other contextual assumptions, would provide an answer to it. We should require that when a speaker puts forth a proposition, it must stand in the appropriate ANSWER relation to the QUD. This is a constraint on the addition of a proposition to ps , regardless of whether it is added to $cg(ps)$ as well.

5. This approach follows F is saying that an evidential does not affect the propositional content of a sentence in the following sense: The highest phrase (the sister of the evidential) which denotes a proposition doesn't incorporate the evidential, and this proposition is the one presented.

⁷If a proposition p is put forth, the proposition that p has been put forth will inevitably be added to the common ground. However, I take this to be a perlocutionary side effect of the utterance (perhaps intentional).

6. By going from the notion of a common ground to that of a discourse structure, we avoid the problem which arose for F's SDRT implementation. Though the common ground should be consistent, there's no reason that *report(ps)* or *ps* itself needs to be.
7. Of course we could have a similar (S)DRT implementation. One way to do this would be to have a number of top-level DRSs, each modeling an information state with a distinct cognitive/communicative status. Only one top-level DRS, the one corresponding to the common ground, would represent the truth conditions of the discourse.



8. Given the constraints, a sentence with an evidential will perform a triple conversational update. In the conjectural case, for example, p is added to ps and $conj(ps)$, and $\diamond p$ is added to $cg(ps)$. As F proposes, there is modality in the evidentials, but it is an indirect effect of a distinct variety of speech act.

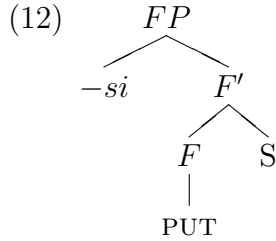
The addition of $\diamond p$ to $cg(ps)$ is not different from what happens in F's system. She notes that to the weak assertion of p when marked by *-chá* is equivalent to the assertion of $\diamond p$, following Krifka. Given that this equivalence would be obvious to language users, a weak assertion of p would have to result in $\diamond p$ being added to the common ground.

9. As seen in F’s (40), discourse relations like anaphora and temporal sequencing can hold within *report* and *conj*, just as they can within *cg*. Given that all of the subsets of *ps* are formally the same kind of thing, this similarity is expected. I would speculate that they can hold across sentences with different evidentials as well, subject to modal-subordination type restrictions. For example, I’d expect that discourse referents introduced by a sentence marked with *-si* could not be accessed by an anaphor in a sentence marked with *-mi*, unless the report was taken as true, and so part of *cg* as well.
10. As should be obvious, this way or recasting F’s ideas readily takes over F’s explanation of the scope facts.
11. It can also explain the assent/dissent facts on either of two assumptions:
 - (a) *That’s not true* does not have access to the speech act level of meaning, and therefore targets the denotation of the highest proposition-denoting constituent.
 - (b) *That’s not true* targets the proposition which is presented as relevant.
12. The “evidential variant of Moore’s paradox” is simply a matter of inconsistency in the common ground:

A sequence of the form “p-mi/-si/-chá, but I didn’t see/wasn’t told p/am not conjecturing p” is infelicitous in the same way as a sequence of the form “p, but I don’t believe p” is infelicitous. (Faller (2006), p. 21)

For example, p-*si* adds to the *cg(ps)* that the speaker was told that p, and so it creates inconsistency to subsequently add that the speaker wasn’t told that p. The sequence is infelicitous and not just contradictory because of the fact that any competent speaker would be aware of the inconsistency, and there’s no time for one’s understanding of the nature of one’s evidence to change during the time it takes to say “but”.

13. Once a sentence with an evidential has been accepted, do we need to remember who the speaker was – i.e., who had the evidence which motivated the evidential? This amounts to asking whether we should have a simple *bpg*, as above, or whether we need a function *bpg_x* which associates participants *x* in the conversation with sets of propositions representing what they are understood to have direct evidence for.
14. In these definitions, the evidentials are not really illocutionary modifiers. Rather, they are sentential force operators. However, they are similar enough to one another that one might describe them as ‘sentential force specifiers’ – elements which specify precisely which kind of conversational update is to be performed. We could cash this out by letting *bpg_L*, *report_L*, and *conj_L* be arguments of a schematic PUT function represented in syntax.



Not that I'm personally endorsing a 'Force phrase', but it does fit in with F's ideas about the evidentials.⁸

4.3 Connections to epistemic modals

F comments in numerous places on the relationship between epistemic modals and evidentials. Moreover, the notion of presenting/putting forth of a proposition is closely related to ideas in the recent literature on epistemic modality (for example, von Fintel (2003), von Fintel and Gillies (2006), Papafragou (to appear), Swanson (2006)). There we find the following intuitions:

1. Epistemic *might* and *must* have modal truth conditions.
2. They also imply some other act of communication involving their prejacent.

For example:

1. The psychological/relevance theory perspective

The fact that the embedded proposition, rather than the proposition plus the modal verb, is the main locus of cognitive effects is responsible for the intuition that (50a) [*Bar Noir* is popular with students] is the main point of the utterance [of *Bar Noir* must be popular with students].

(Papafragou (to appear), p. 16)

2. The dynamic semantics perspective

Our suggestion is that a sentence like (20) [*There might have been a mistake in the calculation*] is used to make two speech acts: an assertion (?) that it is compatible with the evidence that there has been a mistake, and proffering (with an explicit lack of conviction) that there has been a mistake or giving advice not to overlook the possibility that there has been a mistake.

⁸At this point, we've gotten to a perspective similar to that of von Fintel (2003). However, in von Fintel's discussion, speech acts update a 'commitment state', and since the commitment state is not defined, it isn't clear what effect putting forth a proposition has on it. See Section 4.3 for more on von Fintel's ideas concerning modality.

These ideas can be formalized in the framework of evidential semantics as follows:

1. *Might S* makes a double conversational contribution: $\llbracket \textit{might S} \rrbracket$ is added to $cg(ps)$ and $\llbracket S \rrbracket$ is added to ps .
2. *Must S* makes a double conversational contribution: $\llbracket \textit{must S} \rrbracket$ is added to $cg(ps)$ and $\llbracket S \rrbracket$ is added to $infer(ps)$.

Here *infer* is the component of the discourse context which would be used in the analysis of inferential evidentials; $infer(ps)$ is the subset of ps whose members are represented as being known by inference. That is, they follow from the common ground in combination with other beliefs.

Comments:

1. If this is going to work, we need to say something about the status of ps which makes something of Papafragou's suggestion that the prejacent proposition is often the main point of the utterance. Just as with evidentials, I think we can do this by going back to Roberts' (1996) definition of Relevance. A proposition p added to ps should stand in the ANSWER relation to the question under discussion in the context. Usually p is asserted, but perhaps not in the case of *might* and *must*.

(13) A: Is it going to rain?

B: It might.

Here, the proposition that it will rain would answer the question; that is, it is relevant, and so it is perceived as the main point. However, it is not asserted. The proposition that it might rain is asserted. This combination leads to the impression that the question is being answered, but with a weak level of commitment.

2. At this point, we can see that our theory of conversational update should require that at least one of the propositions presented by an utterance be relevant in Roberts' sense. Sometimes more than one proposition is presented. For example, an utterance of *Might S* presents both p ($=\llbracket S \rrbracket$) and $\diamond p$. (That is, p is added to ps and $\diamond p$ to $cg(ps)$; since $cg(ps) \subseteq ps$, $\diamond p$ is added to ps as well.) It is sufficient in this case that p be relevant.
3. In another context, the asserted $\diamond p$ could be relevant.

(14) A: Is it possible that it will rain today?

B: Yes, it might.

Of course p would also count as relevant here.

4. This way of thinking about epistemic *might* and *must* is similar to Ninan’s (2005) proposals concerning deontic *may* and *must*. He suggests that deontic *may* and *must* contribute their traditional modal truth conditions, and in addition affect the addressee’s To-do List (Portner (2004)). Ideally we will be able to understand the evidential functions of epistemic *might* and *must* as just the analogues, in the knowledge domain, of the imperative-like functions of deontic *may* and *must*. This would strongly support the idea that epistemic modals and (addressee-oriented, “true”) deontic modals are closely related, if not identical, lexical items (see Hacquard (2006a), Hacquard (2006b) for other evidence that these types of modality constitute a semantically relevant class).
5. The evidential nature of epistemic modals has been widely noted (e.g., Drubig (2001), Westmoreland (1995), Izvorsky (1997), as well as the later works just cited.) This way of looking at the connection says that *must* has an evidential function in addition to a truth-conditional function. But there may also be another aspect to the relationship. Consider Kratzer’s (1981) discussion of why following example is weaker than the corresponding one without the modal:

(15) *Das muß die Bürgermeister-Weiß-Straß sein.*
 this must the Bürgermeister-Weiß-Straß be
 ‘This must be the Bürgermeister-Weiß-Straß.’

She says that the use of ‘must’ here signals that the ordering source is not empty. The ordering source in question is a doxastic one containing information which is held as less reliable by the speaker, for example “the route description of a friend, a tourist guide, or my own vague memories from years ago” (Kratzer (1981), p. 57). Perhaps we must add to the semantics of *must* the condition that its ordering source contains propositions for which the speaker has less than the ‘best possible grounds’.

If the semantics of *must* requires such a less reliable doxastic ordering source, the fact that its prejacent is added to *infer(ps)* may not need to be lexically specified. Rather, $\llbracket Must S \rrbracket$ is added to the common ground. This would conversationally implicate that $\llbracket S \rrbracket$ follows from what’s in the common ground in combination with the less-reliable speaker’s beliefs, but not from the common ground alone. In other words, the implicature is that the speaker has inferred it. Suppose that *infer* is a universal component of the discourse structure; then the hearer may deduce that $\llbracket S \rrbracket$ should be in *infer(ps)* and not in *cg(ps)*.

The key assumption here is that *infer* is a universal component of the discourse structure, so that English speakers are on the lookout for propositions to be added to *infer(ps)*.

6. When epistemic modals are possible in embedded contexts, only their truth conditional contribution matters (von Stechow (2003), Papafragou (to appear)). When embedded, they cannot do whatever special extra work they do in root sentences. This is again parallel to what Ninan (2005) finds with deontic *must*.

I’m not sure how to analyze this coming-and-going of the extra speech act, but I have a suggestion. Perhaps *must* and the others are combination mood-modality markers.

They introduce modal meaning, but they also have a mood-like function.

- (a) The fact that *may*, *might*, and *must* can function as mood markers is attested by examples like the following, from Palmer (1990) ((16)a) and Portner (1997) ((16)b,c):

- (16) (a) I pray that God may bless you.
(b) It is possible that Sue might win the race.
(c) It is a requirement that all prisoners must be in their cells by 6 p.m.

(16)b means ‘It is possible that Sue will win the race’, not ‘It is possible that it is possible that Sue will win the race’. Thus, *might* just “agrees with” *possible*, and doesn’t introduce modal meaning of its own.

- (b) When embedded under *think*, both mood-like and modal interpretations are available:

- (17) Mary thinks that Sue may win the race.
(a) Stress on *thinks*: Mary (weakly) thinks that Sue will win the race.
(b) Stress on *may*: Mary thinks that it’s possible that Sue will win the race.

- (c) In root clauses, the use of a non-indicative mood signals that the sentence receives an interpretation in discourse – a non-assertive speech act – parallel to an overt operator that could embed it. The following examples from Portner (1997) make this point.

- (18) Oh, to someday meet her!
(cf. *I hope to someday meet her.*)

- (19) *Il Signore ci protegga.*
the Lord us protect-subj-3sg
‘May the Lord protect us.’

(G.T. di Lampedusa, *Il Gattopardo*, cited in Moretti and Orvieto (1981))

The exact analysis of this phenomenon needn’t concern us here. (Are the non-assertive meanings produced by speech-act operators or through pragmatic processes?)

- (d) So I am speculating that the secondary status of *must*, *might*, and *may* as evidential-like and imperative-like elements may be reducible to their secondary status as mood-markers. More specifically, I’m suggesting that root occurrences simultaneously functions as modals and mood markers. As mood markers, they signal that the prejacent proposition is used in a non-assertive speech act of presenting (epistemic) or requiring (deontic/root).

7. Parting advice:

When you’re thinking about epistemic *must*, *might*, and *may*, the link with evidentiality may be revealing.

But don’t forget their other uses!

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