

LORID'99, HCRC, Edinburgh, 6-9 July 1999

A DYNAMIC APPROACH TO THE DISCOURSE LEVEL SENSITIVITY OF PRAGMATIC CONNECTIVES

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Introduction

In this paper, we discuss the discourse level sensitivity of discourse markers (DM) in five points.

- 1) We observe some differences between the DM -marked and the DM-unmarked discourse relations (DR).
- 2) We present the dynamic approach we use to capture the DM semantic constraints on different levels.
- 3) We discuss the motivation for typing the rules instead of typing the semantic objects.
- 4) We analyse how the semantic constraints of the DM interact with different illocutionar configurations.
- 5) We propose some basic formalisation of the way in which the DM specify the discourse relations.

1. Differences between DM-marked and DM-unmarked DR

It is generally assumed in the literature that DR can be anchored at different discourse levels:

- the content level
- the epistemic level
- the illocutionary level.

These different levels correspond to the next three examples.

- (1) Pierre est arrivé en retard. Il a raté son train
Peter was late. He missed his train
- (2) Pierre doit avoir eu un accident. Il a le bras dans le plâtre
Peter must have had an accident. His arm has been plastered
- (3) Depuis trois semaines Marie ne vient plus au séminaire. Est-ce qu'elle est malade ?
Mary has not attended the course for three weeks. Is she ill

It is generally assumed that DM can be anchored at these 3 levels.

- (1a) Pierre est arrivé en retard. Donc il a raté son train
Peter was late. So he missed his train
- (2a) Pierre doit avoir eu un accident. Parce qu'il a le bras dans le plâtre
Peter must have had an accident. Because his arm has been plastered
- (3a) Depuis trois semaines Marie ne vient plus au séminaire. Donc est -ce qu'elle est malade ?
Mary has not attended the course for three weeks. So, is she ill

However, this parallelism between DM -marked and DM-unmarked DR does not always obtain.

There are configurations that are better without a DM than with it.

- (4a) Jean est très violent. Je ne veux pas que tu aies d'ennuis
John is very violent. I don't want you to get into trouble
- (4b) Jean est très violent. ?? Parce que je ne veux pas que tu aies d'ennuis
John is very violent. ?? Because I don't want you to get into trouble
- (5a) Je ne veux pas que tu aies d'ennuis. Jean est très violent
I don't want you to get into trouble. John is very violent
- (5b) Je ne veux pas que tu aies d'ennuis. ?? Donc Jean est très violent
?? I don't want you to get into trouble. So John is very violent
- (6a) Il faut que l'on soit ponctuel. Tu as l'heure ?
We must be on time. Have you the time
- (6b) Il faut que l'on soit ponctuel. ?? Donc tu as l'heure
We must be on time. So have you the time

Those differences show that we cannot simply recycle the discourse sensitivity of DR. We must use different tools for DM.

The discrepancies between DM-marked and DM-unmarked DR show in configurations where the coherence link is established at the illocutionary level. In such configurations, the causal content link is not required to construct a coherence relation based on some causal primitive. However, DM with a causal flavour such as *donc* and *parce que* seem sensitive to a causal content link, even in these configurations.

2. The dynamic approach to DM semantic constraints

To take into account the double sensitivity of the causal DM we adopted a dynamic approach. The intuitive idea behind various form of dynamic semantics can be summarised by (1).

I Dynamic Semantics Wisdom Expressions denote transitions between states or situations, not just states or situations.

In the case of DM, this idea yields :

II Dynamic DM A DM is a constraint on two transitions between information states or situations.

This basic idea is compatible with a conception of discourse as a sequence of transitions. The DM signal relations of various kinds between those transitions.

The transitions can be considered as updates in Veltman's (1996) sense.

Updating an information state s with p means eliminating all the states where p is false. For instance, an assertion X is viewed as an update of some s with the content of X , p (a proposition).

The semantic profile of the DM is a set of constraints on transitions pairs. In the case of consequence DM, one of the transitions must be able to warrant the success of the other on the basis of some causal rules.

An information state s is a set of epistemic alternatives (worlds).
 $s + p$ consists of getting rid of all the worlds where p is false in s .

An update $s + p$ *succeeds* iff $s + p \neq \emptyset$.

An update with p succeeds iff there is at least one world where p holds. In other terms, an update fails whenever it introduces an inconsistency.

p is *accepted* in s iff p is true in every world of s .

III Basic condition of consequence DM in French A form X DM Y is appropriate with respect to a set of rules R only if:

whenever the X update succeeds, the update of the result with R leads to a state where the Y update necessarily succeeds.

This conception allows us to consider the specific value the DM gives to a DR as a “planned” value. Intuitively, the speaker seems to have Y in mind when he is saying X . In other terms, with a DM the transition with X is planned with respect to the transition with Y . The difference between DM-marked and DM-unmarked DR resides in part in this planned value. By focusing on this planned value, we avoid to see DM as just linking the resulting states of the transitions.

The rules can be of two types : causal if the causal link is direct, abductive if the causal link is in the non-basic order (indirect causality).

Causal rules can be cashed (more or less directly) on observation. Abductive rules are cashed on speaker’s reasoning. There is no such thing as an abductive sequence of facts in the world. We capture this difference by typing the rules:

IV Rule types Causal rules have the type $X_{\text{CAUSE}} \Rightarrow_{\text{OBS} \vee \text{REAS}} Y_{\text{EFFECT}}$. Abductive rules have the type $X_{\text{EFFECT}} \Rightarrow_{\text{REAS}} Y_{\text{CAUSE}}$.

Examples

- (1a) Pierre est arrivé en retard. Donc il a raté son train
Peter was late. So he missed his train

If the first update succeeds, “Pierre est arrivé en retard” is accepted in the real state.

A causal rule such as “Arriver en retard” \Rightarrow “Rater son train” is selected.

This rule entails that “Perdre son train” is accepted.

The update with “rater son train” is necessarily successful.

- (2b) Pierre a le bras dans le plâtre Donc il doit avoir eu un accident
Peter’s arm has been plastered. So he must have had an accident

If the first update succeeds, “Pierre a le bras dans le plâtre” is accepted in the real state.

An abductive rule such as “Avoir le bras dans le plâtre” \Rightarrow “Avoir eu un accident” is selected.

The update with “Pierre a eu un accident” necessarily succeeds.

The abductive rule involves the speaker’s reasoning, hence the ‘epistemic’ flavour of the conclusion

- (6) Je ne veux pas que tu aies d’ennuis avec Jean. ?? Donc il est très violent

I don't want you to get into trouble with John. ?? So he is very violent

If the first update succeeds, "Je ne veux pas que tu aies d'ennuis" is accepted in the real state. A causal rule such as "Pas d'ennuis" => "Ne pas voir Jean" is selected.

This rule entails that "Ne pas voir Jean" is accepted.

The update with "je ne veux pas que tu aies d'ennuis" is not warranted.

3. Why typing the rules instead of typing the semantic objects ?

The difference between (1a) configuration which has no epistemic flavour and (2b), which has a clear epistemic favour, is captured, in our approach, not by typing the semantic objects, but by typing the rules that enable the path between the two transitions.

The dynamic approach is not incompatible with a typing of the semantic objects. It is perfectly possible to admit that updates bear on two types of objects :

- simple propositions that denote states of affairs,
- complex propositions $O(a,p)$ where p denotes a state of affairs, a an epistemic agent and O an epistemic operator. $O(a,p)$ denotes a judgement on the state of affairs.

Let us suppose that DM are sensitive to semantic objects.

We observe that some DM accept indirect causal configurations (*donc*) while others don't (*de ce fait*).

(2b) Pierre a le bras dans le plâtre. Donc il doit avoir eu un accident

(2c) Pierre a le bras dans le plâtre. ?? De ce fait il doit avoir eu un accident

(a) *Donc* admits epistemic objects and *de ce fait* doesn't admit such objects.

(b) Epistemic objects are identified by means of three kinds of clues:

- the abductive rule,
- the presence of modalities,
- the incompatibility with the parenthetical *paraît-il*, because of the contradiction it introduces. The epistemic attitude indicates that the information is endorsed by the speaker and the parenthetical indicates that the information is reported.

(2c) Pierre a le bras dans le plâtre. ?? Donc il doit paraît-il avoir eu un accident
Peter's arm has been plastered. ?? So he must reportedly have had an accident

In this configuration, all clues indicate that Y consists in an epistemic object. *De ce fait* is not possible because of (a).

(c) In direct causal configurations, *de ce fait* can be used with an epistemic modality.

(2d) Pierre a eu un accident à mobylette. De ce fait il doit avoir le bras dans le plâtre
Peter had a moped accident. As a result, he must have a plastered arm

The clue "epistemic modality" seems to be irrelevant: sometimes it is compatible with an epistemic object reading (when the rule is abductive), sometimes with a state of affairs reading (when the rule is causal). In the (2d) discourse, the rule is causal. The Y sentence denotes a state of affairs, therefore *de ce fait* is possible.

- (d) *Paraît-il* is never compatible with an epistemic modality if the two indications are on a par (no scoping over).

(2e) ?? Pierre doit paraît-il avoir eu un accident
 ?? Peter must reportedly have had an accident

If the clue epistemic modalit » is really irrelevant, we cannot explain the oddness of *paraît-il*.

- (e) So, to keep this hypothesis we have to assume that the epistemic modalities are irrelevant (*donc* vs. *de ce fait*) AND relevant (*paraît-il*).

- (f) By typing the rules, we avoid such a paradox

(i) *De ce fait* doesn't accept abductive rules.

(ii) Causal rules may be associated with observations or reasonings. So the conclusion of a causal rule (the Y_{EFFECT} part) can correspond to a reasoning of the speaker and, to that extent, accept modalities.

(iii) Abductive rules are associated with reasonings only. So the conclusion of an abductive rule (the Y_{CAUSE} part) must be associated with a reasoning of the speaker and, to that extent, accepts modalities but not *paraît-il* (or other reported information markers).

4. Speech act sensitivity of *parce que* ?

Consider (7).

(7a) Tu peux me trouver le marteau ? Parce qu'il faut que je répare l'étagère
 Can you find the hammer? Because I have to fix the shelf

(7b) Jean est très violent, ?? parce que je ne veux pas que tu aies d'ennui
 John is very violent, because I don't want you to get into trouble

Examples like (7a) = evidence for the speech act sensitivity of justification/explanation connectives, but (7b)

If (7b) is a kind of warning, the intention of sparing the addressee troubles is certainly a *cause* of the warning speech act.

A possible solution (suggested by a reviewer): there is a tension between the indirect character of the first sentence and the explicitness of the second sentence. Two problems:

- To assess the direct/indirect character, we have to say something about the non-warning (literal) interpretation of *Jean est très violent*,
- How is it that making the first sentence quite explicit does not redeem the example

(7c) Attention, Jean est très violent, ?? parce que je ne veux pas que tu aies d'ennui

We propose that, in monologues, *parce que* is sensitive to the *illocutionary goal* (i.g.) or *point* of the 'literal' act (i.e. the secondary act in the case of an indirect speech act).

Searle's notion of i.g. => a representative commits the speaker to the truth of the proposition expressed.

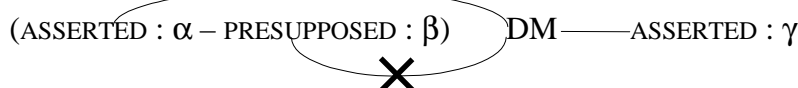
There is no (intuitive) causal link between the fact that the speaker commits himself to the truth of John being violent and the fact that the speaker cares about the addressee.

The i.g. is a sort of background information (a precondition of the act), similar to a presupposition. BUT,

this does not square well with the well-known observation **V**

V DM don't like presuppositions in monologues

DM are not easily plugged in presuppositions in monologues

(ASSERTED : α – PRESUPPOSED : β) DM — ASSERTED : γ


- (8) Marie a arrêté le français, (??) parce qu'elle voulait aller en France
 Mary stopped studying French, (??) because she wanted to go to France

?? if the presupposition that Mary has been studying French for some time is used in the causal connection.

So if the i.g. is a presupposition, it should always block connection by DM in monologues.



What bans pres. from the range of possible antecedents in monologal discourse connections
 Pres. are not *introduced* in discourse (think of their anaphoric value, Krahmer 1998).

So, they cannot give rise to updates, neither standard (informational) updates nor discourse updates as in (9).

- (9) Marie a arrêté le français. Elle a arrêté le français, donc je ne vais pas lui offrir un CD d'apprentissage
 Mary stopped learning French. She stopped learning French, so I'm not going to buy her an assisted learning CD

In (9), "Mary stopped learning French" is introduced then reintroduced. Reintroduction means signalling that the saliency of a proposition is high w.r.t. inferential operations (see Sperber & Wilson's notion of relevance). Pres. are not 'salient' in any sense.

However, i.g. are not *standard* presuppositions. Configuration.

1. I.g. are not standard propositions (they would license consequence connections).
2. They are not pres. (they would block justification/explanation connections).
3. They may be considered as propositions in a special type of information state, the common ground of i.g. (CG_{ig}), where the i.g. of the different agents are stored.
4. Conclusion: The standard update associated with the speech act should *entail* the update on CG_{ig} . How do we get the update machinery going

VI Common ground relativised to agents

CG_a = the set of propositions such that a believes them and believes that any other agent believes them.

In Groenenveld DEL (Dynamic Epistemic Logic),

$$CG_a = \{p : \Box_a p \wedge \Box_a \Box_{b_1} p \wedge \dots \wedge \Box_a \Box_{b_n} p\}$$

VII C.G. update Updating CG_a with ϕ amounts to draw all the conclusions that ϕ permits in view of CG_a

$$CG_a + \phi = \{p : [\phi]_a p \wedge [\Box_{b_1} \phi]_a p \wedge \dots \wedge [\Box_{b_n} \phi]_a p\},$$

where $[\phi]_a p$ means that updating the information state of a with ϕ leads to an information state of a where p holds.

Analogy.

p holds in $s = p$ holds in every world of s (p is *accepted* in s).

p is in $CG_a = p$ holds in every member of the set $\{\text{What } a \text{ believes}\} \cup \{\text{What } a \text{ believes that } b_1 \text{ believes}\} \cup \dots \cup \{\text{What } a \text{ believes that } b_n \text{ believes}\}$


Information states = sets of epistemic alternatives (worlds)

Shared information states = sets of information states

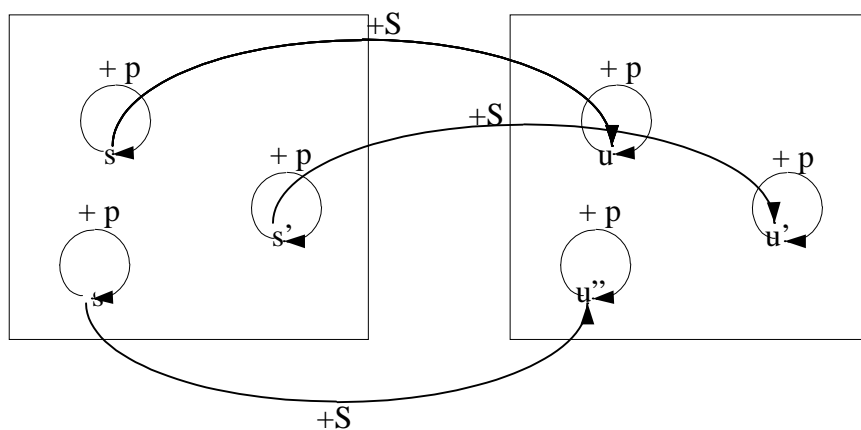
Updates.

Non trivial updates : $s + p \neq s$,

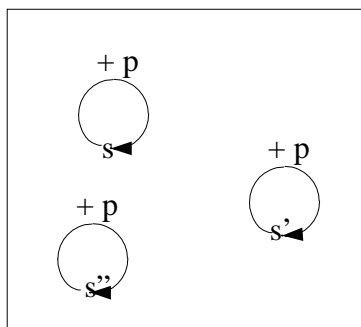
trivial updates : $s + p = s$

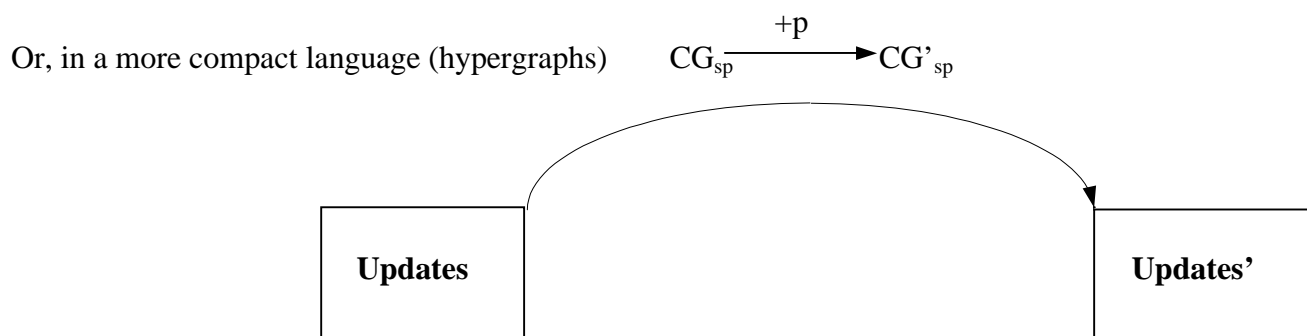
non trivial update $s \xrightarrow{+p} s'$ trivial update 

A trivial update on a shared info. state



VIII Standard Presuppositions Let S_p be a sentence with a standard presupposition p and CG_{sp} be the CG of the speaker. S_p denotes the transition $CG_{sp} \rightarrow CG'_{sp}$ only if S denotes the transition $CG_{sp} \rightarrow CG'_{sp}$ and p holds in CG_{sp} .





I.g. are introduced when the speech act takes place. Problem: a speech act is more like an event than like a proposition (see criteria in Vendler, Bennett, Asher, Peterson).

We can 'propositionalise' speech acts by flattening everything down to the level of epistemic expressions (see our paper).

Then, i.g. = propositions and we have to provide special conditions to avoid connections with *donec* etc..

Alternatively, we can consider speech acts as updates. A speech act is not what is said but the event of saying what is said.



Updates become first-class citizens on a par with propositions.

Parallel : information state = set of worlds = set of sets of propositions

update state = set of sets of updates = set of sets of transitions between sets of sets of propositions

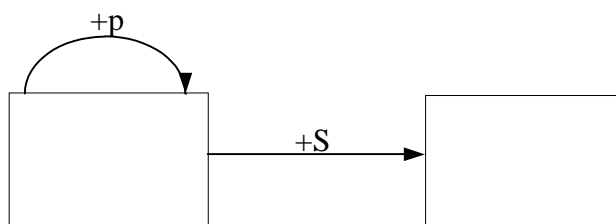
Each update state contains the updates already done (the effective updates), which holds at every point of the update state and the potential updates which are compatible with the effective updates.

Updates are typed (there are assertive, imperative and interrogative updates, there are also conditional updates for accommodation). Updates leading to contradictions ('emptyfication') in information states are contradictor (typically contradictory assertions or imperatives).

There are rules for updates. An update can entail another update ($v_i \Rightarrow v_j$).

IX Updates As Objects An update is an object $\langle\langle s, s' \rangle, p\rangle$ where s and s' are the initial and final state of the transition and p the updating proposition.

Remember that updates are transitions. If we see them as informational complex objects, what are the transitions between those objects? They are *higher order updates*.



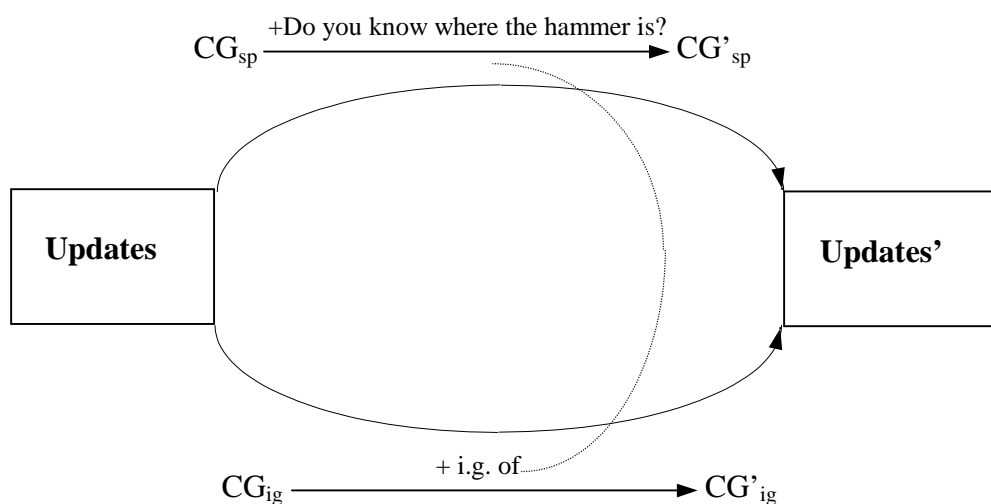
X Higher Order Updates As Objects A higher order update is an object of form $\langle\langle U, U' \rangle, \upsilon\rangle$ where U and U' are the initial and final state of the transition and υ is the updating update.

We want to have different updates for proposition introduction and updates concerning i.g. We have been using CG_{sp} , we add CG_{ig} the set of manifest i.g. of the different speakers.

Crucially, the update associated with a speech act entails the update associated with the i.g. of that speech act on CG_{ig}

XI Illocutionary Goal Update The update state contains the entailment: $\langle\langle CG_{sp}, CG'_{sp} \rangle, p \rangle \Rightarrow \langle\langle CG_{ig}, CG'_{ig} \rangle, IG(\langle\langle CG_{sp}, CG'_{sp} \rangle, p \rangle)\rangle$, where IG is the function which, for a given update, returns the appropriate i.g.

In (7a), when the speech act corresponding to *Do you know where the hammer is?* takes place, the update state is updated with the corresponding update. Simultaneously, because of the entailment, the update state is updated with the appropriate update on CG_{ig} .



It is not necessary to postulate a specially exotic condition for the monological uses of *parce que*

XII Parce que *Parce que* is appropriate in particular when it indicates the cause of a proposition introduced in CG_{sp} or CG_{ig} .

Conclusion

1. A theory of DM in a dynamic framework, which is consonant with most recent approaches in formal and/or cognitive semantics.
2. Discourse level sensitivity reanalysed as the manifestation of rule and i.g. sensitivity.
3. Distinction between propositions and event-like entities (speech acts).