The epistemic and the counterfactual interpretations of present perfect 'pouvoir' in French

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The contrast

Hacquard (2006):
Pouvoir in the present perfect ($a_{pres}\ p_{mod}\, u_{perfect}$):

- Epistemic interpretation

(1)

Il	a	pu	prendre	le	train
He	has	$\text{can}_{perfect}$	take	the	train

He might have taken the train

The contrast

- Implicative interpretation

(2) Il a pu prendre le train
He has can$_{perfect}$ take the train
He could the train
Actuality entailment: he took the train

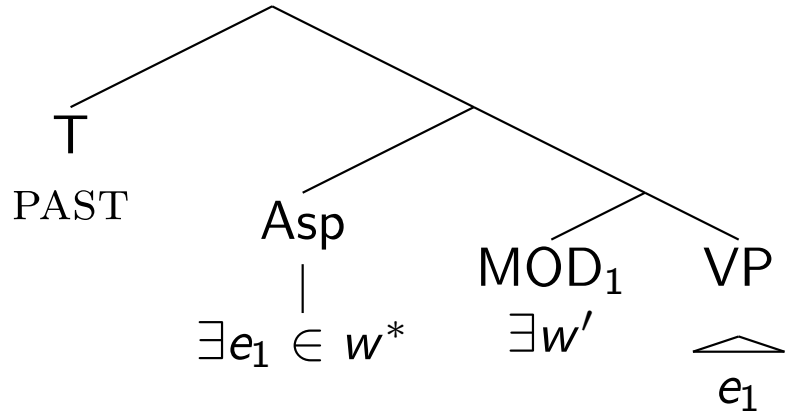
Hacquard (2006,2009,2010)

The merit of Hacquard (2006,2009,2010) is to present a theory of the systematic ambiguity of the modal that, in her work, is solved as syntactic scope ambiguity.

Available works that do not address the question of the polysemy: Mari and Martin (2007); Demirdache, H. et Uribe-Etxebarria, M. (2008); Laca (2008); Mari and Schweitzer (2010); Homer (2010a,b); Mari (2011); Piñón, C. (2011).

Implicative interpretation

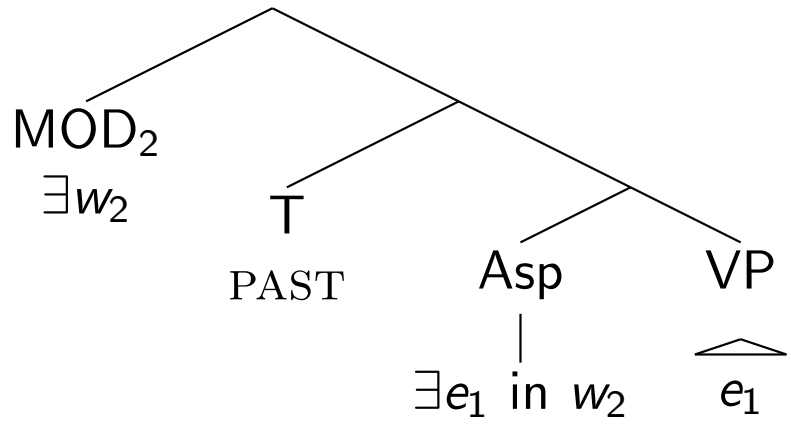
PAST $>$ MOD.



PAST determines the time of the modal evaluation. Event variable closed at PAST, i.e. outside the modal. AE arises.

Epistemic interpretation

MOD $>$ PAST.



PAST determines the time of the eventuality and not the time of the conjecture.

Major advantage

Hacquard, 2006: 26, ex. 20

(3) Jean a très bien pu prendre le train
Based on what I know (now), he might have taken the train (in the past)

Present evidence is used; if the modal is evaluated in the past, mismatch; hence the time of the modal evaluation is the speech time (hence movement).

No movement: questions, questions, questions, ...

Without movement: modal is interpreted in the past, but epistemic alternatives are projected at the utterance time.
The modal evaluated in the past is **not epistemic** (i.e. #given the evidence I had then ...)
↪ **Question:** How open past alternatives and present uncertainty relate to each other ?

Anticipating ... on the spirit of the solution
→ Mari and Schweitzer (2010): rely on inferential mechanisms (reasoning forward from past alternatives to epistemic uncertainty).
$\Diamond p$ in the past allow to infer that both p or $\neg p$ are available alternatives in the present. Since the speaker is in a state of epistemic uncertainty in the present, both p and $\neg p$ are considered viable alternatives.
The question: *how are past metaphysical alternatives reconstructed given present uncertainty ? Reasoning backward*

Major problem for the whole enterprise of Hacquard (2006,2009): the third interpretation

- Empirical: Mari and Martin (2007) first identify a root (that they call abilitative), non-implicative reading.

  (4) Ce robot a pu repasser les chemises à un stade bien précis de son développement, mais cette fonction n'a jamais été utilisée.
  The robot could have ironed skirts at a precise stage of its development, but this function has never been used.

Goal (I): explain the three-fold ambiguity

A unified theory for the three-fold ambiguity :

(5)
a. **Root, Implicative**. Jean a pu déplacer la table, #mais il ne l'a pas fait.
John could move the table, #but he did not do it.

b. **Epistemic**. John a pu prendre le train (comme il a pu ne pas le prendre)
John might have taken the train (but he might not have taken it)

c. **Root, non-implicative**. Ce robot a pu repasser les chemises à un stade bien précis de son développement, mais cette fonction n'a jamais été utilisée.
The robot could have ironed skirts at a precise stage of its development, but this function has never been used.

Goal (II): competition with past conditional

Speakers reports judgements that highlight a competition between the non-implicative reading of *a pu*-sentences and *aurait pu*-sentences (modal in the past conditional):

(6) Ce robot aurait pu repasser les chemises à un stade bien précis de son développement, mais cette fonction n'a jamais été utilisée.
This robot could have ironed skirts at a precise stage of its development, but this function has never been used.

↪ Why?

Goal (III): explain discursive properties

(7) Qu'est-ce qu'il a fait Jean dans ce bureau ?
Il a déplacé un meuble
Il a pu déplacer une table

What did John do in this office ?
He moved a table
#He could move a table

Goal (III): explain discursive properties (continued)

Same property observed for other operators (VERUM operator, Gutzman and Castrovejo-Miro, Mari for the French future 2013)

(8) Qu'est-ce qu'il a fait Jean dans ce bureau ?
#Il a DÉPLACÉ un meuble
Il a déplacé une table

What did John do in this office ?
#He MOVED *a table*
He moved a table
Gutzman and Castrovejo-Miro solution: assert p and downdate $?p$.

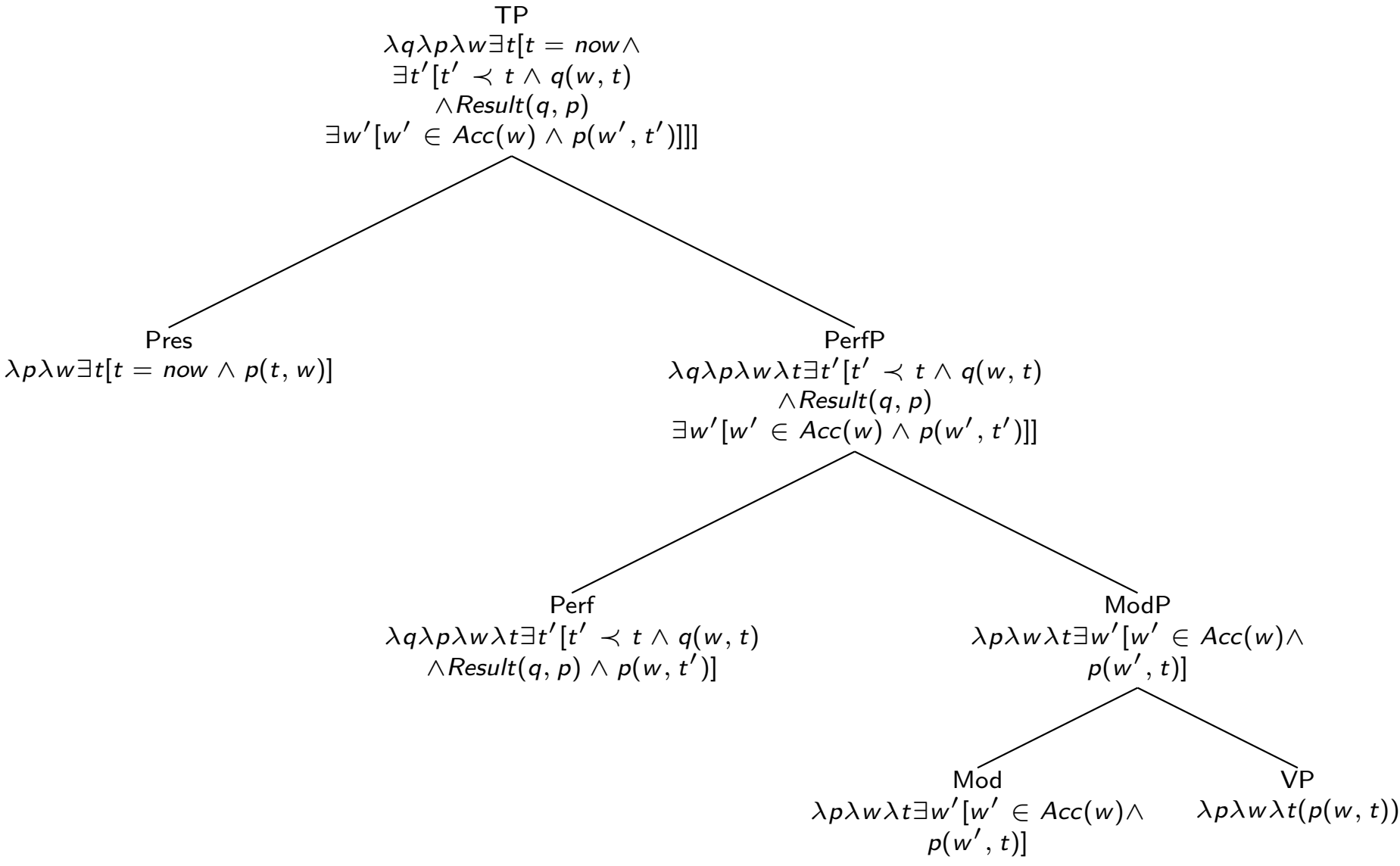
Overview

New semantic / pragmatic theory:

- The **meaning**:
  - There is an underspecified semantic rule of interpretation of *a pu*-sentences, in which all the operators are interpreted *in situ*.
  - The present perfect is analyzed as a combination of present + perfect, hence as providing a result state (see Schaden, 2009).
- The **interpretations**:
  - The present perfect has an abductive-inferential use that exploit knowledge of the result state.
  - The variety of interpretations depends on what the speaker knows, compatibly with the semantics.

Model-theoretic side: branching time framework (Thomason, 1984; Condoravdi, 2002; Mari, 2013).

Composition



Composition

VP: provides a proposition; its truth is relativized to worlds and times.
ModP: provides a possible world in which p is true.
Perfect:
- Perfect treated as operator over properties of events (e.g. de Swart, 2007; Schaden, 2009). It locates the event at a past time w.r.t. a reference time (which can be present, past or future) and provides a result event.
- Here, we treat it as a propositional operator.
Perf: provides a past time at which p is true (in possible world w') and provides a result proposition, which is true at a time t in world w.
Pres provides the now. Proposition q (the result proposition) is true at *now* in world w.
$\hookrightarrow$ p is true in a possible world w' (accessible from w) at a past time t' (for short $\Diamond p(t')$); the result proposition q is true at *now* in world w.

The q world

'Result' event-related notion, we use it here improperly for propositions.

(9) Let $t', t \in T$, $t' \prec t$:
$Result(p, q) = 1$ iff $\forall w' \in W(p(w', t') \rightarrow q(w', t))$

- If q is the result of p, then all worlds in which p is true are worlds in which q is true.
- p is evaluated at a time that precedes the time of evaluation of q.

Decidedness

The key notion is (non)-decidedness defined in a branching time framework, Mari, 2013.
and the relations between epistemic and metaphysical (un-)decidedness, evaluated at different times.

Branching time: basics

We employ a $W \times T$ forward-branching structure (Thomason, 1984). A three-place relation $\simeq$ on $T \times W \times W$ is defined such that (i) for all $t \in T$, $\simeq_t$ is an equivalence relation; (ii) for any $w, w' \in W$ and $t, t' \in T$, if $w' \simeq_{t'} w$ and t precedes t', then $w' \simeq_t w$ (we use the symbols $\prec$ and $\succ$ for temporal precedence and succession, respectively).

In words: $w' \simeq_{t'} w$: w and w' are historical alternatives (i.e. are identical) at least up to t' and thus differ only, if at all, in what is future to t'.

Branching time: basics

Assume two worlds w' and w in W and two times t', t'' in T such that $t' \prec t''$. In both partial models in Figure 1, w' and w are equal up to and including t' (Thomason, 1984). Worlds that stand in the equivalence relation $\simeq_{t'}$ need not branch at t'; they can branch at a time after t' (e.g., t'' in Figure 1b).

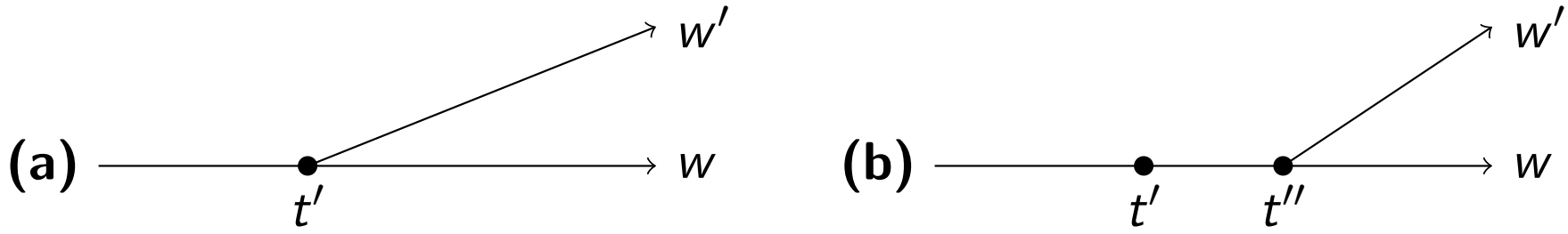


Figure: $w \simeq_{t'} w'$

Branching time: common ground

For any time $t \in T$, we define the *common ground* $cg(t)$ as the set of worlds that are identical to the actual world w_0 at least up to and including t.

(10) $cg(t) := \{w \mid w \simeq_t w_0\}$

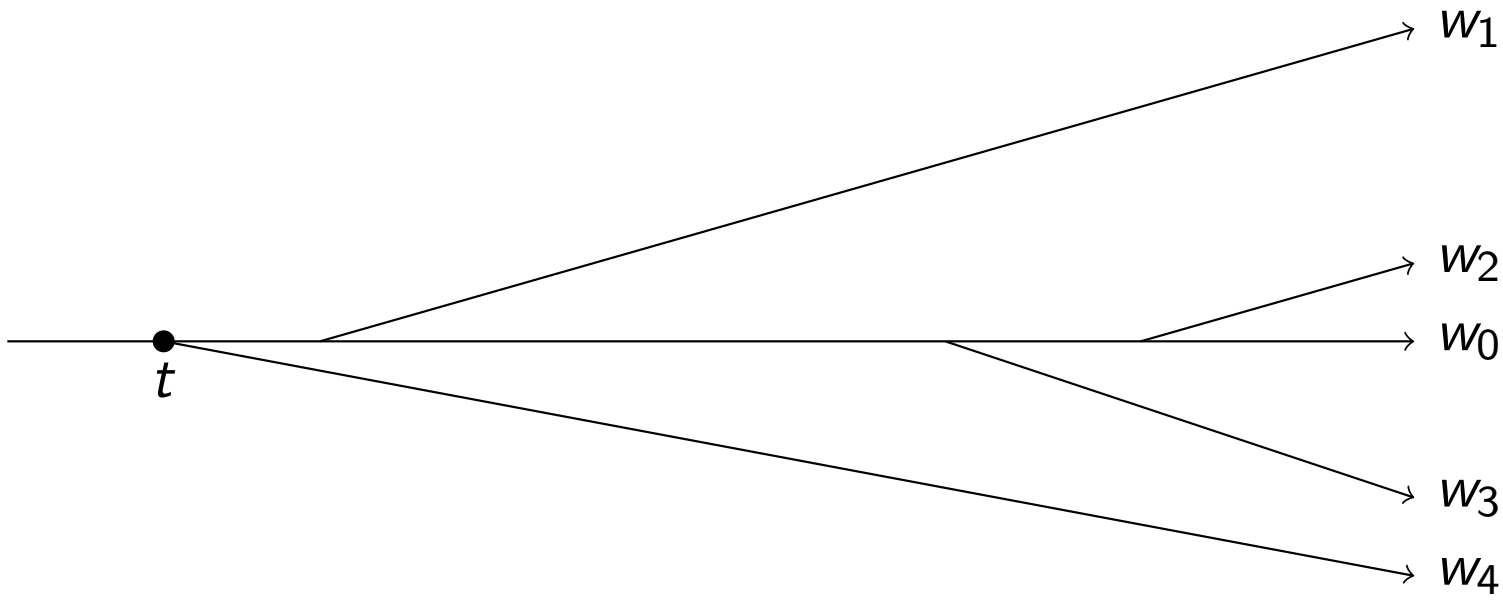


Figure: $cg(t)$

Branching time: reasonable futures

(11) ReasFut(t) :=
$\{w_i \in cg(t) \mid w_i$ is such that the set of rules fixed at t continue to hold in $w_i\}$

(12) ReasFut(t) $= \{w_1, w_2, w_0, w_4\}$

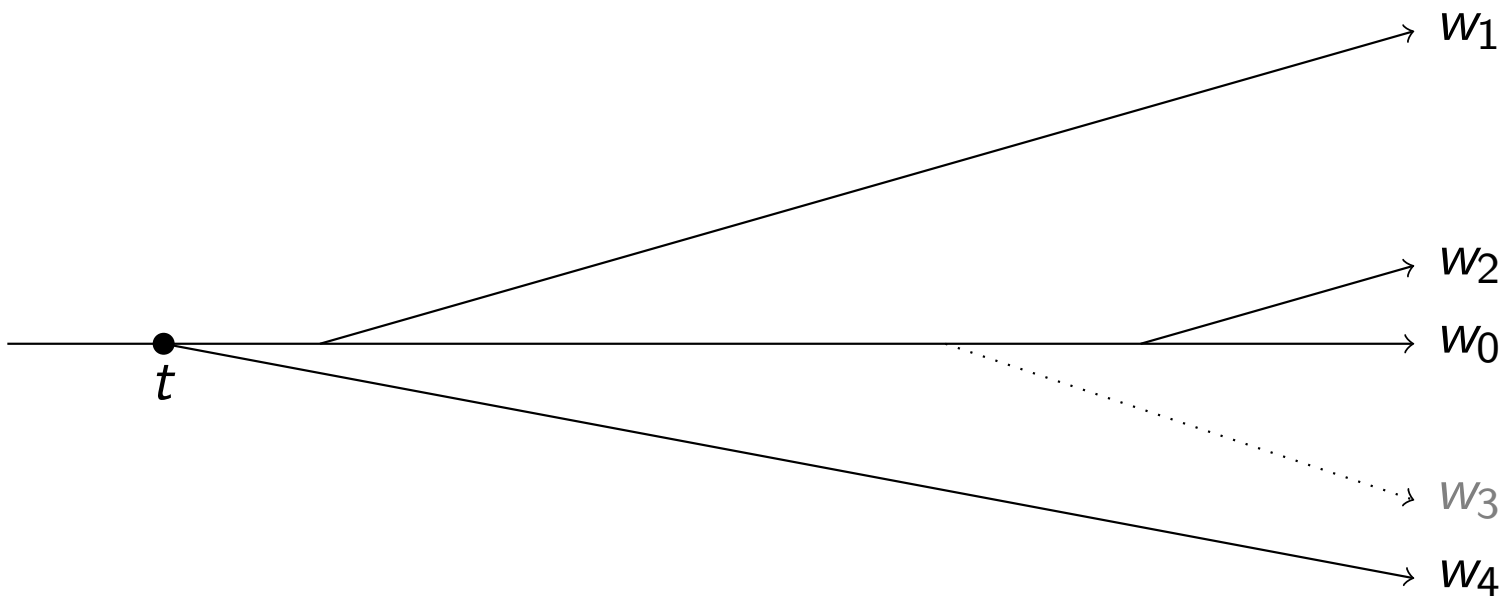


Figure: Reasonable Future Worlds (ReasFut)

Branching time: (un)decidedness

- The actual world exists only until the utterance time.
- The actual world is metaphysically decided until and including the utterance time.

Condoravdi, 2002; Mari, 2013:

- Epistemic interpretation: is compatible with metaphysical decidedness (options can be metaphysically closed but epistemically open).
- Metaphysical interpretation: is available with metaphysical un-decidedness.
  $\rightarrow$ Given a branching point t, the actual-world-to-be at t is metaphysically undecided at t.

Representing the semantics in the reasonable-future branching framework

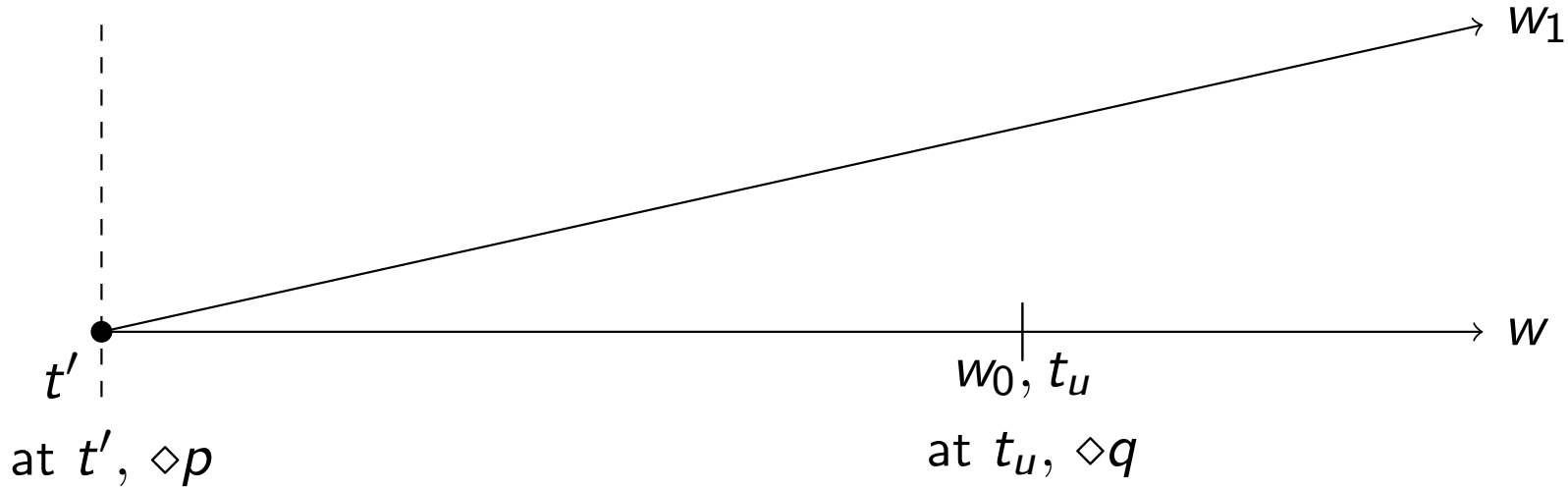


Figure: Semantics

- $\Diamond q$ is true at t_u : w_0 decided at t_u. $\Diamond q(t_u)$: **epistemic** alternatives (q, $\neg q$).
- Since $\Diamond p$ is true at t' which is a branching point, $\Diamond p(t')$ has a **metaphysical** interpretation. p and $\neg p$ are metaphysical alternatives.

The inferential use of the present perfect

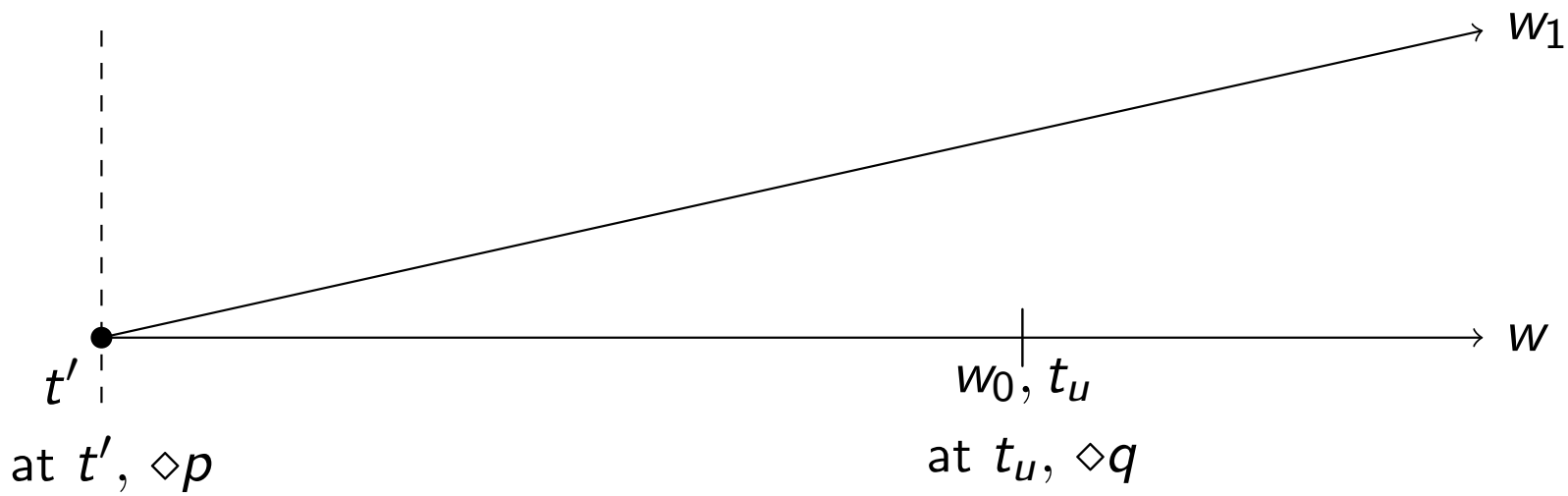
Present perfect across languages has an inferential use. (see among many others: Comrie, 1976; Apotheloz and Nowakowska, 2010 for French and Polish, DeLancey, 2001 for Bulgarian).
Various typologies for the 'inferential use': illative, abductive, explicative, based on direct/direct evidence ....
Apotheloz and Nowakowska (2010) identify an inferential-abductive use of the present perfect: (free translation, A&N, *ibid.*:4): from a present result state one can infer a past event that has produced this state.
$\hookrightarrow$ We exploit here the inferential-abductive use of the present perfect. I will use the term inferential for short.

The inferential use of *pouvoir* in the present perfect

- Result state $\Diamond q(t_u)$
- Knowledge supporting $\Diamond q(t_u)$
- But also ... Knowledge **compatible** with $\Diamond q(t_u)$:
  - $\Diamond q(t_u) \wedge q(t_u)$
  - $\Diamond q(t_u) \wedge \neg q(t_u)$

Epistemic in picture

Semantics:



Pragmatics: at t_u knowledge compatible with $\Diamond q(t_u)$; infer $\Diamond p(t')$.

- $\Diamond q$ is true at t_u : w_0 decided at t_u. $\Diamond q(t_u)$: **epistemic** alternatives.

- Since $\Diamond p$ is true at t' which is a branching point, $\Diamond p(t')$ has a **metaphysical** interpretation.

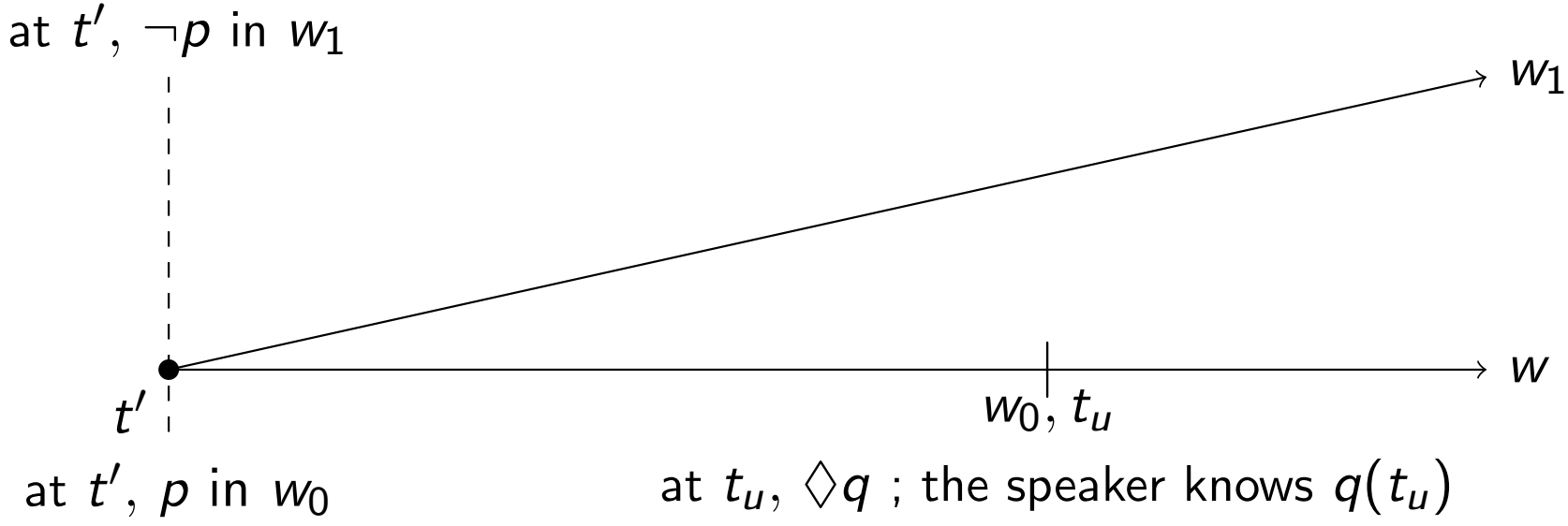
Epistemic: example

(13) Le voleur a très bien pu rentrer par la fenêtre
The thief might have entered through the window

• My parents never close the windows; knowledge compatible with the thief having passed (result state) through the window ($\Diamond q(t_u)$):
- Present settledness (the thief passed through the window or did not pass through the window).
- Both plausible, given what I know.
- The thief passing through the window or not passing through the window were available continuations of the actual world at the branching point.
• Backward (i.e. abductive) Inference: it was undecided at the branching point whether the actual-world-to-be was such that the thief would pass through the window or not.
- Given what I know, there were metaphysical alternatives such that p and $\neg p$ were both possible continuations of w_0 at t', the branching point.

Implicative in picture

Semantics: as above.
Pragmatics:



Know at t_u: $q(t_u)$; infer $p(t')$ is true in w_0. Implies that $\neg p(t')$ is true in w'. Counterfactual interpretation: knows that p but knows that the actual world could have evolved in a way such that $\neg p$.

Implicative reading: deriving the AE

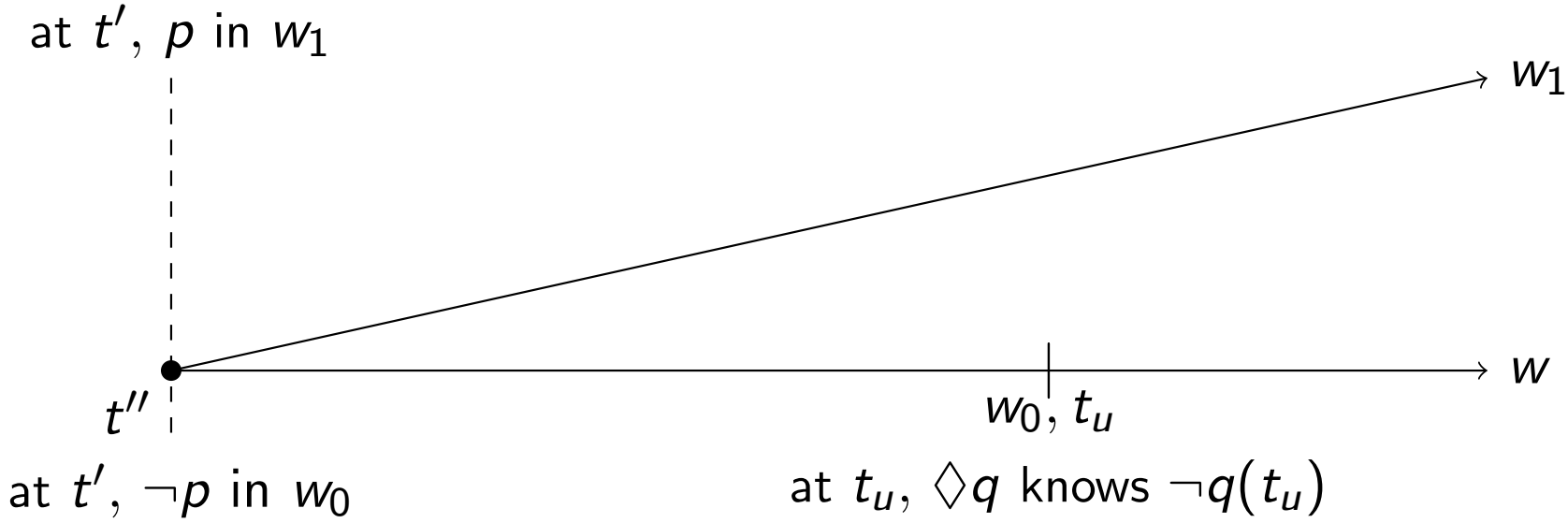
(14) Il a pu prendre le train
He managed to take the train

• *Know*: $q(t_u)$; *Infer* $p(t')$.
• Ex. John is on the train $q(t_u)$; Abductive inference: $p(t')$: he took the train. No actuality entailment.
• Knowledge that q and hence that p, in the context of utterance.
BUT:
• **Asserts**: $\Diamond p(t')$ (**is the speaker being informative ?**): since he knows $q(t_u)$ he knows $p(t')$. Why does he choose to use the modal ?
• $\neg p(t')$ true in a possible continuation of the actual world at t'.
$\hookrightarrow$ Counterfactual use. He took the train, but the actual world could have evolved in a way such that $\neg p$.
$\hookrightarrow$ And also .... Abilitative flavor (see Belnap, 1991).

Root non-Implicative in picture

Semantics: as above.

Pragmatics:



Know at t_u: $\neg q(t_u)$; infer $\neg p(t')$ is true in w_0.
Hence conveys that $p(t')$ is true in w', branching from w_0.
Counterfactual interpretation: knows that $\neg p$ but knows that the actual world could have evolved in a way such that p.

Root non-Implicative

(15) Il a pu s'échapper à ce moment là, mais il ne s'est pas échappé
He could escape at that moment, but he did not escape

- *Know* $\neg q(t_u)$; *Infer* $\neg p(t')$.
- Asserts: $\Diamond p(t')$ (is the speaker being informative ?): $p(t')$ true in a metaphysical alternative at t'.

$\hookrightarrow$ Counterfactuality.
$\hookrightarrow$ 'Occasion': at the time of the branching, the actual world could have evolved in such a way that he escaped.

Chess player 1

Scenario: John could have won at move 39, but he misses the chance.

(16) Il a pu / aurait pu gagner à ce moment là, #mais il a perdu sa chance
He could have won at that precise moment, #but he missed his chance

Same analysis for both (knowledge that $\neg p$ at t_u, and opening up of the alternatives at the past time t') !
Strong set of constraint: present knowledge + constraint on identity of worlds up to t' (*à la* Condoravdi, 2002).

Chess player 2

Scenario: John never played the game which is under discussion.

(17) Il #a pu / aurait pu gagner, s'il avait joué
He could have won, if he played

No constraint on identity (*à la* Abush, 2012).

Preference for the past conditional

• In general: the preferred form is the one that conveys specific information. We would have expected complementary distribution.
• However, for now (possible evolution ? See Spanish), the conditions on the use of present perfect *pouvoir* seem too constraining and require very precise knowledge.
• In particular, present perfect *pouvoir* cannot be used when the adverb denoting a bounded period of time are absent, *providing the branching time*.
$\hookrightarrow$ Preference for the conditional as it requires only taking into account a certain body of evidence and poses no constraints on branching points.

In discourse

(18) What did John do ?
(#) Il a pu déplacer la table
He could move the table

The theory: the speaker conveys that (i) John moved the table and (ii) it was not taken for granted.

Without previous expectation/doubt of the hearer, the speaker is being too informative.
• If previous expectation is presupposed (*What did John do, finally?*), then the sentence is felicitous.

Conclusion

Maim features of the semantic-pragmatic theory:

- Operators in situ.
- Result state of the present perfect.
- Inferential use of the present perfect.
- Knowledge of/compatible with the result state.

Main results:

- Explain in a unified way the three available interpretations of *a pu*-sentences.
- Explain why there is a competition between the non-implicative reading and the counterfactual.
- Explain in a principled way how indirect evidence at the utterance time and metaphysical alternatives relate to each other.
- Explain the behavior of implicative *a pu* sentences in discourse.

Thank you !

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