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

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To cite this version:

Alda Mari. The epistemic and the counterfactual interpretations of present perfect ‘pouvoir’ in French. 2013. ijn_00839362
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LSRL 43

*CUNY, NY*
April 17th-19th, 2013
The contrast

Hacquard (2006):

*Pouvoir* in the present perfect ($a_{\text{pres}} \ p_{\text{mod}} u_{\text{perfect}}$):

- Epistemic interpretation

\[(1) \quad \text{Il a pu prendre le train}
\quad \text{He has can}_{\text{perfect}} \text{ take the train}
\]

*He might have taken the train*
The contrast

- Implicative interpretation

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

\( T \)

\( \exists e_1 \in w^* \)

\( \exists w' \)

\( e_1 \)

PAST determines the time of the modal evaluation. Event variable closed at PAST, i.e. outside the modal. \( \exists e \) arises.
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).
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). ◊p in the past allow to infer that both p or ¬p are available alternatives in the present. Since the speaker is in a state of epistemic uncertainty in the present, both p and ¬p are considered viable alternatives.

The question: how are past metaphysical alternatives reconstructed given present uncertainty? Reasoning backward


(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.*
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 \( \neg p \).
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

\[\lambda q \lambda p \lambda w \exists t [ t = \text{now} \land \exists t' [ t' < t \land q(w, t) \land \text{Result}(q, p) \land \exists w' [ w' \in \text{Acc}(w) \land p(w', t') ] ] ]\]

\[\lambda q \lambda p \lambda w \lambda t \exists t' [ t' < t \land q(w, t) \land \text{Result}(q, p) \land \exists w' [ w' \in \text{Acc}(w) \land p(w', t') ] ]\]

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\[\lambda p \lambda w \lambda t \exists t' [ w' \in \text{Acc}(w) \land p(w', t') ]\]

\[\lambda p \lambda w \lambda t (p(w, t))\]
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 $w$.

$p$ is true in a possible world $w'$ (accessible from $w$) at a past time $t'$ (for short $\diamondsuit p(t')$); 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 $t', t \in T$, $t' \prec t$:

\[ \text{Result}(p, q) = 1 \text{ iff } \forall w' \in W (p(w', t') \rightarrow q(w', t)) \]

• 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: $w \simeq_{t'} w'$](a) \hspace{1cm} (b)

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

\begin{equation}
\text{cg}(t) := \{ w \mid w \simeq_t w_0 \}
\end{equation}
Branching time: reasonable futures

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

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

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.
  → 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

- $\diamond q$ 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.

→ 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 \( \Diamond q(t_u) \):
  - \( \Diamond q(t_u) \land q(t_u) \)
  - \( \Diamond q(t_u) \land \neg q(t_u) \)
Epistemic in picture

Semantics:

- At $t'$, $\Diamond p$
- At $w_0, t_u$, $\Diamond q$

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:**

\[\text{at } t', \neg p \text{ in } w_1\]

\[\text{at } t', p \text{ in } w_0\]

\[\text{at } t_u, \Diamond q; \text{ the speaker knows } q(t_u)\]

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

\[(14) \quad \text{Il a pu prendre le train} \quad \quad \quad \text{He managed to take the train}\]

- **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 \( t' \). \( \leftrightarrow \) Counterfactual use. He took the train, but the actual world could have evolved in a way such that \( \neg p \).
- \( \leftrightarrow \) 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 $p$. 
(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 \( t' \).
- \( \implies \) Counterfactuality.
- \( \implies \) ‘Occasion’: at the time of the branching, the actual world could have evolved in such a way that he escaped.
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).
Scenario: John never played the game which is under discussion.

(17) Il n’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.
  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

Main 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!
References