Time-Relative Counterfactuality: Future-Less Vivid Conditionals and the Modal Past

Paolo Santorio ∘ University of Maryland, College Park

> Overview

Future-Less-Vivid conditionals (FLVs) are X-marked conditionals whose antecedent has future reference time.

(1) If Ava arrived, Ben would be happy.

- FLVs are thought to be non-contrary-to-fact.
- This is incorrect: they are **counterfactuals about the future** ⇝ they (can) contradict settled facts about the future.
- This is problematic for Past-as-Past theories, but can be predicted by a novel Past-as-Modal theory.

> Background: X-marking and FLVs

Across languages, X-marked conditionals involve past tense.
⇝ In English: PAST in ant. + *would* (PAST[WOLL]) in consequent

A (partial) taxonomy of WOLL-conditionals:

(2) a. If Ava arrives, Ben will be happy.
⇝ **Future Indicatives (FIs)**
b. If Ava arrived, Ben would be happy.
⇝ **Future-Less-Vivids (FLVs)**
c. If Ava was here, Ben would be happy.
⇝ **Simple Past Count. (SPCs)**

The puzzle: how can PAST express a modal meaning?

Past-as-Past (PaP) (Arregui 2007, Ippolito 2013 a.o.): PAST is a tense, and backshifts the time index of the modal base of *would*.
Past-as-Modal (PaM) (Iatridou 2000, Schulz 2014 a.o.): PAST receives a modal interpretation in X-marked constructions.

FLVs. FLVs seem to mean the same as FIs (aside from a 'remoteness' inference). Hence (2-a) and (2-b) seem roughly equivalent.

In fact, FLVs can't seem to express contrary-to-fact hypotheses.

(3) My plants just died. That's a shame.
If they died next week, my mom would see them.
(adapted from Arregui 2007)

On the strength of data like (3), many theorists endorse:

Non-counterfactuality (NC). The antecedent of a FLV uttered at c cannot be false in the common ground of c.

> New data

But: **FLVs can express contrary-to-fact hypotheses**.

A botanist told me that my plants have only one day left to live.

(4) My plants will die tomorrow. That's a shame.
a. #If they die next week, my mom will see them.
b. If they died next week, my mom would see them.

(5) a. #If the plants that will die tomorrow don't die, . . .
b. If the plants that will die tomorrow didn't die, . . .

So NC is wrong, and the right generalization is:

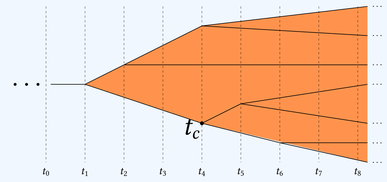
Future counterfactuality (FC). The antecedent of an FLV uttered at c must be compatible with all facts in w_c, up to t_c, but can be incompatible with settled facts about the future.

> Two views about X-marking

Temporal backshift. PAST affects the modal base by backshifting the time index of the accessibility relation.

$$[\![\text{PAST}\ [\ f_{w,t}\ [\text{MODAL}\ [\text{A}]\ ]\ ]\ ]\!]^{t} = \exists t' \prec t_c\ [\![\ f_{w,t'}\ [\text{MODAL}\ [\text{A}]\ ]\ ]\!]^{t'}$$

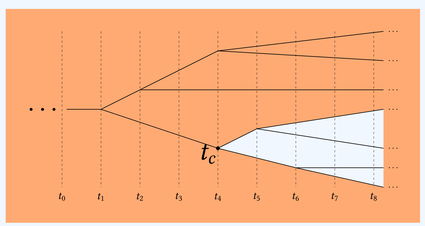
Hence: modals quantify over previously open worlds.



Domain shift. PAST affects the modal base by directly setting the domain of quantification to non-open worlds.

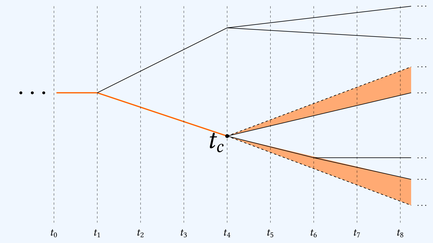
$$[\![\text{PAST}\ [\text{MOD}\ [\text{A}]]]\!]^{t,w,\text{H}} = \exists t' \prec t_c :\ \forall w' \in \text{HIST}_{t_c,w_c} :\ [\![\text{A}]\!]^{t',w'\overline{\text{HIST}}_{t_c,w_c}}$$

Hence: modals quantify over currently non-open worlds (including worlds that were never open).



> An argument for domain shift

Via FC, FLVs can quantify over worlds in the orange area (i.e. worlds that agree with w_c up to t_c, but are non-open):



- This is incompatible with temporal backshift. ✗
- But it's compatible with domain shift. ✓

> Semantic implementation

Tenses. Tenses manipulate a modal parameter H that tracks historical possibilities. PRES sets H to the set of open worlds at c, HIST_c. PAST sets H to the complement of HIST_c, $\overline{\text{HIST}}_c$.

(6) $[\![\text{PRES}\ [p]]\!]^{c,t,w,f,\text{H}} =$
$\begin{cases} \text{defined iff } [\![p]\!]^{c,t,w,f,\text{HIST}_c} \text{ is defined} \\ \text{true iff } [\![p]\!]^{c,t,w,f,\text{HIST}_c} \text{ is true} \end{cases}$

(7) $[\![\text{PAST}\ [p]]\!]^{c,t,w,f,\text{H}} =$
$\begin{cases} \text{defined iff } [\![p]\!]^{c,t,w,\overline{\text{HIST}_c}} \text{ is defined} \\ \text{true iff } \exists t' \prec t_c :\ [\![p]\!]^{c,t',w,\overline{\text{HIST}_c}} \text{ is true} \end{cases}$

Modals. The antecedent of X-marked conditionals is modalized by a subjunctive (see Mendes 2024 a.o.). The modal bases of WOLL and SUBJ are required to be included in H. SUBJ has a referential semantics and denotes a the set of prejacent-verifying worlds.

(8) $[\![\text{SUBJ}_i\ [p]]\!]^{c,t,w,f,\text{H}} =$
$\begin{cases} \text{defined iff } f(w) \subseteq \text{H} \\ \text{if def: } \{w :\ w \in \tau_{p,c}(f(w)) \cap [\![p]\!]^{c,t_c,w,f,\text{H}}\} \end{cases}$

(9) $[\![[\text{if } p]\ [\text{WOLL}\ [q]]]\!]^{c,t,w,f,\text{H}} =$
$\begin{cases} \text{defined iff } f(w) \subseteq \text{H} \\ \text{true iff } \forall w' \in \text{BEST}_{(f_w \cap \text{p})}, [\![q]\!]^{c,t_c,w',f,\text{H}} \text{ is true} \end{cases}$

Two notes. (i) $\tau_{p,c}(f(w)))$ is the set of worlds in $f(w)$ that agree with w_c up to the time of p. (ii) Both SUBJ and WOLL fix the time of evaluation for their prejacent to t_c. Hence, when tenses scope over SUBJ and WOLL, they have no effect on the time parameter.

Example. The predicted meaning for the antecedent clause of (2-b):

(10) $[\![\text{if PAST [SUBJ [A arrive]]}]\!]^{c,t,w,f,\text{H}} =$
$\begin{cases} \text{defined iff } f(w) \subseteq \overline{\text{HIST}_c} \\ \text{if def: } \{w :\ w \in \tau_{\textbf{arr},c}(f(w)) \cap [\![\text{A arrive}]\!]^{c,t_c,w,f,\overline{\text{HIST}_c}}\} \end{cases}$

(10) denotes the set of worlds in $f(w)$ that (i) match the actual world w_c up to shortly before Alice's arrival, (ii) are such that Alice arrives at t_c or later, and (iii) are in $\overline{\text{HIST}}_c$, i.e. they are not among the open historical worlds.

Selected References: Arregui, 2007: "When aspect matters: the case of *would*-conditionals" • von Fintel and Iatridou 2023: "Prolegomena to a Theory of X-Marking" • Iatridou 2000: "The Grammatical Ingredients of Counterfactuality" • Ippolito 2013: "Subjunctive conditionals: A linguistic analysis" • Mandelkern 2024: *Bounded Meanings* • Mendes 2024: "Modality in Future-Oriented Clauses" • Schulz 2014: "Fake tense in conditional sentences: A modal approach".