

Counterfactual biscuit conditionals: Exploring the role of temporal and mood morphology

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Workshop ModUni1@Leiden
December 14-15, 2018

1 Introduction

- Indicative vs. counterfactual (hypothetical) conditionals use different morphology: ‘fake’ past tense.

- (1) If John **had** a hangover yesterday, he **was** in bed. INDICATIVE
- (2) If John **had** a hangover today, he **would be** in bed. COUNTERFACTUAL

- Debate in the literature: how to interpret this fake tense

- Approach 1: modal remoteness [Iat00, Sch14]
- Approach 2: temporal remoteness [Dud83, GvS09, Rom17] ←THIS TALK

- Temporal remoteness approach:

- General idea:
- (3) [Dud83]’s idea:
A counterfactual with ‘fake’ tense involves a back shift in time with a future (metaphysical) conditional interpreted under that back shift.
- (4) [Edg04]:
“I am *not* recommending that we say instead that a counterfactual [A → C] is true iff the consequent is very probable given the antecedent, laws and cotenable facts. (...) I am suggesting instead that we simply stick with the appropriate conditional probability –the conditional probability of *C* given *A* at the time of the fork, as a measure of the acceptability of the counterfactual.” (p. 7)

- (5) PAST[if ~~past~~ A, then ~~past~~ C]

- Open problem, which we will have nothing to say about: counterpossibles like (6):

- (6) If two plus two were five, then ...

- Biscuit conditionals have a special utterance meaning

- (7) There are biscuits on the sideboard if you want them. [Aus56]

- Debate in the literature: how to derive this special interpretation

- Approach 1: special syntax and semantics [EEH14]
- Approach 2: purely pragmatic reasoning: [Fra09], a.o. ←THIS TALK

- PUZZLE FOR TODAY: the morphology observed in biscuit conditionals

- (8) There **were** biscuits on the sideboard, **had** you **wanted** them.
- (9) #There **would have been** biscuits on the sideboard, **had** you **wanted** them.¹

- Goal:

Combining the temporal remoteness approach to counterfactual hypothetical conditionals in [Rom17] and the purely pragmatic approach to biscuit conditionals in [Fra09], the goal is to attempt a first explanation of the morphology observed in biscuit conditionals.

- Roadmap

- §2 Counterfactual hypothetical conditionals [Rom17]
- §3 Indicative biscuit conditionals [Fra09]
- §4 Counterfactual biscuit conditionals
- §5 Outlook

2 Counterfactual hypothetical conditionals

- Counterfactual conditionals (CCs) in English (10)-(11) and in Spanish (12)-(13):

- (10) If Juan had a hang-over (right now/today), he would be in bed. PRESENT
- (11) If Juan had gone to the party yesterday, the party would have been fun. PAST
- (12) Si Juan tuviese resaca (ahora/hoy), (pro) estaría en la cama. PRESENT
If Juan **had.SUBJ** hang-over (now/today), (he) **would-be** in the bed
- (13) Si Juan hubiese ido a la fiesta (ayer), *pro* habría sido divertida
If Juan **had.SUBJ** **gone** to the party (yesterday), it **would.have been** amusing PAST

- (At least) two pieces of verbal morphology are involved:

- An **additional layer of past tense** appears in CCs in English and Spanish.
- The antecedent clause has to appear in the **subjunctive mood** in Spanish.

- This section presents [Rom17]’s analysis CCs:

- i. Additional past tense: interpreted temporally ([Dud84, GvS09, Rom14] a.o.), as independently needed for Sequence of Tense. ⇒ For English and Spanish
- ii. Mood morphology: as imposing a restriction on the world pronoun, as independently argued for Romance complement clauses [Sch05]. ⇒ For Spanish

¹The judgments reported here come from native speakers of English. Note that for independent reasons, German allows counterfactual conditionals to receive a biscuit interpretation, which is why German speakers’ intuitions confound what they deem acceptable in English. The German intuitions **do not translate** to English.

2.1 Additional past

■ An additional layer of past tense morphology is used in past attitude reports in indirect speech, a phenomenon known as ‘Sequence of Tense’ (SoT) [Abu97, Kus05, vS09]:

- | | | |
|------|--|-----------------|
| (14) | a. Annalea said (last week): “Lucía is sick”. | Present |
| | b. Annalea said (last week) that Lucía was sick. | Simple Past |
| (15) | a. Annalea said (last week): “Lucía has arrived on time”. | Present Perfect |
| | b. Annalea said (last week) that Lucía had arrived on time. | Past Perfect |
| (16) | a. Annalea said (last week): “Lucía will come ”. | Future |
| | b. Annalea said (last week) that Lucía would come . | Conditional |

■ Future indicative conditional about hypothetical events *on* a certain salient date:
Salient temporal interval: e.g., today Dec 14, 2018.

- (17) Scenario: Ana was wondering in 2017 how things would be today, Dec 14, 2018. She thought: “If Juan has a hang-over (that day), he will be in bed”.
- (18) Si Juan tiene resaca (ese día), (pro) estará en la cama.
If Juan **has**.IND hang-over (that day), he **will.be** in the bed
‘If Juan has a hang-over (that day), he will be in bed.’
- (19) Ella pensó que, si Juan tenía resaca, (pro) estaría en la cama.
She thought that, if Juan **had**.IND hang-over, he **would.be** in the bed
‘She thought that, if Juan had a hang-over, he would be in bed.’

Our present CC (12) and the complement clause in (19) have exactly the same tenses and differ solely in the mood of the antecedent clause.

■ Future indicative conditional about hypothetical events *prior* to a certain salient date:
Salient temporal interval: e.g., today Dec 14, 2018.

- (20) Scenario: Ana was wondering in 2017 how things would be on Dec 14, 2018. She thought: “If J. has gone to the party (the night before), the party will have been fun”.
- (21) Si Juan ha ido a la fiesta, la fiesta habrá sido divertida.
If Juan **has**.IND **gone** to the party, the party **will.have been** fun
- (22) Ella pensó que, si J. había ido a la fiesta, *pro* habría sido divertida.
She thought that, if J. **had**.IND **gone** to the party, it **would.have been** fun
‘She thought that, if Juan had gone to the party, it (= the party) would have been fun.’

Our past CC (13) and the complement clause in (22) have exactly the same tenses and differ solely in the mood of the antecedent clause.

The tenses in a CC are the same as in a future (indicative) conditional within a past attitude report.

■ LF SYNTAX for Sequence of Tense:

- (Interpretable) tense morphology is treated like pronouns ([Par73] a.o.) with a (superscripted) relative temporal feature ([vS95, Abu97, Kus05], a.o.): $pro_i^{[PAST\ pro_j]}$.
- Some pieces of temporal morphology may be left uninterpreted when licensed in a chain headed by a temporal pronoun with an interpretable past feature [Ogi95, Kus99, GvS09]. Such uninterpretable bits will appear crossed out in our LFs.
- The future indicative conditional is headed by a silent modal with a metaphysical modal base METAPHY and a stereotypical ordering source L (cf. [Kau05]).

■ SEMANTICS for Sequence of Tense:

- Temporal features are interpreted as imposing presuppositions on the value of the variable [Hei94, Kra98]: (23)-(25).
- We treat the value of a temporal(/mood) pro_i as a world-time pair, i.e., as an index.
- Temporal and accessibility constraints on indices are understood as in (26):

$$(23) \llbracket pro_i^{[PAST\ pro_j]} \rrbracket^g \text{ is defined only if } g(i) < g(j); \\ \text{if defined, } \llbracket pro_i^{[PAST\ pro_j]} \rrbracket = g(i)$$

$$(24) \llbracket pro_i^{[PRES\ pro_j]} \rrbracket^g \text{ is defined only if } g(i) \circ g(j); \\ \text{if defined, } \llbracket pro_i^{[PRES\ pro_j]} \rrbracket = g(i)$$

$$(25) \llbracket pro_i^{[FUT\ pro_j]} \rrbracket^g \text{ is defined only if } g(j) < g(i); \\ \text{if defined, } \llbracket pro_i^{[FUT\ pro_j]} \rrbracket = g(i)$$

- (26) a. For any two indices $\langle w, t \rangle$ and $\langle w', t' \rangle$:
 $\langle w, t \rangle < \langle w', t' \rangle$ iff $w = w'$ and t is prior to t' .
 $\langle w, t \rangle \circ \langle w', t' \rangle$ iff $w = w'$ and t and t' overlap.
- b. For any two indices $\langle w, t \rangle$ and $\langle w', t' \rangle$:
 $\langle w, t \rangle \in \text{MOD}(\langle w', t' \rangle)$ iff $t = t'$ and w' is accessible from w via MOD.

■ Application to LF with \exists_1/\exists_4 and semantic derivation of present (19)

Note that pro_4 in (28c) ranges over indices i_4 (which share the world-member with i_3 and) whose temporal coordinate is a salient time, namely, today 13.07.2018 in our scenarios.

$$(27) \text{ LF: } \lambda 0 \exists_1 [\text{Ana think at } pro_1^{[PAST\ pro_0]}] [\lambda 2 \text{ MODAL}_{\text{METAPHY}}^L\ pro_2 \\ \lambda 3 \exists_4 [\text{John have hang-over at } pro_4^{[FUT\ pro_3][\text{present}]}] \\ \lambda 3 \exists_4 [\text{John be in bed at } pro_4^{[FUT\ pro_3][\text{present}]}]]$$

- (28) Truth conditions:
 $\lambda i_0. \exists i_1 [i_1 < i_0 \wedge \forall i_2 \in \text{Dox}_{\text{Ana}}(i_1) \forall i_3 \in \text{Metaph}^L(i_2): \\ \exists i_4 [i_3 < i_4 \wedge J \text{ have hang-over at } i_4] \rightarrow \\ \exists i_4 [i_3 < i_4 \wedge J \text{ be in bed at } i_4]]$

2.2 Subjunctive mood

■ Mood in complement clauses in Spanish and other Romance languages:

- Representational verbs like *creer* ‘believe’ and *decir* ‘say’ select INDICATIVE: (29).
- Non-representational verbs like *lamentar* ‘regret’ and *hacer* ‘to make (somebody do something)’ select SUBJUNCTIVE: (30).

(29) Bea cree [que Juan enseña / *enseñe semántica]
Bea believes [that Juan teaches.IND / *teaches.SUBJ semantics]
‘Bea believes that Juan teaches semantics.’

(30) Bea lamenta [que Juan *enseña / enseñe semántica]
Bea regrets [that Juan *teaches.IND / teaches.SUBJ semantics]
‘Bea regrets that Juan teaches semantics.’

■ [Sch05]’s analysis of mood morphology, adapted here:

- Mood morphology introduces a mood feature on world pronouns: $pro_i^{[IND\ pro_k]}$
- The features IND(icative) and SUBJ(unctive) are relative to a pronoun pro_k that picks up the so-called “local context” (in the sense of [Sta75]):
 - For root clauses, $\llbracket pro_k \rrbracket = g(k) = \text{Common Ground (CG)}$
 - For embedded complement clauses, $\llbracket pro_k \rrbracket = g(k) = \text{the set of doxastic alternatives } Dox_x(w_0) \text{ of the attitude holder } x$
- The feature IND imposes a presupposition on the value of the world pronoun whereas the feature SUBJ imposes no presupposition: (32)-(33).

(31) LF of the indicative morphology in a verbal form: $pro_i^{[IND\ pro_k]}$

(32) $\llbracket pro_i^{[IND\ pro_k]} \rrbracket$ is defined only if $g(i) \in g(k)$;
if defined, $\llbracket pro_i^{[IND\ pro_k]} \rrbracket = g(pro_i)$

(33) $\llbracket pro_i^{[SUBJ\ pro_k]} \rrbracket = g(pro_i)$

■ Indicative vs. subjunctive proposition from a complement clause (where x is the attitude holder):

(34) $\llbracket \text{Juan teach semantics at } pro_i^{[IND\ pro_k]} \rrbracket = \lambda w':w' \in Dox_x(w_0). J \text{ teaches sem in } w'$
= the function f such that, for any w in W :
 $f(w)=1$ if $w \in Dox_x(w_0)$ and John teaches semantics in w
 $f(w)=0$ if $w \in Dox_x(w_0)$ and John does not teach semantics in w and
 $f(w)=\#$ if $w \notin Dox_x(w_0)$

(35) $\llbracket \text{Juan teach semantics at } pro_i^{[SUBJ\ pro_k]} \rrbracket = \lambda w':w' \in Dox_x(w_0). J \text{ teaches sem in } w'$

■ *Believe* plus a complement clause: \checkmark IND-proposition, * SUBJ-proposition.

- Lexical entry for *believe*: (36).
- This lexical entry simply asks us to check the value of our proposition at the worlds $w \in Dox_x(w_0)$. For that, the partial IND-proposition (34) suffices. Hence, \checkmark IND-proposition.
- By Maximize Presupposition in (37) [Hei91], the maximally presuppositional IND-proposition has to be used. Thus, *SUBJ-proposition.

(36) $\llbracket \text{believe} \rrbracket(p)(x) = \lambda w_0. \forall w \in Dox_x(w_0): p(w)$

(37) Maximize Presupposition: Make your contribution presuppose as much as possible!

■ *Regret* plus a complement clause: * IND-proposition, \checkmark SUBJ-proposition.

- Lexical entry (38) for *regret* (slightly modified from [Hei92]’s *be glad*), where:
 - i. it is presupposed that the subject x believes the proposition p ,
 - ii. $Dox_x(w_0)$ is temporarily revised with respect to p , as defined in (39),
 - iii. the result of this revision is updated with $\neg p$, and
 - iv. $Sim_w(\psi)$ ask us to find the most similar world w' to w for which $\psi(w')$ yields TRUE/1.

(38) $\llbracket \text{regret} \rrbracket(p)(x) = \lambda w_0. \forall w \in Dox_x(w_0) [p(w)].$
 $\forall w \in Dox_x(w_0) [Sim_w(\text{rev}_p(Dox_x(w_0)) + \neg p) >_{Bou_x(w_0)} w]$

(39) For any context c and proposition p :
 $\text{rev}_p(c) = \cup \{X \subseteq W: c \subseteq X \text{ and } X+p \text{ is defined}\}$

- If we take p to be the total SUBJ-proposition (40), task (iv) can be carried out.
 - ii. The (temporarily) revised $\text{rev}_p(Dox_x(w_0))$ contains worlds w' for which $p(w')$ yields TRUE/1 and worlds w' for which $p(w')$ yields FALSE/0
 - iii. This revised doxastic state is updated with the subjunctive- $\neg p$ in (40), so that the result contains only worlds w' for which $\neg p(w')$ yields TRUE/1
 - iv. Sim_w ask us to look at the worlds w' within this updated revised doxastic state and to select, from these worlds, the world w' most similar to w .

(40) $\lambda w'. \neg(J \text{ teaches sem in } w')$ (=35)

- If we use the partial IND-proposition (41), task (iv) cannot be carried out.
 - ii. The (temporarily) revised $\text{rev}_p(Dox_x(w_0))$ contains only worlds in which John teaches semantics, as the original $Dox_x(w_0)$ did.
 - iii. This revised doxastic state is updated with the indicative- $\neg p$ in (41), which this time results in an empty doxastic state (contradiction).
 - iv. Again, Sim_w ask us to look at the worlds w' within this updated revised doxastic state and to select, from these worlds, the world w' most similar to w . But there is no world within that state and, thus, it is impossible to select one!!!

(41) $\lambda w': w' \in Dox_x(w_0). \neg(J \text{ teaches sem in } w')$ (=34)

2.3 Tense and mood in hypothetical conditionals [Rom17]

■ Back to [Dud83]’s original idea:

- (42) A counterfactual with ‘fake’ tense involves a back shift in time with a future (metaphysical) conditional interpreted under that back shift.

■ Translating [Dud83]’s idea into an LF structure gives us an interpretable past tense scoping over an entire future metaphysical conditional ([GvS09], cf. [Ipp03]). Adding the analyses of tense and mood in the preceding sections, [Rom17] obtains the following preliminary LF for our Spanish present CC:

- (43) Si Juan tuviese resaca (ahora/hoy), (pro) estaría en la cama. PRESENT
If Juan **had**.SUBJ hang-over (now/today), (he) **would-be** in the bed
‘If John had a hang-over (now/today), he would be in bed.’ (=12)

- (44) (Rough) LF for present CC (43):
 $\lambda 0 \exists_1 [\text{MODAL}_{\text{METAPHY}}^L \text{pro}_1^{\text{PAST pro}_0}]$
 $\lambda 8 \exists_4 [\text{John have hang-over at pro}_4^{\text{[SUBJ CG][past][FUT pro}_s]}]$
 $\lambda 8 \exists_4 [\text{John be in bed at pro}_4^{\text{[past][FUT pro}_s]}]$

- (45) (Rough) truth conditions for present CC (43):
 $\lambda i_0. \exists i_1 [i_1 < i_0 \wedge \forall i_8 \in \text{Metaph}^L(i_1):$
 $\exists i_4 [i_8 \in \text{CG} \wedge i_8 < i_4 \wedge \text{J have hang-over at } i_4] \rightarrow$
 $\exists i_4 [i_8 < i_4 \wedge \text{John be in bed at } i_4]]$

■ Two adjustments are still needed to derive appropriate truth conditions for CCs.

■ First, [Dud83]’s original idea needs to be refined in order to guarantee the correct temporal alignment of the hypothetical events with respect to the utterance index i_0 .

- In the indirect speech examples (19)-(22), the attitude holder Ana was thinking about how things would be on a particular date, represented in our LFs as a pronoun pro_4 whose temporal coordinate happens to be –but did not need to be– today’s date in our scenarios.
- In our CCs, pronoun pro_4 must be temporally co-valued with the utterance index pro_0 .

- (46) Refinement of [Dud83]’s idea:
A counterfactual with ‘fake’ tense uttered at index i_0 involves a back shift in time with a future metaphysical conditional *about* i_0 under that back shift.

- (47) $[[pro_i^{\text{[T-IDENT } pro_j]}]]$ is defined only if $\text{time}(g(i))=\text{time}(g(j))$;
if defined, $[[pro_i^{\text{[T-IDENT } pro_j]}]] = g(i)$

■ Second, CCs do not quantify over all future metaphysical possibilities branching out from a given past time t' . “Intermediate” facts that took place between t' and t_0 –and that we will pack in a situation argument pro_{sit} added to the modal cluster– sometimes restrict the metaphysical possibilities quantified over:

- (48) For any situation s and world w : [Arr09]
 $s \subseteq_m w$ iff there is a situation s' such that s' is a counterpart of s and s' is part of w .

- (49) $[[\text{MODAL}_{\text{METAPHY}}^L \text{pro}_{sit} \text{pro}_2]](p)(q) =$
 $\lambda i. \forall i' \in (\text{Metaph}^L(i) \cap \{ \langle w', t' \rangle : [[pro_{sit}] \subseteq_m w' \}) [p(i') \rightarrow q(i')]$

■ [Rom17] adds these two adjustments to the preliminary LF of the present CC (43), with the following resulting the semantic derivation.

- (50) LF for present CC (43):
 $\lambda 0 \exists_1 [\text{MODAL}_{\text{METAPHY}}^L (\text{pro}_{sit}) \text{pro}_1^{\text{[PAST pro}_0]}]$
 $\lambda 8 \exists_4 [\text{John have hang-over at pro}_4^{\text{[SUBJ CG][past][FUT pro}_s][\text{T-IDENT pro}_0]}]$
 $\lambda 8 \exists_4 [\text{John be in bed at pro}_4^{\text{[past][FUT pro}_s][\text{T-IDENT pro}_0]}]]$

- (51) Truth conditions for present CC (43):
 $\lambda i_0. \exists i_1 [i_1 < i_0 \wedge \forall i_8 \in (\text{Metaph}^L(i_1) \cap \{ \langle w', t' \rangle : [[pro_{sit}] \subseteq_m w' \}) :$
 $\exists i_4 [i_8 \in \text{CG} \wedge i_8 < i_4 \wedge \text{time}(i_4)=\text{time}(i_0) \wedge \text{J have hang-over at } i_4] \rightarrow$
 $\exists i_4 [i_8 < i_4 \wedge \text{time}(i_4)=\text{time}(i_0) \wedge \text{John be in bed at } i_4]]$

- Tense and temporal alignment: In the truth conditions (51), we quantify over law-like metaphysical alternatives i_8 to an index i_1 preceding the utterance index i_0 (alternatives at which, additionally, certain “intermediate” facts hold). For each of these i_8 , we check whether the index i_4 that has the same world-member as i_8 and the same time-member as i_0 is such that John has a hang-over at i_4 . If so, then the sentence commits us to there being an i_4 with the same modal and temporal alignment being such that John is in bed at i_4 . This delivers the correct temporal alignment of the hypothetical events.
- Mood: The use of subjunctive in the *if*-clause makes the antecedent proposition total. If, instead, indicative mood were used, the antecedent proposition would be defined only for the worlds in CG. Since the antecedent is false in the CG, this would lead to vacuous quantification: For any index i_8 that we would apply the indicative version of the antecedent proposition to, we would obtain # (if $i_8 \notin \text{CG}$) or FALSE/0 (if $i_8 \in \text{CG}$). Hence, indicative mood cannot be used; subjunctive must be used.

■ In sum, the correct truth conditions are derived for our CC in [Rom17] using the analysis of tense and mood morphology independently motivated in sections 2.1 and 2.2.

3 Indicative biscuit conditionals: An independence-based approach

■ Biscuit conditionals have intuitively a different interpretation from hypothetical conditionals

- (52) If Peter went shopping, there is pizza in the fridge. HYPOTHETICAL
 (53) If you are hungry, there is pizza in the fridge. BISCUIT
 (54) If you need me, I'll be in my office. AMBIGUOUS

■ ‘Independence-based’ account ([Fra09], [Fra15], [Lau15], [Csi18], [BGta]):

- Ingredient 1: same syntax and semantics as in hypothetical conditionals

- (55) Semantics for an *indicative* hypothetical conditional *if A then C*:
 $A \subseteq C$

- Ingredient 2 (biscuit interpretation):
Conditional independence paired with pragmatic reasoning

■ ‘Conditional independence’: a minimal change in the belief about A will not result in a change in the belief of C, and vice versa

- (56) C is conditionally independent of A iff
 $\forall X \in \{A, \bar{A}\}, \forall Y \in \{C, \bar{C}\}: \diamond Y \text{ iff } X \diamond \Rightarrow Y$
 where $\diamond Y$ iff $\text{Min}_w \cap Y \neq \emptyset$ and
 $X \diamond \Rightarrow Y$ iff $\text{Min}_w(X) \cap Y \neq \emptyset$

- (57) Hypothetical conditional; conditionally *dependent* clauses:
 A: If Peter went shopping, there is pizza in the fridge.
 B: Peter didn't go shopping recently.
 A: Oh, then I don't know if there is pizza in the fridge/there probably isn't any pizza in the fridge.

- (58) Biscuit conditional; conditionally *independent* clauses:
 A: If you are hungry, there is pizza in the fridge.
 B: I'm not hungry.
 A: #Oh, then I don't know if there is any pizza in the fridge/then there probably isn't any pizza in the fridge.

■ When encountering a conditional with conditionally independent clauses, the hearer engages in pragmatic reasoning:

- Speaker's epistemic state allows her to utter *if p, q*
- But *p* and *q* are also conditionally independent
- Speaker must either believe falsity of *p* or truth of *q* (otherwise $\diamond(A \cap \bar{C})$, which contradicts the Speaker's belief that *if p, q* because *if p, q* $\rightsquigarrow A \subseteq C$)
- Non-triviality \rightsquigarrow Speaker must believe *q*

■ **Pragmatic, independence-based account:** Biscuit conditionals have the same syntax and semantics as hypothetical conditionals; the ‘biscuit’ reading is derived pragmatically. Often overlooked, but crucial: the fact that the speaker believes *q* to be true *in the actual world* is derived pragmatically; this is not the definition of what biscuit conditionals are.

4 Counterfactual biscuit conditionals: Combining temporal remoteness and independence

■ Core data on counterfactual *hypothetical* conditionals:

- (59) a. If you were hungry right now, your stomach **would be** making noises. HYPCF
 b. # If you were hungry right now, your stomach is making noises.
 (60) a. Si (tú) tuvieses hambre, tu estómago estaría haciendo ruidos. HYPCF
 If (you) had.Subj hunger, your stomach **would.be** making noises.
 b. # Si (tú) tuvieses hambre, tu estómago está haciendo ruidos.
 If (you) had.Subj hunger, your stomach is.Ind making noises.

→ The apodosis (and protasis) contains fake tense (English and Spanish).

■ Core data on counterfactual *biscuit* conditionals:

- (61) a. # If you were hungry right now, there would be pizza in the fridge.
 b. If you were hungry right now, there **is** pizza in the fridge. BiCF
 (62) a. # Si (tú) tuvieses hambre, habría pizza en el frigorífico.
 If (you) had.Subj hunger, would.have pizza in the fridge.
 b. Si (tú) tuvieses hambre, hay pizza en el frigorífico. BiCF
 If (you) had.Subj hunger, **have.Ind** pizza in the fridge.

→ The apodosis contains no fake tense (English and Spanish).

→ The apodosis appears in the indicative (Spanish).

■ If we simply combine the temporal approach to fake tense from §2 and the analysis of mood from §2 with the independence-based semantics of biscuit conditionals from §3, the following issue arises:

If the intuited interpretive difference between hypotheticals and biscuits is due the independence-based inference, why must the two conditional types typically be expressed with different morphology –in terms of tense and mood of the apodosis– when in counterfactual form?

■ Our modest goal for this section is to put things together and see what happens...

4.1 Breaking Sequence of Tense (SOT) [Ogi99]

■ When SOT is broken in attitude reports by using an absolute tense, e.g. present tense in (63), we obtain the so-called “double-access” reading: The time of the embedded proposition must align both with the utterance time t_0 and with the attitude holder's subjective “now” t_1 .

- (63) John said Mary is pregnant.
 a. John said at a past time t_1 that Mary is pregnant at t_0 .
 b. John said at a past time t_1 that Mary is pregnant at t_1 .

- However, the corresponding LF (64) only gives us temporal alignment with t_0 , as in (65a). To obtain the desired alignment with t_1 , [Ogi99] proposes an analysis (simplified here) where the temporal property is duplicated and linked to t_1 , as underlined in (65b):

- (64) LF: $\lambda 0. \exists i_1 [\text{John say at } \text{pro}_1^{[\text{PAST PRO}_0]} \lambda 3 \exists i_4 [\text{Mary be pregnant at } \text{pro}_4^{[\text{PRES PRO}_0]}]]$
- (65) a. $\lambda t_0. \exists i_1 [i_1 < i_0 \wedge \forall t_2 \in \text{SAY}_{\text{john}}(t_1): \exists t_4 [t_4 \circ t_0 \wedge \text{Mary be pregnant at } t_4]]$
 b. $\lambda t_0. \exists i_1 [i_1 < i_0 \wedge \forall t_2 \in \text{SAY}_{\text{john}}(t_1): \exists t_4 [t_4 \circ t_0 \wedge \text{Mary be pregnant at } t_4 \wedge \underline{t_4 \circ t_2}]]$
 c. $\lambda t_0. \exists i_1 [i_1 < i_0 \wedge \forall t_2 \in \text{SAY}_{\text{john}}(t_1): \exists t_4 [t_4 \circ t_0 \wedge \text{Mary be pregnant at } t_4 \wedge \underline{t_4 \circ t_2} \wedge \text{Mary be pregnant at } t_4]]$

- Note that the same result would obtain if the temporal property plus the entire embedded proposition were duplicated, as in (65c). We will use the latter kind of duplication in our proposal.

4.2 (Tentative) proposal

- Idea in a nutshell:

- Grammatical BiCFs (61b)/(62b) \Rightarrow broken Sequence of Tense and, additionally for Spanish, broken “Sequence of Mood”.
- Ungrammatical BiCFs (61a)/(62a) \Rightarrow competition with the grammatical forms
- Grammatical HypCFs (59a)/(60a) \Rightarrow as in section 2.3
- Ungrammatical HypCFs (59b)/(60b) \Rightarrow Principle of Manner

- The **grammatical BiCF** forms as a case of broken SoT / broken “Sequence of Mood”.

- (66) If you were hungry right now, there **is** pizza in the fridge. = (61b)
 (67) Si (tú) tuvieses hambre, hay pizza en el frigorífico. = (62b)
 If (you) had.Subj hunger, **have.Ind** pizza in the fridge.

- The present and indicative morphology leads to the LF (68). This gives us the temporal alignment of index i_4 with the utterance index i_0 in the last subformula in (69), but no temporal alignment and no modal alignment –given that $i_4 \in \text{CG}$ – with the counterfactual index i_8 quantified over.

- (68) $\lambda 0 \exists i_1 [\text{MODAL}_{\text{METAPHY}}^L \text{ at } \text{pro}_1^{[\text{PAST PRO}_0]} \lambda 8 \exists i_4 [\text{you be hungry at } \text{pro}_4^{[\text{SUBJ CG]} \text{ p***} [\text{FUT PRO}_0]}] \lambda 8 \exists i_4 [\text{be pizza at } \text{pro}_4^{[\text{IND CG]} [\text{PRES PRO}_0]}]]$ LF for (66)/(67)

- (69) $\lambda i_0. \exists i_1 [i_1 < i_0 \wedge \forall i_8 \in \text{MODAL}_{\text{METAPHY}}^L(i_1): \exists i_4 [i_8 \in \text{CG} \wedge i_8 < i_4 \wedge \text{you be hungry at } i_4] \rightarrow \exists i_4 [i_4 \in \text{CG} \wedge i_0 \circ i_4 \wedge \text{there be pizza at } i_4]]$

- To supply the desired alignment, we extend [Ogi99]’s strategy and propose to duplicate the consequent proposition and the temporal and modal relations as $i_8 \circ i_4$ and $i_4 \in \text{METAPHY}^L(i_0)$ to allow local binding, resulting in (70):

- (70) $\lambda i_0. \exists i_1 [i_1 < i_0 \wedge \forall i_8 \in \text{MODAL}_{\text{METAPHY}}^L(i_1): \exists i_4 [i_8 \in \text{CG} \wedge i_8 < i_4 \wedge \text{you be hungry at } i_4] \rightarrow \exists i_4 [i_4 \in \text{CG} \wedge i_0 \circ i_4 \wedge \text{be pizza at } i_4] \wedge \exists i_4 [i_4 \in \text{MODAL}_{\text{METAPHY}}^L(i_0) \wedge i_8 \circ i_4 \wedge \text{be pizza at } i_4]]$

- The **ungrammatical BiCF** forms are ruled out via competition with the grammatical BiCF forms:

- (71) # If you were hungry right now, there would be pizza in the fridge. = (61a)
 (72) # Si (tú) tuvieses hambre, habría pizza en el frigorífico. = (62a)
 If (you) had.Subj hunger, would.have pizza in the fridge.

- [Fra09] predicts (71)/(72) and (66)/(67) to equally receive a biscuit interpretation irrespective of tense or mood, since p and q are conditionally independent.
- This means that (71)/(72) and (66)/(67) compete for signalling the same message.
- But the present tense morphology in (66) and additionally the indicative morphology in (67) break SOT/Sequence of Mood, *explicitly* signalling overlap of i_4 with i_0 and membership of i_4 to CG, while (71)/(72) do not.
- Thus, (66)/(67) are stronger when the speaker wants to communicate her commitment to q in i_0 and should be chosen then. Cf. similar effects for cessation implicatures with competition between tenses ([Cab17]) and for attitude verbs with competition between moods due to *Maximize presupposition!* ([Hei92], [Sch05]).
- Note that [Fra09]’s inference deriving the “biscuit feeling” is still run when the grammar does not allow speakers a choice, e.g. in modal subordination cases such as (73) due to [Swa13]; here the speaker is only committed to there being biscuits in her desire indices (conditionally independently of p), but crucially not at i_0 .

- (73) I want to vacation at a posh hotel in London. We would have tea every afternoon, *and there would be biscuits on the sideboard if one were so inclined.* [Swa13]

- On the **ungrammatical HypCF** forms:

- (74) # If you were hungry right now, your stomach is making noises. = (59b)
 (75) # Si (tú) tuvieses hambre, tu estómago está haciendo ruidos. = (60b)
 If (you) had.Subj hunger, your stomach is.Ind making noises.

- [DG99] note that there are two reasons why a speaker may utter a conditional *if p, q*: she is either uncertain about q ’s truth (if p and q are conditionally dependent) or about its relevance (if conditionally independent) when uttered on its own. If she is convinced of both q ’s truth and its relevance, she should utter plain q .
- This explains the oddity of (74)/(75), a conditional whose p and q are conditionally dependent. Signalling that q is true (qua present indicative) means that, given the Gricean Principle of Manner, the speaker should have simply uttered q .

5 Outlook

- The temporal remoteness approach to temporal/mood morphology in hypothetical conditionals and the independence-based approach to biscuit conditionals have been tentatively combined to derive the entire pattern in (59)-(62), with the following key ingredients:

- breaking Sequence of Tense / Sequence of Mood (roughly) à la [Ogi99]
- competition between more informative vs. less informative forms
- Gricean Principle of Manner

- Further Research

- Other cases of breaking “Sequence of Mood” / double-access reading in the modal domain? Data from [Sch04], translated into Spanish:

- (76) Context: It is raining outside. [Spanish]
- Si Juan pensase que hace.Ind buen tiempo, estaría loco.
If John thought that the weather **is.Ind** nice, he would be crazy.
 - # Si Juan pensase que hiciese.Subj buen tiempo, estaría loco.
If John thought that the weather **is.Subj** nice, he would be crazy.
- Can the *modal* remoteness approach to HypCFs ([Iat00, Sch14]) combine with the independence-based approach to biscuits to derive the grammatical BiCFs?
 - What about HypCFs and BiCFs in other languages?

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