

Tense and Mood in Counterfactual Conditionals: The View from Spanish*

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Abstract

Counterfactual conditionals in Spanish are expressed using an additional layer of past tense –‘fake’ tense– and subjunctive mood. An analysis is developed in which each of these two pieces of morphology receives a uniform semantics independently motivated across the grammar: ‘Fake’ tense is analysed within the temporal remoteness line and subjunctive follows [Sch05]’s analysis of mood in complement clauses.

1 Introduction

The Spanish conditional sentences (3)-(4) give rise to the (defeasible) inference of counterfactuality, just like their respective English translations (1)-(2) [Lew73, And51]. Leaving Severe Tense Mismatch cases aside [Ipp03, Ipp13], we will refer to these structures as Counterfactual Conditionals (CCs). (At least) two pieces of verbal morphology are essential to produce a grammatical CC structure in Spanish and other Romance languages. First, like English, an additional layer of past tense –known as ‘fake’ tense– is needed. That is, even though the *if*-clause in (3) is concerned with an event happening at present time, that event is described using Past tense (i.e., ‘had’); and even though the event in the *if*-clause in (4) is understood as directly preceding the speech time, it is described using Past Perfect (i.e., ‘had gone’). Second, unlike English, where there is no (productive) mood distinction between indicative and subjunctive, the antecedent clause has to appear in the subjunctive.

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|-----|---|---------|
| (1) | If Juan had a hang-over (right now/today), he would be in bed. | PRESENT |
| (2) | If Juan had gone to the party yesterday, the party would have been fun. | PAST |
| (3) | Si Juan tuviese resaca (ahora/hoy), (pro) estaría en la cama.
If Juan had.SUBJ hang-over (now/today), (he) would-be in the bed | PRESENT |
| (4) | Si Juan hubiese ido a la fiesta (ayer), la fiesta habría sido
If Juan had.SUBJ gone to the party (yesterday), the party would.have been
divertida.
amusing. | PAST |

If either of these two ingredients is removed, the sentences are not CC anymore. Keeping Subjunctive mood but removing the additional tense layer leads to ungrammaticality in the case of (3) and to a hypothetical interpretation in the case of (4).¹ Keeping the additional tense

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¹Removing one layer of past tense in the *if*-clause and matrix clause of (4) results in (i), which can be used in a situation where time travel is possible and, hence, it is possible today for John to go to yesterday’s party.

- (i) Si Juan fuese a la fiesta (ayer), la fiesta sería divertida.
If Juan **went.SUBJ** to the party (yesterday), the party **would.be** amusing.

layer and removing Subjunctive mood leads, as will see, to structures that are grammatical in certain linguistic environments but that, again, have no counterfactual interpretation.

The present paper exploratorily develops an analysis of Spanish CCs that assigns each of these two pieces of morphology a uniform semantics independently motivated across the grammar. On the one hand, the additional past tense will not be interpreted modally, as has been done in the so-called modal remoteness approach to ‘fake’ tense in English ([Iat00, Sch14]). Instead, building on the temporal remoteness account by [Dud84, GvS09] a.o. and modifying [Rom14], it will be interpreted temporally, as independently needed for Sequence of Tense. On the other hand, mood morphology will be treated as imposing a restriction on the world pronoun, as independently argued for complement clauses in Romance [Sch05]. In the bigger picture, the present paper contributes one more step in the formalization of the temporal remoteness approach to ‘fake’ tense, bringing it closer to a stage in which it can be compared to fully worked out analyses in the modal remoteness line like [Sch14]’s.

The paper is organized as follows. Section 2 presents [vS09]’s account of Sequence of Tense and applies it to complement clauses containing future indicative conditionals. Section 3 presents [Sch05]’s approach to mood in Romance complement clauses. Section 4 combines these two ingredients and presents the proposal. Section 5 concludes.

2 Additional past

It is known that 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]. Some simple examples are in (5)–(7). An event described using (Simple) Present in direct speech is described using (Simple) Past in indirect speech, as in (5). Similarly, an event described using Present Perfect in direct speech is described using Past Perfect in indirect speech, as in (6). Finally, an event described using a Future form in direct speech is described using the (corresponding) Conditional form in indirect speech, as in (7).² The same pattern obtains in Spanish and other Romance languages.

- (5) a. Annalea said (last week): “Lucía **is** sick”.
b. Annalea said (last week) that Lucía **was** sick.
- (6) a. Annalea said (last week): “Lucía **has arrived** on time”.
b. Annalea said (last week) that Lucía **had arrived** on time.
- (7) a. Annalea said (last week): “Lucía **will come**”.
b. Annalea said (last week) that Lucía **would come**.

To make the similarity between SoT and our Spanish CCs (3)–(4) more apparent, let us see how certain conditional structures change their verbal morphology when transferred from direct to indirect speech. Consider first scenario (8), which describes in direct speech Ana’s past thought about a certain date –a salient temporal *res*, e.g., today December 20, 2017. The content of the thought is a future indicative conditional concerning hypothetical events *on* that date. When we describe this thought in direct speech, we have (9). When we describe this thought in indirect speech, temporal morphology shifts as indicated above: Present in the *if*-clause turns to Past and Future in the consequent clause turns to Conditional, as shown in (10). Interestingly, our CC (3) and the complement clause in (10) have exactly the same tenses and differ solely in the mood of the antecedent clause.

²Historically, *would* is the past form of *will* in English and the Spanish Future and Conditional arise from the present and past forms respectively of the same verbal periphrasis.

- (8) Scenario: Ana was wondering in summer 2017 how things would be on Dec 20, 2017. She thought: “If Juan has a hang-over (that day), he will be in bed”.
- (9) 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
- (10) 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.'

Consider now scenario (11), which describes in direct speech Ana's past thought of a future indicative conditional concerning hypothetical events *prior* to a certain date (e.g., today December 20, 2017). When the thought is expressed in direct speech, we have (12). When expressed in indirect speech, a parallel shift in temporal morphology obtains: Present Perfect in the *if*-clause turns to Past Perfect and Future Perfect in the consequent clause turns to Conditional Perfect, as shown (13).³ Again, the tenses of our CC (4) and the complement clause in (13) are exactly the same, the two clauses differing only in the mood of the *if*-clause.

- (11) Scenario: Ana was wondering in summer 2017 how things would be on Dec 20, 2017. She thought: “If Juan has gone to the party (the night before), the party will have been fun”.
- (12) 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
- (13) Ella pensó que, si Juan había ido a la fiesta, la fiesta habría sido divertida.
She thought that, if Juan **had.IND** gone to the party, the party **would.have been** divertida.
fun
'She thought that, if Juan had gone to the party, the party would have been fun.'

Let us see how these forms in indirect speech can be analysed under current theories of tense. We start with assumptions about LF structure. (Interpretable) tense morphology is treated like pronouns ([Par73] among many others). This means that, at LF, a temporal morpheme introduces a variable –represented as pro_i at LF– and some temporal feature –which we will write as a superscript at LF–, as illustrated in (14). Note that the superscripted temporal relation is relative to an anchor time variable pro_j . This is because, besides absolute uses of tense taking the utterance time t_0 as the anchor time, there are also relative uses taking other temporal variables as anchor [vS95, Abu97, Kus05]. Additionally, some pieces of temporal morphology may be left uninterpreted when licensed in a chain headed by an temporal pronoun with an interpretable PAST feature [GvS09, Rom14]. This is the case of the past tense layer in ‘had.IND’ and ‘would.be’ in e.g. our example (10), licensed by the c-commanding interpretable past tense in ‘thought’. Such uninterpretable bits will appear crossed out in our LFs. Finally, the future indicative conditional is headed by a silent modal with a metaphysical modal base METAPHY and a stereotypical ordering source L (cf. [Kau05]). This leads to the LF (15) for our first indirect speech example (10):

- (14) LF of past tense morpheme *-ed*: $pro_i^{[PAST\ pro_j]}$

³It is also possible to have the direct speech version (12) with Present Perfect (‘has been’) in the consequent clause (see [Kau05] on the difference between future indicative conditionals with and without *will*). The corresponding indirect speech version would be like (13) but with Past Perfect (‘had been’) in the consequent.

- (15) LF: $[\lambda 0 \text{ Ana think at } pro_1^{[PAST \text{ } pro_0]} [\lambda 2 \text{ MODAL}_{METAPHY}^L \text{ } pro_2$
 $[\lambda 3 \text{ } \text{past} [pro_4^{[FUT \text{ } pro_3]} \lambda 7[\text{John have hang-over at } pro_7]]]$
 $[\lambda 3 \text{ } \text{past} [pro_4^{[FUT \text{ } pro_3]} \lambda 7[\text{John be in bed at } pro_7]]]]]$

Semantically, temporal features are interpreted as imposing presuppositions on the value of the variable [Hei94, Kra98], as defined in (16)-(18). We assume that the value of a temporal/(mood) variable, e.g. $g(i)$, is an index, that is, a world-time pair. Temporal and accessibility constraints on indices are understood as in (19):

- (16) $\llbracket \text{past} \rrbracket^g = \llbracket pro_i^{[PAST \text{ } pro_j]} \rrbracket^g$ is defined only if $g(i) < g(j)$;
 if defined, $\llbracket pro_i^{[PAST \text{ } pro_j]} \rrbracket = g(i)$
- (17) $\llbracket \text{pres} \rrbracket^g = \llbracket pro_i^{[PRES \text{ } pro_j]} \rrbracket^g$ is defined only if $g(i) \circ g(j)$;
 if defined, $\llbracket pro_i^{[PRES \text{ } pro_j]} \rrbracket = g(i)$
- (18) $\llbracket \text{fut} \rrbracket^g = \llbracket pro_i^{[FUT \text{ } pro_j]} \rrbracket^g$ is defined only if $g(j) < g(i)$;
 if defined, $\llbracket pro_i^{[FUT \text{ } pro_j]} \rrbracket = g(i)$
- (19) 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.

This gives us the semantic derivation in (20) for our example (10). After locally accommodating some of the temporal presuppositions, we obtain the truth conditions in (20c). Note that the pronoun pro_4 remains unbound and refers to an index i_4 whose temporal coordinate is a salient *res* time, namely, today December 20, 2017 in our scenarios.⁴

- (20) a. Antecedent clause: $\lambda i_3: i_3 < i_4$. John have hang-over at i_4
 b. Consequent clause: $\lambda i_3: i_3 < i_4$. John be in bed at i_4
 c. Sentence: $\lambda i_0: i_1 < i_0. \forall i_2 \in \text{Dox}_{\text{Ana}}(i_1) \forall i_3 \in \text{Metaph}^L(i_2):$
 $i_3 < i_4 \wedge J \text{ have hang-over at } i_4 \rightarrow i_3 < i_4 \wedge J \text{ be in bed at } i_4$

Our example (13) receives a parallel analysis. At LF, the c-commanding ‘thought’ licences one layer of uninterpreted past tense in the antecedent and consequent clauses, as before. But, since now we have Past Perfect and Conditional Perfect, we still have on layer of past tense to interpret in each clause, represented as $pro_6^{[PAST \text{ } pro_5]}$ in the LF (21).⁵ The semantic derivation proceeds a before, leading to the truth conditions in (22c):

⁴The treatment of pro_4 and i_4 in the text is a simplification. Since, in our scenario, Ana is having a *de re* thought about i_4 , a proper treatment of it should include the acquaintance relation under which Ana accesses this *res*. This could be achieved by extending concept generators (CG) on *res* of e-type and more complex types ([PS03]) to *res* of sxt-type. The CG needed here would have to be as indicated in (i), where $w(i)$ is the world-member of index i , $t(i)$ is the time-member of i and α stands for the identifying property under which Ana is acquainted with i_4 . We leave for future research a detailed exploration of how to combine temporal *de re*, indices and concept generators.

(1) $\llbracket \text{CG}_{\text{Ana}, i_3} [pro_4] \rrbracket^g(i_3) = \text{the index } \langle w', t' \rangle \text{ such that: } w' = w(i_3), t(i_3) < t' \text{ and } t' \text{ has property } \alpha \text{ at } i_3$

⁵We leave the two occurrences of pro_6 free and co-indexed in (21), but of course they could also be not co-indexed or each existentially bound (via an \exists -closure operator). This will not play a role for our purposes.

- (21) LF: $[\lambda 0 \text{ Ana think at } \text{pro}_1^{[\text{PAST } \text{pro}_0]} [\lambda 2 \text{ MODAL}_{\text{METAPHY}}^L \text{pro}_2$
 $[\lambda 3 \text{ past } [\text{pro}_4^{[\text{FUT } \text{pro}_3]} [\lambda 5 [\text{pro}_6^{[\text{PAST } \text{pro}_5]} \lambda 7[\text{John go at } \text{pro}_7]]]]]$
 $[\lambda 3 \text{ past } [\text{pro}_4^{[\text{FUT } \text{pro}_3]} [\lambda 5 [\text{pro}_6^{[\text{PAST } \text{pro}_5]} \lambda 7[\text{the party be a fun at } \text{pro}_7]]]]]]]$
- (22) a. Antecedent clause: $\lambda i_3: i_3 < i_4 \wedge i_6 < i_4$. John go at i_6
 b. Consequent clause: $\lambda i_3: i_3 < i_4 \wedge i_6 < i_4$. the.party be fun at i_6
 c. Sentence: $\lambda i_0: i_1 < i_0. \forall i_2 \in \text{Dox}_{\text{Ana}}(i_1) \forall i_3 \in \text{Metaph}^L(i_2):$
 $i_3 < i_4 \wedge i_6 < i_4 \wedge \text{John go at } i_6 \rightarrow$
 $i_3 < i_4 \wedge i_6 < i_4 \wedge \text{party be fun at } i_6$

3 Subjunctive mood

In Spanish and other Romance languages, representational verbs like *creer* ‘believe’ and *decir* ‘say’ select indicative mood in their complement clause, whereas non-representational verbs like *lamentar* ‘regret’ and *hacer* ‘to make (somebody do something)’ select subjunctive: (23)-(24).

- (23) Bea cree [que Juan enseña / *enseñe semántica]
 Bea believes [that Juan teaches.IND / *teaches.SUBJ semantics]
 ‘Bea believes that Juan teaches semantics.’
- (24) Bea lamenta [que Juan *enseña / enseñe semántica]
 Bea regrets [that Juan *teaches.IND / teaches.SUBJ semantics]
 ‘Bea regrets that Juan teaches semantics.’

[Sch05] analyses mood morphology as introducing mood features on world pronouns, as illustrated in (25). The features IND(icative) and SUBJ(unctive) are relative to an anchor attitude holder pro_k and call up the so-called “local context” pertaining to that attitude holder [Sta75], that is, the set of doxastic alternatives $\text{Dox}_{g(k)}$ of pro_k at the relevant evaluation world. The feature IND imposes the presupposition that the world variable of the verb is a member of that $\text{Dox}_{g(k)}$, whereas the feature SUBJ imposes no presupposition, as defined in (26)-(27):

- (25) LF of the indicative morphology in a verbal form: $\text{pro}_i^{[\text{IND } \text{pro}_k]}$
- (26) $\llbracket \text{pro}_i^{[\text{IND } \text{pro}_k]} \rrbracket$ is defined only if $g(i) \in \text{Dox}_{g(k)}$;
 if defined, $\llbracket \text{pro}_i^{[\text{IND } \text{pro}_k]} \rrbracket = g(\text{pro}_i)$
- (27) $\llbracket \text{pro}_i^{[\text{SUBJ } \text{pro}_k]} \rrbracket = g(\text{pro}_i)$

Let us see what happens when these mood features combine with the rest of the material in a clause. IND makes the resulting proposition partial, defined only for worlds w' in $\text{Dox}_{g(k)}$, where $g(k)$ is the referent x of the matrix subject. This is shown in (28). SUBJ yields the (usual) total proposition. To make clear that the presupposition is waived by having explicitly used a subjunctive form, we cross out the content of that presupposition in our formulas, as in (29):

- (28) $\llbracket \text{Juan teach semantics at } \text{pro}_i^{[\text{IND } \text{pro}_k]} \rrbracket = \lambda w': w' \in \text{Dox}_{g(k)}(w_0). \text{J teaches sem in } w'$
 = the function f such that, for any w in W :
 $f(w)=1$ if $w \in \text{Dox}_{g(k)}(w_0)$ and John teaches semantics in w
 $f(w)=0$ if $w \in \text{Dox}_{g(k)}(w_0)$ and John does not teach semantics in w and
 $f(w)=\#$ if $w \notin \text{Dox}_{g(k)}(w_0)$

$$(29) \quad \llbracket \text{Juan teach semantics at } pro_i^{\text{[SUBJ } pro_k]} \rrbracket = \lambda w'. w' \in \text{Dox}_{g(k)}(w_0). J \text{ teaches sem in } w'$$

Now we are ready to combine the indicative and subjunctive complement clauses with the embedding verbs. We start with ‘believe’, defined in (30). This lexical entry simply asks us to check the value of our proposition at the worlds $w \in \text{Dox}_x(w_0)$. For that, the partial indicative proposition (28) suffices. By Maximize Presupposition in (31) [Hei91], indicative has to be used under ‘believe’ and, thus, a subjunctive complement clause is ungrammatical.

$$(30) \quad \llbracket \text{believe} \rrbracket(p)(x) = \lambda w_0. \forall w \cap \text{Dox}_x(w_0): p(w)$$

$$(31) \quad \text{Maximize Presupposition: Make your contribution presuppose as much as possible!}$$

In the case of ‘regret’, defined in (32) [Hei92], it is presupposed that the subject x believes the proposition p , that is, that in all the worlds $w \in \text{Dox}_x(w_0)$, p is true at w . Then, for each such world w , $\text{Sim}_w(p)$ asks us to find, on the one hand, the most similar world w' to w for which $p(w')$ yields TRUE/1 –which will be w itself– and $\text{Sim}_w(\neg p)$ ask us to find, on the other hand, the most similar world w' to w for which $\neg p(w')$ yields TRUE/1. If we use the partial indicative proposition (28), the latter task cannot be carried out. Given that the subject x believes p , $\neg p$ is the proposition in (33). But there is no world w' –no matter how similar or dissimilar to w – for which $\neg p(w')$ yields TRUE/1. This means that the value of $\text{Sim}_w(\neg p)$ is undefined, which in turn means that sentence (24) with indicative leads to a presupposition failure. Since this presupposition failure arises systematically from the logical structure of the components, the sentence is ungrammatical (cf. [Gaj02]). If, instead, the total subjunctive proposition (29) is used, no presuppositional failure arises and the sentence is grammatical.

$$(32) \quad \llbracket \text{regret} \rrbracket(p)(x) = \lambda w_0: \forall w \cap \text{Dox}_x(w_0) [p(w)]. \\ \forall w \cap \text{Dox}_x(w_0) [\text{Sim}_w(\neg p) >_{\text{Bou}_x(w_0)} \text{Sim}_w(p)]$$

$$(33) \quad \text{The function } f \text{ such that, for any } w \text{ in } W:$$

$$\begin{aligned} f(w) &= 0 \text{ if } w \in \text{Dox}_x(w_0) \text{ and John teaches semantics in } w \\ f(w) &= 1 \text{ if } w \in \text{Dox}_x(w_0) \text{ and John does not teach semantics in } w \text{ and} \\ f(w) &= \# \text{ if } w \notin \text{Dox}_x(w_0) \end{aligned}$$

4 Proposal

[Dud83]’s original idea is that a counterfactual with ‘fake’ tense involves a back shift in time with a future (metaphysical) conditional interpreted under that back shift. Translating this idea into an LF structure gives us an interpretable past tense scoping over an entire future metaphysical conditional. Adding to that the analyses of tense and mood in the preceding sections, we obtain the following preliminary LFs for our present CC (34) (= (3)) and our past CC (36) (= (4)):

$$(34) \quad \begin{aligned} &\text{Si Juan tuviese resaca (ahora/hoy), (pro) estaría en la cama. PRESENT} \\ &\text{If Juan } \mathbf{had.SUBJ} \text{ hang-over (now/today), (he) } \mathbf{would-be} \text{ in the bed} \\ &\text{‘If John had a hang-over (now/today), he would be in bed.’} \end{aligned}$$

$$(35) \quad \text{Preliminary LF for present CC (34):}$$

$$\begin{aligned} &\lambda 0 [\text{pro}_1^{\text{[PAST } pro_0]} \lambda 2 \text{MODAL}_{\text{METAPHY}}^L \text{pro}_2 \\ &\quad [\lambda 8 [\text{pro}_8^{\text{[SUBJ } pro_{SP}]} \lambda 3 [\text{past} [\text{pro}_4^{\text{[FUT } pro_3]} \lambda 7 [\text{John have hang-over at } pro_7]]]] \\ &\quad [\lambda 8 [\text{pro}_8 \lambda 3 [\text{past} [\text{pro}_4^{\text{[FUT } pro_3]} \lambda 7 [\text{John be in bed at } pro_7]]]]]] \end{aligned}$$

- (36) Si Juan hubiese ido a la fiesta (ayer), la fiesta habría sido divertida. PAST
 If Juan **had.SUBJ gone** to the party (yesterday), the party **would.have been** amusing.
 ‘If John had gone to the party (yesterday), the party would have been fun.’

- (37) Preliminary LF for past CC (36):
 $\lambda 0 [\text{pro}_1^{[\text{PAST } \text{pro}_0]} \lambda 2 \text{MODAL}_{\text{METAPHY}}^L \text{pro}_2$
 $[\lambda 8 [\text{pro}_8^{[\text{SUBJ } \text{pro}_{Sp}]} \lambda 3 [\text{past} [\text{pro}_4^{[\text{FUT } \text{pro}_3]} \lambda 5 [\text{pro}_6^{[\text{PAST } \text{pro}_5]} \lambda 7 [\text{John go at } \text{pro}_7]]]]]]$
 $[\lambda 8 [\text{pro}_8 \lambda 3 [\text{past} [\text{pro}_4^{[\text{FUT } \text{pro}_3]} \lambda 5 [\text{pro}_6^{[\text{PAST } \text{pro}_5]} \lambda 7 [\text{it be fun at } \text{pro}_7]]]]]]]$

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

First, [Dud83]’s original idea needs to be profiled a bit more in order to guarantee the correct temporal alignment of the hypothetical events with respect to the utterance index i_0 . To see this, recall the analysis of the indirect speech examples (10) and (13). There, the attitude holder Ana was thinking about how things would be on a particular date, represented in our LFs as a free pronoun pro_4 which happened to pick today’s date in our scenarios. But of course Ana’s thoughts could be about any other salient date given the appropriate scenario. When we turn to CCs, pronoun pro_4 cannot pick a random date but must be co-valued with pro_0 . This is because, in the LF (35), the index $\llbracket \text{pro}_7 \rrbracket / \llbracket \text{pro}_4 \rrbracket$ at which John has a hang-over and John is in bed is necessarily understood as temporally overlapping with the utterance index $\llbracket \text{pro}_0 \rrbracket$ and, in the LF (37), the index $\llbracket \text{pro}_7 \rrbracket / \llbracket \text{pro}_6^{[\text{PAST } \text{pro}_5 / \text{pro}_4]} \rrbracket$ at which John goes to the party and the party is fun is obligatorily interpreted as temporally preceding the utterance index $\llbracket \text{pro}_0 \rrbracket$. This means that Dudman’s original idea should be refined as follows: A (present or past) counterfactual uttered at index i_0 involves a back shift in time with a future metaphysical conditional *about* i_0 under that back shift. In other words, a counterfactual is not just about considering how the world would be like at some time if certain things had happened, but about how the world would be *now* if those things had happened. For concreteness, this is implemented by adding the feature [T-IDENT pro_0] to pro_4 , interpreted as follows:

- (38) $\llbracket \text{pro}_i^{[\text{T-IDENT } \text{pro}_j]} \rrbracket$ is defined only if $\text{time}(g(i)) = \text{time}(g(j))$;
 if defined, $\llbracket \text{pro}_i^{[\text{T-IDENT } \text{pro}_j]} \rrbracket = g(i)$

Second, it is known that 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 are sometimes taken into account too, with the effect that they further restrict the metaphysical possibilities quantified over. These are the so-called Morgenbesser cases, one example of which, from [Edg04], is given in (39):

- (39) I am driving to the airport to catch a 9 o’clock flight to Paris. The car breaks down in the motorway. I sit there waiting for the breakdown service. 9 o’clock passes: I’ve missed my flight. More time passes. ‘If I had caught the plane, I would have been half way to Paris by now’, I say to the repairman who eventually shows up. ‘Which flight were you on?’, he asks. I tell him. ‘Well you’re wrong’, he says. ‘I was listening to the radio. It crashed. If you had caught that plane, you would be dead by now.’

Unless we want to commit to determinism (and assume that the later plane crash at t'' was already determined at t'), this case makes clear that the domain of quantification of the modal cluster $[\text{MODAL}_{\text{METAPHY}}^L \text{pro}_2]$ in our LFs should not include all the metaphysical possibilities

branching out from index $\llbracket pro_2 \rrbracket$ that follows the set of laws L , but only the possibilities out of those that, additionally, contain certain later facts –here, the plane crash. While there is important discussion in the literature on how to characterize which intermediate facts play a role and which ones do not, our modest goal here is to have a place holder for that information in our LFs. For concreteness, we implement this by adding a situation argument pro_{sit} to the modal cluster, whose denotation should be a modal part (\subseteq_m) of w' , as defined in (40) [Arr09]. Our complex modal cluster $[MODAL_{METAPHY}^L pro_{sit} pro_2]$ is interpreted as in (41):

- (40) For any situation s and world w :
 $s \subseteq_m w$ iff there is a situation s' such that s' is a counterpart of s and s' is part of w .
- (41) $\llbracket MODAL_{METAPHY}^L pro_{sit} pro_2 \rrbracket(p)(q) =$
 $\lambda i. \forall i' \in (Metaph^L(i) \cap \{ \langle w', t' \rangle : \llbracket pro_{sit} \rrbracket \subseteq_m w' \}) [p(i') \rightarrow q(i')]$

Let us add these two adjustments to our preliminary LFs. For the present CC (34), we obtain the LF (42). This leads to the partial semantic computation in (43). The resulting truth conditions (43c) quantify over law-like metaphysical alternatives i_3 to an index i_2 preceding the utterance index i_0 , alternatives at which, additionally, certain “intermediate” facts hold. For each of these i_3 , we check whether the index i_4 that has the same world-member as i_3 and the same time-member as i_0 is such that John has a hang-over at i_4 .⁶ If so, then the sentence commits us to i_4 being such that John is in bed at i_4 . This delivers the correct temporal alignment of the hypothetical events. As for mood, the use of subjunctive in the *if*-clause makes the antecedent proposition total, as in (43a). If, instead, indicative mood were used, the antecedent proposition would be defined only for the doxastic alternatives of the attitude holder, here the speaker. Since the speaker believes that the antecedent is false, this would lead to vacuous quantification: For any index i_3 that we would apply the indicative version of (43a) to, we would obtain # (if $i_3 \notin \text{Dox}_{Speaker}(i_0)$) or FALSE/0 (if $i_3 \in \text{Dox}_{Speaker}(i_0)$). Hence, indicative mood cannot be used and subjunctive mood must.

- (42) LF for present CC (34):
 $\lambda 0 [pro_1^{[PAST\ pro_0]} \lambda 2 MODAL_{METAPHY}^L (pro_{sit}) pro_2$
 $[\lambda 8 [pro_8^{[SUBJ\ pro_{sp}]} \lambda 3 [past [pro_4^{[FUT\ pro_3][TEMP\ pro_0]} \lambda 7 [John\ have\ hang-over\ at\ pro_7]]]]]$
 $[\lambda 8 [pro_8 \lambda 3 [past [pro_4^{[FUT\ pro_3][TEMP\ pro_0]} \lambda 7 [John\ be\ in\ bed\ at\ pro_7]]]]]]]$
- (43) a. Antecedent clause:
 $\lambda i_3: i_3 \in \text{Dox}_{SP}(i_0) \wedge i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0). \text{ John have hang-over at } i_4$
 b. Consequent clause:
 $\lambda i_3: i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0). \text{ John be in bed at } i_4$
 c. Sentence:
 $\lambda i_0: i_1 < i_0. \forall i_3 \in (Metaph^L(i_1) \cap \{ \langle w', t' \rangle : \llbracket pro_{sit} \rrbracket \subseteq_m w' \}) :$
 $i_3 \in \text{Dox}_{SP}(i_0) \wedge i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge \text{John have hang-over at } i_4 \rightarrow$
 $i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge \text{John be in bed at } i_4$

For the past CC (36), we obtain the following LF and semantic derivation. As the reader can check for herself, now the index i_6 at which the hypothetical events of the antecedent and consequent clauses hold has to temporally precede i_4 . Again, i_4 has the same time-member as i_0 (and the same world-member as i_3). This leads to the correct temporal ordering. As for mood, the same considerations apply as above.

⁶See footnote 4 on i_4 . Alternatively, one could \exists -bind i_4 .

- (44) LF for past CC (36):
 $\lambda 0 [\text{pro}_1^{\text{[PAST pro}_0\text{]}}, \lambda 2 \text{MODAL}_{\text{METAPHY}}^L (\text{pro}_{\text{sit}}) \text{pro}_2$
 $[\lambda 8 [\text{pro}_8^{\text{[SUBJ pro}_{\text{SP}}]}], \lambda 3 [\text{past} [\text{pro}_4^{\text{[FUT pro}_3\text{]}}, \text{[TEMP pro}_0\text{]}], \lambda 5 [\text{pro}_6^{\text{[PAST pro}_5\text{]}}, \lambda 7 [\text{J go at pro}_7]]]]]$
 $[\lambda 8 [\text{pro}_8], \lambda 3 [\text{past} [\text{pro}_4^{\text{[FUT pro}_3\text{]}}, \text{[TEMP pro}_0\text{]}], \lambda 5 [\text{pro}_6^{\text{[PAST pro}_5\text{]}}, \lambda 7 [\text{it be fun at pro}_7]]]]]$
- (45) a. Antecedent clause:
 $\lambda i_3: i_3 \in \text{Dox}_{\text{SP}}(i_0) \wedge i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge i_6 < i_4$. John go at i_6
 b. Consequent clause:
 $\lambda i_3: i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge i_6 < i_4$. the.party be fun at i_6
 c. Sentence:
 $\lambda i_0: i_1 < i_0. \forall i_3 \in (\text{Metaph}^L(i_1) \cap \{ \langle w', t' \rangle : \llbracket \text{pro}_{\text{sit}} \rrbracket \subseteq_m w' \})$:
 $i_3 \in \text{Dox}_{\text{SP}}(i_0) \wedge i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge i_6 < i_4 \wedge \text{John go at } i_6 \rightarrow$
 $i_3 < i_4 \wedge \text{time}(i_4) = \text{time}(i_0) \wedge i_6 < i_4 \wedge \text{the.party be fun at } i_6$

In sum, the correct truth conditions have been derived for our CC using the analysis of tense and mood morphology independently motivated in sections 2 and 3.

5 Conclusions and further issues

The truth conditions of CCs in Spanish have been derived within the temporal remoteness line while keeping a uniform analysis of temporal and mood morphology across the grammar.

I would like to make two further points about the temporal remoteness approach.

First, relating CC structures to the description of future events under a back shift cannot only account for ‘fake’ tense, as we saw, but also for ‘fake’ aspect. It has been noted that, even when the event described in the antecedent clause is punctual, an imperfective past form has to be used. We note that the same is true for indirect speech reporting a past utterance of an indicative future conditional. To see one case, our indirect speech example (10) uses Past Imperfect (= Pretérito Imperfecto) in the antecedent clause. If we use Perfective Past (= Pretérito Indefinido) in (46), the sentence lacks a parallel interpretation.

- (46) Ella pensó que, si Juan alcanzó la cima, (pro) estaría cansado.
 She thought that, if Juan **reached.Pft.Ind** the summit, he **would.be** tired

Second, counterpossibles like *[If 2 plus 2 were 5, ...]* have always been an important problem for the temporal remoteness line. While I have no real solution to offer, one possible avenue to explore is to relativize indicative and counterfactual conditionals to a given epistemic state (cf. [Sta14, Lea17]). In that case, Dudman’s back shift may be understood not as taking us back to a time point t' at which the metaphysical future conditional is true, but to a time point t' at which the some agent’s epistemic state deems the metaphysical future conditional true.

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