Counterfactual Biscuit Conditionals: A Temporal Remoteness Account
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**Issue** • In the case of indicative conditionals, hypothetical and biscuit conditionals like (10) and (11) resp. are identical in terms of verbal morphology. An elegant line of analysis proposes that the two types share the same syntactic structure and semantic modal template and differ exclusively in the pragmatics, in that an additional inference is run for biscuits conditionals ([DG99, Fra09, Fra15, Lau2015, BG18, Csi18]): Since the antecedent and consequent propositions are independent from each other in (11) –i.e., changing one’s belief about one will not change one’s belief about the other–, the consequent must hold of the actual world \( w_0 \) regardless of the truth or falsity of the antecedent, hence giving rise to the “biscuit feeling” that the consequent is being asserted.

However, in the case of counterfactual conditionals, hypothetical counterfactuals (HypCFs) and biscuit counterfactuals (BiCFs) differ in the verbal morphology of the consequent clause in languages like English and Spanish. On the one hand, to express a BiCF, we (typically) have to use a real/non-fake tense form –e.g., present tense for a present BiCF, as in (12-b)– and cannot use fake tense (giving rise to would morphology) as in (12-a) ([RD01], pace [Fra09]). Additionally, in Spanish, the consequent of a BiCF must be in the indicative: (13). On the other hand, to express a HypCF, we must use fake tense, as in (14-a)/(15-a), and cannot use real tense, witness (14-b)/(15-b). This raises a puzzle for the uniform approach above: 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 when in counterfactual form?

**Goal** • The goal of this paper is to provide an analysis of the tense and mood morphology in BiCFs that derives the morphological pattern in (12)-(15) while maintaining the general uniform approach to hypotheticals and biscuits. To do so, we will follow the temporal remoteness analysis of counterfactual morphology ([Dud83,84, Ipp03, GS09, Rom17]) and extend mechanisms independently needed for breaking Sequence of Tense in attitude reports ([Ogi99]).

**Background: A temporal remoteness account of HypFC** • A HypCF involves a back shift in time with a future metaphysical conditional interpreted under that back shift ([Dud83,84, Edg04]). This translates into the LF (1), with the modal MODAL\(_L^{METAPHY} \) scoping under the back shift introduced by \( \exists_1 \). One layer of past tense morphology is left uninterpreted in the antecedent and the consequent –represented as \([\text{past}]\) in (1)– by virtue of being in a binding chain headed by a past temporal pronoun \( \text{pro}_i^{\text{past \ pro}} \) ([GvS09]). The remaining bits of verbal morphology introduce a pronoun \( \text{pro} \), with the relevant tense and mood features \([\text{TENSE/MOOD}]\) and are interpreted as in (2)-(3) ([Hei94, Fin98, Kra98; Sch05], adapted in [Rom17] to indices, i.e., to world-time pairs). This results in the truth conditions (4), somewhat simplified from [Rom17]:

\[
\begin{align*}
(1) & \quad \lambda_0 \exists_1 [\text{MODAL}\_L^{\text{METAPHY}} \ \text{at pro}_i^{\text{past \ pro}}] \\
& \quad \lambda_8 \exists_4 [\text{you be hungry at pro}_4^{\text{subj \ CG}} [\text{past}] [\text{FUT} \ \text{pro}_4]] \\
& \quad \lambda_8 \exists_4 [\text{your stomach be making noises at pro}_4^{\text{past \ pro}} [\text{FUT} \ \text{pro}_4]] \\
(2) & \quad \text{a. } [\text{pro}_i^{\text{past \ pro}}]^g \text{ is defined only if } g(i) < g(j); \text{ if defined, } [\text{pro}_i^{\text{past \ pro}}] = g(i) \\
& \quad \text{b. } [\text{pro}_i^{\text{pres \ pro}}]^g \text{ is defined only if } g(i) \circ g(j); \text{ if defined, } [\text{pro}_i^{\text{pres \ pro}}] = g(i) \\
& \quad \text{c. } [\text{pro}_i^{\text{fut \ pro}}]^g \text{ is defined only if } g(j) < g(i); \text{ if defined, } [\text{pro}_i^{\text{fut \ pro}}] = g(i) \\
(3) & \quad \text{a. } [\text{pro}_i^{\text{ind \ CG}}]^g \text{ is defined only if } g(i) \in \text{CG}; \text{ if defined, } [\text{pro}_i^{\text{ind \ CG}}] = g(\text{pro}_i) \\
& \quad \text{b. } [\text{pro}_i^{\text{subj \ CG}}]^g = g(\text{pro}_i). \quad \text{[CG = Common Ground]} \\
(4) & \quad \lambda_0 \exists_1 [i_1 < i_0 \land \forall i_8 \in \text{MODAL}\_L^{\text{METAPHY}}(i_1): \exists_4 [i_8 \in \text{CG} \land i_8 < i_4 \land \text{you be hungry at } i_4] \rightarrow \exists_4 [i_8 < i_4 \land \text{stomach be making noises at } i_4]]
\end{align*}
\]
Background: Breaking Sequence of Tense (SOT) • When SOT is broken in attitude reports by using an absolute tense, e.g. present tense in (16), 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” $t_1$. However, the corresponding LF (5) only gives us temporal alignment with $t_0$, as in (6-a). 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 (6-b). Note that the same result would obtain if the temporal property plus the entire embedded proposition were duplicated, as in (6-c). We will use the latter kind of duplication in our proposal.

(5) LF: $\lambda 0. \exists i_1 [\text{John say at pro}_1 \text{PAST pro}_0 \lambda 3 \exists i_4 [\text{Mary be pregnant at pro}_4 \text{PRES pro}_3]]$

(6) a. $\lambda t_0, i_1 [i_1 < i_0 \land \forall t_2 \in \text{SAY}_{\text{john}(t_1)}: \exists t_4 [t_4 \in t_0 \land \text{Mary be pregnant at } t_4]]$

b. $\lambda t_0, i_1 [i_1 < i_0 \land \forall t_2 \in \text{SAY}_{\text{john}(t_1)}: \exists t_4 [t_4 \in t_0 \land \text{Mary be pregnant at } t_4 \land t_4 \in t_2]]$

c. $\lambda t_0, i_1 [i_1 < i_0 \land \forall t_2 \in \text{SAY}_{\text{john}(t_1)}: \exists t_4 [t_4 \in t_0 \land \text{Mary. pr. at } t_4 \land t_4 \in t_2 \land \text{Mary. pr. at } t_4]]$

Proposal • We propose to treat the grammatical BiCFs (12-b)/(13-b) as a case of broken Sequence of Tense and, additionally for Spanish, broken “Sequence of Mood”. The present and indicative morphology leads to the LF (7). This gives us the temporal alignment of index $i_4$ with the utterance index $i_0$ in the last subformula in (8), but no temporal alignment and no modal alignment –given that $i_4 \in \text{CG}$– with the counterfactual index $i_8$ quantified over. To supply the desired alignment, we extend [Ogi99]’s strategy and propose to duplicate the consequent proposition and the temporal and modal relations as $i_8 \in i_4$ and $i_4 \in \text{METAPHYL}(i_0)$ to allow local binding, resulting in (9):

(7) $\lambda 0 \exists i_1 [\text{MODAL}_{\text{METAPHYL}} \text{ at pro}_1 \text{PAST pro}_0 \lambda 8 \exists i_4 [\text{be pizza at pro}_4 \text{SUBJ CG PAST FUT pro}_1] \lambda 8 \exists i_4 [\text{be pizza at pro}_4 \text{IND CG PRES pro}_3]]$

(8) $\lambda i_0. \exists i_1 [i_1 < i_0 \land \forall i_8 \in \text{MODAL}_{\text{METAPHYL}}(i_1): \exists i_4 [i_8 \in \text{CG} \land i_8 < i_4 \land \text{you be hungry at } i_4] \rightarrow \exists i_4 [i_4 \in \text{CG} \land i_4 \in i_0 \land \text{there be pizza at } i_4]]$

(9) $\lambda i_0. \exists i_1 [i_1 < i_0 \land \forall i_8 \in \text{MODAL}_{\text{METAPHYL}}(i_1): \exists i_4 [i_8 \in \text{CG} \land i_8 < i_4 \land \text{you be hungry at } i_4] \rightarrow \exists i_4 [i_4 \in \text{CG} \land i_4 \in i_0 \land \text{there be pizza at } i_4]]$

As for the ungrammatical BiCFs (12-a)/(13-a), [Fra09] predicts them and (12-b)/(13-b) to equally receive a biscuit interpretation irrespective of tense or mood, since $p$ and $q$ are conditionally independent. This means that (12-a)/(13-a) and (12-b)/(13-b) compete for signalling the same message. But the present tense morphology in (12-b) and additionally the indicative morphology in (13-b) break SOT/Sequence of Mood, explicitly signalling overlap of $i_4$ with $i_0$ and membership of $i_4$ to CG, while (12-a)/(13-a) do not. Thus, (12-b)/(13-b) are stronger when the speaker wants to communicate her commitment to $q$ in $i_0$ and should be chosen then. Similar effects arise for cessation implicatures with competition between tenses ([Cab16]) 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 (17) 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 $i_0$.

Finally, for the ungrammatical HypCFs (14-b)/(15-b), [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 (14-b)/(15-b), a conditional whose $p$ and $q$ are conditionally dependent. Signalling that $q$ is true (qua present indicative) means that the speaker should have simply uttered $q$. 
(10) [On a whatsapp message:] (I know you well...) If you are hungry right now, your stomach is making noises. HYP IND

(11) If you are hungry right now, there is pizza in the fridge. BISCUIT IND

(12) a. #If you were hungry right now, there would be pizza in the fridge. BiCF
b. If you were hungry right now, there is pizza in the fridge. BiCF

(13) a. #Si (tú) tuvieses hambre, habría pizza en el frigorífico. If (you) had.Subj hunger, would.have pizza in the fridge. HYP CF
b. Si (tú) tuvieses hambre, hay pizza en el frigorífico. If (you) had.Subj hunger, have.Ind pizza in the fridge. BiCF

(14) a. If you were hungry right now, your stomach would be making noises. HYP CF
b. #If you were hungry right now, your stomach is making noises. BISCUIT CF

(15) a. Si (tú) tuvieses hambre, tu estómago estaría haciendo ruidos. If (you) had.Subj hunger, your stomach is making noises. HYP CF
b. #Si (tú) tuvieses hambre, tu estómago estariía haciendo ruidos. If (you) had.Subj hunger, your stomach would be making noises. BiCF

(16) John said Mary is pregnant.
   a. John said at a past time $t_1$ that Mary is pregnant at $t_0$. BISCUIT
   b. John said at a past time $t_1$ that Mary is pregnant at $t_1$. HYP CF

(17) 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] ex. (1)