

# The Asymmetry of Past Tense \*

Hadil Karawani<sup>1</sup>, Carina Kauf<sup>2</sup>, and Hedde Zeijlstra<sup>3</sup>

<sup>1</sup> Leibniz-ZAS, Berlin & University of Konstanz [hadil.karawani@gmail.com](mailto:hadil.karawani@gmail.com)

<sup>2</sup> Georg-August-Universität Göttingen & Massachusetts Institute of Technology  
[carina.kauf@stud.uni-goettingen.de](mailto:carina.kauf@stud.uni-goettingen.de),

<sup>3</sup> Georg-August-Universität Göttingen [hzeijls@uni-goettingen.de](mailto:hzeijls@uni-goettingen.de)

## Abstract

In this paper, we propose a semantics for (the highest instance) of past tense in a syntactic domain that is essentially modal and not strictly temporal. Given this asymmetry we are able to account for the fact that, once embedded under another modal, past tense morphology can receive a modal interpretation and is not an inherent time shifter. This naturally derives the syntax of counterfactual *if* - and *wish* clauses. Overgeneration of modal readings in other modal contexts is ruled out by means of pragmatic competition with present tense morphology.

## 1 Background

One of the central questions in the studies of counterfactual conditionals (and similar constructions, such as *wish*-clauses, (cf. [Iat00])) concerns the usage of past tense morphology. In many languages, including English, past tense morphology in such constructions does not give rise to an anteriority effect, but rather conveys that the predicate holds in a different world than the actual one. Why is it that in (1) the inclusion of past tense morphology conveys that the antecedent does not hold in the actual world?

- (1) If Mary didn't speak English, she would be helpless.

Two approaches have been formulated to account for the semantic contribution of such past tense morphology: (i) a fake tense approach where past tense morphology expresses exclusion from either the time of utterance or the actual world (see [Pal01, Iat00, Sch05, Sch14, Kar14], a.o.); and (ii) a real tense approach where past tense is inherently temporal, but the locus of tense can be shifted outside the conditional. In the latter, the past tense morpheme refers to a point back in time at which the antecedent was still a possibility: the conditional means that in the worlds at which the antecedent holds (and which are closest to the actual world), the consequent holds (cf. [Dud83, Dud84, Ipp03, Arr09, GVS09]).

The real tense approach may provide the null hypothesis in the sense that it keeps past tense morphology purely temporal, but is challenged by (i) the fact that the locus of past tense interpretation does not match its surface position—*if*-clauses form an island for movement (see [Rom14])—and (ii) the fact that not every counterfactual conditional denotes a possibility that was available at an earlier point in time—in other words, some conditionals may be counterfactual in earlier times, or throughout time. For instance, for counteridenticals like (2), arguably, at no time in history was its antecedent inferred not to be false.

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- (2) If I were you, I would be thrilled.

At the same time, the fake tense (exclusion) approach also suffers from non-trivial problems. For one, there is a clear asymmetry between the availability of the temporal and the modal reading of the past tense morpheme: A sentence like (3) can only mean that John’s sleeping took place, not that he may sleep now. What blocks a modal reading in such cases?

- (3) John slept.

[Iat00] argues that when access to alternative worlds is given, the modal interpretation becomes available, but does not formalize this requirement; the semantics of her exclusion feature, which past tense morphology denotes, does not have an in-built preference for a temporal interpretation. Moreover, not in every modal context does past tense morphology trigger a modal interpretation. Under modal predicates or adverbs, or under intentional predicates, past tense morphology is interpreted in a purely temporal way, as is the case in the examples below.

- (4) a. It is possible that John was happy.  
 b. Probably, Mary was leaving.  
 c. Mary believes John was leaving.

Hence, the question remains open as to what blocks a modal interpretation for plain past tense constructions. We aim to solve this problem, and present a viable alternative to the temporal approach, by lexically encoding this asymmetry into the semantics of past tense morphology. However, in doing so, we explicitly make the past tense morpheme a modal indexical and not a temporal one. For us, a past tense morpheme makes reference to world-time pairs involving the the actual world, but not the time of utterance.

Before continuing, let us point out one potential caveat. In some languages, like Greek, Italian, and Zulu, a.o., imperfective aspect accompanies past tense in constructions akin to the example in (1). While some authors (cf. [Ipp02, Fer14]) argue that imperfective aspectual semantics plays a role in the composition of hypothetical and/or counterfactual readings, we follow [HK12] in their analysis, which takes imperfective morphology to fulfil a morpho-syntactic role, rather than a semantic one: being default, imperfective aspect ‘comes along for the ride’ to fulfil a syntactic requirement for aspect. Hence, we will, therefore, not further discuss the role of (fake) aspect here.

## 2 Our Proposal

### 2.1 Assumptions

Our proposal is based on the following assumptions. First, we note that past tense makes reference to a local evaluation time, not to the time of utterance. Evidence for this comes from examples like (5), where the time of hiding takes place prior to the time of thinking, not prior to the time of utterance.

- (5) Alan will think that everybody hid.

This means that past tense morphology is inherently relative to a local evaluation time. However, this also entails that the locus evaluation time, in cases where the past tense morpheme is the highest instantiation of tense morphology, must be set to a default time-of-utterance index,  $t_u$ , that enters the derivation as a last resort, as in (6).

(6) Mary left.

$$\begin{array}{c}
 \lambda w. \exists t [t < t_u. \text{Leave}(\text{Mary}) \text{ at } t] \\
 \swarrow \quad \searrow \\
 \text{PAST Leave}(\text{Mary}) \quad t_u \\
 \lambda t^*. \lambda w. \exists t [t < t^*. \text{Leave}(\text{Mary}) \text{ at } t]
 \end{array}$$

In the same vein, an actual world index  $w_0$  is applied to every proposition that is not further modally anchored. Uttering (6) will ultimately receive an interpretation about the actual world, so an additional  $w_0$  must be added to the derivation as a last resort as well, as in (7):

(7) Mary left.

$$\begin{array}{c}
 \exists t [t < t_u. \text{Leave}(\text{Mary}) \text{ at } t \text{ in } w_0] \\
 \swarrow \quad \searrow \\
 \lambda w. \exists t [t < t_u. \text{Leave}(\text{Mary}) \text{ at } t \text{ in } w] \quad w_0 \\
 \swarrow \quad \searrow \\
 \text{PAST Leave}(\text{Mary}) \quad t_u \\
 \lambda t^*. \lambda w. \exists t [t < t^*. \text{Leave}(\text{Mary}) \text{ at } t]
 \end{array}$$

With this in mind, we take past tense to have the following semantics, which we present as an operation (for the sake of exposition), but which can easily be recast in presuppositional terms (see [Kar19]):

$$(8) \quad \llbracket \text{PAST} \rrbracket = \lambda P. \lambda t^*. \lambda w. \exists t [ \langle w, t \rangle \neq \langle w_0, t^* \rangle \ \& \ P \text{ holds at } t \text{ in } w ]$$

Under this semantics for past tense morphology, the asymmetry between the two usages follows. In plain past tense constructions, the temporal interpretation immediately follows: Since the proposition is applied to  $t_u$  and  $w_0$  at the final stage of the derivation, both world-time pairs will include  $w_0$ , but only one of them  $t_u$ , and therefore the two tense variables must receive a distinct interpretation; taking the future to be a modal and not a tense [Iat00, Cop09, GM17], only a past tense reading thus emerges.

$$\begin{aligned}
 (9) \quad & [ \text{PAST} (\text{John sleep})(t_u)(w_0) ] \\
 & = \lambda P. \lambda t^*. \lambda w. \exists t [ \langle w, t \rangle \neq \langle w_0, t^* \rangle \ \& \ P \text{ holds at } t \text{ in } w ] (\text{John sleep})(t_u)(w_0) \\
 & = \lambda t^*. \lambda w. \exists t [ \langle w, t \rangle \neq \langle w_0, t^* \rangle \ \& \ \text{John sleep holds at } t \text{ in } w ] (t_u)(w_0) \\
 & = \lambda w. \exists t [ \langle w, t \rangle \neq \langle w_0, t_u \rangle \ \& \ \text{John sleep holds at } t \text{ in } w ] (w_0) \\
 & = \exists t [ \langle w_0, t \rangle \neq \langle w_0, t_u \rangle \ \& \ \text{John sleep holds at } t \text{ in } w_0 ] \\
 & = \exists t [ t \neq t_u \ \& \ \text{John sleep holds at } t \text{ in } w_0 ]
 \end{aligned}$$

Only if the entire proposition is embedded under a modal quantifier, as is the case in a conditional, the world argument is not set to  $w_0$ , and a modal interpretation may arise. Assuming an (oversimplified) semantics for the conditional  $\lambda p. \lambda q. \forall w [ p(w) \longrightarrow q(w) ]$  ([Sta68, Vel86]), the interpretation of the antecedent of the conditional *If John slept, ...* is as in (10).

$$\begin{aligned}
 (10) \quad & [ \text{IF} (\text{PAST} (\text{John sleep})(t_u)) ] \\
 & = [ \lambda p. \lambda q. \forall w [ p(w) \longrightarrow q(w) ] ] (\lambda P. \lambda t^*. \lambda w. \exists t [ \langle w, t \rangle \neq \langle w_0, t^* \rangle \ \& \ P \text{ holds at } t \text{ in } w ] (\text{John sleep})(t_u)) \\
 & = \lambda q. \forall w [ \exists t [ \langle w, t \rangle \neq \langle w_0, t_u \rangle \ \& \ \text{John sleep holds at } t \text{ in } w ] \longrightarrow q(w) ]
 \end{aligned}$$

What past tense morphology does here is make a non-actual veridical contribution. It says of any predicate that it holds at a world-time pair that is different from the local evaluation time and the actual world. The fact that the past tense morpheme is ultimately a modal indexical and not a temporal indexical derives the desired asymmetry.

The idea that past tense is inherently modal might lead to over generalization — so what blocks the modal reading from arising in every modal, or intentional, environment, for that matter?

## 2.2 Preventing overgeneration

Our proposal states that once a past tense is modally embedded, a non-temporal reading may emerge. The idea that past tense is inherently modal might therefore lead to overgeneralization. To see this, take for instance the example in (11) below.

(11) It is possible that Mary was leaving.

Under our proposal, this sentence is assigned the following meaning: there is a world  $w'$  accessible from the actual world  $w_0$ , and there is a time  $t$ , such that  $\langle w', t \rangle \neq \langle w_0, t_u \rangle$ , and Mary's leaving takes place at  $t$ .

(12) [POSSIBLE (PAST(Mary leave)) ( $t_u$ )( $w_0$ )]  
 =  $\exists w' [ \text{ACC}(w', w_0) \ \& \ \exists t [ \langle w', t \rangle \neq \langle w_0, t_u \rangle \ \& \ \text{Leave}(\text{Mary}) \text{ holds at } t \text{ in } w' ] ]$

The meaning in (12) is compatible with a scenario in which it is possible for Mary to be leaving *now*, and where we know that Mary was not leaving *before*. Clearly, this is not the meaning that (11) ought to have: it is intended to read as past and to not be compatible with a present reading. What is the mechanism that blocks the non-temporal reading under a modal when only a temporal reading is intended?

A similar challenge arises for sentence like (13), which is predicted, under our proposal, to have the following meaning in (14).

(13) John believes Mary was leaving.

(14)  $\forall w [ w \in \text{BEL}(\text{John}, t_u) \longrightarrow [ \exists t. \langle w, t \rangle \neq \langle w_0, t_u \rangle \ \& \ \text{Leave}(\text{Mary}) \text{ at } t \text{ in } w ] ]$

According to (14), in all worlds compatible with John's beliefs at the time of utterance  $t_u$ , there is a time  $t$ , such that  $\langle w, t \rangle \neq \langle w_0, t_u \rangle$ , and Mary's leaving takes place at  $t$ . That means that Mary, in principle, could be leaving at the time of the believing, at least in every world where John's beliefs do not correspond with the actual world. These readings are thus too weak.

However, rather than strengthening our original proposal, we conjecture that these readings result from pragmatic competition with the present tense. This competition is most likely an instance of Maximize Presupposition (originally postulated by [Hei91]) — provided that the contributions that tense morphology make are actually presuppositional in nature. To see this, take (15a)–(15b).

(15) a. It is possible that Mary is leaving.  
 b. John believes Mary is leaving.

As shown in (16a) and (16b) below, the meanings of (15a)–(15b) are stronger than (12)–(13):

- (16) a.  $\exists w'. \text{ACC}(w', w_0) \ \& \ \text{Mary leave holds at } t_u \text{ in } w'$   
 b.  $\forall w. w \in \text{BEL}(\text{John}, t_u) \longrightarrow [\text{Leave}(\text{Mary}) \text{ at } t_u \text{ in } w]$

Hence, by uttering (11)–(12), instead of (15a)–(15b), it can be inferred that the speaker does not believe (15a)–(15b) to be true. As (15a)–(15b) only allow a simultaneous reading, i.e., a reading where Mary’s leaving takes place in the local context time, (11)–(12) can only be uttered with a temporally shifted reading. The modal contribution that past tense morphology makes in comparison to present tense morphology gets annihilated by the modal embedding under competition with the present tense.

The reason for us to opt for this pragmatic competition instead of altering our denotation of past tense morphology is that the simultaneous reading comes about in exactly those environments where a present tense alternative is absent. This is the case in counterfactual *if*- and *wish*-clauses. To see this, consider (17) and (18):

- (17) a. If Mary was leaving, John would be happy.  
 b. \*If Mary is leaving, John would be happy.
- (18) a. John wishes Mary was leaving.  
 b. \*John wishes Mary is leaving.

Hence, the restriction, according to which non-temporal interpretations of past tense morphology are preserved to those grammatical contexts that are known to give rise to counterfactuality inferences, is warranted. Naturally, the question as to why (17b) and (18b) are ungrammatical arises, though. We do not have a concrete answer to this question, but we presume that the natural answer here seems to be that the lexical semantics of *wish* does not allow it to reach within the set containing the actual world and the time of utterance.

### 3 Sequence of Tense

One might wonder to what extent our analysis of fake past applies to Sequence of Tense (SoT) contexts as the temporal contribution of past tense morphology in these environments appears to be redundant — just like the temporal contribution in fake past is also absent. This depends on how you treat SoT; for us, what counts is the highest instance of past tense in the chain.

That our semantics for the past tense only necessarily applies to the highest instance of past tense in a sentence means that for multiple embedded past tenses, lower past tenses are either only phonologically marked for past tense (cf. [Kra98, Abu97, Sto95], a.o.), or agreement markers with respect to a higher covert tense operator (cf. [KZ18]), which should carry the semantics in (8). Our proposal is thus fully compatible with the existence of Sequence-of-Tense readings.

As a case study, consider the approach by [KZ18]. They argue that the perceived ambiguity of past-under-past embeddings is not the result of ambiguity but rather of lexical underspecification, which they cast in terms of two ingredients. Every past tense morpheme for them denotes a relative non-future (*RNF*) with respect to its local evaluation time; and every past tense morpheme (*-ed*) is assumed to be equipped with a past tense feature that needs to be checked by a past tense operator (*Op-PAST*) higher up in the structure. Given the fact that a past tense operator can check the features of all past tense morphemes in its syntactic domain via multiple agree, no second operator is allowed if all past tense morphemes are part of the same syntactic domain (cf. [Zei12]). The logical form of *John said Mary was ill* is then as follows:

- (19) John said Mary was ill.
- $[Op-PAST_{[iPAST]} [John [say-ed_{[uPAST]} [Mary [be-ed_{[uPAST]} ill.]]]]]$   
 $\exists t' < t_u \quad \exists t^2 \leq t' \quad \exists t^3 \leq t^2$
  - $\exists t' < t_u \ \& \ [\exists t^2 \leq t' \ \& \ say(John, t^2, [\exists t^3 \leq t^2 \ \& \ be-ill(Mary, t^3)])]$
  - John's saying is strictly before the utterance time  $t_u$  and Mary's being ill starts out no later than at the time of John's saying.*

Combining this approach with the generalized past-tense meaning proposed in this paper can be achieved straightforwardly, by replacing the past tense operator with PAST as proposed in (8), but keeping the not-later-than meaning of past tense morphology as well as their feature checking relation the same.

- (20)  $[[PAST]] = \lambda P. \lambda t^*. \lambda w. \exists t [ < w, t > \neq < w_0, t^* > \ \& \ P \text{ holds at } t \text{ in } w ]$
- (21) John said Mary was ill.
- PAST(John say-ed Mary be-ed ill)( $t_u$ )( $w_0$ )
  - $\lambda P. \lambda t^*. \lambda w. \exists t [ < w, t > \neq < w_0, t^* > \ \& \ P \text{ holds at } t \text{ in } w ](John \text{ say-ed Mary be-ed ill})(t_u)(w_0)$
  - $\exists t [ < w_0, t > \neq < w_0, t_u > \ \& \ [\exists t^2 \leq t \ \& \ say(John, t^2, [\exists t^3 \leq t^2 \ \& \ be-ill(Mary, t^3)])]$
  - There exists a time  $t$  such that the ordered pair  $< w_0, t >$  is not the same as  $< w_0, t_u >$  and John said no later than this time  $t$  that Mary was ill at a time no later than his saying time.*

Even though these semantics look quite complex, it can be easily confirmed that the worlds in which this statement is true are the same as those in (19b).

## 4 Conclusions

In this paper, we have proposed a semantics for (the highest instance) of past tense in a syntactic domain that is essentially modal and not strictly temporal. Given this asymmetry we are able to account for the fact that, once embedded under another modal, past tense morphology can receive a modal interpretation and is not an inherent time shifter. This naturally derives the syntax of counterfactual *if*- and *wish* clauses. Overgeneration of modal readings in other modal contexts is ruled out by means of pragmatic competition with present tense morphology.

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