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Justifying tense and mood morphology in counterfactuals

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Standard counterfactuals about the present (1) or past (2) are a bit quirky, but still possible to understand:

- (1) If the light were red, it would be too late. (Klein)
- (2) If Dickens had died in 1849, he would not have finished *David Copperfield*. (Klein)

We can spell out the truth-conditions in Lewis, Stalnaker or Klein style, without, however, fully comprehending the linguistic details of the basic constructions. In the philosophical tradition “since antiquity”, to quote Wolfgang Klein, there is a tendency to shy away from the unexpected morphology in ordinary counterfactuals and instead construct bizarre sentences where our intuitions about truth-conditions break down:

- (3) If kangaroos had no tails, they would not be kangaroos. (Klein)
- (4) If $2 + 2$ were 5, $2 + 3$ would not be 1, but $2 + 3$ could then be 6. (Grønn)

As Klein puts it towards the end of the target paper: “We are somehow in the dark.”

Therefore, I will follow Klein’s research agenda in my commentary below where much care will be devoted to justifying the morphology observed in these constructions. I share Klein’s main objective, which is to present a compositional theory, where “linguistic meaning is strictly derived from the meaning of its components” (Klein).

I will draw attention to the purely linguistic puzzles which counterfactuals give rise to in the temporal domain, the morphology and interpretation of word forms like *have/had*, *were*, *would* and *could*, the hallmark of counterfactual conditionals. These specific words, except *would* and *were*, are admittedly not the main focus of Klein’s target article, but I think they should be of interest for any new or old approach to counterfactuals. Hopefully, towards the end I can say with Klein that “an alternative analysis that is very close to the linguistic facts is proposed.”

The linguistic facts also include the little word *if*, the analysis of which is decisive for the architecture of counterfactual conditionals, their logical form. Here

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I will agree with Klein's position, which goes back to work by Kratzer (1981, 2012), that the *if*-clause merely restricts the main modal of the construction. As a challenge for Klein's account, though, one should arguably make room for the counterfactual *could* (not analysed by Klein) as the dual of *would* (Lewis 1973).

The novelty of my response article is the attempt to shed new light on the puzzling and much discussed fact that the counterfactual modals *would* and *could* in the apodosis, as well as *were* and *had* in the protasis, are not used, despite their morphology, to convey information about a past time.

For this purpose, I will need a modal semantics with built-in temporal control and a feature system with sequence-of-tense/mood rules at the interfaces. These theoretical underpinnings of my commentary stem from unpublished joint work with Arnim von Stechow.¹

1 On the architecture of counterfactuals – towards temporal control

A reasonable paraphrase of Klein's analysis of counterfactuals of the form *if P, Q* seems to be "the topic situation *P* has the comment feature *Q*".

A certain parallel – allegedly a shared non-monotonic behaviour – between definite descriptions in the individual domain and conditionals in the world domain, was noted in passing already by Lewis (1973). Schlenker (2004) and Ebert et al. (2014) worked out a formal analysis in the spirit of Lewis' observation. Klein's target paper can also be seen as an implementation of this idea.

It should be noted that the proposals in Schlenker (2004) and Ebert et al. (2014) differ from Klein's analysis in at least one important aspect: The former argue – convincingly in my view – that in the world domain, the definite descriptions must be pluralised: "The topic situations *P* have the comment feature *Q*".

Still, there are at least three remaining problems, as I see it, shared by these accounts: They do not succeed in explaining (1) the fake past tense morphology, (2)

¹ I owe much of the following to Arnim von Stechow, who has also been a close friend and colleague of Wolfgang Klein for more than 50 years. Von Stechow raised my own interest in counterfactuals in Malaga 2006. A joint invitation to participate in Cathrine Fabricius-Hansen's research group "Meaning across languages" at the Norwegian Academy of Science in Oslo 2011 gave us the opportunity to sketch an analysis of counterfactual conditionals. This work was never published, as our collaboration shifted towards (sequence of) tense and the perfect. When I write "our account" below, I have in mind what I learnt about counterfactuals from von Stechow, for which I am deeply grateful. The shortcomings of this commentary are, of course, my sole responsibility.

the temporal control from the main modal into the *if*-clause and (3) the duality of the counterfactual necessity modal *would* and the counterfactual possibility modal *could*. Where does *could* fit into the definite description as in the paraphrases above? The problem is perhaps most acute if one adopts Klein's non-pluralised version.

For Lewis, the duality of *would/could* was important, and he developed an influential theory, which I will take as my point of departure. However, Lewis was concerned with neither temporality (temporal control) nor the problem of fake past. A shortcoming of Lewis' system, from a linguistic point of view, is that he did not propose a unified analysis for *would/could*-conditionals on the one hand, and *would have/could have*-conditionals on the other.

The position I will defend here is the following: the main tense of a counterfactual conditional with simple past morphology – the *would–could* conditional in English – is a semantic PRESENT, while constructions with two layers of past morphology – the *would–could have* conditionals – are (typically) shifted to a past time by the matrix time shifter HAVE.

- (5) Present counterfactuals
NOW [would/could [~~ed~~ protasis] [apodosis]]
- (6) Past counterfactuals
NOW HAVE [would/could [~~had~~ protasis] [apodosis]]

The system to be developed can also account for cases where a perfect is interpreted locally in the protasis or apodosis. Klein actually provides a few examples of these mixed constructions which I will return to later in Section 2.2. Semantically, such *would (have)*-conditionals are still embedded under a semantic present:

- (7) Mixed present perfect counterfactuals
 - a. NOW [would/could [~~ed~~ protasis] [HAVE apodosis]]
 - b. NOW [would/could [~~ed~~ HAVE protasis] [apodosis]]

The phenomenon is known as *tense transposition*: What looks like a past is semantically present; what looks like a pluperfect is a semantic past, or, more marginally, a semantic present perfect. Our analysis of this anti-past behaviour will make use of a theory of temporal agreement in terms of interpreted/uninterpreted features.

1.1 The role of *if*

Klein stresses the fact that his topic situation is not necessarily provided by an *if*-clause, and an *if*-clause needs not be topical. As we will see in a moment, the Lewis-

Kratzer claim is that *if* doesn't mean anything, but *if*-clauses simply restrict quantifiers or modals.

Additional arguments in favour of this view of *if* – and in favour of Klein's approach as well – come from the observations that (a) a single *if*-clause (Klein's topic situation) can modify more than one modal and (b) that *if*-clauses can be stacked like relative clauses. If *if-then* were a two-place operator, this could not be explained.

Here is an example of the first case.²

(8) If $2 + 2$ were 5, $2 + 3$ would not be 1, but $2 + 3$ could then be 6.

(9) Not Would (*if*_i $2 + 2 = 5$) ($2 + 3 = 1$), but
Could (*then*_i) ($2 + 3 = 6$)

The role of *if* might then be of carrying an anaphoric index for the *then* at the modal. We need an extra store for the *if*-clauses from which they can be taken if needed for a modal they can restrict. We cannot interpret *if*-clauses *in situ*, but for our purposes, a tensed version of Kratzer's rule for modal restriction will do (see Section 1.3).

1.2 The main modal: *would* or *could*

The *if*-clause restricts some quantificational element, and the architecture of the construction depends on this operator. Here we consider the standard counterfactual modals *would* and *could*.

Importantly, despite the prevailing view in the linguistic literature from Iatridou (2000) to Klein, I will argue that it is not the past tense morphology that takes us to the remote worlds in counterfactuals, but the modal. In this respect, I will follow Lewis (1973), for whom a *would*-conditional amounts to the subset relation between propositions: the set of protasis-worlds which are maximally similar to the world of evaluation, is a subset of the apodosis-worlds (the relation of conditional necessity), while a *could*-conditional amounts to a non-empty intersection between protasis-worlds and apodosis-worlds (among the nearest protasis-worlds, there is at least one apodosis-world – the relation of conditional possibility).

There is, however, no consensus in the literature as to where and how semantic tenses fit into this picture.

² Since my primary concern is to explain “the linguistic facts”, I will ignore the more philosophical problem that a possible worlds semantics for counterfactuals seems to break down when we challenge mathematical truths as in (8).

Arguably, a tensed version of Lewis' analysis will have the following truth-conditions:

- (10) Time dependent Lewisian *would*-counterfactual:
 "If P were the case, then Q would be the case"
 is true in world w at time t
 iff the worlds w' in which P is true at time t and which are maximally
 similar to w
 are worlds in which Q is true at t .

Modals embed a non-finite clause ("the prejacent"). Like all other verbs, modals have a time argument. The semantics of modals contains the information that the prejacent is to be evaluated in the accessible worlds at the local evaluation time of the modal. Thus, modals are verbs of temporal control.

1.3 Temporal control

Counterfactual conditionals give rise to a structure at logical form (LF) in which the temporal proposition expressed in the protasis restricts the domain of quantification of the modal operator *would/could*, which takes the temporal proposition (the prejacent) in the apodosis as its argument.

Lewis' two separate modals are interpreted with respect to a similarity relation $\leq$ that orders the accessible worlds with respect to the local evaluation world w : $w_1 \leq_w w_2$ means that w_1 is at least as similar to w as w_2 . Our innovation is the temporal control: the variable t has three bound occurrences in the meaning representation:

- (11) A tensed version of Lewis' modals.
- $[[\text{would}_R]]^{g \leq} = \lambda w \lambda t \lambda p: g(R) \text{ as below. } (\forall w') [(w \ g(R)_t \ w' \ \& \ \neg(\exists w''))$
 $[w \ g(R)_t \ w'' \ \& \ w'' <_w w'] \rightarrow p(w')(t)],$
 where $w \ g(R)_t \ w'$ iff w and w' have the same past up to time t .
 - $[[\text{could}_R]]^{g \leq} = \lambda w \lambda t \lambda p: g(R) \text{ as above. } (\exists w') [(w \ g(R)_t \ w' \ \& \ \neg(\exists w''))$
 $[w \ g(R)_t \ w'' \ \& \ w'' <_w w'] \ \& \ p(w')(t)]$

Would and *could* are one-place operators. Like any other verb they have a temporal variable. For the (metaphysical) accessibility relation R , see Lewis (1979). We have to relativize R to time, a point also made by Ippolito (2003) and others. Which worlds are accessible depends on the local evaluation time. In other words, the accessibility relation R gives us different facts at different times because we know different facts at different times.

Klein makes an important point that the “counterfactuality” expressed by *would* does not mean “false in the actual world”. In fact, without further restriction, the Lewisian one-place modals don’t add anything to the content. This is so because at each time *t* every world that is maximally similar to the local evaluation world while having the same past is the local evaluation world itself. This trivialization of the modals might be the reason for why we virtually never use them without a restriction (an *if*-clause).

- (12) It would be too late. (in a counterfactual sense!)
 = It could be too late.
 = It is too late.

I would think this is the key to an explanation for what Klein calls “the missing modus ponens” (see also Bennett 2003). According to Klein, from a counterfactual conditional *If the light were red, it would be too late*, we cannot add (*Now,*) *the light would be red*, and then proceed to (*Hence,*) *it would be too late*.

Indeed, it is hard to have intuitions about unrestricted counterfactual modals without Klein’s contextually provided topic situation. What does the isolated sentence *Now, the light would be red* actually mean? Klein – following Kratzer – still has a good point that the *if*-clause is not necessary for a counterfactual statement. It is an optional addition.

What is important for the tense-mood-system is that whenever we have an *if*-clause (or something similar) as a restrictor to the modal, we get temporal control in the sense that the subordinate time variable is bound from the matrix.

Semantic control is built into the meaning of the modals in (11) above. The semantic type of the prejacent must be a temporal property, and this must also be the type of the protasis. From the paraphrase in (13), we see that the *if*-clause is evaluated at the local evaluation time of the modal (“now”):

- (13) If the light were red, it would be too late.
 All the nearest worlds now in which the light is red now, are worlds in which it is too late now.

This is not an independent, deictic ‘now’, but a bound time variable. The protasis and prejacent of the modal are tenseless propositions interpreted via λ -conversion as if they contained a deictic present.

The highest semantic tense in the protasis will always be semantically empty, called TPRO (a covert temporal pronoun) in Grønn and von Stechow (2010). TPRO is also the highest embedded tense under attitudes in this theory. In both cases, we can apply S(equence)O(f)T(ense)-rules.

In order to get this machinery working, the *if*-clause is combined with the modal via a special rule, which is similar to the rule that combines a relative clause with its head noun, i.e. *Predicate Modification*. We call this rule *Modal Modification*:

(14) Modal Modification (MM)

Let α be a modal, R an accessibility relation, and let β be an *if*-clause (type $\langle s, it \rangle$).

$[[\alpha_R \beta]]^g = [[\alpha_R]]^{g^*}$, where g^* is like g with the exception that
 $g^*(R) = \lambda w \lambda t \{w' : w \ g(R)_t \ w' \ \& \ [[\beta]]^g(w')(t)\}$

This is a tensed version of Modal Restriction given in Kratzer (1981, 2012). The rule has an inbuilt temporal control device. The semantics of the modal and the rule MM force us to have bound tense in the *if*-clause. Otherwise, we would have a type mismatch.

We can reconstruct one or several *if*-clauses to a position adjacent to and c-commanded by the modal. If one *if*-clause modifies several modals, we simply copy it to the adjunct positions of the modals that are to be modified. Thus, the *if*-clause is subordinated to the modal at LF, and we have in fact regained the structural configuration from which we started in (5) and (6) above.

2 Challenges for compositionality

I have to disagree with Klein's claim that "The way how the compositional meaning of a sentence comes about follows the usual rules of English grammar and is not specific to the problem at hand." On the contrary, the counterfactual modals, the past tense in the protasis, and the perfect tenses all have a very special status.

The analysis of the temporal organisation of counterfactual conditionals is confusing for at least the following reasons. They have their own syntax, which is quite different from other constructions. Romance languages even have a special mood (e.g. *le conditionnel* in French) that is only used in these constructions. An outcome of this syntax is the phenomenon of tense transposition: Counterfactuals that speak about the present look as if they were in the past tense, and counterfactuals that speak about the past look as if they were in the pluperfect.

In our system of temporal control, the "fake past/perfect" will be an empty past/perfect due to agreement. Our claim that *would*-conditionals are semantic present statements, and *would-have*-conditionals are semantic past statements (or, sometimes, present perfect statements) is also found elsewhere in the literature, e.g. Ippolito (2003); however, her semantics of the counterfactual modals does not have temporal control built into the meaning, which is arguably essential for the compositional semantics.

2.1 Fake past

The most controversial issue in tense semantics for conditionals is the interpretation and analysis of the past tense morphology in *would* and *would have*-conditionals.

Klein adheres to a view popularised in Iatridou (2000): past tense morphology has an exclusion feature (ExclF) and points to a remoteness operator (<) in the temporal or modal domain.

The idea underlying these approaches is that the semantic Past brings us either to a remote (past) time or to a remote world. It is not obvious how the modal version should be spelled out. A merit of Schulz (2014) is that she makes the idea precise: In her technical implementation, the *would*-conditional brings us a little bit away from our world w_0 ; the *would have*-conditional brings us even farther. Temporally, both conditionals are semantically present since the modal past and real past are in complementary distribution. See also Schlenker (2004) for an explicit analysis along these lines.

The idea is nice, but if the past and perfect can be world shifters, then this raises the question where the quantification over worlds comes from. What would be the role of the necessity modal *would* versus the possibility modal *could* in such a system?

The modal approach also faces the problem that *would-have*-conditionals end up being semantically present. Empirical evidence from temporal adverbials shows that unlike ordinary *would*-conditionals, they are semantically past statements in most cases:

- (15) If Dickens had died in 1849, he would not have finished *David Copperfield*. (Klein)
- (16) If the light were red (*in 1849; OK: now), it would be too late. (Klein)

Finally, as pointed out also by Klein, a theory – like the past-as-modal approach – which asserts or presupposes that the protasis in *would-have*-conditionals is untrue in the actual world, will, obviously, have a problem with so-called Anderson-conditionals.

Thus, the approach that I will defend here rejects the idea that the semantic past brings us to a remote world. For an adequate analysis, one arguably has to separate quantification over worlds from quantification over times. The first is done by verbal quantifiers (modals), the second is done by semantic tense operators.

In our approach, counterfactual *would* quantifies over worlds, but there is more to it: *would* is a universal quantifier, we have a special accessibility relation and we

have to distinguish this modal from the counterfactual possibility modal *could*. The past-operator cannot do all these things alone. Furthermore, the evaluation of *would* can be shifted to a past time in *would-have*-conditionals. This would not be possible if the local past shifted the evaluation simply into remote worlds.

2.2 Real and fake perfect

The temporal structure of most English modals is obscured by the fact that they only have finite forms and have lost their non-finite counterparts. Accordingly, there is no transparent way to express a past tense modal (“#*must-ed*”). Most modals, including the subjunctive modals *could*, *should*, *ought* and *would*, must be shifted to a past time through the presence of an embedded infinitive perfect. At LF, we have the semantic perfect *have* above the finite modal. In a truly past counterfactual conditional, the perfect is therefore like a past:

- (17) [[HAVE]] as a relative past, i.e. $\lambda t\lambda P.(\exists t' < t) P(t')$

The main function of this perfect is to locate the necessity or possibility modal in the past by restricting the time variable of the accessibility relation of R.

A transparent semantics wants to have the perfect auxiliary above the modal. German or French surface syntax is parallel to a transparent logical form, while English is misleading: The surface syntax reverses the expected hierarchical order with the modal above the perfect auxiliary. At LF, we have to switch the relative hierarchy:

- (18) HAVE(NOW) would/could(protasis)(prejacent of apodosis)

In Arregui (2009) *would-have*-conditionals are analyzed in situation semantics. In that theory, *would-have*-conditionals are out-scoped by a semantic past (denoting a particular situation).

- (19) *would-have*-conditionals in Arregui (2009)
PAST(NOW) would(protasis)(prejacent of apodosis)

Semantically, the two approaches come to the same, but the compositional contribution of *have* is obscure in Arregui's approach.

In the theory sketched here, we allow for the perfect also to have local scope inside the apodosis (20) or protasis (21):

- (20) If this book were boring, I would not have recommended it. (Klein)

- (21) If Ito had eaten the fish, he would now be dead. (Klein)

The main semantic tense in both cases is the present. The local perfect in counterfactual conditionals can have different flavours (relative past, resultative perfect or extended now) depending on your favourite theory for the perfect (Grønn and von Stechow 2020).

Arregui (2007) provides some counterexamples to a treatment of *would have*-conditionals as having a perfect (relative past) out-scoping the bare conditional. Her examples involve real perfects which seem to occur locally in the conditional. This is precisely the kind of examples we have in mind when we acknowledge the presence of local perfects in the protasis and apodosis.

Arregui analyzes *have* as a stativizer. In Grønn and von Stechow (2020), we argue that the perfect can also be a relative past (anteriority reading) or extended now (true perfect). In this respect, our account is different from the one in Arregui (2007).

But there is yet another reading of the perfect: the identity reading, or the fake/empty auxiliary.

- (22) If Dickens had died in 1849, he would not have finished *David Copperfield*.
(Klein)

Note that *had* in the protasis does not contribute to the meaning. This is one of the mysteries of the protasis in ordinary *would have*-conditionals: Both layers of past in the protasis in (22) are in a sense tenseless.

We thus have three structures where the perfect is involved:

1. A relative past *have* in the apodosis out-scopes *would* at LF, and *had* in the protasis is semantically fake.
2. A real perfect *have* remains in the scope of *would*, i.e. the entire conditional is out-scoped only by NOW, cf. ex. (20).
3. A real perfect *had* is interpreted locally inside the protasis, i.e. the entire conditional is out-scoped only by NOW, cf. ex. (21).

3 Feature system

In this section, we will explain how we obtain the correct LF from surface syntax. Given the puzzling anti-past behaviour of tense/perfect in counterfactuals, a feature theory that licenses the temporal morphology will be outlined.

As pointed out by Klein, “To the extent possible, such an analysis should conform to the linguistic make-up of the sentence and only operate with grammatical rules that are needed anyway.” Indeed, the principles of the theory below have been independently motivated in von Stechow (2009) and applied to SOT in complements under attitudes in Grønn and von Stechow (2010). I refer the reader to those papers for additional details and explanations.

We will make crucial use of feature pairs iF/uF, where iF is the interpretable feature, and uF is the uninterpretable counterpart. The i-features are carried by semantic operators, which may be overt or covert. A semantic operator transmits its i-features to the variables it binds, so-called *feature transmission under binding*. The u-features are licensed under agreement, possibly multiple agreement, by an i-feature. The transmitted/licensed feature has to be in the *semantic* domain of the operator. In the case of one-place operators, this is the c-command domain.

The features needed here are: [n] “now”, [p] “past”, [perf] “perfect” and [sub] “subjunctive”. The features are prefixed by i- (interpretable) or u- (uninterpretable). If the time variable is an argument of a finite verb form, the u-feature on the variable has to agree with the inherent morphology of the verb.³

On this view of the form-meaning interface, tense morphology is semantically empty and licensed by covert operators under agreement. What about subjunctive morphology? One thing I have not discussed so far is the subjunctive in cases like *if the light were red*.

For Klein, the finite verb of the protasis is *always* in the subjunctive, since “the English simple past and the subjunctive in the protasis have become identical in form (except for *was/were*)”. Klein sees this “more as a terminological issue than as a content question”.

However, as pointed out recently in Arregui (2020), “there is converging agreement that the verbal morphology we see in the embedded clauses of so-called “subjunctive” conditionals in English, including counterfactuals, is actually temporal morphology and not subjunctive mood morphology”. The point is that we consistently find fake past morphology in counterfactuals cross-linguistically and not necessarily the subjunctive forms, even in languages with morphologically robust subjunctive paradigms. Therefore, it makes more sense to treat the form *were* as the exception, a remnant of an earlier system.

In our approach, the u-features will be exactly what we see on the surface. The subjunctive has no meaning by itself. It is morphology (*were*) and a reflex of semantic operators like *would* (or *could*). Crucially, we need a feature like [sub] in order to distinguish the temporal interpretation of past forms in counterfactual conditionals from those in other contexts.

³ Strictly speaking, there are two kinds of u-features: transmitted versus inherent/morphological. I will distinguish between the two in my figures below by putting the transmitted features in parenthesis, e.g. (u-past) versus the morphological feature u-past.

3.1 Present counterfactuals

Here is an LF and feature analysis of a concrete example:

- (23) If the light were red, it would be too late.
 $N \lambda_1 \text{ would}_R(t_1) (\text{if } \lambda_2 \text{ light were}(t_2) \text{ red})(\lambda_3 \text{ it be}(t_3) \text{ too late})$
i-n	i-p	(u-n)		u-p	(u-p)
	i-sub			u-sub	(u-sub)
	—————				

Counterfactual modals like *would* are treated as overt, semantic operators which carry the interpretable feature combination i-past, i-subjunctive. The modal does not have an inherent morphological uF. In the example above, the temporal variable of the modal, the time of the accessibility relation R , receives a present tense feature (u-n) from the deictic NOW. Semantically, the construction is therefore present. The u-now feature on the operator is blocked there and not transmitted any further because it is in conflict with i-past of the same operator. Due to temporal control, the present interpretation still gets into the *if*-clause and the preajcent.

In the semantic binding domain of *would*, we encounter the form *were* in the *if*-adjunct. Recall from Section 1.3 that temporal control is inherited by the adjunct clause through modal modification. The verb form *were* has two inherent morphological features, past and subjunctive, which appear as u-features on the temporal variable t_2 where they can be checked against the i-features of *would*. Hence, the past subjunctive of *were* is licensed and semantically empty. We have basically applied the SOT-rules from Grønn and von Stechow (2010).⁴

Let me enumerate five relevant principles behind the feature system in view of what we have just seen:

- P1. An iF of a semantic operator (e.g. i-past, i-sub of *would*) is transmitted under binding as an uF to a variable bound by the operator.
- P2. For each lexical entry with an inherent uF (e.g. u-past, u-sub of *were*), there must be an overt or covert semantic operator with a corresponding iF (e.g. i-past, i-sub of the overt *would*).

⁴ Arregui (2009) also advocates an SOT-approach in order to explain the morphology in the protasis. Schulz (2014), inspired by works of von Stechow and his collaborators, explores the parallel with SOT (or, rather, “sequence of mood”, in her approach): “Conditionals are generally analyzed as intensional contexts, and the literature on SOT agrees that intensional constructions give rise to SOT phenomena. [...] In order to make the argument in favour of an SOT analysis work, one would still need to show that the *if*-clause of subjunctive conditionals is embedded under the tense of the matrix clause” (p. 122). This is precisely the idea behind temporal control and modal modification.

- P3. An iF of an overt operator does not require the presence of an inherent uF in its semantic domain. A clear case is i-sub of *would*, which only has a function in the system when the form *were* with the inherent feature u-sub surfaces in the *if*-clause. Typically, we find indicative past forms in the protasis, and [sub] is then neutralised.
- P4. Verbs, adjectives and operators in general transmit features to the variables they bind provided there is no competition with an inherent i-feature of the operator. Thus, if an operator has a feature iF and it inherits uF' via binding, it does not transmit uF' into its semantic domain. For example in (23), *would* inherits the feature (u-n) which is in conflict with its own semantic tense feature i-past. The feature (u-n) is therefore not transmitted further.
- P5. Lexical entries can be unmarked with respect to F. The counterfactual modals *would*, *could*, non-finite verbs etc. don't have inherent, morphological u-features.

3.2 Past counterfactuals

If-adjuncts under verbal quantifiers like *would* are subject to the SOT-parameter, but that is not enough to explain away the second layer of past tense in the protasis of Germanic and Romance languages.

- (24) If Dickens had died in 1849, he would not have finished David Copperfield.

How is the perfect auxiliary justified? The problem with this construction is that *had* in the *if*-clause must be semantically void, because the matrix *have* shifts the entire construction into the past and the *if*-clause is not temporally back-shifted with respect to the main clause. In some sense *had* is an agreement phenomenon with the shifting of *would* toward the past.

The special status of these constructions is evident from the existence of a separate paradigm in Romance – the conditional has its own grammar. Hence, we

should not be too surprised to find construction specific rules. The stipulation in the LF for (24) is simply that *had* in this construction comes with a u-perf feature⁵ and is licensed and deleted by i-perf under binding. This is how we express the idea that *had* is in a pure agreement with the matrix *have*.

In other words, when we do the standard decomposition of *had* as *Past + have*, our account says that the first layer is deleted as a fake past, and the other layer is uninterpreted as well.⁶

The assumptions made so far are not sufficient to rule out sentences with a simple past in the protasis as a *would-have*-conditional:

(25) (??) If Dickens died in 1849, he would not have finished *David Copperfield*.

The feature checking is OK in accordance with the predictions of our system. The sentence has precisely the meaning one wants for a *would-have*-conditional, and it doesn't contain the semantically inert *had*, which we find in Klein's original example (22). Still, (22) is clearly preferred over (25). The construction without *had* is not accepted by school grammars.

The construction with an empty/fake *if...had* is found in most Germanic and Romance languages, and is presumably a pragmatic/stylistic phenomenon: a device to signal that *have* in the apodosis must have scope over the main modal. If a deeper motivation for the presence of the auxiliary in the protasis could be given, that would point to a weakness of our account.

3.3 Some interesting properties of *would* under attitudes

The feature i-past originating with an operator *would* that is not a semantic past, encodes the fact that we observe *tense transposition* in counterfactual conditionals, i.e. statements that look like past statements are semantically present. Similarly, we expect that counterfactual conditionals that look as if they were pluperfect statements are past statements. This is what we find in ordinary *would-have*-conditionals.

From the point of view of feature assignment, *could* is analysed exactly as counterfactual *would*. However, as Klein points out, there are other versions of *would*, e.g. the temporal *would*, known from school grammar as *the future in the past*. Let's call the latter *would2* and distinguish it from the counterfactual *would1*.

⁵ This is not to be confounded with a subcategorization feature, something that is ignored in this paper. The system presented here does not encode the fact that the perfect auxiliary subcategorizes for a past participle.

⁶ An equivalent, alternative way of expressing this in our system is to say that *had* with the feature combination u-past, u-sub can (optionally and typically) be interpreted as identity: $\lambda t \lambda P.P(t)$.

Semantically, the forward shifter *would2* is the mirror operator of the relative past, the backwards shifting perfect we encountered in (17) above.

(26) $[[\textit{would2}]]$ as a relative future: $\lambda t\lambda P.(\exists t' > t) P(t')$

However, there is an interesting difference in the u-features between the lexical entry in (26) and the matrix use of *had*. Therefore, I cannot fully agree with Klein when he writes about the temporal *would2* that “it can designate a time after a past time, just as the pluperfect designates a time before a past time”.

Unlike the pluperfect, *would2* is typically blocked in main clauses:

(27) John *had* forgotten his money, when he entered the bar. (backwards shift)

(28) (?? On an episodic reading) When John entered the bar, he *would2* order a beer. (forward shift)

In our system, the difference between *would2* and *had* is explained by the features. The temporal auxiliary *had* carries a feature u-past which is checked by a covert operator PAST with the feature i-past. On the other hand, *would2* has the inherent feature combination u-past, u-sub, but there is no subjunctive operator in (28) that could license u-sub.

So when do we use *would2*? Under past attitude verbs (Abusch 1997)!

(29) Mary said: “it will be too late” → Mary said that it *would2* be too late.

Attitude verbs are known to be intensional and embed temporal properties; hence we get the following feature distribution in a standard SOT configuration:

(30) PAST Mary said that it *would2* be too late.

i-p	u-p	u-p	(u-p)
	i-sub	u-sub	(u-sub)

The feature i-sub on the attitude verb, an overt operator, is normally not articulated by morphology in the complement clause in English and can be ignored (cf. principle P3 in Section 3.1), but in (29/30) we clearly need it to license *would2* in the complement.

Attitude verbs and their complements can also inform us in non-trivial ways about the temporal properties of the counterfactual *would1*.

Recall that the counterfactual operators *would1/could* have the feature combination i-past, i-sub. We know (also from the discussion in previous sections) that counterfactual *would1/could* cannot have an inherent/morphological u-past feature since the construction cannot be modified by a past time adverbial:

(31) * PAST Yesterday it *would1*(t) be too late.

i-p	i-p	u-p
	i-sub	

Works in tense semantics within this framework, e.g. von Stechow (2009) and Grønn and von Stechow (2016), have established that the covert semantic operator PAST must be made visible through a corresponding inherent morphological u-past.⁷ The features would be OK in (31), but it is an empirical fact that the configuration does not exist in English. Hence, *would1* cannot have an inherent u-past feature.

Now comes the interesting point. We have seen that *would1* is semantically present in Klein's examples, but could *would* have an inherent present feature u-now? The answer is no, as we see from counterfactual conditionals embedded under past attitudes:⁸

- (32) N PAST Mary believed that *would1*(t) (if the light were red) (be too late).
 i-n i-p u-p i-p (u-p) u-p (u-p)
 i-sub i-sub (u-sub) u-sub (u-sub)

In (32), the temporal variable of *would1* must receive the feature u-p from the matrix PAST, the closest temporal operator. There is no other option. This shows that *would1* cannot be an inherent present despite our informal talk of *would*-conditionals as being semantically present. Furthermore, if *would1* were inherently present, we would expect to encounter the special *double access* reading since this is what is observed for present tense complements under past attitudes in English (Abusch 1997). But this is not what we find in (32). The conditional only has a simultaneous reading with the attitude verb.

Note also that the embedded *would1*-conditional in (32) cannot be backwards shifted under the past attitude, which would be expected as a possible reading if *would1* had an inherent u-past feature. So in some sense, counterfactual *would* (*could*) must be semantically tenseless, i.e., it cannot be classified as a plain present or as a plain past. It follows from this that we can insert the same counterfactual also under the present form *believes* in (33). The feature distribution is different, but we obtain the same simultaneous reading as in (32):

- (33) N Mary believes that *would1*(t) (if the light were red) (be too late).
 i-n u-n i-p (u-n) u-p (u-p)
 i-sub i-sub (u-sub) u-sub (u-sub)

The system presented here can account for the empirical fact that neither the modal nor temporal *would* can be immediately bound by a semantic PAST, but both are perfectly fine under past attitudes. The modal *would1* is tenseless and cannot make

⁷ The i-past of *would1* can obviously not check its own u-feature.

⁸ For the record, we note that i-sub on the attitude verb in the two examples here is not really needed, because it is overwritten by i-sub of *would1*.

i-past visible on past; the temporal *would*₂ has a u-sub feature that must be licensed in addition to u-past.

To sum up, we have developed a feature system using the following time and mood features, which arguably play an essential role in counterfactual conditionals:

1. [i-n] originates with the semantic present N.
2. [i-p] originates with the semantic past and counterfactual modals like *would* and *could*.
3. [i-sub] originates with verbs of attitude and counterfactual modals like *would* and *could*.
4. [i-perf] originates with the temporal auxiliary *have*.

Klein makes a point that an approach looking only at the overall meaning of the construction, say, the truth-conditions of counterfactual conditionals, could be “disastrous for the linguist who has to explain how this overall meaning results from its components”. This is why I have dragged the reader of this commentary into the tedious details of semantic and morphological features at the interfaces.

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