When the Present is all in the Past*

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1. Introduction

This paper is concerned with English sentences where a present tense embedded under a past tense need not refer to the utterance time (t*). Such sentences are illustrated in (1):

(1) a. The medieval monarch King Richard said that he would let his daughter marry any knight who come**s** back from the Third Crusade.
   b. Caesar declared that he would execute any senator who stir**s** up rebellious sentiment in the Roman Empire.
   c. After the battle of Bunker Hill, Washington said that he would promote a soldier who ha**s** fewer than five wounds in order to bolster morale.

   In (1a), the relative clause present tense (on *comes back*) is interpretable as simultaneous with the embedding sentence past tense (i.e., the *letting* time) and not with t* (i.e., today: May 2, 2005). Similarly, the present tense in (1b) and (1c) need not include t*.
   These facts are puzzling on any current theory of tense, as they all predict that (in English) a present in the scope of past has to overlap t*, given the interpretation of sentences as in (2):

(2) a. Two weeks ago, Jon met a student who lives in Tokyo.
   b. Jon said (#two years ago) that Sue is pregnant.

   (2a) is felicitous only if there is a student who lives in Tokyo during an interval overlapping t*. (2b) is a classic double-access sentence where Sue's pregnancy overlaps both t* and Jon's speech time (modulo intensional concerns).
   We show that current analyses of tense cannot handle the facts of (1), and in particular, that theories of tense where the English present has an indexical component (because of sentences like (2)) are not rescuable.

Sentences of type (1), which we call *Present-in-the-Past* sentences are licensed under very specific conditions: the present must be (i) embedded under a future-oriented modal (such as *woll*[1]), (ii) in a non-specific relative clause (i.e., in contrast with CP complements of attitude verbs). We show that this distribution can be straight-forwardly accounted for, once we make the theoretical move that there are polarity relations between tenses.

Specifically, we propose a new analysis of tense where (i) the present tense (henceforth PRES) is an anti-PAST Polarity Item, in that it cannot be in the scope of a PAST tense, following Stowell's (1993) insight; (ii) the future *woll* is a polarity intervener (cf. Kroch 1979, Szabolcsi 2002); and (iii) a semantic type restriction on the tense of the complement of an attitude verb (cf. Kratzer 1998) forces a PRES under a PAST to scope out of an embedded CP, and thusly escape the protective domain of the polarity intervener.

This paper is organized as follows: in Section 2 we describe the classic and novel data involving English present under past sentences. We discuss short-comings of previous theories of tense in Section 3. Section 4 proposes a new analysis of tense.

2. The Data

2.1. English PRES under PAST (the classic picture)

English PRES, when embedded under a PAST, seems to have the peculiar property of forcing the event time to always include t* (and possibly more), yielding double-access sentences such as (2b), repeated below:

(2b)   Jon said (#two years ago) that Sue is pregnant.

The (alleged) state of pregnancy has to overlap both the time of Jon's speech act and t*. Note that in a non sequence-of-tense language (like Japanese), PRES would only require the pregnancy to overlap Jon's speech time.

When PRES is in a relative clause embedded under a matrix PAST, it also must overlap t* (note however that, in this case, it doesn't have to overlap Jon's speech time):

(3)   Jon said that he met a woman who is pregnant.

As pointed out by Ogihara (1989) and Abusch (1988), *et seq*., this sentence

requires a *de re* reading of the DP containing the relative clause, which suggests a correlation between scope-taking mechanisms of DPs and the licensing properties of tense in relative clauses.

In sum, an English PRES embedded under a PAST in both relative clauses and CP complements shows a requirement to overlap t*. However, CP complements with PRES force a double-access reading, while relative clauses obligatorily refer to t* alone and are read *de re*. This suggests that the mechanisms for interpreting PRES under PAST in complement CPs must be different from the scope-taking explanation for relative clauses.

2.2. PRES under PAST *(novel data)*

While our puzzle sentences in (1) have a *de re* reading (ignoring felicity concerns) just like (3), they also have a second reading which (3) lacks, namely, the *de dicto* reading of (4):

(1c)   After Bunker Hill, Washington said that he would promote a soldier who has fewer than five wounds.

(4)   After Bunker Hill, Washington said that he would promote a soldier who **had** fewer than five wounds.

(1c) and (4) share a reading where the state of having fewer than five wounds holds during promotion time after Bunker Hill, but *not* in the present day. For (4), this is analyzed as a case of sequence of tense, where the past tense on *have* is semantically vacuous (through a deletion (Ogihara 1996) or morphological agreement (Schlenker 1999) rule, triggered by a higher PAST). However, this sequence-of-tense (SOT) rule is not an option for (1c), given that there is no c-commanding PRES that could trigger such a rule. Hence, something else must be responsible for the availability of (1)'s *de dicto* reading.

2.3. *Conditions on* Present-in-the-Past

There are specific conditions which license *Present-in-the-Past* sentences. First, it appears that a future-oriented verb needs to intervene between PRES and a matrix PAST. Hence the *de dicto* reading in (1c) is also available when other future-oriented attitude verbs replace *woll*:

(5)   After Bunker Hill, Washington {<u>wanted, expected</u>} to promote a soldier who has fewer than five wounds in order to bolster morale.

However, the extra reading of (1) is unavailable with non future-oriented embedding verbs (such as *try*):

(6)   #After Bunker Hill, Washington <u>tried</u> to promote a soldier who has fewer than five wounds in order to bolster morale.

The availability of this reading is also sensitive to the specificity[2] of the relative clause's head. If a specific reading is forced by using a determiner like '*the',* the sentence becomes infelicitous (PRES has to overlap t*):

(7)   #After Bunker Hill, Washington said that he would promote <u>the soldiers</u> who have fewer than five wounds.

Finally, the availability of this reading of PRES is unavailable in complement CPs of attitude verbs (i.e., in contrast with relative clauses). The sentence in (8) is infelicitous because it has to be interpreted double-access:

(8)   #After Bunker Hill, Washington promised that he would say [$_{CP}$ that his generals are no longer required to serve in the army].

The generalization that emerges from these facts is described below:

> **GENERALIZATION**: An embedded English PRES requires the event time to overlap with t* when in the scope of a matrix PAST, unless it is in a relative clause which is:
> (i) non-specific; and (ii) embedded under a future-oriented verb.

3. Problems with Current Analyses of Tense

The punchline of this section is simple: all previous analyses of tense reduce Present-in-the-Past sentences to the cases of PRES under PAST discussed above, and as such are inadequate.

All theories of English tense argue that a (non-vacuous) PRES in the scope of a PAST is ill-formed. Ogihara (1996), Abusch (1997), and

Schlenker (2003) assume some form of Abusch's (1993) Upper Limit Constraint:

(9)   **Upper Limit Constraint** (ULC): The tense of the embedding clause is an upper bound on the tenses in subordinate clauses. (Abusch 1993)

Abusch (1993) motivates the ULC based on the observation that sentences such as (10a) cannot be understood as in (10b).

(10) a. Sue believed that it was raining.
      b. Sue believed that it would rain.

Informally, the believing event of Sue in (10) cannot strictly precede the raining event without the presence of a future element (e.g., *would*).

Note that in considering (3), we already saw one way of rescuing a potential ULC violation: movement. However, as that correlated with *de re* interpretation of the DP containing the offending PRES, while the *Present-in-the-Past* sentences do *not*, we cannot appeal to DP movement to explain these. In other words, it seems that the PRES has to stay where it is, and our best bet is to play with the interpretation of PRES itself.

3.1. Indexical Accounts of PRES

Ogihara (1996), Schlenker (2003), and von Stechow (2003) all assume PRES has an indexical component, like (11):

(11) $[\![\text{PRES}_j]\!]^{c,i,g} = g(j)$ iff $g(j) \cap t^*$, else undefined. (Schlenker 2003)

The key fact motivating an indexical reading is that in English a PRES under PAST cannot get a simultaneous reading, which follows if PRES is always utterance-indexical. The obligatoriness of double-access readings follows from the ULC (the standard derivation of double-access readings is a *de re* interpretation of the lower PRES; see section 4.2.4). Suspending the ULC in *Present-in-the-Past* environments will *not* get the correct reading, as the PRES will be utterance indexical (hence in (1a) the knight would be returning *now* from the Crusades). What we want is to remove the presupposition PRES contributes.

Such a mechanism is needed independently by indexical theories to

handle a present tense under *will*.

(12)   Sue will think that her husband is a doctor.

   In a context where Sue is an unmarried child, (12) is still felicitous, even though (11) would require her to have the belief that her future husband is a doctor *now*. Such non-indexical PRESs are explained in indexical accounts by Tense "Deletion," which removes the indexical presupposition:

(13) $[[\varnothing\text{PRES}_j]]^{c,i,g}$ = g(j) iff g(j)∩TIME(i), else undefined.

The distribution of (11) and (13) is governed by Tense Deletion licensing constraints, which descriptively allow a $\varnothing$PRES only in the immediate scope of another PRES.[3] This does not arise in the Present-in-the-Past examples. We may, of course, add the environment of 2.3 as a subcase for Tense Deletion, but this would only amount to restating the problem.

3.2. Abusch (1998): a digression

Abusch (1998) attempts to handle the future-shifting effects of (12) given unified semantics for PRES. She assumes the following (using the formalism presented above), where PRES is the $\varnothing$PRES above:

(14) a. $[[\text{PRES}]]^{c,i,g} = \lambda Q_{it}.\ Q(\tau)$
      b. $[[\text{PAST}_j]]^{c,i,g} = \lambda Q_{it}.\ Q(-\infty, g(j))$ iff g(j) ⊆ τ; else undefined.
      c. $[[\text{woll XP}]]^{c,i,g} = \lambda t.\ [[\text{XP}]]^{c,i',g}$, where i' = <w, (t, ∞)>

   Woll serves to shift the local evaluation time to a final segment beginning at some time *t* (specified by the higher tense), and so Abusch's (1998) system correctly derives our *Present-in-the-Past* reading (the final future shifted interval would be (g(j), ∞)). There are, however, two problems. First, the system predicts that *Present-in-the-Past* should hold for complements as well as adjuncts; this is not so. More importantly, it is unclear how the system of Abusch (1998) drives the semantics of double-access configurations. In her 1998 framework, it is argued that double-access sentences have the LF in (15):

(15)   PAST$_j$ [Sue say $\lambda\tau.[[\text{PRES [it be raining]]]}^{c,<w,\tau>,g}$]

Thus, attitude verbs bind the evaluation time of the complement clause. This seems sensible, and indeed, we adopt it later on in our own analysis as the proper formulation of the ULC (cf. Kratzer 1998). However, as PRES simply asserts that the event time is the evaluation time, (14) gives us a *simultaneous* reading for double-access sentences (modulo whatever mediating relation between the matrix clause now and the belief worlds' nows). This unfortunate derivation proceeds in the manner it does precisely because there is nothing in the grammar forbidding a PRES in the scope of a PAST.[4] In sum, Abusch (1998) is both too weak (no complement-relative clause difference for *Present-in-the-Past*) and too strong (does not derive double-access readings).

4. Proposal

We propose a new analysis of tense, which uses two ingredients from previous analyses: polarity (cf. Stowell 1993) and a semantic restriction on tenses of embedded complements (cf. von Stechow 1995, Kratzer 1998). In a nutshell, we claim that there are polarity relations between tenses. Specifically, PRES is an anti-PAST polarity item: it cannot be in the scope of a PAST. Future modals act as interveners in this polarity relation, by protecting an illicit PRES: PRES under *woll* doesn't need to escape the scope of matrix PAST. The second ingredient is a restriction which states that the tense of a complement of an attitude verb must be bound: it either needs to be deleted (SOT), or it needs to move out by *res* movement. This *res* movement scopes above the intervening domain of *woll*, such that a future can no longer intervene between matrix PAST and a *res* moved PRES.

4.1. Overview of von Stechow (1995)'s Theory of Tense

Our analysis is couched within the framework of von Stechow (1995), a referential theory of tense. This system postulates a distinguished time variable $t_0 = g(0)$ (cf. Heim 1994): when it is free, it denotes t*; in an intensional domain, it gets bound by lambda abstraction and serves as a local evaluation time.

The tense morphemes can either be free or bound. Free and bound morphemes share the same morphology.

- "free" tense morphemes are generalized quantifiers which use t_0 as a reference time:

(16) $[\![\text{PRES}_j]\!]^{c,g} = \lambda P_{it}. \; g(j) \cap g(0) \wedge P(g(j))$
        $[\![\text{PAST}_j]\!]^{c,g} = \lambda P_{it}. \; g(j) < g(0) \wedge P(g(j))$

- "bound" tense morphemes are anaphors that refer to the distinguished time t_0:

(17) $[\![\varnothing\text{PRES}]\!]^{c,g} = g(0) = [\![\varnothing\text{PAST}]\!]^{c,g} = [\![\varnothing\text{-FUT}]\!]^{c,g}$.

The bound tense morphemes are the result of an LF Tense Deletion rule (cf. Ogihara 1989, 1996, Schlenker 1999):

(18)   **LF Deletion Rule**: A tense can be deleted under c-command by a tense of the same type.

We will further make use of a version of Abusch's ULC, which forces tenses in intensional domains to get bound. The reformulation we use is that of Kratzer (1998), which differs from that of von Stechow (1995) in that, only the highest tense is bound (and not any tense within the complement). As we will see, Kratzer's formulation allows tenses of relative clauses to either be free or bound. This is crucial if we want to account for the differences between tenses in relative clauses and CP-complements of attitude verbs. Note that this requirement on tenses of complements of attitude verbs follows without stipulation, given the lexical properties of attitude verbs: the information that they need complements that denote properties of time is part of their semantics (attitude verbs are of type $<<i,st>,<e<i,st>>>$ that is, they quantify over world-time pairs, not just worlds). Abusch's constraint is thus formulated as follows:

(19)   **"Abusch's Constraint"**: The highest tense of an attitude context must be bound. (Kratzer 1998)

Finally, we will use the following lexical entry for future *woll* (from von Stechow 1995):

(20) $[\![woll]\!]^{c,g} = \lambda t \lambda P_{it}. \; \exists t' > t \; [P(t')]$

We treat *woll* as a tense (not a modal) which selects for a tenseless clause, headed by $\varnothing$-FUT (the tense shifted forward of the reference tense by *woll*). In contrast with PRES and PAST, *woll* (like perfect HAVE) takes an additional time argument, as a time of reference for the time shifted forward.

4.2. Accounting for *Present-in-the-Past* Sentences

4.2.1. Relative Clauses 101

We start by accounting for the relative clauses cases. Let's first look at a sentence with a PRES in the scope of a matrix PAST where no future auxiliary intervenes:

(21) a.   Jon said that he met a woman who is pregnant.

Recall Abusch's Constraint, which forces the *highest* tense of the complement of an attitude verb to be bound. Because of this specific formulation, a free tense in a DP does not have to scope out, even though it is in an attitude complement. This gives rise to the following (simplified) LF for a PRES in a relative clause under a PAST:

(22) b.   [PAST$_1$ λt_2 Jon say λt_0 λw [$\varnothing$PAST he meet [a woman who PRES$_4$
      λt_3 be pregnant at t_3] at t_0] at t_2] $\downarrow$
                                                             t_0

    c.   [Jon say λt_0 λw [he meet [a woman who is pregnant at $t_4 \wedge t_4 \cap$
      t_0] at t_0] at $t_1 \wedge t_4 < t^*$]

The $\varnothing$PAST is the result of the LF deletion rule in (18). The movements of PAST$_1$ and PRES$_4$ are driven by type reasons (as for any generalized quantifier); von Stechow assumes that when these quantifiers move they bind the distinguished variable t_0, which in the matrix context is identified with t^*, and in general is used as the reference time for free tenses.

Importantly, because of Kratzer's reformulation of Abusch's Constraint, (22c) is a well-formed LF, and the time denoted by relative clause PRES doesn't need to overlap with t^* (it actually overlaps with counterparts of the saying time picked out by the attitude verb's accessibility relation). This is clearly not what (22a) means.

To explain the ill-formedness of (22c), we adopt Stowell's (1993)

proposal that polarity is involved,[5] specifically, by assuming that the free PRES is an anti-PAST polarity item, which cannot be in the scope of a PAST.

4.2.2. Present is an anti-Past Polarity Item

We propose the following anti-PAST polarity relation:

(23)   **Tense polarity**: PRES cannot be c-commanded by PAST.

The polarity relation in (23) is illustrated in the example below. The PRES in the relative clause is in the scope of the matrix PAST:

(24)   Jon said that he met a man who lives in Tokyo.
(25)   [PAST   [relative PRES]]

                                *

The way this violation is resolved is by QRing the DP containing the relative clause:

(26)   [DP [relative PRES]]i [PAST .... ti ....]

This analysis naturally captures the fact that the DP in (24) can only be interpreted *de re*, as discussed in section 2.1. If it were interpreted *de dicto* and stayed *in situ*, it would create a temporal polarity violation. (Though see Kusumoto (1999) for empirical problems for a scope-taking view of relative clause temporal independence).

4.2.3. Intervention Effects

The NPI literature offers several examples of intervention effects in polarity relation. Kroch (1979) first observed, for instance, that positive polarity items may appear in the scope of negation, provided a quantifier intervenes between the two (cf. Szabolcsi 2002):

(27) a. {Not every student, No one} said something.
                                    [✓not>every>some]
      b. I don't think that Jon didn't call someone.
                                    [✓not>not>some]

We propose that in the temporal domain, there can also be intervention effects in polarity relation. Specifically, we propose that for *Present-in-the-Past* sentences, the intervener is not a quantifier but the future *woll*.

(28)   **anti-PPI blocking (to be revised)**: *woll* acts as an intervener between a PAST tense and a PRES in its scope.

This intervention effect is what rescues our *Present-in-the-Past* sentences: the PRES which was in the scope of a matrix PAST is now protected by the intervener *woll*. This is informally represented in (29):

(1c)   Washington said that he would promote a soldier who has fewer than five wounds.

(29)   [PAST ... *woll* ... [$_{relative}$ PRES]]

Now in formal terms, (30a) is the LF of (1c):

(30) a. [PAST$_1$ G.W. say λt_0 λw [$_\alpha \varnothing$-PAST he woll λt_0 [$\varnothing$-FUT promote [a soldier who PRES$_4$ has >5 wounds]]]]

b. [PAST$_1$ λt_2 G.W. say λt_0 λw [$_\alpha$ he woll λt_0 [promote [a soldier who PRES$_4$ λt_3 has >5 wounds at t_3] at t_0] at t_0]at t_2]

c. [G.W. say λt_0 λw [$_\alpha$ he woll λt_0 [promote [a soldier who has >5 wounds at $t_4 \wedge t_4 \cap t_0$] at t_0] at t_0] at $t_1 \wedge t_1 < t^*$]

d. [G.W. say λt λw [$_\alpha$ he woll λt' [promote [a soldier who has >5 wounds at $t_4 \wedge t_4 \cap t$'] at t'] at t] at $t_1 \wedge t_1 < t^*$]

(30d) gives the truth conditions we want for *Present-in-the-Past* sentences: a relative clause PRES is interpreted as overlapping the promotion time, which is future-shifted with respect to the saying time. However, without (28), (30d) violates the polarity condition in (23), since the relative clause PRES$_4$ is c-commanded by the matrix PAST$_1$. We propose that (30d) is well-formed because of the intervention of future *woll*, which neutralizes the illicit scopal relation between PRES and PAST.

Finally, note that in a sentence such as (1c), a DP still has the option of QRing, yielding a *de re* reading (giving rise to the infelicitous reading of (1c)). This is in fact what obligatorily occurs with specific DPs (in (7), repeated below):

(7)　　　Washington said that he would promote <u>the soldiers</u> who have fewer than five wounds.

(31)　　　[PAST … *woll* … [SPEC DP [relative PRES]]

In (7) the DP has to move outside of the VP domain for specificity reasons. Indeed, according to Diesing (1992), weak determiners have to be VP-internal, as they contain a variable that must be bound by existential closure (provided at the VP-level). In contrast, a definite/strong quantifier must move outside of the VP, forcing QR. Our analysis of tense seems to provide evidence for such a split: we have seen that when the DP contains an indefinite, it may stay in situ in order to prevent PRES from violating past polarity conditions. When we allow QR of the indefinite, the sentence receives an interpretation where PRES overlaps t*. Crucially, the DP then presupposes the non-emptiness of its restrictor. Correspondingly, we can make sense of the sharp intuition that, when the DP is introduced by a definite (as in (7)), it must mean that there exists a particular plurality of soldiers and that they must have fewer than five wounds. This fact is not surprising in the light of Diesing's proposal: a definite/strong determiner must undergo QR.

Diesing's proposal only requires that the strong determiner moves out of VP. The tense facts discussed above force movement in fact above T, otherwise PRES would still be shielded from matrix PAST by the intervening *will*. If QR is above T, the polarity conditions are violated: the DP must raise further up and the reference time of the relative clause is t*, in accordance with the judgments. This has the interpretative consequences that the DP is interpreted specifically and the present overlaps t*.

In sum, a PRES in a relative clause embedded under a matrix PAST can be licensed *in situ* if a future intervenes between the present and the past, unless the DP containing the relative clause has to move for independent reasons (e.g., specificity). We have explained this fact in terms of polarity relations in the temporal domain: PRES is an anti-PAST Polarity Item and future *woll* acts as an intervener in this polarity relation.

4.2.4. Explaining Complements

We now turn to complements of attitude verbs. Ordinary PRES under

PAST seems to violate the same polarity restriction as relative clauses, schematized in (33):

(32)   Jon said that Sue is pregnant.
(33)   [PAST ... [$_{CP}$ PRES   ]]

                        *

However, contrary to the earlier relative clauses examples, a complement CP cannot QR to matrix level.[6] Indeed, this would give rise to the independent tense readings of relative clauses, which are unavailable to complements. Instead, a PRES in a complement clause to a matrix PAST is *always* read double-access: the state of pregnancy in (32) has to overlap both Jon's speech time AND t*.

(34)   [$_{CP}$ PRES]$_i$ [PAST .... t$_i$ ....]

                        *

So the first puzzle that emerges when we look at complements is why they give rise to double-access readings. We also have another problem: as it stands, *woll* should be able to intervene between a CP complement and a matrix PAST, as it does for relative clauses. However, such a configuration gives rise to an infelicitous reading. (8) can only be interpreted double-access (the requirement to serve in the army has to hold at an interval which includes t*):

(8)   #Washington promised that he would say that his generals are no longer required to serve in the army.

(35)   [PAST ... *woll*   [$_{CP}$ PRES   ]]
                        ─?‖?──────────

What is different about complements that doesn't allow *woll* to intervene for a CP PRES, but allows it for a relative clause PRES? The answer to the second puzzle will relate to the first one. Specifically, we will argue that (32) violates a condition independent of polarity. Resolving that condition will force a CP PRES to move beyond *woll*'s intervention domain.

Let's first consider the double-access requirement. Since (35) doesn't violate our polarity constraint, there must be some other reason for PRES to

move. This is where Abusch's Constraint (repeated below) plays an active role.

(19)   **"Abusch's Constraint"**: The highest tense of an attitude context must be bound. (Kratzer 1998)

The formulation in (19) ensures that this restriction only applies to the tense of the attitude verb complement.[7] Going back to our double-access sentences, the problem with (35) is that the CP tense is not bound. How do we fix it? Recall that one way for a tense to be bound in von Stechow's system was through Tense Deletion. However, this won't do in PRES under PAST sentences, where no c-commanding PRES can trigger the deletion of the embedded PRES. The solution that von Stechow (and others) adopts is *res*-movement of the PRES, which leaves a variable to be bound by the attitude verb. $PRES_i$ is then interpreted *de re*.

(36)   [PAST say $PRES_i$ λt_i [$_{CP}$ t_i]]

Following Lewis (1979), *de re* interpretation of a tense or an individual α is mediated by a contextual acquaintance relation R, which picks out α in the actual world and picks out the attitude holder's counterparts for α in his belief/saying/etc. worlds. Thus, *Ralph believes that Ortcutt is a spy* can be interpreted with Ortcutt read *de re* in contexts where, for example, the relation R is *the suspicious looking man walking on the beach*. In the actual world, this happens to be the individual Ortcutt, but in Ralph's belief worlds, this may not be the case. Given a suitable R, *de re* ascription asserts that the embedded proposition holds of the attitude holder's counterparts for α (i.e., who Ralph might believe the suspicious looking man actually is), but not of α itself. The semantics of attitude verbs that allow *de re* construal is as follows (the picking out α condition is cast as a presupposition).

(37) $[[say]]^{c,g}$ = λt λP_{ist} λx. $\forall <w',t'>$ compatible with $<w_0, t_0>$ $[P(R(w',t'))(<w', t'>)=1]$ iff $R(w_0, t_0)=t$, else undefined.

Consider the particular PRES under PAST example in (38):

(38) a.   Sue said that it is raining [because her bones ache].
      b.   [$_{CP}$ Sue $PAST_i$ say $PRES_j$ [$_{CP}$ that it t_j be raining]

For PRES$_j$ to be interpreted *de re,* there must be an R – suppose it is 'the interval of Sue's bones aching' – which in the actual world must pick out an interval overlapping t* (by the denotation of PRES$_j$). Further, for each accessible world-time coordinate $<w',t'>$, it must be raining in w' during $R(w',t')$. The PRES$_j$ itself will contribute that g(i) overlaps t$_0$; as the presupposition of *say* in (37) ensures that $R(w_0,t_0) = g(i)$, we have that $R(w_0,t_0)$ overlaps t$_0$. In a matrix context (without *woll*), this will ensure that, for instance, Sue's aching time in (38) overlaps t*.

Note that there is no inherent ordering of $R(w',t')$ with respect to t' itself; in particular, as it stands there is no constraint forcing the rain time to overlap the internal now of the attitude verb. This seems like a job for the ULC, and that is precisely what Abusch (1993) proposes: the ULC applies to the trace t$_j$, forcing it to precede or overlap Sue's speech time. Heim (1994) argues that this is because the ULC is a definedness condition on T nodes, not the lexical items themselves:

(39)   ULC [Heim 1994]: For any T dominating term α,
$$[[\, [_T \, \alpha] \,]]^{c,g} = [[\alpha]]^{c,g} \text{ iff. } [[\alpha]]^{c,g} \leq t_0, \text{ else undefined.}$$

As written, the ULC in (39) will apply to the trace of res-movement t$_i$ in (36). It thus will project to the attitude verb quantifier the presupposition that $R(w',t') \leq t'$ (as t'= t$_0$ within the scope of the attitude verb), ensuring the lack of any future-shifted readings even when the tense itself moves.

This avenue is not open to us, since our ULC ("Abusch's Constraint") is a type-theoretic restriction, and not a temporal-ordering constraint. Following an option that Abusch (1997) considers, we will assume that the ULC effects result from a lack of suitable *de re* acquaintance relations about the future.[8] This means there is no need to postulate the strange functional category label triggered presupposition Heim is forced to adopt.

Let us return to the main quarry, complement clauses under *woll*. Let us assume *res*-movement occurs to satisfy Abusch's Constraint:

(40)   [PAST … *woll*   say PRES$_i$ λt$_i$ [$_{CP}$ t$_i$]]
              └──────?‖?──────┘

As it stands, this is not enough: indeed, PRES is still in the scope of *woll*, and hence need not move further. Thus, we must have a *res*-moved tense raise further, outside of the domain of *woll*. Why would it move higher? The key is that PRES is a generalized quantifier. As shown in (41), the *res*

slot is only for times, not temporal quantifiers. Hence, we assume that the PRES must continue onward by QR for interpretability (von Stechow 1995). Thus, PRES will move further up, outside of the domain of *woll* for type-theoretic reasons. This yields a configuration which then violates our polarity restriction, as schematized below:

(41)   [PAST ... PRES$_i$ ... *woll* say ... t$_i$ ...   [$_{CP}$ t$_i$]]

         *

Because (41) violates our polarity restriction, PRES is forced to move to the matrix level, yielding a double-access reading:

(42)   [PRES$_i$ ... PAST... t$_i$ ... *woll*   say   ...   t$_i$ ... [$_{CP}$ t$_i$]]

In sum, a complement PRES under a matrix PAST is bad for two reasons: (i) it violates our polarity restriction and (ii) it leaves an embedded CP tense free. The PRES first moves by *res-movement* in order to satisfy Abusch's Constraint. It will further move for type-mismatch resolution, outside of the protective domain of an eventual *woll*, and further again until the polarity restriction is satisfied (i.e., all the way to matrix level). Abusch's Constraint will not apply to relative clauses, thus the first step (res-movement) will not be required: a PRES in a relative clause will never need to scope out of *woll*'s protective domain.

So far, we have schematized the role of the different constraints and how they were resolved. Formally, the story is complicated by the semantics of the future, which selects for a tenseless clause headed by $\varnothing$-FUT (the tense shifted forward of the reference tense by *woll*):

(43) $[\![woll]\!]^{c,g} = \lambda t \lambda P_{it}. \exists t'>t [P(t')]$

Consider the LF of (44) below:

(44)   a.   Sue thought that Jon would say that Bill is unhappy.
       b.   [PAST$_1$ Sue think λt_0 λw [$\varnothing$-PAST Jon woll λt_0 [$\varnothing$-FUT say λt_0 $\lambda w''$ [$_\alpha$ PRES$_4$ Bill be unhappy]]]]
       c.   [PAST$_1$ λt_2 Sue think λt_0 λw [Jon woll λt_0 [say λt_0 $\lambda w''$ [$_\alpha$ PRES$_4$ λt_3 Bill be unhappy at t$_3$] at t$_0$] at t$_0$] at t$_2$]

    d. [Sue think λt_0 λw [Jon woll λt_0 [say λt_0 λw" [$_\alpha$ Bill be unhappy at $t_4 \wedge t_4 \cap t_0$] at t_0] at t_0] at $t_1 \wedge t_1 < t^*$]

    e. [Sue think λt λw [Jon woll $\lambda t'$ [say $\lambda t''$ $\lambda w''$ [$_\alpha$ Bill be unhappy at $t_4 \wedge t_4 \cap t''$] at t''] at t'] at $t_1 \wedge t_1 < t^*$]
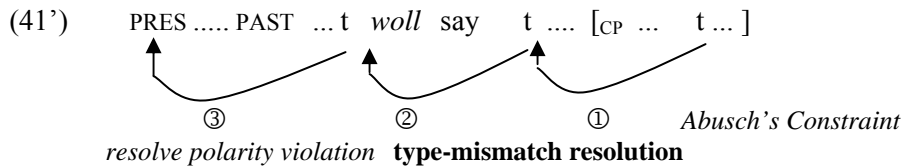
As can be seen in (44e), the tense of the complement CP α is not bound, and hence violates Abusch's Constraint. In order to solve this, PRES must scope out, by *res*-movement. This yields the LF in (45).

(45) [PAST$_1$ Sue think λt_0 λw [$\varnothing$-PAST Jon woll λt_0 [$\varnothing$-FUT say PRES$_4$ [λt_3 λt_0 λw" [$_\alpha t_3$ Bill be unhappy]]]]]
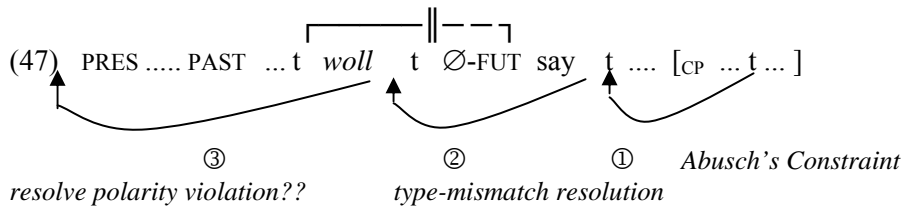
However, because the *res* argument of the embedding verb is an individual (time) type, the quantifier must move again to adjoin to a node of type $\langle s,t \rangle$; the closest such node is above the $\varnothing$-FUT:

(46) [PAST$_1$ Sue think λt_0 λw [$\varnothing$-PAST Jon woll λt_0 [PRES$_4$ λt_2 $\varnothing$-FUT say t_2 [λt_3 λt_0 λw"   [$_\alpha t_3$ Bill be unhappy]]]]]

Note that this is distinct from the LF of (41) we offered in our schematized version, where type mismatch resolution drove PRES above *woll*:

(41')   PRES ..... PAST ... t *woll* say   t .... [$_{CP}$ ...   t ...]

              ③   ②   ①   *Abusch's Constraint*

    resolve polarity violation **type-mismatch resolution**

The complication is that type-mismatch resolution actually moves PRES below *woll* and above the tense it selects for, as illustrated below:

(47) PRES ..... PAST ... t *woll* t $\varnothing$-FUT say t .... [$_{CP}$ ... t ...]

              ③   ②   ①   *Abusch's Constraint*

resolve polarity violation??   *type-mismatch resolution*

This LF *is* actually well-formed if we take *woll* to be the intervener in

the polarity relation, which would mean that there shouldn't be an adjunct-argument asymmetry for *Present-in-the-Past* readings. Recall that we postulated that it was *woll* itself that intervened between the PRES and a matrix PAST. We propose instead that (28) be reformulated as follows:

(48) **anti-PPI blocking** (final version): ∅-FUT acts as an intervener between a PAST tense and a PRES in its scope.

(48) renders (46) ill-formed and drives PRES to scope above matrix PAST for polarity reasons. This correctly yields the double-access reading for complements under future-oriented items.

What is this ∅-FUT, which is interpreted as a bound tense but suffices to intervene between PAST and PRES? First, we assume that it is found with all future-oriented modals, explaining why they also create *Present-in-the-Past* environments. We further suggest that this particular null tense morpheme is actually the marker of a kind of irrealis, indicating that complement is unrealized at the time of the matrix tense (and saying nothing about its truth at t*). It is this irrealis component that gives rise to the "hypothetical" or "conditional" flavor of the *Present-in-the-Past* examples.[9]

5. Conclusion

We have discussed examples in English in which a present embedded under a past, a configuration which should be illicit under any theory of tense, seems to be rescuable when a future-oriented predicate intervenes between the two. We have called such sentences *Present-in-the-Past*, and have shown that such examples seem to counterexemplify indexical accounts of the English Present. We have suggested instead that we should incorporate notions of temporal polarity, which would allow us to explain: (i) why PRES under PAST is ill-formed for both complements and DPs; (ii) why embedding under future-oriented items repairs the ill-formedness for DPs but not complements.

Notes

∗   The data we present in this talk has been compiled from an online survey. For helpful discussions, thanks to D. Fox, I. Heim, S. Iatridou, D. Pesetsky, P. Schlenker, T. Stowell, and the CHRONOS 6 audience.

1. Following Abusch's (1988), the tenseless future modal.
2. We assume that DPs that allow *Present-in-the-Past* readings differ from those that do not in 'specificity' (assuming that specific DPs must QR). Whether the correct generalization involves definiteness, strength or genericity we leave to further research.
3. The technical implementations of these deletions vary. We will continue to employ the term Tense Deletion for the principles governing the regulation of the distribution of (13).
4. If we allowed the embedded PRES to *res*-move, we would obtain a double-access reading, but only if we stipulated that res movement (but not say, temporal adverbials) can extend the top node's evaluation time.
5. Note that for Stowell, the *present* and *past* morphemes are semantically vacuous Polarity Items. What is responsible for temporal relations in his system are the tense heads themselves which are (i) morphologically null; (ii) not polarity items themselves. Our proposal is substantially different in that we don't have a separation of the *present* and *past* morphemes vs. the corresponding tense heads. Thus, we adopt von Stechow's semantics of PRES and PAST but retain Stowell's notion of polarity.
6. Stowell (1993) actually claims that CP complements can and in fact must QR in cases of double-access. See von Stechow (1995) for a semantic argument against this position.
7. It also naturally accounts for temporal attitudes *de se*; see Kratzer (1998).
8. A potential problem which ultimately makes Abusch reject this possibility is the alleged lack of suitable acquaintance relation in sentences such as:

    (i)   Jon PAST$_i$ believe that he PAST$_j$ be in Paris at some time.

    However, we are not sure this is a real problem: we can think of relations for the evaluation time such as "my life up to this point" and aspect would ensure that the event time be contained within that interval.
9. (ii) may appear as a counterexample to our generalization (P. Schlenker, p.c.):

    (ii) #In 40 B.C. Caesar met someone who would later kill any senator that stir**s** up rebellious sentiment in the Roman Empire.

    PRES in (ii) needs to be interpreted as overlapping t*, despite the presence of *would*. However, sentence (ii) feels like a fate in hindsight (cf. Kamp 1971).

    (iii)   A child was born that would be king (*in 2010).

    Crucially, fate in hindsight sentences require that the complement of *would* be realized by t*. The exact relation between fate in hindsight *would* and "regular" *would* remains puzzling: distributionally, the former appears in extensional contexts, the latter in intensional ones, but there is nothing in the semantics of *woll* combined with lack of intensionality that would prevent its complement to be interpreted after t*. We suggest that fate in hindsight is

always realis *de facto* and thus won't select the irrealis $\varnothing$-FUT, which is responsible for the intervention effect in the temporal polarity in (i).

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