Infinitival Complements *

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Abstract

Kusumoto (2005) argues against a scope analysis of tense in a Priorian system and for one where explicit tense variables appear in the object language of semantic analysis. She bases her argument partly on sentences where a verb in a relative clause is interpreted at a later time than the matrix verb, even though the relative clause occurs in a Determiner Phrase trapped below tense by an Negative Polarity Item. However, Kusumoto admits that her system alone does not explain the generalization noticed by Abusch (1988) that later-than-matrix readings for transitive intensional verbs correlate with *de re* readings of their objects. This paper argues for a version of the scope analysis of tense that accounts for both the Abusch and the Kusumoto facts, as well some new evidence that does not easily fit into an explicit tense variable system.

1 Problem

Kamp (1971) and Cresswell (1990) (among others), note that sentences like (1) have two readings:

(1) Hillary married a man who became the president of the U.S. (=Kusumoto's 21)

(2) Earlier than Matrix: *Election* *Marriage* *Now*

(3) Later than Matrix: *Marriage* *Election* *Now*

The reading represented in (2) is one where the man in question became president before Hillary married him. The reading represented in (3), which Kusumoto (2005)

*I would like to thank Irene Heim, Danny Fox, and Sabine Iatridou.

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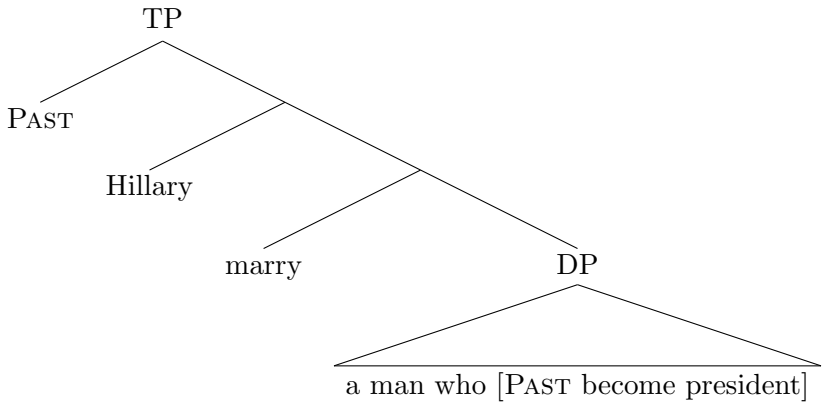
calls the "later-than-matrix" interpretation, is where the man became president after Hillary married him.

This latter reading ostensibly poses a problem for a Priorian tense system, given (for instance) the following definition of a past tense operator and LF for (1):

(4) $[\![\textsc{Past}\ \phi]\!]^t = 1$ iff $\exists t' \prec t : [\![\phi]\!]^{t'} = 1$.
(The evaluation time for ϕ precedes the evaluation time for PAST ϕ.)

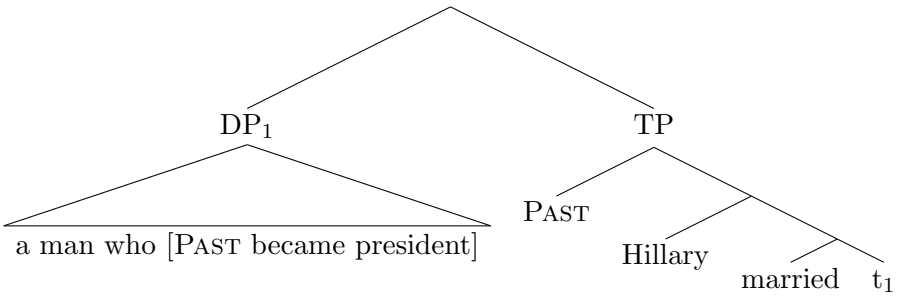
(5)



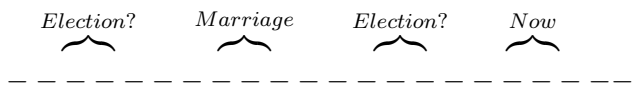
The first instance of PAST sets the evaluation time for *Hillary marry a man who* PAST *become president* to an interval, call it t, before the utterance time. The second instance of PAST shifts the interval for *become president* to an interval before t. Therefore, only the reading in (2) should be available, contrary to fact.[1]

Consequently, proponents of the Priorian system (Ladusaw, 1977; Ogihara, 1996; Stowell, 1993) have analyzed later-than-matrix interpretations as involving an LF in which the object DP raises to a position above the matrix past tense where it is evaluated with respect to the speech time. Kusumoto calls this the "scope analysis":

(6)



(7) Independent:



[1]Note that this is different from a traditional Sequence of Tense case because the two events are not simultaneous; their relative order is simply underdetermined.

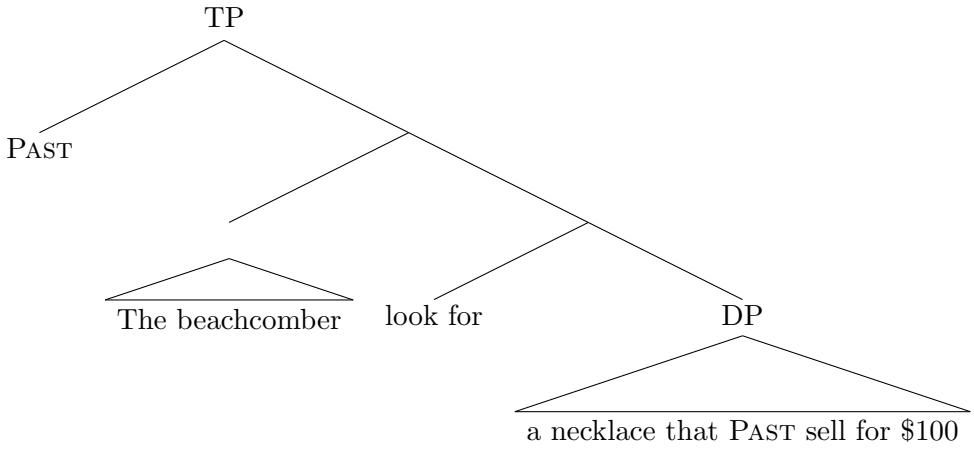
In (6), the evaluation time for DP_1 is independent from that for TP, although both must be before the utterance time, as illustrated in (7).

Some evidence for this approach comes from Abusch (1988), who points out that the temporal interpretation of certain relative clauses in intensional contexts correlates with whether the object DP containing the relative clause is interpreted *de re* or *de dicto*:

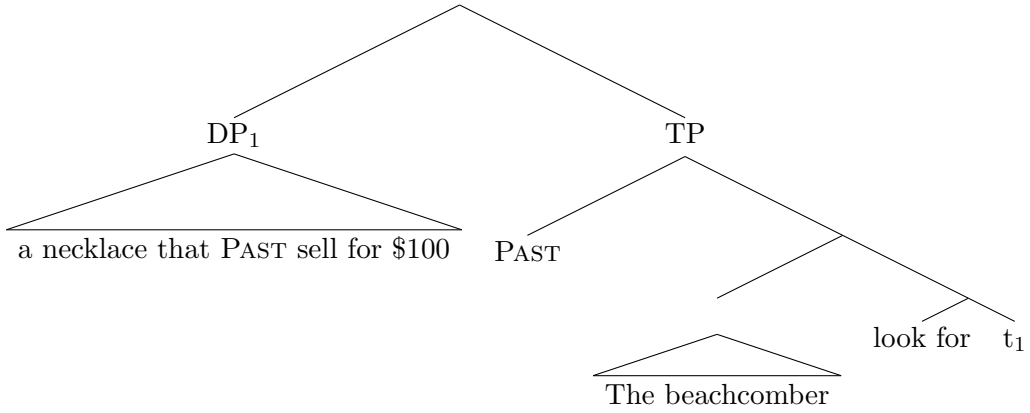
(8) The beachcomber was looking for a necklace that sold for more than $100.

If the DP headed by *a necklace* is interpreted *de dicto* – i.e., the beachcomber was looking for any necklace that sold for more than $100 – the selling must have taken place before the looking. This fact is explained nicely in a Priorian system, assuming that the *de re* reading arises from a structure where the object DP raises above the intensional verb (and hence potentially above the PAST operator), and the *de dicto* reading from a structure where the DP remains in situ (and hence below the PAST operator):

(9) *De dicto*: selling $\prec$ looking



(10) *De re*: selling $\rightleftarrows$ looking

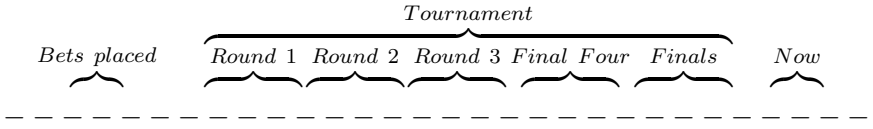


However, despite this evidence, Kusumoto (2005) argues against the scope analysis. She points out that even some sentences where the DP is "trapped" below the matrix verb by a Negative Polarity Item in fact have a later-than-matrix reading.

To illustrate these sentences, consider the NCAA basketball "March Madness" tournament and the betting pools concerning this tournament. The way such betting proceeds is that you must choose a winner for every game in every round before the tournament begins. So, if there are four teams – call them A, B, C, and D –, you might choose A to beat B and C to beat D in round one, and choose A to beat C in round two. The second-to-last round of the tournament is called the "Final Four," since there are four teams left. Now, let us say that I placed such a bet before the tournament began. After the tournament, I can say:

(11) I failed to pick any team that made the final four. (≈ Kusumoto's 24b)

(12) I managed not to pick any team that lost in the first round.

(13)


Both of these sentences sound fine, even though the NPI *any team* should presumably prevent the object DP from raising as needed in the scope analysis. Based partly on this evidence, Kusumoto argues against the Priorian system and for one where explicit tense variables appear in the object language of semantic analysis. However, she admits that her system alone does not explain the generalization noticed by Abusch (1988). In the remainder of this paper, I argue for a version of the scope analysis that accounts for both the Abusch and the Kusumoto facts, as well some new evidence that does not easily fit into an explicit tense variable system.

2 Implicatives

Notice that the verbs Kusumoto chooses are both implicative verbs[2], so named by Karttunen (1971):

(14) (≈ Karttunen's 2)

a. IMPLICATIVE: manage, remember, bother, get, dare, care, venture, condescend, happen, see fit, be careful, have the misfortune/sense, take the time/opportunity/trouble, take it upon oneself, fail.

[2]Kusumoto also has an example with "try," a non-implicative verb, but I have not found any native speaker that can get the later-than-matrix reading for examples like the following:

(i) I tried not to pick any team that lost in the first round.

b. NON-IMPLICATIVE: agree, decide, want, hope, promise, plan, intend, try, be likely, be eager/ready, have in mind.

Implicative verbs presuppose some sort of modal statement about their complements and assert the truth of falsity of that complement:[3]

(15) John managed to solve the problem. ⇒
   a. John tried to solve the problem. [presupposition]
   b. John solved the problem [assertion]

(16) John didn't manage to solve the problem. ⇒
   a. John tried to solve the problem. [presupposition]
   b. John didn't solve the problem [assertion]

The fact that the modal portion of the meaning (given in the (a) sentences above) survives negation is evidence that this portion of the meaning is presupposed; the rest of the meaning (given in the (b) sentences) does not survive negation.

Furthermore, unlike non-implicative verbs, the assertion about the complement of an implicative verb seems to occur at a time at least linked to the time of the matrix sentence:

(17) (based on Karttunen section 5)
   a. Yesterday, John hoped to solve the problem next week.
   b. *Yesterday, John managed to solve the problem next week.

This is why these verbs work well for Kusumoto's purposes; there is a larger structure that allows intermediate positions for negation, but the tense is still linked between the higher and lower clauses. Last, note that only a subset of the implicative verbs (as shown in (19)) allow later-than-matrix interpretations of relative clauses, and no non-implicative verbs (as shown in (20)) do so:

(18) I managed/happened/had the fortune not to pick any team that lost in the first round.

(19) #I remembered/dared/condescended/saw fit/etc. not to pick any team that lost in the first round.

(20) #I agreed/decided/planned/promised/etc. not to pick any team that lost in the first round.

The implicative verbs that do work seem to be those that are perhaps slightly less agentive: *manage*, *happen*, *have the misfortune/fortune*, and *fail*. So, examples like

[3]This view of the presuppositions of implicatives is different from Karttunen's.

those Kusumoto gives only work with a handful of verbs: less agentive implicatives.

3 Aspect

I assume in what follows that all verbs, even infinitives, have aspect, like perfective or imperfective. In a language like Czech, aspect on infinitives even shows up overtly[4]:

(21) Včera jsem dokázala vyřešit ten problém.
yesterday Aux-1sg. managed to solve.PRF the problem
'I managed to solve the problem yesterday.'

(22) Dokázala jsem řešit ten problém, když Jan přišel na návšťěvu.
managed Aux-1sg to-solve.IMPRF the problem when Jan came on visit.
'I managed to be solving the problem when Jan came by.'

(23) Dokázal jsem poskakovat hodinu.
managed Aux-1sg hop.ITER-IMPERF hour
'I managed to hop for an hour.'

Even though all the verbs in the three complement sentences above are infinitives, and all appear under the verb *manage*, they exhibit three different markings for aspect. The verb *vyřešit* 'to solve,' appears in the perfective and imperfective above; *poskakovat* 'to hop,' appears in the imperfective iterative.

In the implicative examples examined in this proposal, there is perfective aspect on the infinitives in the complement clauses:

(24) $[\![\text{PRF } \phi]\!]^t = \exists t' \subset t : [\![\phi]\!]^{t'}$.
(The evaluation time for ϕ is a subinterval of the evaluation time for PRF ϕ.)

(25) a. PAST I managed PRF to finish the test.
b. There is a time interval t in the past such that there is a time interval $t' \subseteq t$ such that I finished the test in t'.

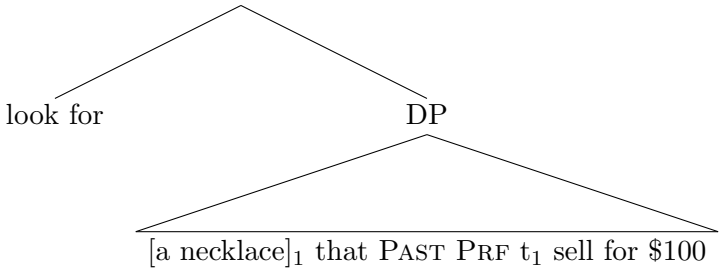
Under this definition, the action in the complement happens at a subinterval of the interval in which the matrix sentence occurs. As we will see below, this creates an extra scope position for sentences with implicatives.

[4]Thanks to Ivona Kučerová for these examples.

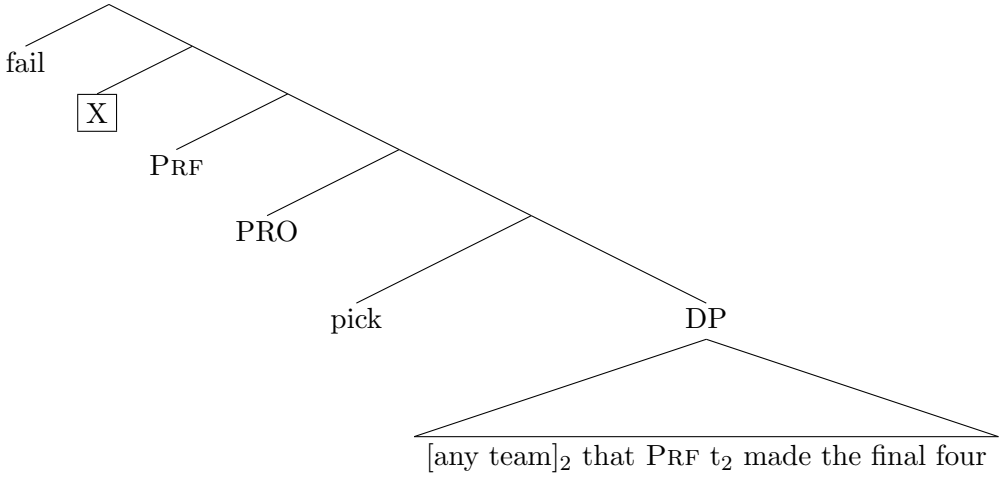
4 Proposal

The crux of the issue examined in this paper is deciding what the difference is between the Abusch-style example in (8), partly represented in (26), and the Kusumoto-style example in (11), partly represented in (27). I propose that the difference is that (27) has an extra scope position between the verb and the potentially later-than-matrix DP, marked with an *X* below[5]:

(26)



(27)



Since *look for* does not take an infinitival complement, there is no aspect and hence no position to raise the object above this aspect. Complements to implicative verbs such as *fail*, on the other hand, do have such a position, as described in the previous section.

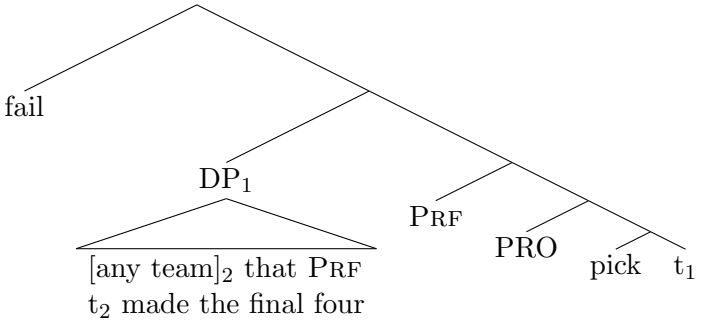
The highest occurrence of PRF in (27) sets the evaluation interval for everything below it to a time interval t within the matrix time interval. The relative clause *made the final four*, when it scopes in situ, as shown in (27), will occur at a subinterval of the time of picking, t; but this is almost impossible, since picking is almost instantaneous.[6] However, if the DP scopes in the position marked X, the time interval for the relative clause may differ from that of the infinitive *to pick*, even though the DP remains below

[5]There is no tense in (27) because I assume that, under this reading, the past tense on *sold* and *made* is purely due to sequence of tense (Abusch, 1988; Ogihara, 1996; Stowell, 1993) and carries no actual meaning of anteriority.

[6]One possibility is that the earlier-than-matrix reading of (11) involves actual past tense on the relative clause, instead of sequence-of-tense past-tense marking.

the matrix verb and hence is able to contain an NPI:

(28)



Here the relative clause is outside the scope of the perfective aspect on the infinitive *to pick*, and hence only has to occur within the matrix time interval.

Given this analysis, and ignoring the presuppositional meaning, the assertion of (11), repeated as (29) comes out as follows:

(29) I failed to pick any team that made the final four.

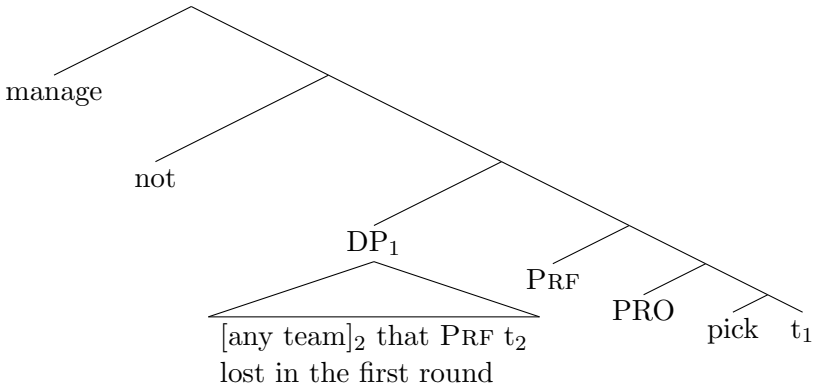
(30) $[\![\textbf{fail}\ \phi]\!]^t = \lambda x \in D_e : x \text{ tries } \phi\ .\ [\![\phi]\!]^t = 0.$

(31) There is a time interval t in the past and it is not the case that there is a team x such that there is an interval $t' \subset t$ in which x makes the final four and an interval $t'' \subset t$ in which I picked x.

Under this meaning, the relationship between the time of the picking and the time of the making the final four is unspecified, and therefore the later-than-matrix interpretation is possible. Similarly:

(32) I managed not to pick any team that lost in the first round.

(33)



(34) $[\![\textbf{manage}\ \phi]\!]^t = \lambda x \in D_e : x \text{ tries } \phi\ .\ [\![\phi]\!]^t = 1.$

(35) There is a time interval t in the past and it is not the case that there is a team x such that there is an interval $t' \subset t$ in which x loses in the first round and an interval $t'' \subset t$ in which I picked x.

This proposal, like Kusumoto's, derives the facts in (11) and (12). Unlike Kusumoto's, however, my proposal allows us to maintain a scope analysis for (8), since in such sentences there is no intermediate position for the object DP to land.

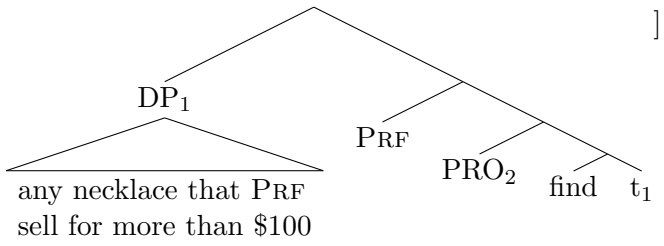
5 Further Predictions

5.1 (Not Quite) A Minimal Pair to the Abusch Example

Sentences very similar to (8), but differing in having infinitival complements, do allow the later-than-matrix interpretation, even with an NPI:

(36) The beachcomber failed to find any necklace that sold for more than $100.

This example is similar to the *de dicto* reading of (8), in that the object DP theoretically must be below the matrix verb *fail*, due to the NPI *any*. Here, however, the selling actually can be after the finding. I submit that this reading is made possible by the extra scope position provided by the infinitive in (36), as illustrated below:

(37) [[The beachcomber]$_2$ failed 

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5.2 Different Time Intervals

My proposal suggests that the time interval for the matrix sentence might differ from the time interval for the infinitival complement, and certain data seem to back this up:

(38) Before Duke won yesterday, I had failed to pick a single team that made the third round.

(39) #Before the tournament began, I had failed to pick a single team that made the third round.

To analyze these sentences, consider the following definitions, adapted from von Fintel and Iatridou (2002):

(40) $[\![\textsc{Past}\ \phi]\!]^t = 1$ iff $\exists t' \prec t : [\![\phi]\!]^{t'} = 1$.

(41) $[\![\textsc{Prf}\ \phi]\!]^t = 1$ iff $\exists t' \subseteq t : [\![\phi]\!]^{t'} = 1$.

(42) $[\![\textsc{Perf}\ \phi]\!]^t = 1$ iff $\exists t' : RB(t, t')$ and $[\![\phi]\!]^{t'} = 1$.
(The evaluation time ϕ is an interval whose right boundary is the evaluation time of $\textsc{Perf}\ \phi$.)

(43) $RB(t, t')$ – t is the Right Boundary of t' – iff $t \cap t' \neq \emptyset$ and $\exists t'' \subseteq t : t' \preceq t''$.

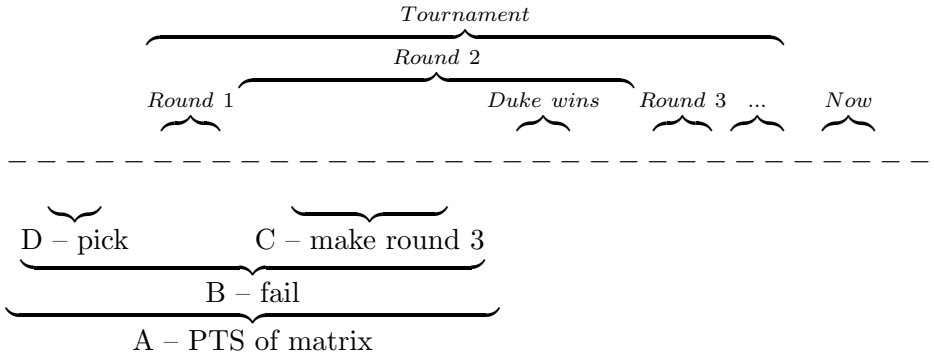
(44) $[\![\textbf{fail}\ \phi]\!]^t = \lambda x \in D_e : x$ tries ϕ . $\neg[\![\phi]\!]^t$.

(45) $[\![\textbf{Before}\ \psi\ \phi]\!]^t = 1$ iff $RB(\textit{time-of}(\psi), t)$ and $[\![\phi]\!]^t = 1$.

The LF for (38) is as follows, as well as a timeline representation of the events as necessitated by the meanings given above:

(46) [Past [Perf [$_A$ Before Duke won,
[Prf [$_B$ I$_1$ fail
[a single team [Prf [$_C$ that make the third round]]]$_2$
[Prf [$_D$ PRO_1 pick t_2]]
]]
]]]

(47)



This sentence sounds fine, since the failing is entirely before the time at which Duke won. Not so, however, for (39):

(48) [Past [Perf [$_A$ Before the tournament began,
[Prf [$_B$ I$_1$ fail
[a single team [Prf [$_C$ that make the third round]]]$_2$
[Prf [$_D$ PRO_1 pick t_2]]
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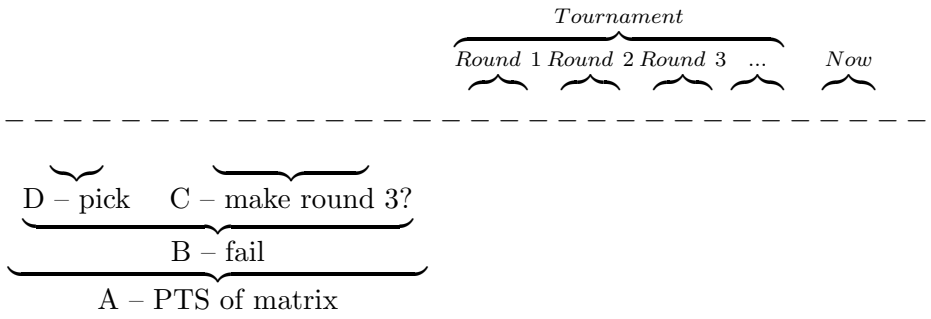
]]]

(49)

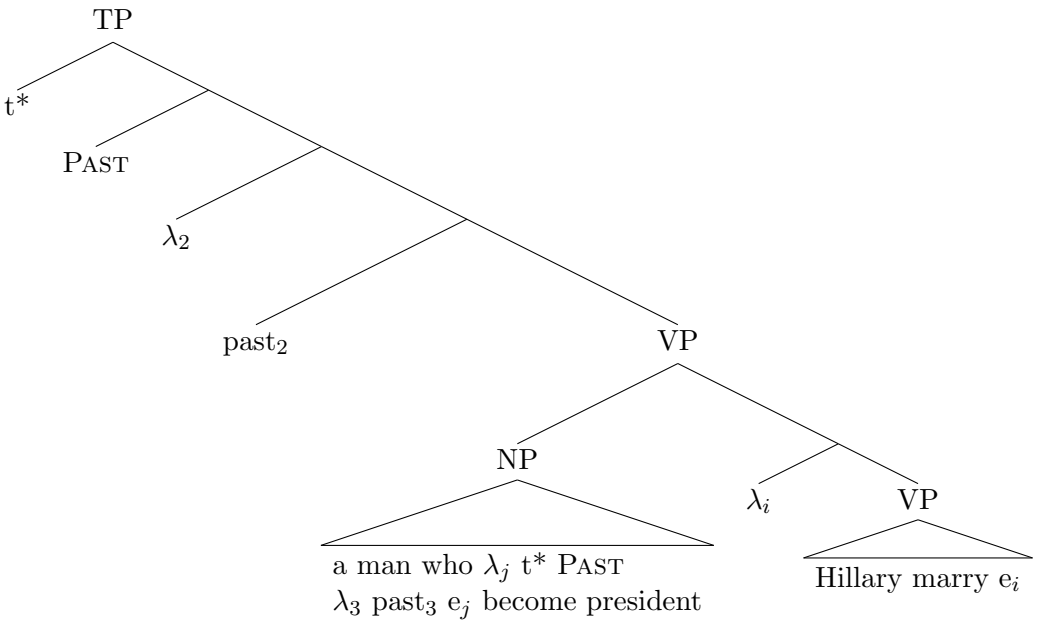


I submit that the oddity of (39) is due to the fact that although the picking happened before the tournament began, the teams to make the third round were not determined at that point, and therefore (before the tournament) the speaker has not *yet* failed to pick any team that made the third round. So, the picking and the failing can occur at different intervals.

5.3 Kusumoto's Analysis

Kusumoto's structure for a later-than-matrix reading is as follows:

(50)



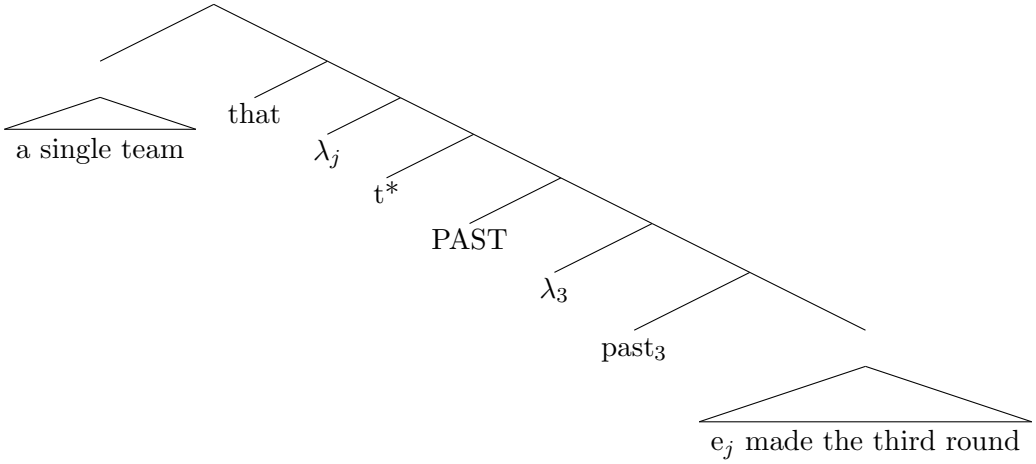
(51) $[\![\textbf{t*}]\!]^g$ = the speech time provided by the context.
(Indexical referring to now)

(52) $[\![\text{PAST}]\!]^g = \lambda P \in D_{ist}[\lambda t \in D_i[\lambda w \in D_s[$ there is a time t' such that t' $\prec$ t and that P(t')(w) =1]]]
(Higher type PAST operator)

(53) $[\![\textbf{past}_n]\!]^g = g(n)$
(Explicit time variable)

In her system, verbs take an explicit time variable as one of their arguments, so *marry* takes $past_2$ and *become president* takes $past_3$ above. Therefore, she would posit the following structure for the DP in (39):

(54)



Since the t* does not depend on anything above it but rather always picks the utterance, (54) should yield a fine interpretation for (39); it is unclear, then, how Kusumoto would rule (39) out.

5.4 VP-Internal NPIs

Last, notice that when an NPI is trapped inside a VP, the later-than-matrix reading is disallowed:

(55) a. I sent some letters to someone who wrote me back the next day.
b. I sent no letters to anyone who insulted me.
c. # I sent no letters to anyone who replied the next day.

A later-than-matrix interpretation is acceptable in (55-a) and an NPI without a later-than-matrix interpretation is acceptable in (55-b), but an NPI may not have a later-than-matrix interpretation, ruling out (55-c). I argue that this is due to the fact that the NPI may not raise out the VP to receive interpretation outside of the matrix tense. But embedding the sentence as an infinitival clause does not improve it this time:

(56) # I managed to send no letters to anyone who replied the next day.

(56) still lacks the later-than-matrix interpretation. This is compatible with my proposal that an infinitival clause allows the later-than-matrix interpretation by providing an

extra scope position above the infinitive. In (56), the object DP cannot even raise to this scope position and therefore the interpretation is prevented. This also is unaccounted for in a Kusumoto-style analysis.

6 Remaining Issues

6.1 Other Adverbials

The implicatives that allow later-than-matrix readings are split with respect to taking adverbials that target the main verb of the complement:

(57) This year / #On March 1st, I had the good fortune not to pick any team that lost in the first round.

(58) This year / #On March 1st, I happened not to pick any team that lost in the first round.

(59) This year / On March 1st, I managed not to pick any team that lost in the first round.

(59) seems to have two readings: first, a reading where *on March 1st* is part of the presupposition of *manage* ("Even way back on March 1st...") and second, a reading where *on March 1st* contrasts with another date ("On March 1st, ...; on March 2nd, ..."). So, it seems as though in some limited cases, adverbials at the beginning of the sentence can be interpreted low in the structure. Having a perfect, as the examples in section 5.2 do, seems to force the adverbial to apply to the higher structure.

6.2 Other Verbs with Infinitival Complements

Other implicatives cannot take the later-than-matrix reading:

(60) #I forgot to pick any team that made the final four.

(61) #I was careful not to pick any team that lost in the first round.

This will require further work to explicate completely, but my feeling is that it is the presupposition of these (more agentive) implicatives that preclude the reading. For instance, *be careful* requires that whether you accomplish the action in its complement is entirely within your power.

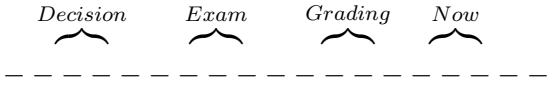
Non-implicatives often shift the time of their complements forward, as seen above:

(62) Yesterday, John hoped to solve the problem next week.

When the time of the relative clause is after the time of the main verb of the infinitival complement, such a sentence is good even if the relative clause's verb occurs after the matrix verb:

(63) Yesterday, I decided not to give an 'A' to any student who failed next week's exam.

(64) l-t-m but earlier than infinitive:



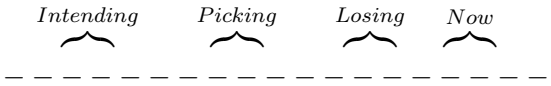
However, for many of these verbs, the relative clause cannot be later than the infinitive:

(65) #I agreed/decided/planned not to pick any team that lost in the first round.

I believe that this is for the same reason as the rest of the implicatives. Verbs such as *decide* carry a presupposition that the decision is in your power. Still, some non-implicatives do seem to allow a later-than-infinitive interpretation:

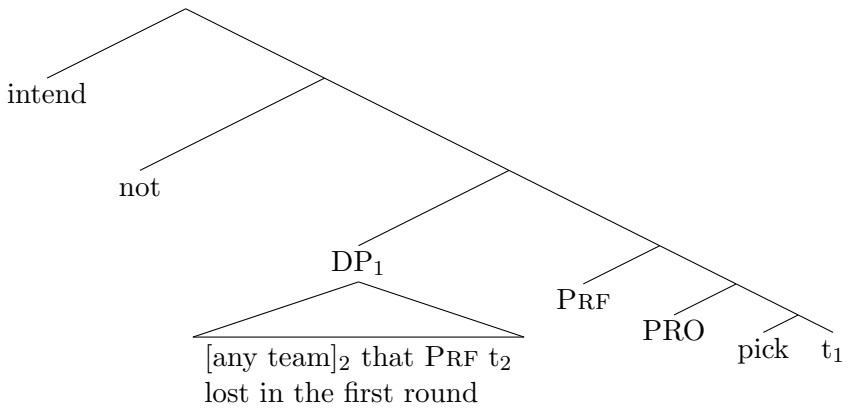
(66) ?I intended not to pick any team that lost in the first round (... but things didn't work out the way I wanted).

(67) later than infinitive:



To the extent that such verbs are good, I presume that they do not have any presuppositions that preclude such a reading, and they allow a similar structure to that of the later-than-matrix implicatives:

(68)



7 Conclusion

In this paper, I have demonstrated that at least one type of example that Kusumoto (2005) uses to argue against scope theories of tense should be reexamined. She claims to show sentences with later-than-matrix readings in relative clauses trapped below tense by a negative polarity item. I have suggested an analysis where such readings are not, strictly speaking, later-than-matrix; but rather more accurately independent-from-complement tense. I posited a scope position below matrix tense and negation, but above perfective aspect on the complement infinitive. From this position, verbs in a DP's relative clause may be evaluated at a time interval independent from the main tense of the infinitival complement clause. This analysis maintains Abusch's (1988) analysis of transitive intensional verbs, since such sentences lack the extra scope position present in the implicative sentences. Last, the proposal in this paper explains certain further facts that are troublesome for Kusumoto's theory, involving different times of evaluation for an implicative verb and its complement and involving VP-internal NPIs.

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