

### Relativizing Time Arguments

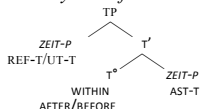
D&UE: Seek to uniformly define temporal relations in terms of elementary isomorphic semantic & structural primitives

*Tenses, aspects and time adverbials are predicates establishing a relation of spatiotemporal ordering between 2 times:*

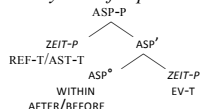
- They take time denoting arguments.
- They project their (temporal) argument structure in the syntax as **temporal DPs or Zeit-Phrases** (Stowell 1993).
- They establish a topological relation—inclusion, subsequence or precedence—between their temporal arguments
- They are uniformly defined in terms of a basic semantic opposition: +/-central coincidence in the location of the Figure with respect to the Ground (Hale 84)

On this proposal, tenses, aspects & time adverbs are assigned *isomorphic* structural representations. The heads  $T^\circ$ ,  $ASP^\circ$  and  $P^\circ$  in (1) each establish ordering relations between their (respective) external (F) & internal (G) time arguments

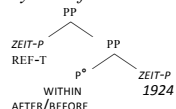
#### 1a. Syntax of tense



#### 1b. Syntax of aspect



#### 1c. Syntax of time adverbs



The null assumption is that the time intervals projected into the syntax as either covert arguments of tenses and aspects, or as overt arguments of temporal prepositions can, just as any regular DP/QP:

- Enter into scopal or anaphoric dependencies relations with other time arguments (D&UE 2007a, 2008, 2010)
- Be (non) restrictively modified. (D&UE 2005, 2007a)

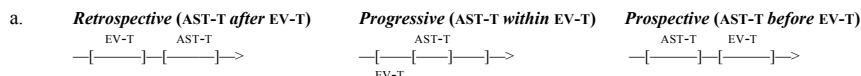
#### 2. Spatiotemporal predicates

→ *Viewpoint aspect* serves to focus a subinterval in the temporal contour of the described event (Smith 91). This interval is the *assertion-time* (AST-T): “the time to which the assertion is confined, for which the speaker makes a statement” (Klein 95).

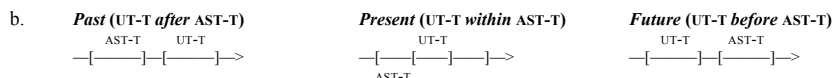
Why does aspect focus a time span in the temporal contour of the described event?

Because aspect is a spatiotemporal predicate relating / ordering 2 time spans: the AST-T relative to the EV-T.

This ordering relation can be one of subsequence, precedence or inclusion:

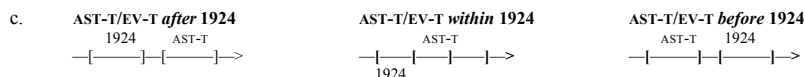


→ *Tense* is likewise a spatiotemporal predicate ordering 2 times: the AST-T relative to a REF-T (UT-T in main clauses). This ordering relation can be one of subsequence, precedence or inclusion:



→ *Time adverbs* are uniformly analyzed as PPs headed by a spatiotemporal predicate.

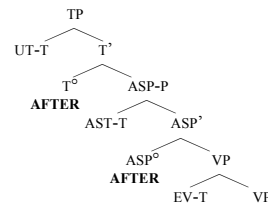
Modify, restrict the temporal reference of either the AST-T or the EV-T by establishing an ordering relation between the time designated by their external argument (AST-T/EV-T) and the time designated by their internal argument –e.g. 1924 in (c).



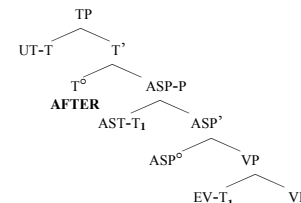
#### 3. Typology of Spatiotemporal Predicates

	-central, centrifugal coincidence AFTER (subsequence)	+central coincidence WITHIN (inclusion)	-central, centripetal coincidence BEFORE (precedence)
Tense	Past	Present	Future
Aspect	Retrospective (perfect)	Progressive	Prospective
Locating adverbs	after DP / CP	at, in, during DP; when CP	before DP / CP
Durational adverbs	from DP; since, DP / CP	for DP; while CP	until DP / CP

#### 4a. Past perfect Zoey had left school

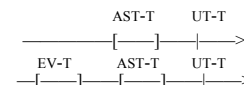


#### b. Simple past Zoey left school



#### 4a'. Past perfect ((4a)) temporal derivation:

b. Past orders the UT-T after the AST-T:



c. Perfect orders the AST-T after the EV-T:

Time of Zoey's departure is viewed as having culminated prior to a reference time (our AST-T) itself ordered by  $T^\circ$  prior to the UT-T.

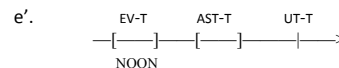
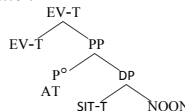
→ Once we assume that time arguments are represented in the syntax as temporal DPs or ZeitPs, the null assumption is that they can be modified, *just like any DP can*.

This is precisely the role of time adverbs: they are semantic and syntactic modifiers of Zeit-Ps (AST-T/EV-T) projected in the syntax as arguments of  $T^\circ$ ,  $ASP^\circ$  or  $V^\circ$ .

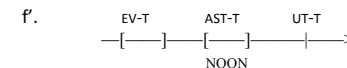
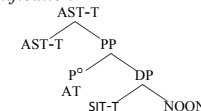
→ Adding a PP modifier to the past perfect in (4a) yields 2 distinct readings depending on whether the PP modifies the AST-T or EV-T:

d. Zoey had left school at noon.

e. EV-T modification



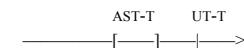
f. AST-T modification



- EV-T reading in (4e/e'): PP predicated of the EV-T, thus establishing a relation of central coincidence between the EV-T and the *situation time* of the temporal noun 'noon' → Zoey's leaving occurs at noon
- REF-T reading in (4f/f'): PP is predicated of the AST-T, thus restricting the reference of the AST-T to the time designated by 'noon'. Since the AST-T follows the EV-T ((f')) → Zoey's leaving occurs prior to noon

#### 5a'. Simple past ((5a)) temporal derivation:

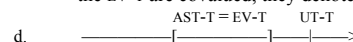
b. Past orders the UT-T after the AST-T:



c. When there is no temporal head under  $T^\circ/ASP^\circ$  to order their time arguments (UT-T/AST-T, AST-T/EV-T)

Temporal ordering between time arguments is established via **anaphora**  
Anaphora between time-denoting arguments, just like anaphora between individual-denoting arguments, is established via either binding (predicate abstraction) or coreference/covaluation, with binding the default construal of temporal anaphora (extending Reinhart 1997).

In (5a), anaphora between the AST-T and the EV-T is established via coreference yielding temporal identity (the assignment of identical semantic/temporal values to 2 intervals). The resulting viewpoint is perfective (the described event is portrayed in its entirety, from its initial to its final bound). Why? Because when the AST-T & the EV-T are covalued, they denote exactly the same time interval:



d. For simplicity, we uniformly represent anaphora via coindexation in what follows, ignoring the distinction between binding and coreference (except where relevant)<sup>1</sup>

<sup>1</sup> In contrast, binding of the EV-T by the AST-T, in (5a), yields either an imperfective viewpoint or so-called neutral aspect. See D&UE 2007a, 2008, 2010 for discussion.

## I. The temporal syntax of temporal adverbial clauses (TACs)

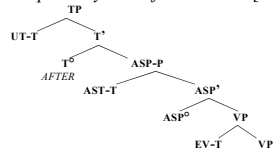
- 6a. Franny left [before/after Christmas]                      b. Franny left [before/after Zoey arrived]
- The sentence *Franny left* describes an eventuality occurring at a past time. Time adverbs in (6) are syntactically PPs headed by a spatiotemporal predicate. The PP in (6a) serves to restrict the reference of this past event time by ordering it *within/after/before* the time denoted by its internal argument – *2000/Christmas*.
- Likewise, the adjunct clauses in (6b) restrict the past temporal reference of the event described by the clause *Franny left* by establishing a relation of temporal ordering between the EV-T of the matrix and the EV-T of the subordinate clause: the past time of Franny's departure is ordered before/ after the past time of Zoey's arrival.
- P° in (6b) take a time-denoting NP as internal argument (*Christmas*), while those in (6a) take a clause as internal argument (*Zoey arrived*).
- Since the complement of the preposition in (6b) is not a temporal noun but a clause, we analyze the subordinate clauses in (6b) as relative clauses restricting the temporal reference of an implicit Zeit-phrase, roughly:

- 7a. [PP [P° before/after] [ZEIT-P the time [CP λ<sub>AST-T</sub> [TP UT-T [T° AFTER] [ASP-P λ<sub>AST-T</sub> [ASP°] [VP EV-T [VP Maddi [VP arrive ]]]]]]]]
- b.
- ```

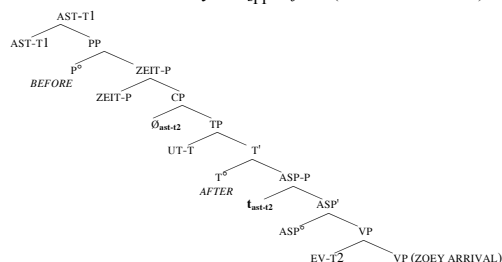
      AST-T/EV-T
     /      \
  AST-T/ EV-T  PP
                / \
              P°   [ZEIT-P EASTER]
                /  \
      BEFORE/AFTER [ZEIT-P the time [CP λAST-T [TP UT-T [T° AFTER] [ASP-P λAST-T [ASP°] [VP EV-T [VP Maddi [VP arrive ]]]]]]]]
  
```

- In sentences with simple tenses such as (6b), we cannot tell whether the TAC modifies the AST-T or the EV-T of the matrix – as these 2 times coincide. That is, analyzing the TAC as a modifier restricting the reference of either the EV-T or the AST-T yields non-distinct construals since the EV-T and AST-T are cotemporal (perfective viewpoint, see ((5)). For concreteness, we assume that they modify the matrix AST-T by ordering it, relating it to the subordinate AST-T.

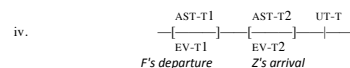
### 8. Temporal syntax of the matrix [Franny left]



- i. Past tense: matrix tense orders UT-T after matrix AST-T (AST-T1)
- ii. Perfective aspect: matrix AST-t (AST-T1) & matrix EV-T (EV-T1) are cotemporal (covalued)
- iii The reference of AST-T1 is further restricted by the PP in (6b), as shown in (9).
9. Modification of AST-T1 by the [PP *before* (the time at which) Zoey arrived].



- i. The PP, in (9), is a modifier of/is predicated of the matrix assertion time (AST-T1). BEFORE thus establishes an ordering relation between 2 times: AST-T1 & Zeit-P.
- ii. The CP [Zoey arrived] is analyzed as a relative clause restricting the reference of this Zeit-P. Restrictive temporal modification achieved via predication: temporal head of the RC (Zeit-P) coindexed with the Ø moving from the external argument position of ASP° (AST-T2) to Spec CP in order to create a predicate variable.
- iii. The external argument of ASP° (AST-T2) is itself in the past since T° orders the UT-T after AST-T2 & is cotemporal with EV-T2 (perfective viewpoint: AST-T2 = EV-T2)
- Predication via null operator movement in (9), thus, ensures that the internal temporal argument of *before* has the property of being a time in the past & coinciding with EV-T2:



- The past event described by the matrix (Franny's departure) is thus indirectly ordered before the past event described by the subordinate adjunct clause (Zoey's arrival).

**Recapitulating.** Temporal adjunct clauses are PPs headed by a spatiotemporal predicate relating 2 times: the AST-T of the matrix and another time which itself indirectly denotes (via predication of the adjunct clause mediated by temporal Ø-movement) the AST-T of the adjunct clause.

- We have assumed that the spatiotemporal predicates introducing clausal adjuncts establish a relation between the AST-Times (as opposed to the EV-T-Times) of the matrix and the adjunct clause. Why?

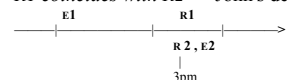
### 10. Hornstein's (1990):

- a. John had left the office when Sam walked in at 3 o'clock

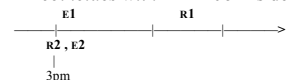
→ John's departure is unambiguously *prior* to 3 o'clock

Thus (10a) can only have the temporal structure in (b), not that in (c).

- b. *R1 coincides with R2* → John's departure is prior to 3 o'clock



- c. *E1 coincides with E2* → John's departure is at 3 o'clock



→ TACs modify the matrix REF-T—that is, our AST-T—not the matrix EV-T

- Consistent with the evidence from VP ellipsis/ACD that TACs cannot always be interpreted as modifiers of the matrix VP, but rather must out scope the matrix VP [see Fox & Nissenbaum 2003].

### 11. Bare Locating Time Adverbs

- a. Zoey left June 1<sup>st</sup> 2000

- b. Zoey left Sunday /yesterday

— The time adverbs in (11) are locating adverbs: they specify that the past time of Zoey's departure is contained within the time designated by *yesterday/June 10th 2001*.

→ Bare time adverbs are in fact concealed PPs – PPs headed by a silent preposition expressing central coincidence (cf. Jespersen 29, Kamp & Reyle 93).

### 12. Bare CP Adverbs

- a. French (Grévisse 1980)

La mort nous prend [<sub>CP</sub> Ø [<sub>C°</sub> que [nous sommes encore tout pleins de nos misères et de nos bonnes intentions]]

Lit.: 'Death takes us that we are still full of our miseries and good intentions.'

'Death takes us while we are still full of our miseries and good intentions.'

- b. Basque

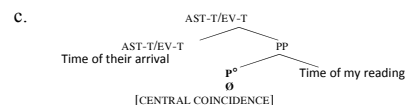
[ [liburu-a irakur-tze-n ari nintze] [ la c°] Ø<sub>CP</sub> heldu ziren ]  
 book-DET read-NOM-in engaged be.PAST.1SG that arrived be.PAST.3.PL

Lit.: 'That I was in the reading of this book, they arrived.'

'They arrived while I was reading this book.'

→ We refer to the temporal adjunct clauses in (12) as bare CP (time) adverbs since they are not introduced by an overt preposition, but merely by a complementizer.

— The ordering relation between the time of the event described by the matrix and the time of the event described by the adjunct clause is one of central coincidence although, once again, there is no overt preposition expressing central coincidence.



13. Time adverbs are uniformly analyzed as PPs headed by a dyadic spatiotemporal predicate
- This predicate can be either overt or null
  - Silent spatiotemporal predicates express central coincidence.

14. *On the temporal syntax of 'when' Clauses*

- a. Franny was leaving when Zoey arrived                      b. Franny was leaving \*when Christmas

— Adjunct clauses expressing central coincidence do not always have the overt syntax of a PP: the English adjunct clause in (14a) is not headed by an overt spatiotemporal P° (unlike the *before/after* clauses discussed in (6-8)).

→ *wh*-phrase *when* is a temporal relative pronoun: the overt *wh* realization of the null temporal  $\emptyset$  posited in (9):

- b. [PP before/after [ZEIT-P the time<sub>AST-T</sub> [CP  $\emptyset$ <sub>AST-T</sub> [TP UT-T [T° AFTER] [ASP-P t<sub>AST-T</sub> [ASP° ] [VP EV-T [VP Zoey [VP arrive
- c. [PP  $\emptyset$  [ZEIT-P the time<sub>AST-T</sub> [CP **when**<sub>AST-T</sub> [TP UT-T [T° AFTER] [ASP-P t<sub>AST-T</sub> [ASP° ] [VP EV-T [VP Zoey [VP arrive
- d. [DP the girl]<sub>ARG</sub> [CP  $\emptyset$ /who<sub>ARG</sub> [TP Zoey [T° ] [ASP° ] [VP SAW t<sub>ARG</sub>

→ Entails that *when* clauses must be PPs headed by a *silent* spatiotemporal predicate.

That *when* clauses express central coincidence then follows automatically from the generalization in (13ii): silent spatiotemporal predicates – whether they take NP or CP arguments – always express central coincidence.

15. French instantiates three distinct but –given the parameters of variation defined here– *logically possible* structures for adjunct clauses of central coincidence:

a. *Overt preposition of central coincidence – null temporal relative pronoun*

Zoé dort [PP **pendant** [ZEIT-P [CP  $\emptyset$  [que Franny travaille ]]]  
 Zoey sleeps P° that Franny works  
 Zoé dort [PP **pendant** [ZEIT-P le jour ]]  
 Zoey sleeps P° the day

b. *Null preposition of central coincidence – overt-wh temporal relative pronoun*

Zoé travaille [PP  $\emptyset$  [CP **quand** [Franny dort ]]]  
 Zoe works **when** Franny sleeps

c. *Null preposition of central coincidence – null temporal relative pronoun*

La mort nous prend [PP  $\emptyset$  [ZEIT-P [CP  $\emptyset$  [C° que [nous sommes encore tout pleins de nos misères et de nos bonnes intentions]]]] [= (11a)]

16. Hall & Caponigro 2010: Temporal *when*-clauses syntactically & semantically free relatives

Like all other free relatives:

- Syntactically, they are *wh*-clauses that have a gap and the same distribution as DPs or PPs,
- Semantically, they denote the maximal element of a given set (times or events in the case of temporal relatives)

17. Assuming a head internal/raising analysis of free relatives:

[PP  $\emptyset$  [ZEIT-P [CP **when/quand**<sub>AST-T</sub> [C° [TP UT-T [T° AFTER] [ASP-P **when/quand**<sub>AST-T</sub> [ASP° ] [VP EV-T [VP Zoey [VP arrive]]]]]]]]]

18. On the temporal syntax of *before/after* TACs in Basque

a. *before*

[Jon etorri **aurre-tik / aitzin** pro alde-egin zuten  
 [Jon come<sub>NON-FINITE</sub> **front-LOC / front** pro leave Aux<sub>PAST</sub>  
 'They left before Jon came'

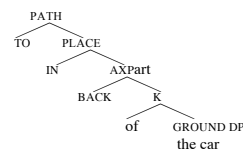
b. *after*

[Jon etorri **ondo-ren/oste-an** pro alde-egin zuten  
 [Jon come<sub>NON-FINITE</sub> **side-GEN/back-inesive** pro leave Aux<sub>PAST</sub>  
 'They left after Jon came'

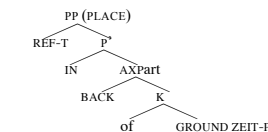
The temporal connectors in (18a-b) involve axial parts (AxParts): *aurre* 'front', *aitzin* 'front', *atz* (back), *ondo* (side, vicinity), *oste* (back)

- 19a. Jackendoff (1996): "The "axial parts" of an object—its top, bottom, front, back, sides, and ends—behave grammatically like parts of the object, but, unlike standard parts such as a handle or a leg, they have no distinctive shape. Rather, they are regions of the object (or its boundary) determined by their relation to the object's axes. The up-down axis determines top and bottom, the front-back axis determines front and back, and a complex set of criteria distinguishing horizontal axes determines sides and ends."

- b. *Svenonius 2006*: such expressions motivate a syntactic category distinct from both N and P, called *AxPart* for 'Axial Part' [see also Tortora 2005, Fabregas 2006, Rooryck & Vanden Wngaerd 2006, a.o.]

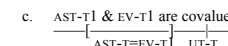
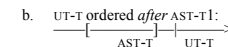
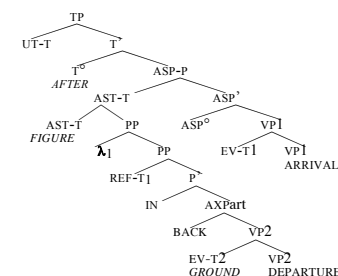


20. Assuming a more articulated structure for spatiotemporal PPs along the lines of (19b), the phrase structure for temporal modification in (18b) would be roughly:



21. [Zu etorri **oste-an** pro alde-egin nuen  
 [you come<sub>NON-FINITE</sub> **back-inesive** leave Aux<sub>PAST</sub>  
 'I left after you came'

a.



➤

- PP headed by the complex spatiotemporal predicate IN BACK ((20)) is predicated of the matrix AST-T1  
 i. Predication is achieved via (semantic) binding: AST-T bind the highest time variable inside the PP (REF-T). Binding creates a predicate that takes the AST-T as its external argument.<sup>2</sup>

- ii. Complex P° selects a nonfinite bare VP complement → no tense or aspect marking allowed on V°

→

IN BACK indirectly orders matrix AST-T (FIGURE) in an interval contiguous to the subordinate EV-T2 (GROUND). But how do we locate this span relative to the subordinate EV-T2? That is, how do we identify the *back* of EV-T2?

d.

*Zwarts & Winter (2000)*

Locative prepositions locate an object (FIGURE) relative to another one, the reference object (GROUND). Projective preposition such as *behind* require information about the **direction from** the reference object/ GROUND

→

BACK is a predicate of [-Central +Centrifugal Coincidence] indicating that the location of F is *after* G, or that the trajectory of F is *from/begins at* G. [cf. Hale 1984]

IN BACK thus orders the F, AST-T1 (cotemporal with EV-T1), within an interval immediately *subsequent* to EV-T2, e G.



22. In contrast, FRONT in (18a) is a predicate of [-Central +Centripetal Coincidence] indicating that the location of F is *before* G, or that the trajectory of F is *towards/will end at* G. [cf. Hale 1984]

IN FRONT thus orders the F, AST-T1 (cotemporal with EV-T1), within an interval immediately *preceding* EV-T2, the G.

<sup>2</sup> Predication could have equally been achieved via movement of a temporal  $\emptyset$  (itself coindexed with its antecedent (AST-T)) from the external argument position of P° (REF-T) to the top of the PP in order to create a predicate variable.

## II. Evidence for movement of temporal arguments

II.1 *The classis argument: weak island (subjacency) effects (see Geis 1970, Larson 1990 a.o.)*

23a. I saw Mary in New York [PP before/when [CP1 she claimed [CP2 that she would arrive

(23a) is ambiguous, it can mean either that:

- b. I saw Mary in NY before/when she made a certain claim
- c. I saw Mary before/at some time that she alleged would be the time of her arrival

➤ Standard analysis: these ambiguities arise through movement of either *when* or  $\emptyset$  PP generated in an adjunct position internal to CP1 or CP2 moves to the spec of either CP1 or PP

23b'. *Short distance construal:*  $\emptyset$  moves from within IP1 [PP before [CP1  $\emptyset$ i [IP1 she claimed [CP2 that she would arrive CP2] ti IP1] CP1] PP]

c'-'. *Long distance construal:*  $\emptyset$  moves from within IP2 [PP before[CP1  $\emptyset$ i [IP1 she claimed [CP2 that [IP2 she would arrive ti IP2] CP2] IP1] CP1] PP]

→ Analysis correctly predicts island effects:

d. I saw Mary in NY [PP before [CP1 she made [NP the claim [CP2 that she had arrived

(23d) is not ambiguous, it can only mean that:

d'. I saw Mary in NY before/when she made a certain claim

→ Long distance reading ruled out as a violation of subjacency

➤ (23) provides evidence for our analysis of TACs, as involving relativisation of a time argument:  
(23a) is ambiguous → both short and long distance relativization of the AST-T are licit, do not violate standard locality constraints on movement  
(23d) is unambiguous → long distance relativization of the AST-T violates standard locality constraints on movement

II.2 *A novel argument: strong island (CED) effects (see D&UE 2004)*

24. Hornstein's (1990) generalization:

REF-T of a temporal adverbial clause cannot itself be modified by a time adverb.

a. John left after Harry had departed at 3 o'clock

b. John had left at 3 o'clock

→ Harry's departure in (24a) unambiguously understood as occurring at 3, not prior to 3.

→ *at 3 o'clock* modifies the EV-T of the past perfect subordinate clause.

→ *at 3 o'clock* cannot modify the REF-T (= our AST-T) of the subordinate clause.

— Lack of REF-T in (24a) surprising since an adverb modifying a past perfect *matrix* clause ((24b)) allows both an EV-T and a REF-T reading, as discussed in (4d-f) above.

➤ Why does the REF-T/AST-T reading disappear in (24a)?

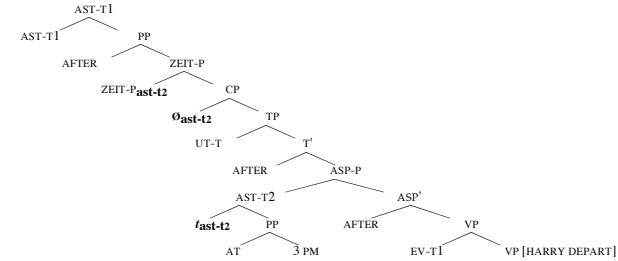
Our analysis provides a straightforward explanation for Hornstein's generalization.

The AST-T reading of the adverb *3 o'clock* disappears in (24a) because:

→ Once the AST-T is itself modified by a PP, it becomes itself an island for movement ((25))

➤ Relativization of the AST-T in (25) takes place from a position embedded inside the specifier of ASP-P, violating the CED/left branch condition, since specifier/subject positions are islands for movement.

25. after Harry had departed at 3 o'clock  
*Illicit Assertion-Time reading*



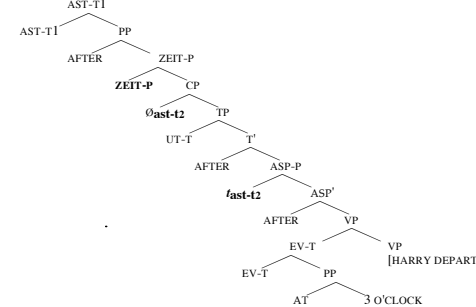
→ Predicts the REF-T reading of the PP at *3 o'clock* in (24a) to be ungrammatical:  
Extraction of the AST-T from within the specifier of ASP cannot take place without violating the CED.

➤ In contrast, (24a) allows an EV-T reading of the PP:

*at 3 o'clock* is predicated of / base generated adjoined to the EV-T

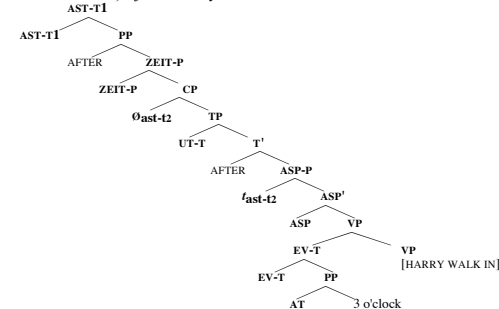
→ EV-T reading is grammatical: no extraction from within the EV-T (specifier of VP) is involved  
& extraction of the AST-T is licensed since it is movement of the specifier itself – not from within the specifier of ASP-P, as was the case with the illicit AST-T reading in (25).

26. after Harry had departed at 3 o'clock  
*Licit Event-Time reading*



Finally, consider the temporal structure of adverbial clause in (27).

27. (John left the office) *after Harry walked in at 3 o'clock*



— Adverbial clause in the simple past tense. → perfective aspect (AST-T2 & EV-T2 cotemporal)

— By hypothesis, the PP at *3 o'clock* modifies the EV-T of the subordinate clause since the alternative (that is, modification of the AST-T) would yield a CED violation.

**Summarizing.** Spatiotemporal P° heading a TAC relates the matrix AST-T to another time — itself indirectly denoting (via predication of the subordinate CP) the subordinate AST-T.  
 Predication is established by movement of a temporal relative pronoun null or overt (e.g. *when* in English).  
 We derive the disappearance of certain readings, when time adverbs are embedded within TACs, as violations of locality constraints (CED) on movement of the temporal relative pronoun.

### II.3 The argument from (strong) crossover

➤ Crosslinguistic variation in the availability of LD distance construals discussed in II.1 ((23))

28. LD available in English *before/after* TACs

a. John arrived after Harry told Mary that she should leave

b. I saw Mary in New York before she said she would arrive

→ (28) are ambiguous: allowing both a short & long distance construal

29. LD unavailable in Basque *before/after* TACs

a. [ [ [etorriko ze-la] esan oste-an] heldu zen ]

b. [[[ come<sub>PROSPECTIVE</sub> Aux<sub>PAST-Comp</sub>] say<sub>NON-FINITE</sub> back-inesive] arrive Aux<sub>PAST</sub>]

c. 'S/he arrived after s/he said he would come'

→ (29) not ambiguous: allows only a short distance construal

30. LD unavailable in Japanese *before/after* TACs

Watasi-wa Satoshi-ni [ Junko-ga [kaetta to] iu maeni] Amherst-de atta  
 I-TOP S-DAT J-NOM leave-PAST COM say-NON PAST before A-in meet.PAST  
 'I met Satoshi in Amherst before Junko said (he) left' [Kusomoto 1999]

→ (30) not ambiguous: allows only a short distance construal

➤ The morphosyntax of the Japanese *before/after* connectives is very similar to that of the Basque connectives discussed in (18-21): *mae* in (30) is a noun literally meaning 'front'. It can be used to mean 'before' by itself or it can be followed by the postposition *ni* 'at'. [cf. Kusomoto 1999]

→ The articulated temporal phrase structure proposed for the Basque *before/after* connectives in (20-21) could thus carry over to Japanese. One important difference: the complex predicate *IN FRONT* in (30) selects a *tensed IP*, not a bare nonfinite VP complement, as was the case in Basque ((21)).

➤ English/French/Spanish, LD construals excluded when the clause selected by the connective is a:

31. *Gerund* (English, Munn 1991, Johnson 1988)

Franny left after saying that Zoey left

32a. *Infinitive* (French/Spanish)

Rosa est partie après [CP1 avoir dit [CP2 que Max était parti]  
 Rosa is gone after have said that Max had left  
 'Rosa left after having said that Max had left.'

b. *Subjunctive* (French/Spanish)

J'ai vu Rosa avant [CP1 qu'elle ait dit [CP2 qu'elle serait à New-York]  
 I saw Rosa before that she have-SUBJ said that she would be in NY

c. vi a Rosa antes de [CP1 que Pedro nos dijera [CP2 que llegaria  
 saw to Rosa before from that Peter us told-SUBJ that arrived-FUT.PAST  
 'I saw Rosa before Peter told us that she/he would arrive.'

33. In contrast, *indicatives* in French/Spanish are *ambiguous*

J'ai vu Rosa au moment où [CP1 elle nous avait dit [CP2 qu'elle serait à New-York]  
 I saw Rosa at the time when she us had told that she would be in NY  
 'I saw Rosa at the time when she told us that she/he would be in NY.'

➤ Surprising state of affairs: LD construal is unavailable in gerunds, nonfinite/infinitives clauses, subjunctives  
 → clauses typically transparent for other LD dependencies such as binding.

34. **Generalisation:** LD temporal construal unavailable in **temporally dependent** TACs.

→ Why? Are Japanese tensed TACs a counterexample? No.

35. *A well-known difference between Japanese and English TACs*

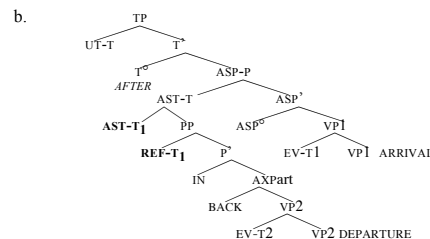
a. *English:* tenses in TACs behave like those in root clauses → they are absolute tenses.

That is, although tenses in TACs are syntactically embedded under the scope of matrix tenses, they are evaluated relative to UT-T/evaluation time of the sentence, not relative to the tense immediately dominating them.

b. *Japanese:* tenses in TACs are relative tenses (see Ogiwara, Kusomoto. That is, they are evaluated with respect to the tense immediately dominating them (and not with respect to UT-T)

36. D&UE: subordinate TAC temporally dependent on the matrix if its highest REF-T gets bounds by the matrix AST-T as was the case with the Basque TAC in (21) repeated as (36a):

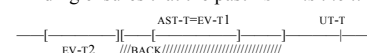
a. [Zu etorri oste-an] pro alde-egin nuen  
 [you come<sub>NON-FINITE</sub> back-inesive] leave Aux<sub>PAST</sub>  
 'I left after you came'



i. Matrix AST-T is past time: — [ — ] —>

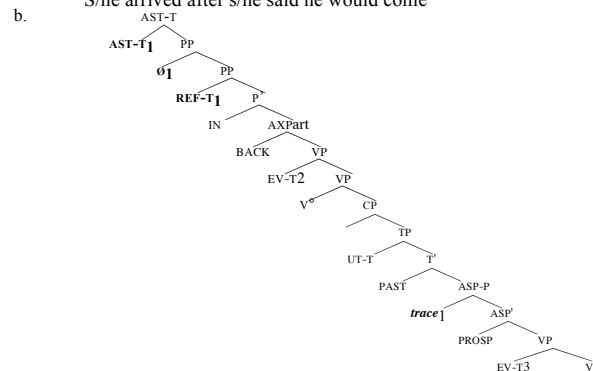
ii. Past matrix AST-T binds the topmost REF-T inside the PP

→ Binding ensures that the past AST-T is the time that falls within the interval immediately subsequent to EV-T2:



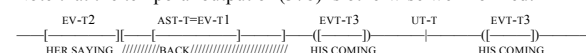
37. So, why is the LD construal in (29) unavailable?

a. [ [ [etorriko ze-la] esan oste-an] heldu zen ]  
 [[[ come<sub>PROSPECTIVE</sub> Aux<sub>PAST-Comp</sub>] say<sub>NON-FINITE</sub> back-inesive] arrive Aux<sub>PAST</sub>]  
 'S/he arrived after s/he said he would come'



→ LD construal involves LD relativization of the subordinate AST-T:  
 temporal  $\emptyset$  moves from the external argument position of the subordinate ASP° to the top of the PP.  
 Since, however, the matrix AST-T binds the REF-T in its immediate scope, movement yields a SCO violation.

→ Note that the temporal output of (37b) is otherwise well-formed:



**Summarizing.** The assumption that LD construals involve LD *movement* of a temporal pronoun allows us to exclude LD construals in temporally dependent clauses (infinitives, gerunds, Japanese tensed TACs) as *SCO* violations.

➤ Why are Japanese tensed TACs, unlike English TACs, but like infinitive & gerunds, temporally dependent.

→ Kusumoto 1999 (& references therein): Japanese TACs, unlike English TACs, are not CPs – but IPs

38a. D&UE 2004: computing the temporal reference of a given sentence takes place not **after** syntax –that is, once phrase structure units have been merged together/assembled– but rather at different points of the derivation, in parallel to the cyclic assembling/merger of syntactic units.

b. Roughly, PACS (in English) are temporally dependent because the temporal construal of the RC is computed *after* the subordinate CP is built (in parallel to the matrix), but *before* it is merged (counter-cyclically) into the matrix. The default evaluation time is thus the UT-T (since the highest REF-T inside the adjunct CP is free, unanchored). Resetting the evaluation time is prohibited *after* the CP is late merged into the matrix if this step in the computation is semantically vacuous, temporally uninformative.

→ In contrast, with clausal adjuncts that are smaller than CP (Japanese & Basque *before/after* clauses, gerund/infinitive TACs in English/French), the default evaluation time will be the matrix AST-T/EV-T (since the REF-T inside the adjunct is in the scope of the matrix AST-T/EV-T).

39. Spanish *LD* construal → movement of an *overt* relative (temporal) clitic pronoun

vi a Maria antes de lo que Pedro nos dijo que llegaria  
saw-1SG to Maria before of CL that Pedro us told-IND that arrive-FUT.PAST.3SG  
'I saw Maria before Peter told us that she would arrive'

II.4 Further evidence for a relative clause head internal/raising analysis of TACs

40. Scope dependencies (Artstein 1995, Kusumoto 2008)

a. A secretary cried after/before/when each executive resigned.

b. *Single-time* reading: all executives resign at the same time, which is itself followed by the crying of a secretary

c. *Dependent-time* reading:  
each resignation is at different times and followed by a possibly different secretary crying

→ Dependent time reading only found in temporal adjunct clauses: *not in other kinds of adjunct clauses*:

41. A secretary cried if/although/because each executive resigned.

→ Unambiguous: yields only a single-time reading.

➤ Why do **only** TACs yield dependent-time readings? Because they are head internal, raising relative.

42. Raising vs. Matching RCs (see Sauerland 1998, Bhatt 2002)

a. Matching RC : head NP interpreted outside of the relative clause.

b. Raising RC: head NP interpreted only in the relative clause internal trace position.

43. From Hulsey & Sauerland (2006)

a. Mary liked the picture of himself that every boy sent.

→ Binding of the anaphor requires a raising analysis of the RC:

b. [the  $\lambda x$ . everybody  $\lambda y$ .  $y$  send in the $_x$  picture of  $y$ ] annoyed the teacher

Predicate created by  $\lambda x$  is only defined for an individual that is, for everybody, a picture of that person. (43b) thus presupposes there to be a single picture that shows collectively every student.

→ (43b) cannot be the only LF for (43a) since (43a) can also be true in a situation where each person sent in a picture that only shows a single person, namely himself.

➤ When the binder in the RC is a QP, further assumptions about the interpretation of raising RCs are required:

c. Possible LF-structure for (43a):

everybody  $\lambda y$ . [the  $\lambda x$ .  $y$  send in the $_x$  picture of  $y$ ] annoyed the teacher

➤ QP has moved out of the relative clause to attach to the matrix clause

*Raising relative clauses are not islands for QR !*

→ The simplest solution to derive the observed ambiguity is to appeal to QR :

Derive the dependent-time reading by allowing the universally quantified subject in (40a) to raise out of the TAC to scope over the existential subject in the matrix clause:

44. [[each executive resigned] $_i$  [a secretary cried [after  $t_i$ ]]]

→ This simple solution violates the locality constraint of QR

➤ This violation of the locality constraints on QR is expected, however, on:

i. H&S's proposal that *raising* relative clauses are *not* scope islands, but rather are transparent for QR

Together with the assumptions that

ii. TACs are Temporal Relative Clauses

b. The dependent time reading involves a raising analysis of the temporal relative clause

➤ *Other kinds of adjunct clauses* ((41)) do not yield dependent time readings because they are not (raising) relative clauses and, as such, remain islands for QR.

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