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ASPECT AND TEMPORAL MODIFICATION

I. Tense and Aspect as Spatiotemporal Predicates

Demirdache & Uribe-Etxebarria (1997a, 2000, to appear a, b) propose a uniform analysis of Tense and Aspect as spatiotemporal predicates, projecting their temporal argument structure in the syntax and defined in terms of a basic semantic opposition: +/-central coincidence in the location of the Figure with respect to the Ground (Hale 1984).

We take as point of departure Klein's (1995) proposal that both Tense and Aspect relate two times. Tense relates the time of utterance (UT-T) to a reference time: the *Assertion Time* (AST-T). Aspect then relates the AST-T to the time at which the event (or state) denoted by the VP occurs or holds (EV-T). We derive this proposal from the thesis that tenses and aspects are dyadic predicates of *spatiotemporal* ordering, defined in terms of (non-) central coincidence in the location of the Figure with respect to the Ground. This proposal explains why predicates expressing central coincidence between the Figure and the Ground – e.g. pre/postpositions such as *in*, *on*, *at*, as well as verbs of location, stance or posture such as *stay*, *sit*, *lie down*, *live*, or even verbs of non-directed motion such as *walk* – are systematically used to form progressive sentences across languages. It also straightforwardly explains why predicates expressing +centrifugal coincidence between F and G – typically, verbs of motion towards G such as *go* – are cross-linguistically used to express the Prospective/Future, whereas predicates of -central +centrifugal coincidence between F and G – that is, prepositions such as *after* or verbs of motion from G such as *come from* or *throw away* – can surface cross-linguistically to express the Perfect/Past.

We capture the semantic parallel between Tense and Aspect syntactically by proposing a uniform phrase structure for temporal relations. The idea that Tense relates two times has been captured in syntactic terms by breaking down Tense syntactically into its semantic components. For Zagona (1990), Tense is a head that projects a maximal projection (TP) taking two time-denoting arguments. Its external argument is a REF-T (typically, the UT-T). Its internal argument is the EV-T. Stowell (1993) extends this proposal by analyzing Tense as a two-place predicate of temporal ordering. We propose that Aspect, just like Tense, is a dyadic predicate, taking time-denoting phrases as arguments, and projecting its temporal argument structure in the syntax. We thus define a single uniform phrase structure for temporal and aspectual relations,

This proposal reduces Tense and Aspect to the same set of substantive primitives: both Tense and Aspect are spatiotemporal ordering predicates. T^0 is a spatiotemporal ordering predicate with the meaning of AFTER (past), BEFORE (future) or (WITH)IN (present) [cf. Stowell 1993]. Likewise, ASP^0 is a spatiotemporal ordering predicate with the meaning of AFTER (perfect aspect), BEFORE (prospective aspect), or (WITH)IN (progressive aspect). This proposal also reduces Tense and Aspect to the same set of structural primitives: Tense and Aspect are both dyadic predicates taking time-denoting phrases as arguments. The external argument of T^0 is a reference-time (typically, the UT-T), its internal argument is the AST-T. Likewise, the external argument of ASP^0 is a reference-time (the AST-T), its internal argument is the time of the event denoted by the VP (the EV-T). We thus establish a strict parallel between the syntax-semantics of Tense and that of Aspect.

The proposal that Aspect, just like Tense, is a predicate of spatiotemporal ordering establishing a topological relation between two time-denoting arguments allows us to capture the traditional idea that the role of grammatical Aspect is to focus an interval in the temporal contour of the event described by a sentence. The time focussed by Aspect is the Assertion-Time. Why does Aspect focus (pick out) a time interval in the temporal contour of the event described by a sentence? Because Aspect (just like Tense) is a spatiotemporal predicate, establishing a topological relation

between its external argument - the AST-T - and its internal argument - the EV-T. Only the time interval focused by Aspect is visible to semantic interpretation, as Smith (1991) puts it: “Continuing the analogy of a viewpoint with the lens of a camera, we shall say that the part focused by a viewpoint [aspect] is visible to semantic interpretation [...] What is focused has a special status, which I will call visibility. Only what is visible is *asserted*.”

We illustrate our proposal with an analysis of two aspects: the progressive and the perfect. We distinguish perfect aspect from perfective or aoristique aspect. The described event is viewed/presented as completed prior to a reference time (perfect aspect) when the AST-T is ordered by ASP° AFTER the EV-T. The described event is portrayed in its entirety, as including both its initial and final bounds (perfective aspect), when the AST-T and the EV-T are cotemporal – that is, when the AST-T binds the EV-T.

II. Time Adverbs as Modifiers of the Spatiotemporal Arguments Projected by ASP°

Once we assume, following Zagana (1990) and Stowell (1993), that time arguments are represented in the syntax as temporal DPs or *Zeit* Phrases (Stowell 1993), the null assumption is that they can be modified, just like any DP can. This, we argue, is precisely the role of time adverbs: time adverbs are semantic and syntactic modifiers of *Zeit* phrases projected in the syntax as arguments of ASP°.

In particular, we argue that time adverbs are semantically and syntactically **PP** modifiers, predicated of the time-denoting phrases projected in the syntax as arguments of ASP° – that is, of either the AST-T or the EV-T (of the clause in which they occur). Under this proposal, time adverbs are uniformly analyzed as PPs headed by a dyadic predicate of spatiotemporal ordering. This predicate can be either overt – e.g. **at** Christmas, **in** 2000, **before/after** Sunday, **before/after** Zazy left – or null – e.g. **Ø** Sunday, **Ø** this morning. Silent spatiotemporal predicates always express central coincidence. The proposal put forth holds for all time adverbials – whether they have the semantics of locational or durational adverbs, or whether they have the syntax of PPs, bare NPs, bare CPs, or clausal adjuncts headed by a temporal connective. PP time adverbs modify the reference of the AST-T/EV-T, by establishing a relation of (non-)central coincidence – inclusion, precedence, or subsequence – between the AST-T/ EV-T (their external argument) and the time denoted by their internal argument. The spatiotemporal predicate which heads a temporal adjunct clause relates the AST-T of the main clause and another time, which itself indirectly denotes (via predication of the adjunct clause) the AST-T of the adjunct clause. Predication is mediated by movement of a temporal operator, which can be null or overt (e.g. spelled out as *when* in English, or as *quand* in French).

We further show how the phrase structure proposed for Tense and Aspect explains certain cooccurrence restrictions on the distribution of multiple adverbs within a single a clause (e.g. *John left a week ago yesterday* or *Yesterday John left a week ago* vs. **A week ago, John left yesterday* – Hornstein 1990).

The proposal that time adverbs are PPs predicated of the time arguments projected in the syntax as argument of ASP° allow us to reduce the grammar of tenses, aspects and time adverbs, cross-linguistically, to the same set of universal substantive and structural primitives, and thus define a single, uniform grammar for temporal and aspectual relations. Tenses, aspects and time adverbs are uniformly analyzed as dyadic predicates of spatiotemporal ordering, projecting their argument structure in the syntax, and establishing a topological relation – inclusion, subsequence or precedence – between their time-denoting arguments.

III. Anchoring Subordinate Clauses

We now turn to the restrictions that obtain between tense and aspect combinations in matrix and adjunct clauses, as illustrated in (1-8). Note that there are both restrictions on the occurrence of tenses/aspects in temporal adjunct clauses, as well as restrictions on their interpretation. Thus, for instance, the sentences in (2) are ungrammatical whereas those in (4) are grammatical but only under a future shifted interpretation of the present tense adjunct clause.

Temporal subordinate clauses

- | | |
|--|---|
| 1a. Max left after Rosa arrived | b. Max left before Rosa left |
| 2. <i>Temporally uninformative</i> | 3. <i>Semantically uninterpretable</i> |
| a. *Max will leave after Rosa arrived | a. *Max left after Rosa will arrive |
| b. *Max left before Rosa will arrive | b. *Max will leave before Rosa arrived |
| 4. <i>Temporally informative iff the adjunct clause has a future reading</i> | |
| a. Max will leave after Rosa leaves | c. Max will arrive after Bill has left |
| b. Max will leave before Rosa leaves | d. Max will arrive before Bill has left |

From Hornstein (1990):

- | | |
|---|---------------------------------------|
| 5a. John left after Harry had arrived | b. *John had left after Harry arrived |
| <i>Temporal reading of 'before' only</i> | |
| 6a. Sue had walked in before Peter left | |
| b. Harry will have put money in the parking meter before the cop gives him a ticket | |
| <i>Counterfactual reading of 'before'</i> | |
| 7a. Max escaped before he had served his term | |
| b. Harry will put money in the parking meter before the cop has given him a ticket | |

We will show that these restrictions on the interaction of tenses/aspects when a temporal adjunct clause is embedded into a matrix clause fall out uniformly from the principles given in (8) below. Thus, (8ii) will rule out the ungrammatical combinations in (2), and explain why the present tense adjunct clauses in (4) must have a future shifted reading. Roughly, the restrictions illustrated in (2) and (4) obtain because the temporal connective is not contributing semantically to the temporal ordering of the AST-Times of the matrix and adjunct clauses (the ordering is itself already determined by the tenses of the clauses). We argue that (8) further derives the contrast between the grammatical (5a) and the ungrammatical (5b) with the temporal connective *after*, as well the contrast between (6) and (7) where the preferred interpretation of the *before* clause is counterfactual and not temporal. Finally, the unacceptable combinations in (3) will be filtered out because they are semantically uninterpretable (they yield contradictory temporal orderings).

- 8i. Any given derivation must yield an unambiguous ordering of the AST-T of the matrix clause and the AST-T of the subordinate clause.
- ii. No step in the temporal derivation can be semantically vacuous; every step in the derivation must be temporally informative (that is, must yield a temporally distinct interpretation).

Subordinate adjunct clauses differ from subordinate complement clauses in one important respect. As is well known, complement clause can yield dependent construals, where the temporal interpretation of the subordinate clause is dependent on the matrix AST-T (that is, the REF-T of T° in a complement clause is anaphorically anchored to the matrix AST-T), as the shifted readings in (9) illustrate. In contrast, temporal adjuncts clauses always yield independent construals: the external argument of T° in an adjunct clause must be anchored to the UT-T, and not to the matrix AST-T. We argue that this difference between complement and adjunct clauses need not be stipulated: it falls out straightforwardly from the principles given in (8). That is, anaphorically anchoring the REF-T of T° in an adjunct clause to the matrix AST-T will always be ruled out as either a violation of (8i) (the AST-Times of the matrix and adjunct clauses remain unordered), or as violation of (8ii), or finally because it yields a temporally uninterpretable (contradictory) ordering.

Finally, we argue that the principles in (8) also explain the typology of construals in complement clauses with eventive verbs, as illustrated in (9-11). Roughly, shifted readings obligatorily arise when merging a complement clause into a matrix clause requires resetting the anchor time from its default value (UT-T) to the matrix AST-T – else (8i) is violated, as the AST-Times of the matrix and complement clauses remain unordered. The complement clauses in (9) thus contrast sharply with the adjunct clauses in (1): temporal anchoring of the complement clauses in

(9) into the matrix can only be established anaphorically via control of the embedded REF-T by the matrix AST-T, whereas temporal anchoring of the adjunct clauses in (1) into the matrix can only be established via the temporal connective. Finally, resetting the anchor in (11) from its default value (UT-T) to the matrix AST-T in (11) is legitimate (though not obligatory) as it yields a distinct temporal interpretation (thus, satisfying (8ii)), and can, further, have overt morphological reflexes (e.g. the *will/would* alternation in (11a-a')).

Complement clauses

- 9. *Resetting the anchor obligatory*
 - a. Max said that Lou kissed Max
 - b. Max will say that Lou will kiss Max

- 10a. *Resetting the anchor is vacuous (temporally uninformative)*
 - a. Max says that Lou will kiss Max
 - b. Max says that Lou will kiss Max
 - c. Max says that Lou is kissing Max

- 11. *Resetting the anchor is temporally informative (yields distinct temporal interpretations)*
 - a. Max said that Lou will kiss Max
 - b. Max will say that Lou kissed Max
 - a'. Max said that Lou would kiss Max
 - c. Max will say that Lou is kissing Max

We view the principles in (8) as principles of economy determining the structures and steps in a derivation at the interface with the semantic component. (8i) ensures that merging a subordinate clause into a matrix yields a temporally interpretable output (where the AST-Times of the matrix and subordinate clauses end up ordered with respect to each other). (8ii), in turn, is designed to ensure that a given temporal interpretation is achieved in an optimal manner in the spirit of Fox' (2000) scope/variable binding economy principles – that is, “with no more effort than is necessary”.