

“Measuring Out” Complement Clause Tenses

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Abstract

This article addresses the phenomenon commonly referred to as “the double access reading” (DAR) of complement clause tenses, which concerns a type of restriction on the reading of the complement in relation to a matrix tense. The restrictions in question have been analyzed previously as deriving from “double anchoring” of the complement tense, both by the matrix event and by utterance time. On the basis of evidence from Spanish and Italian, this article claims that only one of these relations is genuine tense anchoring: anchoring by utterance time. The other relation, “event anchoring” is shown to derive from the role of complement constituents in “measuring out” the aspect of the matrix predicate. Spanish and Italian provide evidence that the distribution of the DAR correlates with aspectual properties of the matrix predicate. This generalization is argued to derive from the capacity of complement clauses to express a temporal “Path” along which a Theme progresses, analogous to Paths expressed by other constituents such as PPs and DPs. Tense anchoring is simplified as a consequence.

1. Introduction.

A traditional problem in the analysis of tense—from both a semantic and a syntactic perspective, is the existence of certain temporal restrictions that are found exclusively in complement clauses. A principal restriction is the “Double Access Reading” (DAR). The DAR is observed when an embedded Present tense is understood as expressing a situation that includes both utterance time (UT) and the time of a matrix Past event. This is illustrated by the contrast between (1a) and (1b):

- (1) a. John heard that Mary is pregnant.
- b. *John heard two years ago that Mary is pregnant.

In (1a), the time of Mary’s pregnancy is understood to include the time of John’s hearing as well as the UT of the sentence. Example (1b) is temporally anomalous because Mary’s pregnancy cannot be understood to include both the matrix event of two years previous and the UT. This restriction is not observed in clauses other than complements, as noted by Enç (1987), illustrated by the contrast between (1b) and (2):

- (2) John saw two years ago [the woman who is pregnant]

In (2), the embedded clause Present tense is evaluated only relative to UT. It need not include the matrix Past event. It appears that only complement tenses are required to be evaluated “doubly”, relative to two times: the matrix event and UT.

Previous accounts of complement temporal restrictions (and the DAR in particular) have posited an “anchoring” relationship between the embedded tense and the matrix tense. That is, while main clause tenses are generally evaluated in relation to UT, embedded clause tenses have been presumed “defective”, in the sense that they cannot be evaluated relative to UT directly. They are instead supposed to be anchored to a higher tense, which is in turn evaluated relative to UT. A recent study by Giorgi and Pianesi (2000) shows that a particular structure is associated with the complement clause of sentences which show DAR. G&P argue that this exceptionally permits the embedded tense to be evaluated relative to UT also. This means that, for an embedded Present tense like (1a), the time of Mary’s pregnancy is “in the present” relative to the time of John’s hearing, and to UT. Double Access thus implies double temporal ordering—relative to two evaluation times.

The present study argues that there is an independent basis for the DAR that does not involve tense anchoring of the embedded tense by the matrix event. The generalization is that the relationship between the complement tense and the matrix event-time is not a form of tense anchoring at all, but is instead a temporal relationship that derives from the compositional nature of aspect evaluation of the matrix predicate. The relevance of the complement to aspect evaluation can be illustrated by well-known contrasts such as the

one in (3), which shows that differences in grammatical features of a complement correlate with differences in aspect:

- (3) a. Mary drew a circle (in a minute/*for a minute).
 b. Mary drew circles (for a minute/*in a minute).

In (3a), the situation of drawing a circle reaches an endpoint, as is shown by the familiar diagnostic of modification by *in*-adverbials, and not by durative *for*-adverbials. In (3b) on the other hand, the bare plural complement correlates with a situation that is durative, as shown by the possibility of *for*-adverbials instead of *in*-adverbials. The contrast in (3) illustrates how features of a complement can affect the “measuring out” of the event (Tenny 1987; Jackendoff 1996, among others). Although the mechanisms for “measuring out” remain under investigation, there is some consensus that in (3), the status of the circle(s) over the temporal course of the event affects the nature of the event itself as well as the object(s). Jackendoff (1996) proposes that there is a spatial axis which represents both changes in the object and different moments in the time interval of the event. He argues that the Path is the basis for measuring out the event, not the Theme which moves along the path. In other words, it is the spatio-temporal coordinates of the object rather than the object itself which can be said to move the event forward toward an endpoint over time.

A natural extension of Jackendoff’s conception of measuring out is that a clause should in principle be able to provide a (temporal) Path for measuring out a matrix event.

It will be claimed below that complement clauses can provide such a Path, so that an analogous form of measuring out occurs in sentences like (1a). In this case, the Path is the time of Mary's pregnancy, which also includes UT. The event of John's hearing is temporally located on this path by virtue of the aspectual measuring out of the main clause event. Consequently, a temporal Path in a complement clause produces the appearance of double tense anchoring. The two approaches can be distinguished, as I argue below. The aspectual account has theoretical advantages. One is that, insofar as the stipulative device of double tense anchoring can be eliminated, the theory of tenses is simplified. Although the readings in question can be described by double anchoring, they cannot be explained by it, since double anchoring is not otherwise motivated in the grammar. A second consequence of the analysis is that it provides independent support for the view that measuring out involves a Path directly, rather than a Theme, since only the former approach extends naturally to temporal Paths in complement clauses.

The discussion is organized as follows. Section 2 introduces the DAR and argues that its distribution is governed by aspectual properties of the matrix predicate, not by tense anchoring. One crucial observation concerns aspectual differences between predicates whose complements observe the DAR and those whose complements do not. The partition derives from an important observation due to Giorgi and Pianesi (2000), who note that in Italian the DAR is observed under "verbs of saying" (*verba dicendi*), but not under verbs of belief. These verb classes differ along several dimensions, including an aspectual one: verbs of saying are processes, while verbs of belief are stative. It is argued

that the aspectual distinction is the crucial one. Section 3 examines the mechanics of aspectual evaluation, and shows how it applies to temporal Paths in complement clauses. Section 4 will briefly compare the case discussed here with another type of temporal dependence in complement clauses, the “simultaneous” reading of an embedded Past tense under a matrix Past event.

2. Double Access under verbs of saying.

As noted above, Giorgi & Pianesi (2000) show that the DAR is observed in Italian in complement clauses under verbs of saying, but not under verbs of belief. In 2.1 below, these cases are reviewed. We then examine evidence from Spanish suggesting that the crucial contrast between these two verb classes with respect to the DAR is aspectual.

2.1. Italian verbs of saying versus verbs of belief.

Giorgi & Pianesi (2000) (henceforth G&P) show that there are two classes of matrix predicates with respect to the DAR: verbs of saying and verbs of belief. Verbs of saying impose DAR on their complements, as illustrated in (4)-(5) from G&P:

(4) *Gianni ha detto [che Maria è incinta]*

‘Gianni said that Maria is pregnant.’

(5) **Dieci mesi fa Gianni mi ha detto che Maria è incinta.*

‘Ten months ago Gianni told me that Maria is pregnant.’

In (4), the embedded Present is grammatical and must include both UT and the time of the matrix event, as is shown by the contrast with (5).¹

Complements of verbs of belief do not show obligatory DAR; in fact they do not allow Present tense embedded under Past. They impose strict sequence of tense:

(6) a. **Gianni credeva [che Carlo sia malato]*

‘Gianni believed that Carlo is(PR.SUBJ) sick.’

b. *Gianni credeva [che Carlo fosse malato]*

‘Gianni believed that Carlo was(PA.SUBJ) sick.’

The ungrammaticality of (6a) is due to the Present tense embedded under Past, as is shown by the grammaticality of (6b), with Past embedded under Past. According to G&P, the absence of DAR under verbs of belief is illustrated by the fact that a Past embedded under Past is not temporally restricted. It can be interpreted as either preceding or following both UT and the matrix event time:

(7) a. *Gianni credeva [che Maria partisse domani]*

‘Gianni believed(PA) that Maria left(PA.SUBJ) tomorrow.’

b. *Gianni credeva che Maria scrivesse una lettera.*

‘Gianni believed(PA) that Maria wrote(PA.SUBJ) a letter

Summarizing to this point, we have seen that verbs of communication permit Present tense to be embedded under Past tense, and impose the DAR on the complement. Verbs of belief do not allow Present tense to be embedded under Past tense, and do not impose DAR on their embedded Past tense.

Although verbs of saying generally select indicative complements while verbs of belief select subjunctive complements, G&P show that the contrast with respect to DAR cannot be attributed to mood. The verb *ipotizzare* ‘hypothesize’ selects a subjunctive complement, but the complement can pattern with both classes described above, according to whether *ipotizzare* is construed as a verb of communicative behavior or a verb of attitude (mental state):

(8) a. *Gianni ha ipotizzato (che) fosse incinta.*

‘Gianni hypothesized (that) she was(PA.SUBJ) pregnant.

b. *Gianni ha ipotizzato *(che) sia incinta.*

‘Gianni hypothesized that she is(PRES.SUBJ) pregnant.

In (8a), complementizer deletion is diagnostic for non-obligatory DAR; the difference between (8a) and (8b), where the complementizer cannot be omitted, is that in the latter, the verb is understood as a verb of saying, and the sentence has the temporal characteristic of obligatory DAR. In (8a), *ipotizzare* is a verb of mental attitude. To summarize, the DAR correlates with an interpretation of the matrix predicate as a verb of

saying, and not with an interpretation as a verb of attitude, independent of the mood of the complement clause.

2.2. *The aspectual contrast.*

We turn now to evidence that the occurrence of the DAR under verbs of saying, but not under verbs of belief, is related to the aspect of the verb. This contrast is suggested by their respective status in the progressive:

- (9) a. John was saying/hypothesizing/confessing that . . . (process)
 b. *John was believing that . . . (state)

It is further supported by a class of verbs in Spanish whose stativity co-varies with the DAR in the complement. As noted in Zagona (to appear), the normally stative reading is lost in the preterite past, and this is accompanied by a loosening of sequence-of-tense, and the appearance of DAR. This is illustrated by the contrasts in (10) and (11):

- (10) a. **Juan sabía que María está embarazada.* (state)
 ‘Juan knew that Maria is(PR.IND) pregnant.’
 b. *En cuanto la vi, supe que María está embarazada.* (inchoative state)
 ‘As soon as I saw her, I knew that Maria is(PR.IND) pregnant.’
- (11) a. *?*Juan creía que María está embarazada.* (state)
 ‘Juan believed that Maria is pregnant.’
 b. *De inmediato Juan creyó que María está embarazada.* (inchoative state)

‘Immediately Juan believed that Maria is pregnant.’

The (a) examples above are pure stative predicates; the (b) examples are inchoative states. Only the latter admit Present embedded under Past, and impose the DAR. Other classes of verbs that do not vary in stativity also do not vary in imposing the DAR. This is illustrated by statives such as those in (12) and non-statives like (13):

- (12) a. **Fue probable/posible que María esté embarazada.* (stative)
 ‘It was(PRET.) probable/possible that Maria is(PRES.SUBJ.) pregnant.
- b. **Era probable/posible que María esté embarazada.* (stative)
 ‘It was(IMPERF.) probable/possible that Maria is(PRES.SUBJ.) pregnant.
- (13) a. *Juan notó que María está embarazada.* (non-stative)
 ‘Juan noticed(PRET.) that Maria is(PRES.INDIC.) pregnant.
- b. **Juan notaba que María está embarazada.* (non-stative)
 ‘Juan noted(IMPERF.) that Maria is(PRES.INDIC) pregnant.

The adjectival predicates in (12) are stative in both the Preterite and the Imperfect Past. Like the Italian belief predicates, they observe strict sequence of tense and do not impose DAR. The non-stative “semi-factives” in (13) have a punctual reading, and allow DAR, as in (13b). The punctuality of the predicate makes the Imperfect Past in (13a) anomalous. Summarizing, two patterns of behavior have been illustrated above: (a) predicates which exhibit a stativity alternation also display a corresponding alternation in

the DAR; (b) predicates which do not alternate in stativity are uniform with respect to the DAR: statives disallow it, while non-statives allow it.

Notice that the predicates in (10)-(11) which exhibit a stativity alternation do not have an accompanying activity/mental state alternation as do the Italian predicates illustrated by G&P. This suggests that, at least for Spanish, the basis for the partition is simply presence or absence of stativity, since this subsumes both inchoative states and verbs of communication.

2.3. Limitations of Tense anchoring.

We turn now to an argument against Tense anchoring as a mechanism for analyzing the relationship between the event times in the matrix and complement clauses. Briefly stated: the Tense anchoring approach predicts incorrectly that Event-event dependence of the type illustrated above should disappear in the absence of a Tense that requires anchoring. The aspectual analysis correctly predicts that the Event-event dependence should not disappear in the absence of a finite tense. It is expected to persist insofar as the aspectual relations that interact under non-statives are satisfied. This is borne out; non-statives show the same event-event dependency in their complements regardless of whether or not both matrix and embedded tenses are present. In (14) and (15), the (a) examples illustrate the standard examples of DAR with Present embedded under Past.

The (b) examples illustrate that Present embedded under a nominal is still dependent on the time of the nominal:

- (14) a. John stated (*two years ago) that Mary is pregnant.
 b. [John's statement (*of two years ago) that Mary is pregnant] will not surprise anybody.
- (15) a. John found out (*two years ago) that Mary is pregnant.
 b. [John's finding out (*two years ago) that Mary is pregnant] will not surprise anybody.

The adverbial *two years ago* makes the sentence temporally anomalous in nominal as well as verbal predicates. This means that the DAR occurs in the complement of a nominal, even though there is no superordinate Past tense.

The event-event dependence is also observed when the complement clause does not contain a finite tense:

- (16) a. John hypothesized two years ago [about Mary's being pregnant]
 b. [John's hypothesizing two years ago [about Mary's being pregnant]] should not surprise anybody.
- (17) a. John heard two years ago [about Mary's being pregnant]
 b. [John's hearing two years ago [about Mary's being pregnant] should not surprise anybody.

In (16) and (17), we see that what disappears when the embedded clause is not finite is the anchoring to UT; the Event-event dependency remains in force. In (16a) and (17a), the gerundive complement includes the time of the superordinate event (i.e., two years ago); it does not include UT. This indicates that an embedded finite tense is anchored to UT, while a non-finite event is not. It also indicates that the “access” to a matrix event time is not a product of Tense anchoring. This conclusion is further supported by the fact that the same generalization holds regardless of whether the matrix predicate is verbal.

To conclude, we began by summarizing the evidence that the DAR in Italian is sensitive to properties of the selecting verbal predicate: it occurs under verbs of communicative behavior but not under verbs of belief. We then showed that the crucial distinction between these classes is an aspectual one, at least in Spanish, where the stativity of the predicate determines the whether or not the DAR is imposed, regardless of whether the verb is one of communication or of belief. Finally, support for an aspectually based account was adduced from the persistence of the event-event dependency even in the absence of finite tenses that would be subject to anchoring.

3. The complement clause as a temporal ‘Path’.

We turn now to an examination of aspectual evaluation or ‘licensing’, and propose an account of the type of event-event dependencies discussed above. We will address the

issue of why the temporal dependence arises in the complements of non-statives such as verbs of communicative behavior, and why it is absent in complements of statives. The account should explain also why the dependence persists even in the absence of finite tenses, as discussed in 2.3 above. The discussion is organized as follows. Section 3.1. summarizes a framework for establishing (or ‘licensing’) lexical aspect, then discusses how the framework applies to verbs of communication. We will focus on Jackendoff’s claim that DP and PP complements identify a ‘Path’ on which the event progresses (is measured out). Section 3.2 shows how this approach extends naturally to clausal complements, with the embedded event providing a temporal ‘Path’ on which the matrix event develops. In 3.3 we why this relation is absent in complements of stative verbs.

3.1. The role of the Path in “measuring out” events.

Setting aside many important issues for the grammar of aspect, there is general consensus that the following generalizations should be expressed by any theory of “lexical” aspect:²

- (18) a. Predicates are stative or non-stative; non-statives are ‘telic’ or ‘atelic’.
 b. The classification of predicates is compositional, not strictly lexical.

The classification in (18a) derives three of the four classes described by Vendler (1967): States, Activities (processes with no endpoint) and Accomplishments (processes that reach an endpoint).³ States are distinguished by the impossibility of progressives: **John is knowing the answer*, **The box is containing the papers*. Non-statives can be

differentiated from each other by their compatibility with *in*-adverbials (with Accomplishments) versus *for*-adverbials (with Activities):

- (19) a. Mary ate the apple (in ten minutes/*for ten minutes).
 b. Mary ate apples (for ten hours/*in ten hours).

The examples in (19) also illustrate the generalization in (19b): that aspectual classification is compositional, not a purely lexical property. In (19a), the definite singular object is compatible with a telic (Accomplishment) reading; in (19b) the bare plural object is compatible with an atelic (Activity) reading. It is not possible to classify the verb *read* in the lexicon as either an Activity or Accomplishment. Such a classification would predict incorrectly that the verb always has either a telic or an atelic interpretation. Instead, features of other constituents co-determine aspectual class. Tenny (1987) describes the complement as crucial in ‘measuring out’ the event. As the event (19a) progresses, the apple disappears little by little, until the moment when it is entirely gone, and the event has reached its natural endpoint or culmination. The successive changes of state of the apple thus “measure out” the event. In (19b) the succession of apples eaten measures out an event without a definite endpoint.

It is argued in Jackendoff (1996) that an adequate formalism for expressing the “measuring out” an event depends in part on the expression of a “Path” along which a dynamic situation develops. In 3.1.1 below, we describe Jackendoff’s framework; in

3.1.2, we then integrate Jackendoff's claims into syntactic licensing approaches; finally in 3.1.3, we examine how this framework applies to verbs of communicative behavior.

3.1.1. Jackendoff (1996): Structure-preserving Binding

As noted in (18) above, predicates are generally partitioned into states and non-states, and the latter are interpreted as either telic or atelic. For purposes of differentiating predicates that impose DAR from those which do not, the stative/non-stative distinction was argued in Section 2 to be crucial. The discussion below will summarize how Jackendoff's framework differentiates stative predicates from non-statives, and relevant properties of non-statives.

Jackendoff (1996) proposes an account of aspect that is centrally concerned with the representation of change over time. A central component of Jackendoff's account is the proposal that locations on a Path, or linear axis, measure out events. Jackendoff takes motion verbs as a core case. These show explicitly the relevance of properties of a Path (a set of positions) as distinct from the entity—usually the Theme argument of the verb—which moves on the Path. For motion verbs, the Path is specified by PPs in (20):

- (20) a. John pushed the cart **toward/along** the river (for an hour/*in an hour).
 b. John pushed the cart **to** New York. (in two days/*for three days).

In these examples, telicity is determined by the choice of preposition, not by features of the direct object itself. Other classes of verbs may have linear axes of different types. For

example, the object of a verb of consumption like *eat* comprises an axis through which the event progresses; likewise for verbs of performance such as *recite a poem* or *sing the anthem*. The distinction between the object itself measuring out the event and the notion that the progress of the object along an axis measures out the event can be illustrated by comparing a motion verb like *push* with a motion verb like *flow*. If I push the cart, the change is only expressible in terms of the appearance of the cart at different positions in space; *the cart* does not undergo change independent of its position. Syntactically, the PP is the constituent that measures out the progress (change) through the event. Compare this with: *Water flowed over the dam*. In this case, different parts of the water are understood to occupy a single position at different times. In this case, the change concerns the “parts” of the water that occupy a single location at different moments. The DP *the water* thus measures out change over time. It is the Path for the *flow*-type of predicate.

Support for the relevance of the Path in construing aspect derives from the following alternation in Italian, discussed in Kempchinsky (2000) (data from Hoekstra and Mulder 1990):

- (21) a. *Gianni ha corso.*
 ‘Gianni has run.’
- b. *Gianni è corso a casa.*
 ‘Gianni has [BE] run home.’
- c. *Ne sono corsi due a casa.*

‘Two of them have [BE] run home’

These examples illustrate that an unergative activity predicate like *correr* ‘run’ in (21a) patterns like an unaccusative when a goal argument is added. This is shown by the choice of auxiliary in (22b) and the grammaticality of *ne*-cliticization in (22c). Kempchinsky shows further that Spanish counterparts of these derived unaccusatives are aspectually Achievements. This is illustrated by the impossibility of durational adverbials, as in (22b) and the impossibility of the *terminar de* ‘finish’ context in (23b):

- (22) a. *El niño corrió por diez minutos.*
 ‘The child ran for ten minutes.
- b. **El niño corrió a casa por diez minutos.*
 ‘The child ran home for ten minutes.
- (23) a. *El niño terminó de correr.*
 ‘The child finished running.’
- b. **El niño terminó de correr a casa.*
 ‘The child finished running home.’

Kempchinsky notes that an account of the different aspectual properties of the sentences based exclusively on the grammatical or semantic properties of the DP *el niño* ‘the child’ is impossible. Kempchinsky proposes that the incorporation of the preposition into the verb can create a syntactically derived aspectual structure. This approach supports the claim that a Theme DP is only indirectly involved in measuring out an event; the direct

mechanism that represents change is the linear axis or Path on which the Theme is located at different moments in time.

Jackendoff's approach represents dynamic events in terms of cross-sections that are projected onto axes. Each cross-section expresses a state of an object ('Theme') at some location, at some point in time. The components of the event then are: (a) the Situation, (b) a Space, and (c) Time.⁴ These three components are independent of one another, although their axes are related in a systematic way. The relationship among the three axes is referred to as Structure-preserving Binding (SPB). As the name implies, the three axes must be bound to one another in a "structure-preserving" fashion. Simplifying greatly, the axes are co-indexed:

(24) [Event]ⁱ [Path]ⁱ [Time]ⁱ

SPB also relates the structure of the Event with Path and Time axes so as to reflect that the beginning of the Event corresponds to the beginning of the Path and the beginning of the Time interval. Likewise, the end of the Event corresponds to the end of the progress on the Path, and the end of the Time interval (of the event).⁵

The distinction between telic and atelic events is determined by whether or not the Path has a specific endpoint. If it does, then the Event will also, due to the SPB relation. The specific endpoint de-links the three axes. Jackendoff argues that the features that are relevant for ascribing a specific endpoint to the Path are [+directed] and [+b] (i.e.,

[+bounded]). A path may or may not have directionality. For example, *to*, and *toward* are directional; *along* is [-directional] (e.g., *She pushed the cart along the river for hours*). Directional Paths may be bounded. If the Path is [+b], the Event is telic. It will be compatible only with [+b] adverbials:

- (25) a. *John ran toward [-b] the house in [+b] an hour. (Jackendoff 1996:326)
 b. John ran into [+b] the house for an hour (iterative only)

The contrast in (25) illustrates that the Path generally controls boundedness. However, if the Path is ambiguous in boundedness, a time adverbial can control:

- (26) a. The cart rolled down the hill in ten minutes.
 b. The cart rolled down the hill for ten minutes.
 (27) a. The cloud crossed the sky in ten minutes.
 b. The cloud crossed the sky for ten minutes.

Finally, consider the distinction between stative and dynamic predicates. Jackendoff suggests that while a dynamic Event has a time-course, a State “... ‘just sits there’, with no dependence on time—only *location* in time” (Jackendoff 1996:327). Unlike Events, States do not have an axis that is co-indexed with Time. Again simplifying for expository purposes, the difference between states and events can be represented as in (28), where Sit=Situation, a cover term which includes Events (Ev) and states (S):

- (28) a. Event: [_{Sit} Evⁱ Pathⁱ Timeⁱ]

- b. State: [_{Sit} S Path Time]

As (28) shows, the SPB relation is absent in States; the Eventuality consists only of a single state of the argument, and it does not have a time-course.⁶

3.1.2. *Syntactic realization of aspectual relations.*

The fact that aspectual readings are determined by lexical features of the verb together with grammatical and lexical features of other constituents has led to a view of aspect as a functional category, AspP.⁷ The AspP is potentially the locus of the SPB relation, since the manner in which the SPB relation is effected (if at all) depends on properties of the verb, its arguments, and spatial and temporal adjuncts. Features of these constituents are licensed in AspP via feature checking. In keeping with the notion that “measuring out” an event is expressed on a linear axis, the function of AspP may be understood as establishing cross-sections and projecting them onto different locations on the ‘Path’ axis. Feature checking may license the cross-sections, which in turn are projected onto the linear axis under the SPB relation. Following Jackendoff’s proposal, let us suppose that the elements of the cross-sections are: the Event, the Path on which it develops and a Time interval. The Event is well-formed if the verb is non-stative; formally, a V-feature [-Stative] is checked in Asp. The Path will be well-formed if a constituent that is interpreted as an s-selected Path (which varies according to the verb class, as discussed in 3.1.1) is [+directed], and either [±bounded]. I will assume that [-directed] Paths may have either a single cross-section (a Space, rather than a Path) or plural cross-sections whose order is non-specific. However [+directed] Paths must have

plural locations (therefore plural cross-sections,) and their order is specific (i.e., directed). For this reason the “specified quantity” of an argument, discussed by Verkuyl (1993), must be checked in AspP also, independent of the [\pm bounded] feature. Both bounded and unbounded events can require licensing of a directed Path.

Summarizing, the function of the AspP is suggested to be the licensing of cross-sections of dynamic events and their projection onto a Path axis. AspP licenses the cross-sections by checking features related to the event ([$-$ Stative]) and features related to the Path: [\pm directed]; [number] and [\pm bounded].⁸ Summarizing:

(29) [_{Asp} [Asp]

Event feature: [$-$ Stative]

Path features: [\pm directed] (and for [$+d$]: [Plural] [\pm Bounded])

The checking of features shown in (29) licenses the elements of the cross-sections of the event activate the Path as an axis.

Notice that only [$-$ Stative] verbs can satisfy the V-feature requirement of AspP. This implies that Stative predicates do not project AspP. This is consistent with Jackendoff’s supposition that Statives do not include a Path.⁹

The analysis of AspP as in (29) captures the main generalizations discussed above, beginning with the broad aspectual classification of predicates based on lexical and grammatical features of the VP. Stativity is distinguished categorially: statives are bare VPs, while non-statives are VPs dominated by AspP (cf. note 8). A telic reading of the event is one that corresponds to a [+bounded] Path. The compositional nature of the reading is captured, in that a telic reading is licensed by features that may come from two or three different constituents. The verb specifies stativity; the s-selected Path constituent specifies [\pm directed]; a DP specifies features for number, and the feature [\pm bounded] can be specified by a DP path or by other constituents: locative complements of motion verbs, locative adjuncts, and temporal adverbials, discussed above. The “privileged” status of the direct object as a determinant of boundedness follows from economy considerations. Since a DP has to move for independent reasons (to check a Case feature), its (specified) number feature can always check the number feature of AspP. This is less costly than an alternative derivation in which a second constituent moves also to check D-features of AspP. If there is no direct object, then another constituent checks the D-feature of AspP. This accounts for the ability of locative and temporal adjuncts to control boundedness in sentences like (22) and (26), repeated below:

- (22) a. *El niño corrió por diez minutos.*
 ‘The child ran for ten minutes.
- b. **El niño corrió a casa por diez minutos.*
 ‘The child ran home for ten minutes.

- (26) a. The cart rolled down the hill in ten minutes.
 b. The cart rolled down the hill for ten minutes.

In (22a), the temporal PP specifies [-bounded]; in (22b), the locative adjunct does, thereby preventing the adjunct from doing so. In (26), the PP headed by *down* is ambiguous between bounded and unbounded readings. Presumably a preposition like *down* can be either [+directed] or [-directed]; if [-directed], it cannot be specified as [+bounded], in which case the temporal adjunct supplies this feature value. If the preposition is [+directed], it specifies boundedness, as in (26a).

Recall that for verbs like *push*, Jackendoff showed that the PP controls boundedness, even in the presence of a direct object DP, as in (20), repeated below for convenience:

- (20) a. John pushed the cart **to** New York. (in two days/*for three days).
 b. John pushed the cart **along** the river (for an hour/*in an hour).

According to Jackendoff's analysis, the PP specifies the Path, and the preposition is either bounded or unbounded. Notice, though, that features of the direct object do have a contribution:

- (30) a. John pushed carts to New York for two hours/*in two hours.
 b. John pushed the cart to New York in two hours/*for two hours.

The contrast in (30) shows that features of a direct object can control boundedness for the potentially bounded Path headed by *to*. This is explained naturally if the preposition checks the boundedness feature, while the DP can check the [number] feature of the Path as a free rider in the process of Case checking.¹⁰

3.1.3. *Verbs of communication.*

We turn now to verbs of communication, in order to specify their temporal representation within the framework introduced above. Consider first examples of such verbs with DP complements. With a bare plural or mass complement, these verbs are atelic as in (31); with definite objects, boundedness is disambiguated by an adverbial:

- (31) a. John discussed money/elections (for ten minutes/*in ten minutes.)
 b. John announced results (for ten minutes/*in ten minutes.)
 c. John stated facts (for ten minutes/*in ten minutes)
- (32) a. John discussed the elections (in ten minutes/for ten minutes.)
 b. John announced the results (in ten minutes/for ten minutes)
 c. John stated the facts (in ten minutes/for ten minutes)

These examples show that the DP can control boundedness, since the mass or bare plural DP forces an atelic reading. If the features of DP do not disambiguate, the temporal adverbial does, as in (32).

The ability of the DP to control boundedness suggests that it may be a Path constituent. However, there is an important difference between the interpretation of the complements in (31)-(32) and the complements discussed previously. Notice that the DP objects in (31)-(32) do not measure out the events in the same way that concrete objects do. For example in (31a), *elections* do not occur as the discussion proceeds; in (31b) *results* do not occur at the time of the announcement, and so on. In this respect these verbs differ from verbs of motion, whose PP complements determine a Path through which the motion proceeds, while the direct object moves along the Path in the course of the event. These verbs are also different from verbs of consumption like *eat*, whose DP complement is the Path, as discussed above in 3.1.1. For verbs of communication, the Path seems to be the process of communication itself, in the sense that the change over time is measured relative to the uttering of words, not their contents.

It is possible to account for this generalization by analyzing these predicates as similar to verbs of performance such as *sing*, which are standardly assumed to derive from complement nominals (Hale & Keyser 1993). Predicates of communication may likewise derive from lexical structures similar to (33):

- (33) a. have a discussion (about) elections
 b. make an announcement (about) results
 c. make a statement (about) facts

The directed activity expressed by the noun constitutes the Path for the derived event just as the cognate objects of *sing* and *read* in (34) do:

- (34) a. Bill read the paper/sang the tune (in two minutes/for two minutes).
 b. Bill read fiction/sang opera (for two minutes/*in two minutes).
 c. Bill read/sang (for two minutes/*in two minutes).

An event like *sang the tune* derives from [V song]; once the nominal incorporates into V, a cognate object such as *the tune* can occupy the Path position, and is understood as the Path, not as an entity that occupies different positions on a Path. The event progresses through positions in the tune. Likewise, if John discusses something, the event progresses through “positions” on the Path formed by the utterances in the discussion. The important difference between pure performance verbs in (34) and verbs of communication is that only the former have surface cognate objects. The surface cognate object of a performance verb can express both directedness and boundedness. On the other hand, A phrase like *elections* or *results* supplies a [number] feature associated with directedness of Asp, but since the DP is not a cognate object, it is not a Path: it does not satisfy a feature for directedness or boundedness. Its relationship to the event is purely formal. The Path features remain on the incorporated constituent as V-features.

3.1.4. Summary.

This section has introduced some of the basic generalizations that an analysis of lexical aspect must account for, and a rough sketch of the syntactic mechanisms by which

aspectual generalizations are expressed. Following Jackendoff (1996), we assume that events are measured out relative to a Path, rather than relative to a DP argument of the verb directly—unless the DP is s-selected as a Path by the verb. The AspP is taken to be a predicate which licenses cross-sections of an event and locates them on Path positions. The three components of a cross-sections must be licensed: the Event must be [-Stative]; the Path must be [\pm directed], be specified for [number], and be [\pm bounded]. Depending on characteristics of particular predicates, these features can be checked in different ways, including by separate constituents, such as direct object DPs, PPs, and locative and temporal modifiers.

3.2. *Clausal complements of verbs of communication.*

We turn now to verbs of communication with clausal complements. The issue to be explored here concerns whether “double access” under verbs of communication can be explained in terms of the capacity of the CP to be interpreted as a Path for the main clause event. In particular, the question is whether or not in sentences like (35),

- (35) a. John announced that Mary is pregnant.
 b. John discussed that Mary is pregnant.
 c. John stated that Mary is pregnant.

the aspectual licensing of AspP for the verb of communication is the basis for the fact that the time of John's announcement, discussion, or statement, must overlap with the time of Mary's pregnancy.

The hypothesis that will be explored here is that the interval expressed by the event in the complement clause can be interpreted as a Path constituent for the main clause event, because it bears an internal Path feature associated with its TP. Consequently, it is capable of supplying a Path for the matrix predicate in the manner of a cognate object. Recall that, according to the discussion of the previous section, the incorporated nominal in the main clause is the primary Path constituent. However, just as spatial PPs and temporal adverbials can contribute features that are relevant for the interpretation of the Path, as discussed above, it is reasonable to suppose that the CP can also, if it expresses features that are relevant for the interpretation of the Path. We will see that TP contains a feature for boundedness—related not specifically to the embedded event, but rather to the time interval during which a finite event is asserted. This accounts for the limited range of relationships between the time of the complement event and the time of the matrix event.

3.2.1. Is CP a Path?

The first issue to consider is whether or not the CP constituent provides features relevant for the interpretation of the Path for the main clause event. If it does, then the feature provided by the CP in effect temporally restricts the main clause event.

Alternatively, it may be that the CP does not represent a Path at all, but only provides

grammatical feature of specified [number] for identifying the primary Path in the main clause, parallel to the behavior of DP complements of verbs of communication (e.g., *discuss the elections*). If this were correct, the “access” phenomenon would not be explained, since as was shown for DP complements, a constituent that provides a [\pm b] feature can be temporally independent if it is not the Path constituent of the verb of communication. Unlike the DP complement of these verbs, however, CP complements do not simply provide a grammatical feature that licenses the primary Path: If they did, they should have a systematic effect on telicity, as is the case for non-cognate objects like *discuss the elections*. This is not the case, as shown by (36)-(37):

- (36) a. ??John discussed in one minute that Mary is pregnant.
 b. John announced in one minute that Mary is pregnant.
- (37) a. John discussed for one minute that Mary is pregnant.
 b. ??John announced for one minute that Mary is pregnant.

If the CP controlled boundedness for the matrix event Path, identical CPs in these sentences should produce identical telicity effects in the main clause. Either *for*-adverbials or *in*-adverbials would be expected to be grammatical. Likewise, if the CP were capable of controlling boundedness but were ambiguously specified for the relevant features, adverbials should control boundedness, and all of the sentences in (36)-(37) should be fine, parallel to (32), repeated for convenience:

- (32) a. John discussed the elections (in ten minutes/for ten minutes.)

- b. John announced the results (in ten minutes/for ten minutes)
 c. John stated the facts (in ten minutes/for ten minutes)

What the pattern in (36)-(37) implies is that, when verbs of communication select a CP complement, the primary Path constituent is identified by the verb itself, since the verb *discuss* takes [-b] adverbials while *announce* takes [+b] adverbials.¹¹ Apparently, the event itself—the activity of announcing or discussing—is has inherent value for [±b]. This is expected on the analysis discussed above, according to which the Path constituent of the main clause predicate is the verb itself, derived from an underlying nominal complement.

Summarizing, we have seen that neither DP nor CP complements of verbs of communication represent the (primary) Path for the verb. The two types of complements differ, however, in that only DP complements supply grammatical features for licensing the primary Path, despite being themselves temporally independent objects. The CP complement does not do this. The significance of this is that the CP is not formally associated with the primary Path, while a DP complement is. The fact that the DP can be temporally independent follows from the fact that it has no Path features. The CP, on the other hand, is formally independent of the primary Path, but can be temporally related to it as a secondary predicate because it contains its own internal Path features.

3.2.2 *Secondary Predicates*

Let us consider now the possibility that because CP contains its own Path, it functions as a secondary predicate, parallel to absolutes like (38) or depictives like those in (39):

- (38) a. Sue jogged with the kids **in a stroller**.
 b. The announcer left the stage with the audience **unhappy**
 c. Mary watered the plants with **the faucet leaking**.
- (39) a. Mary ate the carrot **raw**.
 b. Sue left the room **happy**.
 c. Sandra drank the coffee **hot**.

The depictives in (39) describe secondary properties of an argument. These differ from “resultative” secondary predicates:

- (40) Resultatives:
 a. Sue hammered the nail **flat**.
 b. He laughed himself **blue in the face**.
 c. She painted the house **sienna**.

Resultative secondary predicates express states that are brought about by the primary event, while depictives are independent of it. This discussion will focus on Depictives, since CP complements of communication verbs are not caused by the main predicate.¹²

Temporally, *with*-absolutives and depictive secondary predicates express an indefinite interval that *includes* the time of the main predication. For example, in (38a), the duration of the kids being in the stroller includes the event of jogging. Likewise in (39a), the time of the carrot's being raw includes the time of the event of eating. The temporal relationship between the primary and secondary predicates can be illustrated as in (40), where *S* is the interval of the secondary state, and *E* is the interval of the event.

(40) _____(-----(-----E)-----S)_____>

In terms of SPB, the inclusion relation implies that the secondary predicate is not “linked” to or “delinked” from the Time interval associated with the primary event. In (39a), for example, even though the carrot is consumed at the end of the event, its rawness is not understood to cease (although pragmatically it may). The secondary state is therefore not subject to the SPB relation of the main AspP. The fact that the two predicates are independent of one another means that they constitute different Paths with independent SPB relations.

We now arrive at the issues of (a), what constituent introduces the Path feature associated with secondary predicates, and (b), how the inclusion relation arises. Previous discussion showed that the canonical category representing Paths in adjuncts is prepositions. Let us suppose that a preposition—overt or null—selects the absolute and depictive predicates:

- (41) a. The announcer left the stage [with [_{sc} the audience [_{AP} unhappy]]]
 b. Sue left the room [P [_{sc} PRO [_{AP} unhappy]]]

The preposition, an overt or null *with* is assumed to introduce the relation (between states, perhaps). Under assumptions discussed above, the small clause does not have its own AspP, since their adjectival predicates are stative. As for the inclusion relation, one possibility is that the Preposition has inclusion as part of its meaning. An alternative is that inclusion is the default interpretation under the conditions given. Since there is no ordering relation between the primary and secondary predicates, either they must be simultaneous or one interval must include the other. Simultaneity should not arise if, as suggested above, it is a product of “linking” and “delinking” under SPB; since there is no SPB relation involving the primary and secondary predicates, simultaneity should not arise. This leaves inclusion as the only possibility. Since only the primary predicate expresses an event that is potentially bounded, the primary predicate is favored (grammatically or pragmatically) as the included interval.

Consider now the gerundive and finite complements in (42):

- (42) a. John discussed [Mary(’s) being pregnant]
 b. John discussed [that Mary is pregnant]

What these have in common structurally is the presence of a TP. Since Time intervals seem likely to be intrinsically [+directed],¹³ a TP has Path features, regardless of whether

it is finite or not. Consequently, TP can introduce a Path in the same way that PP secondary predicates do. As for the inclusion relation, the same possibilities obtain. It may be that the Present tense and the Progressive aspect in (42) have inclusion as part of their meaning. This is in fact suggested to be the same semantic feature as a tense and as a progressive, in Demirdache and Uribe-Etxebarria (2000). Alternatively, inclusion may be the default, given other properties of the primary and secondary predicates, just as suggested above for PP secondary predicates.

There is evidence which shows that TP has a specific function in complements of verbs of communication, in Giorgi & Pianesi (2000). They argue convincingly that the absence of complementizer deletion in DAR contexts (i.e., under verbs of communication), illustrated in Section 1, is due to the role of the complementizer in attracting T-to-C. On the present analysis, the requirement for T-to-C has a natural explanation: the Path features in the complement are T-features. To be accessible for interpretation in the main clause, they must move to the edge of the constituent.

Summarizing, it was proposed that CP can function as a secondary predicate for a main clause verb of communication, just as small clause secondary predicates do. Both types of secondary predicates are interpreted as including the primary predicate. This was proposed to follow from the fact that both primary and secondary predicates are Path constituents, and therefore have internally determined links to the Time axis. Their relationship to each other can be attributed either to semantics of the Path constituents, or to the absence of any other possible relations. We conclude that a clause can function as a

“temporal path” along which a primary predicate in the main clause can be located. The fact that this holds whether the TP is finite or not supports this approach, as opposed to approaches based on tense anchoring.

3.3 *Statives and Inchoative States.*

Recall from Section 2 that the DAR is not observed in complements of statives, which impose strict sequence-of-tense: Present under Past is not generally acceptable in complements of these verbs. However, inchoative states pattern with verbs of communication. In particular, Spanish inchoative states have the same properties as verbs of communication with respect to DAR, as discussed in Section 2, illustrated again as (43) for convenience:

- (43) a. **Juan sabía que María está embarazada.* (state)
 ‘Juan knew that Maria is(PR.IND) pregnant.’
- b. *En cuanto la vi, supe que María está embarazada.* (inchoative state)
 ‘As soon as I saw her, I knew that Maria is(PR.IND) pregnant.’

Our concerns in this section are first, to account for why statives such as (43a) do not require the DAR, and second, to analyze how “de-stative” predicates like (43b) come to have properties of process predicates like those discussed above.

With respect to the first issue, the present approach leads to the following formulation of the problem: in what way does a stative predicate fail to license a CP as a “temporal path”-type secondary predicate? To answer this, we begin by reviewing the conditions that were proposed above to hold in the case of verbs of communication, which do license a CP as a temporal path secondary predicate. The primary and secondary predicates for CP under verbs of communication such as (44) are summarized in (45):

(44) John said [that Mary is pregnant]

(45) Primary predicate: [AspP Event: [-stative] Path: [+directed], [±b], [number]]
 Secondary predicate: [TP Time: [+directed], [-bounded] [number]¹⁴]

The temporal axis associated with TP is [+directed], [-bounded], while the Path of the primary predicate is [+directed], [±bounded]. Compare (45) with a stative such as (46), whose primary and secondary predicates are as given in (47):

(46) John believed [that Mary was/*is pregnant]

(47) Primary predicate: Eventuality: [+stative]
 Secondary predicate: [TP Time: [+directed], [-bounded] [number]]

In (46), there is no AspP associated with the primary predicate, since there is no Path and no SPB relation. The generalization that apparently should be captured with respect to the difference between the interpretation of the CPs in (44) and (46) is that the absence of “time dependence” of statives (cf. 3.1.1) precludes the stative from being associated with

a temporal path as a secondary predicate. If there were such a secondary predicate, the stative would in effect become time-dependent. What this implies about the well-formedness of the relation in (45) is that the secondary predicate, as a path, modifies the primary Path, i.e., locating it relative to a Time-interval that has secondary properties. The predication relation holds between the Primary Path (as subject) and the Secondary Path (as secondary predicate). The shared feature [+directed] is a function of the Predication relation. In (47), since there is no Primary Path, there is no subject for the Secondary Predicate.

Turning now to inchoative states, recall from the discussion of Section 2.2 that sentences like (43b) may not involve activity, but simply an onset to the state. This has the effect that the predicate behaves like a non-stative. I will suggest that these predicates derive from their stative counterparts by incorporation of a Path: essentially, the AspP itself. In the same way that a predicate (48a) converts to an achievement in (48b) by incorporation of a PP, I suggest that (49a) converts to an achieved state in (49b):

- (48) a. Juan corrió (por una hora/*en una hora). ‘J. ran (for an hour/*in an hour).’
 b. Juan corrió a casa (en una hora/*por una hora).
 ‘Juan ran home (in an hour/*for an hour).’
- (49) a. Juan TNS [_{VP} sabía [que ...]] ‘Juan knew that . . .’
 b. Juan TNS [_{Asp} ASP [_{VP} V_[-stative] [_{VP} supO_[+stative] [que . . .]]]
 ‘J. found out that...’

Once the derived [-stative] verb is produced by incorporation into the light verb, the predicate has features that license a Path, hence AspP is present. The primary Path can now take a modifier, or secondary predicate.

3.4. Conclusion.

In this section, we examined the mechanics of aspect, and showed how the aspectual composition of non-stative and stative verbs differ in terms of their compatibility with a temporal path as a secondary predicate. The behavior of verbs of communication was accounted for, based on an analysis of them as partially analogous to performance verbs like *sing*. The difference between their DP and CP complements with respect to temporal independence was accounted for in terms of whether the complement is formally linked to the Path associated with the primary predicate (DP), or contributes an independent, secondary Path (CP). Statives were analyzed, following Jackendoff (1996), as lacking time dependence—formally this means that they do not contain any Path. Consequently, they cannot interpret their complement CP as a secondary predicate, since there is no primary Path of which to predicate the temporal path as secondary predicate. Inchoative states were suggested to be derived by incorporation into a [-stative] verbal head, thus acquiring Path features.

4. *Sequence-of-tense.*

The previous section argued that the absence of DAR under stative verbs is due to the impossibility of secondary predication, since statives do not have a path of which to predicate a secondary temporal path. Here we address two remaining issues with respect to the clausal complements of stative predicates. The first issue concerns the contrast illustrated in (50), noted previously:

(50) John believed that Mary was/*is pregnant.

As (50) shows, a stative predicate imposes strict sequence-of-tense on its complement clause, so that Present under Past is disallowed. A second issue that was noted above is the fact that there are temporal restrictions on the complements of stative verbs also. The sequence in (51) can have either a ‘shifted’ reading’, or a ‘simultaneous’ one, but not a ‘subsequent’ one:

- (51) John believed last week that Mary was pregnant.
- a. ‘John believed last week that Mary was (then=last week) pregnant.
 - b. ‘John believed last week that Mary had been previously pregnant.
 - c. *’John believed last week that Mary was pregnant yesterday.’

We address these issues below.

Recall from Section 3.1.1 that stative predicates are proposed in Jackendoff (1996) to differ from dynamic predicates in lacking a Path. Unlike Events, States are linked to a Time interval directly, as shown in (28), repeated as (52):

- (52) a. Event: [_{Sit} Evⁱ Pathⁱ Timeⁱ]
 b. State: [_{Sit} State Time]

What this contrast implies is that the “cross-section” of a State does not include a spatial Path, only a temporal one. Furthermore, there is no linear axis possible, since States have only a single cross-section; since no change occurs, there can’t be more than a single cross-section. The directedness of the “time-line” must be construed as external to the State.

The account to be proposed of the impossibility of Present under Past with statives has two elements. The first is the claim that the “cross-section” of a State (i.e., the entire State) must be licensed, just as the “cross-sections” of dynamic predicates are, as discussed in Section 3. However, since States lack a Path (and therefore AspP), States are licensed in relation to a Temporal “space”.¹⁵ By analogy with the properties of AspP, I will assume that feature-checking licenses the components of the cross-section and their compatibility. In this case however, the functional category is TP. The second element of the proposal is that, just as a complement TP can function as a secondary predicate for a main clause AspP, it can also function as a secondary predicate for a main clause TP—

in its function as a temporal path. In this respect, the complement shares attributes of temporal adverbials.

We begin by reviewing the features that are associated with stative predicates. Recall from Sec. 3.1.2 that the AspP for a dynamic predicate has the features specified in (29), repeated as (53):

- (53) [_{Asp} [Asp]
 Event feature: [-Stative]
 Path features: [±directed] (and for [+d]: [Plural] [±Bounded])

A state will differ both in its value for the [Stative] feature, and in the nature of its Path, which is Temporal:

- (54) [_{Tns} [Tns]
 Event feature: [+Stative]
 Time features: [-Directed], [-Plural]

The temporal “space” on which a state is located is a time point or interval; i.e., a temporal “space”. This space differs from a temporal Path in its lack of dimension: it is a singular temporal location, rather than an axis. The cross-section of the state is then licensed as a singular State, associated with a temporal space that is [-Plural], and necessarily [-directed] and [-bounded].

Let us continue to assume that Tns is an ordering predicate for Times (in the sense of Stowell (1993), analogous to Asp as an ordering predicate for Locations). We must specify the relationship between the State cross-section, which is singular, and the plural, [+Directed] Path constructed by the ordering predicate, Tns. The State will be a singular Time on this Path. We can accomplish this by assuming an agreement relation between the State and the temporal space with which it is associated on its cross-section: [-Plural]. The Tns head will then take the Time/State cross-section as one of the entities that it orders in the construction of the “time-line”. The State can only instantiate a single Time on this interval. This requirement is shown schematically in (55):

- (55) [Tns [Tns]
 Event feature: [+Stative] [-Plural]
 Time features: [-Directed] [-Plural]

Now consider how a state is related to other Times, beginning with simple tenses:

- (56) a. Mary is pregnant.
 b. Mary was pregnant.

In (56a), the State of Mary’s being pregnant coincides with UT, and in (56b) it precedes UT, as shown in (57):

- (57) a.
$$\begin{array}{c} \text{UT} \\ \text{-----|-----} \\ \text{State} \end{array}$$



Finite Tns establishes an interval with ordered Times, one of which is the cross-section of the State of Mary's pregnancy. As a singular, this cross-section is grammatically indivisible: it does not contain plural Times, even though it is durative and pragmatically it is of course understood to contain many shorter intervals. In (57a), this cross-section includes UT.¹⁶ In (57b), the State cross-section precedes UT.

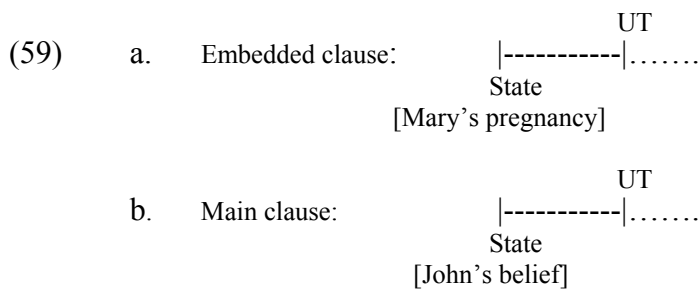
Let us now consider embedded tenses in (50), repeated as (58):

- (58) a. John believed that Mary was pregnant.
 b. *John believed that Mary is pregnant.

In these sentences, I suggest that the complement clause has the capability to be interpreted as a temporal adverbial in the main clause. Before examining the mechanics, let us consider why this should be possible. In Section 3, we saw that a complement TP could be construed as a secondary predicate modifying the Path associated with the main clause event. Those TPs were essentially modifiers of the AspP of the main clause, like other types of secondary predicates. In the sentences under analysis here, there is no AspP in the main clause, because the main clause predicate is stative. However, it is generally assumed that there is a higher, "outer" AspP (Verkuyl 1993, Travis 1994, Maruenda 2001, among others), that is concerned with the boundedness of the broader Time axis, as determined by factors beyond the scope of lexical aspect. Such factors may

include aspectual elements like progressivity, or the effects of such elements as modals, negation, and temporal adverbials. This “outer” AspP may be accessible in the absence of an intervening “inner” AspP for statives. As we will see, the complement interval seems to pattern like temporal adverbials with respect to defining an interval which specifies or locates the interval of a main clause TP.

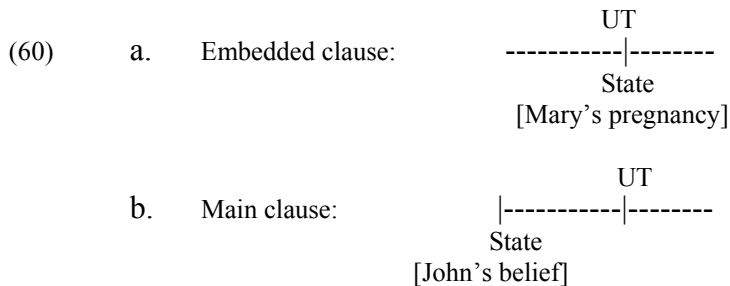
Let us first consider how the complement clause specifies a “location” for the interval of the main clause in (58a), where Past is embedded under Past:



In (59), the embedded clause establishes an interval that locates the time of John’s belief. Notice that if the SPB relation holds between these two intervals, a “simultaneous” reading is produced: both interval begin at the same time in the past, and both end with UT. If the SPB relation does not hold, then the complement clause interval is understood as including the main clause interval. In other words, a “shifted” reading is produced, as in the case of the secondary predicates discussed in Section 3. The relationship that does not hold between the two intervals is a reading where the main clause interval includes

the complement interval. This was also observed in the case of secondary predicates, for reasons that are not clear. Whatever the cause, it seems not to be specific to the interpretation of time intervals, since it was observed with small clause depictive secondary predicates also (such as: *She ate the carrot raw.*)

Consider now the intervals that would be related in (58b), where Present is embedded under a Past stative:



In (60), the embedded clause cannot be related to the main clause interval in either of the ways that are possible in (59): either as a temporal modifier or as a secondary predicate with an inclusion relation. The embedded clause interval in (60a) cannot include the main clause interval because the main clause interval is intrinsically “larger”: it includes two subintervals, Past times and non-Past times (UT), while the complement includes only non-Past times. Nor can an SPB relation hold. Recall that the SPB relation discussed by Jackendoff (cf. Sec. 3.1.1) has the effect of aligning the beginnings and ends of the axis (Event, Path and Time of Event). As we see by comparing the intervals in (60), it is not possible to align both States and UT for the two intervals. Notice that if UT were aligned, the only way to align the States would be to stretch the time of Mary’s

pregnancy into the Past, so as to include the time of John's belief, and also stretch the time of John's belief forward into the present to include UT. However, States cannot be "stretched forward" by temporal adverbials, unlike non-States:

- (61) a. Mary leaves at 3:00/in an hour/tomorrow.
 b. Mary writes that message tonight.
- (62) a. Mary likes that movie (*at 3:00/*in an hour/*tomorrow.)
 b. Mary is pregnant (*by next year.)

In sum, there is no coherent reading of the complement CP as a modifier of the main clause outer AspP. One issue that is unclear and remains for further research is why the TP of complement clauses seem obligatorily to be construed relative to a higher clause TP at all.

Finally, let us compare the preceding example with that of a Past embedded under Present State:

- (63) John believes that Mary was pregnant.
- (64) a. Embedded clause: $\begin{array}{c} \text{UT} \\ |-----|----- \\ \text{State} \\ \text{[Mary's pregnancy]} \end{array}$
- b. Main clause: $\begin{array}{c} \text{UT} \\ -----|----- \\ \text{State} \\ \text{[John's belief]} \end{array}$

In (64), the two intervals cannot be interpreted under the SPB relation, since the State of Mary's pregnancy would again be improperly "stretched forward" to include UT.

However, the embedded clause can be understood as including the main clause interval, since the embedded clause interval is "larger", containing both Past and non-Past times.

To conclude, this section has shown that the analysis of complement clauses as modifiers of a main clause interval can account for the temporal restrictions that characterize the relation between the complement and main clauses. The modification relation holds between time intervals in the two clauses because the temporal path in the complement clause can "access" the outer AspP of the matrix clause. This is possible because the potentially intervening inner AspP is absent in stative clauses. We saw that two types of temporal relationships are possible: one in which the complement includes the main clause interval, parallel to the construal of secondary predicates discussed in Section 3; and an "SPB" reading, where the beginnings and ends of the intervals are aligned, à la Jackendoff's analysis of inner aspect. These readings account for two generalizations concerning the complements of Statives: one is that Present will not be legitimate embedded under a Past stative, since neither the inclusion nor the SPB reading is possible; second, the ambiguity of Past embedded under Past follows, the "simultaneous" reading is an SPB reading, and the "shifted" reading is a "depictive" secondary predicate reading of inclusion. The issue that remains for future study is why the complement clause appears to require temporal alignment with the main clause predicate.

5. Conclusions

This study has argued that the temporal dependencies that hold between a matrix event and the event of a finite complement clause should not be analyzed in terms of “Tense Anchoring”. Instead, it was proposed that they should be understood in terms of the role that complements constituents (clausal and non-clausal) can have in “measuring out” a matrix clause predicate. Taking as a starting point the observations of Giorgi and Pianesi (2000) concerning the distinction behavior of verbs of communication and verbs of belief with respect to the DAR, Section 2 argued that the difference between these classes is aspectual. In Section 3, the DAR under verbs of communication (and derived non-statives) was shown to follow from the analysis of the complement TP as an interval that modifies the Path associated with the main clause AspP. In Section 4, we analyzed statives, which have been suggested to lack an AspP. We saw that the stronger sequence-of-tense that holds in these contexts, as well as the readings that are possible, follow from the analysis of the complement TP as a modifier of the main clause “outer” AspP. An important question that remains unanswered here is why the complement TP seems to be obligatorily linked to an AspP in the main clause.

The present analysis has accounted for three types of temporal dependencies that are observed in complement clauses: (a) the obligatory DAR for Present under Past predicates of communication; (b) the stronger sequence-of-tense phenomenon under statives; and (c) the ambiguity between the so-called “simultaneous” and “shifted” readings of Past embedded under matrix Past. Insofar as the notion of anchoring of a Tense by a matrix

Event has been seen as necessary to account for just these phenomena, it appears possible to dispense with this second type of Tense anchoring. It may be that indicative tenses can be anchored to UT exclusively, while non-indicative tenses are anchored to a ‘World’ rather than a Time, along the lines of the proposal for counterfactuals of Iatridou (2000).

The analysis developed here made crucial use of the notion of Path (Jackendoff 1996) as a basis for measuring out events. The functioning of a complement clause TP as a secondary Path in a matrix clause provides further support for an analysis of events which incorporates a notion of Path. Finally, it generally supports models of temporal structure (Demirdache and Uribe-Etxebarria 2000) in which tense-related and aspect-related phenomena are analyzed as structurally and semantically parallel systems.

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Notes

¹ G&P analyze sentences with Past tense embedded under a matrix Past as involving DAR on one reading: the “shifted” reading, where the embedded PAST is understood to precede both UT and the matrix event, as in (i).

(i) a. *Ha detto *(che) è partito.*

has.3rd.sg. said that has(IND) left

‘He said that he left.’

b. *Ha confessato *(che) è partito.*

has.3rd.sg. confessed that has(IND) left

“He confessed that he left.”

Notice that the complementizer cannot be omitted in (1). G&P show that the obligatory complementizer occurs in complementary distribution with DAR, and it is thus a diagnostic for the absence of obligatory DAR.

² This is not to imply agreement with respect to terminology, nor that the notion of ‘lexical aspect’ is always accepted as conceptually distinct from other “layers” of aspect in a clause. For different views on the relationship between layers, see Verkuyl (1993, 2000), Demirdache and Uribe-Extbarria (2001), Guerón (2000), Schmitt (1996), Tenny (2000), Travis (2000), Ritter & Rosen (2000).

³ Verkuyl (1993, 2000) argues that there are no diagnostics which differentiate Vendler's fourth class, Achievements, (punctual events that reach an endpoint), from Accomplishments.

⁴ A "situation" is a cover term for both Events and States. Jackendoff suggests that these differ from each other in that an Event is "directed": it has an implicit connection with the passage of time, while a State does not. The "cross-sections" of an Event are not identical. In this sense the Event is time-dependent, since its different cross-sections depend on different times for their existence. Jackendoff suggests that the spatial axis can also be directed or undirected. A directed Space is a Path, such as: *to New York, along the river* in (20). A non-directed Space is a "Place", such as *at the house*.

⁵ Although Time and the Event progress smoothly, the progress of an entity along a literal path is not smooth. For example, if John pushed the cart to New York, there could be moments without any progress, and moments of rolling backward away from New York.

⁶ Minimally different from States are predicates of staying. Jackendoff suggests that verbs like *stay* and *remain*, which are non-stative, do not project a path (or spatial dimension). Their representation is (i):

(i) [Sit Eⁱ Path Timeⁱ]

⁷ Several different proposals have been advanced within the Principles-and-Parameters framework as to the identity of the functional category associated with aspectual

licensing (Travis 1994, Borer 1994). The descriptive generalization that underlies the general picture of aspectual feature-checking may be due originally to Verkuyl (1993), where it is suggested that the relevant feature values are read “bottom-up” from nodes dominating the verb and its arguments.

⁸ The features that are suggested in the text as formal features for AspP are used for expository purposes on the basis of the familiarity of the descriptive generalizations that their values are intended to reflect. Numerous features have been suggested in the literature; the choice among them takes us beyond the scope of the present investigation.

⁹ Likewise Kempchinsky (2000) suggests that the Event Phrase (= AspP as understood here) is absent for statives. An alternative possibility is that AspP is present for statives, but it has different features or feature values, for example a feature that would produce an interpretation as a “Space” rather than a Path. A different approach is taken by Guerón (2000). She proposes that statives must supply spatial extension for AspP; since the stative verb itself cannot provide it, it must be contributed by an argument of the verb.

¹⁰ The observation in the text supports an approach to aspectual composition as a by-product of purely formal configurational relations, a position taken by Schmitt (1996).

¹¹ Two other [+b] adverbials that are diagnostic for telic predicates are shown in (i):

- (i) a. It took John two hours to announce that Mary is pregnant.

-
- b. By 8:00 John announced that Mary is pregnant.

Unlike *in*-adverbials, these also occur with *discuss*:

- (ii) a. It took John two hours to discuss that Mary is pregnant.
 b. By 8:00 John discussed that Mary is pregnant.

Although it is not clear why these differ from PPs headed by *in*, one possible explanation is suggested by the readings of the sentences in (ii): it is possible to construe the event as having begun by the specified time, rather than ended by that time. In (iia), one reading is that it took John two hours to initiate the discussion of Mary's being pregnant. In (iib), one reading (perhaps the primary one) is that by 8:00 John had begun the discussion. These adverbials may differ from *in*-phrases in that the latter always modify the whole interval of the event, while the adverbials in (ii) can modify either an event or a sub-event.

¹² Because the secondary property is brought about by the primary event, its onset is the event of the primary predicate, as illustrated in (i):

- (i) _____(E -----s)_____>

The result state in (i) is an inchoative state, since it has a discrete onset.

¹³ Stowell (1993) proposes that Tense is an ordering predicate. In terms of the framework discussed here, Tense always has the feature [+directed].

¹⁴ Recall from the discussion of 3.1.2 that [number] is relevant for licensing a directed path, in the sense described by Verkuyl's "specified quantity" feature.

¹⁵ The term "temporal space" is intended to be understood as a type of temporal Path in the sense discussed in Section 3. Following Jackendoff (1996), an axis that contains only one location is a "space".

¹⁶ Because the SPB relation does not hold for States, the relationship between the time of a State and other singular times, such as UT, may be indeterminate in the absence of an ordering relation. Either simultaneity or inclusion may hold.