Sequence-of-tense and the Features of Finite Tenses

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Abstract

Sequence-of-tense (SOT) is often described as a (past) tense verb form that does not correspond to a semantically interpretable tense. Since SOT clauses behave in other respects like finite clauses, the question arises as to whether the *syntactic category* Tense has to be distinguished from the *functional category* tense. I claim that SOT clauses do in fact contain interpretable PRESENT tense. The "past" form is analyzed as a manifestation of agreement with the (matrix past) controller of the SOT clause evaluation time. One implication of this analysis is that finite verb forms should be analyzed as representing features that correspond to functional categories higher in clause structure, including those of the clausal left periphery. SOT morphology then sheds light on the existence of a series of finer-grained functional heads that contribute to tense construal, and to verbal paradigms. These include Tense, Modality and Force.

1. Introduction

The phenomenon of sequence-of-tense (SOT) poses several challenges for the standard assumption that a "past tense" verb form signals the presence of a functional category in clause structure with an interpretable 'past' value. SOT is illustrated by the 'simultaneous' reading of sentence (1):

(1)   Terry believed that Sue was pregnant.
         a.   The time of Sue's pregnancy precedes time of Terry's belief   (precedence)
         b.   The time of Sue' pregnancy overlaps time of Terry's belief   (simultaneity)

For the 'precedence' reading in (1a), the embedded clause tense is semantically transparent in the sense that the past form *was* corresponds to a past ordering relation (relative to the time of Terry's belief). For the 'simultaneous' reading shown in (1b), the embedded clause retains its past form, but lacks a corresponding precedence relation. Semantic approaches to SOT have assumed either a zero tense in the embedded clause (Kratzer 1998) or a rule of tense deletion (Ogihara 1995). Syntactic approaches analyze the embedded tense as referentially dependent on the higher tense.[1]

      The mismatch between form and interpretation in SOT contexts raises questions as to how the syntactic derivation proceeds and how the interpretation is built up from the material that is the input to logical form. In ordinary finite clauses such as main clauses, the Agree relation between Tense and *v* results in feature checking, but not in deletion of Tense(P), because Tense is an interpretable category. In a main clause such as (2), finite Tense agrees with features of *v*:

(2) $[_{CP}$ C $[_{TP}$ [Tense:past] $[_{vP}$ DP *v*[Tense:] [V …]]]]   (main clause tense)
                                                                    Agree

Suppose Tense entered the derivation as an uninterpretable or unvalued feature, as in (3):

(3) $[_{CP}$ C $[_{TP}$ [Tense:past] $[_{vP}$ DP *v*[Tense:] [V …]]]]   (SOT clause)
                                                                    Agree

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[1] The referentially dependent tense is analyzed as a past polarity item in Stowell (1996); and as an anaphoric relation in Enç (1987) and Zagona (2002).

If the Tense feature were uninterpretable or unvalued, it would also delete,[2] leaving the clause with no TenseP. But deletion of TenseP is problematic in other ways, since SOT clauses behave like other tensed clauses with respect to Case, EPP, binding and extraction.

A second difficulty with the classical approach to SOT is that it leaves unexplained the existence of a fixed temporal relationship between the main clause predicate and the SOT clause: the embedded event time cannot be construed as subsequent to the main clause event (Enç 1987):

(4)   *Terry believed two years ago [that Sue was pregnant last week].

If the embedded clause Tense were absent, the subsequence restriction would have no basis in functional category values; it would need to be stipulated.

The impossibility of a precedence or subsequence relationship between the events of the two clauses suggests that a relationship between the clauses *is* in fact specified. The analysis of SOT that is developed below takes this temporal relationship at face value, and proposes to account for the overlap relationship by analyzing the SOT clause as a finite clause whose tense value is one of temporal overlap with its time of evaluation—in other words, the embedded clause SOT interpretation is due to a present tense. By analyzing the embedded clause tense as present, it is possible to dispense with the stipulated rule of tense deletion, and with the rule that imposes temporal overlap between the events of the two clauses.[3] Present tense automatically receives an interpretation of temporal overlap with its evaluation time. But unlike a main clause present tense, the SOT clause is not evaluated relative to the speaker's 'Now', but rather to the main clause event: the context of Mary's belief.[4] In order to describe this relationship, it is necessary to represent the evaluation time for Tense in the clausal functional projections, as in the tense anchoring approach of Enç (1987). This is shown informally in (5) for a main clause past tense and for an SOT clause in (6):

(5)   [$_{CP}$ Evaluation time (=utterance time) [$_{TP}$ PRESENT [$_{vP}$ (time of) v . . .]]]
(6)   [. . . Terry believed$_i$ [$_{CP}$ Evaluation time$_i$ [$_{TP}$ PRESENT [$_{vP}$ (time of) v . . .]]

In the main clause in (5), tense is interpreted as overlapping with the speaker's 'Now'; in (6), the embedded clause event is interpreted as overlapping with the time of Terry's belief. This approach explains without stipulation how the temporal overlap is built up, and explains the impossibility of a subsequence interpretation for the complement clause.

We can now consider why the verb in the SOT clause has "past" morphology despite the semantic PRESENT specification of the embedded TenseP. Notice that the evaluation time of the embedded clause is understood as the time of the main clause event. It is natural to suppose that the embedded verb manifests agreement with the matrix v.[5] Briefly stated, the verb seems to take "past" form not because Tense has a past value, but because the verb is evaluated relative to a past time. For this account to go through, however, it must be assumed that the morphology of the verb reflects values of functional categories beyond the local tense. Another case that calls for a similar assumption is counterfactual

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[2]Presumably the Tense feature in (3) has to be uninterpretable in order to be marked for deletion to avoid violating the No Tampering Condition (Chomsky 2008).

[3]See Ogihara & Sharvit (2012) for discussion. The absence of precedence is accomplished by a rule of deletion of the Past value of Tense; overlap with the time of the main clause event is accomplished by replacement of the past tense with a relative present tense and a constraint blocks a subsequence reading.

[4]In this respect English SOT is parallel to non-SOT languages like Japanese. English differs from Japanese only in the form that the embedded present tense takes.

[5]A reviewer raises the question of what happens if there's an auxiliary in the main clause. In that case, agreement must be with the finite verb. This is shown by the fact that a future or perfect form of believe doesn't allow the simultaneous reading:

(i) Terry has believed (for a year) that Sue was pregnant.   (precedence only)
(ii) Terry will have believed (by tomorrow) that Sue was pregnant.   (precedence only)

conditionals. Iatridou (2000) observed that counterfactual conditional clauses systematically use past forms without past meaning, as illustrated in (7).

(7)   a. If it weren't raining, we could go outside.
        b. If Mary knew the answer, she would be the only one.

Iatridou suggested that what appears to be a past morpheme may correspond to an abstract 'exclusion' predicate. When this predicate has temporal value, it refers to a time that excludes the evaluation time (i.e., a past time); in counterfactuals it refers to a world that excludes the speaker's world. I extend this idea here to a third exclusion predicate beyond temporal exclusion and world exclusion: in SOT contexts, there is exclusion of the speaker as the source of evaluation (assertive force) of the embedded clause. In main clauses, the speaker is the source of the assertion. In embedded clauses, the speaker may or may not be a source of assertive force. The speaker's role varies according to whether the embedded clause is an intensional context such as an attitude verb like *believe*.

Summarizing, the analysis that is developed below is that SOT clauses—clauses with past form and 'simultaneous' interpretations—have interpretable present tense; the "past" morphology reflects agreement with the main clause *v*P, which corresponds to the time of evaluation for the SOT clause tense.

The discussion begins in Section 2 with background assumptions and a sketch of the analysis, including elaboration of the features that underlie the interpretation and the agreement between the matrix verb and the evaluation time. Section 3 shows how the approach accounts for the cluster of properties associated with SOT. Section 4 considers some implications of the analysis.

2. The CP-TP layers and SOT

The informal account of SOT shown in (6) above shows agreement between the external evaluation time of the embedded clause and the matrix verb, which is proposed to underlie the "past"[6] form of the complement clause verb. The goal of the present discussion is to provide a framework for introducing the evaluation time and motivating Agreement as having a role in its licensing.[7]

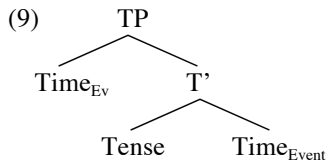### 2.1   The Function Categories and Times

Two semantic approaches to tense are the Tense Logic theory, which treats tenses as operators, and the referential approach of Partee (1973). Partee showed that the operator approach fails to capture the fact that a past sentence refers to a specific time in the past, not to arbitrary past times. Partee analyzed tenses as similar to pronouns, which take different antecedents in different contexts. A different referential approach analyzes 'Times' as referential, introduced as arguments of TenseP (Zagona 1990, Stowell 1993, Demirdache & Uribe-Etxebarria 2000). On this approach, tense and aspect are ordering predicates whose syntax and semantics are parallel to predicates of location, but whose arguments are 'Times'. This analysis provides a way of introducing Times into syntactic structure, at the same time accounting for the limited structure of tenses (as is illustrated by the impossibility of tenses with iterated structure, such as a past-past-future-perfect tense). In the approaches mentioned above, Time arguments were conceptualized as structurally analogous to other arguments; the syntactic instantiation of Time arguments in (8) were assumed to be abstract pronoun-like categories that occupy specifier positions, as shown in (9)

(8)   a. T_{Eval} = external evaluation time
        b. T_{vP} = time of the situation represented by *v*P

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[6]In the text, "past" in quotes is intended as a reminder that the feature in question does *not* correspond to a semantic precedence relation, but looks for like the form that does correspond to semantic precedence.

[7]The representation of Evaluation time for tense in CP is due to Enç (1987).
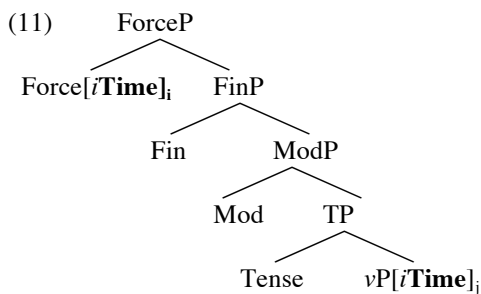
(9)   TP
     ╱ ╲
  Time$_{Ev}$ T'
          ╱ ╲
      Tense   Time$_{Event}$

The issue to be addressed here is the representation of Times under current assumptions as to clausal functional categories. The functional categories in (10) are assumed:

(10)   Force – Finite – Modality - Tense

TenseP and FinP are assumed to make up two parts of an extended TenseP, with the two Tense heads mediated by Modality. I return to Modality below, first we can address the representation of the Time arguments of TenseP. As shown in (11), the time arguments are implicit arguments, mapped onto the heads above and below FiniteP/TP:[8]

(11)   ForceP
        ╱   ╲
  Force[i**Time**]$_i$ FinP
              ╱   ╲
           Fin   ModP
                 ╱   ╲
              Mod   TP
                    ╱   ╲
                Tense vP[i**Time**]$_j$

As implicit arguments, Times are features on other functional heads rather than independent categories. The choice of heads on which Times appear is not arbitrary. The rationale for this representation is that TenseP temporally links two events, which are grammatically encoded in vP and ForceP. The latter is assumed to be the grammatical reflex of the "speech act", the event of evaluation of the vP event. Assigning a [Time] feature to each of these events a relation between vP and an event of evaluation that occurs at 'Speechtime', in Reichenbachian terms. Time arguments are not overt, however, and their licensing necessarily involves identification.

Before we look further at the Evaluation Time in ForceP, a brief word should be said about Modality. It is suggested in (Zagona 2013) that the Modality or Mood Phrase is responsible for establishing a temporal relationship between the two events. Indicative mood establishes a temporal scale for locating one event in relation to the other. Other modes of evaluation do not refer to a temporal scale. For example, in the presence of epistemic modals like those in (12a) and (12b), modality specifies a degree of certainty on the part of the speaker with respect to the truth of the event:

(12)   a. That bag may contain pears.
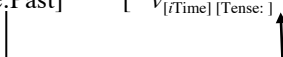   b. Mary must be practicing the preludes.

The contrast between Indicative and other values of Modality will not enter into the analysis of SOT that follows.[9]

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[8] The relationship between FinP and TP may be parallel to the relationship between vP and VP, where the external argument is selected by the former and internal arguments by the latter; in other words: [$_{tP}$ t [T . . .]].

[9] The assumption that ModP specifies temporal or atemporal modality of evaluation of the clause gives rise to the possibility of variation in the type of location that is specified, as the Universal Spine hypothesis proposes (Ritter and Wiltschko 2009, Wiltschko 2014, Ritter 2015).

2.2   Identification

The times that are introduced by FinP and TP are not overt DPs. Like other covert arguments, their reference has to be recoverable from context. A condition on recoverability is that the empty category is "identified" morphologically. For the *v*P-event time, identification is satisfied by feature checking of the [*u*Tense] feature of *v*:

(13)   [Tense:Past]   [*v*$_{[iTime]\,[Tense:\,]}$ . . .]   (Identification of Event time)

The [Time] argument on ForceP also needs to be identified.[10] This implies that there must be features in the left periphery that allow identification of the evaluation time. I propose that there are two varieties of Force head, which differ in their features, and consequently also differ in their distribution and their mechanisms of identification. One variety appears in main clauses, and its evaluation time is identified contextually. The second variety appears in complement clauses; in particular, SOT clauses. Its evaluation time is identified by a linguistic antecedent—the matrix event.

With this assumption, we can propose how different features of the left periphery derive the two forms of identification. I propose that the crucial feature difference concerns whether or not ForceP expresses an assertion *by the speaker*. If ForceP has a [Speaker] feature, it implies a speech act event in which the speaker is the actor, and determines a center of deixis for the event. This is represented as an interpretable Person feature, valued as Speaker.[11] For ease of reference I refer to this as Force$_{SP}$:
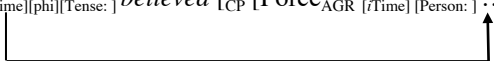
(14)   Force $_{[iTime]\,[Person:speaker]}$ (Force$_{SP}$: contextual identification)

Force$_{SP}$ appears in main clauses and in unselected environments like relative clauses; since it does not have any unvalued features, it can appear in root environments and is interpreted accordingly, in relation to discourse context. Furthermore, the time of evaluation is also identified contextually, as the time of the speech act or time of utterance.

The second variety of Force lacks specification for the speaker. Lacking a contextual basis for identification, it requires grammatical identification; I refer to this variety of ForceP as "Agreeing ForceP" or ForceP$_{AGR}$:

(15)   Force $_{[iTime]\,[Person:\,]}$ (Force$_{AGR}$: grammatical identification)

This variety of Force is does not have a contextual basis for identification; it requires grammatical identification by verbal morphology. In the context of an embedded clause such as (16), the unvalued [Person] feature is valued by the matrix *v*:

(16)   Terry believed [that Sue was at home]
        [… [$_{vP}$ *v*$_{[iTime][phi][Tense:\,]}$ *believed* [$_{CP}$ [Force$_{AGR\,[iTime]\,[Person:\,]}$ … *Sue was at home*]]

Force$_{AGR}$ appears in environments where it can be probed by a head with phi-features, such as a complement clause that can be probed by a matrix *v*. By virtue of agreement with *v*, the matrix subject in (16) is identified as the source of assertion. Since the evaluation event has an interpretable [Time] feature as well, the time of belief also identifies the evaluation time of the embedded clause.

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[10]The internal, or *v* P-event time is identified by interpretable Tense features. Notice that this is compatible with the standard approach to uninterpretable Tense features on *v*, since the [Time] feature is interpretable, while the ordering feature (past or present) is uninterpretable.

[11]For discussion of [Speaker] encoding and indexicality see Giorgi (2010).

2.3   The sequence-of-tense parameter

The preceding discussion showed how the embedded clause evaluation time is identified by Agreement with the Person feature of the matrix verb. We can now address morphological agreement: SOT languages generalize the mechanism of grammatical identification that applies in *v*P, (shown in (13)), applying it more broadly to both *v*P and ForceP. In other words, ForceP has an unvalued [Tense] feature also:

(17)   Force$_{AGR}$ $_{[iTime]}$ $_{[Person:][Tense:]}$ (grammatical identification)

The parameter is stated in (18):

(18)   SOT parameter: A language shows sequence-of-tenses if Force$_{AGR}$ bears unvalued [Tense].

In non-SOT languages, the antecedent does not have bear [Tense], and consequently does not trigger agree.[12]

2.4   Form of the verb in SOT clauses.

The question arises as to how the derivation of an SOT clause proceeds in such a way as to permit a "past" verb form to appear in a clause whose Tense is specified as present. On standard assumptions it is natural to assume that this would be problematic, since the more local Agree relation between Tense and *v* would always derive a present tense verb form, and would disallow a second, more distant application of feature valuation to the same verb. It must be the case then, that, contrary to appearances, the verb form has slots for features values of higher functional heads in the clause. Notice that it is already necessary to assume this for counterfactual conditionals. As discussed above, this is a case of an apparent "past" form that is not a tense feature, but a modal feature that signals value for world of evaluation, rather than the time of evaluation. In SOT clauses, the "past" morpheme is not a tense morpheme but a Force feature, as shown in (17) above. The conclusion that can be drawn is that *v* has a series of feature sets differentiated in terms of the functional category with which they are associated.

3.   Sequence-of-tense clauses

In the discussion below, I show how the approach introduced above accounts for the conditions on SOT summarized in (19):

(19)   *Conditions on SOT contexts:*
        a. Embedded clause occurs in an intensional context
        b. Embedded verb is stative/imperfective
        c. Matrix verb is past tense
        d. Embedded verb is formally past tense

3.1 Intensional contexts.

It is argued in several studies that SOT is restricted to intensional contexts.[13] These include matrix attitude verbs, future tense/modality, and subjunctive clauses. These contexts have in common that their context of evaluation is not speaker-based. The discussion here focuses on attitude verbs. The context of a matrix attitude verb was illustrated above with the verb *believe* in (16). Similarly, *think, imagine* and other attitude verbs have complement clauses whose past tense is ambiguous between shifted and simultaneous readings. Attitude verbs contrast with verbs of saying with respect to SOT behavior. While attitude verbs

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[12]A question that is left open here is what property of the language sets the parameter for SoT versus non-SoT.

[13]See Hatav (2012) and references cited.

are uniform with respect to SOT, verbs of saying show optional SOT effects. Both allow simultaneous readings of past under past, but the two differ with respect to the availability of present under past:

(20) a. John believed that Mary was happy.   (simultaneous or shifted)
      b. John said that Mary was happy.   (simultaneous or shifted)[14]

(21) a. ??John believed that Mary is happy.
      b. John said that Mary is happy.

The wellformedness of (20b) without an intensional context implies that a Force$_{AGR}$ is freely available in complement clauses. If it occurs, it imposes a grammatically identified source of evaluation—other than the speaker, just as attitude verbs do. The contrast in (21) is attributable to the fact that, since English is an SOT language, the disagreement between the two clauses implies that the embedded present tense can only be analyzed as a Force$_{SP}$. In (21a) there is a mismatch between the Force$_{SP}$ and the attitude verb, which selects Force$_{AGR}$. In (21b), however, the verb of reporting is compatible with a Force$_{SP}$ context of evaluation.[15]

      Giorgi and Pianesi (2000) show that for Italian, there is a strong SOT requirement for verbs of belief, shown in (22), but not for verbs of saying, as in (23):

(22) a. *Gianni credeva [che Carlo sia malato]*
          'Gianni believed that Carlo is(PRES.SUBJ) sick.'
      b. *Gianni credeva [che Carlo fosse malato]*
          'Gianni believed that Carlo was(PAST.SUBJ) sick.'

(23) *Gianni ha detto [che Maria è incinta]*
      'Gianni said that Maria is(PRES.INDIC) pregnant.'

It should be noted that (22) and (23) also differ with respect to whether the complement clause is subjunctive, as in (22), or indicative, in (23). However these authors argue that the crucial contrast is due to the class of the verb, not the mood of the complement clause. They show that a verb like *ipotizzare* 'to hypothesize' can be construed either as an attitude verb or as a verb of saying, and that according to the interpretation, SOT is either strict or not. Furthermore, SOT is accompanied in Italian by the potential for a covert Complementizer. The contrasts in (24) show that the attitude verb observes SOT and allows Complementizer deletion; the verb of communication need not observe SOT, and disallows complementizer deletion:

(24) a. Gianni ha ipotizzato (che) fosse incinta.   (mental state)
          'Gianni hypothesized (that) she was(PA.SUBJ) pregnant.'
      b. Gianni ha ipotizzato *(che) sia incinta.   (communication)
          'Gianni hypothesized that she is(PRES.SUBJ) pregnant.'

In addition to the relevance of the attitude verb, these contrasts provide evidence that SOT is not a due to modality in the complement clause, and instead, is related to features that are specified in the Complementizer system.

      The analysis of ForceP outlined above implies that there are only two varieties of ForceP with respect to temporal identification of the evaluation time. If this is correct, it is predicted that finite clauses are either "purely" root-like in their behavior, with no grammatical identification of evaluation time (Force$_{SP}$) or that they allow grammatical identification, leading to SOT. Contrary to these expectations, the double access reading of clauses under of verbs of saying, as in (21b), suggests that a strictly two-way

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[14]This generalization is due to Gillian Ramchand, personal communication.

[15]Sentence (21b) has a 'double access' interpretation. The interval of Mary's being happy includes both speaker's evaluation time and the time of John's speaking.

distinction is insufficient. Either there is a third type of identification, or it may be that verbs of saying select clauses with complex ForcePs. That is, the 'double access' reading, as the name suggests, could involve licensing by both Force$_{SP}$ and Force$_{AGR}$. It has been pointed out (Franco 2012) that double complementizers are common cross-linguistically. Although the examples from a number of different languages cited by Franco are subjunctive clauses, it may be that indicative clauses also contain double ForceP structures with one covert member.[16]

3.2   *Stativity of the complement verb*

In SOT contexts a simultaneous interpretation is only possible if the complement clause verb is imperfective:

(25)   a. John believed that Fred resembled a squid.   (overlap/precedence)
        b. John believed that Fred ate a squid.   (precedence only)

This generalization follows directly from the analysis of the embedded clause predicate as a present tense, since only imperfective situations are compatible with present tense:

(26)   a. Fred resembles a squid.
        b. *Fred eats a squid.

The analysis predicts that, aside from any differences that may be due to contrasts between the two types of ForceP, the same contexts that are well-formed as matrix present tense should be possible with a simultaneous interpretation in SOT contexts. One piece of evidence that points in this direction is that, when non-stative events have a reading other than a single ongoing event, they are compatible with present tense, as shown in (27); these same predicates can be embedded in SOT contexts with a non-past interpretation, as in (28):

(27)   a. Sue arrives at noon.
        b. That store sells shirts.
        c. Her car goes 100 MPH.
        d. Those poems translate easily.

(28)   a. John believed that Sue arrived at noon.
        b. John believed that that store sold shirts.
        c. John believed that her car went 100 MPH.
        d. John believed that those poems translated easily.

The examples in (28) are ambiguous between precedence and non-precedence readings. (28a) could have a non-precedence reading in a situation where John was waiting at the airport in the morning because he believed Sue's flight arrived at noon. Summarizing, the present approach accounts for the types of predicates that can occur in the SOT clause with a simultaneous (non-precedence) reading, in terms of independently motivated constraints on predicates that are compatible with present tense.

3.3   *Matrix Past Tense*

Sequence-of-tense is generally considered to be restricted to past contexts. However, the analysis outlined above seems to allow for the possibility of a grammatically identified embedded present embedded under a main clause present tense. This situation would only be distinguishable from an ordinary main clause

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[16]The licensing of double access for (21b), repeated as (i), would then be as shown in (ii), which combines FORCE$_{AGR}$ with FORCE$_{SP}$.

(i) John said that Mary is happy.
(ii) John said [Force$_{AGR}$ $_{[iTime]}$ $_{[Person:]}$ $_{[Tense:]}$ Force$_{SP}$ $_{[iTime]}$ $_{[Person:speaker]}$ $\cdots$ Mary is happy]

(Force$_{SP}$) present tense in terms of the context of evaluation. In other respects, the conditions on the two seem difficult to tease apart. The question is whether (29a) and (29b) differ with respect to the objective status of Mary's pregnancy:

(29)   a. John believed that Mary was pregnant.
          b. John believes that Mary is pregnant.

Abusch (1997) observed that for sentences such as (29a), it is not necessary that Mary is pregnant, but only that there is a condition that gave John a belief that she was. If the same is true of (29b), then it is reasonable to suppose that (29b) also has a relative present tense: a tense whose world of evaluation is not an objective one that is accessible to speaker and hearer, but a non-deictic world controlled by John's beliefs. [17]

3.4   *Past Morphology of the embedded Verb*

As noted in Section 1 above, a standard assumption for SOT clauses is that a rule of tense deletion removes the past tense of the embedded clause in the context of a main clause past tense. The analysis introduced above proposes that the embedded clause tense is a relative present tense. This means that the time and world of evaluation are non-deictic, and as such there needs to be a linguistic antecedent that licenses the reference of the evaluation context. In SOT languages, agreement with the intensional context of evaluation leads to past (Exclusion) feature value on the specifiers of the embedded clause Force, Deixis and Finite Phrases. The verb in the SOT clause should be understood as having morphology that reflects features beyond just ordering features. The goal of the discussion here is to show that there is independent motivation for the assumption that embedded clause morphology can display agreement with a grammatically identified, non-context-dependent evaluation time. These include modals *will/would* and subjunctive clauses in non-deictic contexts in Spanish.

The modal *will* and its counterpart *would* both have meanings of subsequence, but they differ with respect to whether subsequence is introduced relative to a contextually determined time or not. *Will* is sometimes analyzed as a 'present tense modal, because its evaluation time is the speaker's 'now'. *Would,* on the other hand, is described as a 'past modal', because it describes subsequence relative to a past time. The terms 'present tense' and 'past tense' are not descriptively accurate though, assuming that 'tense' refers to the inherent ordering relation encoded by *will* and *would,* that is, subsequence. The two apparently do differ in whether their evaluation time is the speaker's event or a grammatically identified one. In an intensional context, *will* has the same degraded status that absolute present tense has:

(30)   a. John believed that Mary would leave at noon.
          b. ??John believed that Mary will leave at noon.

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[17] A reviewer suggests that narrative contexts with historical present may provide evidence as to whether an absolute present is possible in an embedded context. In the reviewer's example of a story about Jules Verne, who on his deathbed in 1914 is sealing a letter with instructions that it not be opened for 100 years, the sentence (i) is suggested to allow an absolute present reading:

(i) It's 1914 and Jules is sealing the letter.
(ii) He believes that 21st century Europe is united.

In the belief context in (ii), the belief state held in 1914, and Jules Verne is the source of the belief. If the statement that 21st century Europe is evaluated relative to the speaker's context rather than to Jules Verne's context, then it must be that (ii) has an absolute tense. Although somewhat awkward, I agree that this context has unexpected independence. A possible contributing factor is that in historical present, the narrator shifts contexts, viewing the events of 1914 and the event of 21st century Europe from a simultaneous perspective, so it may be that the narrator's "dual context" provides a mechanism for licensing the shift to the 21st century.

The oddness of (30b) is expected on the present approach. The morphology of *will* and *would* can be understood as specifications for Force—rather than Tense. The contrast between *will* and *would* could not be a Tense distinction, since their intrinsic ordering is subsequence.

Another context in which verbal morphology reflects a grammatically identified evaluation time is subjunctive clauses in intensional contexts. Complement clauses with the matrix verb *creer* 'believe' in Spanish illustrate that subjunctive imposes a stronger SOT requirement than indicative. The verb *creer* 'believe' takes a subjunctive clause only when it is negated. The indicative complement in (31) is degraded if SOT does not apply; the effect is strengthened in the negative context (32), where the complement is subjunctive:

(31) a. Juan creía   que Carlos   estaba   enfermo.
          J. believe.PAST.IMPF   that C.   be.PAST.INDIC   sick.
          'Juan believed that Carlos was sick.'

      b. ??Juan creía   que Carlos   está   enfermo.
          J.   believe. PAST.IMPF   that C.   be.PRES.INDIC   sick
          'Juan believed that Carlos is sick.'

(32) a. Juan no creía   que Carlos   estuviera   enfermo.
          J. not believe.PAST.IMPF   that C.   be.PAST.SUBJ   sick.
          'Juan didn't believe that Carlos was sick.'

      b. *Juan no creía   que Carlos   esté   enfermo.
          J.   believe.PAST.IMPF   that C.   be.PAST.SUBJ   sick
          'Juan didn't believe that Carlos is sick.'

These patterns illustrate that an embedded clause verb sometimes shows values for tense, and sometimes shows values for a contextually identified versus a grammatically identified evaluation context. The analysis of SOT proposed above provides a natural account of this phenomenon. Force$_{AGR}$ requires an antecedent or controller, and that relationship is inflectionally encoded in the embedded verb's morphology.

3.5   Summary.

It was argued that SOT clauses are not lacking a semantically contentful tense; this approach simplifies the description of SOT and captures insights that are not otherwise expressed on deletion or zero tense approaches. The analysis also accounts for the stativity/imperfectivity of the embedded clause predicate, and for the stronger preference for SOT in complement clauses under attitude verbs. The 'subjective', non-speaker based source of evaluation of the embedded proposition is also accounted for as an effect of ForceP lacking speaker evaluation.

If this approach is correct in its outlines, the broader conclusion for Tense in English and other SOT languages is that verb morphology manifests features related to Force and Modality as well as Tense. SOT is a reflection of a series of functional heads, each of which supplies values that specify components of the relational meaning of tenses.

4.   Interpretability of Tense

As I discussed in the introduction to this paper, any analysis of sequence of tense in terms of a semantically empty or deleted tense is problematic from syntactic and semantic perspectives. Finding an interpretable tense in SOT clauses is compatible with a semantically grounded analysis of Tense. The question of whether tense is a category that is grounded semantically can be viewed from the perspective of language acquisition and language impairments. I briefly mention two generalizations that lend support to a grounded view of tense from research on aphasic speech. According to Varlokosta *et al*. (2006), impairments in verb morphology are prominent characteristics of aphasic speech. One finding from

studies of aphasic speech is that there is a correlation between impairments of production of verb morphology and impairments of comprehension of tense (Varlokosta *et al*. 2006, Wenzlaff and Clahsen (2004)). This is expected on an analysis of these categories as semantically grounded; if morphology reflects specific functional categories, any impairment in the representation of those categories should affect their both interpretation and morphology. A second generalization is that several studies have found selective impairments, where tense and aspect are affected to a greater degree than subject agreement. (Varlokosta *et al*. 2006). One proposed account of this selective impairment is the tree pruning hypothesis. It posits that the clausal structures of agrammatic individuals are intact up to TP, but are missing or 'pruned' from there up (Friedmann and Grodzinsky 1997). An alternative account is the representational impairment hypothesis, according to which the functional category of Tense is not specified in the grammar of impaired individuals. (Wenzlaff and Clahsen (2004). If we consider these accounts in comparison with non-aphasic grammars, we should assume that individuals for whom tense interpretation is intact must have full representations of the functional categories discussed above, regardless of whether the categories have morphologically overt reflexes or not. At the same time, the present approach predicts that individuals who have impairments in Tense should also have related impairments in distinguishing deictic versus non-deictic contexts of evaluation, and impairments in distinguishing realis from irrealis situations. In other words, since tense interacts with modality and deixis to produce tense interpretations, a full, unimpaired grammar should represent values for all of these categories. The tree pruning approach predicts that all the categories above Tense should be impaired if Tense is impaired.

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