Sequence of Tenses in Spanish. 

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The purpose of this paper is to demonstrate that the Sequence of Tenses phenomenon can be explained from the perspective of a relational theory of tenses similar to the one proposed by Reichenbach (1947), and adopted by Hornstein (1990). Furthermore, we will adopt the results of recent theories on verb syntax and sentence structure (see among others; Giorgi and Pianesi (1991), Grimshaw (1991), Stowell (1993), and Zagora (1990, 1992)).

The main conclusions we have arrived at are that the syntactic structure of tenses is the same throughout all the derivation levels; secondly, that by means of the free coindexation between empty temporal phrases we can account for the sequence of tenses phenomena that Hornstein (1990) explains with a mechanism of association of temporal points. It seems to be the case, finally, that whenever the time of the event denoted by the main predicate precedes the speech time, the embedded tense must belong to the [+past] sphere.

This paper is structured as follows: we will first briefly describe the behaviour of Hornstein’s (1990) Sequence of tenses rule, and we will point out some of the problems that such a rule poses. In the second section, we will give our analysis of the Spanish tenses. To conclude, we will propose a solution to the problems mentioned in the first section.

We will concentrate on the phenomenon of Sequence of tenses in complement clauses and on the contribution of tenses to temporal deixis; the contribution of temporal adverbs to temporal deixis is not going to be addressed here.

1. Sequence of tenses (SOT) is the name that is traditionally given to the fact that the tense of the complement clause verb varies according to the tense of the matrix clause verb. For instance, in (1a), where the matrix tense is present, we choose the verbal form asistiría for the expression of a future event; in (1b), where the matrix verb is in the simple past, we choose instead the verbal form asistió for the expression of the same content:

(1) a. Juan asegura que Pilar asistirá a la fiesta.
"Juan affirms that Pilar will attend the party"

b. Juan aseguró que Pilar asistió a la fiesta.
"Juan affirmed that Pilar would attend the party"

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In many languages there are not any morphological differences between the verbal forms embedded under the simple past \(^3\) and the verbal forms embedded under a tense which does not denote anteriority with respect to the speech time. At the same time, sentences like (1b) are very often considered indirect speech versions of sentences like (1a). Due to this fact, many scholars have proposed that in D-Structure, both *asistiría* and *asistiría* are not different tenses. That is what Hornstein (1990) does. In 1.1, and 1.2, we will briefly describe his proposal, and we will point out some of the facts that it does not account for.

1.1. Following Reichenbach (1947) \(^4\), Hornstein (1990) conceives tenses as expressions of the relation between three temporal points \(^5\): the point of speech (S),

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4. The following is the inventory of tenses of Reichenbach (1947:297):

<table>
<thead>
<tr>
<th>Structure</th>
<th>New Name</th>
<th>Traditional Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-R-S</td>
<td>Anterior past</td>
<td>Past perfect</td>
</tr>
<tr>
<td>E,R-S</td>
<td>Simple past</td>
<td>Simple past</td>
</tr>
<tr>
<td>R-E,S</td>
<td>Posterior past</td>
<td></td>
</tr>
<tr>
<td>R-S,E</td>
<td>Anterior present</td>
<td>Present perfect</td>
</tr>
<tr>
<td>E-S,R</td>
<td>Simple present</td>
<td>Present</td>
</tr>
<tr>
<td>S-R,E</td>
<td>Posterior present</td>
<td>Simple future</td>
</tr>
<tr>
<td>S-E-R</td>
<td>Anterior future</td>
<td>Future perfect</td>
</tr>
<tr>
<td>E-S-R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-R,E</td>
<td>Simple future</td>
<td>Simple future</td>
</tr>
<tr>
<td>S-R-E</td>
<td>Posterior future</td>
<td></td>
</tr>
</tbody>
</table>


5. As Hornstein (1990:92-97) points out, a Reichenbachian theory of tenses is superior to the ones provided by the temporal logic or by the generative semantics due to its restrictive character. In temporal logic, tenses that are not basic, such as the past perfect or the future perfect, are built up from the basic tenses by iteration of the primitive operators; in generative semantics, temporal predicates serve for the same purpose. As an illustration, we give the analysis of the sentences (ia-b) according to the temporal logic (look at (iiia-b) and according to the generative semantics (look at (iiia-b))):

\( P \) is the symbol of the past tense operator; \( F \) is the symbol of the future tense operator:

(i) a. Juan había hablado.
   "Juan had spoken."
   b. Juan habrá hablado.
   "Juan will have spoken."

(ii) a. \( P(P(a)) \)
    b. \( F(P(a)) \)
which refers to the utterance time; the point of the event (E), which represents the
time of the event denoted by the predicate of the clause; and the point of reference
(R)\(^6\), which corresponds to the relevant time with respect to which the speaker
situates the point of the event on the time line. The Basic Temporal Structures (BTSs)
that Hornstein proposes are the following (points separated by a comma are
interpreted as contemporaneous; if two points are separated by a line the leftmost
point is interpreted as temporally earlier than the other):

\[
\begin{align*}
\text{(2) a. } & \text{S,R,E present} & \text{d. } & \text{E-S,R present perfect} \\
\text{b. } & \text{E,R-S past} & \text{e. } & \text{E-R-S past perfect} \\
\text{c. } & \text{S-R,E future} & \text{f. } & \text{S-E-R future perfect}
\end{align*}
\]

According to Hornstein (1990), both the verbal form \textit{asistiría} of (1a), and the
verbal form \textit{asistiría} of (1b) have the BTS of a future tense in D-Structure. The
temporal interpretations of (1a) and (1b) are not the same, though. In order to explain
this, Hornstein devises a SOT rule which consists of reproducing the BTS of the
embedded verb below the BTS of the matrix verb and associating the speech point of
the former with the event point of the latter. Consider (3a-b) \(^7,8\):

\[
\begin{align*}
\text{(3) a. } & \text{S1,R1,E1} & \text{SOT} & \text{S1,R1,E1} \\
\text{S2-R2,E2} & & & \text{S2-R2,E2}
\end{align*}
\]

This way of dealing with the past perfect and the future perfect carries the implication that there is an
infinite number of possible tenses within natural language because there is nothing to prevent the
iteration of operators or temporal predicates from continuing indefinitely. However, in a
Reichenbachian theory complex tenses are not formed by recursion of primitive sentences. Rather,
the full ordering of the R point, the E point, and the S point defines a set of possible tenses.

6. Reichenbach (1947) takes from Jespersen (1924:262-263) the idea that the interpretation of the
past perfect and the future perfect requires a third temporal point different from the speech point and
the event point. However, Reichenbach makes use of what he calls point of reference for the
interpretation of all tenses.

7. In what follows, with the number 1 we will indicate that we are referring to the main clause
or to a phrase higher in the tree, and with the number 2 that we are referring to the embedded clause
or to a phrase lower in the tree.

8. As stated by Hornstein (1990:169-170), this mechanism is the mirror image of the syntactic
relation of government that exists between the positions that provide the temporal points E1 and S2,
namely, V1 and FLEX2.
b. E1,R1-S1
S2-R2,E2

The temporal structures on the left are the BTSs of asegura, asistirá, aseguró and asistirá in D-Structure. The temporal structures on the right are their Derived Temporal Structures, that is, the temporal structures that account for the specific relation that exists between the BTS of a main tense and the BTS of an embedded tense in S-Structure.

If two temporal points are associated, they are interpreted as contemporaneous. That is why, although the BTS of asistirá and asistirá is the same in D-Structure, the association of S2 and E1 means that E2 is understood as in the future relative to the speech time in (1a), and as in the future relative to an event which is situated in a time prior to the moment of utterance in (1b). In addition, the presence in (1b) of an event which is situated in a time prior to the moment of utterance causes the morphological change that the embedded verb undergoes between D-Structure and S-Structure. In languages such as Russian and Japanese this is not the case, though.

Finally, given that there are sentences like (4), in which the embedded verb does not change between D-Structure and S-Structure even though E1 is prior to the speech time, Hornstein claims that the SOT rule is optional.

(4) (*)Juan aseguró que Pilar asistirá a la fiesta.
"Juan affirmed that Pilar will attend the party."

If the SOT rule does not apply, S2 denotes the speech time.

1.2. We do not agree with Hornstein on the assumption that the BTSs of the verbs embedded to a past tense or to a tense that does not denote anteriority with respect to the speech time are the same in D-Structure.

Coming back to our sentences of (1a-b), notice that the verbal form asistirá can also appear in independent sentences, where the SOT rule does not apply. Consider (5):

(5) Eran las nueve de la mañana de un domingo lluvioso del mes de Abril. Pilar asistió poco después a un acontecimiento memorable.
"It was nine in the morning on a rainy Sunday in April. Pilar would attend a memorable event a bit later."

So, if the BTSs of the embedded verbs of (1a) and (1b) were the same, we would have to claim not only that one BTS in D-Structure can correspond to more than one verbal form in S-Structure (that is what happens in (1a-b), according to Hornstein), but also that one verbal form in S-Structure can correspond to more than one BTS in

9. Not all Spanish speakers think that this sentence is grammatically correct. That is what the asterisk in parenthesis means.

10. We agree with Ignacio Bosque (personal communication) that most Spanish speakers would use asistió ("attended") in (5) instead of the verbal form asistirá due to the simplification that is so frequent in narrative texts as regards temporal deixis. Nevertheless, we still have to account for the fact that asistirá is not excluded from (5).
D-Structure, as we may deduce from (1b) and (5)\textsuperscript{11,12}. Moreover, the strongest argument of Hornstein in support of the fact that the embedded verb undergoes a morphological change between D-Structure and S-Structure when E1 is prior to the speech time is that in S-Structure the embedded verb keeps the properties that it had in D-Structure. One property of the future is that it can be modified by the adverb mañana. Asistirá is possible in (6b), then, because it has the same BTS as the embedded verb of (6a).

(6) \begin{enumerate}
  \item a. Juan asegura que Pilar asistirá mañana a la fiesta.
  "Juan affirms that Pilar will attend the party tomorrow."
  \item b. Juan aseguró que Pilar asistirá mañana a la fiesta.
  "Juan affirmed that Pilar would attend the party tomorrow."
\end{enumerate}

Given the contrast that we observe in (7a-b), however, it appears that asistirá and asistirá have different properties with respect to which temporal adverbs they can be modified by. In terms of Hornstein’s theory, those different properties would mean that the embedded tenses do not have the same BTS.

(7) \begin{enumerate}
  \item a. * Juan asegura que Pilar asistirá ayer a la fiesta.
  "Juan affirms that Pilar will attend the party yesterday."
  \item b. Juan aseguró que Pilar asistirá ayer a la fiesta.
  "Juan affirmed that Pilar would attend the party yesterday."
\end{enumerate}

\textsuperscript{11} That is what Hornstein’s proposal seems to convey, but he is not clear about which BTS corresponds to the verbal form would attend in independent sentences. In the second chapter, he puts together would and the English modal verbs and says that they have the BTS of the simple present. In the third chapter, however, he makes a list of the possible tenses within natural language in which there is a tense that indicates posteriority with respect to a point in the past. He does not say whether that temporal structure corresponds to would attend, though. In any case, our argument remains the same.

\textsuperscript{12} The sentence of (i) is even more problematic than the one of (1b) because, in terms of Hornstein’s theory, there is not just an unique BTS to which the embedded verbal form can be related. In fact, (i) can be the indirect speech version of either (iia) or (iib). As we show in (iii), whether we suppose that the embedded verbal form of (i) has the BTS of (2b), or whether we suppose that it has the BTS of (2d), the result is the same, that is, E2 is prior to E1.

(i) \begin{itemize}
  \item Juan aseguró que Pilar había asistido a la fiesta.
  "Juan affirmed that Pilar had attended the party."
\end{itemize}

(ii) \begin{enumerate}
  \item a. Juan asegura que Pilar asistió a la fiesta.
  "Juan affirms that Pilar attended the party."
  \item b. Juan aseguró que Pilar ha asistido a la fiesta.
  "Juan affirmed that Pilar has attended the party."
\end{enumerate}

(iii) \begin{enumerate}
  \item a. \begin{align*}
    \text{E1,R1-S1} & \rightarrow \text{SOT} \rightarrow \text{E1,R1-S1} \\
    \text{E2,R2-S2} & \rightarrow \text{E2,R2-S2}
  \end{align*}
  \item b. \begin{align*}
    \text{E1,R1-S1} & \rightarrow \text{SOT} \rightarrow \text{E1,R1-S1} \\
    \text{E2-S2,R2} & \rightarrow \text{E2-S2,R2}
  \end{align*}
\end{enumerate}
Thirdly, if the morphological change that the embedded verb undergoes were a parametric option, we would expect to find the verbal form asistiría in (8) instead of the verbal form asistirá. In effect, the event of Juan's affirming that Pilar would attend the party a bit later is not situated in a time prior to the moment of utterance, so the morphological change is not motivated.

(8) El doctor aconsejó a Pilar que no saliera, pero Juan asegura que poco después proyectará asistir a la fiesta.
"The doctor advised Pilar not to go out, but Juan affirms that she will attend the party a bit later."

Finally, we should not go on claiming that the futures of (1a) and (1b) have the same BTS and ignoring the semantic differences which have to do with the fact that a future has or does not have its point of reference in the past. As an illustration, only the verbal form asistiría of (9b) receives a temporal interpretation whereas asistirá in (9a) is an example of what some of our grammarians call future of probability (that is, (9a) really means "Juan affirms that probably Pilar is with Ana at this moment"). That is why (9a) with the verb asegurar, which means that the subject is certain about the content of the communication, is odd from a semantic point of view (cfr. Juan dice que Pilar estará con Ana en este momento. "Juan says that Pilar will be with Ana at this moment").

(9) a. ?? Juan asegura que Pilar estará con Ana en este momento.
"Juan affirms that Pilar will be with Ana at this moment."

b. Juan aseguró que Pilar estaría con Ana en este momento.
"Juan affirmed that Pilar would be with Ana at this moment."

The facts pointed out so far seem to us important enough to doubt that the futures of (1a) and (1b) have the same BTS. According to the proposal that we will present in the next section, the BTSs of all tenses remain the same throughout all the derivation levels. Thus, the BTS of the futures of (1a) and (1b) is different from D-Structure.

We do not agree with Hornstein either on the assumption that the SOT rule is optional. We will give another explanation to the fact that not all Spanish speakers consider (4) as grammatically correct because there are sentences with a past perfect in the main clause that are agrammatical. Consider (10):

(10) * Juan había asegurado que Pilar asistiría a la fiesta.
"Juan had affirmed that Pilar will attend the party."

In Hornstein's system, it is not evident how to relate the claim that the SOT rule is optional and the fact that (10) is agrammatical without the application of the SOT rule. We will say that (10) is agrammatical because the embedded verb does not belong to the [+past] sphere as it is required when the matrix event is situated in a time prior to the speech time (see the generalization of (25) below). We will suggest instead that (4) is possible for some Spanish speakers because the simple past can be reinterpreted as a present perfect at LF. As a result, the embedded verb is allowed to belong to the [-past] sphere.

2. In the first part of this paper, we have presented the explanation of the
sequence of tenses phenomena given by Hornstein (1990), and we have pointed out some of the problems that it poses. Among them, we have pointed out the problem of having to accept that there are BTSs in D-Structure which correspond to more than one verbal form in S-Structure and that there are verbal forms in S-Structure which correspond to more than one BTS in D-Structure. We have also suggested that it is not sufficient to postulate that the SOT rule is optional in order to explain the fact that a future tense can be embedded under a simple past since it is not possible to embed a future tense under a past perfect. We will come back to these problems in subsections 3.1, and 3.2. In the present section, we will give our analysis of the Spanish tenses. In 2.1, we will postulate the existence of four different temporal phrases the syntactic category of which will be precised in 2.2. In 2.3, we will concentrate on the temporal interpretation of complement clauses.

2.1. Like Pollock (1989), Chomsky (1989), and Belletti (1990), we assume, on the one hand, that the temporal morphemes head their own projections. Following also the common point of view that different morphemes head different projections, we postulate that there are two temporal phrases 13. The morphological information which has to do with the two temporal spheres differentiated in Spanish 14, that is, the past sphere and the non-past sphere, projects in our T1P. The verbal morphemes that provide the temporal contents of "simultaneity", "posteriority", and "anteriority" project in our T2P. Like Stowell (1993) and Zagona (1988, 1990), on the other hand, we think that the predicative content of tenses can have a syntactic manifestation. By saying that tenses have predicative content we mean that tenses express a relation of temporal ordering holding between times. For example, the future tense of (11) situates the event denoted by the verbal predicate in a time posterior to the speech time:

(11) Pilar asistirá a la fiesta.
    "Pilar will attend the party."

What we propose is that T2 has an internal argument, which we will call time of the Event Phrase (tEP), and an external argument, which we will call time of the Reference Phrase (tRP) 15. The first one refers to the time in which we situate the event 16 denoted by the verbal predicate; the second one refers to the time with respect to which the tEP express simultaneity, anteriority, or posteriority. Thus, the syntactic structure we propose is the one in (12):


15. The use of the capital letter T for T1 and T2, and the use of the small letter t for tRP and tEP has to do with the difference that exists between tense and time, that is, between the phrases where temporal morphemes project and the empty categories which denote points of the time line.

16. We understand event in the broad sense. Thus, states will be referred to as events as much as actions.
In terms of the theory of tenses of Reichenbach (1947), the temporal information in T1 and T2 provides the comma or the line, that is, two temporal points are contemporaneous or one comes after the other depending on the verbal morphemes. Our tEP can also be seen as equivalent to the E point of Reichenbach (1947) and Hornstein (1991), but our tRP is not the same as their R point. The R point and the S point of Reichenbach (1947) and Hornstein (1991) are two theoretical entities which are present in the representation of all tenses. For us, as for Stowell (1993), the time of the speech is just one of the possible denotations of the tRP (see subsection 2.2.3).

We will try to determine now the syntactic category of the temporal phrases just introduced.

2.2. Fukui and Speas (1986) postulated the existence of two types of categories, the lexical and the functional. Inflection, in which the morphological information related to tense and agreement projected, was between the functional categories, so it was supposed to have the characteristics given in (13):

(13) a. It is not specified with respect to the (lexical) features [±N, ±V].
    b. It has only one (i.e. non-iterable) specifier and always selects a unique complement.
    c. Its specifier is (usually) moved from within its complement.
    d. It does not have a theta grid.
    e. It assigns a functional feature (i.e. Kase) leftward.
    f. It does not govern or Case-mark into its complement.

However, since papers as Pollock (1989) and Chomsky (1989), in which Agreement and Tense were considered two independent projections, the functional character of T has been called into question, particularly, as regards the property in (13d). In Barriers, Chomsky had already suggested that VP was theta-marked by Inflection. In (14), for example, the trace of the verb is properly governed by its antecedent as long as VP is not a barrier to government:

(14) [InflP NP [V1 + Infl [VP ...tI...]]]

Chomsky (1986:144) proposes that VP is not a barrier because it is theta-marked by Inflection, and once movement takes place, VP is L-marked, so it is not a Blocking Category, hence not a Barrier to antecedent government. Zagora (1988,
1990) makes use of this explanation and adds some further data to claim that VP receives a temporal role from T and, consequently, to postulate that the head which contains the temporal information is a lexical category. The same point of view is adopted in the paper by Giorgi and Pianesi (1991), where the notion of T-role is meant to capture the subcategorization properties of T, which must always have a VP complement.

We are going to follow the classical assumption that T1 and T2 are not lexical in the sense that their heads are not nouns, verbs, etc. Nevertheless, in accordance with Poletto (1992), we consider that T1P and T2P are different from AgrPs because they have semantic content related to the predicate; AgrPs on the contrary bear only structural information: they connect a certain argument to a predicate. If we suppose moreover that the possibility of having a theta grid has to do with the fact of being a category with predicative content, not with the fact of being lexical or functional, we can state that T2 is different in this respect from other functional categories with semantic content related to the predicate.

To consider T1 and T2, on the one hand, as functional categories and, on the other hand, as not sharing the same properties has two important theoretical consequences. In opposition to Giorgi and Pianesi (1991), T1 and T2 will be present in the syntactic structure of a language even if the temporal morphemes are null, provided that T1 and T2 are part of the inventory of functional categories of that language. Secondly, we do not think that it is necessary to postulate the existence of an AgrP between T1P and T2P, contrary to Poletto (1992), because T1P itself is a kind of AgrP in a sense. In fact, the features of T1P, as those of the AgrPs, are related to the referential properties of the argument of one predicate, namely, T2. However, the condition established by Poletto (1992:18) according to which Agreement saturates a word does not apply to T1P. It seems to us that this condition has to do with the agreement heads whose features are related to the referential properties of the arguments of lexical predicates.

Regarding tEP, we assume, with Stowell (1993), that it is equivalent to another referential phrase, the DP. As D, tE is a functional head which enables the tEP to refer, and it saturates the external argument position of its complement, the VP. We suppose that in such an external position of the complement of tEP there is another tP, and that the traditional subject of the sentence is in a lower position. The idea that the external argument of the VP is not the traditional subject of the sentence is in Kratzer (1989), but she calls that argument "event argument" or "argument of spatio-temporal location". Like Stowell (1993), we are going to consider it instead a temporal argument 17 which behaves syntactically as a variable bound 18 by the

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17. As Stowell (1993) points out, however, if the notion of "event argument" turns out to be theoretically necessary, it would be necessary either to postulate the existence of a temporal argument in addition to the event argument, or to stipulate that event arguments carry a temporal index and that event arguments with the same index are interpreted as being contemporaneous or overlapping in time.

18. We understand the binding and c-command relations as follows:

(i) \( \alpha \) binds \( \beta \) iff
(a) \( \alpha \) c-commands \( \beta \).
(b) \( \alpha \) and \( \beta \) are co-indexed.

(ii) \( \alpha \) c-commands \( \beta \) iff
(a) \( \alpha \) does not dominate \( \beta \).
(b) \( \beta \) does not dominate \( \alpha \).
(c) the first branching node dominating \( \alpha \) also dominates \( \beta \).
referential head of tEP. Let us consider an example. The interpretation of the abstract structure in (15) is: "the 19th time X such as the event denoted by VP is situated in X".

(15)  \[ \text{tEP} \text{ tEi} [\text{VP} \text{ tPi} [\text{VP} \text{ DP} [\text{V' V DP}]]]]

Finally, following with the paralellism between categories referring to individuals and categories referring to times, we suggest that the syntactic behaviour of the tRP is similar to that of pro. tRP generates in the Spec position of T2P, where the formal conditions for its licensing are met (it is assigned a theta-role by T2) and moves to the non-thematic position of Spec of T1P, where it gets by agreement with T1 the features necessary for its identification 20. Thus, we complete the syntactic representation of (12) as follows (tRP indicates the constituent which leaves the trace):

(16)
\[
\begin{array}{c}
\text{T1P} \\
\text{tRP} \\
\text{T1'} \\
\text{T1} \quad \{ [+\text{past}], [-\text{past}] \} \\
\text{T2} \\
\text{tRP} \\
\text{T2'} \\
\text{T2} \\
\text{tEP} \\
\end{array}
\]

\{ anteriority, simultaneity, posteriority \}

The tenses that we obtain from (16) are, on the one hand, the preterit (aseguró "affirmed"), the present (asegura "affirms") and the future (asegurar "will affirm"), which denote, respectively, anteriority, simultaneity and posteriority in the [-past] sphere; on the other hand, we get the co-preterit (aseguraba "affirmed") and the post-preterit 21 (aseguraria "would affirm"), which denote, respectively, simultaneity and posteriority in the [+past] sphere. In Spanish, there is no simple verbal form for the

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19. As suggested by Stowell (1993), the tEP can have definite or indefinite reference (look at (ia) and (ib)), analogous to the situation with DPs in languages which lack overt definite and indefinite articles.

(i)  a. Pilar no asistió a la fiesta.
   "Pilar did not attend the party."
   b. Juan asegura que Pilar encontró la solución al problema.
   "Juan affirms that Pilar found the solution to the problem."

The time of the event is definite in (ia). In (ib), instead, the time at which Pilar found the solution to the problem may not be familiar in the discourse setting.

20. See Rizzi (1986) for these different conditions regarding the licensing and the identification of empty categories.

21. We take the terms co-preterit and post-preterit from Bello (1841).
expression of anteriority in the [+past] sphere. Such information is conveyed by the co-preterit perfect (había asegurado "had affirmed"). We call this tense co-preterit perfect instead of anterior co-preterit, in terms of the theory of tenses of Reichenbach (1947), because, like Zagona (1992), we think that the difference between the simple verbal forms and the verbal forms with the auxiliary verb have is not one of tense, but one of aspect. What the compound tenses mean is that just one aspect of the event, namely, the one which corresponds to the resulting state of a prior situation, is located on the time line with respect to a point of reference. The syntactic structure that we propose for the compound tenses is the following (the asterisk on the right of E indicates that both VPs denote the same event):

(17)  AgrP
      /   \
     /     \  
   Agr'   Agr
    /     /  \
   T1P   T1P
  /    /   \
 tRP  T1'  T2P
 { [+past], [-past] }
     / \
 tRP  T2'
     /  \
 T2  tEP
  /  \
 tE'  T2
   /  \
 tEi  V'
  /  \
 tPi  V
   /  \
 V  AgrP
   /  \
 V  Agr'
   /  \
 Agr  AspP
   /  \
 Asp  Asp'
   /  \
 Asp  V
 [perfect]  VP(E*)
     /  \
   V'  V

Notice that our system, similar to Reichenbach's (1947) 22, is restrictive in the sense that it predicts that the number of possible tenses is twelve. In (18) we have tried to assign a BTS to each of them (the comma indicates simultaneity between temporal points; the line that one point comes after the other. tE, tR and tS stands for time of the Event, time of Reference and time of Speech, respectively. In parenthesis we give the values that tR acquires by means of agreement, and in angle brackets the perfective content, as in Zagona (1992)):

(18) a. Present tE, tR(=tS)  
    b. Future tR(=tS)-tE  
    c. Preterit tE-tR(=tS)  
    d. Co-preterit tE, tR(-tS)  
    e. Post-preterit tR(-tS)-tE  
    f. Ante-preterit tE-tR(-tS)  
    g. Present perfect E*<perfect>tE*, tR(=tS)  
    h. Future perfect tR(=tS) E*<perfect>tE*  
       _______  
    i. Preterit perfect E*<perfect>tE*, tR(=tS)  
    j. Co-preterit perfect E*<perfect>tE*, tR(-tS)  
    k. Post-preterit perfect tR(-tS) E*<perfect>tE*  
       _______  
    l. Ante-preterit perfect E*<perfect>tE*, tR(-tS)

As we have already said, no simple form for the expression of anteriority in the [+past] sphere exists in Spanish. Consequently, we lack the corresponding perfect form. That the co-preterit perfect can be used with this meaning has to do, in our opinion, with the fact that the perfectivity can be reinterpreted as temporal anteriority (we will see more examples in section 3.2). This fact provides us with another explanation for the ambiguity often pointed out in the literature of a sentence such as (19):

(19) Pilar (ya) se había marchado a las tres.  
    "Pilar had (already) left at three."

(19) means either that Pilar left before three o'clock or that three o'clock is the time at which Pilar left, depending on whether a las tres modifies the R point (look at (19'a)) or the E point (look at (19'b)):

(19') a. E________R________S  
           |  
           a las tres

22 See footnote (5).

23 Notice that there is a comma or a line only between tR and tE(*). There is no comma or line between tR and E* because E* is the part of the event that is not situated on the time line. Due to this fact, the line in (18b) and (18k) is a bit longer.
b. E________R________S

|       |
| a las tres |

We are of the opinion that, in the first reading a las tres would modify the part of the event which is relevant from a temporal point of view (look at (19"a)). In the second reading, a las tres would modify the part of the event which can become relevant from a temporal point of view (look at (19"b)):

(19") a. E*<perfect>tE*,tR(-tH)

|       |
| a las tres |

b. E*<perfect>tE*,tR(-tH)

|       |
| a las tres |

We also have an explanation for the fact that (20) is unambiguous, unlike (19):

(20) Juan (*ya) se ha marchado a las tres.
     "Juan has (already) left at three."

In (20), a las tres, which denotes a time prior to the speech time, cannot modify tE* because tE* is contemporaneous with tR, which denotes the speech time (see (18g) above).

Let us consider now how tenses are interpreted in complement clauses.

2.3. In matrix clauses, a tRP in the Spec position of a [-past] T1 denotes the speech time; a tRP in the Spec position of a [+past] T1 denotes a time prior to the speech time which is contextually determined. In a sentence such as (21), for instance, the future situates the event denoted by VP in a time posterior to the speech time (it is a D-Structure representation, so the subject and the verb have not moved out of VP yet):

(21) Pilar asistirá a la fiesta.
     "Pilar will attend the party."
In complement clauses, the pronominal category tRP can be freely assigned an index, and it can denote, consequently, the same point of the time line as the temporal phrase with which it is co-indexed. In (22), for instance, we have assigned the same index to the tRP of the matrix clause and to the tRP of the embedded clause because both of them denote the speech time (we omit the part of the representation that is not relevant here):

(22) Juan asegura que Pilar asistirá a la fiesta.
"Juan affirms that Pilar will attend the party."
In (23), instead, the tRP of the embedded clause can have the same reference as the temporal external argument of VP1 because both of them refer to points of the time line previous to the moment of utterance (we omit the part of the representation that is not relevant here):

(23) Juan aseguró que Pilar estaba a disgusto en la fiesta.
"Juan affirmed that Pilar was uncomfortable at the party."
Then, the event denoted by VP2 is situated in a time simultaneous with the time in which is situated the event denoted by VP1. Besides, there is another reading for (23) according to which the tRP of the embedded clause and the temporal external argument of VP1 do not have the same reference. In this reading, the event denoted by VP2 is situated in a time simultaneous with a time that is prior to the speech time but contextually determined. This contextually determined time, however, cannot be posterior to the time in which the event denoted by VP1 is situated. Complement clauses are different from relative clauses in this respect. As an illustration, consider (24):
(24) Juan habló hace dos semanas con la chica que estaba a disgusto en la fiesta.  
"Juan talked two weeks ago to the girl who was uncomfortable at the party."

In (24), the event denoted by VP2 is situated in a time simultaneous with a time of reference which is prior to the speech time; on the other hand, this time of reference can be prior, simultaneous or posterior to the time in which the event denoted by VP1 is situated. As it has been often pointed out in the literature, this difference between complement clauses and relative clauses has to do with the fact that the CompP of the former is governed whereas the CompP of the latter is not. As a result, the [+past] feature of a complement clause can be selected by the matrix verb. Concretely, the matrix verb selects the [+past] feature of its complement clause when the event denoted by VP1 is situated in a time anterior to the speech point. The generalization that we can state is thus as follows: 24

(25)  
[-past] iff  
(a). [-past] is the feature specification of the T1 of a complement clause.  
and  
(b). According to the BTS of the matrix verb, tE1 does not precede the speech time.

According to (25), if the matrix time of the event precedes the speech time, the embedded verb cannot belong to the [-past] sphere. What explains the contrast that we have just mentioned between (23) and (24) is that when the [+past] feature is selected by the matrix verb, the point of the time line on which the event denoted by VP1 is situated becomes a new axis of the temporal deixis. So, if the denotation of tRP2 is determined contextually, the context we have to look at is the context previous to the time in which the event denoted by VP1 is situated; if we take the speech time as the unique axis of the temporal deixis, we will be referring to two distinct past spheres, as in (24).

According to the last paragraph, we expect that the tRP of a co-preterit can be interpreted as denoting a time posterior to the time in which the event denoted by a verb in preterit tense is situated, provided that such a verb does not govern the CompP of the clause of the co-preterit. As we see in (26c), this expectation is fulfilled:

(26) Juan aseguró que Ana nos contaría que Pilar estaba a disgusto en la fiesta.  
"Juan affirmed that Ana would tell us that Pilar was uncomfortable at the party."

---

24. According to the parallelism that we have established in subsection 2.2 between tEPs and DPs, the generalization in (25) can be considered in a sense as equivalent to the restriction that definite Ds impose on the DP complements of the Ns whose external argument saturate (Luis A. Sáez, personal communication). Such DP complements cannot be indefinite. See (i):

(i)  
* Compré esas fotos de varias personas.  
"I bought those photographs of several people."
Sequence of Tenses in Spanish

a. Juan aseguró [tEP tEi [VP tPi tY que Ana nos contarfa [T1P tRPi tY " [T2P tRP tY ' [tEP tEj [VP tP] tY que Pilar estaba [T1P tRPi tY " [T2P tRP tY ' [tEP tEk [VP tPk tY a disgusto en la fiesta]]]]]]]]

b. Juan aseguró [tEP tEi [VP tPi tY que Ana nos contarfa [T1P tRPi tY " [T2P tRP tY ' [tEP tEj [VP tP] tY que Pilar estaba [T1P tRPj tY " [T2P tRP tY ' [tEP tEk [VP tPk tY a disgusto en la fiesta]]]]]]]]

c. Juan aseguró [tEP tEi [VP tPi tY que Ana nos contarfa [T1P tRPi tY " [T2P tRP tY ' [tEP tEj [VP tP] tY que Pilar estaba [T1P tRPk tY " [T2P tRP tY ' [tEP tEl [VP tPl tY a disgusto en la fiesta]]]]]]]

We are going to finish this subsection in an attempt to determine how the syntax can account for the relation of selection that exists between the matrix verb and the temporal features of the complement clause. Since selection is a grammatical relation typically local, we need the [+past] feature 25 to be in a higher position in the tree. According to the Projection Principle, the property which defines the maximal projection of a head is that of being the domain in which the features of the head are transmitted. If we consider that T1P is the maximal projection of T1, the [+past] feature will be transmitted up to T1 and the maximal projections AgrP and CompP will be an obstacle to the selection of this feature by V1. On the contrary, if we suppose, like Grimshaw (1991), that T1P, AgrP and CompP are part of the same extended projection, the [+past] feature will be transmitted up to CompP, where it can be selected by V1. This is the explanation that we will adopt here. So, following Grimshaw (1991), the agreement relation that exists between CompP and T1 as members of the same extended projection is what makes possible the selection of the [+past] feature of the complement clause by V1 when tEl precedes the speech time. In terms of Hornstein’s theory of tenses, what this means is that the matrix clause and the embedded clause must share the sequence of temporal points R-S. On the other hand, when the sequence of temporal points of the matrix clause is S,R or S-R (in our terms, when tEl does not precede the speech time), the tenses of the embedded clause can belong to the [+past] sphere or to the [-past] sphere. Intuitively, we do not expect restrictions on which tenses can be embedded under a present tense since the present means that tE is contemporaneous with the speech time, and the

25. We will concentrate on the selection of the [+past] feature. Nevertheless, there are some cases in which it seems that the features in T2 can also be selected. For instance, consider the sentence in (i):

(i) Juan prometió que Pilar había asistido a la fiesta.
"Juan promised that Pilar had attended the party."

prometer ("promise") is ambiguous in Spanish; it can mean either "swear" or "assure (somebody) that one will do something". (i) is not ambiguous, though. Prometer ("promise") with the second meaning selects a complement whose verbal predicate denotes an event situated in a point of the time line posterior to that in which is situated the event denoted by VP1. Since in (i) the event denoted by VP2 is prior to the event denoted by VP1, prometer ("promise") is being used as equivalent to jurar ("swear").
speech time is the zero point of the time line. So, we expect that all tenses that have the reference to the speech time as part of their meanings (namely, all deictic tenses) can be embedded under a present tense. The reason why there are not any restrictions either on which tenses can be embedded under a future tense is instead morphological. We cannot state a generalization similar to (25), but allowing that T1 of the complement clause be specified with the feature [-fut] just in case T1 does not follow the speech time because we would need verbal forms expressing anteriority, simultaneity and posteriority in the future. The Spanish morphology, however, does not provide us with such forms.26, 27

26. Reichenbach (1947:297) claims that in Latin there was a verbal form to express posteriority in the future, namely, the periphrastic form *abitus ercu* ("I shall be one of those who will leave"). We agree with Reichenbach that there must be languages with a future sphere and, consequently, with verbal forms to express anteriority, simultaneity and posteriority in the future. We do not think that Latin is one of those languages, though. Neither are English or Spanish. Against Reichenbach's assertion, there are two facts that we want to point out. On the one hand, the periphrastic and the simple future forms were often used interchangeably. Consider (ia-b) (all examples in this footnote are taken from Ernout and Thomas (1951)):

(i)  
   a. Ipse hanc acturus Iuppiter comediam.  (Plautus, *Amphitruo*, 88 (prol.))
       "Jupiter himself is going to act in this play."
   b. Iuppiter hodie ipse ager.
       (Plautus, *Amphitruo*, v.94)
       "Jupiter himself will act today."

According to Ernout and Thomas (1951:§290), they could be used indistinctly because the difference between them was not one of time. The future participle indicated that somebody was destined or had the intention of doing something (look at (ii)-(iii)), or that something was about to happen (look at (iv)):

(ii)  
   *quoniam eo miseriae venturus eram.*  (Sallustius, *Bellum Jugurthinum*, 14, 3).
   "as it was destined that I would come to this misery."

(iii)  
   *apud quos aliquid ager aut erit acturus.*  (Cicero, *de Oratore*, 1, 223)
   "in front of whom he will plead or will have the intention of pleading."

(iv)  
   *cum (apes) iam euolaturae sunt aut etiam inceperunt.*  (Varro, *Res Rusticae*, 3,
       16, 30)
   "when the bees are about to take off or they have already begun."

On the other hand, the tenses that are usually found in complement clauses are the following (see Ernout and Thomas (1951: § 394)):

(iv)  
   a. *[dico/dicam] quid faciat, quid fecerit, quid facturus sit.*
       "[I say/will say] that he makes, he made or has made, he will make."
   b. *[dixi/dixeram/dixerat] quid faceret, quid fecisset, quid facturus esset*
       "[I said/said/had said] that he made, he had made, he would make."

The sequence of tenses did not change whether there was a present or a future in the main clause. From our point of view, this fact and the fact that the difference between the periphrastic and the simple future forms was not one of time demonstrate that there was no future sphere differentiated in Latin.

27. In (i), the presence of a non-deictic adverb in the embedded clause favors the interpretation according to which the event denoted by VP2 is situated in a time which is not prior to the speech time, but prior to a time of reference in the future:

(i)  
   *Juan asegurará el lunes que Pilar estuvo en la fiesta el día anterior.*
   "Juan will affirm monday that Pilar was at the party the day before."

We leave for the moment this problem.
We come back now to the problems that we posed in subsection 1.2.

3. In 2.1, we have postulated that the temporal morphemes head their own projections and that there are two distinct projections of T. Moreover, we have pointed out that T2 behaves as a dyadic predicate which takes tPs as its arguments. In 2.2, we have tried to determine the syntactic category of the temporal phrases distinguished in 2.1. We have also given the list of possible tenses within natural language. Finally, we have concentrated in 2.3 on the interpretation of tenses in complement clauses. In the present section we will see how the theory outlined in the previous section allows us to account for the problems mentioned in 1.2.

3.1. As we said in 1.2, we do not agree with Hornstein on the assumption that the BTSs of the verbs embedded under a past tense or under a tense that does not denote anteriority with respect to the speech time are the same in D-Structure. Concretely, we pointed out some of the consequences of postulating that the embedded verbs of (1a) and (1b) have the same BTSs. Firstly, we would have to postulate that there are BTSs in D-Structure which correspond to more than one verbal form in S-Structure, and that there are verbal forms in S-Structure which correspond to more than one BTS in D-Structure. We would have to admit also that tenses which have the same BTS differ, however, with respect to which adverbs they can be modified by. Thirdly, we would have to ignore the semantic differences that have to do with the fact that a future tense has or does not have its point of reference in the past. Finally, we would have to explain why there are cases of embedding of a post-preterit under a present tense.

In (18), we gave the BTSs that our analysis predicts as possible within natural language. We stipulate now that those BTSs remain the same throughout all the derivation levels. So there would be no SOT rule that changes the BTS of a tense either 28, and, in contrast to Hornstein, there would be an unique BTS corresponding

28. Consider the Serbo-Croatian sentences in (i) and (ii):

(i) Juan je potvrdio da će Pilar biti na zabavi.
    Juan AUX+FUT+3SG se+PRES+SG asegurar+PART.ACT+MASC.SG que Pilar
    estar+INF en fiesta.
    "Juan aseguró que Carlos estara (lit. estará) en la fiesta."

(ii) Pilar će ici na zabavu.
    Pilar AUX+FUT+3SG ir+INF a fiesta.
    "Pilar irá a la fiesta."

In Serbo-Croatian (as in Japanese and Russian, see Comrie (1985,1986) and Ogihara (1989)) there is no tense other than the future to express posteriority in the [+past] sphere. One possible explanation is that Hornstein’s (1990) SOT rule applies at LF. According to our proposal, an alternative solution would be to suppose that in this language TIP does not exist. So, tRP would behave syntactically as the empty category PRO in the sense that it would obtain its reference by means of Control. The speech time would not be, as a result, one of the possible denotations of tRP, but its default denotation (see Stowell (1993) for the application of this idea to the sequence of tenses in English). In (i), the tRP would be controlled by the nearest tP c-commanding it, that is, the temporal external argument of VP1. The temporal interpretation of the embedded clause would be, then, that the event denoted by VP2 is situated in a time posterior to a tRP that denotes a point of the time line prior to the speech time. On the contrary, since tRP is not controlled in (ii), the event denoted by the verbal predicate is situated in a time posterior to a tRP that denotes, as a default value, the speech time.
to each possible tense. Secondly, the future and the post-preterit occur with different adverbs because their BTSs are not the same, according to (18). The BTS of (27a) corresponds to the embedded verb of (1a); the BTS of (27b) corresponds to the embedded verb of (1b):

\[
(27) \begin{align*}
(\text{a}) & \quad tR(=tS)-tE \quad (=18b) \\
(\text{b}) & \quad tR(<tS)-tE \quad (=18c)
\end{align*}
\]

As we have seen in (6b), (7b) and (9b), the post-preterit can be modified by adverbs which denote a time posterior to the speech time, such as mañana ("tomorrow"), a time prior to the speech time, such as ayer ("yesterday"), or a time simultaneous with the speech time, such as en este momento ("at this moment"). We can relate this property to the fact that, according to the BTS of the post-preterit, the position with respect to the speech time of the point in which the event denoted by the verbal predicate is situated is not determined. Thirdly, that the future and the post-preterit have not the same BTS is also the reason why sentences (9a-b) differ in meaning. Finally, since the post-preterit is a deictic tense we expect that it can be embedded under a present tense (see the last paragraph of 2.3).

Furthermore, our proposal provides an additional advantage. Consider the syntactic representation of (28) corresponding to (1b) (we omit the part of the representation that is not relevant here):
The temporal interpretation of the embedded clause is that the event denoted by VP2 is situated in a time posterior to a tRP which refers to a point of the time line prior to the speech time. By postulating that tRP is an empty pronominal category that can have the same reference as the temporal external argument of VP1, we obtain the same interpretation as by Hornstein’s mechanism of association of the temporal points S2 and E1. Notice, however, that by means of such a mechanism we cannot obtain the interpretation according to which tRP refers to a point of the time line prior to the speech time but contextually determined (look at (8)).

3.2. We do not agree with Hornstein either on the assumption that the SOT rule is optional. As we pointed out at the end of 1.2, it is not evident how to relate the claim that the SOT is optional and the fact that sentences like the one in (29) are agrammatical without the application of such a rule:
(29) * Juan había asegurado que Pilar asistirá a la fiesta.
   "Juan had affirmed that Pilar will attend the party."  (=10)

From our point of view, the agrammaticality of (29) is due to the fact that the embedded tense does not belong to the [+past] sphere, as it is required by the presence in the main clause of a tE which precedes the speech time. However, in support of what Hornstein claims, there are sentences like (30), which at least for some speakers are grammatical:

(30) (*) Juan aseguró que Pilar asistirá a la fiesta.
    "Juan affirmed that Pilar will attend the party."  (=4)

Like (29), (30) is rejected by many speakers because it violates the generalization stated in (25). On the other hand, if there are speakers who consider (30) as grammatically correct, the reason must not have to do with (25). As it has been stated, such generalization always applies.

Our explanation is that in the interpretational level (LF) the meaning of the present perfect interferes with the meaning of the preterit. So, the anteriority of the event time with respect to the speech time, which is expressed by the preterit, can be reinterpreted by some speakers as anteriority of just one aspect of the event with respect to the speech time, which is part of the meaning of the present perfect (look at (18g)). The aspect of the event with respect to which the embedded event is situated on the time line is thus considered by those speakers as situated in a time simultaneous with a tRP that refers to the speech time. The possibility of having a tense of the [-past] sphere in the embedded clause of (30) follows, then, from the fact that tE1 does not precede the speech time from a semantic point of view.

This explanation allows us to make some important predictions. Firstly, we can account for the fact that even those speakers who consider (30) as grammatically correct do not accept sentences like (31):

(31) * Juan aseguró hace dos años que Pilar asistirá a la fiesta.
    "Juan affirmed two years ago that Pilar will attend the party."

We have observed, in effect, that the phenomenon just described is possible only when the event denoted by the embedded predicate is still relevant at the speech time.

Those speakers who consider (30) grammatically correct do not accept either sentences like (32), due to the fact that only the events denoted by predicates embedded under verbs like asegurar still have relevance at the speech time. Consequently, the possibility of embedding a tense belonging to the [-past] sphere under a preterit tense is lexically restricted.

(32) * Juan pensó que Pilar asistirá a la fiesta.
    "Juan thought that Pilar will attend the party."

Thirdly, the presence of a tense belonging to the [-past] sphere in (30) and the presence of an adverb that denotes a period of time including the speech time in (33) would receive the same explanation:

(33) (*) Lo vi esta semana.
    "I saw him this week."

To conclude, there is also some evidence in support that it is the meaning of the preterit which interferes with the meaning of the present perfect. Concretely, the perfectivity of the present perfect can be reinterpreted as temporal anteriority (see also
the explanation of the use of the co-preterit perfect to express anteriority in the [+past] sphere given in 2.2). Firstly, in Spanish we can find examples in which the present perfect is modified by an adverb which refers to a time prior to the speech time (look at (34)), and examples in which the time of reference of a post-preterit can bear the same index as the external temporal argument of a VP whose head is in the present perfect (look at (35)):

(34) (* ) Juan lo ha visto ayer.
    'Juan has seen him yesterday.'

(35) Juan ha asegurado que Pilar asistirá a la fiesta.
    'Juan has affirmed that Pilar would attend the party.'

Secondly, in many Romance languages such as French, Italian, and Romanian (especially in their spoken forms), and in some varieties of German the present perfect has become the only past tense, quite irrespective of aspect.\textsuperscript{29}

Finally, in certain nonfinite verbal constructions the compound verbal form does not necessarily have perfect meaning. Indeed with such nonfinite verbal forms there is no other way of indicating past time:

(36) Juan lamentará no haber asistido a la fiesta.
    'Juan will regret not to have attended the party.'

The purpose of this paper has been to point out some of the problems posed by Hornstein's (1990) analysis of SOT phenomena, and to suggest an alternative explanation. In doing so, we have benefited from Reichenbach's (1947) relational theory of tenses and from the result of recent theories on the matter, such as Giorgi and Pianesi (1991), Stowell (1993), and Zagona (1990, 1992). First, we have proposed a list of possible BTSs within natural language. Next, we have shown the advantages of substituting the SOT rule by the free coindexation between empty temporal phrases. We have stated, finally, a generalization about the way in which the BTS of the embedded verb is determined by the order in the time line between the matrix time of the event and the speech point.

\textsuperscript{29} See Comrie (1976:53).
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