Along the Time Line:
Tense and Time Adverbs in Italian Sign Language

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Abstract

In Italian Sign Language (LIS), when past or future time adverbs are present, the signs for verbs exhibit the same manual configurations whether the sentence reports a past event or a future event. Facts of this kind, also observed for American Sign Language (ASL) and other sign languages, have led some authors (Friedman 1975, among others) to conclude that these languages, on a par with spoken languages like Chinese, lack grammatical tense. Neidle et al. (2000) and Jacobowitz and Stokoe (1988) have challenged this view for ASL and have argued that ASL sentences contain tense markers. I present some data showing that LIS verbs inflect for tense. I argue, moreover, that the apparent lack of tense inflection when LIS past and future time adverbs are present is due to the fact that these adverbs shift the speech time and that LIS past and future tenses are absolute tenses. I provide a formal account of the LIS tense system based on these assumptions. The account is implemented in Heim's (1997) analysis of tense.

1 The starting point

Consider the following sentences of Italian Sign Language (LIS): [1]

(1) GIANNI HOUSE BUY
"Gianni is buying a house"

(2) TIME-AGO GIANNI HOUSE BUY
"Some time ago Gianni bought a house"

(3) TOMORROW GIANNI HOUSE BUY
"Tomorrow Gianni will buy a house"

One difference between these LIS sentences and their English translations is that, while the English verbs are inflected for tense, in LIS the sign for the verb appears in its citational form. Similar facts have also been observed for American Sign Language (ASL) and have led some authors [2] to conclude that these sign languages, on a par with spoken languages like Chinese, lack grammatical tense. Neidle, Kegl, MacLaughlin, Bahan and Lee (2000) and Jacobowitz and Stokoe (1988) have challenged this view for ASL and have argued that ASL sentences contain

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[1] I follow the standard practice of using words in capital letters to represent signs. All the example sentences in the paper are from LIS, unless indicated otherwise.

[2] See Friedman (1975) for ASL and Pizzuto, Cameracanna, Corazza and Volterra (1995) for LIS.

tense markers. In particular, Neidle et al. claim that ASL has a set of lexical tense markers located in the head position of TP that differ, both morphologically and distributionally, from related time adverbs; Jacobowitz and Stokoe argue that certain movement features of ASL verbs encode tense inflection. In this paper, I'll present some data showing that LIS verbs are also inflected for tense, and I'll argue that, contrary to what (1)-(3) suggest, matrix clauses are tense-marked in LIS.

I'll proceed as follows. In section 2, I'll describe how temporal information is encoded in LIS and I'll show that LIS verbs inflect for tense, though tense inflection and time adverbs interact differently in LIS and in spoken languages like Italian and English. In section 3, I'll present an informal sketch of how the interpretation of tense and time adverbs works in a paradigmatic tense-inflected language: Italian. In section 4, I'll describe the intuitive ideas on which my account of the interaction of tense and time adverbs in LIS is based. Section 5 contains the official proposal: a formal account of the LIS tense system and of its interaction with time adverbs based on Heim's (1997) analysis of tense. Section 6 discusses some related data from LIS. Section 7 tackles some issues left open by the analysis and leads to a refined description of the typology of LIS adverbs. Section 8 contains some final considerations.

2   Time in LIS

There are at least four ways of conveying temporal information in LIS:

  (i) by means of time adverbs,

 (ii) by means of suprasegmental features co-occurring with the verb,

(iii) by means of lexical markers like DONE[3] and MUST,

(iv) by means of context.

Sentences (2)-(3) in the previous section are examples of (i). Sentences (4)-(6) below instantiate (ii):

(4)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{shoulder straight}}$
            "Gianni is buying a house"

(5)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{shoulder backward}}$
            "Gianni bought a house"

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[3]This sign is traditionally glossed in Italian as FATTO. Here, I'll keep the English gloss since its meaning is more transparent for English readers.

(6) $\overline{\text{GIANNI HOUSE}}$ $\overset{\text{shoulder forward}}{\overline{\text{BUY}}}$
      "Gianni will buy a house"

In these sentences, the position of the shoulder while the verb is being signed indicates that the action is present, past or future: if the shoulder is aligned with the rest of the body, the action is claimed to be taking place at the time of utterance; if the shoulder is tilted backward, the action is claimed to take place before the time of utterance; if the shoulder is tilted forward, the action is claimed to take place after the time of utterance.[4]

Sentences (7)-(8) are instances of (iii):

(7)   GIANNI HOUSE BUY DONE
      "Gianni has bought a house"

(8)   GIANNI HOUSE BUY MUST
      "Gianni will buy a house"

The sign DONE in (7) indicates that the action is completed before the time of utterance and the sign MUST in (8) indicates that the action takes place after the time of utterance.[5]

Finally, temporal information may be gathered from the context. For example, in discourse (9) below the first sentence specifies that the action of going to the movies occurred yesterday and the following sentence is understood as describing a past action as well, although it lacks an overt marker indicating that the time is past:

(9)   YESTERDAY GIANNI MOVIE-THEATER GO THERE MARIA
      HIM MEET
      "Yesterday Gianni went to the movie-theater. Maria met him there"

Data (4)-(6) above suggest that the view that LIS lacks grammatical tense should be reconsidered. The position of the shoulder co-occurring with the sign of the verb seems to play the same role as tense inflection on the verb in spoken languages like Italian and English, what changes is simply how grammatical tense is marked: by means of suffixes or stem modification in Italian and English and by means of a suprasegmental element, the position of the shoulder, in LIS. On the basis of these considerations, I will assume that the shoulder position while the

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[4]This use of the shoulder to convey temporal information is mainly found in the variety of Italian Sign Language used in the South of Italy.

[5]The use of lexically contentful elements to perform grammatical functions is common in sign languages and in Creoles. On this point, see Fischer (1978), Fischer and Gough (1999), and Meir (1999).

verb is signed in LIS is a way of inflecting the verb for tense, and, from now on, I'll gloss the suprasegmental feature on the verb in (4)-(6) as present, past and future, respectively:

(4)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$

            "Gianni is buying a house"

(5)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

            "Gianni bought a house"

(6)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

            "Gianni will buy a house"

Even if we regard data (4)-(6) as instances of tense inflection, and thus as evidence that LIS is unlike Chinese and more like Italian and English with respect to the marking of grammatical tense, there is still a conspicuous difference in how tenses and time adverbs interact in LIS and in spoken languages like Italian and English. In Italian and English, past and future tense inflection co-occurs with past and future time adverbs. In the corresponding LIS sentences containing past and future time adverbs, on the other hand, past and future inflection on the verb is absent: in (2) and (3) below the shoulder position is straight, and not backward and forward respectively, as it should be if the LIS verb BUY were inflected for past and future tenses.

(2)   TIME-AGO GIANNI HOUSE BUY

            "Some time ago Gianni bought a house"

(3)   TOMORROW GIANNI HOUSE BUY

            "Tomorrow Gianni will buy a house"

Indeed, if we add past and future inflections to the verb in (2)-(3), the resulting sentences are anomalous:

(10)   *TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

            "Some time ago Gianni bought a house"

(11)   *TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

            "Tomorrow Gianni will buy a house"

This is the problem we face then: explaining why verbal inflection and past and future time adverbs interact differently in LIS and in spoken languages like Italian and English.

Notice that the qualification regarding past and future time adverbs is important here. The lack of past and future inflection on the verb does not arise with all types of time adverbs in LIS. Indeed, with adverbs that in Italian and English fail to locate the event time relative to the utterance time, past and future inflections are possible. For example, the English adverb *today*, by itself, does not locate events in the past, present, or future with respect to the utterance time, as shown by the fact that this adverb can co-occur with past, present, and future tenses:

(12)   a.   Today John bought a house
        b.   Today John is buying a house
        c.   Today John will buy a house

Adverbs of this kind in LIS, like in English, can co-occur with different tenses:

(13)   a.   TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$
        b.   TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
        c.   TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

Finally, before I go on with the plot, I should point out that the lack of past and future tense inflections with past and future time adverbs is no exclusive property of sign languages. Some spoken languages behave in a way similar to LIS in this respect. England (1983) reports that in Mam, a Mayan language spoken in Guatemala and Mexico, past tense particles are obligatorily omitted when a past time adverb is present:

(14)   o   chin   jaw   tz'aq-a
        past 1st-abs. direct. slip-1st
        "I slipped"

(15)   eew   chin   jaw   tz'aq-a
        yesterday 1st-abs. direct. slip-1st
        "I slipped yesterday"

Comrie (1985) reports that similar, though less strict, co-occurrence restrictions are found in Jamaican and other Creole languages.

In the next section, I'll prepare the ground for my account by providing an intuitive picture of the interaction of tense and time adverbs in Italian (I'll be using Italian rather than English as the paradigmatic tense-inflected spoken language for reasons that will be clear later). In sections 4-5, I'll come back to the LIS facts in

(2)-(3). The data in (13) will be addressed later on in section 7.

3 Tense and time adverbs in Italian

According to Reichenbach (1947), natural language tenses express relations among times. In his theory, the time parameters at stake are three: the speech point, the event point, and the reference point. The reference point plays a role in describing the behavior of perfect tenses in English, while for the simple tenses the reference point coincides with the event point.[6] Since in the following discussion the reference point will not play a role, I'll assume for simplicity that tenses express relations between two temporal parameters: the speech point s and the event point e. If we make this assumption, one might describe Italian (as well as English) simple tenses in this way: the simple present tense requires the speech time to coincide with the event time, the simple past tense requires the event time to precede the speech time, and the simple future tense requires the event time to follow the speech time.

> Simple past: $e<s$
>
> Simple present: $e=s$
>
> Simple future: $e>s$

The intended result of this characterization is that, for example, sentences (16)-(18) below are true if the time of the house buying event precedes, coincides with, and follows, respectively, the time of utterance of (16)-(18).

(16)   Gianni comprò una casa
        "John bought a house"

(17)   Gianni compra una casa
        "John is buying a house"

(18)   Gianni comprerà una casa
        "John will buy a house"

How do time adverbs interact with simple tenses? In the Italian sentences in (19)-(20) below (and in their English translations), the time adverbs specify the event time. In (20), the time adverb tells us that the time of the house buying event is included in the day that follows the time of utterance and the inflection on the verb

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[6]This is not quite true for the simple future tense, for which Reichenbach also allows an interpretation where the reference point coincides with the speech point.

redundantly specifies that this time is in the future. In (19), the adverb tells us that the event time is in the past and the tense reiterates this information.

(19)   Tempo fa Gianni comprò una casa
        "Some time ago John bought a house"

(20)   Domani Gianni comprerà una casa
        "Tomorrow John will buy a house"

This interaction between tenses and time adverbs is illustrated in Figure 1 (where t is the interval specified by the past time adverb).
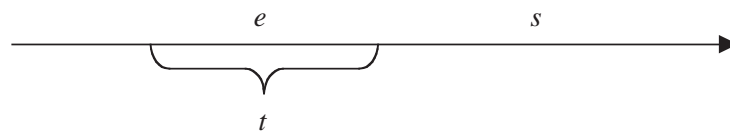

Figure 1: Temporal relations with Italian simple past tense and past time adverbs

There are several ways in which this preliminary sketch of the workings of tenses and of their interaction with time adverbs needs to be revised. For the time being, I'll ignore most of the complex issues that arise in this respect. However, there is one point that needs to be clarified for the purpose of our discussion. I observed that, according to the relational analysis of tense, present tense requires the event time to coincide with the speech time. As is well known, however, present tense may also be used to report events that precede the time of utterance. This is shown in the following examples from Italian and English (due to Bertinetto 1991 and Hornstein 1990):[7]

(21)   Stavamo aspettando il treno. All'improvviso, giunge trafelato Enrico. Ha appena parlato con il capostazione e dice che il rapido arriverà con molto ritardo. Fu così che decidemmo di prendere l'espresso.

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[7]Present tense may also be used to report events that follow the time of utterance, as shown by the following Italian examples:

(i)   Nel prossimi mesi mesi, ecco lo scenario che ci aspetta. Nell'aprile del 2006, Berlusconi perde le elezioni, in maggio si insedia il nuovo governo, in luglio le truppe italiane vengono ritirate dall'Iraq.
        "This is the scenario for the next months. In April 2006, Berlusconi loses the elections, in June a new goverment is formed, in July the Italian troops will be withdrawn from Iraq."

(ii)   Il prossimo luglio, esattamente tra nove mesi, arriva David. (Bertinetto 1991)
        "Next July, exactly nine months from now, David arrives."

"We were waiting for the train. Suddenly, Enrico arrives in a hurry. He has just spoken to the station master and says that the *rapido* will arrive with a long delay. That was how we decided to take the express train."

(22)   It was 1812, just before the Battle of Borodino. The anticipation of the coming struggle is palpable. Napoleon has just woken. He is getting ready to inspect the troops and see that they are ready for the battle that will determine the fate of Europe.

How can this use of the present tense be reconciled with the assumption that the simple present identifies the event time with the speech time? The answer is that the term "speech time" for the temporal parameter s needs to be qualified. In the simple case, this time interval is identified with the time of utterance, but, in general, it need not coincide with it. In the historical present examples (21)-(22), the speech time is shifted back with respect to the time of utterance and the event time is identified with the shifted speech time.[8] Figure 2 illustrates the relation among time of utterance, speech time, and event time in the historical present (c_T is the time of utterance).

Figure 2: Temporal relations in historical present sentences

The relation among time of utterance, speech time, and event time in Italian simple past sentences with past time adverbs is now illustrated in Figure 3.
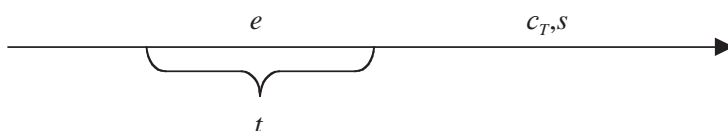

Figure 3: Location of e, s, c_T with Italian simple past tense and past time adverbs

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[8]The idea that the speech time may be distinct from the time of utterance is already present in Dowty (1982), where the speech point is shifted in the scope of certain tense operators. Hornstein (1990) suggests that the possibility of anchoring the speech time to times other than the time of utterance may account for the historical present. In Zucchi (2005), I argue that this way of analyzing the historical present accounts for its aspectual and discourse properties. In Zucchi (2001), the temporal properties of modifiers like *In the novel* are explained by assuming that these modifiers shift the speech time but not the time of utterance.

4 Tense and time adverbs in LIS

Now that we have seen an intuitive sketch of how tenses and time adverbs interact in Italian, let's come back to the LIS facts in (2)-(3), (5)-(6):

(2)   TIME-AGO GIANNI HOUSE BUY
        "Some time ago Gianni bought a house"

(3)   TOMORROW GIANNI HOUSE BUY
        "Tomorrow Gianni will buy a house"

(5)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$
        "Gianni bought a house"

(6)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$
        "Gianni will buy a house"

At first blush, these data seem to show that, although LIS verbs can be inflected for tense, tense inflection is absent when a past or future time adverb is present. Why should there be this co-occurrence restriction on tenses and time adverbs in LIS?

A good rule of thumb to tell someone who wants to learn how the interaction of tenses and time adverbs works in LIS is this: past and future tenses (i.e., the shoulder positions co-occurring with the signs of the verbs to indicate past and future times) are used only when the action isn't already located in the past or in the future by an adverb; if the time specification introduced by the tense is redundant, tense is dropped. This intuitive rule leads us to expect that past and future tenses should be dropped in (2)-(3), as it indeed happens. However, effective as it may be for predicting the behavior of tenses in LIS, appeal to redundancy to explain what blocks the occurrence of past and future inflections in (2)-(3) is not satisfactory. Redundancy in LIS does not yield anomaly, as the acceptability of (23) shows: [9]

(23)   IN-PAST YEARS-AGO MANY PARIS GO
         "In the past, several years ago, I went to Paris"

Moreover, appeal to redundancy fails to answer a natural question raised by the LIS data: why isn't the same co-occurrence restriction also present in other tense inflected languages like Italian and English? As we have observed, from a seman-

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[9]One could suggest that redundant temporal information is barred in LIS only when the information provided by the tense is redundant with respect to the information provided by the time adverb. This correctly describes the facts, but indicates that the unacceptability of (10)-(11) cannot be simply derived from a pragmatic principle barring redundancy: it is the way tenses and time adverbs interact in the grammar of LIS which is responsible for (2)-(3).

tic standpoint, tense in (20) is no less redundant than it is in (2)-(3), yet (20) is perfectly acceptable:

(20)   Domani Gianni comprerà una casa
        "Tomorrow John will buy a house"

Notice that, if indeed we view the data in (2)-(3) as showing that tense inflection is absent when a past or future time adverb is present, this also raises a puzzle for grammatical theory. It is usually assumed that there are three possible ways in which nominative case is assigned: by tense, by agreement, or by both. [10] In LIS, however, person agreement shows up in the complement of raising verbs where the subject NP has undergone raising: [11]

(24)   HE SEEM LEAVE$_{3rd\ pers.}$ DONE
        "he seems to have left"

Since in (24) the subject has moved to receive case, it follows that in LIS nominative case cannot be assigned by agreement. [12] Thus, the only option available for LIS is that nominative case is assigned by the tense of the raising verb. But, if tense is absent in (2)-(3) above, how is case assigned to the subject there? Again, appeal to redundancy fails to answer this question.

A possible hypothesis is that LIS, Italian, and English differ in this respect: in LIS, but not in Italian or English, time adverbs somehow fulfill the function of tense. To see how this proposal may be stated more precisely, let's consider some facts about ASL. Neidle et al., as we mentioned above, have claimed that ASL has a set of lexical tense markers located in the head position of TP. One example of such a lexical tense marker is the sign FUTURE in ASL sentence (25):

(25)   JOHN FUTURE$_{tns}$ BUY A HOUSE   (ASL)
        "John will buy a house"

The claim that these lexical items are indeed grammatical tense markers and not time adverbs is supported by the fact that they can be distinguished from time adverbs both from a distributional point of view and from an articulatory point of view. For example, the position in which FUTURE occurs in (25) is also the position in which modals occur in ASL, while standard time adverbs like TO-MORROW cannot occur in the same position. Moreover, the sign FUTURE in

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[10]See Chomsky and Lasnik (1993) and Chomsky (1995)

[11]Following Bahan (1996) and Padden (1988), I assume that sign language verbs may express agreement with their arguments by spatial movement.

[12]Case assignment may work differently in LIS and Italian, if Giorgi and Pianesi (1997) are right in claiming that case is assigned by agreement in Italian.

(25) cannot be modified to express the degree of distance from the present, while the same sign in other positions can be articulated with the hand staying closer or further away from the body depending on the nearness of the future time. In English, time adverbs like "in the future" may be specified for the degree of distance from the present ("in the near future,""in the distant future"), while tense inflection cannot be specified in the same way. Assuming that ASL is like English in this respect, the lack of modification for the sign FUTURE in (25) may thus be taken as evidence that this sign is a grammatical tense and not an adverb.

Let's now come back to LIS. As data (2)-(3) show, past and future inflections are absent in LIS not only with the indefinite time marker corresponding to "some time ago," but also with the time marker corresponding to "yesterday," which is more plausibly thought of as a time adverb than as a tense. Nonetheless, one possibility suggested by Neidle et al.'s account of ASL tense markers is the following: the time adverbs in (2)-(3) occupy the head position of TP, and this makes additional tense specification impossible. For example, we might suppose that, when the inflected verb checks its features against those of the time adverb in TP, a feature mismatch occurs due to the fact that the element in TP is not of a verbal kind. The time adverbs in TP in (2)-(3), on the other hand, would make sure that TP carries tense features, thus assigning nominative case to the subject. In Italian and English, time adverbs would not occupy the head position of TP, and this would account for the fact that they can co-occur with tense inflection.

While this is a possible hypothesis concerning the interaction of tense inflection and time adverbs in LIS, it should be noticed, however, that the assumption that the time adverbs in (2)-(3) occupy the head of TP is not supported by independent evidence of the kind brought up by Neidle et al. for ASL. The possibility of modulating the sign for the degree of remoteness is available for the time adverb in (2), as shown by (26):

(26)   LONG-TIME-AGO GIANNI HOUSE BUY
          "A long time ago Gianni bought a house"

Moreover, unlike for ASL, the time adverbs in (2)-(3) are sentence initial and do not occur in the same position as the modals, as shown by the following LIS sentences:

(27)   GIANNI 180cm JUMP CAN
          "Gianni can jump 180 cm"

(28)   GIANNI APPLY CAN
          "Gianni can apply"

If, as Neidle et al. assume, modals are located in the head of TP, this suggests that the time adverbs in (2)-(3) are not located in the same position. Although these

considerations are not conclusive evidence that data (2)-(3) are not accounted for by some syntactic feature-checking device, they suggest that the difference in the interaction of tense and time adverbs between LIS on the one hand and languages like Italian and English on the other might be due to factors of a different nature. [13]

Here, I'll propose that these factors are of a semantic kind. Recall how time adverbs work in determining the temporal relations expressed by simple past sentences with past time adverbs in Italian (and English). As figure 3 illustrates, the adverb introduces an interval t that specifies the event time.
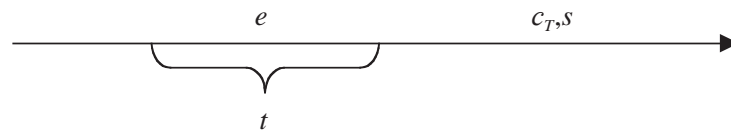

Figure 3: Location of e, s, c_T with Italian simple past tense and past time adverbs

We have observed that, while the speech time s is usually identified with the time of utterance, it is not always so: in some present tense sentences, the speech time is shifted back with respect to the time of utterance. This shift accounts for the so-called historical present. Now, let's suppose that past and future time adverbs in LIS differ from their Italian and English counterparts in the following way. In the Italian sentences (19)-(20) above, as in their English translations, these adverbs specify the event time; in LIS, they specify the speech time. Informally, the way this task is performed may be described by the following rules:

R$_1$ The LIS adverb TOMORROW requires the speech time s to be included in the day after the utterance time c_T.

R$_2$ The LIS adverb TIME-AGO requires s to be included in some interval preceding the utterance time c_T.

Let's assume now that, from a syntactic point of view, tense does not work differently in Italian, English, and LIS. Namely:

A1   In Italian, English, and LIS, matrix clauses must be inflected for tense.

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[13]The above data in (2)-(3) and (10)-(11) are somehow reminiscent of doubly filled COMP effects observed in Chomsky and Lasnik (1977), barring the co-occurrence of a *wh*-word in CP when CP is filled with an overt complementizer. However, the restriction observed in (2)-(3) and (10)-(11) is neither local in the way doubly filled COMP effects are, nor is there evidence that it is parametrized across sign languages in the way doubly filled COMP effects are parametrized across spoken languages. I'll come back to the latter point in section 8.

As the shoulder position in (2)-(3) is straight and this position is an indicator of present tense in (4), the conclusion is that (2)-(3) are present tense sentences:

(2)   TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
        "Some time ago Gianni bought a house"

(3)   TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
        "Tomorrow Gianni will buy a house"

(4)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
        "Gianni is buying a house"

This conclusion, together with the assumption that the adverbs specify the speech time in the way described above, accounts for the interpretations of (2)-(3) correctly. In (2), present tense requires the event time e to coincide with the speech time s. The adverb TIME-AGO in (2) requires s to be some interval preceding the utterance time c_T. Thus, (2) means that the house buying event occurs before the utterance time. The relation between time of utterance, speech time, and event time in (2) is illustrated in Figure 4 (where t is the time introduced by the adverb).
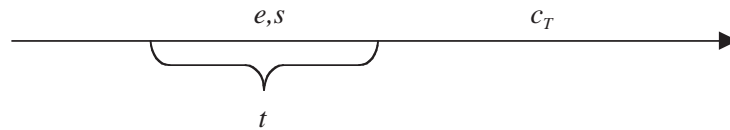

Figure 4: Temporal relations in LIS sentences with past time adverbs

In (3), on the other hand, present tense requires the event time e to coincide with the speech time s, but the time adverb TOMORROW requires s to be some interval included in the day following the utterance time c_T. Thus, (3) means that the house buying event occurs during the day following the utterance time. Under this analysis, moreover, how the subject gets its case in (2)-(3) is no longer a puzzle: nominative case is assigned by tense exactly as in Italian or English.

There is an issue which is still left unresolved by our discussion so far: we have no account of the fact, noted in section 2 above, that, if we add past and future inflections to the verb in (2)-(3), the resulting sentences are anomalous:

(10)   *TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

13

(11) $\qquad$ *TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

These facts are still unexplained for the following reason. By the relational analysis of tense in section 3, the simple past tense should require that the event time e precede the speech time s and the simple future tense should require that the event time e follow the speech time s. Moreover, according to the analysis I propose, the adverbs TOMORROW and TIME-AGO require, respectively, the speech time to be included in the day after the utterance time and to be included in an interval before the utterance time. These assumptions, taken together, predict that it should be possible for (10)-(11) to have the following interpretations: (10) should mean that Gianni buys a house at a time preceding an interval included in a past interval, and (11) that Gianni buys a house at a time following an interval included in tomorrow. In fact, (10)-(11) are simply anomalous, no such readings are allowed.

One possibility is that rules R_1-R_2 above, which describe how past and future time adverbs specify the speech time, should be strengthened to require that the speech time and the event time coincide:

R$'_1$ The adverb TOMORROW requires the speech time s to be included in the day after the utterance time c_T and to coincide with the event time e.

R$'_2$ The adverb TIME-AGO requires the speech time s to be included in some interval preceding the utterance time c_T and to coincide with the event time e.

Given the assumption that past, future and present tenses require e to precede, follow, and coincide with s respectively, rules R'_1-R'_2 amount to requiring that the only tense acceptable with TIME-AGO and TOMORROW should be the present, thus predicting that (10)-(11) should be anomalous.

There is, however, another possible reason for the facts in (10)-(11), which is suggested by the behavior of Italian tenses. In Italian, certain combinations of morphological tenses that are allowed if the simple present conveys simultaneity with the time of utterance are barred if the simple present is used as a historical present. This fact is illustrated in (29)-(30):

(29) $\qquad$ Ora, Beckham gioca nel Real Madrid. Nel '91 iniziò a giocare nel Manchester United. Forse, nel 2006 tornerà a giocare in Inghilterra.
Now, Beckham plays for Real Madrid. In '91 he began$_{pass.rem.}$ playing for Manchester United. Perhaps, in 2006 he will return to England.

(30) $\qquad$ Nel gennaio del 44 a.C. Cesare è dittatore a vita. #Nel 49 a.C. passò il Rubicone. Nel marzo del 44 a.C. verrà ucciso in Senato.

In January 44 B.C. Caesar is dictator for life. In 49 B.C. he crossed$_{pass.rem.}$ the Rubicon. In March 44 B.C. he will be killed in the Senate.

In (29), the simple present in the first sentence refers to the time of utterance, and the simple past (*passato remoto*) and simple future tenses in the second and third sentence are acceptable. In (30), on the other hand, the simple present in the first sentence locates the event at some past time included in 44 B.C. and the *passato remoto* in the second sentence is anomalous. A past tense is possible in a context of the kind in (30) if it is not a *passato remoto*, but a *piuccheperfetto* or an *imperfetto*, as shown in (31)-(32) below. In these sentences, the past tenses are understood as expressing pastness relative to the event of Caesar's being life dictator in 44 B.C.

(31) Nel gennaio del 44 a.C. Cesare è dittatore a vita. Nel 49 a.C. aveva passato il Rubicone. Nel marzo del 44 a.C. verrà ucciso in Senato.
In January 44 B.C. Caesar is dictator for life. In 49 B.C. he had crossed$_{piucch.}$ the Rubicon. In March 44 B.C. he will be killed in the Senate.

(32) Nel gennaio del 44 a.C. Cesare è dittatore a vita. Nel 49 a.C. passava il Rubicone. Nel marzo del 44 a.C. verrà ucciso in Senato.
In January 44 B.C. Caesar is dictator for life. In 49 B.C. he had crossed$_{piucch.}$ the Rubicon. In March 44 B.C. he will be killed in the Senate.

Notice that the anomaly of (30) cannot be plausibly attributed to the fact that the time adverb requires the event time to coincide with the speech time. If this were the case, we should expect any kind of past tense to be prevented from appearing in place of the *passato remoto* in (30), contrary to what (31)-(32) show. What pattern (30)-(32) suggests is that the anomaly of (30) is somehow dependent on the kind of past tense that is used.

In Zucchi (2005), I suggested that the behavior of the *passato remoto* in (30) is accounted for by the assumption that the *passato remoto* is an absolute tense, namely a tense that can only express anteriority with respect to the time of utterance.[14] In terms of the relational characterization of tenses, this assumption may be expressed thus:

(33) The *passato remoto* requires the event time to precede the speech time ($e<s$) and the speech time to coincide with the time of utterance ($s=c_T$).

According to (33), the *passato remoto* not only locates the event time before the speech time as we originally supposed in section 3, but also identifies the speech time with the time of utterance. This assumption accounts of the oddness of (30)

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[14]For independent evidence for this claim, see Bertinetto (1991) and Vanelli (1991).

in this way. The *passato remoto* sentence in (30) appears between a present tense sentence and a future tense sentence that are both used to talk about the past. In our terms, this means that the *passato remoto* sentence appears between sentences that express, respectively, coincidence and futurity with respect to a past speech time. However, by (33), the *passato remoto* in (30) can only be understood as expressing pastness relative to a speech time that coincides with the time of utterance. The occurrence of the *passato remoto* sentence in (30) is thus at odds with the discourse segment in which it is embedded, and, as a consequence, the discourse is incoherent. Assuming that the *piuccheperfetto* and the *imperfetto* can be relative past tenses, that is they do not require the speech time to be identified with the time of utterance, the acceptability of (31)-(32) is also expected.

Let's now come back to the bad guys in (10)-(11):

(10) *TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

(11) *TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

As the device that accounts for the occurrence of present tense in (2)-(3) is similar to the one that underlies the use of the historical present (the speech time is shifted with respect to the utterance time), it's natural to consider the possibility that what blocks the *passato remoto* in (30) is also responsible for barring future and past inflections in (10)-(11). Suppose that, like Italian *passato remoto*, the LIS tenses in (10)-(11) are absolute tenses, namely the suprasegmental features $\underline{\text{past}}$ and $\underline{\text{fut}}$ introduce the following requirements:

R$_3$. $\underline{\text{past}}$ requires the event time to precede the speech time ($e < s$) and the speech time to coincide with the utterance time ($s = c_T$).

R$_4$. $\underline{\text{fut}}$ requires the event time to follow the speech time ($e > s$) and the speech time to coincide with the utterance time ($s = c_T$).

These rules correctly predict (10)-(11) to be anomalous: the adverbs TIME-AGO and TOMORROW in (10)-(11) require the speech time to precede and follow, respectively, the utterance time, but this requirement conflicts with the requirement imposed by the past and future tense inflections that the speech time coincide with the utterance time.

In short, the analysis proposed here for the behavior of LIS tenses and past and future time adverbs may be summed up in this way. LIS past and future time adverbs, unlike Italian time adverbs, shift the speech time. LIS sentences containing these adverbs are present tense sentences, where the present tense equates the event time with the speech time that has been shifted by the adverb. Past and future

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tenses are anomalous in LIS sentences containing past and future time adverbs, since past and future tenses in LIS are absolute tenses and require the speech time to coincide with the time of utterance.

I'll explore the consequences of this account further in section 6. First, however, I want to recast the intuitive proposal sketched in this section in such a way as to reduce some of its features to more familiar devices made available by the grammar of natural languages. One way to proceed, if we want to make the proposal described here more explicit, is to take it literally and assume that the denotations of natural language expressions is relative to (at least) three time intervals: the speech time, the event time, and the utterance time.[15] Tenses and time adverbs impose certain conditions on these time intervals, which may require that the speech time be identified with a time different from the time of utterance. Here, I'll follow a different strategy. Denotations will be relative to a contextually provided time, the time of utterance, and to a variable assignment. The speech time, this mysterious entity that in some case is identical to the utterance time and in other cases gets pushed backward or forward, will disappear as a parameter of evaluation: its role will be played by a variable introduced by tense. The shifting of the speech time induced by LIS time adverbs will be reduced to a case of variable binding. All the ingredients required to implement this strategy are present in the formal analysis of tense proposed in Heim (1997). My official account will thus be based on her analysis.

5   The official account

5.1   A formal account of tense

Models and denotations   I assume that LFs are evaluated with respect to a model M and a context c. The model M contains:

- a set T of time intervals ordered by the precedence relation $<$;

- a set U of individuals;

- an interpretation function F which assigns to each name an entity in U∪T and to each n-place predicate a function from n-tuples of entities in U∪T to $\{0, 1\}$.

The context c specifies a time interval $\mathbf{c_T}$ representing the time of utterance and a variable assignment g_c (Heim and Kratzer 1998). The value of free time variables at LF is determined according to this convention:

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[15]This is the road taken in Zucchi (2005).

C1.   Free time variables at LF refer to the time of utterance $\mathbf{c_T}$.

Formally, this result may be achieved by requiring that for any time variable t, $g_c(t) = \mathbf{c_T}$.

   The denotation of LF expressions relative to a model M and a context c (for short, $[\![\ ]\!]_{M,c}$) is defined thus:

1. If P is a predicate, $[\![P]\!]_{M,c} = F(\mathrm{P})$

2. If a is a name, $[\![a]\!]_{M,c} = F(\mathrm{a})$

3. If v is a variable, $[\![v]\!]_{M,c} = g_c(v)$

4. If $\tau_1, ..., \tau_n$ are terms (variables or names) and $\mathrm{P^n}$ is a predicate,
   $[\![\mathrm{P}^n(\tau_1, ..., \tau_n)]\!]_{M,c} = [\![P^n]\!]_{M,c}([\![\tau_1]\!]_{M,c}, ..., [\![\tau_n]\!]_{M,c})$

5. $[\![\lambda v\varphi]\!]_{M,c} = $ the function h such that for any $a \in U \cup T$, $h(a) = 1$ if and only if $[\![\varphi]\!]_{M,c'} = 1$, where $c' = \langle \mathbf{c_T}, g_{c'} \rangle$ and $g_{c'}$ is just like g_c except that $g_{c'}(v) = a$

Truth in context is defined in the following way:

(T)   An LF φ uttered in c is true in M if and only if $[\![\varphi]\!]_{M,c} = 1$
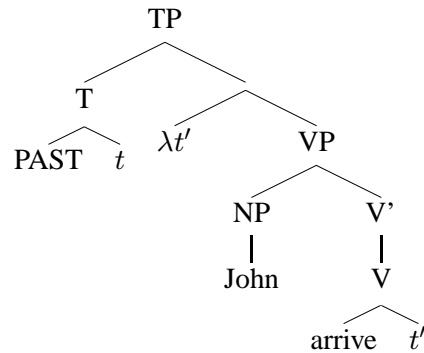
English tenses and time adverbs   Following Heim, I'll assume that

- at LF Verbs project a time variable (which will play a role similar to Reichenbach's event time);

- the time variable projected by the verb is λ-abstracted over if needed for interpretation purposes;

- tenses also project a time variable at LF (which will play a role similar to Reichenbach's speech time).

A standard assumption is that the subject of a sentence is moved from a VP-internal position, where it is theta-marked, to Spec,TP, where it receives case. Following von Stechow (1999), I assume that, at LF, lexical material is reconstructed in the position where it is interpreted. The LF structure for English sentence (34) is given in (35) (ignoring aspect and the empty Spec,TP position):

(34)   John arrived

(35)

```
                        TP
               ┌─────────┴─────────┐
               T                   
          ┌────┴────┐   λt′        VP
        PAST   t          ┌────────┴────────┐
                         NP                V'
                          │                 │
                        John               V
                                      ┌─────┴─────┐
                                   arrive        t′
```

The meaning of PAST assumed by Heim is given in (36):

(36)   PAST $\Rightarrow$ $\lambda t \lambda P \exists t'[t' < t \land P(t')]$

The truth-conditions associated with LF (35) are computed thus:

(37)   a. $\lambda t'$ VP $\Rightarrow$ $\lambda t' arrive(t', John)$
        b. T $\Rightarrow$ $\lambda P \exists t'[t' < t \land P(t')]$
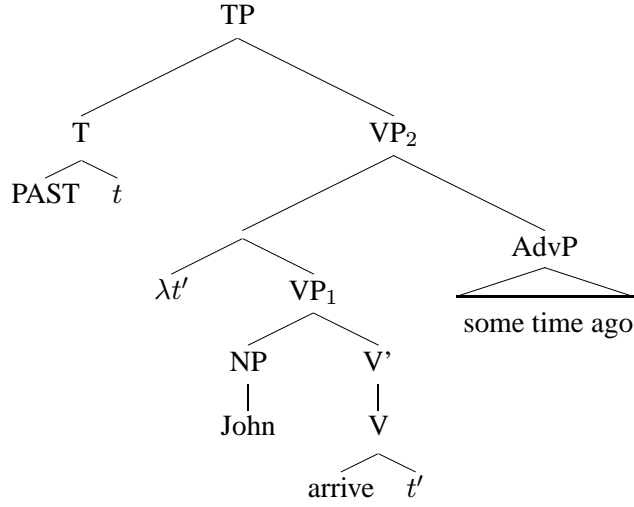   c. TP $\Rightarrow$ $\exists t'[t' < t \land arrive(t', John)]$

Given the assumption that free time variables denote the time of utterance, the formula expressing the meaning of the TP node in (37)c is true if and only if John arrives before the time of utterance.

The time adverb "some time ago" in sentence (38) below specifies the event time. In Heim's system, this means that this time adverb is a VP-modifier that imposes a further condition on the value of the time variable projected by the VP.

(38)   John arrived some time ago

The LF corresponding to (38) is given in (39):

(39)

```
                          TP
                         /  \
                        /    \
                       T      VP₂
                      / \     /  \
                   PAST  t   /    \
                            /      \
                          λt'  VP₁   AdvP
                              /  \    / \
                            NP   V'  some time ago
                            |    |
                          John   V
                                / \
                            arrive t'
```

Let's assume that the interpretation of the "some time ago" is specified as follows:[16]

(40)   some time ago $\Rightarrow$ $\lambda P \lambda t \exists t'[t \subseteq t' \land t' < c_T \land P(t)]$

The truth-conditions of LF (39) are computed thus:

(41)   a. $\lambda t'$ VP₁ $\Rightarrow$ $\lambda t' arrive(t', John)$
        b.   VP₂ $\Rightarrow$ $\lambda t \exists t'[t \subseteq t' \land t' < c_T \land arrive(t, John)]$
        c.   TP $\Rightarrow$ $\exists t''[t'' < t \land \exists t'[t'' \subseteq t' \land t' < c_T \land arrive(t'', John)]]$

This correctly predicts that (38) is true if and only if John arrives some time before the utterance time.

5.2   Deriving the LIS facts

The structure of the LIS sentence   We are now ready to show how the LIS facts concerning the behavior of tenses and time adverbs may be derived. The variety of Italian Sign Language I'm investigating bears the marks of a head final language: its signers consistently use the SOV order in the sentence, negation and modals follow the verb. In LIS, *wh*-elements are usually found at the right periphery of the

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[16]Here, I am departing from Heim slightly. In her system, time adverbs project a time argument at LF, which gets identified with the time argument of the VP. After the time adverb has been combined with the VP, this time argument is still free, it gets λ-abstracted over for compositional purposes when T is combined with the higher VP. In (40), I assume that the result of combining the time adverb with the VP yields a property of times (a λ-expression) directly. I'll come back to the reason for this modification in footnote 18.

sentence. Following Cecchetto, Geraci and Zucchi (2005), I assume this structure for the LIS sentence:[17]
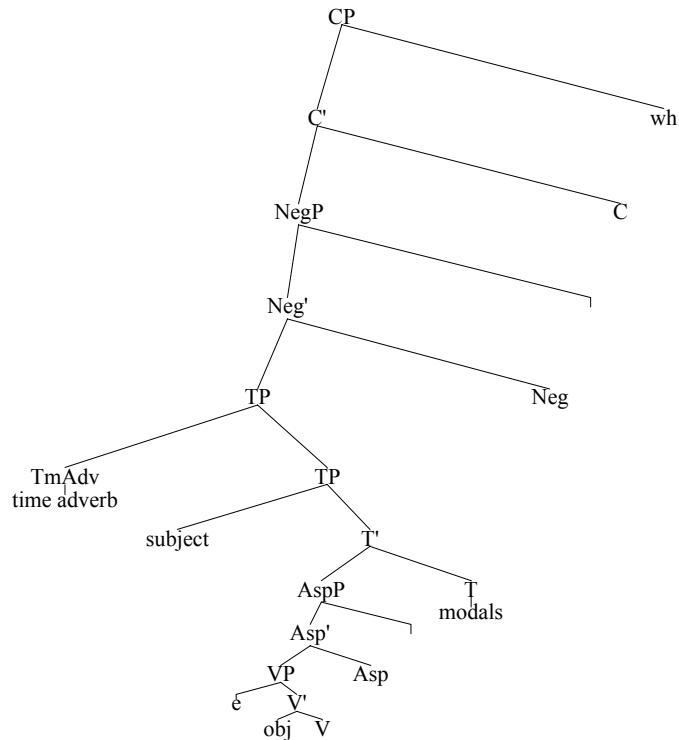
Given our assumptions about the time arguments projected by tenses and verbs, we get an LF structure of this sort for the LIS TP (again, the subject is reconstructed in its VP-internal position; moreover, I'm ignoring aspect and empty spec positions):

(42)

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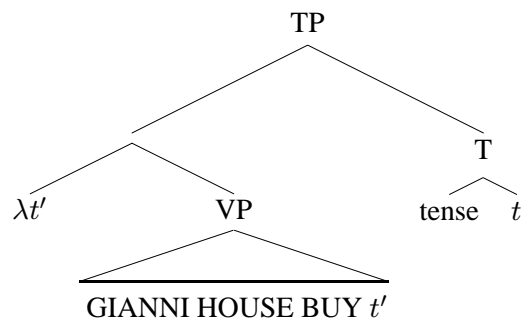
[17]I use the label TP where Cecchetto et al. (2005) use the label IP. I ignore the issue concerning the existence of an autonomous functional projection of agreement.

LIS sentences with past and future time adverbs Now, let's see how the interpretation of LIS sentences with past and future time adverbs is computed. Consider sentences (2)- (3) again:

(2)   TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
       "Some time ago Gianni bought a house"

(3)   TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$
       "Tomorrow Gianni will buy a house"

Recall my claim that in LIS past and future time adverbs specify the speech time. In the system we are adopting, this amounts to assuming that these adverbs have scope over tense and bind the time argument introduced by tense. Given our previous assumptions, this means that the LF corresponding to (2) is (43):

(43)
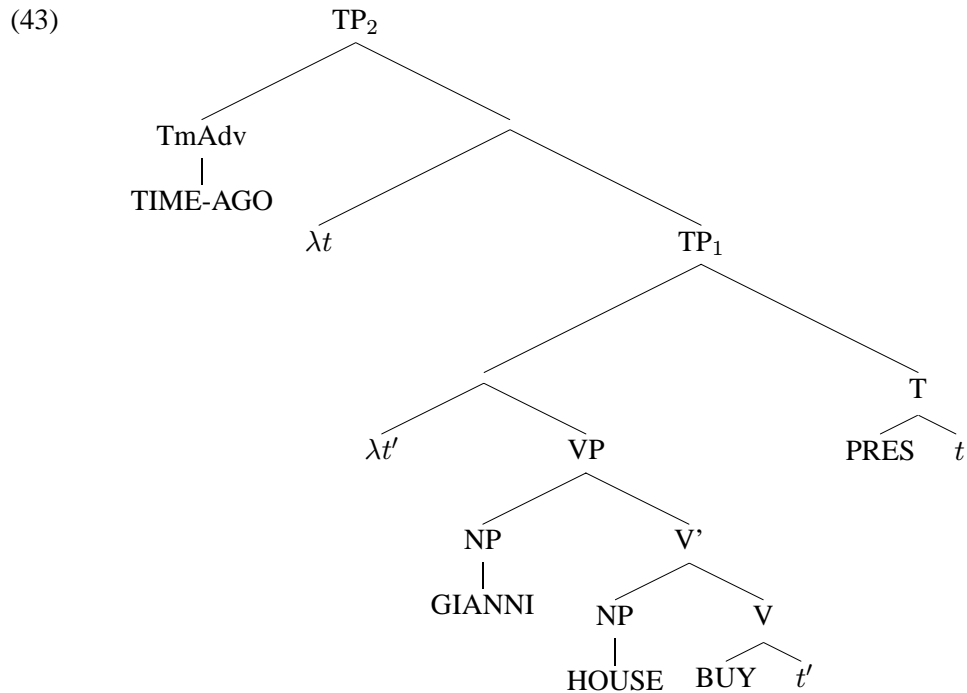
LIS adverb *TIME-AGO* and LIS present tense are interpreted as follows:

(44) $\text{TIME} - \text{AGO} \Rightarrow \lambda P \lambda t \exists t'[t \subseteq t' \;\wedge\; t' < c_T \;\wedge\; P(t)]$

(45) $\text{PRES} \Rightarrow \lambda t \lambda P \exists t'[t' = t \;\wedge\; P(t')]$

Assuming that arguments that are not saturated by the end of the derivation are existentially quantified over, we can compute the truth-conditions of LF (43) in this way:[18]

(46) a. $\lambda t'$ VP $\Rightarrow \lambda t' \exists x \, [house(x) \, \wedge \, buy(t', x, John)]$
      b. T $\Rightarrow \lambda P \exists t'[t' = t \wedge P(t')]$
      c. $TP_1 \Rightarrow \exists t'[t' = t \, \wedge \, \exists x \, [house(x) \, \wedge \, buy(t', x, John)]]$
      d. $TP_2 \Rightarrow \lambda t \exists t''[t \subseteq t'' \, \wedge \, t'' < c_T \, \wedge \, \exists t'[t' = t \, \wedge \, \exists x \, [house(x) \, \wedge \, buy(t', x, John)]]]$
      e. $TP_2 \Rightarrow \exists t \exists t''[t \subseteq t'' \, \wedge \, t'' < c_T \, \wedge \, \exists t'[t' = t \, \wedge \, \exists x \, [house(x) \, \wedge \, buy(t', x, John)]]]$

The final interpretation of the TP correctly predicts that (43) is true if and only if Gianni buys a house some time before the utterance time. The interpretation of the LIS sentence with the future time adverb in (3) is derived in a similar way.

LIS sentences with past and future tenses   Now, let's see how the interpretations of (5)-(6) are derived:

(5)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$
         "Gianni bought a house"

(6)   GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$
         "Gianni will buy a house"

LIS past and future tenses are represented at LF by the functors $PAST_{abs}$ and FUT_{abs} in T. Their interpretations are specified in this way:
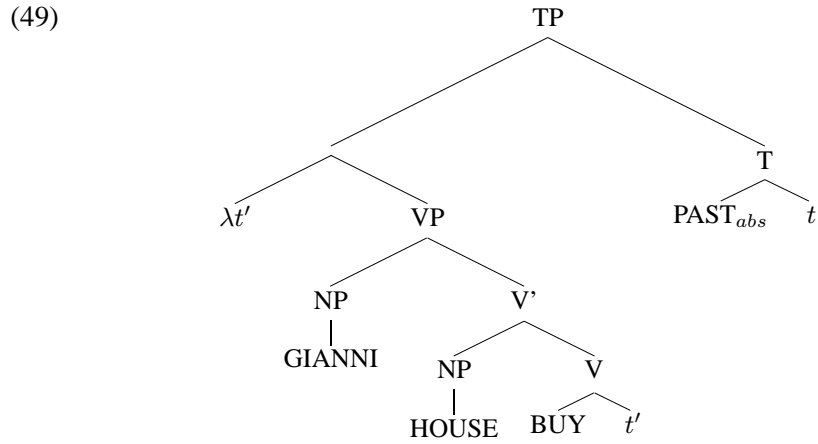
(47) $PAST_{abs} \Rightarrow \lambda t \lambda P \exists t'[t' < t \, \wedge \, t = c_T \, \wedge \, P(t')]$

(48) $FUT_{abs} \Rightarrow \lambda t \lambda P \exists t'[t' > t \, \wedge \, t = c_T \, \wedge \, P(t')]$

The condition $t = c_T$ amounts to anchoring the time variable introduced by these tenses to the time of utterance (in this sense, $PAST_{abs}$ and FUT_{abs} are *absolute*

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[18]The interpretation of the time adverb I adopt yields a λ-expression in step (46-d) of the derivation, which causes the time variable introduced by tense (and further specified by the time adverb) to be existentially quantified, as this time argument is not saturated. If we adopted Heim's treatment of time adverbs, this time variable would remain free, thus yielding a contradictory interpretation, since the time variable introduced by tense would have to denote a time identical to the time of utterance and included in an interval that precedes the time of utterance. Heim's treatment could be made compatible with my analysis if we assume that the option of λ-abstracting over an argument is available not only for the purposes of the semantic composition, but also when the composition yields an anomalous interpretation.

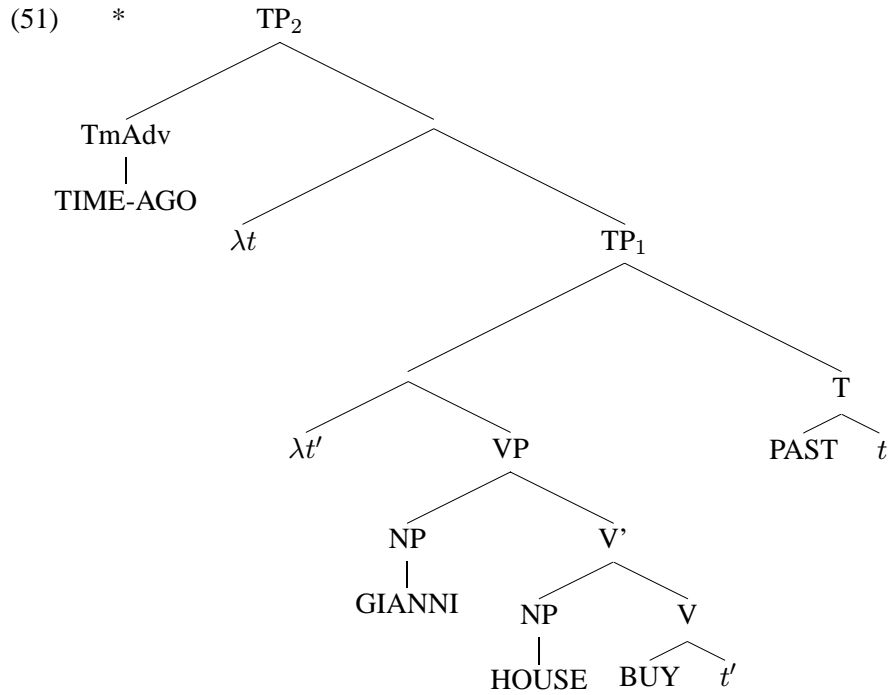tenses). The LF corresponding to (5) is the following:

(49)

```
                              TP
                 ┌─────────────┴──────────┐
                 │                         T
           ┌─────┴─────┐              ┌────┴────┐
          λt'          VP          PAST_abs    t
                   ┌────┴────┐
                  NP         V'
                  │      ┌───┴───┐
                GIANNI  NP       V
                        │     ┌──┴──┐
                     HOUSE  BUY    t'
```

Its truth-conditions are computed thus:

(50)   a. $\lambda t'$ VP $\Rightarrow \lambda t' \exists x\, [house(x) \ \wedge\ buy(t', x, John)]$
       b.   T $\Rightarrow \lambda P \exists t'[t' < t \wedge\ t = c_T\ \wedge\ P(t')]$
       c.   TP $\Rightarrow \exists t'[t' < t\ \wedge\ t = c_T\ \wedge\ \exists x\, [house(x)\ \wedge\ buy(t', x, John)]]$

Ruling out the bad guys   Finally, we may show how the anomaly of (10) is derived:

(10)   *TIME-AGO GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

The LF corresponding to (10) is this:

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(51)　*　TP$_2$

TmAdv
TIME-AGO

λt　　TP$_1$

$\lambda t'$　VP　　PAST　t

NP　V'

GIANNI　NP　V

HOUSE　BUY　t'

Its truth-conditions are computed thus:

(52)　a.　$\lambda t'$ VP $\Rightarrow \lambda t' \exists x\,[house(x) \wedge buy(t', x, John)]$

　　b.　T $\Rightarrow \lambda P \exists t'[t' < t \wedge t = c_T \wedge P(t')]$

　　c.　TP$_1 \Rightarrow \exists t'[t' < t \wedge t = c_T \wedge \exists x\,[house(x) \wedge buy(t', x, John)]]$

　　d.　TIME-AGO $\Rightarrow \lambda P \lambda t \exists t'[t \subseteq t' \wedge t' < c_T \wedge P(t)]$

　　e.　TP$_2 \Rightarrow \lambda t \exists t''[t \subseteq t'' \wedge t'' < c_T \wedge \exists t'[t' < t \wedge t = c_T \wedge \exists x\,[house(x) \wedge buy(t', x, John)]]]$

　　f.　TP$_2 \Rightarrow \exists t \exists t''[t \subseteq t'' \wedge t'' < c_T \wedge \exists t'[t' < t \wedge t = c_T \wedge \exists x\,[house(x) \wedge buy(t', x, John)]]]$

In (52-f), time t is required to be both identical to c_T and included in a time preceding c_T, a requirement clearly impossible to satisfy. Thus, LIS sentence (10) is correctly predicted to be anomalous. LIS sentence (11) is ruled out for similar reasons:

(11)　　　*TOMORROW GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

In this case, the time t is required to be both identical to c_T and included in the day after c_T, again a requirement impossible to satisfy.

6 Probing the analysis

Relative anteriority in LIS   Now that I have spelled out in detail my account of the interaction of tenses and time adverbs in LIS, let's probe this account further by considering other relevant data. According to my proposal, LIS sentences with past time adverbs and suprasegmental past tense are anomalous because this tense is absolute. Being an absolute tense, it requires that the time argument it projects (the speech time) denote an interval identical to the time of utterance, and this requirement is in conflict with the requirement imposed by past time adverbs that this interval be in the past.

If this account is correct, a natural prediction is this: if anteriority were expressed by means of a relative tense, then we should expect no trouble at all with past time adverbs. I'll argue that this is what happens in LIS sentence (53):

(53)   YESTERDAY AT-3 GIANNI EAT DONE

(54)   *YESTERDAY AT-3 GIANNI $\overline{\text{EAT}}^{\text{past}}$

Sentence (53), unlike (54), is acceptable in LIS, and it means that yesterday at 3 Gianni had already eaten.[19]   So, in (53) DONE expresses anteriority relative to yesterday at 3, as we might expect if the anteriority were expressed by a relative tense. But which kind of relative tense is involved in (53)? How should this tense be analyzed? Before I try to answer this question, let me say something more about the nature of this sign I glossed with DONE.

Grammatical use of lexically contentful elements   In (7) DONE occurs after the verb with the grammatical function of indicating that the action performed by the verb was finished before the time of utterance:

(7)   GIANNI HOUSE BUY DONE

But the same sign also occurs as a main verb with the meaning of "finish":

(55)   DONE?
            "Have you finished?"

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[19]Some LIS signers also use (53) with the meaning that Gianni ate yesterday at 3. According to my informants this is not correct, but they acknowledge its occurrence in colloquial signing. Possibly, this occurrence is due to the fact that some LIS signers reanalyze DONE simply as an aspectual marker indicating culmination, with no anteriority meaning at all. For the purpose of my discussion, I'll ignore this use of DONE.

When it occurs as a main verb, but not otherwise, it can appear in preverbal position:

(56)   GIANNI CAKE DONE EAT
         "Gianni has finished eating the cake"

The use of lexically contentful elements like DONE to perform grammatical functions is also common in other sign languages and it is frequently attested in spoken languages like pidgins and Creoles. For example, the sign glossed as FINISH in ASL, investigated by Fischer and Gough (1999), seems to be related to LIS DONE (at least in some of its uses):

(57)   YOU EAT FINISH (ASL)
         "you have eaten"

And the Israeli Sign Language sign glossed by Meir (1999) as ALREADY seems to play the same role as DONE:

(58)   I ALREADY EAT (ISL)
         "I have eaten."

Moreover, the following Creole and pidgin examples from Sebba (1997) show items similar to DONE, namely items born as lexically contentful elements with the meaning of "finish" or "done", which are used as functional markers of anteriority:

(59)   mo fin   mahze   (Mauritian Creole)
         I   finish eat
         "I ate"

(60)   mi waka kba   (Sranan Tongo)
         I   walk finish
         "I had walked"

(61)   mipela i   ting olsem i   mas dai pinis   (Tok Pisin)
         we   him think anyhow him must die finish
         "We think he must have died"

(62)   a don kom   (Pidgin of Western Africa)
         I done come
         "I have come"

Two accounts of DONE   Let's now come back to the use of DONE to indicate temporal anteriority in (53):

(53)   YESTERDAY AT-3 GIANNI EAT DONE

There are two possible ways of accounting for this use of DONE. One possibility is that DONE in (53) is located in TP and is simply a relative past tense, a past tense that may express anteriority relative to the time indicated by the adverb. The other possibility is that DONE in (53) is located lower than TP: it is in the scope of present tense (the shoulder is straight while (53) is signed) and it expresses anteriority relative to the time indicated by the adverb. According to the latter option, GIANNI EAT DONE is similar to Italian *passato prossimo* sentences like (63) below, where the tense is present, but something else in the sentence (presumably, below tense) conveys anteriority meaning. For this reason, I'll refer this option as "the *passato prossimo* analysis" of DONE.

(63)   Gianni ha mangiato.
            "John has eaten"

I'll argue that the *passato prossimo* analysis is the correct one. In order to do that, however, I have to be more explicit on how the two options (the relative past tense analysis and the *passato prossimo* analysis) are implemented.

If the sentence in the scope of the adverb in (53) is the equivalent of Italian (63), (53) should be assigned LF (64) below, where the tense is present and DONE is located in a projection intermediate between TP and VP.[20] I assume that DONE projects its own time argument:

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[20]Here, I choose to locate DONE in AspP, but other intermediate projections, like von Stechow's (1999) PerfP, would do as well.

(64)

TP₂
- YESTERDAY AT-3
- λt
- TP₁
  - λt″
  - AspP
    - λt′
    - VP
      - NP — GIANNI
      - V'
        - V — EAT t'
    - Asp — DONE t''
  - T — PRES t
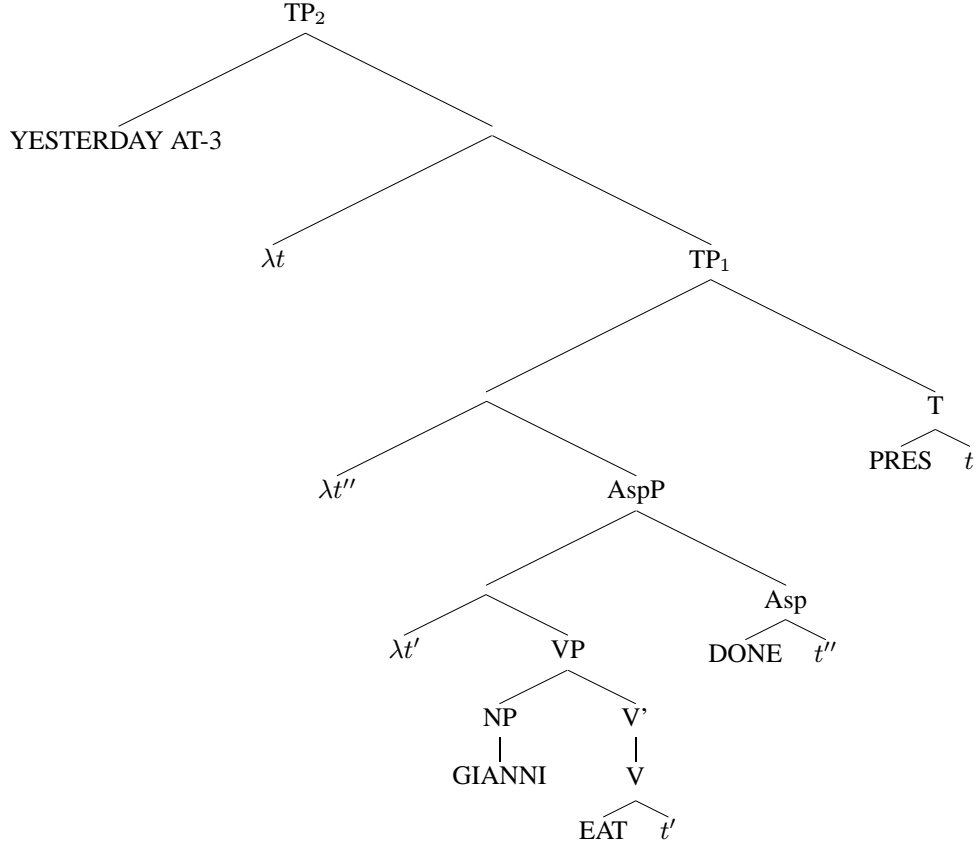
The interpretations of DONE and of the time adverb YESTERDAY AT-3 are specified in this way:

(65)   DONE $\Rightarrow \lambda t \lambda P \exists t'[t' < t \wedge P(t')]$

(66)   YESTERDAY AT$-3 \Rightarrow \lambda P \lambda t[\textit{t is 3pm in the day before } c_T \wedge P(t)]$

The truth-conditions of (64) are now computed thus:

(67)   a. $\lambda t'$ VP $\Rightarrow \lambda t' eat(t', Gianni)$

        b.   Asp $\Rightarrow \lambda P \exists t'[t' < t'' \wedge P(t')]$

        c.   AspP $\Rightarrow \exists t'[t' < t'' \wedge eat(t', Gianni)]$

        d. $\lambda t''$ AspP $\Rightarrow \lambda t'' \exists t'[t' < t'' \wedge eat(t', Gianni)]$

        e.   T $\Rightarrow \lambda P \exists t'''[t''' = t \wedge P(t''')]$

        f.   TP₁ $\Rightarrow \exists t'''[t''' = t \wedge \exists t'[t' < t''' \wedge eat(t', Gianni)]]$

        g. λt TP₁ $\Rightarrow \lambda t \exists t'''[t''' = t \wedge \exists t'[t' < t''' \wedge eat(t', Gianni)]]$

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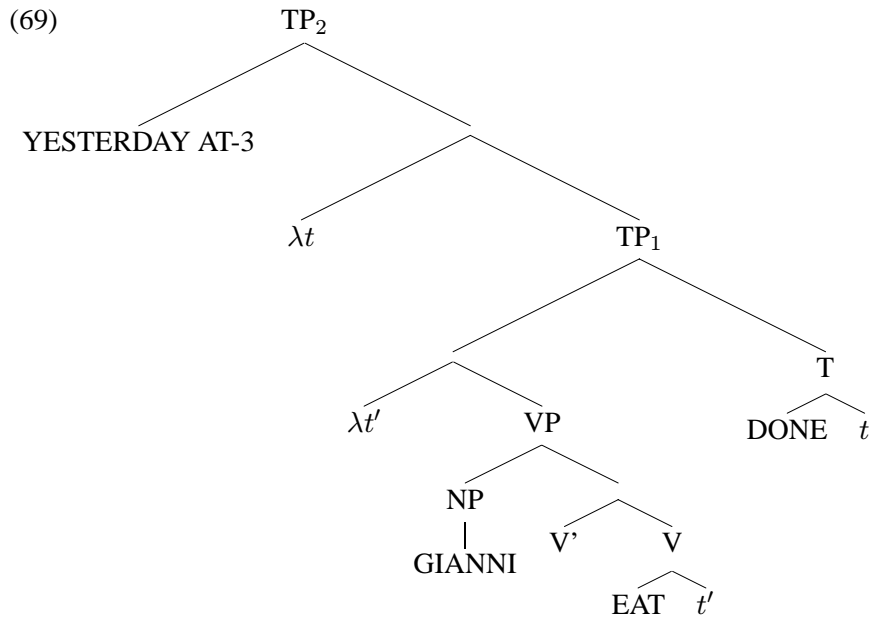h. $\text{TP}_2 \Rightarrow \exists t^*[t^* \text{ is 3pm in the day before } c_T \wedge \exists t'''[t''' = t^* \\ \wedge \exists t'[t' < t''' \wedge eat(t', Gianni)]]]$

As $t^* = t'''$, the formula conveying the meaning of TP_2 is equivalent to (68):

(68) $\exists t^*[t^* \text{is 3pm in the day before } c_T \wedge \exists t'[t' < t^* \wedge eat(t', Gianni)]]$

This correctly predicts that (53) is true if and only if yesterday at 3 pm Gianni had already eaten.

Now, let's turn to the relative past tense analysis. According to this analysis, the LF corresponding to (53) is this:

(69)

The meaning assignments for DONE and the time adverb YESTERDAY AT-3 are the same as before. The truth-conditions of (69) are computed in this way:

(70)   a. $\lambda t' \text{ VP} \Rightarrow \lambda t' eat(t', Gianni)$
        b. $\text{T} \Rightarrow \lambda P \exists t'[t' < t \wedge P(t')]$
        c. $\text{TP}_1 \Rightarrow \exists t'[t' < t \wedge eat(t', Gianni)]$
        d. $\text{TP}_2 \Rightarrow \exists t^*[t^* \text{ is 3pm in the day before } c_T \wedge \exists t'[t' < t^* \\ \wedge eat(t', Gianni)]]$

The formula conveying the meaning of TP_2 in LF (69) is identical to formula (68) assigned to (53) by the *passato prossimo* analysis, and (53) is again correctly predicted to be true if and only if yesterday at 3 Gianni had already eaten.

Thus, both analyses of DONE make correct predictions about the interpretation of (53). Yet, there are other cases in which the two analyses part ways and the *passato prossimo* analysis seems to fare better. This is what I'll show next.

An argument for the *passato prossimo* analysis of DONE We start by looking at the behavior of LIS adverb *NOW*. This adverb is compatible with DONE but not with past tense inflection (shoulder backwards), as (71)-(72) show:

(71)   NOW COFFEE-DRINK DONE
        "I have drunk the coffee now"

(72)   *NOW COFFEE-$\overline{\text{DRINK}}^{\text{past}}$

Let's assume that NOW has the function of anchoring the interval it specifies to the time of utterance. Its meaning assignment is given in (73):

(73) $NOW \Rightarrow \lambda P \lambda t[t = c_T \ \wedge \ P(t)]$

But which time interval should NOW specify? It should not specify the event time in (71) (the interval corresponding to the time argument of the verb), since the event of drinking the coffee in (71) is claimed to occur at a time preceding now. This rules out the option of treating NOW as a VP modifier. But NOW cannot be regarded as a speech time specifier either, since this would predict that (72) should be perfectly acceptable. Indeed, recall that speech time specifiers in the semantics I'm adopting have scope over tense. This means that, if NOW were a speech time specifier, the LF corresponding to (72) should be (74):

(74) *
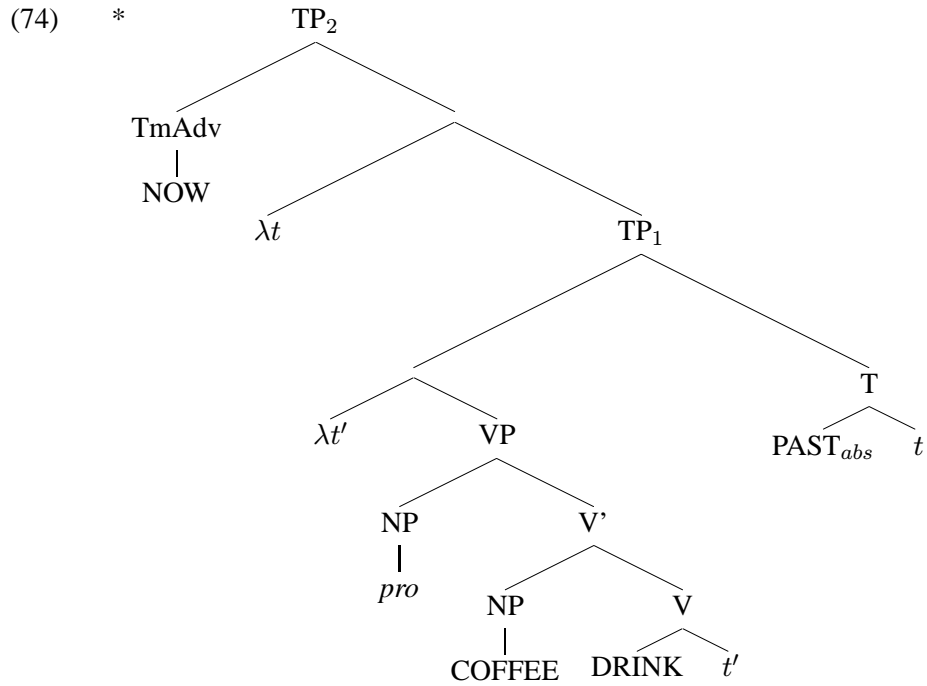
But LF (74) has a perfectly good interpretation. As the last step of the derivation in (75-f) shows, (74) is predicted to be true just in case I drink my coffee some time before now:

(75) a. $\lambda t'$ VP $\Rightarrow \lambda t' \exists x \, [coffee(x) \, \wedge \, drink(t', x, I)]$

  b. T $\Rightarrow \lambda P \exists t'[t' < t \, \wedge \, t = c_T \, \wedge \, P(t')]$

  c. TP$_1 \Rightarrow \exists t'[t' < t \, \wedge \, t = c_T \, \wedge \, \exists x \, [coffee(x) \, \wedge \, drink(t', x, I)]]$

  d. NOW $\Rightarrow \lambda P \lambda t[t = c_T \, \wedge \, P(t)]$

  e. TP$_2 \Rightarrow \lambda t[t = c_T \, \wedge \, \exists t'[t' < t \, \wedge \, t = c_T \, \wedge \, \exists x \, [coffee(x) \, \wedge \, drink(t', x, I)]]]$

  f. TP$_2 \Rightarrow \exists t[t = c_T \, \wedge \, \exists t'[t' < t \, \wedge \, t = c_T \, \wedge \, \exists x \, [coffee(x) \, \wedge \, drink(t', x, I)]]]$

So, NOW in (71) is neither an event time specifier nor a speech time specifier. Where should it be located at LF then? Let's come back to the *passato prossimo* analysis of DONE. According to this analysis, as we saw, DONE is located in the scope of present tense in a projection intermediate between TP and VP (AspP). Let's suppose that NOW has intermediate scope between tense and DONE. This amounts to assuming the following LF for (71):
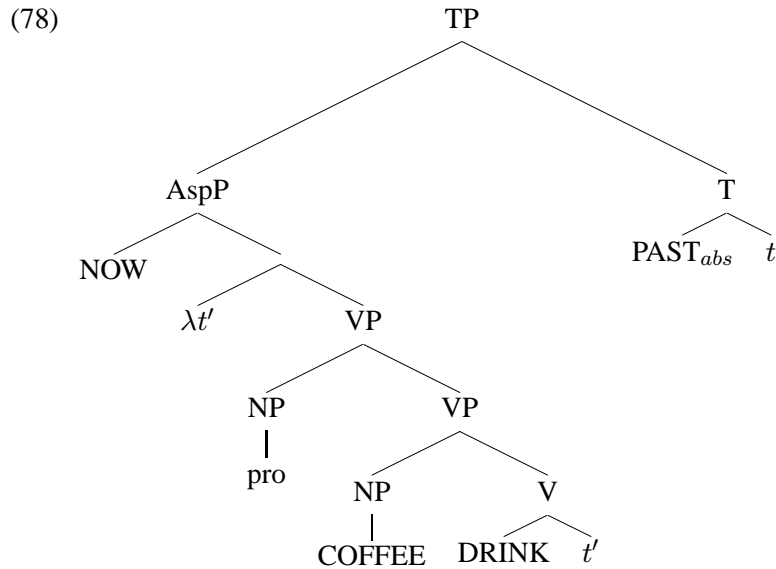
(76)
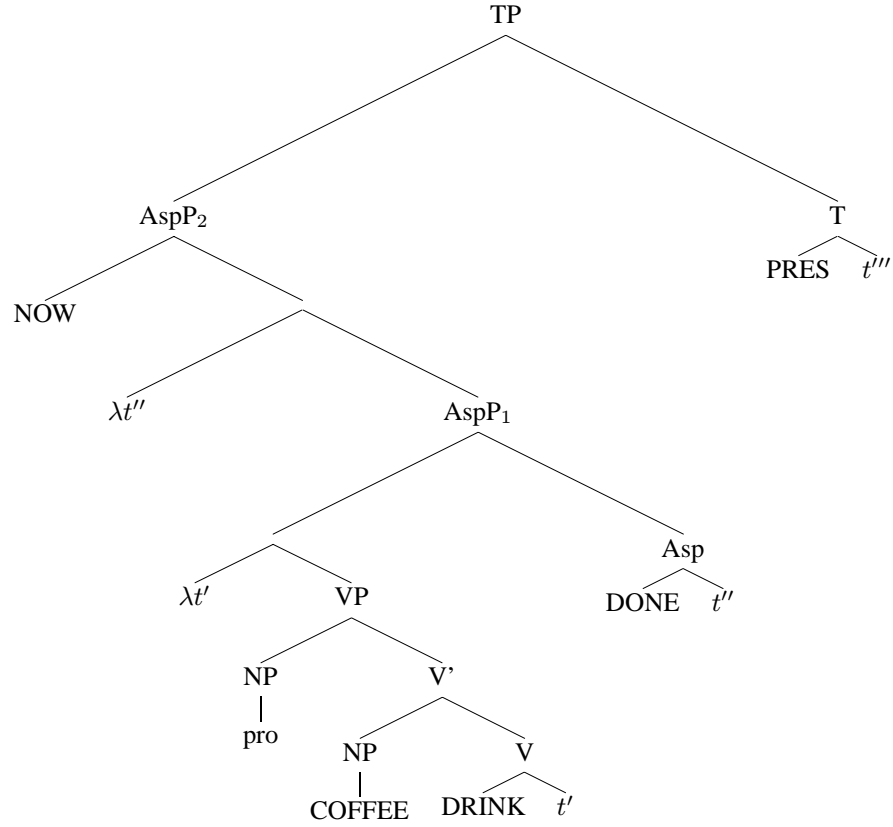
The truth-conditions of LF (76) are computed in (77):

(77) a. $\lambda t'\ \text{VP} \Rightarrow \lambda t' \exists x[coffee(x)\ \wedge\ drink(t', x, I)]$
      b. $\text{Asp} \Rightarrow \lambda P \exists t[t < t''\ \wedge\ P(t)]$
      c. $\text{AspP}_1 \Rightarrow \exists t[t < t''\ \wedge\ \exists x[coffee(x)\ \wedge\ drink(t, x, I)]]$
      d. $\text{AspP}_2 \Rightarrow \lambda t'[t' = c_T\ \wedge\ \exists t[t < t' \wedge \exists x[coffee(x)\ \wedge$
          $drink(t, x, I)]]]$
      e. $\text{T} \Rightarrow \lambda P \exists t^*[t^* = t'''\ \wedge\ P(t^*)]$
      f. $\text{TP} \Rightarrow \exists t^*[t^* = t'''\ \wedge\ t^* = c_T\ \wedge\ \exists t[t < t^*\ \wedge\ \exists x[coffee(x)\ \wedge$
          $drink(t, x, I)]]]$

This means that (71) is correctly predicted to be true if and only if Gianni drinks the coffee before now.

Now, let's see what happens with (72), given the assumption that DONE is located below tense in AspP. In this case, the LF corresponding to (72) is the following:

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(72)   *NOW COFFEE-$\overline{\text{DRINK}}^{\text{past}}$

(78)

```
                                   TP
                          _____/  _____
                         /                    \
                      AspP                      T
                   ___/  \___               __/ \__
                  /          \             /       \
                NOW           \        PAST_abs      t
                          ___/  \___
                         /          \
                       λt'          VP
                                 __/  \__
                                /        \
                              NP          VP
                              |        __/  \__
                             pro      /        \
                                    NP          V
                                    |         _/ \_
                                 COFFEE    DRINK   t'
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The truth-conditions of (78) are computed in (79):

(79)   a. $\lambda t'$ VP $\Rightarrow \lambda t' \exists x [coffee(x) \wedge drink(t', x, I)]$
       b.   AspP $\Rightarrow \lambda t' [t' = c_T \wedge \exists x [coffee(x) \wedge drink(t', x, I)]]$
       c.   TP $\Rightarrow \exists t' [t' < t \wedge t = c_T \wedge t' = c_T \wedge \exists x [coffee(x) \wedge drink(t', x, I)]]$

As it is clear from the last step of the derivation in (79-c), in this case we end up imposing incompatible requirements on t', since t' is required to precede now and to be identical to now. Thus, the *passato prossimo* analysis correctly predicts the contrast in (71)-(72) under the assumption that NOW at LF is in the scope of tense and has scope over DONE.

Now, let's see what would happen if DONE were a relative past tense in T. Under this analysis, we still have to assume that NOW is in the scope of tense. If it were not, as we saw, we should expect (72) to be acceptable and to mean that John drinks the coffee before now, a reading that (72) lacks. Thus, under the relative past tense analysis, the LF corresponding to (71) is presumably the following:

(80)
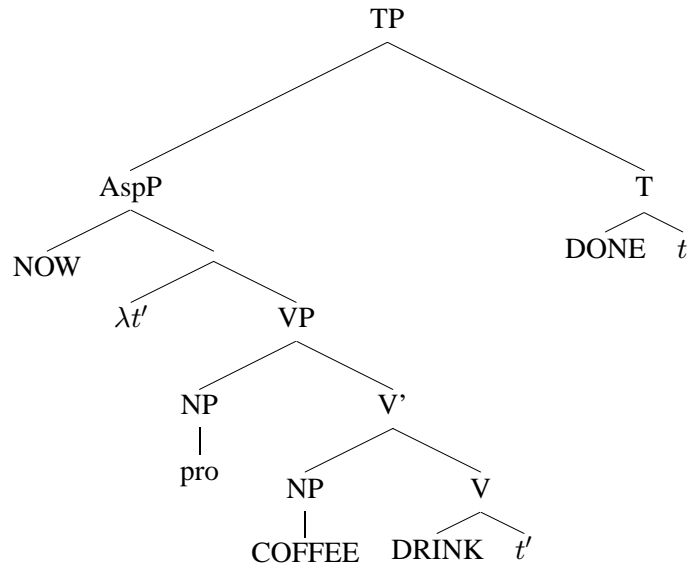
The truth-conditions of LF (80) are computed in (81):

(81) a. $\lambda t'\ \text{VP} \Rightarrow \lambda t'\exists x[coffee(x)\ \wedge\ drink(t',x,I)]$
      b. $\text{AspP} \Rightarrow \lambda t'[t' = c_T\ \wedge\ \exists x[coffee(x)\ \wedge\ buy(t',x,I)]]$
      c. $\text{T} \Rightarrow \lambda P\exists t'[t' < t \wedge\ P(t')]$
      d. $\text{TP} \Rightarrow \exists t'[t' < t \wedge t' = c_T\ \wedge\ \exists x[coffee(x)\ \wedge\ drink(t',x,I)]]$

The problem with (81-d) is that it incorrectly assigns contradictory truth-conditions to (71), as the event time is both required to precede the utterance time and to be identical to the utterance time. Thus, while the *passato prossimo* analysis of DONE correctly predicts the contrast between (71) and (72), the relative past tense analysis of DONE does not.[21] I conclude that the *passato prossimo* analysis is correct.[22]

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[21]Notice, by the way, that a similar contrast has also been observed for Italian *ora* ("now") with the *passato prossimo* and the *passato remoto*, as the following sentences from Bertinetto (1991) show:

(i)   Ora ho finalmente appagato il mio desiderio
         "Now (I) have finally fulfilled my wish"

(ii)   *Ora finalmente appagai   il mio desiderio
          Now finally   fulfilled$_{pass.rem.}$ the my wish

These facts are significant, since my analysis assimilates DONE to a *passato prossimo* and past tense inflection signalled by the shoulder position to an absolute tense like *passato remoto*.

[22]Meir (1999) also argues that the ISL sign ALREADY mentioned in the previous section is a perfect marker. While the behavior of ALREADY differs from that of DONE in some respects, the properties mentioned here for DONE, namely its ability to occur with adverbs like YESTERDAY with past perfect meaning and to occur with NOW, also hold for ALREADY.

7 LIS time adverbs with past and future tenses

TODAY   So far, we have only considered LIS past and future time adverbs and NOW. But, as we anticipated in section 2, there are other LIS time adverbs that show quite a different behavior. For example, LIS adverb TODAY can co-occur with past and future tenses, as (13) shows:

(13) a. TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

      b. TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$

      c. TODAY GIANNI HOUSE $\overline{\text{BUY}}^{\text{fut}}$

In section 4, I argued that LIS adverbs like YESTERDAY, TOMORROW, etc., which cannot co-occur with past and future tenses, are speech time specifiers. Following this reasoning, there is a natural hypothesis that accounts for the behavior of TODAY in (13): this adverb is an event time specifier. Let's see what this means concretely.

First of all, since LIS time adverbs occur in sentence initial position, under the assumption that event adverbs are VP-adjoined at LF, we must suppose that TODAY originates in a VP-adjoined position and moves to a TP-adjoined position before spell out. At LF, it is reconstructed in the position where it originated.

In the semantics I'm adopting, the meaning of TODAY may be specified thus:

(82)   TODAY $\Rightarrow \lambda P \lambda t \exists t'[t \subseteq t' \ \wedge \ t' = the\ day\ including\ c_T \ \wedge \ P(t)]$

By the assumption that TODAY is an event specifier, thus a VP-adjunct, the LF corresponding to (13-a) is (83):

(83)
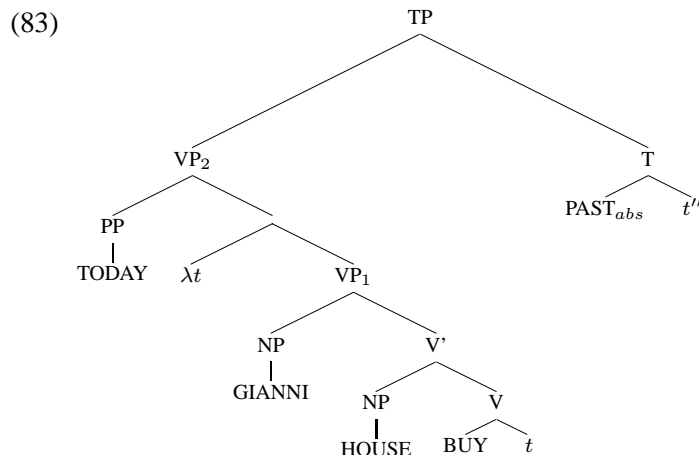
The truth-conditions of (83) are computed in the following way:

(84)   a. $\lambda t\ VP_1 \Rightarrow \lambda t \exists x[house(x) \wedge buy(t, x, Gianni)]$

        b. $VP_2 \Rightarrow \lambda t \exists t'[t \subseteq t' \wedge t' = the\ day\ including\ c_T \wedge \exists x[house(x) \wedge buy(t, x, Gianni)]]$

        c. $TP \Rightarrow \exists t[t < t'' \wedge t'' = c_T \wedge \exists t'[t \subseteq t' \wedge t' = the\ day\ including\ c_T \wedge \exists x[house(x) \wedge buy(t, x, Gianni)]]]$

This predicts correctly that (13-a) is true just in case Gianni buys a house today before the utterance time.

Adverbs like TODAY are not only acceptable with past, present and future tense inflections. They can also occur with DONE:

(85)   TODAY GIANNI HOUSE BUY DONE

Sentence (85) has the same interpretation as (13-a), namely it says that Gianni bought a house today before now. Under the analysis I assumed for DONE, (85) has the following LF:

(86)
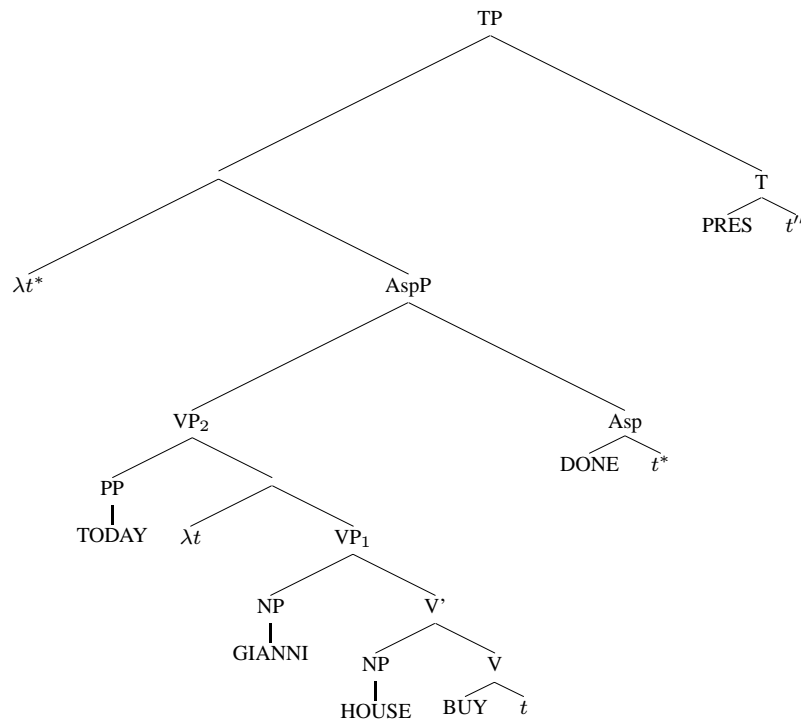
Here's how its truth-conditions are computed:

(87) a. $\lambda t\ \mathrm{VP}_1 \Rightarrow \lambda t \exists x[house(x)\ \wedge\ buy(t, x, Gianni)]$

b. $\mathrm{VP}_2 \Rightarrow \lambda t \exists t'[t \subseteq t'\ \wedge\ t' = \textit{the day including } c_T\ \wedge\ \exists x[house(x)\ \wedge\ buy(t, x, Gianni)]]$

c. $\mathrm{AspP} \Rightarrow \exists t[t < t^*\ \wedge\ \exists t'[t \subseteq t'\ \wedge\ t' = \textit{the day including } c_T\ \wedge\ \exists x[house(x)\ \wedge\ buy(t, x, Gianni)]]$

d. $\mathrm{TP} \Rightarrow \exists t'''[t''' = t''\ \wedge\ \exists t[t < t'''\ \wedge\ \exists t'[t \subseteq t'\ \wedge\ t' = \textit{the day including } c_T\ \wedge\ \exists x[house(x)\ \wedge\ buy(t, x, Gianni)]$

Given that the variable t''' in step (e) of the derivation refers to the utterance time, this derivation correctly predicts that (85) is true if and only if Gianni buys a house today before now.

The problem of dates If I am right with my plot, the typology of LIS time adverbs is quite varied. There are adverbs like YESTERDAY and TOMORROW, which are speech time specifiers, in our terms adverbs adjoined to TP at LF that have tense in their scope. Then, there are adverbs like TODAY, which can be event time specifiers, in our terms adverbs in the scope of tense and adjoined to VP at LF. Finally, there are also adverbs like NOW, that take intermediate scope between tense and VP at LF (in particular, they take scope over DONE).

On the basis of the adverbs we have considered, it seems that the class of speech time specifiers in LIS can be characterized informally in this way from a semantic point of view:

(88) In LIS, time adverbs that by their meaning can order the speech time with respect to the time of utterance ($s < c_T$ or $s > c_T$) must specify the speech time. Time adverbs that by their meaning cannot order the speech time in this way cannot specify the speech time.

Indeed, the adverb TODAY, unless it is implicitly understood as meaning today before now or today after now, cannot order the speech time relative to the time of utterance, as it leaves open the possibility that the speech time can follow, precede, or coincide with, the time of utterance. On the other hand, an adverb like YESTERDAY, as a speech time specifier, requires the speech time to precede the time of utterance.

Statement (88), however, makes it seem as if being a speech time specifier (a TP adjunct at LF) in LIS is solely determined by the meaning that the grammar assigns to the adverb. It is not so. Consider time adverbs denoting dates. In LIS, these adverbs, in some case, may require present tense inflection. Indeed, if I want to claim now (in the year 2005) that John bought a house in 1988, I can only use (89) and not (90). This means that in this context the adverb IN-1998 must be used

as a speech time specifier (a TP adjunct at LF), since it cannot co-occur with past tense inflection.

(89)   IN-1998 GIANNI HOUSE $\overline{\text{BUY}}^{\text{pres}}$

(90)   IN-1988 GIANNI HOUSE $\overline{\text{BUY}}^{\text{past}}$

Yet, if in November of 1988 I want to claim that John bought a house in September of the same year, I can use (90). This means that in this context IN-1988 is used as an event time specifier, since it co-occurs with past tense inflection.

What the above examples show is that, in general, being a speech time specifier (a TP adjunct at LF) is not a property assigned by the grammar of LIS to time adverbs once and for all. Speech time specification is, to some extent, a context-dependent matter in LIS. In the first context we described, where 1988 is in the past, it is only appropriate to use IN-1988 as a speech time specifier; in the second context, where 1988 includes the time of utterance, it is appropriate to use IN-1988 as an event time specifier. But how should this condition be stated in the grammar of the language?

Conditions on TP adjunction   Suppose that adverbs like YESTERDAY, TO-DAY, IN-1988 are borne as VP-adjuncts and that they are adjoined to TP before Spell-Out. Suppose, moreover, that the grammar of LIS requires these time adverbs to stay in TP at LF unless this leads to a structure whose semantic value is undefined, in which case the time adverb is reconstructed in the VP.[23]

Now, when we say that John left today, or that he left in 1988, or that he left yesterday, we often have in mind a particular set of times included in today, 1988, or yesterday. This means that the set of time intervals specified by time adverbs may be contextually restricted. LIS adverbs are no exception, they are often understood as referring to contextually determined sets of times. Let's make this assumption explicit in the translation of the adverbs. For example, the translations of YESTERDAY, TODAY, IN-1988 will be now specified as follows:

(91)   YESTERDAY $\Rightarrow \lambda P \lambda t \exists t'[t \in X_c \wedge t \subseteq t' \wedge t' = \text{ the day before } c_T \wedge P(t)]$

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[23]For the purposes of this account, it is crucial that VP-adjunction is only available when the structure's denotation is undefined, and not simply when its denotation is incoherent in some way, since adverbs like YESTERDAY cannot adjoin to VP in order to avoid generating incoherent readings.

(92)   TODAY $\Rightarrow \lambda P \lambda t \exists t'[t \in X_c \; \wedge \; t \subseteq t' \; \wedge \; t' = \textit{the day including } c_T \; \wedge$
        $P(t)]$

(93)   IN-1988 $\Rightarrow \lambda P \lambda t \exists t'[t \in X_c \; \wedge \; t \subseteq t' \; \wedge \; t' = \textit{ the year } 1988 \; \wedge \; P(t)]$

The set variable X_c in the translations denotes a contextually determined set of times. Its function is to restrict the set of times referred to by the time adverb. Intuitively, it determines which set of times included in yesterday, today, or in 1988 the participants in the conversation intend to talk about.

Now, let's assume that TP adjunction is subject to the following felicity condition (I use TmAdv' to refer to the translation of the time adverb):

(FC)   the denotation of   TP   is defined in a context c if and

                         TmAdv   TP

only if (i) or (ii) is met:

    (i)   TmAdv'$(\lambda t[t = t]) \subseteq \lambda t[t < c_T]$

    (ii) TmAdv'$(\lambda t[t = t]) \subseteq \lambda t[t > c_T]$

This felicity condition means that, for the result of TP adjunction to be defined in a context, the set of intervals in the denotation of the time adverb in that context must be either a set of intervals that precede the time of utterance or a set of intervals that follow the time of utterance. Given what we said above, this means that time adverbs like YESTERDAY, TODAY, IN-1988 must stay adjoined to TP at LF unless neither of the conditions (i)-(ii) in (FC) is met, in which case they are reconstructed in the VP.

Let's now see what predictions this proposal makes about the behavior of these adverbs. In order for YESTERDAY to meet (FC), either (94-a) or (94-b) must obtain:

(94)   a. $\lambda t \exists t'[t \in X_c \; \wedge \; t \subseteq t' \; \wedge \; t' = \textit{ the day before } c_T] \subseteq \lambda t[t < c_T]$
        b. $\lambda t \exists t'[t \in X_c \; \wedge \; t \subseteq t' \; \wedge \; t' = \textit{ the day before } c_T] \subseteq \lambda t[t > c_T]$

Condition (94-a) says that the intervals in X_c included in the day before the time of utterance must precede the time of utterance. This condition obtains no matter what the contextually provided set X_c is. Thus, YESTERDAY must stay adjoined to TP and shift the speech time to a time preceding the time of utterance. As a result, YESTERDAY cannot occur with past tense inflection.

Now, let's consider TODAY. In order for (FC) to be satisfied in the case of TODAY, either (95-a) or (95-b) must obtain:

(95)   a. $\lambda t \exists t'[t \in X_c \; \wedge \; t \subseteq t' \; \wedge \; t' = \textit{the day including } c_T] \subseteq \lambda t[t < c_T]$

b. $\lambda t \exists t'[t \in X_c \ \wedge \ t \subseteq t' \ \wedge \ t' = the \ day \ including \ c_T] \subseteq \lambda t[t > c_T]$

Condition (95-a) says that the intervals in X_c included in the day that includes the time of utterance must precede the time of utterance. Condition (95-b) says that the intervals in X_c included in the day that includes the time of utterance must follow the time of utterance. Thus, unless the contextually provided set X_c only contains intervals included in today before the time of utterance or only contains intervals included in today after the time of utterance, TODAY fails to meet (FC).[24] This means that, unless the context already makes it clear that in speaking about today we are speaking about past intervals included in today or that in speaking about today we are speaking about future intervals included in today, the adverb TODAY cannot stay adjoined to TP and specify the speech time. In this case, TODAY should be reconstructed in the VP and it should be able to co-occur with future and past tense inflections. This also predicts, what is correct, that, when TODAY is contextually understood as meaning today before now or today after now, it should occur without past or future tense inflection, as in this case it meets (FC) and it can shift the speech time.

Now, let's consider time adverbs like IN-1988. In order for this adverb to meet (FC), either (96-a) or (96-b) must obtain:

(96) a. $\lambda t \exists t'[t \in X_c \ \wedge \ t \subseteq t' \ \wedge \ t' = the \ year \ 1988] \subseteq \lambda t[t < c_T]$
b. $\lambda t \exists t'[t \in X_c \ \wedge \ t \subseteq t' \ \wedge \ t' = the \ year \ 1988] \subseteq \lambda t[t > c_T]$

Condition (96-a) says that the intervals in X_c included in 1988 must precede the time of utterance. Condition (96-b) says that the intervals in X_c included in 1988 must follow the time of utterance. When the adverb IN-1988 is used in 2005, it is used to talk about past time intervals. In this case, IN-1988 will meet (FC) and must stay adjoined to TP to modify the speech time. Thus, no past tense inflection is used. On the other hand, if the adverb IN-1988 is being used in 1988 and the context does not make it clear that we are talking about past time intervals in 1988 or future time intervals in 1988, the adverb will fail to meet (FC),[25] as the context set X_c will fail to restrict the set of intervals in 1988 to meet condition (96-a) or condition (96-b). Thus, the adverb is reconstructed in the VP and occurs with past or future tense inflection to indicate that the event occurs in 1988 before or after the utterance time.

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[24]I take it that X_c, having the function to identify the relevant set of times in today, cannot have an empty intersection with the set of times included in today. This prevents TODAY from satisfying (FC) for wrong reasons.

[25]Again, under the plausible assumption that, in non-defective contexts, the intersection of X_c with the set of intervals in 1988 is not empty.

8 Conclusions

The suprasegmental tenses of Italian Sign Language are based on a spatial metaphor: the space in front of the signer represents the future, the space behind the signer represents the past, the space in which the signer is located represents the present. This spatial metaphor is no news. Although other sign languages may lack suprasegmental tenses expressed by shoulder positions, it is common for sign languages to encode this type of spatial metaphor in the signs that refer to time; [26] and spoken languages often use spatial terms to refer to temporal notions (we say of the past that it is behind us and of the future that it lies ahead of us). Moreover, the grammar of Italian Sign Language makes it possible to manipulate this spatial metaphor by shifting the role played by the spatial region corresponding to the present: in the words of P. Amorini (one of my Deaf[27] informants), once an adverb like YESTER-DAY (or TOMORROW) has been signed at the beginning of a sentence, the space region that stood for the present now represents the past (or the future). If I'm right with my story, this isn't news either. The same role shift, present for past, is also performed in spoken languages, although by different means, with the so-called 'historical present' and, perhaps, in the interaction of tenses and time adverbs in Mam and in some Creoles.[28] The main idea I developed here is that, ultimately, this kind of temporal role shift can be reduced to variable binding and scope (not a bad point of arrival for something that started with a spatial metaphor).

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[26]The use of space to represent the time line has been reported for American Sign Language by Friedman (1975), Neidle et al. (2000), Jacobowitz and Stokoe (1988) and others (see the references cited in Neidle et al.), for British Sign Language by Brennan (1983).

[27]I follow the standard practice of using the term "Deaf" to refer to people who use sign language as their primary mean of communication and that, culturally, belong to the community that shares that language.

[28]The case of Mam is different from the one investigated here, since Mam, in addition to the ordinary past tense in (14) which cannot co-occur with past time adverbs, has a kind of past tense, the "dependent past", that can co-occur with them, as (i) below shows:

(14)   o   chin   jaw   tz'aq-a
        past 1st-abs. direct. slip-1st
        "I slipped"

(i)   in   jaw tz'aq-a eew
        -chin
        dep.past-1st-abs. direct. slip-1st yesterday
        "I slipped *yesterday*"

As England herself acknowledges, the exact nature of the conditions that license the dependent past are still unclear. So, I'll leave the case of Mam for further research.

I'll conclude by mentioning one more set of facts that are suggestive from the point of view of the account I pursue. We have seen that ASL, according to Neidle et al. (2000), has a set of lexical tense markers occurring in the TP head, which are distinguished from time adverbs. In the examples given by these authors, the time adverbs and the lexical tense markers never co-occur (except when the tense marker is part of a tag). In particular, Neidle et al. observe that in (97)-(98) below, where the time adverb is present, the tense markers are absent:

(97)   NEXT-WEEK JOHN GO NEW-YORK   (ASL)

(98)   LAST-WEEK JOHN GO NEW-YORK   (ASL)

They suggest that (97) might be a present tense sentence (a case of futurate use of the present of the kind exemplified in English by "tomorrow, I leave for England"), since in ASL present tense is unmarked, namely no lexical tense marker for the present is available on a par with FUTURE$_{tns}$ and PAST$_{tns}$. The data in (97)-(98) are strongly reminiscent of the LIS facts. They suggest that the semantic account proposed here for LIS, or at least part of it, might be of some use for other sign languages as well.

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References

Bahan, B.: 1996, *Non-Manual Realization of Agreement in American Sign Language*, PhD thesis, Boston University.

Bertinetto, P. M.: 1991, Il sintagma verbale, *in* L. Renzi and G. Salvi (eds), *Grande grammatica italiana di consultazione*, Vol. 2, il Mulino, Bologna.

Brennan, M.: 1983, Marking time in British sign language, *in* J. Kyle and B. Woll (eds), *Language in sign: International perspectives on sign language*, Croom Helm, London and Canberra.

Cecchetto, C., Geraci, C. and Zucchi, S.: 2005, Strategies of relativization in Italian Sign Language, *Natural Language and Linguistic Theory* . Forthcoming.

Chomsky, N.: 1995, *The Minimalist Program*, The MIT Press, Cambridge, Massachusetts.

Chomsky, N. and Lasnik, H.: 1977, Filters and control, *Linguistic Inquiry* **8**, 425–504.

Chomsky, N. and Lasnik, H.: 1993, The theory of principles and parameters, *in* J. Jacobs, A. von Stechow, W. Sternefeld and T. Venneman (eds), *Syntax: An International Handbook of Contemporary Research*, Walter de Gruyter, Berlin and New York. Reprinted with minor revisions in Chomsky (1995).

Comrie, B.: 1985, *Tense*, Cambridge Textbooks in Linguistics, Cambridge University Press, Cambridge.

Dowty, D.: 1982, Tenses, time adverbs and compositional semantic theory, *Linguistics and Philosophy* **5**, 23–33.

England, N. C.: 1983, *A Grammar of Mam, a Mayan Language*, Texas Linguistics Series, University of Texas Press, Austin.

Fischer, S. D.: 1978, Sign language and Creoles, *in* P. Siple (ed.), *Understanding language through sign language research*, Perspectives in Neurolinguistics and Psycholinguistics, Academic Press, New York, San Francisco, London, pp. 309–331.

Fischer, S. D. and Gough, B.: 1999, Some unfinished thoughts on FINISH, *Sign Language and Linguistics* **2**(1), 67–78. Manuscript circulating since 1972.

Friedman, L. A.: 1975, Space, time, and person reference in American Sign Language, *Language* **51**(4), 940–961.

Giorgi, A. and Pianesi, F.: 1997, Present tense, perfectivity and the anchoring conditions, *Proceedings of the IATL-97*, Bar-Ilan University, Israel.

Heim, I.: 1997, Tense in compositional semantics: introduction. Handout for the MIT seminar on Tense, Aspect and Events.

Heim, I. and Kratzer, A.: 1998, *Semantics in Generative Grammar*, Blackwell, Oxford.

Hornstein, N.: 1990, *As Time Goes By. Tense and Universal Grammar*, MIT Press, Cambridge, MA.

Jacobowitz, E. L. and Stokoe, W. C.: 1988, Signs of tense in ASL verbs, *Sign Language Studies* (60), 331–340.

Meir, I.: 1999, A perfect marker in Israeli Sign Language, *Sign language and linguistics* **2**(1), 43–62.

Neidle, C., Kegl, J., MacLaughlin, D., Bahan, B. and Lee, G. R.: 2000, *The Syntax of American Sign Language. Functional Categories and Hierarchical Structure*, The MIT Press.

Padden, C.: 1988, *Interaction of Morphology and Syntax in American Sign Language*, Outstanding Dissertations in Linguistics, Series IV, Garland Press, New York.

Pizzuto, E., Cameracanna, E., Corazza, S. and Volterra, V.: 1995, Terms for spatio-temporal relations in Italian Sign Language, *Iconicity in Language*, Current Issues in Linguistic Theory, John Benjamins Publishing Company, pp. 237–256.

Reichenbach, H.: 1947, *Elements of Symbolic Logic*, Macmillan, London, New York.

Sebba, M.: 1997, *Contact Languages*, St. Mark's Press, New York.

Vanelli, L.: 1991, La concordanza dei tempi, *in* L. Renzi and G. Salvi (eds), *Grande grammatica italiana di consultazione*, Vol. 2, il Mulino, Bologna.

von Stechow, A.: 1999, The LOT99-lectures at Postdam. Manuscript, University of Tübingen.

Zucchi, S.: 2001, Tense in fiction, *in* C. Cecchetto, G. Chierchia and M. T. Guasti (eds), *Semantic Interfaces: Reference, Anaphora and Aspect*, CSLI, pp. 320–355.

Zucchi, S.: 2005, The present mode, *in* G. Carlson and J. Pelletier (eds), *The Partee Effect*, CSLI, Stanford.

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