On tense mismatch and a morphosyntactic theory of SOT

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1. Introduction

Subjunctive tenses in Romance languages are often claimed to be anaphoric[1]. Bresnan (1972) and Bouchard (1982) claim that the subjunctive morphology indicates an 'unrealized tense'. The main evidence in favor of this claim is that subjunctive clauses do not seem to have a time reference of their own. This claim has been re-proposed several times. Comparing the indicative and the subjunctive mood in Catalan, Picallo (1985) claims that indicative clauses are autonomous in their tense marking, whereas subjunctive are not. Two pieces of evidence have been called in support of this view: (i) a subjunctive verb cannot occur in a main clause with affirmative illocutionary force, whereas an indicative verb can; (ii) the tense specification of the matrix does not affect the tense specification of the embedded verb if the embedded verb is in the indicative, but it does if the embedded verb is in the subjunctive – the tense specification of a subjunctive clause depends on the tense specification of the matrix verb – the phenomenon of Sequence of Tenses (henceforth, SOT). Picallo finally claims that the relation between the tense morphology of a subjunctive verb and the matrix verb may be compared to the relation between an antecedent and an anaphor[2]. As an 'anaphor', a subjunctive verb is claimed to take a reference from its 'antecedent', the matrix verb.

In this view, SOT, a morphological agreement relation between two tenses, is the morphological expression of tense anaphoricity. Present morphology on the matrix verb is claimed to trigger present morphology on the embedded subjunctive verb; past morphology on the matrix verb is claimed to trigger past morphology on the embedded subjunctive verb, which may be an auxiliary, depending on the aspectual values – perfective or imperfective – expressed by the embedded predicate, and the time relations between the matrix and the embedded event – anteriority, simultaneity, posteriority. In a series of article this view has been extended to other Romance languages. Raposo (1985) puts forward the same proposal analyzing data from Portuguese, Rizzi (1991) and Manzini (2000) analyzing data from Italian: subjunctive tenses are tense anaphors and they are accordingly ruled by SOT mechanisms.

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[1] The term 'anaphoric' is here employed as in Picallo (1985) and Rizzi (1991), and not as in Landau (2004). It corresponds to Landau's 'dependent' tense.

[2] The term 'anaphor' referred to subjunctive tenses will be currently employed here, although I take tha the nature of subjunctive forms as tense anaphors may be reformulated in the sense of Giorgi and Pianesi (2001): in subjunctive clauses the speech temporal coordinate is not represented; only the attitude episode coordinate is represented.

Giorgi has recently (2006) discussed some data that apparently contradict the standard view according to which a subjunctive tense morphology is a function of the superordinate tense morphology (Giorgi 2006, ex. (46)):

(1)   Il testimone crede che ieri alle 5 l'imputato fosse a casa.
        The witness believes that yesterday at 5 the defendant was.SUBJ at home.
        'The witness thinks that yesterday at 5 the defendant was at home'.

In the example above the matrix verb is present indicative, the embedded verb is imperfect subjunctive, a tense denoting a past time. This shows – Giorgi argues – that sometimes a subjunctive verb seems to have an 'autonomous' time reference, that is, a non-strict dependence on the matrix predicate.

This posits a first series of questions to the view that SOT is the expression of anaphoricity. Apparently SOT does not occur in (1). How to explain this fact? That is, how to explain that a subjunctive is anaphoric but may sometimes have an 'autonomous' time reference? (Anaphoricity is not under discussion in examples like (1), as it will be shown in the next section). And when may a subjunctive verb have an 'autonomous' time reference?

This article is an attempt to answer these questions. It is organized as follows: In section 2 I will analyze the hypothesis that subjunctive tenses may have an autonomous time reference when triggered by a time adverbial, as proposed by Giorgi (2006a). I will discuss some prediction following this hypothesis and some counterexamples to it. In section 3 I will discuss the properties of the imperfect tense, suggesting that they can explain the syntactic and semantic characters of the imperfect subjunctive in sentences like (1). In this perspective, I will claim that the stipulations that subjunctive may have an autonomous time reference and that time adverbials can trigger subjunctive morphology are not needed, and an alternative hypothesis based on the properties of the imperfect subjunctive can be worked out, which will be done in section 4. Section 5 draws the lines for a formal model of SOT, based on the minimalist notion of Agree. This model will be implemented and applied to the Italian and French paradigms of tense dependencies in section 6.
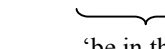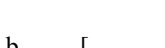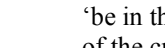
2. Subjunctive tenses and tense mismatch
2.1. Tense anaphors and temporal 'autonomy'
Subjunctive tenses have been considered tense anaphors, basically because they need an antecedent in order to be interpreted. In examples like (1) the subjunctive tense seems to be morphologically independent of the matrix clause. It can be shown however that it is an anaphor despite its morphological 'autonomy' and that examples like (1) are no exception to the hypothesis that subjunctive tenses are anaphors, despite the mismatch between the matrix and the embedded tense. To

show this, it is possible to construct an example in which the matrix predicate is future – SOT under on future predicates follows the same rules as SOT under present predicates. If the embedded verb were not anaphoric, we would expect an interpretation according to which the event referred to by the embedded clause is past with respect to 'now', the utterance time. But this is contrary to the native speaker's intuition:

(2) Il testimone penserà che alcuni giorni prima l'imputato fosse nel luogo del delitto.
The witness thinks.FUT that some days before the defendant was.SUBJ in the place of the crime
'The witness will think that some days before the defendant was in the place of the crime'.

The time adverbial 'some days before' in the embedded clause does not specify the time location with respect to the speech time. It may denote the day in which the speech act takes place ('today'), some day prior to it, or some day posterior to it., as shown by the following diagrams:

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(3)   a.   ----[------|------]-----[-------->
                    'now'        'think'
              ⏝⏝⏝⏝⏝⏝
              'be in the place
              of the crime'

      b.   ----[------------]---------|---------[-------->
              ⏝⏝⏝⏝⏝      'now'      'think'
              'be in the place
              of the crime'

      c.   ----|---------[------------]------[-------->
           'now'      ⏝⏝⏝⏝⏝⏝⏝      'think'
                      'be in the place
                      of the crime'
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The state of being in the place of the crime is not located with respect to the speech act ('now'), but only with respect to the witness' attitude. The embedded tense is then anaphoric despite its 'autonomy'. 'Autonomy' is then to be conceived in morphosyntactic, not in semantic terms.

2.2. Adverbials as SOT triggers

Let us consider the question when a subjunctive verb may have an 'autonomous' time reference. Giorgi (2006a) observes that in sentences like (1) a past time adverbial or the conversational background must provide an approriate temporal location to the embedded predicate. Without an appropriate adverbial or a conversational background providing the appropriate temporal coordinates of the embedded event, sentence (1) is ungrammatical:

(4)   *Il testimone crede che l'imputato fosse a casa.
        The witness believes that the defendant was.SUBJ at home.

If no time adverbial occurs, or if the conversational background does not provide a time framework for the embedded event, the only available morphological form on the embedded verb is the present:

(5)   Il testimone crede che l'imputato sia a casa.
        The witness believes that the defendant is.SUBJ at home.
        'The witness thinks that the defendant is at home'.

Giorgi proposes that in (5) the tense of the matrix is an adequate 'antecedent' for the embedded tense. Both matrix and embedded predicates carry present morphology. In (4) an appropriate antecedent for the embedded verb is missing. The matrix and the embedded predicate do not share the same morphological features. This gives rise to ungrammaticality.

Giorgi's proposal has important implications for a theory of SOT. Following a standard view, I assume that SOT is a mechanism of tense agreement – two tense features co-vary. Some feature must trigger the value of the subjunctive verb. The trigger may be the matrix tense or, according to Giorgi's extension, the reference of an adverbial (implicit or explicit) within the embedded clause. In sentence (1) the past time adverbial has been claimed to be able to license the imperfect morphology, which has a past time reference as well, independently from the temporal value of the main predicate.

Interestingly, however, Giorgi's hypothesis cannot be extended straightforwardly to other cases of mismatch between matrix and embedded verb morphology. For instance, a present subjunctive verb cannot occur within the clausal argument of an imperfect – hence, past – verb[3], even if a future temporal adverbial occurs within the argument clause:

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[3] On this restriction, see Giorgi and Pianesi (1998) and Higginbotham (2001).

(6)   *Il testimone credeva che entro un mese l'imputato venga processato.
        The witness thought that in a month the defendant is.SUBJ tried

Notice that present subjunctive morphology may denote a future event, since it is compatible with future-oriented time adverbials like *entro un mese*, 'in a month':

(7)   Il testimone crede che entro un mese l'imputato venga processato.
        The witness thinks that in a month the defendant is.SUBJ tried
        'The witness thinks that the defendant will be on trial in a month'.

In example (6) the future time adverbial is not able to trigger present morphology. A strict SOT rescues the sentence, as in (7), where the matrix verb is present, or as in the following example, in which the embedded verb is imperfect subjunctive[4]:

(8)   Il testimone credeva che entro un mese l'imputato venisse processato.
        The witness thought that in a month the defendant was.SUBJ tried
        'The witness thought that the defendant would be on trial in a month'.

Example (6) suggests that the tense feature on a temporal adverbial may not instantiate the morphology on the embedded verb. Only past time adverbials may instantiate subjunctive morphology – typically, the imperfect subjunctive morphology. Hence, to go back to the question "when may a subjunctive verb have an 'autonomous' time reference?", it seems that only past time adverbials may trigger past subjunctive morphology. The only instances of 'autonomous' time reference subjunctive occurs only when a subjunctive is imperfect and a past time adverbial occurs (or a past time location for the embedded event is presupposed) in the embedded clause. The hypothesis that a time adverbial can trigger the subjunctive moprhology seems then to be hardly generalizable and the question how to account for the anomalies in the SOT system remains unanswered. An alternative hypothesis may however be put forward to explain why only imperfect subjunctive morphology can apparently violate the SOT rules.

3. Imperfect
The alternative hypothesis that will be pursued here builds on the observation that the co-occurrence of a past time adverbial and the imperfect tense in the examples at issue recalls a property of the imperfect tense that has been investigated

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[4] Notice that the adverbial *entro un mese* 'in a month' is anaphoric and may denote either a past time interval or a future time interval, posterior to a given interval.

in a series of studies on the imperfect indicative: the so-called 'familiar' interpretation of the time to which reference is made by means of an imperfect tense (Bertinetto and Delfitto 1995). This interpretation of the imperfect requires the occurrence of a time adverbial, denoting the so-called 'focalization time'. If this property can be extended to the imperfect subjunctive, as it will be claimed in the next section, the proposal according to which a past time adverbial is able to trigger imperfect morphology can be abandoned in favor of a proposal that explains examples like (1) in terms of more general properties of the imperfect tense.

3.1. Imperfect indicative

Let us first consider the properties of the imperfect indicative. A series of articles has recently paid attention to the properties of the imperfect (more precisely, the imperfect indicative): its temporal and aspectual interpretations and their syntactic implications.

The imperfect has often been claimed to be an 'anaphoric' or dependent tense, in that it is unable to supply an event with an indexical anchoring (Bertinetto and Delfitto 1995, Giorgi and Pianesi 1995, 2004). This property has been supposed to explain the contrast of status between sentences in which the predicate is in the imperfect, which are generally uninterpretable if a different temporal location from the speech time – a 'focalization time' (see Bertinetto and Delfitto 1995) – is not provided by the conversational background, and sentences with an indexical tense (present, present perfect and future), which are instead perfectly interpretable even without a specified time framework, being indexical tenses able in themselves to locate an event prior, after, or in simultaneity with the speech time. The same contrast holds in English between the indexical tenses and the simple past progressive:

(9)   a. Mangio/ho mangiato/mangerò una mela.
        b. I am eating/have eaten/will eat an apple.

(10)   a. #Mangiavo una mela.
        b. #I was eating an apple

(11)   a. Ieri alle 5 mangiavo una mela.
        b. Yesterday at 5 I was eating an apple.

The above examples involve an imperfect with a progressive interpretation. This is not the only aspectual value the imperfect may have. Depending on the interval that the time adverbial denotes, it may also have a habitual reading, or an 'intention-in-the-past' reading (Cipria and Roberts 2000), also known as 'modal' reading

(Giorgi and Pianesi 2004), which conveys a past expectation towards an event to come. These different interpretations may be achieved in different ways: through the illocutionary context, through time adverbials, or through anchoring to another event.

To illustrate, while the time adverbial conveys a progressive reading in (11)a, it conveys a habitual reading in the following example, taken from Bertinetto and Delfitto (1995):

(12) L'anno scorso alle 6 Gianni beveva il tè.
Last year at 6 Gianni drank.IMPF the tea
'Last year Gianni used to drink a cup of tea at 6'.

The illocutionary context conveys an intention-in-the-past reading in the following example, taken from Giorgi and Pianesi (2004):

(13) A: Domani Domingo canterà alla Scala.
Tomorrow Domingo is going to sing at Scala
'Tomorrow Domingo is going to sing at Scala'.
B: Veramente, domani cantava Pavarotti.
Indeed, tomorrow sang.IMPF Pavarotti
'Tomorrow Pavarotti is going to sing, actually'.

Finally, the embedded event can be anchored to the time framework of the matrix event, like in the following example (from Giorgi and Pianesi 1995):

(14) Mario mi ha detto che Gianni mangiava una mela.
Mario told me that Gianni ate.IMPF an apple
'Mario told me Gianni was eating an apple'.

In sentences like (14), the embedded event is interpreted as progressive, simultaneous with respect to the matrix event ('present-in-the-past' or 'simultaneous' interpretation). A habitual time adverbial may turn the progressive interpretation into a habitual interpretation, simultaneous with respect to the matrix event:

(15) Mario mi ha detto che Gianni mangiava una mela ogni giorno.
Mario told me that Gianni ate.IMPF an apple every day
'Mario told me Gianni used to eat an apple every day'.

Given the appropriate context the 'modal' reading is available as well:

(16) A: Mario mi ha detto che domani Domingo canterà alla Scala
         Mario has said that tomorrow Domingo is going to sing at Scala
         'Mario has said that tomorrow Domingo is going to sing at Scala'.
      B: Veramente, Mario ha detto che domani cantava Pavarotti.
         Actually, Mario has said that tomorrow sang.IMPF Pavarotti
         'Mario has said that Pavarotti was going to sing tomorrow, actually'.

In embedded contexts adverbial modification may 'shift' the embedded event in a time interval prior the matrix event time. The aspectual interpretation of the embedded imperfect may be progressive ((17)a) or habitual ((17)b):

(17) a. Mario mi ha detto che ieri alle 5 Gianni beveva il tè.
         Mario me has told that yestersay at 5 Gianni drank.IMPF the tea
         'Mario told me that yesterday at 5 Gianni was having a cup of tea'

      b. Mario mi ha detto che l'anno scorso alle 5 Gianni beveva il tè.
         Mario me has told that last year at 5 Gianni drank.IMPF the tea
         'Mario told me that last year at 5 Gianni used to have a cup of tea'.

The above examples show that an imperfect predicate of an embedded clause shows up the same syntactic and semantic properties of an imperfect predicate of a matrix clause. It is a past dependent tense, in the sense that it needs a past temporal anchoring in order to be elicited.

In example (14) the matrix tense provides the temporal anchoring to the embedded imperfect. The matrix tense is past and provides an appropriate temporal anchoring. If it were present, the anchoring would not take place, and the sentence would turn out to be uninterpretable:

(18) a. #Il testimone afferma che l'imputato era a casa.
      b. #The witness claims that the defendant was at home.

A time adverbial denoting a 'focalization time' within the embedded clause (or presupposed) would rescue the sentence:

(19) a. Il testimone afferma che ieri alle 5 l'imputato era a casa.
      b. The witness claims that yesterday at 5 the defendant was at home.

The status of sentences (18) and (19) parallels the status of sentences (4) and (1). This suggests that whatever properties the imperfect indicative might have, the

imperfect subjunctive might have them as well[5]. In the next section evidence will be shown to claim that the imperfect subjunctive has analogous temporal and aspectual properties as the imperfect indicative.

3.2. Imperfect subjunctive

The imperfect indicative can occur both in matrix and in embedded clauses. The imperfect subjunctive, as well as the other subjunctive tenses, has both dependent and independent employments. The independent uses are constrained to sentences having imperative and interrogative illocutionary force, or in exclamations. A subjunctive verb cannot be the predicate of a sentence having affirmative illocutionary force (see Picallo 1985, Giorgi and Pianesi 1997, Schlenker 2005, among the others). The dependent uses of the imperfect subjunctive parallel the dependent uses of the imperfect indicative:

a) The imperfect subjunctive may have a 'simultaneous' reading, which may be progressive or habitual, depending on the presence of adverbial modification:

(20)   a. Gianni pensava che Maria leggesse il giornale.
Gianni thought that Maria read.IMPF.SUBJ the newspaper
'Gianni thought Maria was reading the newspaper'.

     b. Gianni pensava che Maria leggesse il giornale ogni giorno.
Gianni thought that Maria read.IMPF.SUBJ the newspaper every day
'Gianni thought Maria used to read the newspaper every day'.

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[5] Bertinetto and Delfitto claim that the imperfect morphology corresponds to the introduction of a 'strong' quantifier over times and events. They argue that the imperfect morphology contributes the following semantics:

(i)   ($\forall$t: contextually relevant (t)) (One e: P(e) at(e, t))

In their view, the time adverbial (but the matrix tense, in examples involving embedding, may be add as well) denoting the 'focalization time' is needed in order to provide the set of contextually relevant times that represents the domain of quantification of the strong quantifier. Hence, the imperfect morphology requires a time adverbial or, more generally, a contextually available focalization time, in order to be interpretable, and not vice versa. They also claim that by implicature the semantics given in (i) presupposes the existence of at least another event of P'ing distinct from the one taking place at the focalization time, giving rise to the peculiar progressive and habitual reading, which share the property of having atelic aktionsart and of being non-terminative. I refer to Bertinetto and Delfitto (1995) for a detailed analysis of the semantic properties of the imperfect tense. See Cipria and Roberts (2000) and Giorgi ad Pianesi (2004) on the atelicity and Giorgi and Pianesi (2004) on the non-terminativity of the imperfect.

b) It may have a 'shifted' interpretation, which in its turn may be progressive or habitual:

(21) a. Gianni pensava che il giorno prima alle 5 Maria leggesse il giornale.
          Gianni thought that the day before at 5 Maria read.IMPF.SUBJ. the newspaper.
          'Gianni thought that the day before at 5 Maria was reading the newspaper'.

      b. Gianni pensava che l'anno prima Maria leggesse il giornale ogni giorno.
          Gianni thought that the year before Maria read.IMPF.SUBJ. the newspaper every day.
          'Gianni thought that the year before Maria used to read the newspaper every day'.

c) It may have a 'future-in-the-past' reading, which recalls the 'intention-in-the-past' reading:

(22) Gianni pensava che Maria partisse il giorno dopo.
      Gianni thought Maria left.IMPF.SUBJ the next day.
      'Gianni thought that Maria was going to leave the day after'.

The hypothesis that the indicative and the subjunctive imperfect have the same temporal and aspectual properties (not of course the same mood ones) seems to follow quite naturally from these data. This hypothesis does not require that the indicative and the subjunctive imperfect have all and only the same features. They do not indeed, since – quite trivially – they differ at least with respect to mood. However, I claim that they share the same aspectual properties that are needed to account for their syntactic and semantic behavior.

From this perspective, the presence of a 'focalization' time adverbial in sentences like (1) comes as no surprise – the adverbial is required by the imperfect morphology (paralleling the behavior of the imperfect indicative). Notice that the time adverbial does not trigger the imperfect subjunctive – on the contrary, the imperfect subjunctive requires its presence in order to be properly interpreted.

This conclusion gives rise to the following question. Data like (1) have been claimed to show that the subjunctive morphology is triggered either by the matrix tense morphology or by a time adverbial. But if the time adverbial cannot be a trigger, only the matrix tense morphology can. Examples like (1) are puzzling

because apparently there is no appropriate trigger to the subjunctive tense morphology – there is a mismatch between the matrix and the embedded tenses.

How to explain this fact? In what follows I will address this question.

4. An alternative hypothesis
4.1. Aktionsart and tense mismatch

The fact that the imperfect indicative and the imperfect subjunctive behave alike suggests that the idea that the temporal topic triggers the imperfect morphology in an embedded predicate despite the main predicate has present morphology, is not needed. According to this theory, the morphology of the embedded predicate may be triggered either by the morphology of the matrix predicate or by the features of the time adverbial. However, the latter possibility can be excluded, both on empirical basis (it is not able to exclude the ungrammaticality of sentences like (6)), and from a theoretical viewpoint (the imperfect morphology itself requires a time adverbial).

An alternative hypothesis can however be drawn considering a notable property of sentences like (1): in (1) the subjunctive predicate has stative aktionsart. If embedded under a present attitude verb, a past eventive predicate is rather odd, even though, as far as the interpretation goes, it is coerced into a progressive reading:

(23) a. ?#Il testimone crede che ieri alle 5 l'imputato attraversasse la strada.
The witness thinks that yesterday at 5 the defendant crossed.SUBJ the street

   b. ?#Il testimone crede che ieri alle 5 l'imputato uscisse di casa.
The witness thinks that yesterday at 5 the defendant left.SUBJ home

Since the progressive aspect shifts an eventive predicate into a stative aktionsart, the expectation is that a progressive periphrasis rescues sentences (23), which seems to be correct:

(24) a. Il testimone crede che ieri alle 5 l'imputato stesse attraversando la strada.
The witness thinks that yesterday at 5 the defendant was.SUBJ crossing the street
'The witness thinks that yesterday at 5 the defendant was crossing the street'.

b. Il testimone crede che ieri alle 5 l'imputato stesse uscendo di casa.
       The witness thinks that yesterday at 5 the defendant was.SUBJ leaving home
       'The witness thinks that yesterday at 5 the defendant was leaving home'.

Moreover, since habitual adverbials shift an eventive predicate into a predicate having a stative compositional semantics, the expectation is that sentences (23) should be perfectly interpretable if a habitual adverbial occurred instead of the indexical time adverbial[6]:

(25) a. Il testimone crede che nel 1985 l'imputato attraversasse la strada ogni giorno.
          The witness thinks that in 1985 the defendant crossed.SUBJ the street every day
          'The witness thinks that in 1985 the defendant crossed the street every day'.

      b. Il testimone crede che nel 1985 l'imputato uscisse di casa ogni giorno alle 5.
          The witness thinks that in 1985 the defendant left.SUBJ home every day at 5
          'The witness thinks that in 1985 the defendant left home every day at 5'.

These data seem to show that in examples like (1) the imperfect subjunctive verb can only have a stative aktionsart.

4.2. Two patterns of SOT

I take that the data above show that examples like (1) have a different status from examples where the matrix and the embedded tense match. I will dub the former examples as instances of 'non-canonical SOT', the latter as instances of 'canonical SOT'.

In the non-canonical SOT the embedded predicate can only be stative and must locate a state prior to the matrix eventuality ('shifted' reading); in the canonical SOT the embedded predicate can be either stative (giving rise to a simultaneous reading,

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[6] I take that the ordering of the time adverbials w.r.t. the predicate is not relevant for the hypothesis investigated here.

as in (5)) or eventive (giving rise to a progressive or habitual, simultaneous reading, as in (20), or a modal, future-oriented reading, as in (7) and in (22))[7].

(26) a. *Canonical SOT*
      i. Matrix and embedded tenses match:[8]
          Matrix tense   *Embedded tense (subjunctive)*
          Present/future   present/*imperfect
          imperfect   *present/imperfect
      ii. No restrictions on the embedded predicate aktionsart;
      iii. Simultaneous or modal reading;

      b. *Non-canonical SOT*
      i. Matrix and embedded tenses may not match (only imperfect subjunctive available):
          Matrix tense   *Embedded tense (subjunctive)*
          Present/future   *present/imperfect
          Imperfect   *present/imperfect
      ii The embedded predicate must be stative (lexically or compositionally);
      iii. 'Shifted' (past) reading;

Notice that in the canonical SOT present and imperfect are in complementary distribution. This is in line with the claim that subjunctive tenses are anaphors, provided that anaphors must be bound by an appropriate antecedent – i.e., an antecedent agreeing (that is, sharing some of its morphological features – here, tense features) with the anaphor itself. However, in the non-canonical SOT the only subjunctive tense available is the imperfect, due to interpretative conditions – imperfect is a past tense, present is not. Hence, whatever tense can be an appropriate

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[7] It did not escape our notice that the same generalizations hold for Catalan (see Bonet 2002, examples (154)a and b).

[8] The following table (and table under (b), i, is too) is in fact simplified, since it does not include some matrix indicative tenses – the present perfect ('passato prossimo'), the simple past ('passato remoto'), the matrix conditional tenses – and the embedded composite subjunctive tenses, which will be introduced in a second step. The SOT of present perfect and of the future patterns as the one of the present, whereas the SOT of the simple past and of the conditional patterns like the imperfect. Moreover, the tables catch an adequate generalization for the 'epistemic' attitude predicates, but they do not take into account all the verb classes selecting for subjunctive argument clauses. For instance, present volitional verbs do not allow an imperfect subjunctive predicate (excluding fictional contexts) – they are sometimes claimed to require a 'future-oriented' interpretation of the embedded proposition.

antecedent for an imperfect subjunctive in the non-canonical SOT and tense agreement does not take place. In other terms, present subjunctive predicates and imperfect subjunctive *eventive* predicates having no progressive or habitual aspect, specify which morphological tense features a predicate must have in order to be an appropriate antecedent – present or future tense if the embedded predicate is present, past tense features if the embedded predicate is imperfect. Impefect subjunctive *stative* predictes – where stativity is either a lexical property of the predicate or a compositional property – do not specify any morphological feature of the antecedent and can be bound both by a present or future matrix and by a past matrix[9].

Imperfect subjunctive is appropriate both in the canonical SOT and in the non-canonical SOT, although having different interpretative properties in each case. The semantics of the imperfect subjunctive (past and intensional, as Bertinetto and Delfitto 1995, Giorgi and Pianesi 1995, 2004, Cipria and Roberts 2000) may explain its double status – exactly as its semantics explains the different employments of the imperfect indicative (see section 3.1).

This hypothesis casts light on the mechanism of SOT itself. Since SOT may be conceived as an agreement mechanism (i.e. a mechanism stating that two lexical items co-vary w.r.t. some feature), SOT is predicted to hold if the lexicon provides a range of morphological competing options having one and the same denotation. This is what happens in canonical SOT, where present and imperfect morphology are in complementary distribution. If there is no competition among at least two morphlogical alternatives, SOT does not occur. The hypothesis is that this is the case of non-canonical SOT, where the only morphological item available is the imperfect subjunctive.

4.3. French

The hypothesis here proposed may be easily extended to languages like (spoken) French where the lexicon does not provide any morphological alternative and SOT does not appear to occur – despite subjunctive tenses are anaphoric:

(27)   a. Je veux qu'il vienne.
            I want that he comes.SUBJ.
            'I want him to come'.

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[9] An illustrative parallelism within the nominal domain may be given by the anaphoric system in languages like Italian, in which there are three types of third person anaphors: *se stesso/stessa*, *sè* and the clitic *si*. *Se stesso/stessa* needs an antecedent matching its gender and number features. *Sè* and *si* are underspecified as for gender and number and their antecedent is not constrained.

b. Je voulais qu'il vienne.
    I wanted that he comes.SUBJ
    'I wanted him to come'.

In (27)a, a present subjunctive is embedded under a present indicative; in (27)b, under a past (imperfect) indicative. Notice that the anaphoric nature of the subjunctive tenses in French may be shown through standard diagnostic methods such as indexical adverbial modification. Giorgi (2006b) show that if a tense is indexical it is compatible only with time adverbials denoting a time interval compatible with the the tense itself. For instance, a present perfect indicative, denoting a past time interval, is compatible with a past adverbial but is incompatible with future adverbials:

(28) Gianni ha detto che Maria è partita ieri/*domani.
      *Gianni has said that Maria has left yesterday/*tomorrow*
      'Gianni said that Maria left yesterday/*tomorrow'.

If a tense is anaphoric, however, it is compatible with any indexical adverbial. Thus, for instance, the imperfect subjunctive is compatible with past, present or future adverbials:

(29) Pensavo che Maria partisse ieri/oggi/domani.
      I-thought that Maria left.SUBJ yesterday/today/tomorrow
      'I thought Maria would leave yesterday/today/tomorrow'.

This test can be employed to show the anaphoric nature of French present subjunctive, which is compatible even with past indexical adverbials[10].

(30) Marie regrettait que Jean arrive tard hier.
      Marie regretted that Jean arrives.SUBJ late yesterday
      'Marie regretted that Jean would arrive late yesterday'.

Although the embedded subjunctive carries present morphology, it is compatible with a past indexical adverb such as 'yesterday', which shows that the embedded predicate is anaphoric.

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[10] I am thankful to Vincent Homer for this example.

5. A device for SOT

In what follows a formal device will be drawn to investigate the mechanisms establishing SOT. The basic tenets are that SOT is an agreement phenomenon and that Agree can be useful to explain how it works.

In the late 1980s and early 1990s the idea was put forward that agreement relations are instantiated by raising to a Specifier position (Kayne 1989). The early minimalist idea of Case and agreement was based on the idea that agreement consists in a spec-head relation, under the notion of 'feature checking' (Chomsky 1995). However, building on data from raising and the existential construction in English, Chomsky (2000, 2001) proposed another type of agreement relation, named 'Agreement at a distance' or 'Agree' for short. According to this idea, an agreement relation may take place even without any movement to a specifier. Moreover, Chomsky argues that all instances of agreement checking are realized through Agree, whereas movement to a specifier is conceived as an independent requirement due to EPP[11].

Agree is claimed to establish 'a relation (agreement, Case checking) between an LI [Lexical Item] α and a feature F in some restricted search space (its *domain*)' (Chomsky 2000: 101). Agree obtains when an uninterpretable feature – that is, a feature legible at LF – in a lexical item, which may be metaphorically thought of as a *probe*, seeks a *goal* matching its features in its c-commanding domain, where matching is identity of features (Chomsky 2000: 122, 124). Once matched, the uninterpretable features of the probe are erased.

Chomsky (2001) claims that whether features in a lexical item are interpretable or not is specified in the lexicon. Since only interpretable features are sent to LF, the distinction between interpretable and uninterpretable features must be indicated throughout the derivation, so that at spell-out interpretable features can be sent to LF and uninterpretable features are deleted. In order for this property to be visible in narrow syntax, interpretable features are claimed to enter the derivation valued, uninterpretable features without values. The value of an uninterpretable feature is determined through Agree with an interpretable valued feature. Agree deletes the uninterpretable features, which cannot be available for LF, while leaving available the valued features for PF.

Pesetsky and Torrego (2001, 2004, 2006) point out that the definition of interpretable and uninterpretable features concerns the semantic contribution some features give to the interpretation of a lexical item; the definition of valued and

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[11] Koopman (2005) disputes the idea of Agree at distance and argues that the the 'Spec head' agreement is probably the only agreement configuration. The theory proposed here may be formulated in terms of Spec head agreement if it is proved that an embedded CP is copied in a specifier of the matrix functional field.

unvalued feature concerns instead the morphological content of a certain feature. They propose that interpretability and valuation are independent. Accordingly, features may be interpretable valued, interpretable unvalued, uninterpretable valued and uninterpretable unvalued. In their view, interpretable unvalued features probe their domain to get valued, and uninterpretable unvalued features do so as well[12] - once valued, the uninterpretable features are deleted while the valued features are sent to PF.

Pesetsky and Torrego's model will be now appoloed to SOT. The hypothesis will be here pursued that SOT, as an instantiaiton of agreement between tenses, may be conceived as an instantiation of Agree between some feature of the matrix predicate and some feature of the embedded predicate. The tense feature is taken to be the feature under Agree.

Let us consider first the properties of the tense features. According to standard hypotheses within the minimalist framework (see Pesetsky and Torrego 2004), tense features are generally interpretable in I and valued in V. Agree matches the tense features in I and V. EPP properties of I trigger the internal merge of V into I.

(31)   [I [… V]]
              |_____|
                Agree

According to the hypothesis under investigation, Agree is triggered between the tense features of the matrix I, which are interpretable and valued through Agree with V, and the tense features of the embedded I, which must be interpretable – they are anaphoric – and unvalued. The hypothesis states that anaphoric tenses must get valued under Agree with the matrix tense features. This implies that the tense features in V are unvalued as well. Finally, the anaphoric nature of the subjunctive mood may provide the trigger for the Agree operation: matrix V selects for a subjunctive CP; the relations between complementizer and inflection have often been claimed as very strict[13]. Landau (2005) and Shlonsky (2006) claim for instance that selection involves intermediate steps involving C, where the mood feature is uninterpretable and unvalued (at least in Italian) and the embedded I, where the mood feature is interpretable (as anaphoric) and unvalued.

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[12] I refer to Torrego and Pesetsky (2004) for a detailed illustration of their proposal.

[13] On the nature of subjunctive CP, see Giorgi and Pianesi (1997, 2004), Landau (2005), Shlonsky (2006).

(32)   … V [$_{CP}$ C [$_{IP}$ I …]]
        └────┘└────┘
        Selection Agree

Finally, Subjunctive I is anaphoric and needs an antecedent, the matrix tense, in order to refer to a temporal location – it must be 'bound'. Following the idea by Lasnik and Uriagereka (2005) and Reuland (2006) that binding is parasitic on Agree, Agree matches the subjunctive tense features and the matrix tense features, so that the subjunctive tense features can get a value and be bound[14].

(33)   [$_{IP}$ … I [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I …]]]]
            └────┘└────┘└────┘
            Agree Selection Agree
        └──────────────────┘
            Binding/Agree

It is now possible to turn on the question how this technical device applies to the paradigms of SOT in Italian.
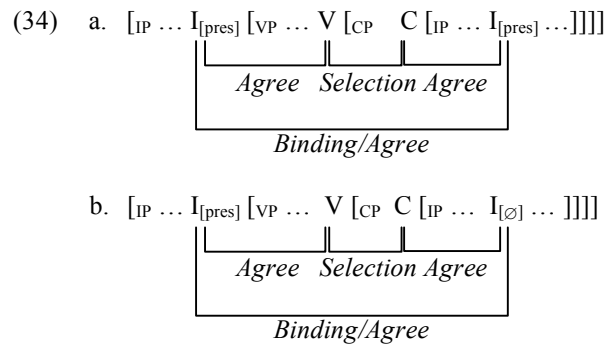

6. SOT paradigms
6.1. Basic paradigm
The mechanism illustrated here allows establishing the values of the embedded I/V. At the end of section 4 it has been claimed that the present subjunctive morphology is unambiguous, whereas the imperfect subjunctive morphology is ambiguous. Present subjunctive morphology requires a present binder (which I label
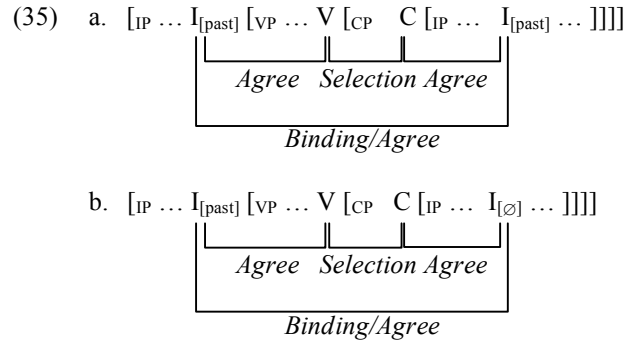
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[14] Notice that according to Chomsky (2000, 2001) a probe scans its *c-command domain* to search for a probe matching some of its features. In (33), however, the embedded I, which is unvalued according to the hypothesis under investigation does not c-command the 'goal' – the matrix I/V. The question whether a c-command requirement holds between the probe and the goal is however unclear (see Landau 2001, Torrego and Pesetsky 2004).

The hypothesis here investigated is in line with recent research on the relations between Binding and Agree – see Lasnik and Uriagereka (2005), Reuland (2006), who propose that ananphor binding is is syntactically encoded as Agree. Lasnik and Uriagereka (2005) propose that anaphoric binding is an instantiation of multiple Agree matching the probe C, and the goals subject and object. Bypassing the problem concerning c-command illustrated above, an analogous proposal may be pursued w.r.t. SOT, which may be conceived as Agree matching matrix C, matrix I and embedded I (or perhaps C). However, I will leave the question for further investigation.

'[pres]'[15]); imperfect subjunctive morphology requires a past binder in the canonical SOT ('[past]'); however, when a 'focalization' time occurs, which does not overlap with the attitude eventuality, giving rise to 'shifted' readings, the imperfect morphology does not specify whether the binder should be present or past ('[∅]'). Hence, if the matrix verb is present, through Agree the embedded verb gets present value (canonical SOT) or imperfect value (shifted reading).

(34) a. [$_{IP}$ … I$_{[pres]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[pres]}$ …]]]]

Agree   Selection Agree

Binding/Agree

     b. [$_{IP}$ … I$_{[pres]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[∅]}$ …]]]]

Agree   Selection Agree

Binding/Agree
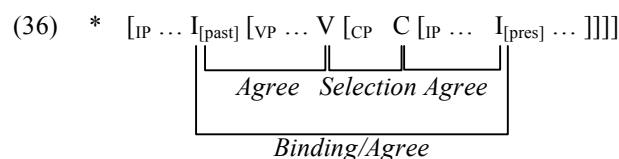
If the matrix verb is past, such as imperfect tense is, through Agree the embedded verb gets past (imperfect) value as a 'strict' SOT effect or as a 'shifted' reading effect:

(35) a. [$_{IP}$ … I$_{[past]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[past]}$ …]]]]

Agree   Selection Agree

Binding/Agree

     b. [$_{IP}$ … I$_{[past]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[∅]}$ …]]]]
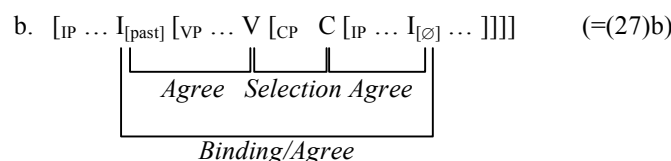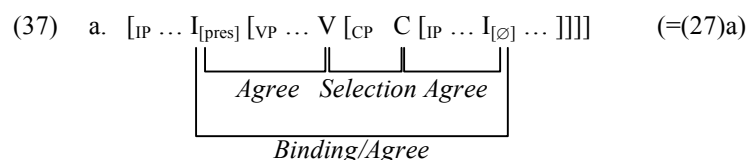
Agree   Selection Agree

Binding/Agree

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[15] Actually, the notation '[-past]' would be probably more appropriate, since future matrixes have the same SOT rules as a present matrix, as examples (2) show. In any case, for simplicity I will keep the label '[pres]'.

Given present subjunctive morphology unambiguity, a present subjunctive verb cannot be embedded under a past tense attitude predicate, since no feature matching, that is, Agree, could take place.

(36) * [$_{IP}$ … I$_{[past]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[pres]}$ …]]]]

$$\underbrace{\overbrace{}^{Agree}\;\overbrace{}^{Selection}\;\overbrace{}^{Agree}}_{Binding/Agree}$$

Notice that the properties of the subjunctive tenses are lexically determined and may vary cross-linguistically. In French subjunctive morphology appears to be underspecified ([∅]). Hence both a present and a past matrix can be an appropriate antecedent:

(37) a. [$_{IP}$ … I$_{[pres]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[∅]}$ …]]]]   (=(27)a)

$$\underbrace{\overbrace{}^{Agree}\;\overbrace{}^{Selection}\;\overbrace{}^{Agree}}_{Binding/Agree}$$

     b. [$_{IP}$ … I$_{[past]}$ [$_{VP}$ … V [$_{CP}$ C [$_{IP}$ … I$_{[∅]}$ …]]]]   (=(27)b)

$$\underbrace{\overbrace{}^{Agree}\;\overbrace{}^{Selection}\;\overbrace{}^{Agree}}_{Binding/Agree}$$

The SOT rules proposed here may be finally extended to the complete paradigm of tense agreement between the matrix verb and each of the subjunctive tenses.

6.2 Extended paradigm

In Italian there are four tenses having subjunctive mood: beyond the present and the imperfect, there are the present perfect ('passato') and the pluperfect ('trapassato'). The present and the imperfect subjunctive have imperfective aspect. The present perfect and the pluperfect are periphrastic perfective forms, built up by an auxiliary carrying respectively present and imperfect subjunctive morphology and the past participle. In section 4 I have hypothesized that under certain conditions subjunctive morphology specifies which morphological tense features a predicate must have in order to be an appropriate antecedent. I have assumed that this is a lexical property of subjunctive morphology. If this hypothesis is correct, periphrastic

subjunctive tenses should also specify the tense features of an appropriate antecedent, given the morphology carried by the auxiliary – the morphology of the auxiliary should establish whether a matrix tense is an appropriate antecedent or not. As it turns out, this prediction seems to be borne out. A present perfect can only appear in a clause selected for by a present matrix:

(38)   a.   Il testimone crede che l'imputato abbia confessato.
            The witness thinks that the accused has.SUBJ confessed
            'The witness thinks that the accused has confessed'.

       b.   *Il testimone credeva che l'imputato abbia confessato.
            The witness thinks that the accused has.SUBJ confessed

A pluperfect can appear in a clause selected for either by a present matrix or by a past matrix[16]. In the former case a focalization time is obligatory – the focalization time should denote a time interval at which the event referred to by the subjunctive predicate has already reached its terminal point:

(39)   a.   Il testimone crede che *(ieri alle 5) l'imputato avesse già confessato.
            The witness thinks that yesterday at 5 the accused had.SUBJ already confessed
            'The witness thinks that yesterday at 5 the accused had already confessed'.

       b.   Il testimone credeva che l'imputato avesse confessato.
            The witness thought that the accused had.SUBJ confessed
            'The witness thought that the accused had confessed'.

       c.   Il testimone credeva che il giorno prima alle 5 l'imputato avesse già confessato.
            The witness thought that the day before at 5 the accused had.SUBJ already confessed
            'The witness thought that the day before at 5 the accused had already confessed'.

(26) should be updated in order to include the data in (38)and (39). Since perfective embedded predicates may have whatever aktionsart (excluding the more general incompatibility between perfectivity and stative predicates – see Bertinetto

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[16] In the present discussion I will abstract away from the presence of the adverb *già* 'already'.

1991: 52-53), and since their only temporal interpretation is anteriority with respect to a time interval (which may be provided by the matrix eventuality or by an adverbial), the conditions on aktionsart (ii) and time interpretation (iii) in (26) may be limited to the subjunctive tenses having imperfective aspect – i.e. present simple and imperfect subjunctive:

(40) a. *Canonical SOT*
         i. Matrix and embedded tenses match:
             Matrix tense   *Embedded tense (subjunctive)*
             Present/future   present/present perfect/*imperfect/*pluperfect
             Imperfect   *present/*present perfect/imperfect/pluperfect
         ii. No restrictions on the embedded predicate aktionsart;
         iii. Simultaneous or modal reading if the embedded predicate is imperfective;

      b. *Non-canonical SOT*
         i. Matrix and embedded tenses may not match (only imperfect subjunctive available):
             Matrix tense   *Embedded tense (subjunctive)*
             Present/future   *present/*present perfect/imperfect/pluperfect
             Imperfect   *present/*present perfect/imperfect/pluperfect
         ii The embedded predicate must be stative (lexically or compositionally) if it is imperfective;
         iii. 'Shifted' (past) reading if the embedded predicate is imperfective;
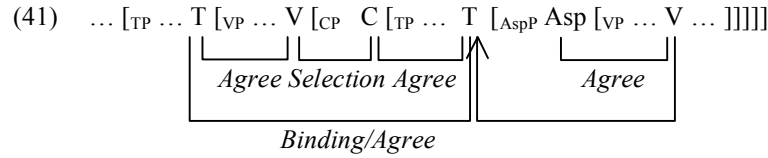
A formal device accounting for the whole SOT paradigm requires that the aspectual properties should be included within the mechanism of SOT proposed above, with no need for further assumptions concerning subjunctive morphology. I will take standard assumptions on periphrastic verbal forms to be sufficient to complete the mechanism.

Tense projections are generally taken to dominate aspect projections[17]. The SOT mechanism may be taken to involve the T projections, since subjunctive is temporally anaphoric.
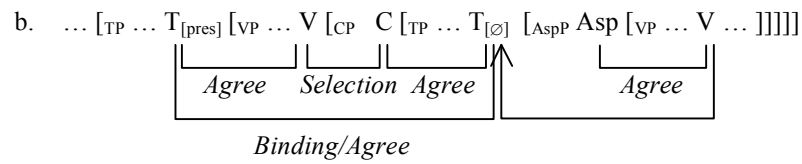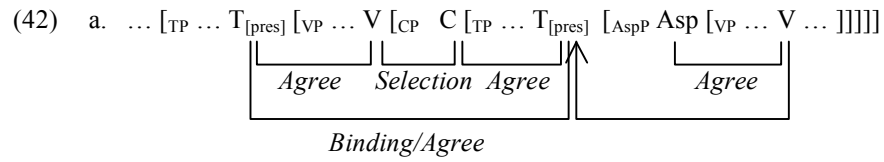
If the subjunctive form is not periphrastic, V has aspectual features valued, Asp having interpretable aspectual features, and T interpretable anaphoric tense features which are valued through Agree by the matrix T. Agree obtains between Asp and V. T finally attract V.
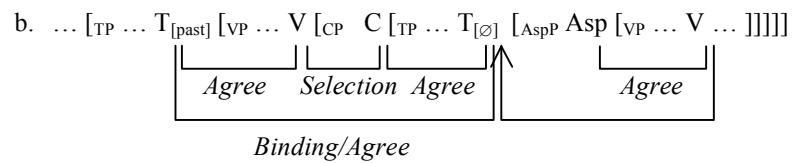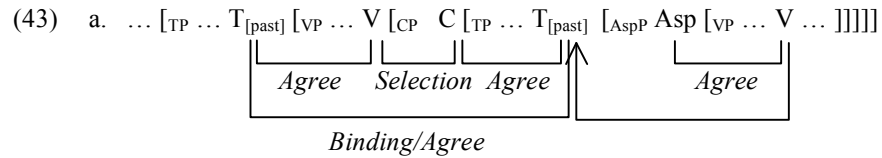
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[17] Among the others, see Bellettti (1990), Giorgi and Pianesi (1997), Cinque (1999).

(41)   … [TP … T [VP … V [CP   C [TP … T [AspP Asp [VP … V …]]]]]

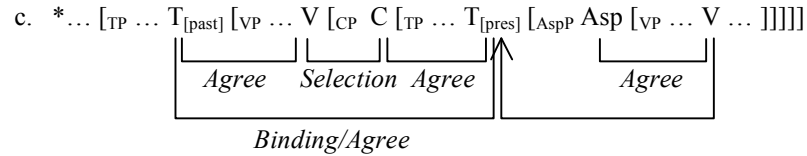*Agree Selection Agree*   *Agree*

Binding/Agree

As shown above, if the matrix verb is present, embedded T can have present subjunctive morphology ([pres] – canonical SOT) or imperfect subjunctive morphology ([∅] – non-canonical SOT):

(42)   a.   … [TP … T[pres] [VP … V [CP   C [TP … T[pres] [AspP Asp [VP … V …]]]]]

Agree   *Selection Agree*   *Agree*

Binding/Agree

       b.   … [TP … T[pres] [VP … V [CP   C [TP … T[∅] [AspP Asp [VP … V …]]]]]

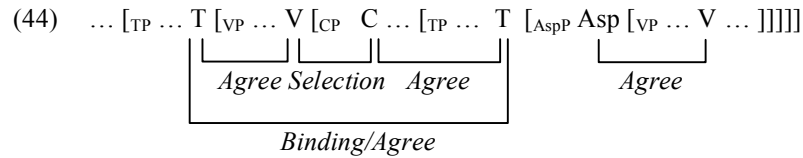*Agree*   *Selection Agree*   *Agree*

Binding/Agree

If it is past, embedded T can only have imperfect subjunctive morphology, having a simultaneous or modal reading ([past] – canonical SOT) or shifted reading ([∅] – non-canonical SOT). Present subjunctive morphology is instead unavailable:

(43)   a.   … [TP … T[past] [VP … V [CP   C [TP … T[past] [AspP Asp [VP … V …]]]]]

Agree   *Selection Agree*   *Agree*

Binding/Agree

       b.   … [TP … T[past] [VP … V [CP   C [TP … T[∅] [AspP Asp [VP … V …]]]]]

Agree   *Selection Agree*   *Agree*

Binding/Agree

c. *… [$_{TP}$ … T$_{[past]}$ [$_{VP}$ … V [$_{CP}$ C [$_{TP}$ … T$_{[pres]}$ [$_{AspP}$ Asp [$_{VP}$ … V …]]]]]

$$\text{Agree} \quad \text{Selection} \quad \text{Agree} \qquad \text{Agree}$$

Binding/Agree

If the subjunctive form is periphrastic, the auxiliary has valued tense features[18], the participle valued aspectual (perfective or terminative[19]) features. Since SOT involves embedded T, when the subjunctive form is periphrastic, the tense morphology of the embedded subjunctive auxiliary enters SOT – binding and Agree – relations with the matrix verb.

(44)   … [$_{TP}$ … T [$_{VP}$ … V [$_{CP}$ C … [$_{TP}$ … T [$_{AspP}$ Asp [$_{VP}$ … V …]]]]]

$$\text{Agree Selection} \quad \text{Agree} \qquad \text{Agree}$$

Binding/Agree

If the matrix verb is present, embedded T (the auxiliary) may be present or imperfect ([$\varnothing$], sorting a present perfect subjunctive or to a pluperfect subjunctive. In the latter case a time adverbial is independently required to provide a time anchor to the embedded eventuality. If the matrix is past, embedded T may only be pluperfect subjunctive ([past] or [$\varnothing$]). Present morphology is again unavailable in this syntactic context, which explains why example (38)b is ungrammatical.

The model here developed accounts for the data in spoken French. I assume that the differences from the Italian paradigm concern the lexicon. First, the French lexicon does not provide alternative morphemes varying in function of the matrix tense in the canonical SOT, as it has been shown in (27). The following examples show the same phenomenon concerning the periphrastic past forms:

(45)   a. Je doute qu'il ait écrit hier.
            I doubt thtat he has.SUBJ written yesterday
            'I doubt he has written yesterday'.

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[18] Following Cinque (1999), auxiliaries are merged directly in a functional projection – here labelled 'T' for simplicity.
[19] See Giorgi and Pianesi (2004). According to Cinque's (1999) hierarchy, the relevant functional head may even be 'T(Anterior)', as suggested by the obligatory presence of the adverb *già* 'already'. T(Anterior) is a distinct, lower tense functional head than those anchoring an eventuality to the speech time.

b. Je doutais qu'il ait écrit la veille.
   I doubted that he has.SUBJ written the day before
   'I doubted that he had written the day before.'

Second, there is no specific morpheme for non-canonical SOT (the imperfect is not part of the standard variety of French although it is employed in the written variety). The past subjunctive is compatible even with a stative predicate or with an eventive predicate having a progressive or habitual reading[20]:

(46) a. Pierre est surpris qu'hier à 5 heures Marie ait été chez elle.
         Pierre is surprised that yesterday at 5 Marie has.SUBJ been at her place
         'Pierre was surprised that yesterday at 5 Marie was at home'.

      b. Pierre est surpris que Marie soit partie chaque jour à 5 heures il y a quelques années.
         Pierre is surprised thatMarie is.SUBJ left every day at 5 some years ago
         'Pierre is surprised that Marie would leave every day at 5 some years ago'.

However, since in French subjunctive tenses do behave as tense anaphors, as example (30) shows, I take (41) to be the mechanism ruling the interpretation of an embedded non-periphrastic subjunctive tense and (44) the one ruling the interpretation of an embedded periphrastic subjunctive tense.

7. Conclusions

In this paper, I have analyzed a puzzle concerning subjunctive SOT in Italian, which apparently challenges the idea that subjunctive tenses are anaphoric. I defended the hypothesis that subjunctive tenses are tense anaphors. Tense mismatch examples, namely the imperfect subjunctive – a past tense – occurring in a clause selected for by a present matrix, do not contrast this hypothesis, since they do show the anaphoric interpretation of the subjunctive verb. Tense mismatch is rather a morphosyntactic phenomenon which may be accounted for by independently needed interpretative properties concerning the imperfect morphology, with no further assumption. Building on aktionsart, aspect and tense characters, two patterns of tense dependencies have been singled out, which I referred to as canonical and non-canonical SOT. While imperfect subjunctive morphology is available in both

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[20] I thank Vincent Homer for these examples.

patterns, present subjunctive morphology is not, being available only in the canonical SOT, which explains why tense mismatch involves imperfect subjunctive only. A formal mechanism has then been worked out for SOT patterns. Since SOT can be defined as an agreement phenomenon involving two non-local items, Agree has been proposed to be an adequate device to implement such a mechanism, which has been applied to the whole Italian SOT paradigm by means of standard assumption concerning the IP field,. Thus, SOT should be considered of foremost importance within the agreement phenomena, since it may provide relevant insights on fundamental theoretical questions such as the nature of agreement.

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