

On Tense-Feature Inheritance

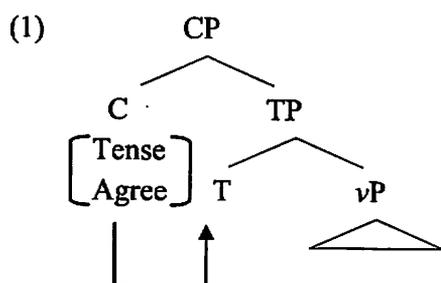
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Abstract

In this paper, we argue that inheritance of the Tense-feature is motivated by temporal interpretation. The Tense-feature in C must be inherited by T in order to determine the temporal order relation between speech time and reference time. Furthermore, this paper deals with temporal interpretation in non-finite clauses, which are argued to lack the Tense-feature. We argue that the speech time of non-finite clauses is simultaneous with the reference time and it is determined by the relation with the matrix event time or reference time.

1. Introduction

Chomsky (2008) proposes that the Tense-feature and the Agree-feature are inherited by T, on the assumption that all syntactic operations are triggered only by phase heads. This is shown in (1).



The phase head C has the Agree-feature, which is uninterpretable and triggers the syntactic operation *Agree*. T inherits the Agree-feature from C. As for the motivation for feature inheritance, Chomsky (2008: 144) argues that Agree-feature inheritance is motivated by the A/A' distinction, which is an interface condition. However, he remains silent on the motivation for Tense-feature inheritance. It should be clarified why

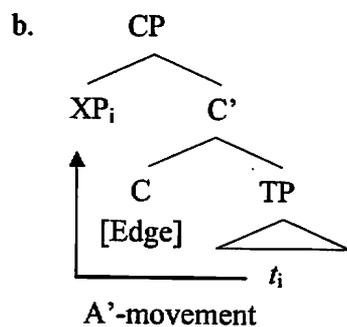
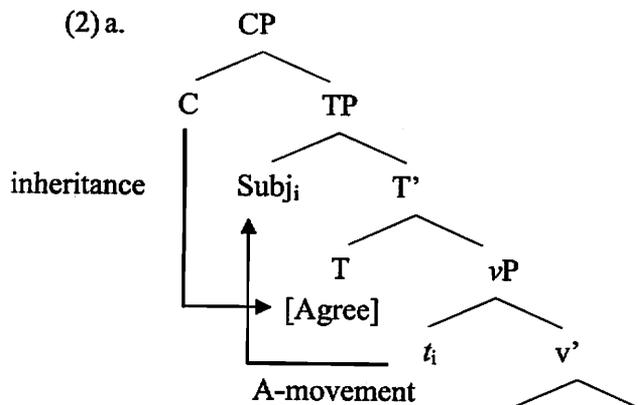
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Tense-feature inheritance takes place.

This paper is concerned with the motivation for Tense-feature inheritance. We argue that inheritance of the Tense-feature is motivated by temporal interpretation. The Tense-feature must be inherited by T and enter into a head-head relation with Asp in order to determine the temporal order relation between speech time and reference time. Furthermore, we consider temporal interpretation in non-finite clauses, arguing that the speech time of non-finite clauses is simultaneous with the reference time and it is determined by the relation with the matrix event time or reference time.

2. The Motivation for Feature inheritance

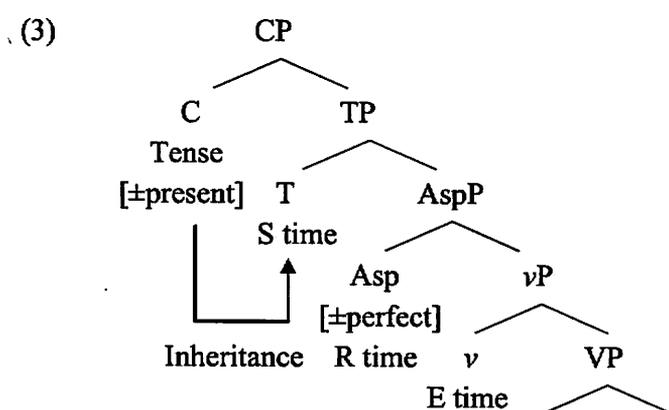
Chomsky (2008: 144) argues that Agree-feature inheritance is motivated by the A/A' distinction, which is an interface condition. If the Agree-feature is inherited by T as in (2a), T induces A-movement. This is distinguished from the A'-movement triggered by the Edge-feature in C as in (2b).



As a result, the requirement of the A/A' interface condition is satisfied. However, Chomsky does not mention why Tense-feature inheritance takes place. This leads us to search for the motivation for Tense-feature inheritance. In the next section, we make a proposal on the motivation for Tense-feature inheritance.

3. The Proposal

We propose that Tense-feature inheritance is motivated by temporal interpretation. Consider (3).



Following Reichenbach (1947), we assume that temporal interpretation is represented in terms of the Speech time (S time), the Reference time (R time), and the Event time (E time).¹ Furthermore, following Hornstein (1990) and Thompson (1996), we assume that the T head is associated with the S time, the Asp head is associated with the R time, and the v head is associated with the E time.

Following Chomsky (2008), we assume that the Tense-feature is in C.² The

¹ The S time is the time at which a sentence is uttered, the R time is the time that the speaker talks about in uttering the sentence, and the E time is the time at which the event or state described in the sentence occurs.

² Chomsky (2007) suggests the possibility that Tense is a property of T rather than C. Contrary to Chomsky's (2007) suggestion, we claim that Tense is a property of C on the basis of Irish data:

(i) Creidim gu-r chuir sí isteach ar an phost.

I-believe C-PAST put she in on the job

'I believe that she applied for the job.'

(McCloskey (2001: 75))

In Irish, the past morphemes "-r" is morphologically realized in C. This shows that Tense-feature is a property of C.

Tense-feature [\pm present] specifies that the S time is simultaneous with a time or follows a time. The feature [\pm perfect] in Asp head specifies that the R time is simultaneous with a time or follows a time.

We argue that the R time is related to the E time by the head-head relation between the feature [\pm perfect] and the E time, and the S time is related to the R time by the head-head relation between the Tense-feature [\pm present] inherited by T and the R time. If the Tense-feature were not inherited by T, it would not be in the head-head relation with the R time, so that the S time would not be related to any time. Consequently, the sentence cannot be assigned a temporal interpretation, which causes the derivation to crash. Therefore, the Tense-feature must be inherited by T in order to enter into the head-head relation with the R time. By the head-head relation, the S time is related to the R time.

The semantic information of [\pm present] determines the temporal order relation between the S time and the R time. The semantic information of [\pm perfect] determines the temporal order relation between the R time and the E time.³

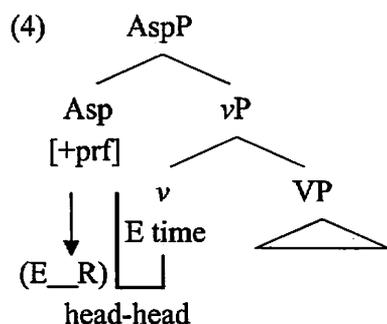
4. Tense in Finite Clauses

Let us consider the temporal order relation between the E time and the R time in the case in which the Asp head has the feature [+perfect]. The feature [+perfect] enters into the head-head relation with the E time, so that the R time is related to the E time. The semantic information of [+perfect] determines that the R time follows the E time.⁴ This

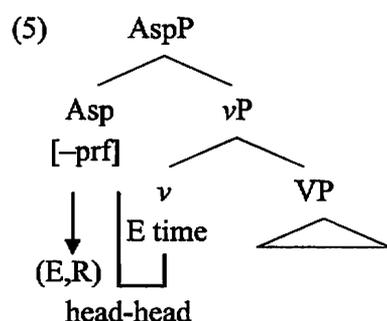
³ C-to-T Tense-feature inheritance violates a no-tampering condition (NTC) since T has the Tense-feature at the stage of derivation where C is merged. We suggest that although it may be a violation of NTC, Tense-feature inheritance is consistent with the strongest minimalist theses (SMT). The C-I interface requires temporal interpretation and this requirement is met by Tense-feature inheritance, which is an optimal device. As long as the interface condition is satisfied in the optimal way, SMT will be met in spite of the violation of NTC. In this sense, Tense-feature inheritance is in line with SMT though violating NTC. I thank an anonymous reviewer for bringing this issue to our attention.

⁴ If Asp is [+perfect], the Asp head is realized as the auxiliary *have* and the sentence is perfective. On the other hand, if Asp is [-perfect], the Asp head is phonologically empty and the sentence is imperfective.

is shown in (4):⁵



If the Asp head has the feature [–perfect], the semantic information of the feature [–perfect] determines that the R time is simultaneous with the E time. This is shown in (5).⁶



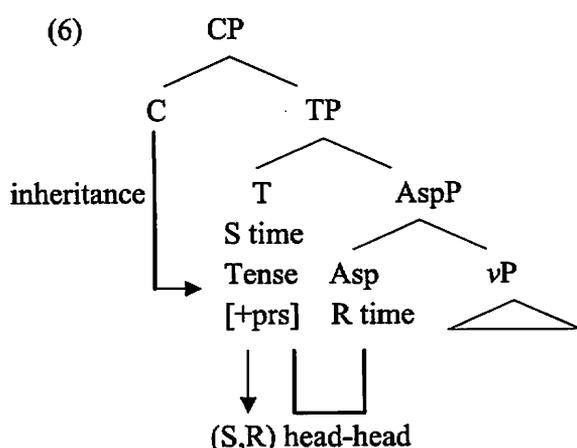
The feature [–perfect] is in a head-head relation with the E time, so that the R time is related to the E time. The E time is simultaneous with the R time due to the semantic information of [–perfect].

Let us go on to the temporal order relation between the S time and the R time. In (6), the Tense-feature [±present] in C is non-local with respect to the R time, being unable to enter into a head-head relation with the R time. Therefore, if it remained in C,

⁵ In (4), the E time is separated from the R time by a line, which means that the E time precedes the R time.

⁶ In (5), the R time is separated from the E time by a comma, which means that the R time is simultaneous with the E time.

the S time would not be related to any time, so that no temporal interpretation could be assigned. Thus, the Tense-feature $[\pm\text{present}]$ must be inherited by T in order to enter into a head-head relation with the R time.⁷ On the basis of the head-head relation with the R time, the S time is related to the R time. If the Tense-feature is $[\text{+present}]$, its semantic information determines that the S time is simultaneous with the R time. This is shown in (6).



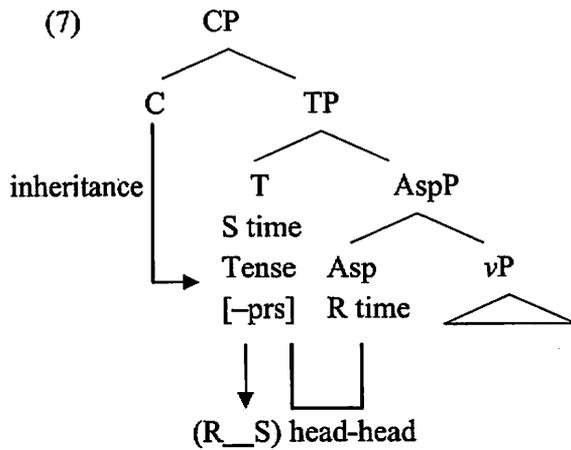
The Tense-feature $[\text{+present}]$ is inherited by T and enters into a head-head relation with the R time. Then, the S time is related to the R time. The semantic information of $[\text{+present}]$ determines that the S time is simultaneous with the R time. On the other hand, if the Tense-feature is $[\text{-present}]$, its semantic information determines that the S time follows the R time. This is shown in (7).

⁷ One might wonder whether the Tense-feature would remain in C if the Asp head *have* head-moved to T as shown in (i).

(i) [_{CP} [C Tense] [_{TP} [T [Asp have [+Prf]]] [_{AspP} t]...]]

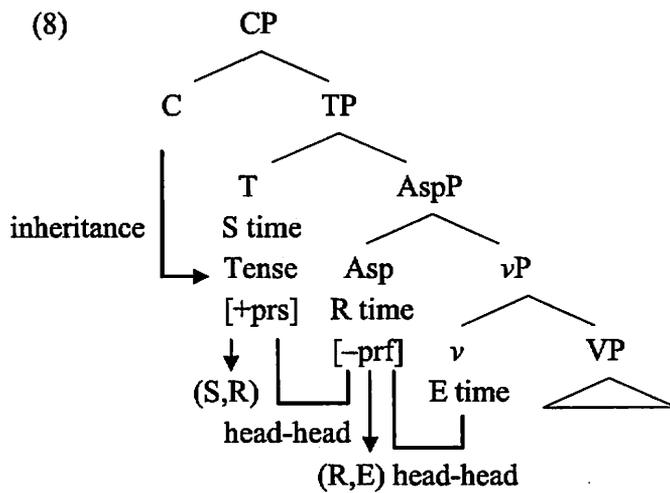
└──────────────────┘
head-head

In (i), the Tense-feature in C is in a head-head relation with $[\text{+Prf}]$ in T. Therefore, Tense-feature inheritance may not take place in this case. We suggest that head-movement is a phonological operation rather than a narrow-syntax operation, in conformity with Chomsky (2001). Then, *have* is in Asp rather than in T in narrow syntax. Therefore, the Tense-feature must be inherited by T in order to enter into a head-head relation with $[\text{+Asp}]$.



In (7), the Tense-feature inherited by T enters into a head-head relation with the R time. Then, the S time is related to the R time. The semantic information of [-present] determines that the S time follows the R time.

Finally, let us consider the temporal order relation of the S time, the R time, and the E time. The temporal order relation of the S time, the R time, and the E time is determined by integrating the semantic information of [±present] and [±perfect] (cf. Kaneko 2004, 2005, 2006, 2009, Kaneko and Endo 2001). Let us consider the case in which the Tense-feature is [+present] and the feature in the Asp head is [-perfect].



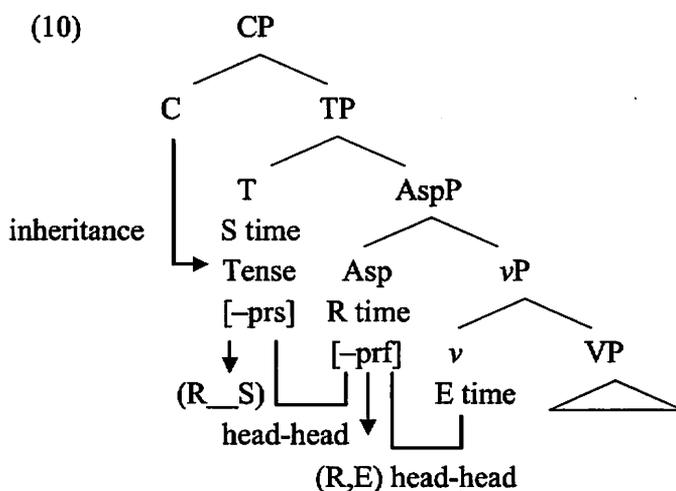
In (8), the R time is related to the E time by the head-head relation between [-perfect] and the E time. The semantic information of [-perfect] specifies that the R time is

simultaneous with the E time. The S time is related to the R time by the head-head relation between the Tense-feature [+present] inherited by T and the R time. The semantic information of [+present] specifies that the S time is simultaneous with the R time. Given that the S time is simultaneous with the R time and the R time is simultaneous with the E time, the S time is simultaneous with the E time by transitivity. Then, the temporal structure is as in (9a) and the simple present tense in (9b) has this temporal structure.

(9)a. S,R,E

b. She wears jeans, shirt, sneakers, gold hoop earrings in pierced ears.

Next, let us consider the case in which the Tense-feature is [-present] and the feature in the Asp head is [-perfect]. This is shown in (10).

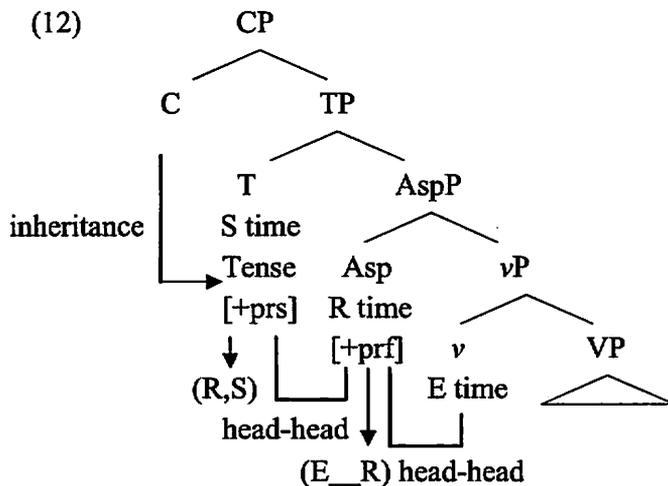


The feature [-perfect] enters into a head-head relation with the E time, so that the R time is related to the E time. The semantic information of [-perfect] determines that the R time is simultaneous with the E time. The Tense-feature [-present] inherited by T enters into a head-head relation with the R time, so that the S time is related to the R time. The semantic information of [-present] specifies that the S time follows the R time. Given that the S time follows the R time and the R time is simultaneous with the E time, the S time follows the E time by transitivity. Then, the temporal structure is as in

(11a) and the simple past tense in (11b) has this temporal structure.

- (11)a. R,E__S
- b. He looked at the woman.

Let us go on to the case in which the Tense-feature is [+present] and the feature in the Asp head is [+perfect]. This is shown in (12).

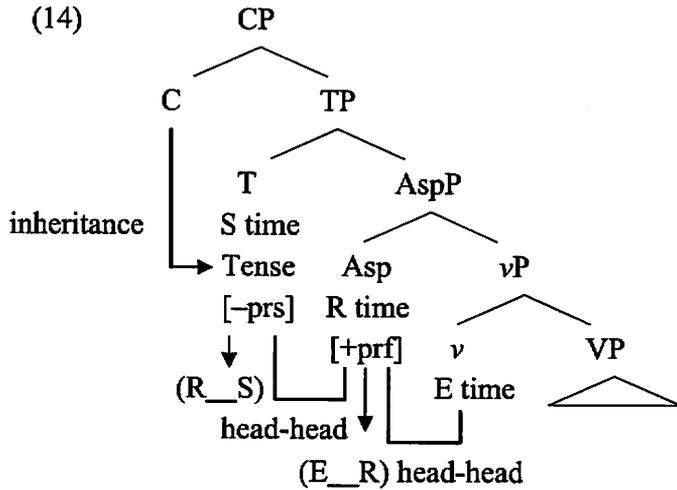


The R time is related to the E time by the head-head relation between the feature [+perfect] and the E time. The semantic information of [+perfect] determines that the R time follows the E time. The S time is related to the R time by the head-head relation between the Tense-feature [+present] inherited by T and the R time. The semantic information of the Tense-feature [+present] determines that the S time is simultaneous with the R time. Given that the S time is simultaneous with the R time and the R time follows the E time, the S time follows the E time by transitivity. Thus, the temporal structure in (13a) is derived and the present perfect in (13b) has this temporal structure.

- (13)a. E__S,R
- b. He has written four detective novels himself.

Finally let us consider the case in which the Tense-feature is [-present] and the feature

in the Asp head is [+perfect]. This is shown in (14).



The feature [+perfect] enters into a head-head relation with the E time, so that the R time is related to the E time. The semantic information of [+perfect] specifies that the R time follows the E time. The Tense-feature [-present] inherited by T enters into a head-head relation with the R time, so that the S time is related to the R time. The semantic information of [-present] specifies that the S time follows the R time. Given that the S time follows the R time and the R time follows the E time, the S time follows the E time by transitivity. The temporal structure is as in (15a) and the past perfect in (15b) has this temporal structure.

(15)a. E_R_S

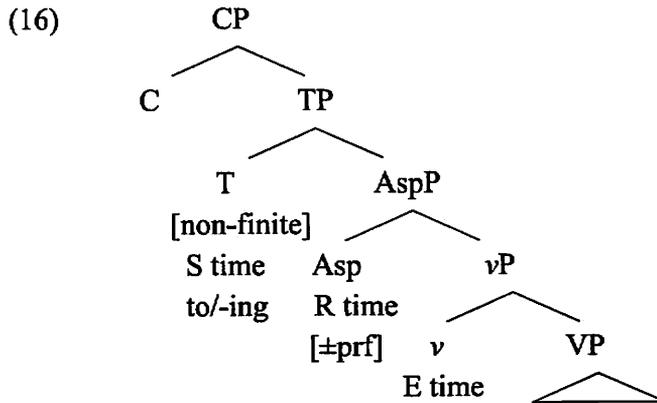
b. She had just gone out when I called at her house.

To summarize what has been argued so far, Tense-feature inheritance must take place. This is because otherwise, the Tense-feature would not be in a head-head relation with the R time, so that the time that the S time is related to would not be determined. This leads to an interpretive crash. Therefore, Tense-feature inheritance must take place.

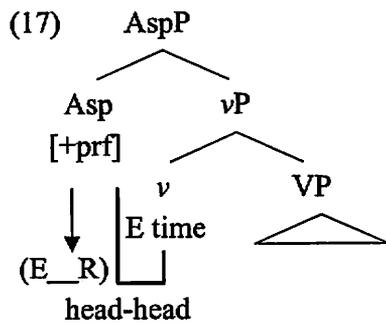
5. Tense in Non-Finite Clauses

So far, we have discussed the temporal order relation of the S time, the R time, and

the E time in finite clauses. Next let us consider temporal interpretation in non-finite clauses. Non-finite clauses are argued to lack the Tense-feature as shown in (16).⁸



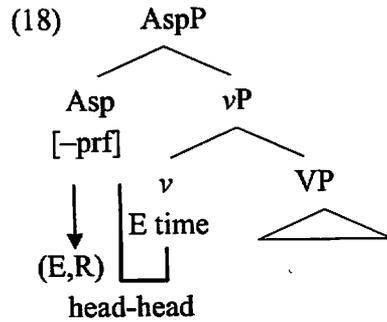
As shown in (16), there is no Tense-feature in non-finite clauses such as *to*-infinitivals and *-ing* clauses, where there is no distinction between past tense and present tense. With this in mind, let us discuss the temporal interpretation in non-finite clauses in detail. First, we consider the temporal order relation between the R time and the E time. As with finite clauses, the feature [+perfect] enters into a head-head relation with the E time, so that the R time is related to the E time. The semantic information of [+perfect] determines that the R time follows the E time. This is shown in (4), repeated here as (17).



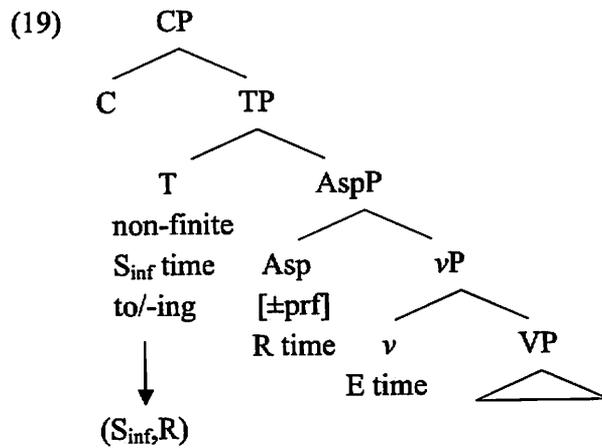
In the case in which the feature in the Asp head is [-perfect], the feature [-perfect] enters into a head-head relation with the E time, so that the R time is related to the E

⁸ Kaneko (1982) argues that infinitives are tenseless.

time. The semantic information of [-perfect] determines that the R time is simultaneous with the E time. This is shown in (5), repeated here as (18).



Next, let us consider the temporal order relation between the S time and the R time.⁹ We assume with Kaneko (2009) and Kaneko and Endo (2001) that the non-finite T head specifies that the S_{inf} time is simultaneous with the R time by default. This is shown in (19).

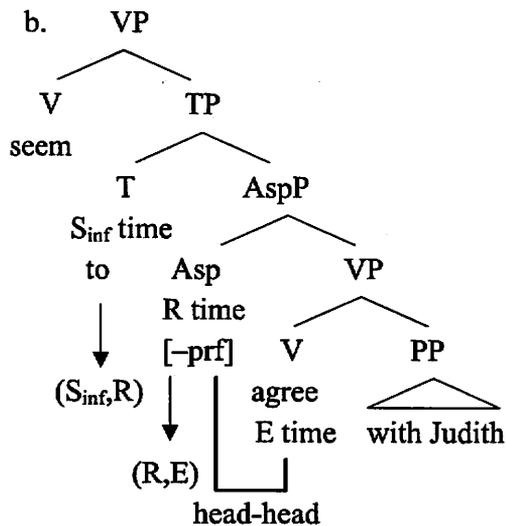


As in (19), the non-finite T head *to/-ing* determines the temporal order relation between the S_{inf} time and the R time. Here, the question comes up of how the S_{inf} time should be

⁹ In what follows we will use the subscript “inf” to refer to the S time of non-finite clauses (i.e. S_{inf} for the S time of non-finite clauses), in order to distinguish the S time of non-finite clauses from the S time of finite clauses.

interpreted. We argue that the S_{inf} time is determined by its relation with the matrix E time. For example, consider the temporal interpretation in the *to*-infinitival clause in (20a).

(20)a. Many women drivers seem [to agree with Judith].



As in (20b), the feature $[-\text{perfect}]$ enters into a head-head relation with the E time and the R time is related to the E time. The R time is simultaneous with the E time because of the semantic information of $[-\text{perfect}]$. The non-finite T head *to* specifies that the S_{inf} time is simultaneous with the R time. By transitivity, the S_{inf} time is simultaneous with the E time. The *to*-infinitival clause is the complement of the matrix verb, so that the S_{inf} time is related to the matrix E time. The matrix verb *seem* specifies that the S_{inf} time is simultaneous with the matrix E time. Then, we get the temporal structure in (21).^{10,11}

¹⁰ In (21), the S_{inf} time is connected with the E_{seem} time by a vertical line, which means that the S_{inf} time is simultaneous with the E_{seem} time.

¹¹ Control verbs such as *hope* take CPs as complements.

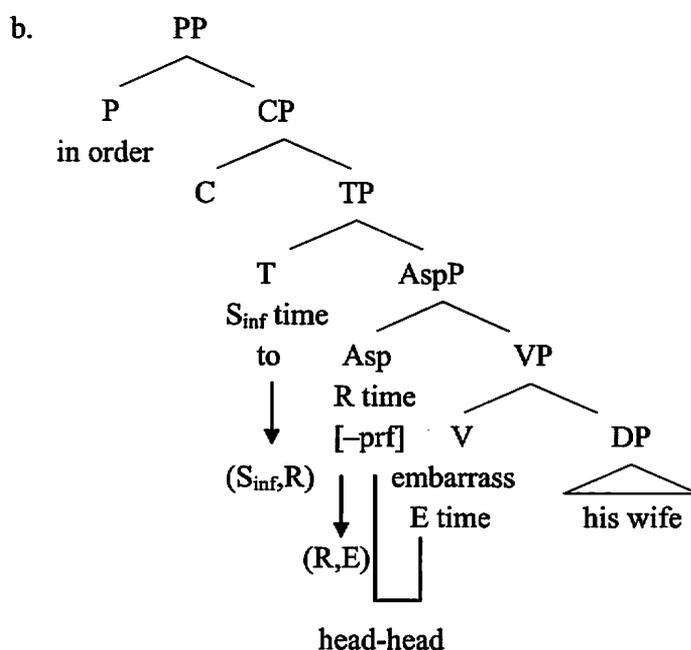
(i) I hope [_{CP} [_{TP} PRO to see you again]].

In (i), TP is not the complement of *hope*. Therefore, the S_{inf} time cannot be related to the matrix E time, which causes an interpretive crash. We leave this problem for future research.

- (21) $E_{\text{seem},R,S}$
 |
 $S_{\text{inf},R,E}$

So far, we have discussed temporal interpretation in non-finite clausal complements. Next, we discuss temporal interpretation in non-finite clausal adjuncts. We argue that the non-finite clausal adjunct *in order*-clause in (22a) has the structure in (22b).

- (22)a. He only mentioned it in order to embarrass his wife.

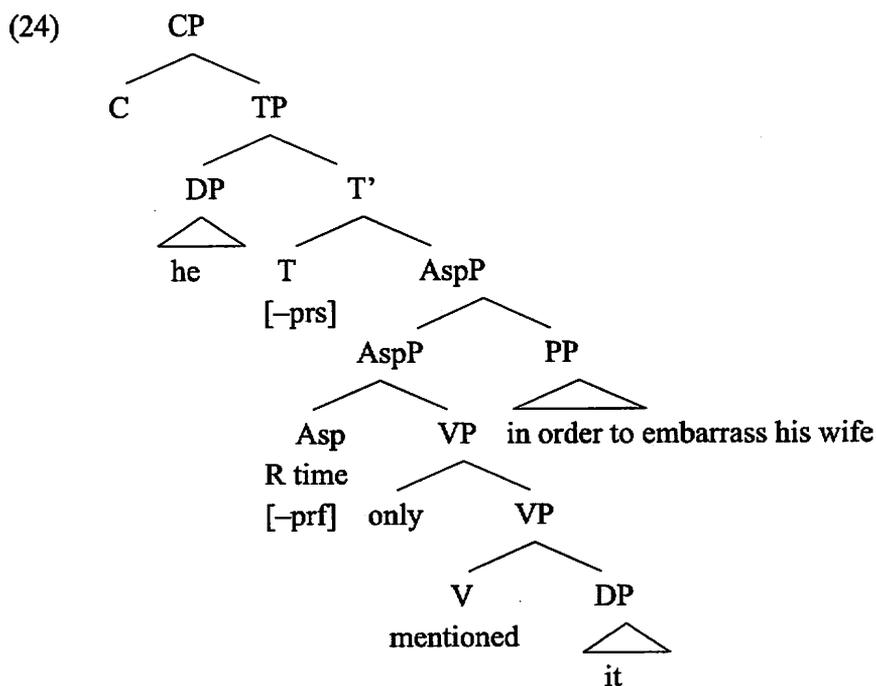


The feature $[-\text{perfect}]$ enters into a head-head relation with the E time, so that the R time is related to the E time. The semantic information of $[-\text{perfect}]$ determines that the R time is simultaneous with the E time. The non-finite T head *to* specifies that the S_{inf} time is simultaneous with the R time by default. By transitivity, the S_{inf} time is simultaneous with the E time. Thus, we get the temporal structure in (23).

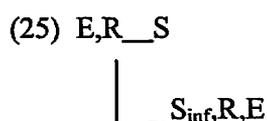
- (23) $S_{\text{inf},R,E}$

There should be the question of how the S_{inf} time is determined. We argue that the S_{inf}

time is determined by its relation with the matrix R time. As shown in (24), the non-finite clausal adjunct adjoins to the matrix AspP, so that the S_{inf} time is related to the matrix R time.



The P head *in order* conveys purpose. This semantic information specifies that the S_{inf} time follows the matrix R time. Then, the temporal structure is as in (25).¹²



To summarize temporal interpretation in non-finite clauses, the S_{inf} time is determined by its relation with the time of the matrix clause: the matrix E time in the case of non-finite clausal complements, or the matrix R time in the case of non-finite

¹² In (25), the S_{inf} time is connected with the matrix R time by an L-shaped line, which means that the S_{inf} time follows the matrix R time.

clausal adjuncts.

4. Conclusion

In this paper, we have argued that inheritance of the Tense-feature is induced by temporal interpretation. The Tense-feature is inherited by T, so that it should be able to enter into a head-head relation with Asp. The temporal order relation between the S time and the R time is determined on the basis of this relation and the semantic information of the Tense-feature. This paper has also dealt with temporal interpretation in non-finite clauses, which are argued to lack the Tense-feature. We have argued that the S_{inf} time is simultaneous with the R time by default, and it is determined by its relation with the matrix R time or E time.

Acknowledgements

This is a revised version of chapter 5 of my doctoral dissertation submitted to Tohoku University. I would like to thank Professor Yoshiaki Kaneko and Professor Etsuro Shima for their invaluable comments and suggestions on earlier versions of this paper. I would also like to thank two anonymous reviewers for very helpful comments. All errors are, of course, my own.

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