# The Syntactic Function of the Auxiliaries of Time

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In Chomsky's *Minimalist Program for Linguistic Theory* (MPLT), movement is constrained by a locality theory on chain-links.[1] Briefly stated, it is assumed that a constituent γ may cross any position β and move to a position α, as long as α and β are equidistant from γ. As Chomsky demonstrates, this locality theory has several highly desirable consequences. However, Chomsky restricts his discussion to examples in the present tense, and at first sight it seems that his proposal does not carry over to the complex tenses. From this, several students have concluded that Chomsky's locality theory should be abandoned (Zwart 1993). In this article, however, we will adopt Chomsky's proposal and investigate the consequences for the description of the perfect tense. Further, we will briefly address the question whether the auxiliaries should be considered as semantically vacuous or not.

1. Equidistance

In MPLT, the derivation of a transitive construction, such as *John ate the meat*, proceeds (either in overt syntax or at LF) as in (1), in which IP is used as an abbreviation of the higher functional projections, TP and Agr_SP, for convenience.

(1) $[_{IP}$ Spec I $[_{AgroP}$ Spec Agr_O $[_{VP}$ Subject V Object]]]
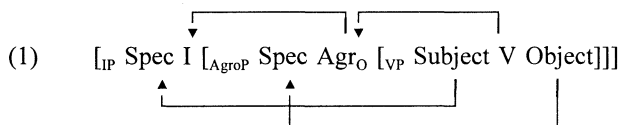
What is relevant for the present discussion is that movement of the subject and the object seems to violate (relativized) minimality, since these movements are cases of A-movement that skip another A-position. Chomsky solves this problem by introducing the notion of equidistance. This solution crucially relies on the assumption that the main verb moves into a functional head higher than Agr_O (in the overt syntax or at LF).

A problem arises if we consider a perfect tense example such as *John has eaten his meat*. It is by no means clear what the structure of this clause should be. For instance, it could be the case that the functional projections are all higher in

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the tree than the auxiliary verb (Zwart 1993). A problem with this assumption is that we are not readily able to account for the fact that the object and the past participle may agree in Φ-features, as in the Italian example in (2).

(2)   Giovanni la ha   accusata
          Giovanni her has   accused(fem.)

Since the Φ-features of the participle must be checked in Agr_O, the participle must move into this head, and hence the Head Movement Constraint will be violated; in fact, since the auxiliary ultimately must be moved into I, this constraint will be violated twice. This is indicated in (3).

(3) $[_{IP}$ ... I $[_{AgroP}$ ... Agr_O $[_{VP}$ ... Aux $[_{VP}$ SU Part OB]]]]

To avoid this, we must assume that at least Agr_OP is lower than the auxiliary verb (Cf. Chomsky 1991:435). However, if the derivation is as given in (4), this would lead to a violation of minimality: movement of the subject into SpecIP (or SpecVP) skips $SpecAgr_OP$, whereas there is no minimal domain that contains both positions.

(4) $[_{IP}$ ... I $[_{VP}$ ... Aux $[_{AgroP}$ ... Agr_O $[_{VP}$ SU Part OB]]]]

An obvious way out would be to assume that Agr_O is adjoined to the higher auxiliary (cf. eg. Den Dikken 1994). As a result, a minimal domain would be created that contains both $SpecAgr_OP$ and SpecVP, so that the subject may move via the latter position into SpecIP. It remains unclear, however, what would trigger movement of Agr_O-to-Aux: presumably, the features of both Agr_O and the participle are checked, and hence movement of Agr_O-to-Aux violates Greed (which states that an operation can only apply if needed for checking the features of the moved element itself). Further, a potential problem may be that the subject of the participle must move through the specifier position of the auxiliary; if the auxiliary is a substantial head, this would imply that the specifiers of ergative verbs may act as an escape hatch for A-movement. It is not clear to us whether this would be a desirable consequence.[2] Finally, the assumption of Agr_O-to-Aux

[2] Apparently, Chomsky (1995:401) wants to exclude this possibility: although he does not exclude the possibility that minimality is satisfied by movement of an element α through a position that satisfies no property of α, he explicitly states that such a position should not be created "by a substitution

would force us to assume an additional process of excorporation in order to allow for stranding of the participle by Aux-to-I (Roberts 1991).

In Kayne (1993), a proposal has been given that involves incorporation of a functional head into the auxiliary. If the Agr_O projection is indeed lower than the auxiliary, Kayne's structure of the perfective construction would be as in (5).

(5)   .. BE $[_{DP}$ ... D/P $[_{AgroP}$ ... Agr_O $[_{VP}$ Subject Part OB]]]

In this structure the D/P head incorporates into BE, thus forming the auxiliary *to have*, and the participle moves into Agr_O. Because of the latter movement, the object may of course raise to $SpecAgr_OP$. Movement of the subject into SpecDP, on the other hand, violates minimality, unless Agr_O incorporates into D/P (or a projection between D/P and Agr_O; see below). However, it is not clear in this case either what would trigger this movement of Agr_O.

Another possibility is to assume that both the auxiliary and the participle are accompanied by the full set of functional projections that occur in the case of a single verb (i.e. Agr_SP, TP, and Agr_OP). In that case, the structure below the auxiliary verb must be as given in (6), where IP indicates Agr_SP and TP again (cf. Kayne 1993, who assumes a D/P projection in addition to these functional heads). Now, if the participle moves via Agr_O to I, the subject may move into SpecIP, which would then act as an escape hatch for the subsequent movement of the subject into the specifier position of the inflectional head associated with the auxiliary.

(6)   ... Aux $[_{IP}$ ... I $[_{AgroP}$ ... Agr_O $[_{VP}$ SU Part OB]]]
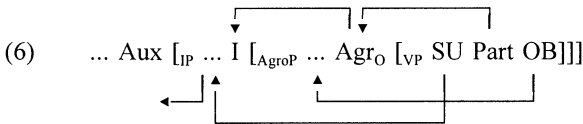
Of course, the participle must move to Agr_O for checking its Φ-features. This implies that the chain (Part,*t*) is formed, and hence that the object may cross SU to reach $SpecAgr_OP$, since both positions are in the minimal domain of (Part,*t*) and therefore equidistant from OB. But can the subject move into SpecIP? Since the Φ-features of the participle are presumably checked (note that the participle does not agree with the subject), further movement of the participle is blocked by Greed. Consequently, if the subject moves to the higher functional projection, it crosses a closer potential target position and minimality is violated.

Note that we will claim in section 2 that accusative Case is not checked in the Agr_OP immediately dominating the projection of the participle but in an Agr_OP above the auxiliary, as in structure (7). If this is correct, (6) would give rise to an additional violation of minimality due to the movement of the object into the

operation that 'creates' a new position, [Spec, K], by raising of α''.

specifier of the higher Agr_OP (cf. fn.5). This means that even if it can be made plausible that the participle contains a Tense-feature (cf. section 4) and hence must move into a functional head that occupies the position of I in (6) (say, T), the structure would still be excluded (cf. the discussion of structure (4)).

Another potential solution would be to assume that a specifier position is not dominated but only contained by the maximal projection of its selecting head, i.e., to assume that all specifiers are adjoined to a maximal projection (Kayne 1994). According to the domain definitions in MPLT, a specifier position would then fall *both* within the minimal domain of the head of the maximal projection it is adjoined to *and* within the minimal domain of the first higher head. In (4), the minimal domain of the chain (Aux,t) would then contain the following specifier positions: SpecIP, SpecVP and $SpecAgr_OP$. Consequently, the subject could move to SpecTP or SpecVP, crossing $SpecAgr_OP$, since all these positions would be equidistant from SU. A serious drawback of this assumption, however, is that as a result of movement of Agr_O to I in (1), all specifiers would be in the minimal domain of (Agr_O,t); consequently, movement of the object to SpecIP can no longer be blocked in (1).
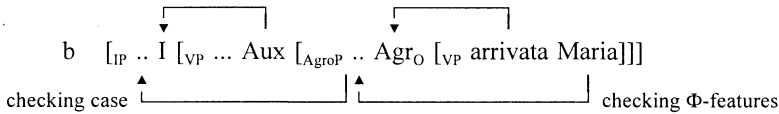
2. The syntactic structure of perfect tense clauses

Before we give our own solution to the locality problem, we like to point out that, according to us, the structure in (4) is still defective. We like to claim that we need an additional Agr_O-projection above the auxiliary as indicated in (7), i.e., we claim that in (7) the Agr_OP1 dominating the auxiliary is needed for checking the Case features of the object (after raising of the auxiliary to Agr_O1), whereas the Agr_OP2 plays a role with respect to the checking of Φ-features only (i.e. agreement of the object and the participle).

(7) $[_{IP} .. I [_{AgroP1} .. Agr_O1 [_{VP} .. Aux [_{AgroP2} .. Agr_O2 [_{VP} SU Part OB]]]]]$

That the role of the lower Agr_O can in principle be restricted to checking of Φ-features is clear from the example in (8a), which contains an ergative verb. The Case features of the internal argument *Maria* are checked in SpecIP, and the movement into $SpecAgr_OP$ is only motivated by the need to check the Φ-features of the past participle. Consequently, in (8b) the only function of Agr_O is to bring about the agreement between the (derived) subject *Maria* and the participle *arrivata*. Note in passing that the NP *Maria* is allowed to skip the specifier position of the auxiliary: after movement of the auxiliary to I, both the specifier of the auxiliary and SpecIP are within the minimal domain of (Aux,t).

(8)   a   Maria è arrivata
            Maria is arrived(fem.)

b $[_{IP}$ .. I $[_{VP}$ ... Aux $[_{AgroP}$ .. Agr_O $[_{VP}$ arrivata Maria]]]

checking case   checking Φ-features

That the Case of *Maria* cannot be checked in SpecAgr$_O$P is rather uncontroversial since we are dealing with an ergative verb in (8).[3] However, what we would like to claim is that the past participle of a transitive verb is not able to check the Case features of its object either, but that the auxiliary that is associated with the transitive verb (*avere* in Italian and *hebben* in Dutch) is able to do so, i.e., we suggest that the assumption that passive participles are not able to assign Case (cf. Den Besten 1981) should be extended to *all* participles (cf. Hoekstra 1984/94a,b).

That auxiliaries such as *avere* have Case-assigning properties is extensively discussed in Broekhuis and Cornips (1994) by means of the Dutch auxiliary *hebben*. Here, we will restrict our discussion to one set of examples. As is well-known, stative verbs such as *staan* 'to stand' can be used as (or are) ergatives: this is evident from the fact that in (9a) the nominative NP *het raam* acts as the subject of the Small Clause predicate *open* (cf. e.g. Mulder and Wehrmann 1989 for further discussion). As is illustrated in (9b), the construction in (9a) does not have a transitive counterpart. However, if we add the verb *hebben* to (9b), as in (9c), the resulting structure is completely well-formed.

(9) a Het raam$_i$ staat $[_{SC}$ t_i open]
        the window   stands   open
        'The window is open'
     b *Jan staat $[_{SC}$ het raam open]
     c Jan heeft $[_{SC}$ het raam open] staan

Since the NP *het raam* appears as the object in (9c), it must have been assigned Case by the verb *hebben*, the ergative verb *staan* being unable to assign structural Case. This shows that, in principle, the auxiliary verb *hebben* is able to assign accusative Case.[4]

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[3] Note that (8a) is a serious problem for the assumption in Zwart (1993) that Case is not checked by the verb (after movement into Agr), but by the Agr-head itself. If this is true, we would expect that the Case of *Maria* can be checked in SpecAgr$_O$P and, consequently, that there is no trigger for the additional movent into SpecIP in (8b). This would lead to postulating a functional head different from Agr$_O$ in (8b), which, we believe, is only a way of concealing the problem.

[4] Note that *staan* really acts as a verb in (9c), since it appears after the auxiliary *hebben* in clause-final position, *dat Jan het raam open heeft staan*, an option not available to predicates of other categorial types. The construction in (9c) seems to be possible with some unergative verbs, too: *Zijn studenten werken aan dat onderwerp* vs. *?Hij heeft zijn studenten aan dat onderwerp werken* '(he has) his students work on that topic'. Note in passing that (9c) does not express (inalienable) possession (cf. Broekhuis and Cornips 1994).

Of course, the assumption of the additional Agr_O projection in (7) does not solve the locality problem. As before, the participle moves to Agr_O2 to check its Φ-features, and movement of the object to $SpecAgr_OP2$ is consequently allowed for the same reason as in (4); after raising of Part to Agr_O2, SU and $SpecAgr_OP2$ are equidistant from OB. Movement of the subject to SpecIP (or the specifier of the higher VP for that matter), however, is still blocked, in spite of the fact that the auxiliary moves into I. The minimal domain of the chain thus formed does not contain $SpecAgr_OP2$, which is therefore a closer potential target position for the subject. Consequently, movement of the subject to SpecIP violates minimality.

Therefore, if we want to maintain the Chomsky's locality theory, we are forced to conclude that the subject cannot be generated within the projection of the participle. Consequently, the only remaining possibility is that the subject is generated within the projection of the auxiliary, as in (10).[5]

(10) $[_{IP} .. I [_{AgroP1} .. Agr_O1 [_{VP} SU Aux [_{AgroP2} .. Agr_O2 [_{VP} Part OB]]]]]$

Note in this connection that the verb *hebben* in (9c) is able to select an argument, too; given the ungrammaticality of (9b), the NP *Jan* in (9c) is clearly not an argument of the verb *staan*.[6]

If we accept the structure in (10), the desired derivation comes within reach. Again, Part raises to Agr_O2, and the object may move into $SpecAgr_OP$ as before; in this position the Φ-features of the participle and the object are checked. Since the Case features of the object still must be checked, the object must subsequently

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[5] If the subject is always generated in the specifier position of the auxiliary verb, we immediately account for the fact that the past participle does not show agreement with the subject of an unergative verb. That the subject is (or may be) generated in a position higher than the (lower) Agr_O is also suggested in Kayne (1993). For the sake of argument, assume that this higher position is the specifier position of DP in (5): ... *BE $[_{DP}$ Subject D/P $[_{AgroP}$ ... Agr_O $[_{VP}$ Part OB]]]*. However, since Kayne assumes that the subject is moved into the specifier position of the auxiliary, movement of the object into the specifier of the Agr-projection above the auxiliary would violate minimality, since this movement from the lower $SpecAgr_OP$ into the higher one would cross the base position of the subject, whereas there is no minimal domain that contains the latter two (unless we would assume that the projection of the auxiliary and D/P are reanalysed as a single projection as the result of D/P incorporation, which would make the structure in (i) essentially similar to the one given in (10)); this problem would also arise (as has already been indicated in the discussion below example (6)) if there is an additional Agr_S between D/P and Agr_O in (i).

[6] Due to space limitations, we cannot discuss Hoekstra (1994b), in which a structure has been proposed with, in certain respects, similar properties as the one in (10). In passing, note that we assume that the object is the internal argument of the participle. If we further assume that the object is an external argument in the case of an adjective, we immediately account for the difference in word order between the perfect and the adjective constructions in (i), since movement into $SpecAgr_oP$ does not apply overtly in English.

(i)   a John has cut his hair.   (perfect tense)
       b John has his hair cut.   (adjective construction)

move into $SpecAgr_O P1$, crossing SU. After raising of Aux to $Agr_O 1$, the chain (Aux, t) is formed. Since the minimal domain of the chain (Aux, t) contains both $SpecAgr_O P1$ and SU, these positions are equidistant of $SpecAgr_O P2$, and as a result the object may move into the first position without violating minimality. The subject must move into SpecIP, crossing $SpecAgr_O P1$, for checking its Case and Φ-features. Since $Agr_O 1$ raises to I for checking the features of the auxiliary, a minimal domain is formed that contains both SpecIP and $SpecAgr_O P1$, which are therefore equidistant from SU. Hence, the subject may move into the first position without violating minimality. This derivation, which is represented in (11), is therefore in accordance with minimality.

(11) $[_{IP} .. I [_{AgroP1} .. Agr_O 1 [_{VP} SU Aux [_{AgroP2} .. Agr_O 2 [_{VP} Part OB]]]]]$

3. The auxiliary zijn: ergative verbs and passive

In section 2, we gave an new analysis of perfect tense clauses. This analysis involves the assumptions in (12) and (13). The properties in (12i,ii) and (13i,ii), of which the latter have been independently motivated by means of the examples in (9), are of course in full accordance with Burzio's Generalization, which interrelates the assignment of an external Θ-role and Case-licensing of an internal argument.

(12) i   Participles have no Case-assigning properties.
      ii   Participles have no external argument.
      iii Participles are associated with one Agr-head.

(13) i   The auxiliary *hebben* assigns accusative case.
      ii   The auxiliary *hebben* takes an external argument.
      iii The auxiliary *hebben* is associated with a full set of functional heads.

The properties in (12iii) and (13iii) are also interrelated: according to (12iii), a participle is able to check the V-features of one Agr-head only, and consequently another verb must be inserted in order to check the V-features of the remaining functional heads in order to arrive at a converging derivation. Therefore, it does not come as a surprise that, besides the auxiliary *hebben*, an auxiliary can be found that lacks the properties in (13i,ii), but has the property in (13iii), e.g. *zijn* in Dutch. This auxiliary is used if the participle is derived from an ergative verb: *zijn* does not assign Case then, since the Case of the subject is checked by Tense

in SpecAgr$_S$P. If Burzio's Generalization is correct, it would follow that *zijn* does not take an external argument either. Given the fact that the internal argument of the participle can be moved into SpecIP without violating minimality (cf. (8)), this causes no specific problem. The properties of *zijn* are given in (14).

(14) i   The auxiliary *zijn* does not assign accusative case.
      ii   The auxiliary *zijn* has no external argument.
      iii The auxiliary *zijn* is associated with a full set of functional heads.

If the characterizations in (12)-(14) are correct, this possibly also gives us a new understanding of passive formation. Take auxiliary selection to be free. If this is really the case, the auxiliary in a structure such as (15), in which the participle is derived from a transitive verb, can be either *hebben* or *zijn*.

(15)   ... Aux [$_{AgroP}$ OB$_i$ Agr$_O$ [Part t$_i$]]

In the former case, an additional argument is added and the internal argument can be assigned accusative Case. In the latter case, no argument is added and the internal argument of the participle moves into SpecIP in order to get its Case checked. This would amount to deriving passive formation on minimal assumptions.

4. Are the auxiliaries of time "semantically vacuous"?

In MPLT, it is suggested that the time auxiliaries are semantically vacuous and that this accounts for the fact that auxiliary (but not main) verbs must be raised to Agr$_S$ in overt syntax in English. If it could be shown that listing the syntactic properties of the auxiliaries in (13)/(14) is sufficient to fully characterize these auxiliaries, this would amount to giving a more precise formulation of the notion of semantic vacuity (although it probably differs from what Chomsky has in mind). This would certainly be desirable from a minimalist point of view, since the insertion of the auxiliaries would then be motivated by the need to arrive at a converging derivation only. However, the intuition that auxiliaries are semantically vacuous is not shared by everyone. Hornstein (1990), for example, claims that the auxiliaries are responsible for the perfective meaning of the perfect tense. In this section, we will address the question whether Chomsky's or Hornstein's intuition can be upheld, and we will arrive at the conclusion that, at the present state of the art, an unequivocal answer cannot be given yet. We start with a brief discussion of some aspects of Hornstein's version of Reichenbach's (1947) tense theory on the basis of some simple Dutch data.

English and Dutch have six basic tenses, which can be described by means of Reichenbach's trivalent system that distinguishes the three moments E(vent time),

R(eference time) and S(peech time). These tenses fall apart into two groups. Present and past tense (16a,b) are expressed by means of a morphological tense marking on the finite verb, whereas the remaining tenses (16c–e) are expressed by means of a periphrastic verb construction: in Dutch, the perfect/future tense is expressed by means of the auxiliaries *hebben/zijn* and *zullen*, respectively.

(16) a present: S,R,E
     b past: E,R__S
     c perfect: E__S,R
     d past perfect: E__R__S
     e future: S__R,E
     f future perfect: S__E__R; S,E__R; E__S__R

According to Hornstein (1990), the representations in (16) must not be considered as primitives, but are derived from the more basic relations between S and R in (17a), on the one hand, and R and E in (17b), on the other. The dissociation of these two relations indicates that the marking as (im)perfect is independent of the remaining tense markings. Consequently, a more proper characterization of the six basic tenses is as given in (18).

(17) a i   present: S and R are associated (S,R)
        ii   past: R precedes S (R__S)
        iii future: R follows S (S__R)
     b i   imperfect: R and E are associated (R,E)
        ii   perfect: E precedes R (E__R)

(18) a present: (S,R) ∧ (R,E)   b past: (R__S) ∧ (E,R)
     c perfect: (S,R) ∧ (E__R)   d past perfect: (R__S) ∧ (E__R)
     e future: (S__R) ∧ (R,E)   f future perfect: (S__R) ∧ (E__R)

Hornstein (1990:111ff.) further claims that the computation of the tense of a given clause consists of a mapping from morphemes to tenses, and provides the following rules ((19b) is slightly adapted in order to account for Dutch which has two time auxiliaries).

(19) a i   present morpheme: associate S and R: S,R
        ii   past morpheme: R removed to the left of S: R__S
        iii future morpheme: R removed to the right of S: S__R
     b i   +*hebben*/+*zijn*: E removed to the left of R: E__R
        ii   −*hebben*/−*zijn*: E and R associated: E,R or R,E

The rules in (19b), according to which the auxiliary *hebben/zijn* is responsible for the perfective interpretation of the perfect tense, are crucial for the present

discussion. These rules can however be replaced by those in (20), which attribute the perfective meaning not to the auxiliary, but to the participle itself.

(20)   i   +participle: E removed to the left of R: E__ R
         ii   −participle: E and R associated: E,R or R,E

With respect to the six basic tenses in (16), the rules in (19b) and (20) make the same predictions, since the set of examples that contain the auxiliary *hebben/zijn* is the same as the set of examples that contain a participle.

    Some evidence in favor of the rules in (20) is provided by attributively used participles in NPs such as *het gelezen boek*; (20i) immediately accounts for the fact that, although no auxiliary is present within the NP, the past participle can only be paraphrased by means of a relative clause in the perfect tense, i.e. 'the book that someone has read' and *not* 'the book that someone is reading'. Assume that the structure of *het gelezen boek* is as indicated in (21), in which *PRO* is the internal argument of the participle.

(21)   het [$_{NP}$ [$_{AgroP}$ Spec Agr [$_{VP}$ gelezen PRO]] boek]

    The fact that the auxiliary must be absent in (21) follows from our proposal under the assumption that *PRO* has no (structural) Case features: movement of *PRO* into SpecAgrP and of the participle into Agr would then suffice for checking of the relevant features (thus accounting for agreement between the participle and the controller of *PRO*), and insertion of an auxiliary is superfluous and therefore excluded. Similar evidence in favor of (20) is perhaps provided by the reduced supplementive clause in (22a), which can only be paraphrased by means of a perfective adjunct clause. If we assume that the structure of the reduced clause is as indicated in (22b), a similar argumentation as in the case of the attributive participle can be given.[7]

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[7] If the direct object is phonetically realized in a reduced supplementive clause, as in (i), the auxiliary *hebben* is obligatorily present, which is of course motivated by the need to check the object's Case. These examples, which are only used in written language and have an archaic flavour, pose several additional problems for the present proposal that need more careful investigation.
(i)   [dit gelezen   *(hebbende)]   zijn we tot de   conclusie   gekomen dat ...
      this read   having   are we at the   conclusion   arrived that ...
      'Having read this, we arrived at the conclusion that ...'
In some constructions, the presence of the auxiliary depends on the relative position of the NP and the participle: the auxiliary is only present, if the first precedes the latter (Marcel den Dikken, p.c). Probably, this is due to a reinterpretation of the participle as a preposition or a conjunction, an assumption which is supported by the fact that various present-day prepositions are participles from a diachronic point of view (Komen 1994), and the fact that an NP that follows the participle can occasionally be assigned nominative case, cf. *Iedereen kwam, uitgezonderd hij*$_{nom.}$/*hem*$_{obj.}$ 'Everyone came, except for him'.

(22) a   Gelezen   geef ik   de krant   altijd   aan mijn buurman
         read$_{part.}$ give I   the daily always to my neighbour
         'When I have read it, I always give the daily to my neighbour'
         not: 'When I am reading it, I always give the daily to my neighbour'
     b   [$_{AgroP}$ Spec Agr [$_{VP}$ gelezen PRO]] geef ...

However, other instances of the same construction provide evidence against
the rules in (20): the reduced clause in (23), for example, can only be paraphrased
by means of a durative, passive adjunct clause.

(23)   Voorgedragen   is dit gedicht indrukwekkend
         prt.-recited   is this poem   impressive
         'If it is recited, this poem is impressive'
         not: 'If it has been recited, this poem is impressive'

In fact, this problem is more general. If, as we suggested in section 3, the
perfective and the passive construction arise form a different selection of the
auxiliary, (20) would predict that all passive constructions are perfective in nature.
Of course, this is not true. In Dutch, for instance, the perfective interpretation is
clearly brought about by the passive auxiliary *zijn* 'to have-been'; if *worden* 'to
be' is used, the construction receives a durative interpretation. This clearly
provides evidence in favor of (19b), unless we would be willing to assume that
the past and passive participle differ in meaning.
    Another piece of evidence that possibly provides evidence in favor of the
rules in (19b) is provided by the Dutch constructions in (24), in which the verb
that is directly dependent on the auxiliary does not show up as a participle but as
an infinitive (*Infinitivus-Pro-Participio*).

(24)   dat   Jan zijn huis   heeft moeten verkopen
         that Jan his house   has   had-to sell
         'that Jan has had to sell his house'

Despite the fact that there is no participle, this example has clearly a perfective
meaning. This would be accounted for immediately if the rules in (19b) are
correct, whereas it must be assumed that the infinitive is in fact a concealed
participle if the rules in (20) are accepted.
    From the discussion above, it will be clear that neither Chomsky's intuition that
the auxiliaries are semantically vacuous, nor Hornstein's claim that the auxiliary
of time expresses perfectivity is fully supported by the facts: the facts in (21) and
(22), if interpreted correctly, provide clear counter-evidence against Hornstein; the
facts in (23) and (24) are problematic for Chomsky, unless we are willing to
accept (i) that the passive and the past participle differ in meaning and (ii) that the
Infinitivus-Pro-Participio construction contains a concealed participle.

5. Conclusion

In this article, we argued that the auxiliaries of time are needed in the perfect tense in order to arrive at a converging derivation. From a minimalist point of view, it would be attractive if the insertion of the auxiliaries is only motivated by that, i.e. that the auxiliaries do not contribute to the meaning of the clause. At the present state of the art, however, it is not clear whether assuming this is tenable.

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