AN INCORPORATION ANALYSIS REVISITED

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The syntactic behaviour of a number of constructions in Catalan involving an
auxiliary and either a participle or an infinitive indicates that the two elements are
very tightly knit, they behave as a unit. Following Baker's (1988) incorporation
proposal, this mechanism was proposed for the Catalan verbal sequences that display
a unit-like behaviour (Llinàs (1990)). However, Kayne's (1993) theory, where phrase
markers determine linear ordering, may seem to imply that movement of the sort
posited for the Catalan verbal sequences is ruled out. More specifically, Kayne's
theory imposes restrictions on the direction of adjunction. In this article we briefly
review the incorporation proposal and reconsider it taking into account Kayne
(1993). We conclude that despite the fact that the type of phrase marker posited for
these verbal sequences does not determine the order of the terminal symbols it
contains, it is a permitted phrase marker because it carries information of nodes
below the zero level.

0.   Introduction

The aim of this article is to re-examine the explanation of the syntactic behaviour of two
elements which have been analysed as a result of the process of incorporation (Llinàs (1990)) in
the light of an apparently problematic prediction made by Kayne (1993). If incorporation is
regarded as the adjunction of a head to another head, certain serious problems arise which
should make us reconsider the adequacy of such an analysis for these sequences. Nevertheless,
if we take Robert's (1991) proposal of making a distinction between types of incorporation, the
analysis need not be invalidated. In section 1 we briefly review the incorporation analysis; in
section 2 we look at the sequences in more detail following Roberts (1991); in section 3 we

consider Kayne's (1993) proposal and his predictions for right adjunction and we review the structure proposed for the sequences in the light of Kayne's theory; in section 4 we consider alternative analyses for these sequences; and, in section 5, we conclude that Kayne's theory should be maintained for zero projections, but not for subhead structure.

1. The Sequences as the Result of Incorporation

Catalan verbal sequences of the kind illustrated in (1) and (2) behave like a unit in many respects.

(1)   La   seva   filla   **ha**   **aprovat**   l'examen.

          the   her   daughter   has   passed   the-exam

          'Her daughter has passed the exam.'

(2)   La   seva   filla   **va**   **aprovar**   l'examen.

          the   her   daughter   PAST   pass   the-exam

          'Her daughter passed the exam.'

The sequences in (1) and (2), from now on *ha/va* sequences[1], do not allow interruption —(3)— nor the application of any movement processes —(4), and (5).

(3)   a.   *La   seva   filla   **ha**   sempre   **aprovat**   els exàmens.

              the   her   daughter   has   always   passed   the exams

              'Her daughter always passed the exams.'

     b.   *La   seva   filla   **va**   no   **aprovar**   l'examen.

              the   her   daughter   PAST   not   pass   the-exam
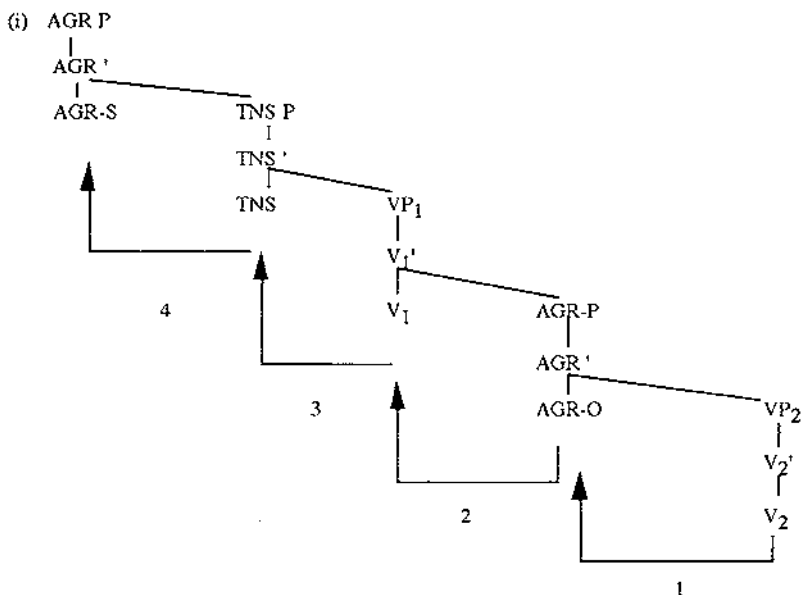
              'Her daughter did not pass the exam.'

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[1] Note, though, that this behaviour is also true of epistemic modal sequences, for ex. *La Maria **deu saber** moltes coses* 'Maria must know many things'. See Llinàs (1991).
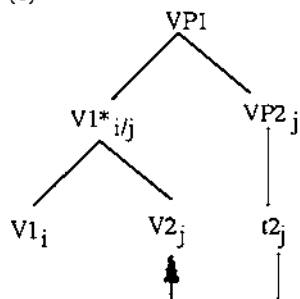
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(4) a. ***Aprovat** l'examen sí   que **ha** la   seva filla.

passed   the-exam yes   that has the   her   daughter

'Her daughter does have passed the exam.'

b. ***Aprovar** l'examen   no   **va**   la seva filla,   però aprendre molt sí.

pass   the-exam   not PAST   the her daughter, but learn   much yes

'Her daughter did not pass the exam, but she did learn a lot.'

(5) a. ***Ha** la   seva filla   **aprovat** l'examen?

has   the   her   daughter passed   the-exam

'Has her daughter passed the exam?'

b. ***Va**   la   seva filla   **aprovar** l'examen?

PAST   the   her   daughter pass   the-exam

'Did her daughter pass the exam?'

Given the close relation between the two verbal elements, the proposed analysis was the incoporation of the participle — V2— onto the auxiliary — V1—, as in the following structure:[2]

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[2] (6) is a simplified version of the more adequate structure:

(i) AGR P

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(6)

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                    VP1
                   /    \
                  /      \
            V1*_{i/j}      VP2_j
             /   \          |
            /     \         |
          V1_i    V2_j      t2_j
                   ↑_____|
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Incorporation of the participle to the auxiliary explains the cohesion of the two elements; once they have incorporated they behave like a head in almost all respects, as (3), (4) and (5) show.[3] The head behaviour of two originally independent heads is explained by a syntactic process that does not lead to the total morphological amalgamation of the two elements.[4] Note that if the

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Steps 1 and 2 have been omitted because they are not relevant to the process examined here; i.e., the right adjunction of V2 to V1. V2+Agr-O moves up to V1 as a unit, anyway. Steps 3 and 4 have been omitted again because they are not directly relevant to the issue of the article and, moreover, V1+V2 move up to higher nodes together, as a unit . Examples (5a,b) show that V1 alone cannot move up to other nodes. The issue of whether V1 is a functional category or a lexical category is not relevant to the essential idea explained here. We leave this issue open. Also, note that an objection to a structure like (i) on the basis of its violating the Structure Preserving Principle implies a misconception of the nature of functional nodes Agr and Tns. These contain the same type of information as V1, as they trigger incorporation obligatorily (see Roberts (1991)) and, therefore, must be claimed to be X^{-1}.

[3] In certain dialects of Catalan there is an element which intervenes between V1 and V2, *pas*: *La Maria no ha* pas *aprovat l'examen* 'Maria has not passed the exam'. There are also a few emphatic monosyllabic adverbs which may also occasionally intervene. Some alternative explanations are available: intervening elements are infixes; intervening elements are heads of other functional projections through which V1+V2 must move, and a morphological reorganization of elements occurs; incorporation is not obligatory in these cases. Leaving this issue open, we must nevertheless account for the facts in (3)-(5), which represent cases of strong ungrammaticality for all Catalan speakers.

[4] The future tense in Catalan is a clear instance of incorporation leading to a totally fused head: *fer + he = faré* 'make + have = will make'. Notice that in this case incorporation of the infinitival form is to the left of the auxiliary, unlike the sequences we are considering.

mechanism is adjunction, as in any head-to-head movement, here it is adjunction to the right departing from other head-to-head processes. In previous frameworks there were no restrictions on the direction of adjunction, but this is a problem for Kayne (1993). We consider this in sections 3 and 5.

2. Types of Incorporation and Types of Affixes

In the preceding analysis, the first verbal element of the sequence behaves like an inflectional affix, triggering the movement of V2. However, unlike all other inflectional affixes in the language it occurs before the host it is linked to, V2, and it never totally amalgamates with it. These properties may be captured and explained by referring to Roberts (1991), as in Llinàs (1991). This work analyses the *ha/va* sequences as a case of substitution incorporation as opposed to adjunction incorporation. Adjunction incorporation structures (as in clitic climbing structures) have the properties of not being obligatory, of allowing excorporation (the movement out of the incorporated constituent), and of resulting in an amalgamated constituent. In substitution incorporation structures (as in V-to-I) there is a structural slot created for the incorporated element as a result of the subcategorization frame of the affix, and this involves substitution instead of a proper adjunction. The movement is required by the subcategorization frame, and there is total amalgamation. The status of the incorporation trigger as a head disallows movement out of the complex unit after incorporation, by minimality. Note that the Catalan sequence has the properties of substitution incorporation —obligatory nature, no excorporation—, except that the affix and the incorporated verb never wholly amalgamate. In Llinàs (1991) we predict this possibility by proposing that there are different types of affixes, which follow from the combination of two features: [±syntactic] and [±morphological]. A positive specification for the feature *syntactic* implies that the affix triggers incorporation, and a positive specification of the feature *morphological* implies that the affix and its host amalgamate. The possible combinations are:

(7)   syntactic   morphological

(a)   +   +

(b)   +   –

(c)   –   +

(d)   –   –

(7a) is the case of V-to-I amalgamated structures, (7b) is the case of the Catalan *ha/va*

sequences, (7d) are neither morphological nor syntactically relevant affixes (maybe LF affixes)

and (7c) are non-syntactically relevant affixes (derivational affixes). The Catalan *ha/va* affixes

trigger incorporation as a result of their morphological subcategorization, as shown in (8). We

will thus claim that what makes incorporation of V2 to V1 *obligatory* is the type of information

contained in V1 and the application of the *Stray Affix Filter* (Baker (1988)):

(8)
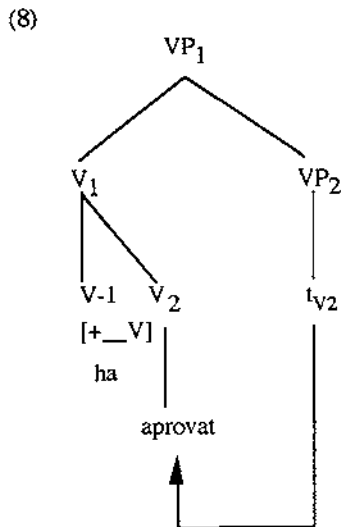
3.   Kayne (1993) and Predictions on Incorporation

Kayne (1993) presents a theory in which linear ordering is totally determined by phrase

structure by positing that asymmetric c-command of non-terminal nodes matches linear ordering

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of terminals in that it is also locally linear and, thus, it has the properties of totality, transitivity and antisymmetry.[5] The linear ordering of terminals is established by a Linear Correspondence Axiom (LCA), which states that d(A) is a linear ordering of T, where A is the maximal set of ordered pairs (X_j, Y_j) such that for each j X_j asymmetrically c-commands Y_j for a given phrase marker P with T the set of terminals. A phrase marker is admissible if it has a d(A) where transitivity holds, antisymmetry is respected and it is total so that its linear ordering is specified. The linear ordering of terminal symbols in (9) is established as follows:
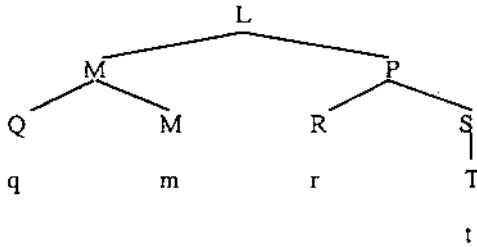
(9)
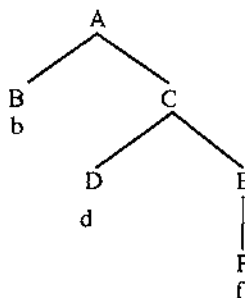
Set A in this phrase marker is (B,D), (B,E), (B,F), (D,F) and its d(A) is (b,d), (b,f), (d,f). Its linear ordering is established as (b,d,f) as the three properties (transitivity, totality and antisymmetry) hold.

With these notions, Kayne derives the constructions allowed by X' theory, including adjunction. Adjunction in his proposal always necessarily results in the precedence of the adjoined element. Take (10) as an example, corresponding to Kayne's structure (16):

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[5] Transitivity : xLy & yLz —> xLz; totality : it must cover all members of the set (for all distinct x, y, either xLy or yLx); antisymmetry: not (xLy & yLx).

(10)

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              L
       _____/ _____
      M               P
     / \             / \
    Q   M           R   S
                        |
    q   m           r   T
                        |
                        t
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Consider only the adjunction part of this phrase marker. In order to establish the linear order of the terminal symbols we must first note that Kayne's definition of c-command voids segments of the ability to c-command:

(11)   X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X also dominates Y.

By virtue of the fact that the adjoined head Q asymmetrically c-commands the category M —M is a segment and does not exclude Q—, the linear ordering of the two elements is established: the terminal node dominated by Q will precede the terminal node dominated by M. Note that if we invert the order of Q and M, problems arise for the LCA:
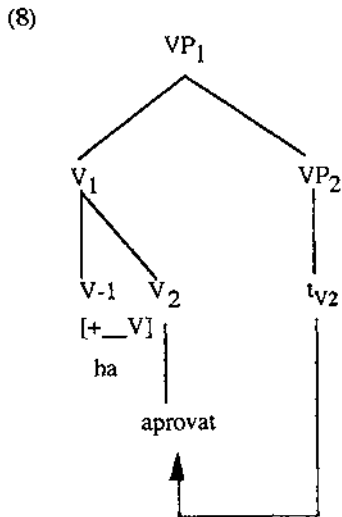
(12)

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        M
       / \
      M   Q

      m   q
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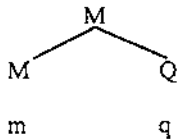
In structure (12), Q asymmetrically c-commands M —again, M is a segment and it does not exclude Q—, hence, the order predicted is (q, m). Therefore, even if elements right adjoin, "... the present theory has the necessary consequence that an adjoining head will invariably precede the head it adjoins to" (Kayne (1993:27)). In other words, we cannot use right adjunction to derive a specific surface order.

If we consider structure (6) again, repeated here, we are left with an impossible structure for a desired order, the adjoining element (V2) asymmetrically c-commands V1 —as Q does in (12)—and the predicted surface order is *aprovat ha* , *aprovar va*.

(6)

```
                VP1
              /     \
        V1*ᵢ/ⱼ       VP2ⱼ
        /    \         |
     V1ᵢ     V2ⱼ      t2ⱼ
              ▲_____|
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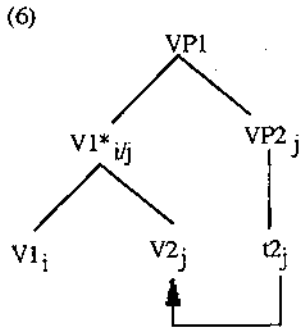
Considering the more detailed incorporation structure (8), also repeated here, the prediction is somewhat different:

(8)

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              VP₁
            /     \
         V₁        VP₂
        /  \        |
     V-1   V₂      tᵥ2
    [+__V]  |        |
      ha    |        |
         aprovat     |
           ▲_____|
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In a structure such as this, the Linear Correspondence Axiom does not specify a linear ordering for V1 and V2. Notice that here, V2 cannot be claimed to asymmetrically c-command V1 —as

In a structure such as this, the Linear Correspondence Axiom does not specify a linear ordering for V1 and V2. Notice that here, V2 cannot be claimed to asymmetrically c-command V1 —as in (6)— because the non-terminal node which dominates *halva* is V^{-1}. There are no segments —recall that this is a substitution incorporation structure where a structural slot is created for the incorporated element. If we grant V^{-1} the ability to c-command, V^{-1} and V2 mutually c-command each other. If Kayne's LCA should apply here, a phrase marker of this type would be predicted inadmissible as the antisymmetry condition fails to hold for the $(V^{-1}, V2)$ pair, and thus, the d(A) fails to be total as it does not cover all the members of the set.

Therefore, unless we find an alternative analysis for the *halva* sequences, we will have to allow for the different status of these sequences with respect to the LCA.

4. Are There Plausible Alternative Analyses to the *halva* Sequence?

Before we consider other alternative analyses, we should say something about the possibility of analysing the *halva* sequences as the left adjunction of V1 to V2. In order to claim this we would have to say that the auxiliary is generated under the participle or infinitival. This is undesirable for several reasons: (a) V1 has scope over V2; (b) V1 selects the form of V2 and this is expressed by a head-complement structure; and (c) the thematic core of the proposition is in VP, headed by the main verb and all other (functional) nodes dominate it. Although we have left this issue open, in the structures considered V1 has many of the properties of functional nodes —it belongs to a closed set, it has an affix status, it does not have descriptive content, it has a non-argument complement—, so it may plausibly be analysed as a functional node, therefore, dominating VP2. Hence, any alternative analyses based on the left adjunction of the auxiliary onto the participle from a lower position are ruled out.

At first sight, Kayne's (1991) explanation for infinitive-clitic structures, as in (13) —his example (3)—, could be taken as a comparable mechanism:

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(13) Parlargli   sarebbe   un   errore.

speak-him(DAT)   be-COND   a   mistake

'Speaking to him would be a mistake.'

Here, apparently, a clitic has adjoined to the right of an infinitive, but Kayne proposes a more complex structure: the infinitive adjoins to a T' node skipping the Tns node below it, and the clitic moves up and left adjoins to the Tns node. To justify this movement Kayne notes that infinitives need not move through Infl as they do not need to pick up affixes (a suggestion made by E. Torrego), and with this proposal, he maintains his claim that clitics always adjoin to functional nodes. What he does is avoid a case of right adjunction by positing that the element that occurs to the right, the clitic, really is left adjoined to a lower node.

If we were to find an equivalent structure for the *ha/va* sequences, we would have to claim that the element that we have analysed as right adjoining to the V1 really left adjoins to a lower node. Two possibilities arise: (a) we may claim that the participle (and the infinitive) left adjoins to the Agr-O node dominating VP2[6] or (b) we could claim that V2 left adjoins to the trace of V1, V1 having moved up to a higher functional node. Both options predict the linear ordering as in both options for the pair (V1, V2) asymmetric c-command holds, and although (b) predicts that for the pair (V2, t_{V1}) the terminal under V2 should precede the trace, its lack of phonetic content makes it unproblematic. Despite these predictions there is a fundamental problem to this solution: none of these two options predict precisely what the incorporation proposal explained, the unit-like behaviour of V1 and V2.

This undesirable result is also obtained if we claim that there is no movement at all and propose an *ad hoc* reanalysis of V1 and V2. What is the trigger of reanalysis? We have claimed that the trigger of incorporation is the subcategorization frame of V1, which is hardly objectionable, but claiming that reanalysis is triggered by an equivalent mechanism is more objectionable, as it is

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[6] Although not included in the structure for convenience, this was regarded as a previous step to incorporation of the participle to the auxiliary. See footnote 2.

not the usual type of information contained in the lexicon. Moreover, if reanalysis is translated as coindexation, again an *ad hoc* proposal, we do not explain why the Spec VP2 position is never filled. Given the *ad hoc* character of this other alternative process, plus the fact that it does not predict the observed behaviour, we are led to conclude that it is also undesirable.

Another analysis that we could confront with incorporation is a downward movement of the auxiliary as the one proposed for those languages in which verb movement is lexically restricted, as in Modern English. The essential problem for this movement remains in the *ha/va* sequences: the c-command restriction on traces. As Pollock (1989) notes, this problem could be overcome by positing that traces are deleted, or that an LF movement of the V+affix complex satisfies the ECP at this level, or that this is a PF movement rule, which leaves no traces. Downward movement is left adjunction, and therefore linear order is predicted. Nevertheless, the fact that this affix is not like other affixes, as explained in section 2, makes the incorporation analysis more plausible, despite the provisos that we will have to make.

5. Conclusion

Having briefly considered a few alternative analyses which leave us unsatisfied in that they do not explain the unit like behaviour of our sequences, it seems reasonable to conclude that Kayne's proposal does not hold for the *ha/va* sequences because the first member, V1, is not a head (nor a maximal projection). In section 3 we saw that the Linear Correspondence Axiom does not specify a linear ordering for V1 and V2, in other words, its d(A) is not total. Recall that this lack of totality is due to a failure of antisymmetry: V2 cannot be claimed to asymmetrically c-command V1. V1 is really V^{-1}, thus, there are no segments as this is a substitution incorporation structure. Hence, V^{-1} and V2 mutually c-command each other given Kayne's definition of c-command (see example (11)).

We may try to analyse this differently: V^{-1} is not a category, and $V1^0$ is not "read" by the LCA as there is no real X^0 head occuring in it. The pair V1 and V2 after incorporation is left

undetermined by the LCA, but this does not make the phrase structure inadmissible as we are dealing with head substructure, which is determined by the morphological characteristics of the elements occuring in these substructure positions. In other words, as we proposed in section 2, the *ha/va* element in the sequence is a type of affix and, precisely because it has affix features — [+syntactic, –morphological] —, it is not subject to the LCA. This claim conflicts with the conclusions reached in Kayne (1993) as regards the application of the LCA beyond the word level. Kayne briefly considers this issue and, on the basis of a verb compound (*overturn*), concludes that *all* non-terminals (even those beyond X^0) are part of the set which asymmetric c-command is defined on. In other words, he posits that the V node dominating *overturn* dominates two non-terminal nodes the structure —and linear order— of which is mediated by the LCA, which forces a left adjunction of *over* onto *turn*. This type of compound lends itself to the application of the LCA, but there are problematic cases for which Kayne has to claim a different, non-adjunction structure beyond the word level. As an example, the noun compound *ouvre-boite* 'can-opener', which is analysed as having the structure:

(14)
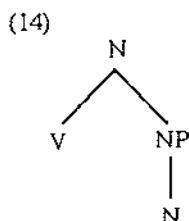
If we allow a structure like (14), where phrase structure principles of a certain kind (X' theory) are overridden by structure below the word level, the strong claim —that Kayne wants to make as regards other phrase structure principles (the LCA)— that structure beyond and above word level follows the same principles is strongly weakened. Kayne does contemplate the alternative of "divorcing sub-word-level structure from phrase structure" (Kayne (1993:28)), although he argues against it.

The *ha/va* sequences become unanalyzable unless we give in to this "divorce". Recall that we have come to this conclusion because we find no alternative left-adjunction derivation for the sequences and because we *must* account for the unit behaviour of the two verbal elements, which we achieve if we posit the type of movement considered in this article.

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