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Participles and Bare Argument Structure

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The operation Merge, then, is asymmetric, projecting one of the objects to which it applies, its head becoming the label of the complex formed. There can be no non-branching projection.

— Chomsky (1995a: 398)

Abstract

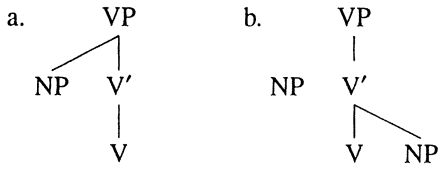
It is potentially undesirable consequence of Chomsky's Bare Phrase Structure framework that ergative and unergative verbs would share the same argument structure. The present paper proposes to address this problem by arguing that all verbs are potentially transitive. An analysis of the structure of complex verb forms (Dutch and German past participles containing an aspectual prefix *ge-* and a tense suffix *-t*) in terms of Kayne's Linear Correspondence Axiom (LCA) suggests that the prefix occurs in the complement of the verbal root, thus in effect making unergatives transitive. The structure proposed for the participle furthermore allows one to explain two familiar restrictions on verb raising, the first being its in compatibility with particle verbs, the second the so-called INFINITIVUS PRO PARTICIPIO (IPP) effect. It is argued that IPP involves the deletion of an inflectional prefix, required to bring the structure of a verbal cluster in agreement with LCA. A particular case of this phenomenon in certain Flemish dialects is discussed, where the prefix gets deleted but the suffix remains unaltered. This variety of IPP supports the hypothesis that the prefix is responsible for the IPP effect.

1. Introduction

Chomsky (1995a: 398) argues that within in the framework of Bare Phrase Structure, "there can be no non-branching projection." This is because projection

is a subcase of Merge, and Merge always applies to two elements, projecting one. A potentially undesirable consequence of this assumption is that there would be no difference in terms of argument structure between unergative and ergative VPs. Earlier theory permitted the distinction to be made in virtue of letting (unergative) V project to a nonbranching V′, as in (1a), so that the unergative argument could be a sister to V′, whereas an ergative argument was a sister of V, as depicted in (1b).

(1)



If, however, non-branching projection is excluded, the single argument is a sister of V both with ergative and unergative verbs. In order to solve this problem, Chomsky suggests that unergative verbs are really transitive, i.e., that in (1a) V′ is really branching, despite the absence of an overt internal argument. This idea he attributes to Hale and Keyser (1993), who argue that unergative verbs are derived from underlying transitive verbs through a process of noun-incorporation.[1] One thus sees that an adoption of a minimalist view on projection or on possible phrase structures has immediate consequences in terms of what are possible and impossible argument structures.

The present paper likewise proposes to establish a link between argument structure and (certain aspects of) minimalism. The minimalist tenet is the LINEAR CORRESPONDENCE AXIOM (LCA; Kayne 1994), and the link with argument structure is established in a somewhat roundabout manner. The first step involves the structure of complex verb forms, notably Dutch and German participles containing an aspectual prefix *ge-* and a tense suffix *-t*. Adopting the LCA, I shall argue in favor of a particular structure for the participle. This structure will then be shown to have important consequences for the argument

1. Actually, Hale and Keyser's theory leaves open another option for making a distinction between ergatives and unergatives, in that it allows subjects to occupy either a VP-internal position or a VP-external position at D-structure. If one accepts this, the conclusion that unergatives are transitive is not compelling from the point of view of bare phrase structure. As it is unclear how Hale and Keyser's alternative would translate into a Bare Phrase Structure Framework, I shall ignore it.

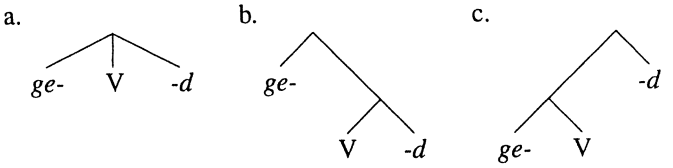
structure of unergative verbs, which go into the direction of confirming the conclusion established in the previous paragraph, i.e., verbs invariably have an internal argument.

The paper is organized as follows: in the second section, I shall develop the structure of the Dutch past participle as it follows from Kayne's LCA. The third section establishes the link between participial structure and argument structure. The analysis proposed will receive support from certain restrictions on verb raising in Dutch, i.e., the clustering of a series of infinitives in sentence-final position. One of these restrictions involves particle verbs, which are incompatible with verb raising (section 4); a second restriction concerns the idiosyncratic INFINITIVUS PRO PARTICIPIO (IPP) phenomenon, which involves the replacement of a past participle by an infinitive in a verb cluster derived by verb raising. In section 5, I shall propose an analysis of the IPP phenomenon which relates it to the prefixal nature of the participle. The sixth section discusses evidence from certain Flemish dialects, in which IPP takes a surprising form.

2. The Structure of the Participle

The past participle in Dutch and German is a tripartite structure, consisting of an aspectual prefix *ge*, a verbal root, and a suffix (*-d* in Dutch and *-t* in German, e.g. Du. *gewandel-d* 'walked', Ge. *gewander-t* 'roamed').[2] In principle, three possible structures could be assigned to such a participle.

(2)



The Linear Correspondence Axiom as proposed by Kayne (1994) has the effect of ruling out both (2a) and (2b), leaving (2c) as the only possible alternative. Let

2. With certain verbs, both in German and Dutch, the suffix is *-en*, e.g., Du. *bakken-bakte-gebakken*, Ge. *backen-backte-gebacken* 'bake-baked-baked'. This exhausts the possibilities, i.e., although there are irregular verbs, these always conform to the pattern *ge-V-d/en* (e.g., Du. *zoeken-zocht-gezocht* 'look for'; *moeten-moest-gemoeten* 'must'; *mogen-mocht-gemogen* 'may').

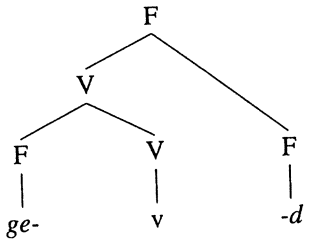
us discuss why this is the case. The idea behind Kayne's theory is, briefly put, the following: linear precedence relationship must mimic asymmetric c-command relationships, i.e., if α a-symmetrically c-commands β (that is, α c-commands β but not *vice versa*), then α must precede β. It follows that a given hierarchical representation can only be associated with one linear order. For example, any head X asymmetrically c-commands the Y head of its complement YP, so that in all languages heads precede their complements. By the same reasoning, Spec-XP universally precedes X, since Spec-XP asymmetrically c-commands X. A further condition imposed by Kayne's theory is that any linear ordering must be *total*, i.e., all terminal elements need to be ordered with respect to one another, ordering being determined by asymmetric c-command. If the ordering is not total, the representation is ruled out. As a consequence of this view, the three-way branching structure (2a) can be ruled out: the three terminals all c-command one another, i.e., no asymmetrical c-command relationships exist between them, so that no linear order is defined for these three terminals with respect to one another. The structure (2b) is also ruled out. Explaining why takes some more elaborate argumentation, however. For one thing, Kayne's theory rules out the possibility that the node immediately dominating two heads is a projection of either one of them. This is because the two heads would c-command one another, and hence be unordered. The only possibility for two heads to be sisters is for one to be adjoined to the other. This still leaves two options, viz. left adjunction and right adjunction; only the former is allowed, however, because in an adjoined structure the adjoined element asymmetrically c-commands the element adjoined to, and hence must occur to its left. This follows from the definition of c-command assumed by Kayne:

(3) X c-commands Y if [...] X excludes Y and every category that dominates X dominates Y.

A category is the opposite of a segment; X excludes Y if no segment of X dominates Y. In an adjunction structure $[_Y$ X Y], X c-commands Y, but Y does not c-command X because Y does not exclude X. As a result, X must precede Y, and right adjunction is barred. Now the label of the node immediately dominating verbal root and inflectional ending could either be identical to the label of the left-hand node (the verb) or the right-hand one (the suffix). However, in the former case, we would have a case of right adjunction, which is illicit for the reasons just discussed. It follows that V+*d* is dominated by the same label as the suffix *-d*; for convenience, I shall use the label F for the prefixal and suffixal functional elements *ge-* and *-d*; the representation of the

lower part of (2b) is therefore necessarily as follows: $[_F$ V $[_F$ *-d*]]. With this much established, we can go on to answer another question, viz. what is the label for the topmost node in (2b)? Two possibilities exist, but neither of them is possible on account of the LCA. One possibility is to assign to the top node the same label as the suffix, yielding the following: $[_F$ *ge-* $[_F$ V $[_F$ *-d*]]]. In this case, there would be two adjunctions to the suffix, which is illicit, the reason being that the two adjuncts, the prefix and the verbal root, c-command one another, and as a result they would not be ordered with respect to one another (cf. Kayne 1994: 19). The second possibility would be to assume that the top node is a projection of the prefix: $[_{ge}$ *ge-* $[_F$ V $[_F$ *-d*]]]. This would again make the resulting structure one of right adjunction, however, which is also ruled out (cf. above). Hence only the structure in (2c) remains, with only one possible labeling:

(4)

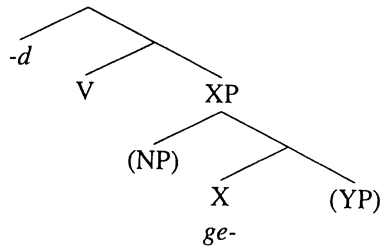


Now it has been assumed at least since Chomsky (1965) that verbal roots and the inflectional endings attached to them, despite appearances, occupy an altogether different structural position in the tree, i.e., head their own projections. Pollock (1989) has refined this view, suggesting that what appears to be a single inflectional ending may in fact distribute over more than one structural position, for example the positions Tense and Agreement, which head the respective phrases TP and AgrP. Since Pollock, various functional head positions have been proposed (e.g. AgrSP, AgrOP, AspP, etc.). Applying this logic to the Dutch and German participle with *ge*, I shall assume that both the prefix and the suffix occupy a functional head position.[3] The question now is, which are these, and where are they situated? Given the structure in (4), there is only one

3. The implicit assumption here is that *ge-* is inflectional, not derivational. Independent evidence in support of this claim is hard to come by. Still, some circumstantial evidence can be given, in that participle formation does not seem to involve a category change; see Hoekstra (1984: 163, 201) for arguments showing that the Dutch participle is indeed verbal rather than adjectival.

compatible tree, viz. one in which the *ge-* prefix occurs in the complement of the verb. In the diagram below, *ge-* occupies the head position of a complement small clause, XP, with NP and YP the optional complements of V.[4]

(5)



If the verb is transitive or ergative, the internal argument can be assumed to occupy the Spec position of the complement XP, much as in Larson's VP-shell analysis (Larson 1988). The participle is formed by raising *ge-*, left-adjoining it to the verbal root, and subsequently raising the complex thus formed to the suffix, left-adjoining it there. Alternatively, one can adopt the lexicalist checking approach to morphology assumed in Chomsky's Minimalist Program, in which case the inflected verb is inserted as is, and checked against functional features at a later stage. In the latter case, it suffices to assume, as in Kayne (1994: 38–41), that LCA applies to morphological constructs.

3. Consequences for Argument Structure

The position of the prefix *ge-* in the complement of the verb puts it in its subcategorization domain, instead of the functional domain dominating the verb, where inflectional information usually goes (e.g. T, AgrS, and AgrO all c-command the verb they belong to). As a result, all verbs, including unergative ones, are potentially transitive, in that a verb in the perfect always has a complement containing *ge-*. This conclusion is particularly interesting in the context of a minimalist theory of phrase structure, as outlined in the introduction: since there can be no nonbranching projection, the distinction between ergatives and unergatives resides in the presence or absence of the *external* argument, rather than the internal one, i.e., all verbs have an internal argument. Now there are still two forms that this claim can take: one could argue that all verbs have a complement regardless of their aspect, or, alternatively, that argument structure changes with perfectivity. The former position is taken by, for example, Hale & Keyser (1993). The latter position, which would relate perfective aspect to argument structure, also receives support from certain indications in the literature, though it is hard to establish hard and fast conclusions. What follows is therefore intended merely as an indication of potentially promising avenues of research, rather than as a conclusive argument one way or the other. For example, the claim that perfective aspect and argument structure correlate agrees well with the argument made in Verkuyl (1987) to the effect that perfective aspect is a property of the VP, notably the verb and its complement, rather than the verb itself.[5] Also, Postma (1994) observes that argument structure is sometimes affected by changing the aspect to the perfect. For example, verbs with defective argument structure are also defective in the perfect, i.e., they cannot appear in the perfect tense. An example are the Dutch verbs *dreigen* 'threaten' and *beloven* 'promise', which are ambiguous between a raising and a control interpretation. In the perfect, only the control interpretation remains, suggesting that the argument structurally defective raising variant cannot be put in the perfect.[6]

(6) a. *Jan dreigt/ dreigde te vallen.*
Jan threatens threatened to fall
'Jan is almost falling/almost fell.' (raising reading)
'Jan threatens/ed that he would fall.' (control reading)

4. Following Chomsky (1995a: 417), *ge-* would need to be a sister of V if *ge-* were the only complement of the verb (as with unergative verbs), because of the ban on nonbranching projection. Kayne's LCA then does not define an order for the terminals V and *ge-*, because they c-command each other. This problem can be overcome, Chomsky argues, by moving either terminal, leaving a trace, which is erased at PF and hence need not be linearly ordered, i.e., is not subject to LCA. I shall ignore these details of implementation here.

5. One piece of evidence given by Verkuyl in support of this view is the observation made in Carlson (1977) to the effect that the determiner on the object affects the perfectivity of the VP.
(i) a. *John discovered a rabbit in his garden* (**for a whole day/in five minutes*)
b. *John discovered rabbits in his garden* (*for a whole day/*in five minutes*)
If the object is a bare plural, the aspect is nonperfective (or atelic), otherwise it is perfective.

6. A reviewer points out, correctly, that the argument structurally defective raising verbs in (6) are ergative, so that thay have an internal argument anyway. For these verbs, then, the point that every verb has a complement needs no further demonstration. Still, the correlation with aspect is suggestive, which is why the facts are brought up here.

b. *Jan belooft/ beloofde een beroemd geleerde te worden.*
Jan promises promised a famous scientist to become
'Jan will/would probably become a famous scientist.'
(raising reading)
'Jan promised to become a famous scientist.' (control reading)

(7) a. *Jan heeft gedreigd te vallen.*
Jan has threatened to fall
'Jan threatened that he would fall.' (control reading only)

b. *Jan heeft beloofd een beroemd geleerde te worden.*
Jan has promised a famous scientist to become
'Jan promised to become a famous scientist.'
(control reading only)

Similarly, Hopper & Thompson (1980: 271) observe that "if the Aspect is perfective, the interpretation — other things being equal — has properties allowing the clause to be classified as more transitive; but if the Aspect is imperfective, the clause can be shown on independent grounds to be less transitive." These remarks are admittedly somewhat vague, and not every factor that Hopper & Thompson classify as contributing to a higher level of transitivity could probably be seen as affecting argument structure, but at least some of them might. For example, Postma (1994) quotes the case of Georgian from Hopper & Thompson. In the present tense, the subject appears in the nominative, and the object in the dative. In the perfect, however, the Case pattern is different: the subject gets ergative Case, and the object nominative.

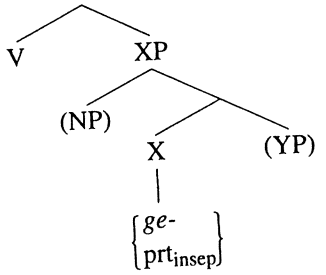
(8) a. $NP_{Nom}\ V_{Pres}\ NP_{Dat}$
b. $NP_{Erg}\ V_{Perf}\ NP_{Nom}$

The former Case pattern is antipassive, the second passive-like, i.e., an object with a structural Case like the one also assigned to (in)transitive subjects, and a subject with oblique Case. Now why would the present and perfect tenses exhibit different Case patterns? One way to think about this is that the argument structure of both tenses differs. Now it is often the case that passivisability correlates with higher transitivity (e.g., English intransitive verbs are not passivisable). The fact that the Georgian perfect, unlike the present, would display a passive-like Case-pattern could then also be attributed to the higher level of transitivity of the perfect tense in comparison with the present.

4. Particle Verbs

Dutch particle verbs provide additional support for the structure given in (5) above. Particle verbs come in two kinds: those with a separable particle and those with an inseparable particle. The latter are interesting because of the way their participle is formed: inseparable particles are incompatible with *ge-*, i.e., there is no prefix other than the particle itself in the participial form of these verbs (e.g., *over.tuigd* 'convinced', rather than **ge.over.tuigd* or **over.ge.tuigd*). This suggests that the particle and *ge-* occupy the same structural position, as indicated in (9).

(9)



Mulder (1991, 1992) independently proposes a structure that is closely analogous to (9) in a discussion of object control verbs. The evidence he provides concerns verb raising, i.e., the clustering of a series of verbs in sentence-final position as a result of successive adjunctions, as described in Evers (1975).[7] Before going on to discuss Mulder's argument, some preliminary remarks about verb raising are in order. Consider the example in (10), with the optional verb raiser *proberen* 'try'.

(10) a. *dat Jan het boek heeft proberen te lezen.*
that Jan the book has try to read

b. *dat Jan heeft geprobeerd [(om) het boek te lezen]*
that Jan has tried COMP the book to read
'that Jan tried to read the book.'

The traditional picture, as sketched by Evers, is that (10) represents the following two possibilities: starting out from an underlying OV order, i.e., [...[...[... *te*

7. Movement to C does not fall under the term "verb raising" as I shall be using it here, since it has quite different characteristics: it only involves the finite verb, and never more than one verb.

lezen] *proberen*] *heeft*], the embedded infinitive *te lezen* 'to read' in (10a) right-adjoins to the dominating verb *proberen* 'try', and the complex thus formed right-adjoins to the matrix verb *heeft* 'has', yielding the cluster [*heeft* [*proberen* [*te lezen*]]]; in (10b), on the other hand, the entire complement clause extraposes from a preverbal position to the right periphery of the clause, through right-adjunction to VP or IP. Verb raising and extraposition constructions differ empirically on a number of counts, having to do with transparency of the complement clause for processes like clitic climbing, negation, etc. (see Evers 1975 for details). Although I shall therefore by and large want to adopt the picture just sketched, it will be obvious that the LCA, with its ban against right adjunction and underlying complement-head order, has important consequences for the analysis of these two structures. Let us start with the extraposition structure (10b). What is important here is that the complement clause remains independent and that no clustering of verbs takes place. In so far as the complement clause needs to move at all, something which is suggested by German examples like (11), I shall assume that it does so to a Spec position on the left.

(11) *daß er das Buch zu lesen gestern versucht hat.*
that he the book to read.INF yesterday try.PART has
'that he has tried to read the book.'

One may consequently replace the term "extraposition" with the term CP-raising. Dutch does not allow the analogue of (11); in line with minimalist assumptions, I shall assume that the difference between Dutch and German resides in the locus of application of CP-raising: overtly in German, covertly in Dutch. Let us next turn to the verb raising structure (10a). By the LCA, all languages, including Dutch (Zwart 1993a), have head–complement order, i.e., are VO underlyingly. As a result, languages which have V1–V2–V3 order in clusters (VP1 highest, VP3 most deeply embedded), like Dutch, directly reflect this underlying order. A language like German, by contrast, which has V3–V2–V1 order in clusters, shows the results of verb raising overtly. Again, this difference can be seen as one between overt verb raising (German) and covert verb raising (Dutch). The application of verb raising not being signalled by surface word order in Dutch, one may look for other clues betraying its presence. I shall side with authors like Bennis & Hoekstra (1989) and Den Dikken (1988, 1989) in assuming that the Infinitivus Pro Participio or IPP effect, i.e., the appearance of an infinitive (*proberen* 'try' in (10a)) where one would expect a participle (*geprobeerd* 'tried' as in (10b)), signals the presence of

cluster formation by verb raising (see section 5 below for details). This effect remains absent in the third construction (Den Besten *et.al.* 1988), so called because it represents a mixed case, which shares with verb raising constructions the appearance of the object to the left of the verbal cluster, but, like extraposition constructions, lacks IPP.

(12) *dat Jan het boek heeft geprobeerd te lezen.*
that Jan the book has try.PART to read.INF

As noted in Bennis & Hoekstra (1989: 39n), such examples in all likelihood do not involve the creation of a cluster, however, as the participle can occur to the left of *heeft*, which is impossible in true verb raising constructions with IPP.

(13) a. *dat Jan het boek geprobeerd heeft te lezen.*
that Jan the book try.PART has to read.INF
b. **dat Jan het boek proberen wil te lezen.*
that Jan the book try.INF wants to read.INF
'that Jan wants to try to read the book.'

Verbs not permitting extraposition also do not permit the third construction. Hence it seems reasonable to assume that the third construction illustrated in (12) is a variant of the extraposition construction illustrated by (10b), rather than a variant of the verb-raising construction (10a).

Having thus outlined the main facts of verb raising, we can return to the issue at hand, which is the structure of particle verbs. Evers (1975: 40) already observed that particle verbs never trigger verb raising; this restriction is illustrated in (14a); instead, the complement clause must remain independent, as in (14b).

(14) a. **dat hij Jan het boek heeft over.tuigen te lezen.*
that he Jan the book has convince.INF to read
b. *dat hij Jan heeft over.tuigd het boek te lezen.*
that he Jan has convince.PART the book to read
'that he convinced Jan to read the book.'

Mulder's argument referred to above concerns object control verbs, but since, as he observes, these are almost all prefixal, his analysis is relevant for particle verbs in general.[8] Mulder proposes the following structure:

(15) V $[_{XP}$ NP $[\phi_{X^0}$ $[_{PP}$ P IP]]]

8. An exception to this generalization is *dwingen* 'force', which Mulder analyzes as covertly prefixal.

This structure must be understood as follows: object-control verbs take a small-clause complement hosting the "object" NP and the sentential complement (PP in (15)). The head of the small clause, indicated by ϕ, contains the particle; P is an infinitival complementizer, which gives the sentential complement the status of a PP. It is easy to see that this structure is virtually identical to the one proposed in (9) above.

Now since object-control verbs are almost all prefixal, they allow no verb raising, like particle verbs in general. Mulder further (1991: 307, 1992: 112) argues that the impossibility of verb raising with object-control verbs follows from his analysis, the particle blocking verb raising. This explanation presupposes that the particle cannot become a member of the verbal cluster, so that its presence will effectively block the application of verb raising through some form of minimality. If however, a particle can become a part of a verbal cluster, there is no reason why it should induce a minimality violation: verbs raising up could adjoin to the particle (thus treating it essentially as a verb), and the complex thus formed could subsequently adjoin to a higher verb. The assumption that particles cannot be a part of verbal clusters, essential to the explanation of the ban on verb raising with particle verbs, is problematic however, in a framework that assumes underlying OV order for Dutch and German, like Mulder's. This is because of the existence of examples like the following, where the lowest verb is the particle verb *op-bellen* 'phone up':

(16)
	1	2	3
	dat ik hem (op)	*had (op)*	*willen (op) bellen.*
	that I him up	had	want phone

'that I had wanted to phone him up.'

In an OV framework, underlying order is V3–V2–V1 (VP1 topmost, VP3 lowest): [...[...[...*bellen*] *willen*] *had*]. The observed order in (16) is the reverse as a result of the application of verb raising, i.e., successive head-adjunction yielding the cluster *[had [willen bellen]*. But if indeed the verbs in (16) form a cluster, it is unclear how the particle could occur in the positions 2 and 3 other than by becoming a part of that cluster. And if particles can become parts of adjunction clusters, it is unexplained why they should block verb raising just in case the particle belongs to the higher verb, as in (14a) and with object-control verbs, but not if the particle happens to belong to the lowest verb, as in (16).

In the universal VO framework adopted here, however, an explanation for the inability of particle verbs to trigger verb raising is forthcoming. Assume, as in Hoekstra (1988), that particles are predicates of (resultative) small clauses.

Further assume, as in Zwart (1993b) and Koster (1995), that small-clause predicates must move to the left, landing in the specifier position of the functional projection PredP. I propose that this leftward movement to PredP is what is responsible for the positions of the particle in (16). However, as remarked at the outset of this section, not all particles can be separated from their verbal root: a distinction can be made between separable and inseparable particle verbs, which differ on a number of counts aside from separability (see Vanden Wyngaerd 1994a, 1994b for detailed discussion of the two classes of particle verbs). I assume that an inseparable particle cannot move to PredP (though, like *ge-*, it must raise to the verbal root). Now an example like (14a) contains a verb with an inseparable particle, *overtuigen* 'convince'. Hence it is necessarily the case that the particle, like *ge-*, becomes part of the verbal cluster if such a cluster is formed through verb raising. Crucially, the sentence could not have arisen through leftward movement to PredP, as that would separate the particle from its verb. The fact that the result is ungrammatical shows that verbal clusters indeed cannot contain particles. The reason for this presumably lies in their nonverbal nature, i.e., verb raising can only affect verbs and the inflectional elements that they support, not preposition-like elements. This claim is supported by German data. Recall that surface word order in Dutch clusters reflects that before the application of verb raising. As a result, particles moved to PredP can intervene between the verbs that will eventually come to form a cluster. In German, by contrast, verb raising takes place in overt syntax, so that one expects a particle to be unable to intervene between the clustered verbs. As (17) reveals, this prediction is borne out.

(17)
	1	2	3
	daß ich ihn (an)	*rufen (*an)*	*können (*an)*	*wollte.*
	that I him up	phone.INF	can.INF	wanted

'that I wanted to be able to phone him.'

The particle can be stranded in PredP as in Dutch (position 1), but not in positions 2 and 3, which are necessarily cluster-internal positions.

In sum, the analysis of particle verbs as in (9) coupled with an underlying VO order for Dutch and leftward particle scrambling allows one to account for the restriction observed by Evers (1975) to the effect that particle verbs never trigger verb raising. In addition, the analysis presented here of the structure of past participles allows one to generalize over the case of particle verbs and the IPP effect, which will be the topic of the following section.

5. IPP

The previous section has shown that the particle in the tree in (9) could block raising of a verb embedded in YP. The question that naturally arises at this point is whether *ge-*, which occupies the same position, has a similar blocking effect. At a superficial level, the answer is affirmative, i.e., no infinitive can be embedded under a participle if the participle is an obligatory inducer of verb raising, such as Dutch *willen* 'want'. The example (18) testifies to this.

(18) **dat Jan het boek heeft gewild kopen.*
that Jan the book has want.PART buy.INF
'that Jan has wanted to buy the book.'

I shall come back to the structure of the cluster in (18) below; the idea that I will defend is that *ge-* is the offending factor that blocks the raising of the infinitive embedded under the participle. Accordingly, the sentence can be made grammatical by dropping the *ge-* prefix and replacing the *-d* suffix by an *-en* suffix, thus turning the participle into an infinitive, whence the name of the phenomenon, the Infinitivus Pro Participio (IPP) effect, or Double Infinitive Construction (DIC).

(19) *dat Jan het boek heeft willen kopen.*
that Jan the book has want.INF buy.INF
'that Jan has wanted to buy the book.'

The effect is found whenever the participle itself has an infinitival complement (with or without *to*) that undergoes verb raising, but not when the participle has a nonverbal complement:

(20) *dat Jan het zo heeft gewild / gewild heeft.*
that Jan it that way has want.PART want.PART has
'that Jan wanted it that way.'

As already shown above, the participle also remains with extraposed infinitives: thus in (10b) the sentential complement remains independent, and there is consequently no IPP; this is in contrast with (10a) where cluster formation occurs, with concurrent IPP.

The idea that the IPP effect relates to the formation of a cluster is one that the present account shares with the ones proposed by Bennis & Hoekstra (1989) and Den Dikken (1988, 1989). A question that has to date not received a satisfactory answer, however, is why *ge-*, or a participle in general, should block cluster formation. The Kaynean framework of antisymmetry allows one to

explain this curious fact. In order to show this, however, some comments on the structure of verb clusters are in order. Verb clusters cannot involve the simple adjunction of one verb to another:

(21) $[_V\ V\ V\ ]$

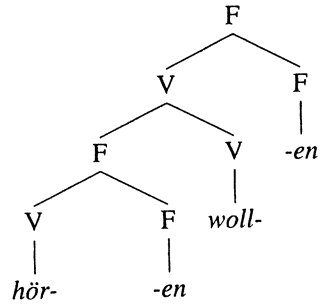
The reason for this is that the two terminal nodes would be too symmetrical, i.e., each would c-command the other so that no linear order would be defined for them. This problem can be solved by assuming that verbs, both finite and infinitival, have internal structure, i.e., that they consist of a lexical and an inflectional head, as follows:

(22) $[_\alpha\ V\ F\ ]$

As we saw above, F is the only possible choice for α in (22), as otherwise the structure would be one of right adjunction. Put in movement terms, an infinitive must be analyzed as resulting from left-adjoining a verbal root to an inflectional head F.[9] Now how can two infinitives be combined in an adjunction structure? Again, there is only one possibility, which is left adjunction of the lower verb+F complex to the verbal root of a higher verb, yielding the structure in (23); an example with the cluster *hören wollen* 'hear want' is given in (24):

(23) $[_F\ [_V\ [_F\ V\ F\ _F]\ V\ _V]\ F\ _F]$

(24)



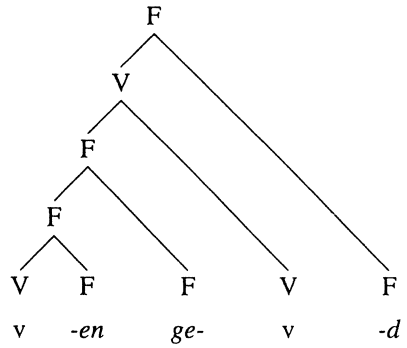
More complex clusters are built on the same pattern. One thus sees that, while LCA on the whole generates uniformly right-branching trees, it generates *left*-branching subtrees in the domain of multiple (head)-adjunction.

Now consider what happens if an infinitive adjoins to a participle. Given

9. In a checking approach to inflectional morphology, the entire inflected form would be moved. This perspective is compatible with the text argument, which concerns the internal structure of inflected verbs and verbal clusters.

the ban on right adjunction, the infinitive must adjoin to the left periphery of the participle, concretely to *ge-*. The resulting structure would be as follows:

(25)



Now what is wrong with this? I should like to suggest that the infinitival suffix and the participial prefix, being inflectional elements, are both dominated by a node with the same categorical label (F in (25)).[10] It then follows that neither c-commands the other, since neither excludes the other; in particular, a segment of the infinitival suffix dominates the participial prefix and hence does not exclude it; conversely, a segment of the participial prefix dominates the infinitival suffix and therefore does not exclude it (see (3) above). As a result, there is no total linear ordering, in violation of Kayne's Linear Correspondence Axiom. This account of the IPP effect attributes the impossibility for a participle to be a link in a verbal cluster to the prefixal nature of the Dutch and German participle. In legitimate clusters, of the type exemplified in (24), there is an alternation of V and F nodes as one goes from the bottom V up to the top node. In the configuration (25), there are two consecutive F nodes on this path, at the point where the infinitival suffix "touches", as it were, the participial prefix. This is what makes it an illegitimate structure. By replacing the participle with

10. This assumption is potentially controversial. It cannot be the case, for example, that all inflection bears the same categorical label F, as this would rule out attested cases of verbal roots with both tense and agreement suffixes attached to them on the same side. In order to allow these, one must assume that tense and agreement suffixes are dominated by distinct categorial labels. Another case that would require distinct labels is that of multiple clitics, in so far as they would be adjoined to one another, a possibility entertained by Kayne (1994: 20): in order to allow this, the two clitics must be dominated by distinct categorial labels. I shall leave this matter aside here.

an infinitive, the offending functional prefix is removed and the V–F alternation is restored.

Taking a cross-linguistic perspective on the matter, one is struck by the rareness of the IPP phenomenon and the restricted distribution of prefixes in the participle. Moreover, the two phenomena are found to occur, i.e., IPP only occurs in languages with a prefixal participle. Thus Lange (1981: 64) notes that the Double Infinitive Construction (i.e., IPP) is found in all Germanic languages in which the participle is built with the prefix *ge-*, and is absent where the participle is merely suffixal.[11] By way of illustration, consider the following data from Frisian and low German, respectively (from Den Besten & Edmondson 1983: 157), which lack *ge-* and do not have IPP either.[12]

11. An exception to this generalization is Yiddish, which has the *ge-* prefix in the participle but no IPP (example from Jacobs, Prince & Van der Auwera 1994: 414).

(i) *hot zi nit gekent farshteyn ver mit vemen es schlogt zikh.*
has she not can.PART understand who with whom it hits self
'so she couldn't understand who was fighting with whom'

Here the participle *gekent* 'could' embeds an infinitive *farshteyn* 'understand', without triggering the IPP effect. Possibly, Yiddish does not permit any verb raising at all, and this is an instance of extraposition (cf. (10b) above). A reviewer points out that Yiddish is also exceptional in that it is the only Continental West Germanic language that has the V2–V3 order in constructions with double participles, which would support the view of Yiddish as a no-raising language. A German example, with the usual V3–V2–V1 order, is the following:

(ii) *daß er entlassen worden ist*
that he fire.PART become.PART is
'that he has been fired'

The Yiddish type order here would be *worden entlassen* 'been fired'.

12. The examples in (26) are also illustrative of a correlation, observed by Weijnen (1966: 320), between word order in the cluster and the existence of IPP. The correlation goes as follows: V1–V2–V3 order correlates with IPP, and V3–V2–V1 order with absence of IPP. The former situation holds in standard Dutch, whereas Frisian, low German, and the Groningen dialect instantiate the latter situation. Both possibilities are attested in Standard German:

(i) a. *daß er das Buch lesen gekonnt hat.*
that he the book read can.PART has
b. *daß er das Buch hat lesen können.*
that he the book has read can.INF
'that he has been able to read the book.'

In (i-a) the participle occurs to the left of HAVE (V3–V2–V1), and there is no IPP; in

(26) a. *dat er it boek lêze ken.t hat.*
that he the book read can.PART has
b. *dat he dat book lesen kunn.t het.*
that he the book read can.PART has
'that he has been able to read the book.'

The prefix *ge-* does not occur in all Dutch dialects either: Van Loey (1964: 137) notes that it is absent in the north of North-Holland, Groningen, Drente, the east of Twente, and the east of the Achterhoek (cf. also Weijnen 1966: 286). In the Groningen dialect at least, IPP likewise remains absent (Schuringa 1923: 105):

(27) *Ik heb 't zeg'n heurd.*
I have it say.INF heard.PRT
'I heard someone say it.'

Still, one would like to explain why *ge-* has such a limited distribution cross-linguistically. A possibility that one could entertain is that, despite appearances, its distribution is not so limited after all; that is, languages not overtly displaying *ge-* could have empty or covert *ge-* in participles. An argument to this effect may be drawn from Bennis & Hoekstra (1989), who have argued that a participle is an impossible link in a verb cluster. While this agrees well with the claim defended here to the effect that the participial prefix *ge-* blocks cluster formation, not all the evidence discussed by Bennis & Hoekstra involves prefixal participles. For the account given above to extend to these cases, one would

(i-b) the participle appears to the right of HAVE (V1–V3–V2), with IPP. In an OV framework, one could propose to account for this correlation by assuming that cluster formation does not apply in the case of V3–V2–V1 order, whence the absence of IPP. Such an account is presented by Den Dikken (1988, 1989). It will be clear that this account crucially relies on the assumption that V3–V2–V1 order is the underlying order, in other words, that VP is head final. If VP is always head initial underlyingly, however, this account no longer stands. Assuming the validity of the correlation observed by Lange between IPP and *ge-*, the question can be phrased as follows: why does the absence of *ge-* tend to correlate with V3–V2–V1 order, and why does presence of *ge-* tend to correlate with V1–V2–V3 order? I am grateful to Erik Hoekstra for helpful discussion on this point.

In a VO framework, the further question arises how (i-a) must be analyzed: the order of the verbs indicates rearrangement, yet there is no IPP. I shall assume that no verb raising has taken place here; instead, the entire complement clause has been raised to the left (see (11) above).

need to assume that in such cases the participle is covertly prefixal as well. Relevant examples from English and Swedish, respectively, are given in (28).

(28) a. **Kaatje was heard sing a song.*[13]
b. **Peter blev hörd sjunga en sang.*
Peter was hear.PART sing.INF a song

These would be cases analogous to Dutch and German IPP, in so far as they illustrate the impossibility of a participle to occur in a verbal cluster. This prefix would block the raising of the embedded infinitive to the matrix verb. As far as Romance is concerned, Kayne (1993: 12) argues that unergatives are covert transitives; his argument concerns certain patterns of past participle agreement and auxiliary selection in Romance. Notably, unergative verbs need an internal argument in Spec-AgrOP to prevent the subject from landing there and triggering (illicit) participial agreement. This analysis could be assimilated to the present proposal, by assuming that the covert internal argument with unergatives is the Romance analogue of the Germanic participial prefix *ge-*. In sum, such cases as (28) can be accounted for by assuming a covert prefix in the participle, as can the Romance facts discussed by Kayne.

6. A Prefixless Participle

Some particularly interesting evidence in support of the account of IPP presented here can be found in certain dialects of Flemish. These dialects have prefixal participles and behave like Dutch in terms of displaying IPP, but deviate from the standard Dutch pattern in one particular construction. The construction is exemplified by the (Standard Dutch) sentence in (29):

13. With respect to English three verb clusters like the one in (i), there is an independent reason why these are ruled out.
(i) **John has could read the book.*
It seems reasonable to assume that the reason for the deviance of (i) reduces to the fact that the English modals are defective in the nonfinite paradigm (i.e., they lack infinitive, present and past participle). This is confirmed by the fact that, even if the participle does not embed another verb, (i) remains bad (**John has could*), whereas this does yield an acceptable result in Dutch and German (*Jan heeft dat gekund* 'Jan has could that').
The grammatical variant of (28a) with *to* could be analyzed as a case where the infinitival complement has been extraposed, analogous to (10b).

(29) *Jan is voetball.en.*
Jan is football.INF
'Jan has gone out to play football.'

If this construction is put into the perfect tense, one expects the participle to be replaced by the infinitive as a case of IPP, but the result is equally ungrammatical.

(30) **Jan is geweest/zijn voetballen.*
Jan is be.PART be.INF football.INF

Postma (1993) argues that this is because the auxiliary *is*, which needs to appear in the perfect of *zijn* in Dutch, is incompatible with the *zijn*-infinitive. As Postma observes, this case instantiates a more general restriction against BE+BE, which can be observed in a wide variety of languages:

(31) **est été* (French)
**is been* (English)
**is gezijnd* (Dutch)
**es sido* (Spanish)

Postma attributes this restriction to Condition B of the Binding Theory. Faced with this restriction, languages have two options: they can turn to HAVE as the auxiliary of the perfect (e.g., English, French, Spanish), or use a suppletive form for the participle (e.g., German, Italian). The latter strategy is also employed in standard Dutch, where the suppletive infinitive *wezen* can be used instead of *zijn*:

(32) *Jan is wez.en voetball.en.*
Jan is be.INF football.INF
'Jan has been out to play football.'

However, the Flemish dialects do not have this alternative form of *zijn* (Van Haeringen 1954). What happens instead is that the participle, which is normally prefixal, is stripped of its prefix:

(33) *Jan is weest voetball.en.*[14]
Jan is be.PART football.INF

14. The geographical distribution of the *weest+infinitive* construction is studied in De Schutter (1974): it occurs in West Flanders, the western half of East Flanders, the southern half of the Antwerp province, and sporadically in Flemish Brabant and East Flanders. Other dialects of Flemish display a *weesten* alternant to the *wezen* infinitive in this construction.

This is despite the fact that prefixless participles otherwise do not occur in the Flemish dialects. The situation with *zijn* can be summarized as follows:

(34) *geweest* → **zijn* → *wezen*
→ *weest*

That is, the participle cannot be replaced bij *zijn* because of the restriction against BE+BE, in which case it is replaced by *wezen*, but if *wezen* is unavailable as well, *weest* occurs.[15] In this way, the structure of the verbal cluster is brought in line with the principles following from the Linear Correspondence Axiom. This case then constitutes rather striking confirmation of our claim that the prefixal nature of the participle, besides the fact of cluster formation, is responsible for the IPP effect.

7. Conclusion

It is a potentially undesirable consequence of Chomsky's Bare Phrase Structure framework, and of the ban on nonbranching projection in particular, that ergatives and unergatives would come to share the same argument structure. Hale and Keyser (1993) develop a theory of argument structure that eliminates this undesirable consequence, by assuming that unergatives are underlyingly transitive. Approaching the matter form a different angle, I have presented some evidence that goes in the same direction: an analysis of the Dutch and German prefixal participles along Kaynean lines suggests that the prefix occurs in the complement of the verbal root, thus in effect making unergatives transitive. The structure proposed for the participle furthermore allowed the development of an explanation for certain restrictions on verb raising, such as its incompatibility

15. One would expect that those dialects that form the perfect of *zijn* with HAVE would allow the *zijn* infinitive in this construction. One such dialect is the Gent dialect, but as Wim de Geest (personal communication) informs me, the prediction is not borne out.
(i) *Jan heeft *zijn/weeste vissen.*
Jan has be.INF/be.SUPPL angle.INF
'Jan has been out to angle.'
While the absence of *heeft zijn vissen* does not undermine the validity of Postma's generalization that the infinitive *zijn* is incompatible with the auxiliary *zijn*, (i) suggests that this cannot be the only motivation for shifting from the *zijn* to the *wezen* root. Another problem is the existence of dialects, reported by De Schutter (1974), which allow *geweest vissen* or *vissen geweest* in this construction; possibly, the latter do not form a cluster, so that IPP remains absent.

with particle verbs and *ge-* participles, the latter phenomenon being known as the IPP effect. A particular case of IPP was discussed, which occurs in certain Flemish dialects, and which involves the mere deletion of the prefix, leaving the affix intact. This phenomenon was argued to support the claim that the prefix of the participle is responsible for the IPP effect.

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