1. What is IPP?

The Infinitivus Pro Participio (IPP) effect involves the appearance of an infinitive where one would normally expect a participle. An example is given in (1).

(1) dat Jan het boek heeft willen/*gewild kopen,
that Jan the book has want/wanted buy
'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 has undergone verb raising, but not when the participle has no complement (cf. (2)). With extraposed infinitives, the participle also remains: thus in (3a) cluster formation occurs, whereas in (3b) the sentential complement remains independent.

(2) dat Jan het zo heeft gewild / gewild heeft,
that Jan it that way has wanted wanted has
'that Jan has wanted it that way.'

(3) a. dat Jan het boek [heeft proberen te lezen].
that Jan the book has tried to read
b. dat Jan heeft geprobeerd [om het boek te lezen]
that Jan has tried comp the book to read
'that Jan has tried to read the book.'

Existing accounts of the IPP effect usually relate the appearance of the infinitive to the formation of a cluster (e.g. Bennis and Hoekstra 1989a,

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Den Dikken 1988, 1989). I shall assume that this idea is correct, i.e. that IPP is contingent on cluster formation.

I shall furthermore show that, within the framework of Kayne (1993), a participle like the Dutch and German one is indeed an impossible link in a verbal cluster. In order to do this, I first need to consider the structure of verbal clusters.

2. The structure of verb clusters

The Kaynean framework of antisymmetry has important repercussions for the structure of verb clusters; these cannot involve the simple adjunction of one verb to another:

(4) \[ V V V \]

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. Put differently, the linear ordering would not be total. 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:

\[ V = \text{lexical head} \quad \text{inflectional head} \]

\[ (i) \quad \text{dat Jan het boek heeft geprobeerd te lezen.} \]
\[ \quad \text{that Jan the book has tried to read} \]

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

\[ (ii) \]
\[ a. \quad \text{dat Jan het boek heeft geprobeerd heeft te lezen.} \]
\[ \quad \text{that Jan the book tried has to read} \]
\[ b. \quad *\text{dat Jan het boek proberen wil te lezen.} \]
\[ \quad \text{that Jan the book try wants to read} \]
\[ \quad \text{‘that Jan wants to try to read the book.’} \]

Verbs not permitting extraposition also do not permit the third construction. Hence it seems reasonable to assume that the third construction illustrated in (i) is a variant of the extraposition construction. A proper analysis of the third construction is beyond the scope of this article, however.
Here F ranges over inflectional or functional heads of whatever kind. If indeed, as seems reasonable, both V and F are heads, it also follows from Kayne's framework that there is only one possible choice for α in (5), which is F. That is, an infinitive must be analysed as resulting from left-adjoining a verbal root to an inflectional head F, right adjunction being barred (see Kayne 1993 for full discussion). 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 (6); an example with the cluster hören wollen 'hear want' is given in (7):

More complex clusters are built on the same pattern.

3. The structure of the participle

A participle cannot be an unstructured whole either if it is to adjoin to another head, for this would yield too symmetrical a structure. This is all the more so in Dutch and German, where the participle is circumfixal, i.e. it consists of a prefix ge- and a suffix -d (in Dutch) or -t (in German); with certain verbs, the suffix is -en (e.g. bakken-bakte-gebakken 'bake-
baked-baked'). Of the three possible structures one could assign to such a participle, only one is permitted in Kayne's theory.

(8)

a. 
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g-e  V -d
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b. 
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ge-  V -d
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The three-way branching structure (8a) is ruled out for familiar reasons: the three terminals all c-command one another and no linear order would be defined for them. The structure (8b) is also ruled out: we have already seen that the complex of verbal root and inflectional ending must be dominated by an F node (I am assuming that the suffix -d is dominated by an F node). The problem with (8b) is that there is no possible choice for labelling the topmost node. One possibility is to assign to it the same label as the suffix, say F. But then there would be two adjunctions to F, which is illicit, the reason being that the two adjuncts, the prefix and the verbal root, c-command one another. The second possibility would be to assume that the prefix has another categorial label than the suffix, and that this label is assigned to the topmost node; the resulting structure would then in effect be one of right adjunction, which is also ruled out.

This exhausts the possibilities, i.e. although there are irregular verbs, these always conform to the pattern ge-V-d/en (e.g. zoeken-zocht-gezocht 'look for'; moeten-moest-gemoeten 'must'; mogen-mocht-gemogen 'may'). In the light of the existence of the -en suffix in the participle, one may legitimately wonder whether the infinitive in IPP constructions is a genuine infinitive or rather a prefixless participle. I shall not go into this question here.
for reasons discussed in Kayne (1993). Hence only the structure in (8c) remains, with only one possible labelling.

\[(9)\]

\[
\begin{array}{c}
  F \\
  V \\
  F \quad V \\
  \_ -d \\
  \_ \quad \_ \\
  ge- \quad v
\end{array}
\]

The participle can adjoin to a higher verb, such as *heeft* 'has', yielding the following structure:

\[(10)\]

\[
\begin{array}{c}
  F \\
  V \\
  F \\
  V \\
  F \\
  \_ -d \quad heef- \\
  \_ \quad \_ \\
  \_ \quad \_ \\
  ge- \quad v
\end{array}
\]

\[4\] Briefly put, because the asymmetrical c-command relationships would not correspond with the linear precedence relationships. Also note that we are assuming that no projection is involved here but only adjunction.

\[5\] If the participle arises through syntactic incorporation, the structure in (9) also implies that the *ge*- prefix occurs in the complement of the verb; after left-adjoining to it, the complex thus formed left-joins to the suffix. See section 5 below for more discussion of this issue.
This is a permissible structure, which accounts for the fact that a participle which does not itself embed an infinitive does not need to be replaced by an infinitive (cf. (2)).

4. IPP

The question we need to address now is what happens if an infinitive adjoins to the participle. The only possible adjunction site is the prefix; any other adjunction site would result in multiple adjunction. The resulting structure would be as follows:

(11)

Now what is wrong with this? I should like to suggest that the infinitival suffix and the participial prefix, being inflectional elements, are both

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8 A potential problem for (10) is the fact that the finite verb is not a constituent, particularly in view of the fact that Verb Second fronts the finite verb only, and never the entire cluster. I shall leave the thorny issue of verb second aside here.
dominated by a node with the same categorial label (F in (11)). 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 (and vice versa, of course). 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. The infinitive being suffixal, it can legitimately replace the participle in the cluster. Cross-linguistically, the prediction is that IPP only arises in languages with a prefixal participle. This prediction appears to be borne out: prefixal participles are in fact extremely rare in both the Germanic and Romance language families, and their distribution concurs with that of IPP, which is equally rare. 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 affixal. By way of illustration, consider the following

7 This assumption is potentially controversial. It cannot be the case, for example, that all inflection bears the same categorial 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 (1993:13): in order to allow this, the two clitics must be dominated by distinct categorial labels. I shall leave this matter aside here.

8 One might suggest that the absence of three-verb clusters as in (i) in English reveals an IPP effect of some kind:

(i) *John has could read the book

It is not clear whether we are dealing with the same phenomenon here as in Dutch and German, however. For example, even if the participle does not embed another verb, (i) remains bad (*John has could). Also, substituting an infinitive for the participle yields no improvement (*John has can 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). In Bennis and Hoekstra's (1989a) account, the principles responsible for the IPP effect are also at work in (ii):

(ii) *Kaatje was heard sing a song

If the explanation proposed here is correct, this generalisation is spurious. Also note that it cannot be the case that there is a null counterpart to ge- in languages not displaying it overtly, as this would predict the occurrence of IPP in languages where ge- is empty, i.e. in languages where the participle has no (overt) prefix.
data from Frisian and low German, respectively (from Den Besten and Edmondson 1983:157).

(12) a. dat er it boek lèze kent hat.
    that he the book read can(PP) has
b. dat he dat book lesen kunnt het.
    that he the book read can(PP) has
   'that he has been able to read the book.'

The prefix ge- does not occur in all Dutch dialects: 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):

(13) Ik heb 't zeg'n heurd.
     I have it say heard
    'I heard someone say it.'

More striking evidence in support of the account presented here can be found in numerous dialects of Flemish. These dialects have prefixal participles and behave like Dutch in terms of displaying IPP, but deviate from the Dutch pattern in one particular construction. The construction is exemplified in (14):

(14) Jan is voetballen.
    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 (i.e. *Jan is zijn voetballen), but this does not happen because the infinitive zijn 'to be' is unavailable for independent reasons. Postma (1993) argues that this is because the be-auxiliary, which is needs to appear with zijn in Dutch, is incompatible
with the \textit{zijn}-infinitive.\footnote{As Postma observes, this case instantiates a more general restriction against BE+BE, which can be observed in a wide variety of languages:}

In standard Dutch, the alternative infinitive \textit{wezen} can be used instead of \textit{zijn}:

\begin{enumerate}
\item[(15)] Jan \textit{is wezen} voetballen.
\begin{itemize}
\item Jan \textit{is be(inf)} football\textit{(inf)}
\end{itemize}
\end{enumerate}

‘Jan has been out to play football.’

The form \textit{wezen}, normally a free alternant of \textit{zijn}, is considered slightly substandard, but this effect is totally absent from (15), \textit{wezen} being the only possible choice. However, the Flemish dialects do not have this alternative form of \textit{zijn} (cf. Van Haeringen (1954)). What happens instead is that the participle, which is normally prefixal, is stripped of its prefix:

\begin{enumerate}
\item[(16)] Jan \textit{is weest voetballen}.
\begin{itemize}
\item Jan \textit{is been football\textit{(inf)}}
\end{itemize}
\end{enumerate}

This is despite the fact that prefixless participles otherwise do not occur in the Flemish dialects. Summarizing, the situation with \textit{zijn} can be schematised as follows:

\begin{enumerate}
\item[(17)] geweest \rightarrow *zijn \rightarrow wezen
\item \rightarrow weest
\end{enumerate}

That is, the participle cannot be replaced bij \textit{zijn} because of the restriction against BE+BE, in which case it is replaced by \textit{wezen}, but if

\footnote{The geographical distribution of the \textit{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 \textit{weesten} alternant to the \textit{wezen} infinitive in this construction.}
wezen is unavailable as well, weest occurs. 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.

5. Conclusion

In this paper, I have argued that Kayne's Linear Correspondence Axiom allows one to develop an account of the IPP effect. Two conditions are necessary in this account for IPP to arise. The first is that there has to be cluster formation between an embedded infinitive and the governing participle; the second condition requires the participle to be prefixal. Arguably, in the so-called third construction in Dutch, IPP remains absent because the first condition is not met. Needless to say, the

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11 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, this is not the case.

(i) Jan heeft *zijn/weeste vissen.
   Jan has be angle
   'Jan has been out to angle.'

While the absence of heeft zijn vissen does not undermine the validity of Postma’s generalisation 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, which allow geweest vissen or vissen geweest in this construction; possibly, the latter do not form a cluster, so that IPP remains absent.

12 A problem for the universal VO hypothesis adopted here concerns a correlation, observed by Weijnen (1966:320), between word order in the cluster and the existence of IPP. The correlation goes as follows: $V_1-V_2-V_3$ order correlates with IPP, and $V_2-V_3-V_1$ order with absence of IPP. The former situation holds in standard Dutch, whereas Frisian, low German, and the Groningen dialect instantiate the latter situation. In an OV framework, one could propose to account for it by assuming that with $V_2-V_3-V_1$ order there is no cluster formation, the verbs remaining in their base positions, 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 $V_2-V_3-V_1$ order is the underlying order, in other words, that VP is head final. If VP is always head initial, however, the correlation becomes quite mysterious.

13 See note 2. The same arguably holds true of a number of sentences from older varieties of High German discussed in Den Besten and Edmondson (1983:175-6), where likewise IPP does not occur.
account of the IPP effect presented here requires that one assume that verb raising takes place in covert syntax in a number of instances where it does not apply overtly. I also adduced some evidence from certain dialects of Flemish, which have a prefixal participle, except in one construction, in which the participle is stripped of its prefix; these were argued to support the correctness of the claim that the prefixal nature of the participle is responsible for IPP.

References


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