

The IPP-effect as a repair strategy

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0. Introduction

The topic of this thesis is the dialectal variation that occurs in a verbal cluster of the type AUX-PPC-INF. That is, clusters in which an auxiliary of the perfect takes a participle as its complement. This participle, in turn, takes an infinitival complement. I will discuss two phenomena that show up in this construction. The first, the so-called *participium pro infinitivo* (PPI) effect, is the occurrence of a double participle. Schematically we can represent this as AUX-PPC-PPC, where the infinitive is replaced by a participle. The *infinitivum pro participio* (IPP) effect is the other phenomenon that I will discuss. IPP describes the cases in which the participle is replaced by an infinitive: AUX-INF-INF. The main objective of this thesis is to account for these phenomena. Another interesting question that will be answered is whether the two phenomena are two sides of the same medal. I will argue that that is not the case. The PPI-effect involves copying of morphological inflection. There are already analyses in the literature supporting this conclusion, so the PPI-effect will receive less attention than the IPP-effect. The latter, as it will turn out, does not involve copying. The fact that two infinitives show up in IPP-cases is purely coincidental. As there exist no accounts for the IPP-effect that can account for all the empirical variation, accounting for the IPP-effect will be the main goal of this thesis.

This thesis is organized as follows. After describing in section 1 the general framework that I will assume in this thesis, the empirical variation with regard to the IPP-effect will be discussed in section 2. In section 3 I will investigate in which context the IPP-effect exactly turns up. In section 4 the PPI-effect will be discussed and analyzed. This discussion shows that the PPI-effect involves copying of morphological inflection. From comparing the results on the IPP-effect of section 2 and 3 with the PPI-effect of section 4, we can conclude that the IPP-effect does not involve copying. At that point, the search begins for an account of the IPP-effect. Since the IPP-effect only arises in dialects that have a *ge*-prefix (see section 2), section 5 will examine the properties of the *ge*-prefix. I will show that *ge*- is a functional head located above VP. In section 6 I will explain how the failure of *ge*- to affixate to V at PF can account for the IPP-effect. The insertion of an infinitive in the place of the participle (i.e. the IPP-effect) is argued to save the derivation when *ge*- fails to affixate to V. Section 7 concludes this thesis.

1. The general framework

In this section I will outline my assumptions regarding the general framework that will be assumed in this thesis. In section 1.1 I will explain why I assume the framework of Anti-symmetry (Kayne (1994)). In section 1.2 I will outline my general assumptions regarding verbal movement in verbal clusters. Other theoretical assumptions will be explained or elaborated upon in the remainder of the thesis, when these topics become relevant for the discussion.

1.1 The universal base hypothesis

Early work on verbal clusters is mainly based on the assumption that Dutch was an OV-language. That is, heads always take their complements to the left in Dutch. The fact of the matter is, however, that Dutch verbal clusters are strictly right-branching superficially. To account for the seeming left-headedness in verbal clusters, it was assumed that verbs undergo verb-raising, which raises a verb out of its VP and right-adjoins it to a higher verb. In recent Minimalist accounts it is often assumed, following Kayne's (1994) Anti-Symmetry theory, that universally all heads take their complement to the right. In that framework, the OV-order

is a derived order, which arises when the object moves to a position higher than the verb. The consequence of adopting this approach is that verbs do not have to be assumed to move in Dutch verbal clusters, since all verbs have their complement base-generated to their right. Appealing as this may seem at first sight, assuming the universal base hypothesis does not immediately lead to a more simpler grammar for Dutch. While verbs are base generated in the right order, objects and adverbs still have to be assumed to move out of the cluster: no overt material (except particles) can intervene between the verbs in a verbal cluster. It must thus be assumed that these elements have moved out of their VPs. If we assume that movement is feature-driven (Chomsky (1995)), it is hard to see why adverbs must move. While these elements are not immobile by any means, it is not clear what would drive them to move out of verbal clusters. It is reasonable to assume that the movement of adverbs is actually head-movement at PF, driven by PF-interface conditions. Let us assume this here, since nothing in the remainder of this thesis hinges on this assumption. Regarding the movement of objects out of verbal clusters, I will assume that this movement takes place in syntax. Objects in Dutch need to check ACC-case in *spec,vP*. I will assume with Wurmbrand (2001) that there are no *vP*-layers in verbal clusters (cf. also section 2 on this matter). Therefore, object movement to the matrix-*vP* can be taken to be driven by the need to check ACC-features.

The issue of OV versus VO is one of ongoing debate (see Wurmbrand (2006) for a comprehensive overview). Therefore, I will not discuss it at length here. The ultimate choice for VO or OV as a base-generated order will, however, have an effect on the theory of the IPP-effect. While word-order generalizations can often easily be translated from an OV to a VO approach, the theories that account for the generalizations often aren't. Therefore, I will now give two arguments for assuming a VO-approach.

In verbal clusters consisting of three verbs, mixing these verbs could in principle result in six possible orders: V1-V2-V3, V1-V3-V2, V2-V1-V3, V2-V3-V1, V3-V1-V2 and V3-V2-V1. Interestingly, though, the V2-V1-V3 order is unattested in verbal clusters. The OV-approach can account for this fact by assuming that movement of V3 cannot skip V2. V3 needs to adjoin to V2 first, before the V2-V3 complex can move to V1. This line of reasoning forces us to adopt right-adjunction as well as left-adjunction. Right-adjunction is needed to derive the standard V1-V2-V3 order. Left adjunction would be needed to derive the V1-V3-V2 order. If V3 may not move to V1 in one fell swoop, we need to assume that V3 has left-adjoined to V2 before [V3 V2] moves and right-adjoints to V1. The OV-approach thus needs a stipulation to rule out the V2-V1-V3 order and it needs to adopt both right as well as left-adjunction. Assuming right and left-adjunction still cannot account for West Flemish verbal constructions for which the existence of VP-movement must also be assumed to be possible. To see this, consider (1).

- (1) da Valère _{ti} willen [dienen boek lezen]_i eet
 that Valère want that book read has
 'that Valère has wanted to read that book'

To derive (1), the [_{VP} dienen boek lezen] must have moved from the complement position of V2 *willen* 'want' to a position to the right of V2 (e.g. right-adjoined to TP2). This example shows that assuming X⁰-movement to derive the empirical variation in verbal clusters, is not enough, since X⁰-movement cannot pied-pipe the object along. An OV-approach thus needs to assume both V⁰ as well as VP-movement, plus left and right-adjunction.

Lets consider the VO-approach that I will adopt in this thesis. First, I take verbal movement to be XP-movement. Lets assume that this is VP-movement for now, for which evidence will be presented in section 3. The verbal orders can be derived by assuming that a VP can move into

the specifier-position of a higher VP. With these minimal assumptions in place, the impossibility of the V2-V1-V3 order is immediately predicted. To derive that order, V2 would have to move without pied-piping V3. Moving V2 without V3 is possible in a head-movement account, but if VP2 moves it cannot strand any material that is contained inside it. The correct prediction that VP2 cannot move without carrying VP3 along is a strong argument in favor of assuming a VP-movement account in an anti-symmetry framework. The fact that the VP-movement account doesn't need to assume right and left-adjunction is another strong point in favor of this approach, since it results in a simpler grammar.

I will leave it by these few remarks on the issue of branching-direction and verbal movement.

Since Chomsky (1995) it is generally assumed that movement is driven by features. In recent minimalism it is often assumed that features enter the derivation either valued or unvalued (Chomsky 2000). Chomsky (2001) argues that a feature is uninterpretable if and only if that feature is unvalued. Pesetski and Torrego (2004), however, argue that this bi-conditional is incorrect. They argue that there exist features that are unvalued but interpretable (for example the T feature of the tense head). In this thesis I will not discuss the interpretability of features. I will assume that features either enter the derivation valued or unvalued. An unvalued feature must receive a value from a valued instance of that feature through Agree. An unvalued feature will crash the derivation at one of the interface levels. As far as interpretability is concerned, I assume that some features are interpretable after valuation, either at the PF or the LF-interface while other features are not. What happens to these features is not important for the discussion to follow. I adopt the following definition of Agree (from Pesetski and Torrego (2004)).

(2) **Agree:**

- (i) An unvalued feature F (a *probe*) on a head H at syntactic location α (F_α) scans its c-command domain for another instance of F (a *goal*) at location β (F_β) with which to agree.
- (ii) Replace F_α with F_β , so that the same feature is present in both locations.

Ideally, we want the VP-movement that takes place in verbal clusters to be driven by features (and the requirement that they be valued at the interface) as well. In the next section I consider the theory of Barbiers (2008) who argues for feature driven VP-movement. The features that drive VP-movement might not seem directly relevant for the issue of IPP at first. It will turn out, though, that the features on V can explain a peculiarity with regard to the IPP-effect, which I will discuss in section 6.6.3. Furthermore, the feature content of V is relevant for the phenomena of copying morphological inflection (section 4).

1.2 Feature driven VP-movement

1.2.1 Barbiers (2008)

Barbiers' (2008) theory is based on the empirical observation that the possibility of PP and VP-orders in clusters is highly similar. To illustrate this, consider the following examples.

- (3) a. dat hij is₁ gaan₂ zwemmen₃
that he is gone swimming
'that he is gone swimming.'
- b. dat hij is zwemmen (ge)gaan

- c. *dat hij zwemmen is (ge)gaan
- d. dat hij zwemmen (ge)gaan is
- e. *dat hij gaan is zwemmen
- f. dat hij gaan zwemmen is

- (4) a. toen je haar [op het perron]₁ [op haar wang]₂ kuste₃
 when you her on the platform on her cheek kissed
 ‘when you kissed her on her cheek on the platform.’
- b. toen je haar [op het perron] kuste [op haar wang]
 - c. *toen je haar kuste [op het perron] [op haar wang]
 - d. toen je haar kuste [op haar wang] [op het perron]
 - e. *toen je haar [op haar wang] [op het perron] kuste
 - f. toen je haar [op haar wang] kuste [op het perron]

The ungrammatical orders in the verbal cluster are V3-V1-V2 and V2-V1-V3. The PP-clusters are ungrammatical in those same particular orders. The similarity between the sentences in (3) and (4) is accounted for by assuming that both VPs and PPs can be predicates. Predicates are understood to be non-saturated projections; projections that are headed by a head that still has an argument-role to dispose. The relation between the syntax of intraposition and the semantics thereof is captured by the following condition:

(5) **Condition on Semantic Interpretation (Barbiers (1995))**

- (i) A node Y is a dyadic relation between the nodes X and Z if X immediately c-commands Y and Y immediately c-commands Z.
- (ii) A node Y is a monadic predicate over a node X if Y is a dyadic relation between X and Z, and X and Z are identical.

In the case of (3), *gaan* ‘go’ can take a VP-argument. For *gaan* to be a monadic predicate over its VP-complement, the condition in (5) dictates that the complement of *gaan* must be intraposed to its specifier. *Is* ‘is’ in (3) requires the same of its VP-complement [gaan zwemmen]. The complete derivation for the sentences in (3) is given in (6).

- (6) dat hij [[[[[zwemmen]_i] gaan]_j] is [[zwemmen]_i] gaan]_j zwemmen_i]]

Just like verbs can intrapose their complements to encode a predicate argument relation, PPs can intrapose VPs as well. These VPs are not complements of P, however.

Consider (4a). The P *op* can take a complement, in the case of (4) *het perron* ‘the platform’ or *haar wang* ‘her cheek’. The PP [op haar wang] is adjoined to the VP [kuste]. This VP can be intraposed in a similar fashion as the VPs in (3) were intraposed. To illustrate this for the case of prepositions, the D-structure and S-structure of (4) are given in (7).

- (7) a. DS: toen je haar [VP [PP op het perron] [VP [PP op haar wang] [VP kuste]]]
 b. SS: toen je haar [VP [PP [[VP kuste]_i op haar wang]_j] op het perron] [VP [PP [[VP kuste]_i op haar wang] [VP kuste]_i]]

The P *op* heading the PP [op haar wang] is adjoined to VP. Subsequently, the VP must intrapose to the specifier of the PP. This establishes a subject-relation with the preposition: on the cheek is predicated over the kissing event. The P *op* heading [op het perron] in turn can predicate over the PP [kuste op haar wang]. This predication relation is established

semantically, according to (5), by movement of the PP [kuste op haar wang] to the specifier position of the PP [op het perron].

The possible orders in (3) and (4) are derived from (6) and (7b), respectively, by deleting either the higher or the lower copy of the intraposed XPs. This copy-deletion process must obey an ‘Anti Scattering Condition’. This condition states that at PF, in the configuration $XP_1 Y t_i$, everything contained in XP must be spelled out on the same side with respect to Y. This assumption correctly rules out the impossible orders X2-X1-X3 and X3-X1-X2. For example, consider the ungrammatical X2- X1- X3 order. This order is ruled out, because X2 is spelled out in a position preceding X1, while X3 is spelled out in a position following X1, thereby violating the Anti Scattering Condition.

While I will adopt Barbier’s theory to a great extent, I will make some different assumptions that are in line with our eventual theory of the IPP and PPI-effect. I will assume that, while the movement of a VP can result in a predicate-subject relation according to (5), the movement does not take place to set up such a relation. Syntax is driven by syntactic features, it cannot establish relations on the basis of semantics. Relations between (the features of) elements are established over the course of the derivation through Agree (Chomsky (2000)). In the AUX-PPC-INF construction the feature content of the verbs is as follows (cf. Barbiers (2008)).

- (8) AUX_[u-participle] PPC_[v-participle, u-event] INF_[v-event]

As said, Agree takes place to value unvalued features. For example, the unvalued [event]-feature of the participle needs to be valued by a valued [event]-feature. The participle searches its c-command domain for the closest goal with a valued [event]-feature. This happens to be the infinitive. As a result of the agreement relation, movement of the infinitival VP to the specifier of the participial VP may take place. If it does, we derive the V1-V3-V2. If no movement takes place the resulting order is V1-V2-V3. The same happens in the case of the unvalued [participle]-feature of the auxiliary of the perfect. This feature gets valued by the [participle]-feature of the participle. Again, this can result in movement of the participial VP to the VP headed by the auxiliary. Depending on whether V3 moved to spec,VP2, we derive the V3-V2-V1 (where VP3 has moved to spec,VP2) or the V2-V3-V1 order (where VP3 hasn’t moved to spec,VP2). I take the Condition on Semantic Interpretation to hold at LF after all overt and covert movement has taken place. I furthermore assume that covert movement of XP to the specifier of Y is sufficient for Y to encode a predicate-argument relation in accordance to (5).

1.2.2 VP-movement

Under the assumption that covert movement can establish predicate-argument relations, it cannot be assumed that structures like (6) or (7b) are the input to derive the possible orders in (3) and (4). If intraposing takes place covertly, there no copies are created of intraposed XPs. As a consequence we no longer need the Anti Scattering Condition, because it can be assumed that it is always the highest copy that gets spelled out.

In fact, there is an argument to reject the Anti Scattering Condition. In some dialects the order in verbal clusters seems to depend on the semantics of the verbs involved. In the Achterhoeks dialect, for example, the causative verb *laten* ‘let’ can only occur in the V1-V2-V3 order, while other verbs generally tend to show either the V3-V2-V1 or the V1-V3-V2 order. This might be explained by assuming that *laten* has no [event]-feature and thus cannot attract its complement to its specifier. It is hard to see how PF deletion could be sensitive to

the semantics of verbs. One might oppose that if *laten* has not attracted its complement to its specifier, deletion doesn't take place at PF, since there exist no copies of the complement of *laten*. However, it is still predicted that there is a copy of *laten* and its complement in the specifier of the auxiliary of the perfect, see (9b).

- (9) a. dat Jan Piet heeft laten zingen.
 that John Pete has let-INF sing-INF
 'that John has let Pete sing.'
 b. dat Jan Piet [laten zingen] heeft [laten zingen]
 c. * dat Jan Piet [laten zingen] heeft [~~laten zingen~~]

Since it is possible in the Achterhoeks dialect to spell out the complement of the auxiliary in the specifier position of the auxiliary (in the [[V3-V2]-V1] order), we predict that the order in (9c) must be possible as well, contrary to fact. These data present evidence against the Anti Scattering approach, and indicate that a syntactic movement account is on the right track.

To restrict the grammar as much as possible, I assume that head-movement takes place at PF (cf. Chomsky (2000)) and that XP-movement is feature driven movement in syntax. PF-movement can be driven by certain phonological/morphological requirements of the morphemes that must be met, or alternatively, it may be driven by checking [categorical]-features. With [categorical]-features I refer to features that are interpretable at the PF-interface, for example a [participle]-feature.

To sum up, I argue that VP-movement is driven by [event] and [categorical]-features. The intuition behind adopting both [event] and [categorical]-features is that [event]-features are interpretable at the LF-interface, whereas [categorical]-features are interpretable at the PF-interface. This is in accordance with Full Interpretation, which states that every feature must be interpretable either at the PF or at the LF-interface.¹

1.2.3 the V3-V1-V2 order

Before we turn to the IPP-effect, a note on the V3-V1-V2 order must be made. The V3-V1-V2 order doesn't seem completely unattested. In fact, in the AUX-PPC-INF construction, the order is about as common as the V1-V3-V2 order in the SAND-database (Barbiers et al. (2008); Barbiers (2005)) See also Hoekstra (1994) for the existence of this order in the Zaans dialect. Furthermore, for many speakers there is a clear contrast between the V3-V1-V2 and the V2-V1-V3 order.

- (10) a. *dat Jan (ge)moeten heeft werken.
 that John (ge)must has work-INF
 (intended meaning) 'that John must have worked.'
 b. ?dat Jan werken heeft gemoeten.

The ungrammaticality of (10a) is accounted for if the V2-V1-V3 order is not derivable. This follows if we adopt the VP-movement account advocated above, where the impossibility of

¹ There is a discrepancy between [event] and [categorical]-features here. An unvalued [event]-feature is not interpretable at the LF interface, since it does not signal that the head that carries the feature denotes an event. A [categorical]-feature that comes to get valued over the course of the derivation is interpretable at the PF-interface. Such a feature can instruct Vocabulary Insertion to insert an element that corresponds to the [categorical]-feature at hand. As we will see in section 4, this is how the copying of morphological inflection proceeds.

the V2-V1-V3 order follows from the fact that VP2 cannot move without pied-piping VP3. While it is possible in principle that the variable judgements on the V3-V1-V2 order find their source in whatever it is that accounts for dialectal variation in any verb order, this is unlikely when a feature driven movement account is assumed. To derive the V3-V1-V2 order, it must be the case that V1 agrees with V3 and consequently VP3 moves into spec,VP1. We might argue that this is possible if V2 is not an intervener (an element which has features in common with V1). However, this analysis is unlikely for the following reason. If we assume the feature content of the elements to be as in (8), V2 is an intervener for Agree between V1 and V3, since it has a [participle]-feature, which V1 also has. V1 can thus not reach V3 to enter into an Agreement relation with. Even if we ignore this issue, it is unclear what feature V1 could have that V3 needs checked, while it must also be the case that V2 lacks this feature. A possible account for the judgements in (10) is to assume that (10a) is underivable whereas there is a derivation of (10b) that does converge, namely one in which [_{VP} werken] has scrambled to the matrix-middlefield to have valued, for example, a [focus]-feature. I will adopt the scrambling analysis of the V3-V1-V2 order, because of the fact that most speakers of Standard Dutch (marginally) allow scrambling of VP3, see (11).

- (11) dat Jan [_{VP} zingen] altijd gewild heeft t_{VP}
 that John sing-INF always has want-INF
 ‘that John always has wanted to sing.’

As we will see below, the existence of the V3-V1-V2 order in itself and the analysis thereof has little consequence for the account for the PPI or IPP-effect. What is important to note is the fact that the IPP-effect is not in all dialects obligatory in this order (see section 2.2).

2. The IPP-effect

In this section I will explain what the IPP-effect is and what variation there exists with respect to it. After reviewing some of the literature on the IPP-effect, I will consider the empirical data from the SAND-database. From these empirical data some clear generalizations emerge. The rest of this thesis is dedicated to explaining these generalizations.

2.1 What is the IPP-effect?

In Standard Dutch the past participle is formed by a ge-prefix and a dental suffix, as shown in (12).

- (12) Jan heeft ge-kook-t
 John has ge-cook-t
 ‘John has cooked.’

Surprisingly, the past participle does not show up in verbal clusters where the participle takes a verbal complement.

- (13) a. Jan heeft *willen* koken.
 John has want-INF cook-INF
 ‘John has wanted to cook’
 b. *Jan heeft gewild koken.
 John has wanted cook
 ‘John has wanted to cook.’

When the past participle takes a verbal complement, an infinitive takes the place of the past participle, see (13a). This replacement of the past participle by an infinitive when the past participle takes a verbal complement is known as the IPP-effect. As evidenced by (13b) the effect is obligatory in standard Dutch. There is a lot of literature on the topic of which most work falls into one of two types of approaches: the word-order approach and the *ge*-prefix approach. These will be discussed in turn in the next section.

2.2 IPP and word order

In this section I will investigate whether, and if so, how word-order is related to the IPP-effect. In the SAND-project, 261 dialects were investigated (Barbiers et al. (2008); Barbiers (2005)). An investigation of word-order showed for the AUX-PPC-INF construction that the V2-V1-V3 order is not attested. As discussed in section 1, this is a general property of restructuring clusters and thus not specific to the AUX-PPC-INF construction. This leaves us with five possible orders for the AUX-PPC-INF constructions.

The V1-V2-V3 is the order most commonly used in standard Dutch. The IPP-effect is obligatory in this order. In fact, there are no dialects that do not exhibit the IPP-effect in the V1-V2-V3 order.

- | | | |
|---------|--|----------|
| (14) a. | Ik weet dat Jan de dokter had kunnen roepen. | V1-V2-V3 |
| | I know that John the doctor had can-INF call-INF | |
| | ‘I know that John could have called the doctor.’ | |
| b. | Ik weet dat Jan de dokter kunnen roepen had. | V2-V3-V1 |
| | I know that John the doctor can-INF call-INF had | |

The V2-V3-V1 order is the one other order in which the IPP-effect always shows up. This order is not attested without the IPP-effect (cf. Wurmbrand (2004)).

Under our XP-movement account, the V2-V3-V1 order is derived by moving [V2-V3] out of the complement domain of V1, thus: [V2-V3] V1 _t[V2-V3].

In the V1-V3-V2, V3-V1-V2 and the V3-V2-V1 orders the IPP-effect is exhibited by some dialects, whereas others lack the IPP-effect in these orders. Dialects often allow more than one verb order. In that case, the co-occurrence of the V1-V2-V3 and the V2-V3-V1 order is common as well as the co-occurrence of the V3-V2-V1 and the V1-V3-V2 order. Whereas the first two of those orders never exhibit the IPP-effect, the latter two orders can either exhibit or lack the IPP-effect. Whether the IPP-effect shows up in these cases is (among other things) related to the semantics of the verbs. I will discuss the issue of optional IPP in the V3-V1-V2, V1-V3-V2, V3-V2-V1 orders in section 6. For now let us note that the IPP-effect is obligatory in the cases where [V2-V3] is intact.

Looking at the SAND-database, there can be found exceptions to every word order generalisation in the literature. For example, West Frisian has head-final verbal clusters, but does exhibit the IPP effect. Hoekstra (1994) notes that the IPP effect in Zaans occurs in the word order in which V1 precedes V2, but also notes that this is not the case in all dialects. Hoekstra states that it might be necessary to abandon the idea to relate the IPP to word order altogether, and that, instead, we have to search for an answer in the presence of the *ge*-prefix in IPP-dialects. The *ge*-prefix approaches will be discussed in the next section. Given the variation in word-order, an account of the IPP-effect on the basis of a word-order

generalization is unlikely to capture all the empirical data. It must be noted, though, that it is significant that the IPP-effect always shows up in case VP3 is in the complement domain of VP2.

2.3 The *ge*-prefix

2.3.1. *Ge*-prefix approaches

The *ge*-prefix approaches take the perfective prefix *ge-* to be responsible for the IPP effect. These accounts argue that if a language has a participial *ge*-prefix it will also exhibit the IPP-effect and vice versa. With respect to Dutch this generalisation seems to make the correct prediction for the north of North-Holland, Friesland, Groningen, Drenthe, the east of Twente and the east of the Achterhoek (Van Loey (1965: 161)). These dialects do not have the *ge*-prefix and do not exhibit the IPP effect. However, while the *ge*-prefix generalisation holds for the majority of the dialects, it does not seem to make the right predictions with regard to West Frisian, Interference Frisian and Achterhoeks. For Achterhoeks, Hoekstra & Blom (1996) show that it has a *ge*-prefix (a schwa) and optional IPP. On the other hand, Wolf (1996) shows that Interference Frisian doesn't have a perfective prefix, but does exhibit the IPP effect. Pannekeet (1995: 178) shows that the same holds for West Frisian. The fact that the IPP-effect is optional in cases that do not obey the prefix generalisation might indicate that other factors are at play here. Hoekstra & Taanman (1996), for instance, argue that the fact that West Frisian has optional IPP while lacking the *ge*-prefix might be due to bilingualism of the dialect speakers. Once we have a theory that explains the correlation between the *ge*-prefix and the IPP it will have to be established that bilingual dialect speakers can optionally violate the generalisation or that they have two competing grammars, one of which respects the generalisation and one that doesn't. While I will provide an account of the IPP-effect below, the optional appearance of it in West Frisian will be left for future research.

Ignoring for the moment how exactly the *ge*-prefix causes the IPP-effect, all *ge*-prefix approaches are based on the observation that dialects that lack the *ge*-prefix lack the IPP-effect. From the similar distribution of the *ge*-prefix and the IPP-effect in Continental West Germanic languages, I conclude that the generalization that the *ge*-prefix causes the IPP-effect is too good to be false. The fact that there appear to be some counterexamples will be put aside here, since there are few and it is possible that they only arise in dialects that are greatly influenced by Standard Dutch. In the rest of this thesis I will take the *ge*-prefix to be the cause of the IPP-effect.

2.4 IPP as a verbal cluster phenomena

The IPP-phenomenon is restricted to verbal clusters. Lets consider the V1-V2-V3 order of standard Dutch here. The IPP-effect is obligatory when the past participle embeds an infinitive. The IPP-effect fails to occur when the complement is not an infinitive. This is illustrated in the following examples.

- (15) Jan heeft gezegd [_{CP} dat hij komt]
John has said that he comes
'John has said that he comes.'

- (16) Jan heeft de bal gegooid [_{PP} naar Piet]
 John has the ball thrown to Pete
 ‘John has thrown the ball to Pete.’
- (17) Jan heeft [_{DP} iets]_i gezegd t_i
 John has something said
 ‘John has said something.’

The examples in (15)-(17) show that the IPP-effect is not attested when the complement of the past participle is a CP, PP or DP. Since the IPP-effect is obligatory in the V2-V3 order in all dialects I take these facts to hold across dialects. The question that we need to address now is in what contexts exactly the IPP-effect shows up. The answer cannot simply be infinitival complements, since infinitival complements introduced by an infinitival complementizer *om* do not show the IPP-effect, see (18).

- (18) Jan heeft geprobeerd om te komen.
 John has tried om to come
 ‘John has tried to come.’

In section 3 I will investigate what kind of verbal complements exhibit the IPP-effect. Before I turn to that, let me summarize the important results of this section in (19).

- (19) **IPP-Generalizations:**
- The IPP-effect only shows up in dialects that have a *ge*-prefix.
 - The IPP-effect is obligatory in the V2-V3 order.

There are two robust generalizations that can be deduced from the empirical data that we have discussed in this section. The generalizations in (19) leave room for dialectal variation. For example, it is possible for a dialect to have a *ge*-prefix and not show the IPP-effect (like in Achterhoeks). Our eventual theory of the IPP-effect should at least explain (19). Furthermore, it must explain why optionality arises only in those cases that are not captured by (19).

3. In what context may/must the IPP-effect occur?

In this section I will investigate the size of IPP infinitives. More specifically, we want to know in what context the IPP arises and in what contexts it never occurs. In the next section I will consider the size of the infinitives embedded by the past participle. To determine the size of the complement of the IPP-verb I will use the following diagnostics.

3.1. Diagnostics for determining complement size

In this section I will examine different type of verbs with respect to their size. I will make use of three diagnostics to determine how big a certain complement is. First, I will use the diagnostic of ‘transparency’ to see if a complement constitutes a phase or not. If a complement is transparent for extraction to the matrix clause, I will assume it is not a CP. As CPs are strong phases (see Chomsky 1995, 2001) they do not allow extraction. We should be careful with this assumption, however, as escaping a strong phase is possible via an escape hatch, namely *spec,CP*. The derivation in (20) illustrates this.

- (20) *Wat_i zei Jan [CP t_i dat hij had gedaan t_i]*
 What said John that he had done
 ‘What did John say that he had done?’

The *wh*-phrase *wat* ‘what’ in (20) has moved from the embedded object position to the matrix spec,CP. This escape out of a CP clause is possible because of the available landing site, the embedded spec,CP. Since the edge and the head of a phasal phrase are accessible for elements in the next phase for syntactic operations (Chomsky 1995), the *wh*-element can be extracted from the embedded spec,CP by virtue of spec,CP’s visibility in the next phase up. In Dutch, escaping via spec,CP is possible for *wh*-elements when the complementizer introduces a finite clause (21a,b) and also when the complementizer introduces an infinitival complement (21c).

- (21) a. *Wat_i denk je [t_i dat ik heb gekocht t_i]*
 what think you that I have bought
 ‘What do you think that I have bought?’
 b. *Wie_i vroeg je [t_i of ik had gezien t_i]*
 who asked you if I had seen
 ‘Who did you ask whether I had seen?’
 c. *Wat_i weigerde je [t_i om terug te geven t_i]*
 what refused you om back to give
 ‘What did you refuse to give back?’

Escaping via spec,CP appears to be possible out of an infinitival clause (21c). That indicates that spec,CP is present here. This presents us with evidence that *weigeren* ‘refuse’ is able to take a CP complement. The infinitival complementizer *om* is often optional. If the matrix verb is able to select a CP-complement, *om* may either be present (22a) or be left out (22b).

- (22) a. *Jan weigert om dat boek te lezen.*
 John refuses om that book to read
 ‘John refuses to read that book.’
 b. *Jan weigert dat boek te lezen.*
 John refuses that book to read
 ‘John refuses to read that book.’

The question now arises whether *om* is covertly present in C in (22b), or whether the absence of the complementizer signals the absence of a CP-layer. I argue that the latter is true. (23) shows that extraction of the object of the embedded verb can be extracted only when the complementizer *om* is absent. If a covert complementizer were present in (23b) we would expect that extraction were impossible. As covertness only refers to the fact whether an element gets spelled out at PF or not, it follows that covertness is not a relevant notion in the domain of ‘narrow syntax’ (D and S-structure).

- (23) a. *??dat Jan [de film]_i weigert om te kijken t_i.*
 that John the movie refuses om to watch
 ‘that John refused to watch the movie.’
 b. *dat Jan [de film]_i weigert te kijken t_i.*
 that John the movie refuses to watch
 ‘that John refuses to watch the movie.’

The same conclusion can be reached when we look at raising verbs. Some verbs in Dutch, like *dreigen* ‘threaten’ or *beloven* ‘promise’, are ambiguous between control verbs and raising verbs. Crucially, the usage of such verbs is disambiguated when the complementizer *om* is present. If *om* is present, only a control reading is possible, whereas a sentence in which *om* is absent can have both a control and a raising interpretation. This is illustrated for *dreigen* in (24).

- | | | |
|---------|---|-------------------|
| (24) a. | Jan dreigt [om PRO zijn portemonnee te verbranden]
John threatens om PRO his wallet to burn
‘John threatens to burn his wallet.’ | Control |
| b. | Jan _i dreigt [t _i veel huizen te verwoesten]
John threatens many houses to destroy
‘John threatens to destroy many houses’ | Raising / Control |
| c. | *[De orkaan] _i dreigt [om t _i veel huizen te verwoesten]
the hurricane threatens om many houses to destroy
Intended meaning: ‘the hurricane threatened to destroy many houses.’ | |

In (24a), where *om* is present, the only possible reading is a control reading in which *Jan* ‘John’ is the agent of a threatening event and the agent of a burning event. If *om* is absent, like in (24b), the subject *Jan* can be the agent of the threatening, but it doesn’t have to be the case. Another reading is available, namely one in which there is no agent for *dreigt* ‘threaten’, but only for *verwoesten* ‘destroy’. Since *dreigt* doesn’t assign a theta-role to *Jan* it follows that *Jan* originated in the subject position of the embedded clause. Since a raising reading involves raising of the subject from the embedded clause to the matrix clause, it follows that raising is impossible across the complementizer *om* (24c). This indicates that *om* is not covertly present in (24b) as we would expect *Jan* not to be able to move from the embedded to the matrix subject position.

To sum up, if a verb is able to take an infinitival complement introduced by a complementizer *om*, it is able to take a CP-complement. These verbs are also able to take a smaller complement as the use of the complementizer *om* is always optionally present. If a verb is unable to take an infinitival complement with *om* present, I will assume a CP-layer is absent.

A diagnostic for determining whether an infinitival complement has a TP-layer is using tense adverbials. To examine whether a complement has a TP-layer we can try to add a tense adverbial to the complement. If the sentence remains grammatical it follows that a TP layer is present, assuming that time adverbials are adjoined to TP and licensed by the presence of a TP-layer.

3.2 The size of IPP-complements

In this section I will put the diagnostics discussed above to use to determine the size of IPP-complements. The verbs I will test are modals, causatives, perception verbs, benefactives, duratives, inchoatives, control verbs and lexical restructuring verbs.

a-examples: CP-complementizer.

b-examples: Modification by (time) adverbial.

c-examples: Extraction of the object.

d-examples: is IPP obligatory?

In the examples * indicates ‘opposite’ (e.g. *CP means that there is no CP-layer)

Modals

- (25) a. Jan heeft hem willen (*om) (*te) ontmoeten. → *CP
 John has him want-INF (*om) (*te) meet-INF
 ‘John has wanted to meet him.’
- b. *Jan heeft hem dinsdag willen ontmoeten. → *TP
 John has him Tuesday want-INF meet-INF
 (intended meaning) ‘John has wanted to meet him on Tuesday.’
- c. Jan heeft hem_i willen (*hem_i) ontmoeten t_i. → DO.ext
 John has him want-INF (*him) meet-INF
 ‘John has wanted to meet him.’
- d. *Jan heeft hem gewild ontmoeten. → obl. IPP
 John has him wanted meet-INF

The example in (25a) shows that modals cannot take a CP-complement, since the complementizer must be absent. The b-example shows that a tense-adverbial cannot be present. (25b) cannot have the meaning ‘John has wanted to meet him on Tuesday’, where *dinsdag* ‘Tuesday’ has scope over *ontmoeten* ‘meet’, but not over *willen* ‘want’. (25c) shows that object extraction is obligatory. (25d) shows that a past participle modal can only show up as an infinitive (25d), i.e. the IPP-effect is obligatory.

Causatives

- (26) a. Jan heeft hem laten (*om) (*te) spelen. → *CP
 John has him let-INF (*om to) play
 ‘John has let him play.’
- b. *Jan heeft hem dinsdag laten spelen. → *TP
 John has him Tuesday let-INF play
 (intended meaning) ‘John has let him play on Tuesday.’
- c. Jan heeft hem_i laten (*hem_i) komen t_i. → DO.ext
 John has him let-INF (*him) come
 ‘John has let him come.’
- d. *Jan heeft hem gelaten spelen. → obl. IPP
 John has him let-PPC play
 ‘John has let him play.’

Causatives show the same characteristics as modals: they do not take CP or TP-complements and the IPP-effect is obligatory. Although (26b) is grammatical under the reading ‘John let him play on Tuesday’, the modifier *dinsdag* ‘Tuesday’ cannot be interpreted as only modifying *spelen* ‘play’. In fact, it is difficult, if at all possible, to comprehend such an interpretation at all. This difficulty might be taken to indicate that a TP-adverbial is ruled out by semantic restrictions. Perception verbs show that this is probably not the case and that the reason for the impossibility of a TP-adverbial in (25) and (26) above is syntactic.

Perception verbs

- (27) a. Jan heeft Piet zien (*om) (*te) zwemmen. → *CP
 John has Pete see-INF (*om) (*to) swim-INF
 ‘John has seen Pete swim.’
- b. *Jan heeft net Piet dinsdag zien zwemmen op tv. → *TP
 John has just Pete Tuesday see-INF swim-INF on tv

- (intended meaning) ‘John has just seen Pete swim on Tuesday.’
- c. Jan heeft hem_i dinsdag zien (*hemi) zwemmen t_i. → DO.ext
 John has him Tuesday see-INF (*him) swim-INF
 ‘John has seen him swim on Tuesday.’
- d. *Jan heeft hem gezien zwemmen. → obl. IPP
 John has him seen-PPC swim-INF
 ‘John has seen him swim.’

Perception verbs pattern with modals and causatives. They do not take CP or TP-complements and the object cannot be licensed in situ (27c). Furthermore, the IPP-effect is obligatory (27d). Although in the case of perception verbs it is perfectly plausible that the modifier *dinsdag* ‘Tuesday’ modifies the swimming event only (27b), this is not possible. Nothing semantically rules out a tense-modifier to modify the verbal event embedded by the past participle (as might have been the case with causatives). (27) therefore provides us with evidence that a TP-layer is absent in the complement of the past participle in (27b). I will assume that this holds true for modals and causatives as well.

Benefactives

- (28) a. Jan heeft Piet geleerd (om) nooit op te geven. → CP
 John has Pete learned (om) never up to give
 ‘John has learned Pete to never give up.’
- a’ Jan heeft Piet leren (*om) (*te) afwassen. → *CP
 John has Pete learned (*om) (*to) off-wash
 ‘John has learned Pete to do the dishes.’
- b. Jan heeft Piet geleerd ‘s morgens af te wassen. → TP
 John has Pete learned in the morning off to wash
 ‘John has learned Pete to do the dishes in the morning.’
- b’ *Jan heeft Piet ‘s morgens leren afwassen. → *TP
 John has Pete in the morning learn-INF off-wash-INF
 ‘John has learned Pete to do the dishes in the morning.’
- c. Jan heeft Piet (*[de bal]_i) geleerd [de bal]_i te gooien t_i. → *DO.ext
 John has Pete (*the ball) learned the ball to throw
 ‘John has learned Pete to throw the ball.’
- c’ Jan heeft Piet [de bal]_i leren (*[de bal]_i) gooien t_i. → DO.ext
 John has Pete the ball learn-INF (*the ball) throw-INF
 ‘John has learned Pete to throw the ball.’

Benefactives show a dual behaviour. They can take a CP-complement, like in (28a). In that case, the IPP-effect is voided. If they take a smaller complement than CP or TP as in (28c’) for instance, the IPP-effect is obligatory. The modifier ‘s *morgens* ‘in the morning’ cannot modify the embedded event of doing the dishes in (28b’).

Duratives

- (29) a. Jan heeft zitten (*om) (?te) spelen. → *CP
 John has sit-INF (*om) (?to) play-INF
 ‘John has been playing.’
- b. *Jan heeft gisteren zitten spelen. → *TP
 John has yesterday sit-INF play-INF
- c. Jan heeft ([dat spel]_i) zitten (*[dat spel]_i) spelen t_i. → DO.ext
 John has (that game) sit-INF (that game) play-INF

- ‘John has been playing that game.’
 d. *Jan heeft gezeten dat spel spelen. → obl. IPP
 John has sat that game play-INF
 ‘John has been playing that game.’

Duratives closely resemble causatives in that they do not take a CP-complement and always show the IPP-effect. Furthermore, a TP-modifier cannot modify the verbal event embedded by the past participle (29b). This seems intuitively correct, since *zitten* ‘sitting’ is not taken literally. Rather, it expresses durative aspect. *Zitten* itself thus doesn’t constitute a separate event. Modifying only the event embedded by *zitten* might therefore be impossible, since *zitten* and *spelen* ‘play’ form one event, both syntactically and semantically.

Inchoatives

- (30) a. Jan is begonnen (*om) *(te) rennen. → *CP
 John has begun (*om) *(to) run-INF
 ‘John has begun to run.’
 a’ Jan is beginnen (*om) (te) rennen. → *CP
 John is begin-INF (*om) *(to) run
 ‘John has begun to run.’
 b. ?Jan is begonnen ’s morgens te rennen. → TP
 John is begun in the morning to run-INF
 ‘John has begun to run in the morning.’
 b’ *Jan is ’s morgens beginnen te hardlopen. → *TP
 John is in the morning begin-INF to run-INF
 (intended meaning) ‘John has begun to (habitually) run in the morning.’
 c. Jan is (*[dat spel]_i) begonnen ([dat spel]_i) te spelen t_i. → *DO.ext
 John is (*that game) begun (that game) to play
 ‘John has begun to play that game.’
 c’ Jan is ([dat spel]_i) beginnen (*[dat spel]_i) te spelen t_i. → DO.ext
 John is (that game) begun (*that game) to play
 ‘John has begun to play that game.’

Inchoatives show a different behaviour from the verbs we have considered so far. First, they are unable to take a CP-complement, see (30a). However, it does show dual behaviour with regard to allowing the IPP-effect. If the event embedded by the past participle can be modified by a tense-adverbial, and thus has a TP-layer, the IPP-effect is absent, see (30b). If the event embedded by the past participle cannot be modified by a tense adverbial, as in (30b’), the IPP-effect is obligatory.

Control verbs

- (31) a. Jan heeft geweigerd (om) te koken. → CP
 John has refused (om) to cook-INF
 ‘John has refused to cook.’
 a’ ??Jan heeft weigeren (*om) *(te) koken. → *CP
 John has refused (*om) *(to) cook-INF
 ‘John has refused to cook.’
 a’’ Jan heeft het boek weigeren (*om) *(te) lezen. → *CP
 John has the book refused (*om) *(to) read-INF
 ‘John has refused to read the book.’
 b. Jan heeft geweigerd gisteren het boek te lezen. → TP

- John has refused yesterday the book to read-INF
 ‘John has refused to read the book yesterday.’
- b’ *Jan heeft gisteren het boek weigeren te lezen. → *TP
 John has yesterday the book refused to read-INF
 (intended meaning) ‘John has refused to read the book yesterday.’
- c. Jan heeft ([het boek]_i) geweigerd ([het boek]_i) te lezen t_i. → DO.ext / *DO.ext
 John has (the book) refused (the book) to read-INF
 ‘John has refused to read the book.’
- c’ ?Jan heeft ([het boek]_i) weigeren (*[het boek]_i) te lezen t_i. → DO.ext
 John has (the book) refuse-INF (*the book) to read-INF
 ‘John has refused to read the book.’

In the case of the control verb *weigeren* ‘refuse’ we observe that a CP and TP-layer can be present, see (31a,b). So far, we have observed that verbs that exhibit dual behaviour with regard to the IPP-effect, show the IPP-effect when the TP-layer is absent. However, for *weigeren* ‘refuse’ this is only the case when the infinitive embedded under the past participle takes a direct object, as in (31a’). When the infinitive has no object, like in (31a’), the sentence is significantly degraded. As this distinction is not important for our discussion, I will simply assume that IPP is possible with *weigeren*, and ignore the fact that it needs a direct object in that case.

Lexical Restructuring verbs

- (32) a. Jan heeft geprobeerd (om) te zwemmen. → CP
 John has tried (om) to swim-INF
 ‘John has tried to swim.’
- a’’ Jan heeft proberen *(om) te zwemmen. → *CP
 John has tried *(om) te zwemmen-INF
 ‘John has tried to swim.’
- b. Jan heeft geprobeerd dinsdag te zwemmen. → TP
 John has tried Tuesday to swim-INF
 ‘John has tried to swim on Tuesday.’
- b’ *Jan heeft dinsdag proberen te zwemmen. → *TP
 John has Tuesday try-INF to swim-INF
 ‘John has tried to swim on Tuesday.’
- c. Jan heeft ([een boek]_i) geprobeerd ([een boek]_i) te lezen t_i. → DO.ext / *DO.ext
 John has (a book) tried (a book) to read-INF
 ‘John has tried to read a book.’
- c’ Jan heeft [een boek]_i proberen (*[een boek]_i) te lezen t_i. → DO.ext
 John has a book try-INF (*a book) to read-INF
 ‘John has tried to read a book.’

3.3 Interpreting the results

Table 1. *The size of IPP-complements.*

	IPP			*IPP		
	CP	TP	DO.ext	CP	TP	DO.ext
Modal	*	*	V	n.a.		
Causatives	*	*	V	n.a.		
Perception	*	*	V	n.a.		
Benefactives	*	*	V	V	V	*
Duratives	*	*	V	n.a.		
Inchoatives	*	*	V	*	V	*
Control	*	*	V	V	V	*/V
Lexical restructuring	*	*	V	V	V	V

This section has investigated the size of the complement of the past participle in the AUX-PPC-INF order. Since the IPP-effect is only exhibited when a past participle takes an infinitival complement, only these complements were considered. It was thus ignored that some verbs do allow for finite CP-complements, such as benefactives or lexical verbs. There are a couple of interesting conclusions that can be drawn from table 1 above. First, some verbs show a dual behaviour: they can show up in IPP and IPP-less constructions. IPP-less constructions can either have a CP-layer or lack it. Furthermore, they predominantly require the object to stay in situ, but not always, like in the case of the lexical restructuring verbs. The only property that all past participles in an IPP-less context have in common is the presence of a TP-layer in their complement. Significantly, in the IPP contexts the TP-layer is never present. The fact that the direct object of V3 obligatorily needs to move to the matrix clause suggests that a *vP*-layer, which licenses ACC case, is missing. However, a general property of restructuring clusters is that they do not allow any material to intervene within the cluster,² which blurs the facts a little. The reason that no material may intervene within a verbal cluster cannot find its explanation in syntax. The fact that phonologically light material like particles may intervene, is reason to believe that the non-intervention condition is a PF-condition. An argument to place the non-intervention condition at PF is that adverbials, which may not occur within verbal clusters, can stay adjoined to the VP they modify in case the VP is moved. To make this clear, consider (33).

- (33) a. *dat Jan [_{VP} gaat vaak zwemmen]
 that John go-INF often swim-INF
 ‘that John often goes swimming.’
 b. dat Jan vaak [_{VP} gaat zwemmen].
 c. [_{VP} vaak zwemmen] gaat Jan.

(33a) shows that *vaak* ‘often’ cannot intervene within a verbal cluster, but must precede it (33b). If this movement were syntactic, *vaak* would have to move out of the cluster directly after the cluster has been derived. If so, the question arises how the adverbial could ever move along with the VP it modifies if it must have moved out of the cluster directly after the cluster was created. The problem disappears, however, if we assume that the non-intervention condition holds at PF. When topicalization of the adverbial + VP takes place, the adverbial

² An exception to this generalization are particles.

hasn't moved out of the cluster yet, since the non-intervention condition holds only at PF, after topicalization has taken place. From this argument it can be concluded that the fact that direct objects must move out of the cluster is syntactic. Direct object can be complex items, say a determiner plus noun. While they are subject to the non-intervention condition at PF, they cannot move at PF, since only head-movement is possible at PF. The fact that the movement of direct objects finds its cause in syntax, leads me to conclude that a ν P-layer is absent in IPP-contexts. Direct objects cannot get their ACC-case checked inside a verbal cluster, hence they have to move out of the cluster to the matrix ν P-layer.

We can now conclude that the complements of participles in IPP-contexts are no bigger than VP.³ In other words, the IPP-effect takes place in restructuring contexts. Contexts in which verbs are able to take VP-complements (see Wurmbrand (2001; 2004)).

3.4 IPP and spell-out domains

The main result of the previous section is that the IPP-effect is a restructuring phenomena. It shows up when a past participle takes an infinitival VP-complement. The question now arises why the IPP-effect shows up when a past participle takes a VP-complement but not when it takes a PP, DP or CP-complement. The solution I adopt here is that VP doesn't constitute a spell-out domain (a phase), while DP, CP and PP do. This is partly in agreement with Chomsky (1995) who assumes that DP and CP are phases. If the IPP-effect were indeed to be the result of a past participle taking a non-phasal complement, we need to answer why the IPP-effect arises in such a context. We don't get to answer this *why*-question until section 6. I will at this point, however, answer the question in which context the IPP-effect arises in more detail here. More specifically, I will argue here that the following generalization holds.

(34) IPP Generalization:

The IPP-effect arises when a past participle dominates overt material within its phase.

(34) captures the empirical data summarized in table 1 above. If non-IPP contexts are at least as big as TP, it follows that a ν P-layer is present as well. Since ν P is a phase, it follows that the participle doesn't dominate any overt material within its spell-out domain. Put differently, in non-IPP contexts, there is no overt material in-between the participle and the right edge of the lower phase. In IPP contexts on the other hand, the participle does dominate overt material within its spell-out domain. The participle takes a VP-complement, which doesn't constitute a spell-out domain. If this domain is non-empty the IPP-effect turns up.

A strong argument that the IPP Generalization in (34) is correct, is the fact that VP-movement in IPP-contexts bleeds the IPP-effect. Consider the example in (35).

- (35) a. [_{VP} Werken] heeft Jan nooit gewild t_{VP}.
work-INF has John never wanted
'Working, John has never wanted.'
b. dat Jan [_{VP} Werken] nooit heeft gewild t_{VP}.
that John work-INF never has wanted
that John has never wanted to work.'
c. [_{VP} Werken] heeft Jan nooit gewild t_{VP} en Piet nooit gekund t_{VP}.
work-INF has John never wanted and Pete never could
'Working, John has never wanted and Pete never been able to.'

³ Below we will see, however, that they are actually AspP. AspP is taken to be situated between VP and ν P.

Above we have seen that modals always take a VP-complement and thus exhibit the IPP-effect. However, if the VP-complement of the benefactive past participle is moved, the IPP-effect is bled. This is illustrated in (35a,b,c) for topicalization, scrambling and ATB-movement, respectively.

VP-movement bleeds the IPP-effect. This follows from (34), since the movement of the VP results in the participle no longer dominating any overt material (within its phase). The argument in favour of (34) can be made even stronger if we consider Right Node Raising. Right Node Raising is often analysed as involving a multi-dominance structure (McCawley (1982; 1987), Goodall (1987), Levine (1985), McCloskey (1986), Ojeda (1987) and Wilder (1999)) Under such an account, the seemingly dislocated element is in fact dominated by two heads. In the case of (36) below, the Vs *willen* ‘want’ and *kunnen* ‘be able to’ both dominate the VP *werken* ‘work’.

- (36) Jan heeft nooit willen en Piet nooit kunnen werken.
 John has never wanted and Pete never could work-INF
 ‘John has never wanted and Pete never been able to work.’

Both *willen* en *kunnen* dominate [_{VP} werken]. These verbs thus dominate overt material (*werken*). As correctly predicted by (34), both *willen* and *werken* exhibit the IPP-effect. An explanation of (34) will have to be postponed until section 6.

4. The PPI effect and copying inflectional morphology

In this section we will look at parasitic participles (this term is borrowed from Den Dikken and Hoekstra (1997)). A parasitic participle is an infinitive that is spelled out as a participle. Schematically this can be represented as in (37).

- (37) [Aux [participle [infinitive]]] → [Aux [participle [participle]]]

In the next sections I will consider some of the properties of parasitic participles. I will first consider Swedish parasitic participles (section 4.1) and outline the theory of Wiklund (2005) (section 4.2). In section 4.3 I will consider Frisian past participles. In section 4.4 I will investigate whether the IPP-effect might involve copying of morphological inflection. Under such an analysis the past participle shows up as an infinitive, because the infinitival morphology of the embedded infinitive has copied onto the past participle.

4.1 Properties of Swedish parasitic participle constructions

The auxiliary of the perfect *ha* ‘have’ in Swedish can be dropped under certain circumstances (see among others Platzack (1986), Holmberg (1986), Hedlund (1992), Julien (2000)).

- (38) a. Lars skulle ha last boken.
 Lars would have read-PTC book-DEF
 b. Lars skulle last boken.
 Lars would read-PTC book-DEF
 ‘Lars would have read the book.’

However, if we were to analyse parasitic participle constructions as involving a dropped auxiliary, like in (38b), we could not explain the following data.

- (39) a. Lars hade börjat o läst boken.
 Lars had start-PTC o read-PTC book-DEF
 ‘Lars had started reading the book.’
- b. Lars hade börjat o ha läst boken.
 Lars had start-PTC o have read-PTC book-DEF
 ‘Lars had started having read the book.’
- c. Lars hade börjat o läsa boken.
 Lars had start-PTC o read-INF book-DEF
 ‘Lars had started reading the book.’ (same as (39a))

(39b) is a double *ha* construction. The interpretation of (39b) is that Lars is getting close to finishing the book. If the double participle construction in (39a) were to be analysed as a case of *ha*-drop, we would expect it to (be able to) have the same interpretation as (39b). Under the *ha*-drop analysis of participle doubling, (39a) would be identical to (39b), except for the fact that in (39a) the auxiliary has been dropped. That the *ha*-drop analysis cannot be correct is evidenced by the fact that (39a) doesn't have the same semantics as (39b). Rather, (39a) has the same interpretation as (39c). (39a) differs only from (39c) in the fact that it has a participle in the place of the expected infinitive. (39a) thus patterns with the copying schema in (37) above, and thereby convincingly shows that a *ha*-drop analysis for parasitic participles to be incorrect. By similar reasoning, the same conclusion is reached by Den Dikken and Hoekstra (1997) for Frisian parasitic participle constructions. I conclude that parasitic participle constructions do not involve AUX-drop, since the semantics are not as would be expected under such an analysis. From the comparison between (39a, c) with (39b) it follows that copying of the participle is semantically vacuous, since copying has no effect on the interpretation. Furthermore, the existence of (39a) next to (39c) shows that participle copying is optional. The same seems to hold in Frisian, where the following sentences are all possible. This shows that copying is optional and may apply to more than one infinitive.

- (40) a. Hy soe it dwaan kinne wollen ha.
 He would it do-INF can-INF want-PTC have
 ‘he would have like to be able to do it’
- b. Hy soe it dwaan kinnen wollen ha.
 He would it do-INF can-PTC want-PTC have
 ‘he would have like to be able to do it’
- c. Hy soe it dien kinnen wollen ha.
 He would it do-PTC can-PTC want-PTC have
 ‘he would have like to be able to do it’

Wiklund (2005) argues that copying applies in a top-down fashion. She gives three arguments for this claim.

One of her arguments comes from semantics. As can be concluded from (39a,c), copied forms of the participle are semantically vacuous. It follows that the real participle hosts the interpretable instance of the participle features. If copying is semantically vacuous, it is reasonable to assume that copying proceeds from the real participle to the parasitic ones. I agree with the reasoning that in parasitic participle constructions the parasitic participle inflection is copied from the real participle onto the infinitive. What does not follow from this reasoning, however, is that the copying procedure must apply top-down in every language. In fact, the following Frisian data is at odds with such a claim.

- (41) Hij soe it dien ha kinnen wollen.
 He would it do-PTC have can-PTC want-PTC
 ‘he would like to be able to have done it’

V4-V3-V2-V1

Under our assumption that all languages are VO, the order of selection at D-structure of the elements in (41) is as in (42).

- (42) Hy soe wollen kinnen dien it
 He would want can have do it

If we assume that the true participle has the property to copy its inflection onto a c-commanded verb, we would expect copying to be impossible in (42), as the true participle is the lowest verb in the structure. We do not want to say that copying of the participial morphology proceeds bottom-up in Frisian and top-down in Swedish. Therefore, we minimally have to assume that copying of participial morphology in Frisian can take place derivationally. I will postpone the analysis of Frisian parasitic participles until section 4.3.

The next argument for copying as a top-down procedure comes from selection. (43) shows that *lätta* ‘let’ and *anse* ‘consider’ can both select an infinitival complement.

- (43) a. Han hade lätit henne vara hemma själv.
 he had let-PTC her be-INF home alone
 ‘He had let her be home alone.’
 b. Han hade ansett henne vara vacker.
 He had consider-PTC her be-INF beautiful
 ‘He had considered her to be beautiful.’

While both verbs can take an infinitival complement, they do not both allow participle copying. (44) shows that only *lätta* allows it and that *anse* doesn’t.

- (44) a. Han hade lätit henne varit hemma själv.
 he had let-PTC her be-PTC home alone
 b. *Han hade ansett henne vara vacker.
 He had consider-PTC her be-PTC beautiful

These data show that it is the real participle that determines whether copying can take place or not. The infinitive cannot be the determining factor, because the infinitival complement is identical in (44a) and (44b). (44) does not present conclusive evidence that copying in general must take place top-down. I refer again to the Frisian data in (41).

The last argument for copying as a top-down procedure comes from missing infinitive copying. As shown in (45), an infinitive embedded under a participle cannot copy its infinitival inflection to the participle.

- (45) a. Jag har velat läsa.
 I have want-PTC read-INF
 b. *Jag har vilja läsa.
 I have want-INF read-INF
 ‘I have wanted to read.’

The sentences in (45) present strong evidence against a bottom-up procedure of inflection copying. However, at first sight this claim seems to be undermined by the Dutch IPP effect. Consider the sentences in (46), which are superficially identical to the ones in (45).

- (46) a. *Ik heb gewild lezen.
I have want-PTC read-INF
b. Ik heb willen lezen.
I have want-INF read-INF
'I have wanted to read.'

The data in (46) are from Standard Dutch and show a different pattern from the Swedish data. The auxiliary of the perfect selects a participle, but this participle cannot show up at the surface. An infinitive must appear instead. While an analysis of the IPP-effect in terms of copying appears possible, I will argue explicitly against this claim below, but I will put the issue aside for now. As it stands, then, (45) presents evidence for the claim that copying is top-down in Swedish.

Another property of copying is that it is local. This is illustrated for the parasitic participle construction by the contrast between (47a,b,d) and (47c).

- (47) a. Han hade velat hunnit komma hit.
he had want-PTC manage-PTC come-PTC here
b. Han hade velat hunnit komma hit.
he had want-PTC manage-PTC come-INF here
c. *Han hade velat hinna komma hit.
he had want-PTC manage-INF come-PTC here
d. Han hade velat hinna komma hit.
he had want-PTC manage-INF come-INF here
'He had wanted to come here.'

Participial morphology can be copied onto infinitives that are selected by the participle. This copying procedure must apply in a local fashion as evidenced by the ungrammaticality of (47c), where the infinitive *hinna* 'manage' disrupts the copying procedure between *velat* 'want' and *kommit* 'come'. The same can be observed for Frisian. Consider (40) again, repeated here as (48a-c). While we do not know exactly how copying proceeds in Frisian (or in Swedish for that matter) we can observe that a copying relation between a (parasitic) participle and a lower verb ('lower' refers to D-structure relations here) cannot be disrupted by an infinitive.

- (48) a. Hy soe it dwaan kinne wollen ha.
He would it do-INF can-INF want-PTC have
'he would have like to be able to do it'
b. Hy soe it dwaan kinnen wollen ha.
He would it do-INF can-PTC want-PTC have
'he would have like to be able to do it'
c. Hy soe it dien kinnen wollen ha.
He would it do-PTC can-PTC want-PTC have
'he would have like to be able to do it'

d.??Hy soe it dien kinne wollen ha.
 He would it do-PTC can-INF want-PTC have
 ‘he would have like to be able to do it’

This section has shown for Swedish and partly for Frisian that parasitic participle constructions at least have the following properties. These properties should be accounted for by any theory on copying of participial inflection.

- Copying is semantically vacuous.
- Copying is optional.
- Copying proceeds top-down.
- Copying is local.

In the next section I will present Wiklund’s account of copying of participial morphology.

4.2 Wiklund’s (2005) analysis of parasitic participle constructions

Wiklund (2005) assumes that the relevant relation in a copying construction is Agree. This assumption accounts for the fact that copying occurs under c-command, that it is a local relation and for the fact that copying involves (feature) sharing. These properties are also acknowledged in Agree.

There is a problem with the assumption that copying involves Agree, however. Wiklund notes that Agree holds between a probe with an unvalued feature and a c-commanded goal with a valued feature. Copying, on the other hand, involves a relation between a specified element upstairs (the true participle) and an underspecified element downstairs (the infinitive). Lets assume for now that ‘underspecified’ refers to the fact that the infinitive does not have a [participle]-feature. In short, Wiklund notes that feature sharing under Agree is a bottom-up procedure, while copying applies top-down. While this seems to be correct for Swedish, for convenience’ sake I will assume for Frisian that Agree and copying both apply top-down.

I will assume here with Wiklund that Agree holds between a probe and a goal in its c-command domain. In the participial cases we are discussing here, agreement holds between two V-heads. I furthermore assume, as noted in section 1, that Agree takes place to value [event] and [participle]-features. Schematically, we can represent the cases under consideration as follows:

$$(49) [_{CP} [_{TP} T_{[vtense]} [_{VP} V^{AUX}_{[u\text{participle}, uevent, utense]} [_{VP} V^{PPC}_{[uevent, v\text{participle}]} [_{VP} V^{INF}_{[vevent]}]]]]]]$$

What happens in the AUX-PPC-INF with regard to Agree? After the participle has merged the infinitival VP as its complement, the V_{PPC} will Agree with the V_{INF} to value its [event]-feature. When V_{AUX} has merged, it needs to have two unvalued features valued, or else the derivation will crash at the PF or LF-interface. V_{AUX} seeks its c-command domain and finds V_{PPC} which has valued instances of the [event] and [participle]-features that V_{AUX} needs to have valued. V_{AUX} still has a [utense]-feature, though. This feature is valued by the [vtense]-feature of T. In this example agreement is top-down (the probe always c-commands the goal). There is, however, another possible configuration in which features can be valued, namely the spec,head-configuration (Chomsky (1995)). As we will see below, Agree alone cannot explain the participle-copying constructions in Frisian. Spec,head-agreement takes place between an XP_{probe} and a Y_{goal} , where XP is merged as a specifier of Y.

In the next section, I will consider the Frisian data and argue that it can be captured under the Agree-account only if we assume both Agree and spec,head-agreement.

4.3 Frisian parasitic participles

Participles in Frisian always occur to the left of the auxiliary that selected them. This is illustrated in (50).

- (50) a. omdat hy it dien hie V2-V1
 because he it do-PTC had
 b. *omdat hy it hie dien V1-V2

As has been suggested in section 1, all verbal movement is XP-movement. The fact that participles in Frisian consistently show up to the left of the verbal cluster led Van Dikken and Hoekstra (1997) to assume that the XP selected by the auxiliary moves to a functional projection FP outside of the verbal cluster, where participial morphology is checked. However, all the verbs embedded under the auxiliary of the perfect are assumed to undergo leftward head-movement. These verbs are subject to the following constraint.

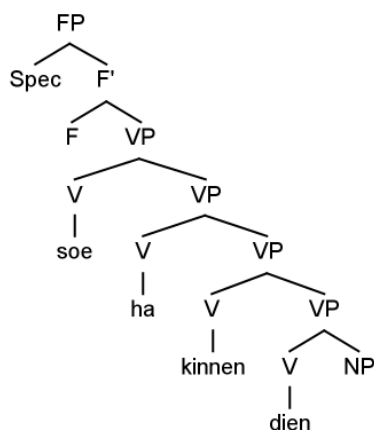
(51) **Relativized head-movement constraint (RHMC)**

Movement of a head X across a c-commanding head Y is illegitimate if X and Y share features and is forced otherwise.

With these assumptions in mind let's consider the derivation of (52). The initial structure for this sentence is given in (53), where the VPs are base generated in accordance to their scopal relations.

- (52) omdat hy it dien kinnen ha soe V4-V3-V2-V1
 because he it done-PTC can-PTC have would
 ‘(because) he would have been able to do it’

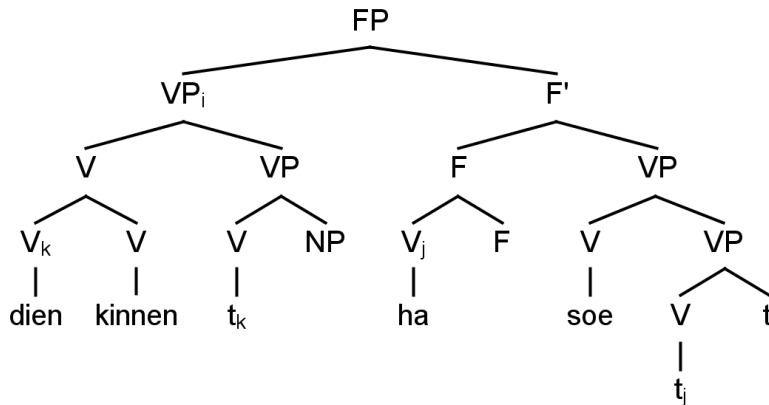
(53)



The participial XP [*kinnen dien*] selected by the aspectual auxiliary moves to spec,FP. Next, *dien* ends up to the left of *kinnen* by left-adjunction. By this movement *dien* checks its participial morphology, since the movement to *kinnen* places *dien* in the checking domain of F. However, it is actually not F that checks participial features, but the selecting verb *ha*. To establish a local checking relationship between *dien* and *kinnen* on the one hand and *ha* on the

other, *ha* moves to F. *Ha* then checks the [participle]-features of *dien* and *kinnen* in a spec,head-configuration. This of course implies that *ha* can check multiple participles. This follows if we assume that F has an interpretable [participle]-feature, whereas *dien* en *kinnen* have an uninterpretable [participle]-feature. This assumption explains why in constructions with multiple participles it seems like only one participle is interpreted. If multiple specifiers are allowed to check features against *ha* in a spec,head-configuration (Chomsky (1995)) there is in principle no limit to how much participles *ha* can license. The completed derivation is shown in (54).

(54)



Only one question remains to be answered and that is why *ha* can move to F skipping *soe*. Given the RHMC, it must be the case that *soe* doesn't have features that block movement of *ha*. Den Dikken & Hoekstra argue that *soe* only has a [modal]-feature, but no-[participle] feature. For *ha* it is exactly the other way around, it has a [participle]-feature but no [modal]-feature, therefore *ha* can skip *soe*. In fact, if *ha* would adjoin to *soe* before adjoining to F, *ha* could not check its uninterpretable [participle]-feature against F in a local fashion; it would be too deeply embedded.

While Den Dikken and Hoekstra's account explains the PPI-effect, it can not be adopted as is, since it doesn't stroke with some of our assumptions. First, we have argued that it is favourable from a conceptual point of view to have only one syntactic type of movement in verbal clusters. In section 1 this was argued to be VP-movement. I assume with Wiklund (2005) and Den Dikken and Hoekstra that participle copying is dependant on [participle]-feature sharing, but I assume that the participle carries the [participle]-feature: not a functional head F. If [participle]-feature valuation is what results in copying, it follows that the parasitic participles (the infinitives) must have a [participle]-feature as well. I follow Den Dikken and Hoekstra in assuming that infinitives can optionally be specified for a [participle]-feature. This feature must receive a value before it reaches the interface levels, otherwise the derivation crashes. Lets consider an example to make this all clear.

- (55) a. Hij soe it [dien ha kinnen]. V3-V2-V1
 He would it done-PPC have can-PPC
 'he would be able to have done it'
 b. D-structure: kinnen_[uparticiple] ha_[uparticiple] dien_[vparticiple]

The participle *dien* 'do' has a valued [participle]-feature. The auxiliary *ha* 'have' has an unvalued instance of this feature. This feature needs to be valued before spell-out. *Ha* thus seeks its c-command domain for a goal and finds the participle *dien*. *Dien* can then value the

[participle]-feature of *ha*. Note that it is the element with the unvalued feature that seeks to Agree with an element with a valued feature. Next, as part of the Agree-relation, the VP containing *dien* is moved to the specifier of *ha*.⁴ Then, *kinnen* is merged, which can optionally be equipped with a [participle]-feature, in the case of (55) this happens to be the case. Since the [participle]-feature is unvalued it needs to be valued before spell-out. *Kinnen* seeks its c-command domain and finds *ha* or *dien*. Both are equidistant from *kinnen* according to Chomsky (1995). Lets say that *kinnen* agrees with *dien*. The [participle]-feature of *kinnen* is now valued. *Kinnen* can now be spelled out as a participle at the PF-interface (this view will be refined in section 6). As part of the Agree-relationship between *kinnen* and *dien*, [_{VP} *dien*] is attracted to spec,_{VP} *kinnen*].

I will now argue that besides Agree we also need spec,head-agreement as a genuine feature-checking procedure (spec,head-agreement can be taken as movement followed by Agree). If the only mechanism for feature-checking were regular Agree, holding between two heads Y_{probe} and X_{goal} , where, as part of the agreement relation, Y could attract XP to its specifier, we cannot explain how *dien* in (56) below can get a valued [participle]-feature.

- (56) a. omdat hy it dien kinnen ha soe V4-V3-V2-V1
because he it done-PPC can-PPC have would
‘(because) he would have been able to do it’
b. soe_[u-participle] ha_[u-participle] kinnen_[v-participle] dien_[u-participle]

(56b) schematically represents the D-structure of (56a). Lets consider how the derivation proceeds. When *kinnen* has taken the VP headed by *dien* as its complement, *kinnen* doesn’t have to enter into an Agree relation, since it already has its [participle]-feature valued. Consequently, nothing happens. However, *dien* has an unvalued [participle]-feature that needs to be valued before spell-out. Thus, *dien* seeks to Agree with a goal in order to get its [participle]-feature valued. However, there are no valued [participle]-features in *dien*’s c-command domain. What happens next is that [_{VP} *dien*] moves to the specifier of the verb it is selected by, namely *kinnen*. In this spec,head-configuration *dien* can enter into an Agree-relation with *kinnen*, since *dien* now c-commands *kinnen*. The rest of the derivation is similar to the one exemplified for (52). That is, *ha* and *soe* get their [participle]-feature valued by Agreeing with the head of their complement, thereby attracting the complement-VP to their specifier.

The analysis presented above predicts that participle-copying can only take place in case an infinitive with an unvalued [participle]-feature c-commands an element with a valued [participle]-feature. Participle copying can thus only take place in case an infinitive, with an unvalued [participle]-feature, embedded under a participle, moves to c-command a valued instance of the [participle]-feature. This prediction is borne out, as can be concluded from the example in (57 = 48).

- (57) a. ??Hy soe it dien kinne wollen ha.
He would it do-PPC can-INF want-PPC have
‘he would have like to be able to do it’
b. ha_[u-participle] wollen_[v-participle] kinne dien_[u-participle]

⁴ It might be the case that verbs enter into an Agree relation to value multiple features. For instance, as argued in section 1, [event]-features can also drive the derivation. In fact, we have to assume that feature-checking other than [participle]-features takes place. This is so, since Frisian always has strictly left-branching clusters, irrespective of the fact whether the infinitives in (55) enter the derivation with a [participle]-feature. Furthermore, even clusters without participles show a head-final order.

c. $ha_{[u\text{participle}]}$ $wollen_{[v\text{participle}]}$ $kinne_{[u\text{participle}]}$ $dien_{[u\text{participle}]}$

For Swedish we have argued that participle copying must be local, see (47) above. This locality requirement was one of the reasons for Wiklund (2005) to assume that the relevant mechanism for copying is Agree. While this reasoning is solid for Swedish, which shows no signs of verbal movement in clusters, this reasoning cannot extend to Frisian, since Frisian does have movement in clusters. Movement in clusters can potentially give rise to spec,head-agreement relations. Agree between *wollen* and *dien* is blocked by *kinne* if no movement would take place. However, movement can feed spec,head-agreement relations. Thus, although it is true that Agree is blocked by *kinne*, it does not mean that no agreement relation can be established during the derivation. The reason why (57) is (nearly) out, is due to the fact that the $[u\text{participle}]$ -feature of *dien* cannot be valued. Here is why. Agree is the mechanism to value a $[participle]$ -feature, which results in copying. Remember that infinitives optionally come equipped with a $[participle]$ -feature. Since no participial morphology is copied onto *kinne*, let's assume that this element has entered the derivation without a $[participle]$ -feature, as represented in (57b). *Dien* has a $[u\text{participle}]$ -feature that needs to be valued. Since *dien*'s c-command domain is empty, $[_{VP} \text{ dien}]$ moves to $\text{spec},[_{VP} \text{ kinne}]$ in order to try to Agree with *kinne*. However, *kinne* has no $[participle]$ -feature and can thus not value the $[participle]$ -feature of *dien*. *Dien* is left with an unvalued $[participle]$ -feature that cannot get valued before spell-out. Further movement of $[[\text{dien}] \text{ kinne}]$ can not salvage the derivation, since *dien* cannot enter into an agreement-relation with *wollen*. *Dien* is in a specifier of a specifier of *wollen* – $[[[\text{dien}] \text{ kinne}] \text{ wollen}]$ – which is not an adequate checking configuration.

In the next section I will consider the commonalities and differences between IPP and PPI-effect. I will also consider whether they can be unified (to some extent) or whether they should really be taken as being two independent phenomena.

4.4 IPP does not involve copying

We have seen in the previous sections that copying has the following properties. It is local, semantically vacuous, top-down and it is optional. If IPP is copying, the copying must necessarily proceed bottom-up in the sense that the true infinitive is c-commanded by the parasitic infinitive.

$$(58) \text{ AUX PPC INF} \rightarrow \text{AUX INF}_{\text{PPC}} \text{ INF}$$

If IPP involves copying of inflection it must be the infinitive that shares its infinitival morphology with the past participle. Since the infinitive is embedded under the past participle, any copying must have taken place bottom-up. If we assume that the participle agrees with the infinitive, thereby enabling copying, we must assume that the infinitive has a feature in common with the past participle. For argument's sake, suppose that infinitives have an $[infinitive]$ -feature. The configuration would be as follows.

$$(59) \text{ AUX PPC}_{[u\text{infinitive}]} \text{ INF}_{[v\text{infinitive}]}$$

In (59) it is the participle that has an $[u\text{infinitive}]$ -feature. This feature searches its c-command domain to check this feature. The infinitive is a good candidate to value the $[u\text{infinitive}]$ -feature of the participle under Agree. The participle can now be spelled out as an infinitive by virtue of its $[infinitive]$ -feature.

If the IPP-constructions involve copying, it is certainly not optional, unlike participle copying in Swedish, Frisian or Hungarian (see Bošković (1995, 1997)). As we have seen in section 3, the IPP-effect is obligatory in standard Dutch. This means that the participle in (59) must necessarily be equipped with an [infinitive]-feature and Agree with an infinitive to get the feature valued, or else the derivation will crash.

Thus, IPP deviates from participle copying in an important way: it is not optional. If the IPP-effect were to involve copying of inflection, the copying must be obligatory for a reason. It is likely that the IPP-effect shows up because a past participle *cannot* be spelled out. The obligatoriness of the IPP-effect then points in the direction that the ‘insertion’ of an infinitive is a repair strategy.

Suppose the IPP-effect is a repair strategy to prevent the derivation from crashing because a past participle cannot be spelled out. The fact that the IPP-effect is a repair strategy does not mean that the repair strategy could not make use of copying. That is, if the past participle cannot be spelled out, copying could take place to save the derivation from crashing. This is unlikely, however, for the following reason. If the IPP-effect involved copying, the past participle would necessarily always have to enter the derivation with an [*u*infinitive]-feature, as in (60).

- (60) Jan heeft moeten_[*u*infinitive] werken_[*v*infinitive]
 John has must-INF work-INF

The [infinitive]-feature of *moeten* ‘must’ can be valued when *moeten* Agrees with *werken* ‘work’. At Vocabulary Insertion, the [infinitive]-feature enables the past participle to spell out as an infinitive.

However, (60) is not the scenario that we normally expect to see. Our expectation would lead us to predict (61).

- (61) *Jan heeft gemoeten_[*v*participle] werken_[*v*infinitive]
 John has must-PPC work-INF

(61) is ungrammatical, but that is not because copying is not possible. If syntax has derived (61), the derivation will crash given its ungrammaticality. However, it cannot be the case that syntax starts over with a new numeration keeping in mind that it should not contain the elements in (61), but the elements in (60). This would require that every time a speaker utters a sentence with an IPP-context, first (61) is derived, after which syntax starts to derive (60). Syntax cannot start an alternative derivation if another one crashes, since that would incorrectly predict that we could never utter an ungrammatical sentence, as it would be overwritten by a grammatical one. This line of thought shows that if the IPP-effect is a repair strategy, as I argue here, it cannot involve copying.

In fact, I make an even stronger claim here, namely that infinitival morphology cannot copy at all. This assumption explains why (45b), repeated here as (62b), is ungrammatical.

- (62) a. Jag har velat läsa.
 I have want-PTC read-INF
 b. *Jag har vilja läsa.
 I have want-INF read-INF
 ‘I have wanted to read.’

If copying of infinitival morphology is impossible, this must be accounted for somehow. We can rule out copying of infinitival morphology, given our copying account above, by

assuming that [infinitive]-feature do not exist. Infinitives are ‘bare’ in the sense that they do not possess any [categorical]-features. This explains why infinitives are the verbs on which morphological inflection is most often (perhaps always) copied onto. If they are not specified for a [categorical]-feature, morphological inflection can copy onto infinitives without ending up with contradicting instructions for Vocabulary Insertion at PF. If an infinitive would have an [infinitive]-feature and optionally also a [participle]-feature, Vocabulary Insertion cannot determine whether to insert an infinitive or a participle.

We now have two arguments against a copying analysis of the IPP-effect. First, we have seen that copying cannot be a repair strategy for the impossibility to spell out a participle. Second, the absence of infinitival copying in Swedish argues against a copying analysis of the IPP-effect and supports my claim that infinitives lack a [categorical]-feature. Since we have taken the *ge*-prefix to be responsible for the IPP-effect, I will consider the properties of the *ge*-prefix in the next section. Once we have established what kind of an element *ge*- is, we can try to determine why it appears to be an ‘impossible link’ in a verbal cluster and how exactly this is salvaged by the IPP-effect.

5. Participial *ge*- and the IPP effect

The *ge*-prefix has often been taken to cause the IPP-effect. Most authors argue that the *ge*-prefix is an impossible link in a verbal cluster (see e.g. Hinterhölzl (1998; 2006), Sybesma and Vanden Wyngaerd (1997), Vanden Wyngaerd (1994; 1996)). In section 2 it was established that the *ge*-prefix is responsible for causing the IPP-effect in a verbal cluster. This section will review some of the arguments for a syntactic blocking account. These accounts hold that the presence of the *ge*-prefix leads to the IPP-effect because of its position in the syntax.

5.1 The syntactic position of the *ge*-prefix and the cause of the IPP-effect

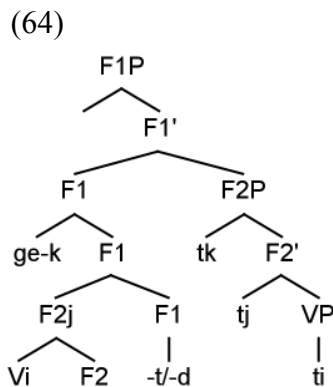
In the sections that follow I will consider two accounts that take the *ge*-prefix to be generated in the domain of syntax. The accounts differ (among other things, but mainly) in the position of the *ge*-prefix. Sybesma and Vanden Wyngaerd (1997) and Vanden Wyngaerd (1994; 1996) argue that *ge*- heads an aspectual small clause projection that is selected by V. Hinterhölzl (1998; 2006) argues that *ge*- is located in the specifier of a functional projection above VP. A critical discussion of these accounts will result in ruling out certain possibilities for the position of *ge*-.

The past participle in Dutch is formed by attaching a *ge*- prefix and a dental suffix *-t* or *-d* to the verbal root. Hinterhölzl assumes that these suffixes are located in a position distinct from V. Verbal inflection is thus picked up derivationally (essentially following Halle and Marantz (1993)). Under his account, *ge*- is generated in spec,F2P and *-t/-d* is generated in F1, see (63).

$$(63) [_{F1P} -t [_{F2P} [ge-] F2 [_{VP} V]]]$$

As said, the inflectional elements are picked up derivationally. Hinterhölzl suggests that this proceeds as follows. First, V moves to F2 to ‘check its prefix’. Next, V moves to F1 to adjoin to the *-t/-d* suffix. In the final step of forming the participle, the *ge*- prefix adjoins to the F1+V complex. I will assume the *ge*-prefix adjoins to the complex F1 head. This complex

head will then be spelled out as a participle at Vocabulary Insertion.⁵ The derivation of the past participle is given in (64).



Under Hinterhölzl's account, the IPP-effect is explained as follows. When a past participle selects a dependant infinitive, this infinitive must move to spec,F2P (this happens after spell-out in Dutch, see below) It then follows that a past participle and a dependant infinitive exclude each other, since both target spec,F2P. The fact that the participle spells out as an infinitive is accounted for by a morphological constraint (that holds at VI) that states that a past participle must consist of a prefix *and* a suffix. If the prefix fails to be inserted in spec,F2P because it is occupied by the dependant infinitive, no phonological material will be inserted in F1. F1 is argued, though, to host the feature [participle], which accounts for the fact that the ersatz infinitive is interpreted as a past participle. If no phonological material is inserted in F1, the participle stays in F2 and is spelled out with the default morphology of a bare infinitive. If the verb stays in F2 when a dependant infinitival clause is in spec,F2P, it follows that the infinitival clause must have moved to spec,F2P after spell-out, since in Dutch a dependant infinitive follows its selecting head.

While Hinterhölzl's account is clear on the environment in which the IPP-effect is to be expected, it fails to account for some of the empirical facts discussed in section 2.

First, it is unclear why the IPP-effect only arises in restructuring contexts. That is, why does the IPP-effect arise when the past participle selects for a VP-complement, but not when it selects a TP or CP-complement? For Dutch the answer could be that only VPs are attracted to spec,F2P after spell-out and TPs and CPs can stay in situ. This line of reasoning does not extend to German, however, where both TP/CP and VP infinitival complements are attracted to a position dominating F2. For TP/CP-complements this position must be higher than F1, since the participle that is spelled out in F1 follows the dependant infinitive. By parallelism, then, we want to argue that TP/CP-complements in Dutch move to the same specifier-position above F1 as in German, but after spell-out.

While the above scenario is possible, it remains a stipulation at this point that only VP-complements move and TP/CP-complement do not, or move higher.

Hinterhölzl's account furthermore fails to account for optionality in the occurrence of the IPP-effect, for instance, the possible absence of the IPP-effect in the V3-V2 order. I will not discuss the issue of optionality here, since most accounts on the IPP-effect fail to account for optionality, which makes the discussion more straightforward if we ignore optionality

⁵ According to Hinterhölzl this actually happens at Morphological Form. The difference possibly lies only be in the terminology used here, which is why I will just use the term Vocabulary Insertion.

altogether. I will, however, argue against the account sketched above based on theory-internal concerns.

First, there is a number of stipulations needed to make the account above work. For instance, we need to stipulate the existence of functional heads, that are not motivated except for the fact that they are needed to host inflectional elements. It is far from clear what selectional properties these elements have. Possibly, F1, hosting the *-t/-d* suffix, selects for a F2P, supposedly some kind of participial phrase, because F1 has a [participle]-feature. Such claims, however, lack empirical support and are not easy to defend. Another issue related to selection is the fact that the F2 head, which is generated empty, can project a specifier hosting the *ge-* prefix. We thus need to allow vacuous heads and base-generation of items that are not selected for.

Furthermore, the status of the participial prefix *ge-* is far from clear. It is generated in a specifier position giving it XP-status. Under the account sketched above, this XP must be allowed to move out of a specifier position and adjoin to a head. Alternatively, we could allow heads to be generated in specifiers. Whatever solution we choose, it seems clear to me that it aids nothing but getting the order right and it is very difficult to find empirical support for these claims. Thus, Hinterhölzl's account is not very explanatory, since it builds on stipulations. To get a better understanding of the IPP-effect it is desirable to theorize on the basis of better understood principles of grammar.

5.2 Distributed Morphology

The critique on Hinterhölzl's account forces me to be clear on certain issues at this point. First, I assume that inflectional items are generated as follows. I assume that lexical items can be merged in the lexicon where they consist only of bundles of features. These bundles of features (both heads and inflectional items) can merge in the lexicon. Given that these bundles of features can merge in the lexicon, it follows that the resulting heads have internal structure. When items that are merged in the lexicon enter syntax only the accumulated feature bundle on the top node is visible to syntactic operations. In other words, inflected elements behave as heads in the syntax. I will call these entities M-words, following Embick (2006). The internal structure of inflected elements is opaque to syntax. After spell-out, I assume with Halle and Marantz (1993) that morphological operations can apply to (the structure of) inflected elements. PF can operate on the internal structure of inflected elements. After these operations vocabulary items are inserted at the level of Vocabulary Insertion. The feature bundle at the top node of an M-word will be considered, and a Vocabulary Item will be inserted that matches the most features of the M-word. In other words, the most specified element will be inserted. This insertion procedure is subject to the Subset Principle (Halle (1997)): a morpheme may not be over specified on insertion, but it may be underspecified.

As we will see below, I take it that there are two kinds of affixes. Ones that are merged in the lexicon, before entering syntax as an M-word, and morphemes that are M-words themselves. I assume that these affixes head functional projections. A clear example of this type of affix are the so-called restructuring affixes in Inuktitut, see Pittman (2006; 2007). Pittman argues that in this language, restructuring affixes are generated as (verbal or functional) heads. The lexical verb comes to host these affixes through means of head-movement. Below I will discuss an example from Yiddish of an affix that is generated as a functional head. I will now turn to the question whether *ge-* is also an affix generated as a functional head, as argued by Hinterhölzl (1998; 2006), Sybesma and Vanden Wyngaerd (1997). Vanden Wyngaerd (1994; 1996).

5.3 Ge- as the head of a Small Clause

Past participles in Dutch generally take a ge-prefix (65), but not with verbs that are already prefixed (66).

- (65) a. *rennen* → *gerend* ‘run → ran’
 b. *lezen* → *gelezen* ‘read → read’
 c. *bouwen* → *gebouwd* ‘build → built’
- (66) a. *beleven* → *beleefd* ‘experience → experienced’
 b. *verpesten* → *verpest* ‘ruin → ruined’
 c. *ontsmetten* → *ontsmet* ‘decontaminate → decontaminated’

Vanden Wyngaerd (1994; 1996) and Sybesma and Vanden Wyngaerd (1997)’s accounts hold that the impossibility of ge- in the prefixed verbs in (66) is caused by the fact that there is only one structural position for prefixes that change the meaning of a verb. Vanden Wyngaerd takes ge- to be an aspectual head generated in a small clause to the verb, as shown in (67).

- (67) [_{VP} V [_{SC} NP ge/PREF]]

However, the small clause could also be headed, for instance, by a prefix such as be-, which can change the arity and (with that) the meaning of a verb.

- (68) a. *Ik spreek.*
 ‘I speak.’
 b. *Ik be-spreek een probleem.*
 ‘I discuss a problem.’

Taking be- and ge- both to head a SC raises the question why be- blocks ge- and not the other way around. In other words, why does a prefix that changes the arity of a verb take precedence over the ge-prefix that changes the aspect of the event denoted by the verb? This would follow under the assumption that be- is a lexical affix, whereas ge- is a syntactic affix. Be- would then be merged in the lexicon before ge- could be attached in syntax. Suggestive evidence for this fact is that be- is a lexical affix that changes the arity of a verb. As argued by Reinhart (2000; 2002), arity operations can only take place in the lexicon. It follows that be- must necessarily be attached in the lexicon. In section 2 we concluded that the ge-prefix is responsible for causing the IPP-effect in certain syntactic contexts. That indicates that the ge-prefix is not attached to V in the lexicon. If that were the case, ge+V would be opaque to syntax, which makes it unlikely that the ge-prefix causes the IPP-effect. Why would a participle with ge- attached lexically, cause the IPP-effect, while a ge-less participle wouldn’t? Aren’t they the same M-word as far as syntax is concerned? These considerations lead me to expect that the ge-prefix is a syntactic prefix heading a functional projection. Evidence for this assumption will be provided below. First, I will argue that ge- does not head a Small Clause.

5.4 Against ge- as the head of a Small Clause

I will now argue against Sybesma and Vanden Wyngaerd’s claim that ge- is in a Small Clause (SC) complement of V. Both particles (69) and resultatives (70) have been argued in the

literature to be generated as the head of a Small Clause. (The examples are from Neeleman and Weerman (1993))

- (69) a. Dat Jan de deur op-merkte.
that John the door up-noticed
b. Dat Jan het meisje op-belt.
that John the girl up-phones
- (70) a. dat Jan de deur groen verfde.
that John the door green painted
b. dat Jan het meisje gek belt.
that John the girl crazy phones

If the ge-prefix is generated in a SC-complement of V we expect ge- to behave syntactically as particles and resultatives. This prediction is not borne out, though. The ge-prefix does not behave as particles and resultatives. I will present two facts that show the non-similarity of the ge-prefix and resultatives/particles. These facts provide us with evidence that ge- is not generated in a SC-complement of V.

Since there is only one SC-complement position, the prediction is that particles and resultatives mutually exclude each other. This prediction is borne out. While there is nothing wrong with the examples in (71) semantically, they are ungrammatical because of the fact that a particle and a resultative SC cannot co-occur.

- (71) a. *dat Jan [_{SC} zijn handen stuk] [_{SC} zijn opvolger in] werkt.
that John his hands broken his successor in works
b. * dat Jan [_{SC} zijn handen stuk] [_{SC} in] werkt.
c. * dat Jan [_{SC} zijn opvolger stuk] [_{SC} in] werkt.

If ge- is generated in a SC-complement of V, the prediction is that the prefix cannot co-occur with particles or resultatives. This prediction is not borne out. Both particles (72a) and resultatives (72b) can co-occur with the ge-prefix. This provides strong evidence against an analysis that places ge- in a SC-complement of V.

- (72) a. dat Jan de deur heeft op-ge-merkt.
that John the door has up-ge-noticed
b. dat Jan de deur heeft groen-ge-verft
that John the door has green-ge-painted

One of the reasons to argue that particles and resultatives are generated in a Small Clause, is because they can predicate over an object. This is illustrated for particles in (73b) and for resultatives in (74) below.

- (73) a. *dat Jan zijn opvolger werkt.
that John his successor works
b. dat Jan zijn opvolger in-werkt.
that John his successor in works
- (74) dat Jan zijn hand stuk werkt.
that John his hand broken works

The fact that the *be*-prefix and the *ge*-prefix exclude each other (see section 5.3) now follows from (78). Both *ge*- and *be*- are prefixes that cannot be stressed. If one of them is attached to a verb, the stress will fall on V. If both *ge*- and *be*- are attached to V, the stress cannot fall on the prefix as dictated by (78), since both prefixes are unstressable.

Next, consider (79) and (80).

- | | |
|--|--|
| <p>(79) a. -
 b. <i>her</i>+<i>z</i>ien
 c. *<i>ge</i>+<i>her</i>+<i>z</i>ien
 d. *<i>ge</i>+<i>h</i>ér+<i>z</i>ien
 e. *<i>h</i>ér+<i>ge</i>+<i>z</i>ien
 f. <i>her</i>+<i>z</i>ién</p> | <p>(80) a. <i>be</i>+<i>w</i>ápen
 b. <i>h</i>ér+<i>be</i>+<i>w</i>apen
 c. ?<i>ge</i>+<i>h</i>ér+<i>be</i>+<i>w</i>apen+d
 d. *<i>ge</i>+<i>her</i>+<i>be</i>+<i>w</i>ápen+d
 e. *<i>h</i>ér+<i>ge</i>+<i>be</i>+<i>w</i>apen+d
 f. <i>h</i>ér+<i>be</i>+<i>w</i>apen+d</p> |
|--|--|

(80a) exemplifies (76a): when only one prefix is attached to V, the stress peak falls on V. If another prefix is attached, by (76b) the stress peak is expected to fall on the leftmost prefix. This is correct, given that the stress peak falls on *her* in (80b). In this light it is surprising that (79e) is out. Why can't *ge*- be attached to [_V *zien*], after which *her* gets attached and is assigned stress? The explanation of Kooij that I adopt here, is that *ge*- is attached syntactically, after the point where all lexical prefixes have been attached to V. In other words, the *ge*-prefix is not part of the M-word (V plus affixes). Still, the question arises why (79c) cannot be repaired by shifting the stress to *her*, resulting in (79d). This follows naturally if we assume that (78) is a PF-condition that applies when all affixation-operations have taken place.

Given what we've said so far, the main conclusion is that *ge*- is a prefix that is generated as a syntactic head. At PF, after Vocabulary Insertion, *ge*- prefixes (in a way to be made clear below) to V. For this account to work, we must make the reasonable assumption that Stress Shifting can only apply within (and not across) M-words, whereas the condition in (78) applies to the result of PF-prefixing.

5.5.2 The scope of *ge*-

We have now established that *ge*- attaches in the syntax. Furthermore, we have also seen that *ge*- cannot head a SC-complement of V (in section 5.4). This leaves us with the plausible option that *ge*- heads an aspectual projection AspP above VP. This section shows that that is indeed the correct analysis. Let's assume that *ge*- is an operator that denotes perfectivity, which we can symbolically represent as COMPLETED. Just like other operators *ge*- can participate in scope interactions. Dislocation of heads does not affect scope, since it takes place at the PF-branch of the derivation. Hence we can use scope as a test for the position of *ge*- in the syntactic domain (given that *ge*- is a head). As it turns out, we can also use scope as another argument against the SC-analysis of *ge*-.

- (81) a. Jan heeft een boek gelezen.
 John has a book read
 'John has read a book.'
 b. Jan heeft lezen [_{SC} [een boek]_i *ge*- t_i]]

The semantics of (81a) are such that the event of reading a book is finished. That means that the COMPLETED-operator is unlikely to be in the position it occupies in (81b) as proposed by Sybesma and Vanden Wyngaerd (1997), where only *een boek* 'a book' is predicted to be in

the scope of *ge-*. Since both verb and object are in the scope of COMPLETED, I assume that the *ge-* prefix is in AspP which takes VP as its complement.⁶

Since the IPP-effect occurs in restructuring contexts, we predict that the COMPLETED-operator takes scope over the whole cluster, since there are no phase boundaries within a restructuring context. This prediction is borne out. While in (82) only the allowing-event is in the scope of COMPLETED, in (83) the operator takes the whole event embedded under AspP in its scope.

(82) a. Jan heeft Piet toegestaan te gaan zwemmen.

John has Pete allowed to go swimming
'John has allowed Pete to go swimming.'

b. [[COMPLETED [allowed]] Pete swimming]

(83) a. Jan heeft Piet laten zwemmen.

John has Pete let swim
'John has let Pete swim.'

b. [COMPLETED [let [Pete swim]]]

(82) has an interpretation in which the allowing-event is completed. However, the swimming event embedded by *toegestaan* 'allowed' doesn't necessarily have to be completed. For (82a) to be true the event of Pete swimming might even take place in the future. For (83a) to be true, however, it is necessary that the whole event of letting Pete swim is completed, as schematically represented in (83b).

Since we have argued that *ge-* heads a syntactic projection, the scope facts discussed in this section provide us with evidence that this projection is located above VP. I have labelled this projection AspP. I assume that AspP takes a VP-complement, which is in accordance with its scope.

6. The IPP-effect: where *ge-* fails to affix hop

Having established that *ge-* is generated in AspP above VP, we need to explain how *ge-* comes to be spelled out as a prefix of V at PF. Movement of V to *ge-* is ruled out for theory internal reasons, as this would require right-adjunction of V to *ge-*. Lowering of *ge-* to V seems to be ruled out by the Extension Condition: all merger must apply to a root syntactic item.

We cannot rule out lowering operations altogether, though. The Extension Condition only rules out lowering as the result of merger inside an existing phrase marker. Bošković and Lasnik (2003) and Bošković (2003) argue that lowering is possible at PF. They call this operation PF-merger. PF-merger could be the operation that attaches *ge-* to V. PF-merger of the *ge-* prefix at PF would then be reminiscent of Affix Hopping (dating back to Chomsky (1957), see also Halle and Marantz (1993), Bobaljik (1994, 1995, 2002) and Lasnik (1995)).

In this section I will first discuss Affix Hopping. I will outline Lasnik's (1995) account of Affix Hopping that is in line with our current assumptions. Next, I will show that it is indeed Affix Hopping that brings *ge-* and V together at PF. Furthermore, it will be shown that an Affix Hopping failure gives rise to the IPP effect.

6.1 Affix Hopping

⁶ This assumption is based on the fact that we have already established that *ge-* is a syntactic head. I assume that in dialects that lack a *ge-* prefix, the COMPLETED-operator is also in AspP, but Asp doesn't have any phonological features. *Ge-* can thus be taken to be the spell-out of the [participle]-feature of Asp.

Lasnik (1995) argues that adopting Affix Hopping as a genuine option of the grammar, explains why (84) is ungrammatical.

- (84) a. *John not likes Mary.
 b. John likes Mary.
 c. John does not like Mary.

Under an Affix Hopping account, (84a) is out because the phonological features of T, which spell out as –ed, cannot lower onto V. This failure of –ed to Affix Hop leaves the affix without a host at PF, which crashes the derivation. The problem in the case of (84a) is that the affix –ed and the verb are not adjacent at PF.⁷ If –ed and the verb are adjacent, like in (84b), Affix Hopping is possible. The ‘repair strategy’ that English turns to in case Affix Hopping fails, is *do*-insertion, see (84c). If Affix Hopping fails, *do* is inserted in T where it provides the necessary host for the –ed affix.

The main evidence that Lasnik gives for Affix Hopping of –ed to V comes from VP-ellipsis.

- (85) a. John slept and Mary will too.
 b. John -ed sleep, and Mary will ~~sleep~~ too.
 c. [[TP [John]_i [T' –ed [_{vP} t_i [_{v'} v [_{VP} sleep]]]]] [and [[TP [Mary]_i [T' will [[_{vP} t_i [_{v'} v [_{VP} sleep]]] too]]]

The assumption that the tense-affixes are in T and not on V, see (85b), explains why ellipsis under identity is grammatical in these cases. As the verbal forms are not yet inflected when they enter the derivation, the elided VPs (or *v*Ps) are identical when they are deleted at PF, see (84c). Importantly, this example shows that affixation at PF can take place after deletion.

The existence of Affix Hopping provides us with evidence that a functional head like *ge-* (or T) can affixate onto V at PF. We thus needn't stipulate head-movement of V to Asp, which would violate the ban on rightward adjunction.

⁷ The adjacency requirement on PF-merger seems not to be met in the case of VP-adverbs as well. However, Affix Hopping of –ed is possible, contrary to our expectations: these adverbs must be attached to VP (ia) and cannot be attached to TP (ib). However, VP-adverbs do not bleed Affix Hopping, witness (ii).

- (i) a. John will completely lose his mind.
 b. *John completely will lose his mind.
 (ii) a. John –ed completely lose his mind.
 b. John completely lost his mind.

Bobaljik (1994) argues that VP-adverbs are not relevant for the adjacency requirement on PF-merger. This is not completely satisfactory, though, since the adjacency requirement is based on phonological material. It is hard to see why the phonological features of a negation head are visible at PF, while phonological adverb features are not. Another interesting possibility to pursue, noted by Lasnik (2003), is that under certain conditions, VP-adverbs can attach above TP.

- (iii) John partially lost his mind and Bill completely did.

What makes the adjunction of a VP-adverb to TP possible in this case of VP-ellipsis is not clear. But if it is allowed in order to save the derivation at PF, it might be worthwhile to explore this possibility for Affix Hopping as well.

However, the story on Affix Hopping so far does not give us the answers to some of the questions that we raised so far with regard to the IPP-effect. For example, Affix Hopping gives us no clue as to why affixation can only take place at a phase edge. The next section addresses this question.

6.2 Affixation and the PF interface

The discussion on Affix Hopping gives us empirical support that affixation via lowering at PF exists. We need to be more specific on how lowering works. Even more so if we consider that movement as lowering in the syntax doesn't seem to exist in natural language. Also, we want to know under what circumstances lowering can take place. This section will address these issues. I will outline the PF-merger account of Embick (2006) and Embick and Noyer (2001), who provide evidence for the existence of affixation via lowering at PF.

First, however, let me note that lowering operations at PF are expected to be found. In this thesis, head-movement is taken to be an instance of PF-movement. This assumption keeps syntax clean from the peculiar properties of head movement. For instance, head-movement does not obey the Extension Condition, since it doesn't target a root syntactic object.⁸ Head-movement is also peculiar in that it makes no contribution to the semantics. These considerations support an analysis of head-movement as PF-movement. If we assume that head-movement involves adjunction, we must conclude that PF is able to break up existing structure to merge material in-between. If head-movement may break up structure and adjoin to a head within existing phrase markers, there is nothing that prevents a head from lowering. Whether head-movement is up or down, the Extension Condition is violated in either case. It should thus be stipulated that lowering is impossible while head-movement up is not.

Here is an example from Embick (2006) which presents evidence for the existence of lowering at PF and illustrates some of the properties of lowering. Basically, Lowering, as Embick calls it, is basically the same operation as PF-merger. However, contra Embick and Noyer (2001) I will assume that Lowering applies under adjacency.

Lowering applies to syntactic structure after spell-out. After Lowering has taken place, Linearization forms a phonological string without structure. Embick and Noyer (2001) argue that besides Lowering, which operates on syntactic structures, there are also operations that apply to the output of Linearization. One such operation is Local Dislocation. This operation can take an element and attach it to an adjacent item. Below is an example that shows a potential counterargument for the claim that Lowering precedes and Local Dislocation follows Linearization. We will see, however, that the counterexample is only apparent, and that it can actually be taken to provide evidence for a cyclic view of PF.

Embick argues that the attachment of an affix to the head of its complement is an instance of adjunction. The argument he provides for this claim comes from the interaction of two phonological processes in French.

The first is *Article Cliticization*. French definite articles can cliticize onto a following noun if it begins with a vowel: *le arbre* → *l'arbre*. Article Cliticization of a definite article is thus sensitive to the phonological properties of the host. These properties motivate analysing Article Cliticization in terms of Local Dislocation. Local Dislocation differs from Lowering (PF-merger) in that it operates on linear strings where the combined elements must be adjacent.

⁸ This problem can be overcome by assuming that, in a case of head-movement, heads merge with each other first, obeying the Extension Condition, after which the resulting complex head merges with a root syntactic object (the spine). Head movement is still exceptional, though, in that it is an instance of movement where the head does not c-command the tail.

The second process is one in which ‘fused’ prepositions/determiners are formed. It applies to the prepositions *à* and *de*, and the masculine and plural definite articles.

- (86) a. du chat (*de le chat)
b. aux enfants (*`a les enfants)

Embick assumes that ‘D-P Fusion’ applies independently of the phonological content. This motivates an analysis in terms of Lowering, the process which adjoins a head to the head of its complement (cf. Embick and Noyer (2001)).

In the system presented in Embick and Noyer (2001), the interaction between the two PF processes of Article Cliticization and P-to-D Lowering appears to be problematic. The reason for this is as follows. Head-to-head operations like Lowering are hypothesized to occur early at PF. Local Dislocation is hypothesized to follow Linearization. Given this order, P-to-D Lowering should bleed the application of Article Cliticization. However, this prediction doesn’t seem to be borne out if we consider (87). Instead, it seems that P-to-D Lowering is bled by the application of Article Cliticization:

- (87) a. de l’arbre
b. *du arbre

To account for this apparent counterexample, Embick argues for a cyclic approach to PF operations. In such an approach, a DP is spelled out before it has merged with a P. Lowering or Local Dislocation can then apply inside the DP. After this DP is merged with P and a PP is formed, the PP can be spelled out. If Article Cliticization has taken place inside the DP, there is no longer a D-node: the elements inside the DP have already been linearized. Linearization can thus bleed D-to-P Lowering. Since Local Dislocation applies after Linearization, it may seem that Local Dislocation bleeds D-to-P lowering.

For an account along these lines to work, it must be assumed that there is no Vocabulary Insertion when PF operations apply to the DP. Vocabulary Insertion cannot apply any earlier than the point at which the entire PP has been spelled out. If Vocabulary Insertion applied to the DP before merger with P, then *le* or *la* would be inserted. This cannot be the case given that some suppletive forms such as *du* or *au* could never appear, contrary to fact.

Given these considerations, it is possible that Vocabulary Insertion only applies when *vP* or *CP*-phases are spelled out. I will not go into this issue, since it is not important for our analysis of the IPP-effect.

Marantz (1984; 1988) defended the view that affixation can only apply to elements at the periphery of the sentence. The intuition behind this claim is that the linear relations between elements remains the same only under peripheral affixation, but not when affixation applies in a non-edge position. Embick (2006) argues that this restriction on affixation cannot be maintained, since we know that affixation doesn’t always takes place at the edge of a sentence. Embick notes that it is possible that affixation is restricted to phase edges. While Embick assumes this restriction to hold only for affixation after Linearization has taken place, I will assume that it holds for Lowering as well. We can define this restriction on Lowering as follows.

(88) **Edge-condition on Affixation**

Lowering of a head X to the head of its complement Y, is possible iff Y is at the right edge of a phase.

The reason for extending the Edge Condition to Lowering is Fox and Pesetsky's (2004) theory on phases. They claim that the spell-out of a phase creates an ordering statement of the elements within that phase. When this ordering statement has been determined after spell-out, Marantz's idea is relevant. No affixation should be possible, unless it applies at the edges. The Edge Condition may now informally be taken to describe the environment in which PF may 'overwrite' the ordering-statement determined after spell-out.

6.3 Cross-linguistic evidence for affixation as Lowering

Acknowledging the existence Lowering, allows us to explain phenomena that seemed to behave peculiar under a syntactic account. In this light I will discuss the stem construction in Yiddish, for which it will be argued that it involves Lowering under adjacency. The analysis as such provides further evidence for PF-lowering. Furthermore, because the stem construction and West Germanic *ge*-affixation behave similarly, the presented analysis provides further evidence for the *ge*-prefix.

Diesing (1997) argues that the stem construction in Yiddish consist of a [*v*+*Asp*+*V*] complex. That is, a complex consisting of a light verb (Chomsky 1995), an aspectual head and a lexical verb. The aspectual head is occupied by the element *a*, which takes an eventive VP as its complement. The element *a* diminutivizes the event denoted by the VP it embeds. *A*'s distribution is thus similar to *ge*- in Continental West Germanic languages in that it heads an aspectual projection above VP. An example of the stem construction (represented in boldface) is given in (89).

- (89) Maks hot **a gey geton** af forroys.
 Max has a go done forward
 'Max marched forward.'

The order of the stem construction in (89) – [*Asp*+*V*+*v*] – does not match the base generated order that Diesing argues for. To derive the order in (89), she proposes that first *V* incorporates into *Asp*, after which [*Asp*+*V*] incorporates into *v*. Given our ban on right-adjunction, the stem construction must be accounted for in another way than incorporation. As it turns out, the affixation via PF-Lowering present a good alternative. The Lowering analysis would derive (89) as follows.

- | | | |
|---------|--|--|
| (90) a. | Maks hot geton a gey af forroys | D-Structure |
| b. | Maks hot geton a-gey af forroys | Lowering of <i>a</i> to <i>V</i> |
| c. | Maks hot [<i>a</i> -gey] _i geton t _i af forroys | [<i>v</i> a-gey] head-moves to <i>v</i> |

(90a) represents the order of the elements after spell-out. At the PF-interface, Lowering can affixate *a* to *gey* forming *a-gey*. This newly formed M-word is then able to head-move to the light verb *geton*, forming [_{*vP*} a-gey geton].⁹ This analysis makes the prediction that *a* and *V*

⁹ If it should turn out that the *ge*-prefix in Yiddish is also attached via *ge*-prefixation, it follows that all PF-lowering operations in the stem construction must apply before head-movement. In other words, all head-movement down precedes all head-movement up.

- | | | | |
|-----|----|--|-----------------|
| (i) | a. | [_{<i>AspP</i>1} ge [_{<i>vP</i>} ton [_{<i>AspP</i>2} a [_{<i>vP</i>} gey]]]] | → PF Lowering |
| | b. | [[ge-ton] a-gey] | → Head-movement |
| | c. | [a-gey ge-ton] | |

must be adjacent to be proper input for PF-Lowering. This prediction is borne out. No adverbials or scrambled material can occur within the stem construction. (91) illustrates the inseparability of the $v+[a+V]$.

- (91) a. *Zi hot an efn nekhtn geton di oygn.
 she has an open yesterday done the eyes
 b. *Zi hot an efn di oygn geton.
 she has an open the eyes done

The inseparability of $a+V$ can be observed in an interesting way. Normally, a particle must precede the verb it belongs to (92a). However, in the stem construction the particle must follow the verb (92b). It cannot intervene between a and V (92c).

- (92) a. Er iz arayngekumen.
 he is in-ge-come
 ‘He came in.’
 b. Er git a kum arayn.
 he gives a come in
 ‘He comes in.’
 c. *Er hot/iz gegebn an **araynkum**.
 he has/is given an in-come

The impossibility of the particle to intervene between the a and V provides strong evidence for the Lowering analysis under adjacency. Diesing accounts for the data in (92) in a similar fashion. Incorporation of V to a via right adjunction is subject to an adjacency requirement. However, under Diesing’s syntactic right-adjunction account, the adjacency requirement must be stipulated, since it doesn’t follow from the theory automatically that adjacency is required for syntactic incorporation to take place. The fact that the adjacency requirement follows naturally from the conditions on PF-lowering, can be taken as an argument in favour of a PF-lowering analysis of the stem-construction.

6.5 Intermediate Summary

This section has presented evidence for the existence of PF-lowering operations and illustrated what the properties of the operation are. The results that are relevant for our account of the IPP-effect in the next section, are summarized below.

(93) **PF-Lowering**

A head may Lower (adjoin) to the head of its complement at PF under adjacency.

(94) **Edge-condition on Affixation**

Lowering of a head X to the head of its complement Y , is possible iff Y is at the right edge of a phase.

We have taken head-movement to be an instance of PF-merger. Head-movement up (traditional head-movement) and down (Lowering, Affix Hopping) are taken to be one and the same operation. It was shown in this section that head-movement in this broad sense can affixate syntactic affixes to their host. Syntactic affixes are functional heads. Basically, the

Note that the stem construction is not a restructuring context. Hence, affixation of a to V is possible, since V is at a right edge of a phase.

term ‘affix’ has no relevancy for syntax. I take the term ‘syntactic affix’ to mean that a morpheme is subject to the PF-requirement that that morpheme needs a host (it must be encoded in the morpheme whether it requires a host to its left or to its right). It follows from this assumption that a syntactic affix at PF can feed head-movement, since it is not until PF that the morpheme needs a host.

Another important point worth mentioning here, is that Lowering can apply string-vacuously (contra Embick (2006)). This is clear from the Yiddish stem construction in which *a* string-vacuously lowers to V.

One problem I do not have a clear answer to is the following. Why should Lowering be subject to an adjacency requirement (see the examples on Affix Hopping and the Yiddish stem construction), while head-movement up is not (consider for example Verb Second)? In search of an answer, the following obvious observation might be important: head-movement up and down are one and the same operation, but they do not apply in the same direction. The answer might thus be that head-movement up applies cyclically, whereas head-movement down might be restricted in that it may only lower across a certain distance.

In the next section I will explain how a PF-Lowering account of the IPP-effect explains the properties of the IPP-effect and the conditions under which it occurs.

6.6 An explanation for the IPP-effect

6.6.1 The IPP-effect: where *ge-* fails to Affix Hop

We have established that affixation at PF can take place via head-movement or Lowering, both being cases of PF-merger. I will now show that if we assume that *ge-* affixates to V at PF provides us with an account of the IPP-effect. The proposal is based on the assumption that affixation is only possible at the edge of a spell-out domain.

First, Affix Hopping of *ge-* gives us an answer to why the IPP-effect is voided when movement (and/or deletion) of the dependant infinitive has taken place.

- (95) [_{VP} Zwemmen]_i heeft Jan nooit gewild t_i
 swimming has John never wanted
 ‘Swimming, John has never wanted.’

Recall that a restructuring context is a single spell-out domain (a phase). Movement of the dependant infinitive results in the participle being at the right edge of the spell-out domain after movement, but not before. Whereas affixation is thus not possible with the embedded infinitive in situ, movement of the infinitive puts the participle at the right edge. *Ge-*affixation is thus fed by the movement of the embedded infinitive.

The IPP-effect is voided when, in a single spell-out domain, the material embedded under the past participle is moved or deleted. It immediately follows why backward ellipsis feeds the IPP-effect: no movement or deletion has taken place of the material below the participle, see (36), repeated here as (96).

- (96) Jan heeft nooit willen/*gewild <werken> en Piet nooit kunnen werken.
 John has never want-INF/want-PPC and Pete never could-INF work-INF
 ‘John has never wanted and Pete was never able to work.’

In (96), the participial V is not in a position at the right edge of the phase, since it dominates the embedded infinitive *werken* (represented in fish-hooks). Affixation cannot apply, since *ge-* would target a verb that is not at the right edge of a spell-out domain.

We have already seen that movement of the infinitive can bleed the IPP-effect. Cases in which the IPP-effect also ceases to arise, are those where the participle takes a phasal complement. The example in (15), repeated here, is a case at hand.

- (97) Jan heeft gezegd [_{CP} dat hij komt]
John has said that he comes
'John has said that he comes.'

When the participle takes a CP-complement, the IPP-effect doesn't show up. We can now see why this is the case. The embedded CP forms a distinct phase. While the CP is contained in the participial VP it forms a different cycle at the PF-interface. If this were not the case, the grammar would be heavily burdened, as a sentence with a lot of embeddings should be run through the PF-cycle in its entirety every time it is shift off to spell-out (i.e. every time a *vP* or CP boundary is encountered). The whole idea behind phases is that material within a phase is shifted off and not accessible to further computations. It is reasonable to assume that the same holds at the PF-interface. To come back to the example in (97), *ge-* can Lower onto V because V is at the right edge of its spell-out domain. The CP is already shift off and is irrelevant for PF-movement in the participial VP-cycle.

6.6.2 When *ge-* fails to Lower

The question now arises what happens when affixation of *ge-* to V fails. In section 4 I argued against a copying analysis of the IPP-effect. Copying is not in line with a repair strategy, since in general copying is optional. Obligatory copying is out, since it is not possible to make use of this repair strategy once a derivation is bound to crash. Inserting an [infinitive]-feature in the course of the derivation is impossible, since that would violate the Inclusiveness Condition (Chomsky (1995)).

Given these considerations, I argue that the [participle]-feature of *ge-* is deleted when *ge-* fails to Lower onto V. When the phonological [participle]-feature of *ge-* is deleted, affixation is no longer required, as this is a requirement on phonological features. I basically follow Lasnik (1999) in assuming that deletion of features that are bound to crash the derivation can save the derivation.

What makes it possible that an infinitive is inserted in the V-slot when *ge-* affixation fails? As argued above (section 4.4), a participle differs from an infinitive in that the former has a [participle]-feature, whereas the latter has no [categorical]-feature. Furthermore, a participle has a COMPLETED-operator giving it more semantic content than the infinitive. If the affixal [participle]-feature of *ge-* cannot lower onto V, it is deleted. When no Lowering has taken place at PF, V has no phonological feature that can tell Vocabulary Insertion what element to insert in the V-node. Vocabulary Insertion must obey the Subset Principle (Halle (1997): the inserted vocabulary item must match some or all of the features of the morpheme. From this it follows that in Continental West Germanic dialects with a *ge-* prefix, the infinitive is the only verbal form that matches the [categorical] features of the V-node (which are none) after *ge-* affixation has failed. In dialects without a *ge-* prefix, the [participle]-feature is on the V-node, hence a participle is inserted in the V-node at Vocabulary Insertion, as the participle is the most specified form that can be inserted in the node. This account also explains why participles are spelled out as infinitives, but are still interpreted as participles; the

COMPLETED-operator is not affected by any of the operations that take place at PF, be it Lowering, deletion or Vocabulary Insertion.

6.6.3 IPP and optionality

We have now established that the IPP-effect involves a repair strategy applying when *ge-* fails to affixate to *V*. What we haven't accounted for is the dialectal variation that we have observed in section 2. Most notably, in some dialects movement of the infinitival complement of the participle doesn't bleed the IPP-effect.

- (98) Ik weet dat Jan is [_{VP} zwemmen] gaan t_{VP}
 I know that John is swimming-INF gone-INF
 'I know that John is gone swimming.'

In the current theory, the IPP-effect is taken to be a repair strategy and can thus only occur when indeed necessary. (98) does not constitute an example in which the IPP-effect is necessary, since *ge-* affixation seems to be possible; *gaan* is at the right edge of its spell-out domain. We must assume then that the IPP-repair strategy is obligatory in (98). In other words, it must be the case that *ge-* affixation fails, which means that at the point at which Lowering of *ge-* takes place, *gaan* 'go' in (98) is not at the right edge. One possibility is that in some dialects, VP-movement does not take place in syntax, but at PF in the form of head-movement. V-movement would then be the PF equivalent of syntactic VP-movement. If Lowering takes place before head-movement, *ge-* affixation fails, as illustrated in (99).

- (99) a. Ik weet dat Jan is *ge-* gaan zwemmen. → affixation fails: *ge-* is deleted.
 I know that John *ge-* gone swim-INF
 'I know that John is gone swimming.'
 b. Ik weet dat Jan is zwemmen gaan. → PF head-movement of
zwemmen

In (99a) *zwemmen* 'swim' is still in the complement domain of the participle. *Ge-* affixation fails as *gaan* 'go' is not at the right edge of its spell-out domain. *Zwemmen* head-moves and adjoins to *gaan* 'go' after Lowering has failed (99b). Evidence that Lowering can take place before head-movement is given in (100).

- (100)a. dat Jan heeft *ge-*probeerd te zwemmen. → Lowering of *ge-* to V
 that John has tried to swim-INF
 'that John has tried to swim.'
 b. dat Jan geprobeerd heeft te zwemmen. → Lowering of *ge-*, then head-
 movement of *geprobeerd*.

(100a) shows the base-generated order. In (100b) *geprobeerd* 'tried' has adjoined to *heeft* 'has' at PF. This must mean that *ge-* has lowered onto *proberen* 'try' before head-movement. Head-movement before Lowering would have made affixation of *ge-* impossible, since *ge-*'s host would have just moved.¹⁰ Another example of Lowering before head-movement is the

¹⁰ If *geprobeerd* in (100b) can head-move across *heeft*, it follows that this is PF-movement, as all head-movement takes place at PF. If we assume that *geprobeerd* moves to *heeft* to check a [*u*participle]-feature of *heeft*, it directly follows why (i) is out.

(i) *dat Jan proberen heeft te zwemmen.

Yiddish stem construction. First, *a* Lowers onto V, after which [a+V] head-moves to *v* (cf. fn. 9).

In the Achterhoeks dialect, IPP is obligatory in the V1-V2-V3 order, as expected. The dialect also allows the V3-V2-V1 and the V1-V3-V2 order. These orders show optionality with respect to the IPP-effect. Whether or not IPP occurs depends on the semantics of the participle. For example, in the V3-V2-V1 and the V1-V3-V2 orders, the IPP-effect is obligatory with causatives, but is optional in the case of modals. With perception verb the IPP-effect never arises in these orders. Furthermore, Hinterhölzl (2006) shows that the IPP-effect in German is never bleeded with modal verbs, but is bleeded with perception verbs. These facts are surprising for the following reason. How is it that a PF-repair strategy can interact with the semantics of verbs?

The assumption that verb movement is driven by [event]-features (Barbier's (2008)) might provide us with an explanation here. Let's take a closer look at Achterhoeks. In this dialect, causatives necessarily exhibit the IPP-effect, no matter what the order of the verbs is. Causatives, by hypothesis, do not have an [event]-feature that needs valuation, since causatives do not denote an event. Rather, these verbs are light verbs and take a verbal event as their complement. Perception verbs and benefactives, on the other hand, never exhibit the IPP-effect. These verbs do denote an event on their own, namely a seeing-event in the case of *zien* 'see' and a learning-event in the case of *leren* 'learn'. These verbs allow both the V1-V3-V2 and V3-V2-V1 orders. The option that I pursue here is that the valuation of [event]-features must take place in syntax (or at LF) and therefore always bleeds the IPP-effect. Valuation of [categorical]-features, on the other hand, may take place at PF as head-movement. Given that this movement does not bleed the IPP-effect, it must take place after the *ge*-prefix has failed to adjoin to V. If the *ge*-prefix were affixed to V2 at the time V3 moved, the movement could no longer bleed the IPP-effect. This is exactly what we have observed in the case of (100). The account proposed here allows us to explain how it is possible that the IPP-repair strategy seems sensitive to the semantics of the IPP-verb.

7. Conclusion

The main goal of this thesis was to account for the PPI and IPP-effect. Since they are both phenomena that show the unexpected double occurrence of an element, it is interesting to investigate whether the phenomena are actually two sides of the same medal. However, it turned out that the two phenomena are unrelated. The PPI-effect was shown to involve copying of morphological inflection (following Wiklund (2005) and Den Dikken and Hoekstra (1997)). Trying to extend the copying analysis to the IPP-effect has shown that the IPP-effect could not involve copying. The main reason for this is that the IPP-effect doesn't show up optionally (in the V2-V3 order). In the rest of the thesis it was argued that the IPP-effect is in fact a repair strategy. The context of the IPP-effect turned out to be restructuring clusters. I took this to mean that the IPP-effect only arises when the IPP-verb takes a non-phasal complement. After arguing that *ge*-heads AspP directly above VP, it was shown that

that John try-INF has to swim-INF
'that John has tried to swim.'

The reason that (i) is ungrammatical follows from the fact that the *ge*-prefix, which actually spells out a [participle]-feature in AspP, has been deleted in (i). This follows from the observation that an infinitive has spelled out instead of a participle. Furthermore, *proberen* takes a VP-complement in (i). *Ge*-affixation has thus failed because *proberen* is not at the right edge of a phase in this case. Head-movement of *proberen* across *heeft* is can then no longer be feature-driven, as the driving [participle]-feature has been deleted before movement.

the failure of *ge-* to affixate to V at PF leads to the deletion of *ge-* (the [participle]-feature of Asp, which is to be spelled out as *ge-* at Vocabulary Insertion). The failure of the *ge-* prefix to affixate to V was shown to follow from the fact that the IPP-verb dominates overt material within its phase. This context gives rise to an affixation failure. Consequently, Continental West Germanic languages turn to the repair strategy that deletes the offending feature. This makes it possible that at Vocabulary Insertion, an infinitive is inserted instead of a participle.

A lot of theories have been put forth to account for the IPP effect, none of which can account for all the dialectal variation with respect to the IPP-effect. The reason for this is probably because there is more than one factor involved in the variation. First, it must be noted that the IPP-effect only occurs in dialects with a *ge-* prefix. Second, the occurrence of the IPP-effect shows variation only when V3 has moved out of the complement domain of V2. Once this empirical variation has been acknowledged, and the context of the IPP-effect has been determined, it is still not straightforward why the IPP-effect arises. The route chosen in this thesis was to look closer at the relation between syntax and the PF-interface. Assuming that movement operations can apply at the PF-interface has already been proven to be successful in the past for Affix Hopping in English and I think that the empirical coverage of the account proposed above, shows that it might be fruitful to take a closer look at the interaction between syntax and the PF-interface to account for other peculiar phenomena as well.

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