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Diachrone Syntax

The IPP-Effect, Phrasal Affixes and Repair Strategies in the Syntax-Morphology Interface

Roland Hinterhölzl

Abstract

In this paper, I provide a formal account of the diachronic development of the IPP-effect and investigate its relation to what Höhle (2006) calls 3V-phenomena. I will argue that the IPP-effect is the result of a repair operation in the syntax that involves the copying of formal/semantic features of affixes that get displaced due to the particular structure shared by verb formation and verb cluster formation and discuss the implications of this account for the syntax-morphology interface.

1 Introduction

The IPP (= infinitivo pro participio)-effect appears if a restructuring verb taking a dependent infinitive as complement is used in perfect tense. In this case, the restructuring verb does not appear in its expected participial form, but is realized as an infinitive, as is illustrated in (1).

- (1) Hans hat das Buch lesen wollen (* gewollt)
Hans has the book read-INF want-IPP (wanted-PP)

This effect occurs in (High) German, Dutch and West Flemish, but is missing in Frisian, Low German and Yiddish. In this paper, I will concentrate on investigating the development of the IPP-effect in German, taking into consideration also cross-linguistic data that support the analysis argued for German.

I will present an account of the IPP-effect that embeds it in a wider class of cases in which the morphology of a verb in a verb cluster is dropped or displaced. I will argue that the dropping and the displacement of morphology constitute the same phenomenon that is best understood, if it is assumed that a) verb cluster formation involves XP-movement and b) the participial morphology

involves a phrasal affix in German. Furthermore, I will discuss several repair strategies and outline their grammatical conditions and their motivation in the historic context. In conclusion, the paper presents strong evidence that the syntax only operates on formal and semantic features of words and affixes with vocabulary insertion applying late (in the postsyntactic component), as is commonly assumed in the framework of distributed morphology.

Investigating the nature and origin of the IPP-effect, which first appears in German texts in the middle of the 13th century (cf. Paul 1998 § 335c), raises a number of questions. The first issue – which is at the centre of traditional accounts – involves the question of how it came about that an infinitive, which is formally and semantically so different from the perfect participle in modern German, happened to replace it. Behind this question is the issue of whether an IPP-infinitive is a real infinitive or a hidden participle of some sort. This question will be dealt with in detail in Section 3.

The second issue concerns the observation that the IPP-effect is triggered by verb cluster formation, as the examples in (2) from Dutch indicate. Only if a verbal cluster is formed, as in (2a), may the selecting verb *probeer*en (try) appear as an infinitive. If the dependent infinitive is licensed as a sentential complement, as in (2b), the selecting verb can only appear in participial form.

- (2) a. Jan heeft het boek proberen te lezen
 Jan has the book try-IPP to read
- b. Jan heeft geprobeerd / *probeer
- en (om) het boek te lezen
-
- Jan has tried-PP / try-IPP the book to read

This implies that an insightful account of the IPP-effect depends on a correct analysis of verb clusters, raising the question of what exactly verbal clusters are and what the motivation for their formation is. These questions will be dealt with in the following section.

2 The triggering environment of the IPP-effect

A standard answer to the question of what verb clusters are has been that they involve head adjunction structures that are either base-generated (cf. Haider 1991) or created by V-Raising (VR), a head movement operation which adjoins the dependent infinitive to its selecting verb (cf. Evers 1975, Rutten 1991, among others).

More recent accounts have proposed that verb cluster formation involves phrasal movement (cf. Hinterhölzl 1997, Koopman & Szabolcsi 2000) or involves base-generated stacked VP-shells (with some reordering processes) (cf. Wurmbrand 2001, 2002, 2004). In section 2.1, I will address the question of whether verbal clusters are derived by head movement or XP movement. I will argue that the formation of verb clusters involves movement of Aspect phrases into the domain of the higher verb. In Section 2.2, I will provide some motiva-

tion for this analysis by embedding it into a generalized theory of sentential complementation.

2.1 On the structure of verbal clusters

In this section, I will present three pieces of empirical evidence indicating that cluster formation, if to be derived by movement, must involve phrasal movement. The first argument comes from the syntax of to-infinitives in West Germanic.

2.1.1 To-Infinitives are phrasal

To-infinitives in the West Germanic languages seem to involve a head initial phrasal structure in which the infinitival marker heading a functional position takes the infinitival VP as its complement to the right, as is illustrated in (3a).

- (3) a. ohne gestern das Buch zu lesen
 without yesterday the book to read-INF
- b. [_{CP} ohne [_{IP} PRO gestern [_{VP} das Buch [_V zu-lesen]]]]
- c. [_{CP} ohne [_{IP} PRO gestern [_{VP} das Buch t_i] [_I zu-lesen_i]]]

To accommodate this order with the particular assumptions about the settings of the head-complement parameter within the standard approach to the West Germanic SOV-languages (where VP and IP are analysed as head-final projections), it is either assumed that the infinitival marker in the West Germanic languages is not an independent head but rather a verbal affix (Haider 1993), as is illustrated in (3b), or that the infinitival verb undergoes rightward head-movement to (right-)adjoin to the head-final infinitival marker in the IP domain, as is illustrated in (3c).

The crucial empirical evidence that disqualifies these assumptions comes from the position of the infinitival marker in non-finite IPP-constructions in West Flemish (4a) and Afrikaans (4b).

- (4) a. mee Valere te [willen [dienen boek kuopen]] een
 with Valere to want that book buy have
 'with Valere having wanted to buy that book'
- b. Die banke moes oop gewees het, om dit gister te [kan betaal] het .
 the bank should open been have to it yesterday to can buy have
 'the bank should have been open to have been able to buy it yesterday.'

Since material, given in square brackets in (4), can intervene between the infinitival marker and the corresponding infinitival verb, it follows that the infinitival marker in these West Germanic SOV-languages cannot be analyzed as a verbal

affix, but, like in English, has to be analyzed as occupying a functional position within the IP-domain. That this functional position is not head-final and that the sequence *te+V* cannot be accounted for by assuming rightward head-movement of the verb within the traditional approach, also follows directly from (4a). In (4a), the constituent that has been moved to the right of the infinitival marker cannot possibly be a head, since it contains the DP *that book*.

In conclusion, there is good evidence that the infinitival marker occupies a functional head to the left of VP in West Flemish and Afrikaans, as is illustrated in (5).¹

(5) [_{AspP} zu/te [_{VP} verb]]

In section 6 below, I will show that the infinitival marker in German constitutes a phrasal affix and thus also requires an analysis along the lines of (5). In the absence of any evidence to the contrary, I will assume (as a null hypothesis) in this paper that the analysis in (5) also applies to the infinitival marker in Dutch. Given the analysis of the sequence infinitival marker + infinitival verb in (5), it follows that movement of a to-infinitive must involve phrasal movement (cf. Hinterhölzl 2000).

2.1.2 Bare infinitives and verbal particles

The second argument comes from the behaviour of verbal particles in Dutch verb clusters. As is illustrated in (6), VR in Dutch can either strand (6a) or pied-pipe (6b) a verbal particle. It has been proposed by Van Riemsdijk (1978) that particles can optionally incorporate into the selecting verb. Note, however, that if VR is treated as an operation of head movement, then it is unexpected that V2 – being standardly analysed as head movement as well – must obligatorily strand the relevant verbal particle, as is illustrated in (6cd).

- (6) a. dat Jan Marie **op** wil bellen
that Jan Marie up wants call
- b. dat Jan Marie wil **op** bellen
that Jan Marie wants up call
- c.* Jan *op*belde Marie
Jan up-called Marie
- d. Jan belde Marie *op*
Jan called Marie up
'Jan called up Marie'

¹ The data in (4) also indicates that there is an additional position below the infinitival marker and above the VP that serves as a landing position for the participle selected by the auxiliary. In subsection 2.2, I will argue that there are two Aspect phrases in the V-domain that serve as licensing positions for dependent non-finite verbs in verb cluster formation.

The contradiction can be avoided if it is assumed that verb raising constitutes phrasal movement. In line with the conclusion of the previous subsection, I propose that verb clusters involving bare infinitives are also formed by movement of the infinitival Aspect phrase. I will provide additional motivation for this analysis in Section 2.2 below. In this account, verbal particles are licensed in [Spec, AspP] and may climb from one Aspect phrase to the higher one in verbal clusters (cf. Hinterhölzl 2006 for the details).

2.1.3 Bare infinitives and VP-topicalisation

The third argument comes from VP-topicalisation data in German. As is illustrated in (7), VP-topicalisation can affect either the entire verb cluster (with the exception of the finite verb that has to undergo V2) (7b), or each subpart of it (7c,d). The latter fact is unexpected, if verb cluster formation would involve head movement, since it is generally assumed that only the head can excorporate from the resulting head-adjunction structure.

- (7) a. weil der Hans das Buch lesen können wollen wird
since Hans the book read can want will
'since Hans will want to be able to read the book'
- b. [lesen können wollen] wird Hans das Buch
- c. [lesen können] wird Hans das Buch wollen
- d. [lesen] wird Hans das Buch können wollen

On the other hand, if it is assumed that an infinitival verb like *lesen* is analysed as constituting an Aspect phrase that is moved into [Spec,AspP] of the selecting verb, with the resultant verb cluster moving (as Aspect phrase) into [Spec,AspP] of the higher selecting verb and so forth, then we derive a verb cluster that has the structure illustrated in (8).

(8) [_{AspP} [_{AspP} [_{AspP} [_{AspP} lesen] können] wollen] wird]

In this scenario, the data in (7) can be explained along the following lines: Assuming that the Aspect phrase constitutes the left edge of the V-domain and assuming that the Specifier of a constituent in the Specifier of the left edge of the matrix verb, is also part of the left edge of the matrix verb by transitive extension, then it follows from the Phase Impenetrability Condition (cf. Chomsky 2001) that each Aspect phrase in the structure in (8) can undergo movement into the next higher strong phrase, namely into [Spec,CP], of the finite verb (cf. Hinterhölzl 2006 for further discussion). Thus the data in (7) provide additional support for the assumption that verb cluster formation involves (remnant) movement of Aspect phrases into the V-domain of the higher verb.

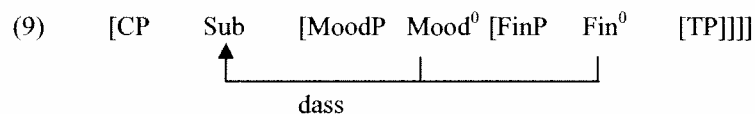
2.2 On the motivation of verb cluster formation

Having argued that verb cluster formation involves movement of Aspect phrases, the question arises of what the motivation of these movement operations could be. As the following quote indicates, Wurmbrand (2002) considers this question still an open issue.

“Many interesting accounts have been suggested addressing the question of how verb clusters are derived. However, what still appears to be an open question is the question of why the elements of verb clusters are inverted in certain languages and constructions. An answer to the question of what the (deep) motivation of verb cluster formation is and why this phenomenon only exists in certain languages is still outstanding.” (Wurmbrand 2002:4)

While it is correct that we do not have a good answer to the question of why this phenomenon exists only in certain languages, there are various proposals in the literature as far as the motivation of verb cluster formation is concerned, which converge on the idea that the complementizer is essential for rendering a sentential complement (a TP) into an argument. In particular, it has been proposed that the complementizer plays a crucial role in linking the embedded TP to the matrix event time (cf. Den Besten (1983), Enç (1987), Gueron & Hoekstra (1988)).

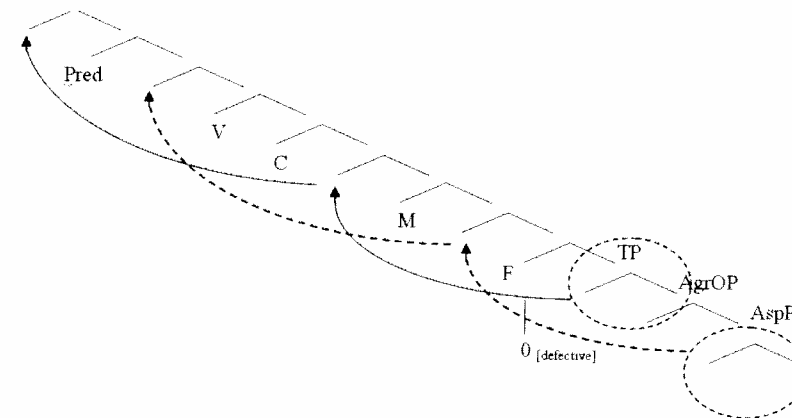
Along these lines, it is proposed in Hinterhölzl (1999, 2006) that the complementizer is responsible for licensing the embedded TP and the embedded AspP. While the embedded TP has to move into [Spec,MoodP] to be temporally linked to the matrix event, the embedded AspP moves into [Spec,FinP] to check the subcategorisation of the matrix verb. As is illustrated in (9), the complementizer, being base-generated in Fin⁰, moves via Mood⁰ to the highest head of the embedded clause (Sub for subordination) and acts as a placeholder for the requirements imposed by the matrix verb. The features of the complementizer, finally, are checked by the matrix verb when the embedded CP moves into a licensing position in the V-domain of the higher verb. In this way, the complementizer transmits the selectional requirements of the higher verb in a standard case of sentential complementation.



Restructuring infinitives have been assumed to lack the entire C-domain. An alternative would be to assume that the C-domain is present nevertheless, but that the complementizer is defective and thus fails to value the infinitival TP and AspP completely (cf. Hinterhölzl 1999, 2006), hence these phrases – parallel to the subject in subject raising contexts – undergo licensing movement into the matrix clause. The infinitival TP – not being temporally linked and thus failing to denote an event token – does not qualify as an argument and is licensed as a predicate in [Spec,PredP] of the selecting verb, which accounts for the general transparency of restructuring infinitives. The infinitival AspP moves into the

Specifier of a functional head in the V-domain to check the subcategorisation of the matrix verb and to link the embedded event to the matrix event time, as is illustrated in (10).

(10) PredP



In conclusion, verb cluster formation has two motivations. It serves to check the subcategorisation of the higher verb and to temporally link the event denoted by the infinitive. This dual dependency on the matrix verb will become important for the account of the IPP-effect in section 4.

3 Explanations of the IPP-effect in traditional grammars

Before I will outline a formal account of the IPP-effect, let us first discuss how IPP-infinitives are treated in traditional grammars. There we find basically two types of accounts of the IPP-effect: A) IPP-infinitives are hidden participles and B) IPP-infinitives are true infinitives. It is interesting to note that account A) is conceptually more appealing, but has serious empirical drawbacks, as will be discussed in detail in Section 4.3 below, while account B) faces no empirical problems, but lacks any explanation for why an infinitive should replace a participle in the first place.

3.1 The IPP-Infinitive as a hidden participle

The hypothesis that the IPP-infinitive is a hidden participle goes back to Grimm (1893 IV) and constitutes the standard account of the IPP-effect. Grimm proposes that the IPP-infinitive is a prefixless participle. Note that the participle in German is built by adding the prefix *ge* and a participial suffix. If the verb belongs to the class of strong verbs the participial suffix is identical to the infinitival ending. In many cases then a prefixless participle will be formally identical

to an infinitive. This proposal is also endorsed by Paul (1998) and most forcefully argued for by Behaghel (1924), who proposes that the construction is initiated by the causative verb *lazen* (let), where infinitive and prefixless participle were identical, and has been quickly extended to other causative verbs like *heizen* (make, order) and to perception verbs like *sehen* (see) (cf. Behaghel 1924, *Deutsche Syntax II*: 367ff). These prefixless participles were reanalysed as infinitives and extended to other verb classes later. Behaghel also notes that while IPP-infinitives have become categorial with modals, causatives and perception verbs in the standard written language, the situation is much diversified in the dialects. IPP-infinitives do not appear in Low German and are mostly missing in Middle German (Franconian and Thuringian) dialects. I will come back to the situation in the dialects below.

3.2 The IPP-Infinitive as a real infinitive

The alternative hypothesis that the IPP-infinitives is a real infinitive and did not develop diachronically from a prefixless participle goes back to Erdmann (1886) and Merkes (1896). They point out that IPP-infinitives did also develop with verbs where prefixless participle and infinitive were clearly distinct morphologically (cf. *helfen* – (*ge*)*holfen* (help)). Most importantly, they argue that the standard theory cannot account for the appearance of IPP-infinitives with the central class of restructuring verbs, namely modal verbs. Modal verbs have undergone a particular morphological development in German: as preterito-presentia modal verbs originally lacked a past participle. According to Ebert et al (1993), the modern weak participles of modals first appear around 1500, with infinitives already being in use before.

It is clear that the standard theory has to be revised in order to accommodate the appearance of IPP-infinitives with modal verbs. One possibility – that is also implicit in Behaghel's (1924) treatment – is to assume that IPP-infinitives were extended to these other verb(class)es, including modals, after the original prefixless participles were reanalysed as infinitives, raising the question of why prefixless participles should be reanalysed in this way in the first place.

One reason why the standard theory – though shaky – is superior to the alternative theory is that it provides at least a reasonable motivation for the appearance of infinitives in contexts requiring a participle, while the alternative theory has no real explanation for this morphological effect. Kurrelmeyer (1910), noting the shortcomings of the standard theory, proposes that the participle is morphologically assimilated to the dependent infinitive without providing any motivation for this process.

4 Towards a formal account of the IPP-effect

The analysis of IPP-infinitives as hidden participles is attractive for a formal account of the IPP-effect, since diachronically it provides some motivation for how infinitives came to replace them and since synchronically it explains how the selectional requirements of the auxiliary are satisfied and how the temporal interpretation of the IPP-infinitive is achieved.

Furthermore, it is important to note that the explanation of the IPP-effect must be purely structural, since semantic accounts cannot explain why the IPP-effect does not appear in all West Germanic languages that display verbal clusters. In particular, the IPP-effect is missing in those West Germanic dialects in which the participle is formed without the participial prefix (cf. Hinterhölzl 1999).

These considerations lead to the following three basic assumptions about the IPP-effect:

- (a) IPP-infinitives involve a zero-morpheme with the formal feature [participle] and a semantic feature guaranteeing a past interpretation ($e < r$).
- (b) the infinitival morphology on the restructuring verb appears as a pure default.
- (c) verb cluster formation blocks (part of) the participial morphology.

4.1 The dependent infinitive blocks the participial prefix *ge*

The idea that the IPP-effect is due to a blocking of the participial prefix (cf. vanden Wyngaerd, 1994, 1996; Hinterhölzl, 1999) capitalizes on the comparative generalisation that the IPP-effect is missing in Frisian and Low German which form their participles without the participial prefix *ge*.

Second, this account is supported by diachronic data as well. In Early New German texts, a prefixless participle may appear parallel to IPP-infinitives. This situation is especially well documented in the writings of Martin Luther, as is illustrated in (11a–b).

Third, remnants of the prefixless participle can also be found in Standard German (*worden*) and in Standard Dutch (*west*), as is illustrated for German in (11c).

- (11) a. hat ...nit mocht der zeit erwarten (Luther, Adel 23)
has ...not can-PP the time expect
- b. hats must fort gahen (Luther, Adel 42)
has-it must-PP away go
- c. das Buch ist gestohlen (*ge)worden
the book has stolen been

These observations all support the conclusion that verb cluster formation blocks the realisation of the participial prefix. In the following section, I will introduce an account of the IPP-effect that is based on the idea that verb cluster formation and verb formation interfere with each other.

4.2 Verb cluster formation and verb formation

In this section, I will sketch an account of the IPP-effect that is based on the assumption that verb cluster formation blocks the realisation of the participial prefix. The idea is to reduce the IPP-effect to a structural incompatibility between the dependent infinitive and the participial prefix. This can be achieved, if it is assumed that the same structural position that is responsible for the licensing of the dependent infinitive plays a role in the realisation of the participial morphology.

Note that we concluded in Section 2 that verb cluster formation has two types of motivations: temporal linking and checking of the subcategorisation. In particular, let us assume, as in Hinterhölzl (2006), that these checking operations involve two functional positions in the V-domain: while dependent infinitives are temporally anchored in [Spec, Asp2P], their subcategorisation is checked in the highest Specifier in the V-domain, namely in [Spec, Asp1P], as is illustrated in (12).

(12) $[_{Asp1P} \text{Subcat } Asp1 [_{Asp2P} \text{T-anchoring } Asp2 [_{VP} V]]]$

To explain the IPP-effect, I will make use of the particular structure of the participle in West Germanic. We noted above that in the West Germanic languages displaying the IPP-effect, the participle is formed by affixation of the prefix *ge* and the weak suffix *t* or the strong suffix *en*. Let us assume that inflected forms are derived in the syntax, as is generally assumed in the framework of distributed morphology (cf. Halle & Marantz 1993). More specifically, it is proposed in Hinterhölzl (2006) that the participial prefix *ge* is inserted in [Spec, Asp2P] of the participial phrase. The verb in the participial phrase in this analysis will first move to Asp2, to check its prefix and then move further up to the Asp1-head to merge with the suffix containing the temporal interpretation. In the final step, the prefix left-adjoins to the complex of verb and suffix to form the participle before Spell-out.² The basic structure is given in (13).

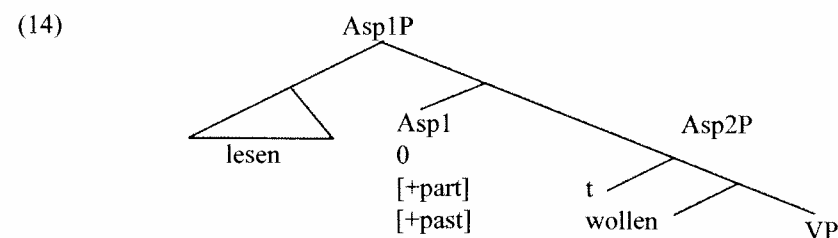
(13) $[_{Asp1P} -t [_{Asp2P} [ge] [_{Asp2} [_{VP} V]]]]$

It should be obvious from (12) and (13) that the (licensing of the) dependent infinitive blocks the realisation of the participial prefix. The result is the appearance of prefixless participles in verb clusters.

² In this account, the prefix is base-generated as an XP. Since it is both a maximal and minimal projection, it is assumed that it can incorporate into the higher head.

This approach raises two major questions. First, it is simply stipulated that the participial prefix is base-generated as a Specifier, leading to the question of whether there is any independent evidence for the structure in (13). In section 4.4 below, I will discuss the historical development of the past participle in German and outline its implications for the correct analysis of its structural and semantic composition.

Second, this approach raises the question of how these forms developed from diachronically plausible prefixless participles to unambiguous infinitives in the modern language. Note that according to our assumptions in the beginning of section 4, a verb cluster comprising an IPP-infinitive in modern German like (*hat*) *lesen wollen* (has read want-IPP) should contain a zero-morpheme in the highest head in the V-domain that carries the formal feature [+participle] and a semantic feature [+PAST] (or the condition that event time precede reference time in a Reichenbachian system), with the selecting verb being spelled out with the default morphology of a bare infinitive, as is illustrated in (14).



This leads to the question of which factors were responsible for the replacement of the participial suffix with this zero-morpheme. Given what we know about the particular development of modal verbs from traditional grammars discussed in the previous section, it is reasonable to assume that modal verbs were responsible for the initial introduction of true infinitives in IPP-contexts containing a zero-morpheme with the relevant specification. Thus, we can envisage the following diachronic scenario in four steps, given in (15):

(15) historic scenario for the development of IPP-infinitives

- Step 1: prefixless participles appear with causative verbs (*lassen* und *heißen*); these are formally identical with their infinitival counterparts.
- Step 2: true infinitives appear with modal verbs, replacing a participle that is missing altogether with this class of verbs; it can be assumed that it is in this stage that the zero-morpheme is introduced in the way sketched in (14) above.
- Step 3: because of the unambiguous situation with modals and the central role of modals in restructuring constructions, prefixless

participles are reanalysed as (default) infinitives plus a zero morpheme.

Step 4: this analysis is then extended to other verb classes, where prefixless participles and infinitives were formally distinct and which did not lack a participle

The scenario in (15) is realistic and concrete enough to be tested against empirical data discussed in the following section.

4.3 Problems of the standard scenario

The diachronic development and diffusion of the IPP-effect in High German has been studied in *detail* by Kurrelmeyer (1910). The development involves three major stages. The construction first appears in the beginning of the 13th century with four verbs: the causative verbs *heißen*, *lassen*, *tun* (make) and the perception verb *hören* (hear), as is illustrated in (16).

- (16)
- a. und haete im heizen machen ... ein wunneclichez huselin
(Tristan und Isolde, 1210)
and had him tell-IPP make ... a wonderful house
 - b. umbe waz hastu daz schif lazen gan (Tristan und Isolde, 1210)
why have-you the ship make-IPP go
 - c. han wir disen brief dun besegelen (Höfer, Urkunden 10, 1259)
have we this letter make-IPP seal
 - d. ditz ist ein wârez maere, ir habt ez ofte hoeren sagen
(Rabenschlacht 98,4)
this is a true story, you have it often hear-IPP say

In the second stage, the construction is extended to modal verbs in the 15th century (that is before modals have developed a (weak) participle in High German) as well as to the ECM-verbs *lehren* (teach), *lernen* (learn), *machen* (make) and *sehen* (see), as is illustrated in (17).

- (17)
- a. des hab aber sein gnade nicht mugen bekommen
(Chr. dt. St. I, 37 – 1438)
of-it has but his mercy not can-IPP become
 - b. das haben wir nicht wollen behalten (ebd. 459)
this have we not want-IPP keep
 - c. hette mister Nielaus nit unsern herren römischen kaiser kun-
nen howen uf stain (1490)
had master Nielaus not our lord roman emperor can-IPP build
in stone

- d. wyle cristus nit yemant hat leren betteln (Nik. v. Wyle 189, 39)
while christ not someone has teach-IPP beg

In the third stage, the construction is further extended to *anfangen* (begin), *pflügen* (use to) and *wissen* (know how to) in the 17th century, as is illustrated in (18).

- (18)
- a. hab ich in br. Albrechten hauss anfangen bawen (1613)
have I in the house of br. Albrechten begin-IPP build
 - b. unbesonnen Urteil hab ich jederzeit zu verachten pflügen
(Opitz, Poemata 8)
imprudent judgement have I always to despise use-IPP
'I always used to despise imprudent judgements'

These data present two problems for the standard approach. First, IPP-infinitives are extended simultaneously with modal verbs to verbs where prefixless participles and infinitives are formally distinct in the second stage. Second, the standard theory also fails to account for the data in the initial stage. The forms *hoeren* and *dun* cannot possibly be analysed as prefixless participles which should have the forms *hoeret* and *tan*. These forms must unequivocally be analysed as true infinitives and seriously challenge the standard account in terms of initial prefixless participles, as has been pointed out also by Paul (1998), since the same story as with modal verbs cannot be made for these verbs, the participial forms of which are clearly attested very early on, as is illustrated by the occurrence of the participial form of *hoeren* in (19).

- (19) von wilden getwergen han ich gehoeret sagen (Nibel. 335, 5)
of wild dwarfs have I heard tell

In conclusion, at least two of the four initial IPP-infinitives must be analysed as true infinitives and the standard account of the IPP-effect must be revised. In keeping with the general approach sketched in Section 4.2, I will propose an alternative account that is inspired by similar cases of mismatches between selected and realized morphological form in parallel environments in German dialects in Section 5. But before, I would like to discuss the development of the past participle in the history of German.

4.4 The role of the prefix *ge* in the development of the German past participle

The German past participle developed from a purely aspectual category to a temporal category in its history. In this process, the participial prefix lost its original aspectual meaning and became a purely formal marker of the participle.

It is important to note that the prefix *gi/ga* in Germanic originally served to derive perfective verbs from imperfective ones and could also appear with infinitives and finite verbs, as is illustrated in (20) for Gothic.

- (20) a. taujan (impf. do) – ga-taujan (perf. complete)
 b. hausjan (impf. hear) – ga-hausjan (perf. notice)

In Old High German the prefix *gi* was regularly used to derive the perfect participle of imperfective verbs. The participle of perfective verbs in OHG was initially built without the prefix. In the later OHG-period the prefix appears optionally with participles of perfective verbs. This indicates that the interpretation of the participial suffix originally required a perfective verb form, suggesting that the semantic composition of the participle was clearly ordered prefix before suffix. Standard assumptions about the interaction between syntax and semantics have it then that the prefix should attach to the stem before the suffix does, supporting the analysis entertained in Section 4.2, where the prefix was introduced in Asp2P, while the suffix was introduced in the higher Asp1P. These considerations, however, leave open whether the prefix originally occupied the head or the specifier position of Asp2P.

In the course of the development of the participle from a purely aspectual category to a temporal category, the participial prefix was either dropped, as in Low German and in Frisian, or became a semantically empty, purely formal marker of the participle in High German. In modern German the participial prefix has a purely prosodic function and is regularly displaced by unstressed lexical prefixes of the verb, as is illustrated in (21).

- (21) ziehen (INF) – gezogen (PP)
 unterziehen (INF) – unterzogen (PP)

To be more precise, the semantic composition of the participle, as long as it constitutes a purely aspectual category, involves attaching the prefix to the stem with the result of creating a bounded event type. The suffix then applies to this category in a second step, by specifying the aspectual reading that the reference time equals the end point of the event time and so derives the perfective interpretation of the base verb.

The semantic meaning of the participle as a temporal category would specify that the event denoted by the verb precedes a given reference time ($e > r$) such that the affixation of the participial suffix is independent of the aspectual type of the base verb. At this stage of the development of the participle, prefix and suffix in principle could attach to the stem at the same point, that is, in the same functional head (possibly Asp2⁰).

These facts must be kept in mind, when discussing the blocking of participial morphology. In particular, the question arises what are the consequences, if at some point in the derivation, a piece of morphology is blocked that is semantically active. I will address this question by considering other cases of blocked morphology in the following section.

5 The IPP-effect and alternative repair strategies

In this section, I will present dialectal and diachronic data which indicate that IPP-infinitives are but one of a number of replacement forms that appear in verb cluster formation. These data suggest that blocked morphology is just a special case of displaced morphology.

5.1 IPP-Infinitives and other substitutes in the dialects

It is important to note that Middle German dialects display next to IPP-infinitives other substitutes for the regular participle, as has been noted by Höhle (2006). As the data in (22) indicate and as is pointed out by Höhle, these forms seem to derive from suffixing the weak participial ending to the bare stem. An analysis of these forms as prefixless participles, however, is excluded, since the regular participle often either displays another stem vowel, as in (22a), or a strong participial suffix as in (22b) or both, as in (22c). These substitutes are called *supina* by Höhle (2006).

- (22) a. de hasd darfd drinke (participle = gedorfd)
 du hast dürfen trinken
 you were allowed to drink
 b. ha:darsche nij he:sd size (participle = gehe:san)
 habt-ihr-sie nicht heißen sitzen
 haven't you told them to sit
 c. se hunn waisd danze (participle = gewisan)
 sie haben ihm weisen tanzen
 they taught him to dance

The data in (22) therefore indicate that IPP-infinitives constitute but one repair strategy next to others (cf. also Schmid 2005, Vogel 2008). However, what is even more important is that Höhle (2006) notes that these replacement forms occur in contexts beyond the one that triggers the IPP-effect. Höhle (2006) proposes that the IPP-effect is just a special case of what he calls 3V-phenomena. It seems that these replacement forms may occur in any selectional sequence involving three verbs.

5.2 Cases of displaced morphology

In some of these dialects discussed by Höhle (2006), the morphology in such a selectional chain of three verbs is misplaced, in the sense that the morphology selected by V1 is realized on V3 instead of V2, with V2 being spelled out as supinum or bare infinitive. For the sake of illustration, let us have a look at the Thuringian dialect spoken in and around Sonneberg. These dialects display three

different types of infinitives: the bare infinitive (IN), the ge-infinitive (GI) and the gerundium (G). As is illustrated in (23), the modal verb *müssen* (must) selects the bare infinitive, the modal verb *können* (can) selects the ge-infinitive and the temporal auxiliary *werden* (become) selects the gerundium. Furthermore, note that the semi-modal verb *brauchen* (need) selects *zu*+gerundium in these dialects.

- (23) a. döös mußmar sough
das muß man sagen.IN
this must one say
- b. mar kaa gesough
man kann sagen.GI
one can say
- c. ich waarsch soughan
ich werde sagen.G
I will say

All these infinitival forms can be displaced in the relevant environment, as is illustrated in (24). (24a) displays a case of displacement of the gerundium. (24b) displays a case of displacement of *zu*+gerundium, while (24c) displays a case of displacement of the ge-infinitive.

- (24) a. ich waesch müd arab dun
ich werd's müssen herab tun.G
I will have to put it down
- b. ban a sich ned fun an brichd los u:n tsa schnütsa
wenn er sich nicht von ihm braucht lassen an zu schnautzen.G
when he does not need to be shouted at by him
- c. kasd ma helaf geschri:
kannst-du mir helfen.IN schreiben.GI
can you help me write

In this context, it is important to note that similar effects occurred diachronically in IPP-contexts.³ Behaghel (1924: 367ff) notes that the construction *haben* + infinitive + participle occurs rather frequently in legal writings in the late 13th and early 14th century. The same construction, however, can already be found in the Nibelungenlied, as is illustrated in (25).

- (25) a. ob in diu edele frouwe het lazen das getan (Nib. 634,2)
whether the royal woman had let-IPP that done
- b. do si so reht wol von irem allerlibsten liep het hören gerett
as she so rightly well from her beloved lover had hear-IPP
said-PP

³ Here I would like to thank Agnes Jäger who made me aware of the historical dimension of the different replacement forms appearing in IPP-contexts in German.

While double participle constructions are rather rare in the history of German – an example is given in (26a) – they are common in colloquial variants of Frisian, Swedish and Norwegian (cf. den Dikken & Hoekstra 1997, Wiklund 2001). (26b) illustrates the double participle in Frisian.

- (26) a. hand wir unser eigen insigel geton henket (Urk. Basel 1387)
have we our own seal done hanged
- b. hy soe it dien ha wollen (den Dikken & Hoekstra 1997, 1058)
he would it done have wanted

To sum up, there are a number of substitutes that appear in three verb clusters, suggesting that the IPP-effect constitutes just one of a number of different repair strategies. In the following section, I will present an analysis of these phenomena of displaced morphology by proposing that this non-finite morphology involves phrasal affixes.

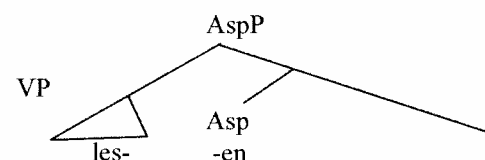
6 Solving the riddle of displaced morphology

Setting aside double participle constructions for a moment, the question that the phenomenon of displaced morphology, illustrated in (24–25) above, poses is how it is possible that a selectional requirement of V1 on V2 is dispensed with and realized on V3, since one would normally think of selectional requirements as being non-violable and non-transferable.

6.1 Displaced morphemes as phrasal affixes

The solution that I am going to present is rather simple and consists in the idea that the morphology of the ge-infinitive, the gerundium and the participle involves phrasal affixes. As is illustrated in (27), a phrasal affix occupying the head of an Aspect phrase combines in morphological form (MF) with the head of a phrase that has been moved into its Specifier in the syntax under the requirement of linear adjacency.

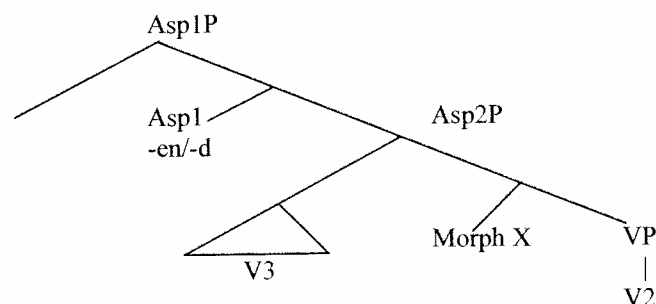
- (27) the infinitival ending as a phrasal affix



If we assume that the morphology selected by V1 is a phrasal affix occupying Asp2 of the selected verb (V2), as is illustrated in (28), a dependent infinitive (V3) in verb cluster formation, moving into [Spec, Asp2P] of V2 would block

the realisation of the selected morphology on V2.⁴ In this case, the selected morpheme X may either remain unrealized or appear on V3. In addition, it can be assumed that the phrase containing V2 is moved to [Spec, Asp1P] and is spelled out with the default morphology of a bare infinitive (-en) or with the default morphology of a supinum (-d) in Middle German dialects.

(28) displacement of the morphology X selected by V1



This analysis of displaced morphology suggests that also to-infinitives in German involve a phrasal affix, since the infinitival marker *zu* is displaced if embedded in an IPP-infinitive. As is illustrated in (29), *zu* is not realized on the auxiliary *haben* (have), as expected, but appears attached to the IPP-infinitive *wollen* (want-IPP).

(29) ohne das Buch haben lesen zu wollen
 # ohne das Buch lesen wollen zu haben
 without having wanted to read the book

In this case as well, it can be assumed that the dependent participle phrase has been moved into [Spec, Asp2P] of the auxiliary, the head of which hosts the infinitival marker *zu*. The infinitival marker is then fused with the adjacent IPP-infinitive at MF, while the auxiliary is spelled out with the default morphology of a bare infinitive in Asp1P, as is illustrated in (30).

(30) [_{Asp1P} hab- [_{Asp2P} [lesen [0 [wollen]]]] zu [_{VP} t_{hab-}]]]
 ↑ FUSION

⁴ An anonymous reviewer points out that the phrase containing V2 should take precedence over the phrase containing V3 in moving into the local [Spec, Asp2P] in (28) according to standard assumptions about locality. This is correct. Attract closest, an economy condition, would attract first the local VP containing V2. Note, however, that VP-movement necessarily pied-pipes V3 in its CP-complement. In this derivation, the morphology will be displaced as well, since it is V3 that occupies the right-edge of this projection. Moreover, the more economic derivation crashes, since the embedded verb V3 cannot be (temporally) licensed in this case. Thus, it can be assumed that a less economic alternative derivation – in which the embedded verb V3 is licensed first – is chosen given that there exists a repair operation that provides V2 with some morphology and thus secures the convergence of the alternative derivation.

If the argument holds water and if displaced morphology always involves phrasal morphology, these phenomena may be taken as a test at least in the West Germanic languages, for deciding whether a given morphological affix is phrasal or not.

At this point, a note on the status of the infinitival marker in the other West Germanic languages is in order. First, note that the data in (29) and its analysis in (30) do not disqualify the conclusions taken about the status of the infinitival marker in West Germanic in Section 2.1 above. For German, the above data support the conclusion that *zu* constitutes a separate morphological unit from the infinitival verb. Second, note that in West Flemish and Afrikaans, the infinitival marker, occupying a separate functional head, is not a phrasal affix, otherwise we would expect it to prefix to the adjacent infinitive and not to the entire infinitival phrase, as a parallel analysis of (4ab) would require. Third, note that the infinitival marker in Dutch as well does not seem to be a phrasal affix either, since in the parallel case to (29), no displacement of this morpheme takes place, as is illustrated in (31).

(31) zonder het boek te hebben willen lezen
 without the book to have want-IPP read

The analysis of the data in (24), (25) and (29) leads to the following conclusions:

- Obviously, morphological information can be displaced or dropped without major consequences. From this, we can conclude that for the fulfillment of the subcategorisation of the higher verb, it is sufficient that the relevant morpheme occupies the correct position in syntactic structure. Therefore, the displacement/dropping of morphology is immaterial as long as this morphology involves only formal features.
- There exists a repair mechanism that supplies the morphologically depleted stem with a default ending.
- We can conclude from the above data that the IPP-effect can be simply analysed as a special case of displaced phrasal morphology. For example, the data in (25) can be explained straightforwardly in this approach by assuming that the participial morphology of V2 is realized on V3 and that V2 consequently appears with the default morphology of a bare infinitive.

6.2 Restoring displaced semantic features

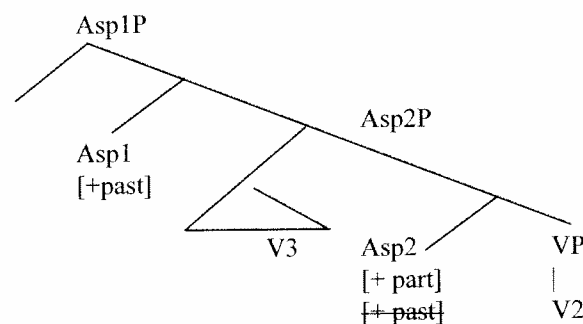
Now, there is only one aspect of the analysis of the IPP-effect missing that was argued for in Section 4.2 above. This aspect concerns the presence of the zero-morpheme that was introduced to take care of the correct temporal interpretation of the verb appearing with default morphology. To this end, we may assume that the displacement of morphology does have consequences and is in need of fur-

ther repair, if the morphology involves more than just formal selectional properties, as is the case with the morphology of the (aspectual) past participle.

The participial morphology has a semantic effect by locating the event denoted by the (extended) vP in its Specifier with respect to some given reference time. Thus, a displaced participial morpheme, whether realized or not, would have the semantic effect of temporally locating the event denoted by V3 rather than the one denoted by V2, leading to a false temporal interpretation of the relevant verbal complex. This consequence must be avoided or in other words this effect of displaced participial morphology must be repaired as well.

The simplest repair strategy that one can think of consists in copying the relevant semantic feature onto the higher head (Asp1) and deleting it in Asp2. Then it becomes again immaterial whether the displaced participial morphology is spelled out on V3 or not at all, since V2 can then receive the correct interpretation by moving into Asp1P, as is illustrated in (32).⁵

(32) repairing the effect of displaced participial morphology



The minimal operation concerning the repair of displaced participle morphology, illustrated in (32), can be taken to derive IPP-infinitives, if V2 is spelled out with the default morphology of an infinitive. However, one can also imagine

⁵ There is another case where an additional semantically motivated repair operation is in order. Höhle (2006) also observes the occurrence of complex supina in the relevant Thuringian dialects. "When the perfect auxiliary has subjunctive form, the suffix -d is not attached to the stem but to something similar to forms of the preterite subjunctive" (Höhle 2006, p. 58–59). This is illustrated in (i).

- (i)
- a. ij hedas misd wise (simple supinum = mud)
ich hätte es müssen wissen
I should have known it
 - b. ij hedn kend drafe (simple supinum = kund)
ich hätte ihn können treffen
I could have met him

In our approach, this would mean that the relevant semantic and formal features of the subjunctive morpheme that are to be realized on the auxiliary and have been displaced by V2 are copied onto the higher Aspect head to supply the auxiliary with the correct morphology, but are also spelled out on V2. I will have to leave this issue for further research and will only make note of an immediate consequence of this phenomenon: if the argument is correct that displacement is due to phrasal affixes, then it follows that also finite verbal morphology is phrasal in this dialect.

that the entire feature matrix, including its formal feature is copied on to the higher head. Since the semantic repair operation only requires deletion of the semantic feature in the lower head, the double participle constructions in Frisian, Swedish and Norwegian can be derived with the effect of yielding the correct temporal interpretation of the entire verb sequence.

It is obvious that this general approach can derive in one way or other the rather diverse replacement forms that we have encountered in section 5. It remains to be shown, however, with which other properties in the grammar the choice of one repair strategy over the other is correlated. This question will be addressed in the final section.

7 Solving the riddle of the IPP-effect

In this final section, I would like to address the question whether the account of displacement of participial morphology argued for in the previous section can help us solve the problem of the initial appearance of true infinitives in the standard approach. But before, I would like to discuss some theoretical implications of the latter analysis. Some of these consequences are already implicit in the above discussion, but it is important for the understanding of this analysis to make them explicit here:

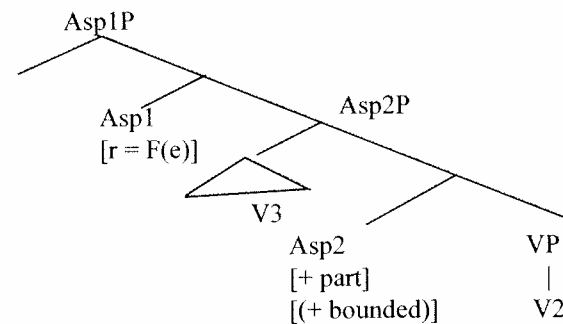
- a) The syntax operates on bundles of formal and semantic features only. Vocabulary insertion is post-syntactic.⁶ Thus, I really refer to feature bundles, when I informally talk about morphemes or affixes in this paper. So far, this proposal coincides with basic assumptions within the framework of DM.
- b) Repair operations can be triggered by morpho-syntactic and morpho-semantic needs and occur in the syntax proper. Thus they can have effects on both the PF- and the LF-side of the computation. This will become important for the analysis of early IPP-infinitives below. These repair operations involve copying of semantic and formal features within the local domain of the containing phase and are allowed as a means of last resort to secure a convergent derivation. These consequences go beyond the assumptions of DM and call for a re-evaluation of the properties of the syntax-morphology interface.

Now, we can address the issue of the appearance of true infinitives in the initial stage of the development of IPP-infinitives in High German. Let us assume that in the initial stage the past participle still had a purely aspectual reading. Following the general approach in terms of phrasal affixes advocated for in the previous section, this means that the participial prefix, being semantically ac-

⁶ Vocabulary Insertion is taken to involve both affixes and stems as in standard treatments within DM. This ensures that with strong verbs the stem with the correct ablaut-vowel is inserted if the affix is specified with the subcategorisational feature [+participle].

tive, should be analysed as occupying the head position of Asp2, while the participial suffix should be taken to occupy the head position of Asp1, as is illustrated in (33). In (33), the dual role of the prefix in this language stage is represented by an optional semantic feature [+ bounded] and the contribution of the suffix consists of a semantic feature specifying that the reference time equals the final point of the event time.

(33)



In this scenario, the displacement of the participial prefix by a dependent infinitive in Asp2P has two different effects. If the underlying verb is perfective, displacing the participial prefix is without further consequences, since with perfective verbs, the prefix constitutes an optional formal marker of the participle. Hence, V2 can be spelled out with the regular participial suffix yielding a prefixless participle. If the underlying verb is imperfective, displacing the participial prefix will have an effect, since the participial suffix cannot simply attach to an imperfective verb. Consequently, a repair operation is in order which copies the relevant semantic information onto the higher head.

Note, however, that this operation fails to derive the correct semantic interpretation, in fact, any valid interpretation, for the following reason. Given that the higher head is already occupied by a feature bundle, informally by the suffix, we can assume that copying the semantic feature of the lower head onto it results into an adjoined feature structure. Hence, the standard interpretation of adjoined structures, namely that the adjunct modifies the meaning of the category it has adjoined to, derives the effect that the two affixes apply in the wrong order to the stem (suffix before prefix) and the derivation crashes. It is not repairable. Thus, an alternative derivation is taken where a (zero) participial morpheme is inserted in the Asp1 head (or in the Asp2 head and copied onto the Asp1 head) which derives the correct interpretation in one step.

As before, this morpheme is taken to be a bundle of features consisting of a formal ([+ part]) and a semantic feature only. What is important is that the temporal feature specifies a past interpretation which is independent of the aspectual category of the base verb. This could be a feature specifying that the event time precedes the reference time ($e > r$). Since no lexical material in the relevant stage of the language corresponds to this feature specification, the morpheme

necessarily remains covert and V2 is thus spelled out with the default morphology of a bare infinitive.

In conclusion, this account derives the desired effect that perfective verbs would trigger prefixless participles in IPP-contexts, while imperfectives, including *hören* und *tun*, would trigger true infinitives in the initial stage of the construction. Furthermore, this approach predicts that more prefixless participles should appear in later stages of OHG, that is to say, when the prefix has lost its semantic contribution and has become a purely formal marker of the participle and therefore can account for the appearance of prefixless participles in Early New High German (cf. (11) above).

In essence, taking into account the diachronic development of the participle itself, has allowed us to restore the standard account of the IPP-effect in terms of blocking of the participial prefix.

Finally, let us address the question of how supina as substitutes in Middle German can be derived in this approach. A precondition for the occurrence of this type of supina seems to be that the participle morphology has attained a purely temporal interpretation. Then, if the participle morphology is blocked and only the semantic feature is copied onto the higher head, this feature can be spelled out with a past morpheme that attaches to the bare verbal stem, as required. Thus the difference between the appearance of an IPP-infinitive and a supinum boils down to the point of whether the lexicon in the relevant language stage already contains lexical material with the corresponding interpretation.

Summing up, the (initial) appearance of the diverse substitutes supinum, IPP-infinitive and (prefixless) participles depends on two factors. First, it is important whether the semantic repair operation only copies semantic features or both semantic and formal features. In the first case, default morphology, that is to say, an IPP-infinitive or a supinum will appear, in the second case, a participle will appear. Second, it is important whether the lexicon already contains phonological material that corresponds to the copied semantic feature or not, deciding whether an IPP-infinitive or a supinum will appear.

We have now an account of the IPP-effect that is general enough to encompass the diverse substitutes that we have encountered and is restrictive enough to make empirical predictions that can be checked by a careful philological study of the historic records.

In conclusion, the phenomenon of blocked/displaced morphology with its different replacement forms and repair operations provides strong evidence for the assumption that the syntax operates on feature bundles comprising formal and semantic features only, with vocabulary insertion applying post-syntactically. Thus, the quirky morphological facts presented in this paper provide support for the general architecture argued for in the framework of DM and provide counterevidence to a framework that assumes that words enter the derivation fully inflected, since the latter cannot account for the coming into existence of the different substitutes. Differently from assumptions with the standard DM-framework, however, the facts presented in this paper also show that the mor-

phology does not simply interpret the output of syntax. These facts support a view of a bidirectional interface between syntax and morphology in which formal and semantic demands of the interface influence the syntactic computation by requiring copying of semantic and formal features in the course of the derivation.

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