Life of Phi: Phi-features in West Germanic and the syntax-morphology interface

Alem, A.H.J. van

CHAPTER 2

Position dependent agreement and the representation of φ-features

2.1 Introduction

The first case study on φ-features in West Germanic focuses on position dependent agreement (PDA) in Dutch dialects. In many Dutch dialects, as well as Standard Dutch, the realisation of agreement with some person/number combinations is sensitive to word order: in sentences with subject-verb (SV) word order, the verb shows a different agreement ending than in sentences with a verb-subject (VS) word order. Example (1) illustrates this phenomenon for Standard Dutch, and example (2) for Losser Dutch, a Dutch Low Saxon dialect.

(1) Als je gezond **leef-t**, **leef-Ø** je langer.
if you healthy live-AGR, live-Ø you longer
'If you live healthy, you will live longer.' Standard Dutch

(2) As wie sober **leew-t**, **leew-Ø** wie gelukkig.
if we frugal live-AGR, life-Ø we happily
'If we live frugally, we will live happily.' Losser Dutch (DynaSAND)

In this chapter, I develop a novel analysis of PDA, that captures the main patterns of cross-dialectal variation that can be observed in the data. The main idea I will pursue is that the cause of PDA is a defective Probe, a Probe that misses some φ-features. The defective Probe can only partially Agree with the subject, and this leads to the insertion of an unexpected affix in certain contexts. Based on the empirical generalisations and the analysis, I argue that the defective Probe approach to PDA gives us unique insight

into the representation of φ-features in syntax and morphology. In particular, I will argue that in syntax, φ-features are organised in a φ-feature geometry that is built up of privative φ-features (in line with Harley and Ritter, 2002). In morphology, on the other hand, φ-features are binary features.

The goals of this chapter are as follows. First of all, the chapter will give an empirical overview of the main patterns of position dependent agreement, and present empirical generalisations. Second, it presents a novel account of PDA, using the notion of defective Probes. Based on this account, I provide a novel argument in favour of a geometric organisation of φ-features. Finally, the chapter argues that the representation of φ-features is not uniform across grammatical modules.

This chapter is organised as follows. In section 2.2, I present the main verbal agreement paradigms of Dutch dialects, based on data from over 200 dialects from the DynaSAND (Barbiers et al., 2006). In this section, I also present the generalisations over these paradigms. In section 2.3, I show that the typology of PDA paradigms motivates a feature-geometric organisation of φ-features. Section 2.4 turns to the analysis: I argue that PDA is the result of a defective Probe, and that defectiveness of the Probe is restricted by the φ-feature geometry. Based on a detailed consideration of the relation between PDA and the affix inventory, I show that a full account of PDA requires features to be privative in syntax, and binary in morphology. Section 2.5 demonstrates that this conclusion is in line with the cross-linguistic evidence on the valence of φ-features, and suggests that this is caused by the nature of the spell out algorithm. In section 2.6, I extend the analysis of PDA in Dutch dialects to PDA in Standard Arabic, and discuss the implications for the φ-feature geometry. Section 2.7 compares previous morphological and syntactic approaches to PDA, and argues that the analysis I develop in this chapter is superior. Section 2.8 concludes this chapter with a short summary and implications of the proposed distinction between the representation of φ-features in syntax and morphology.

2.2 Position dependent agreement

2.2.1 Data

The data that I present in this chapter come from the DynaSAND (Barbiers et al., 2006), which contains systematically collected data on the (morpho)syntax of 267 Dutch dialects. The data I present in this section are based on the data for the verb *leven* ('to live'), for which 202 paradigms are available with complete data for all person/number combinations in both subject-verb (SV) and verb-subject (VS) word order. Although these data have been the topic of previous research (Bennis & MacLean, 2006; Don et al., 2013), the novelty of my approach is that I look at both SV and VS word orders (in contrast to Bennis and MacLean, 2006, who only looked at SV word order), and that I take into account the frequency of the paradigms (in contrast to Don et al., 2013).

At first sight, the variation between the 202 complete paradigms is enormous, with 55 unique paradigms. However, the distribution of these paradigms is very unequal;

the majority of the dialects is accounted for by only a few paradigms. These frequent paradigms furthermore show a high degree of geographical clustering that corresponds to the traditional dialect areas (see below, and the Appendix). Because each dialect has only contributed one paradigm to the DynaSAND, I rely on frequency and geographical clustering of the paradigms to determine whether a certain paradigm is a true representation of the grammar of a group of Dutch dialects. There are 15 paradigms that are relatively frequent (occur 4 times or more), and that show a clear geographical clustering. These 15 paradigms represent 150 dialects (74 %). The remaining paradigms occur only once or twice, and many are very similar to a frequent paradigm within their geographical vicinity. The reasons for this type of variation can be manyfold. For instance, it may be the result of noise introduced in the elicitation process; a quirk of the specific verb that was used (*leven*, 'to live'); or the dialect maybe be unstable because of the influence of standard Dutch or other varieties (see e.g. Barbiers, 2020 on transitional forms). I will leave an investigation of this type of variation for future research, and focus instead on the frequent and geographically clustered paradigms.

Looking at these paradigms in more detail, the 5 most frequent paradigms are all PDA paradigms, and these will be the main focus of this chapter. There are also 6 full agreement (FA) paradigms; because they do not involve position dependent agreement, they are currently of less interest, although I will discuss some of them below. All FA paradigms can furthermore be found in the Appendix. The 4 paradigms that remain are PDA paradigms. These paradigms do not straightforwardly fit into the analysis I will argue for, but we can understand them with further assumptions, as I will also show in the Appendix.

Let us now turn to the main paradigms. The first two paradigms to consider are given in table 2.1 and table 2.2. The varieties with the paradigm in table 2.1 are spoken in the west of the Netherlands (Hollandic); Standard Dutch is also an example of this variety. The varieties from table 2.2 are the Brabantic dialects spoken in the Dutch province Noord Brabant and the Belgian provinces Antwerpen and Vlaams-Brabant. Apart from the 2PL verb, the paradigms of Hollandic Dutch and Brabantic are highly similar. In both paradigms, we find PDA for 2SG: in the SV word order, the 2SG suffix is *-t*, but in VS word order, it is Ø, just like with the 1SG verb. In addition, the paradigm in table 2.2 has PDA for 2PL: the *-t* suffix in SV word order alternates with a zero ending in the VS word order.

Table 2.1: Agreement paradigm Hollandic Dutch ($n = 23$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

Table 2.2: Agreement paradigm Brabantic ($n = 44$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leef-t	leef-Ø
3PL	leev-ə	leev-ə

A typical characteristic of southern Dutch varieties like Brabantic is that they use a special form of the 2PL pronoun that is complex, consisting of a 2SG base and a plural ending derived from *lui* or *lieden* ('people'). To illustrate with a particularly transparent example: in Heist op den Berg Dutch, the 2SG pronoun is *gij*, and the 2PL pronoun *gijle* (DynaSAND); the 2PL pronoun is very clearly related to the 2SG form (cf. also English *you guys*, *ya'll*, etc.). Bennis and MacLean (2006) suggest that these complex pronouns are made up of a pronominal part that has second person features, and an apposition (*lui/lieden*) that expresses plurality. Because the apposition is not part of the pronoun, these complex pronouns behave morphosyntactically like a 2SG pronoun, and therefore trigger 2SG agreement on the verb. Assuming that this is correct, the Brabantic paradigm can be fully reduced to the Hollandic Dutch paradigm; the difference is that in the Brabantic paradigm, the 2PL verb inflects as a 2SG verb, because of the form of the 2PL pronoun. However, the affixes that make up these paradigms are the same.

Another note about the Brabantic dialects and their second person pronouns is that there is some disagreement on what is agreement and what is part of the subject pronoun in these varieties. In Brabantic varieties, the verb-subject complex in VS word order typically looks like the examples in (3). The morpheme of interest here is *de*, and the question is whether this morpheme is an affix or a pronominal clitic.

(3) a. leef de gij
live 2P you.SG

b. leef de gullie
live 2P you.PL

Tilburg Dutch (DynaSAND)

The agreement analysis is assumed by for instance Zwart (1997) and Postma (2011, 2013), whereas Barbiers et al. (2016) take *de* to be a clitic. I believe the clitic analysis is correct, for several reasons. First, subject clitic doubling is very common in southern Dutch varieties, as illustrated in (4) with an example from Wambeek Dutch. In this example, *se* is the clitic double of the pronoun *zaailn*. See also Haegeman (1992), van Craenenbroeck and van Koppen (2008) and Barbiers et al. (2016) for more data and analyses. In this light, it is not surprising that Brabantic has subject clitic doubling for second person.

(4) Ik paus da **se** **zaailn** kommen.
I think that they they come
'I think that they are coming.'
Wambeek Dutch (van Craenenbroeck & van Koppen, 2008, p. 208)

The second argument is based on the observation that *de* is found as 'complementiser agreement' in some varieties, as illustrated in (5). In the next chapter of this dissertation, I argue that the complementiser agreement morpheme in several other West Germanic varieties is a pronominal clitic. Given this analysis, the fact that *de* can also be used as a complementiser agreement morpheme is compatible with interpreting it as a clitic.

(5) da-de gij eerder thuis zij als ik.
that-2P you.SG earlier home be than I
'that you will be home earlier than me.' Geldermalsen Dutch (DynaSAND)

Finally, in contrast to agreement morphemes, *de* can appear on its own; the presence of a strong pronoun like *gij* or *gullie* (cf. (3)) is optional. This is sometimes interpreted as that *de* licenses *pro*-drop (e.g. Postma, 2011, 2013). The interpretation that *de* is a clitic is simpler, however, as this way we avoid positing that the Brabantic dialects are partial *pro*-drop languages that only allow *pro*-drop in a particular word order—something that is generally not attested for 'real' *pro*-drop languages like Italian (see Koeneman and Zeijlstra, 2019 for a recent overview of properties of *pro*-drop languages). Interpreting *de* as a clitic means that the verb is uninflected in VS in these varieties, as I have treated them in the paradigm in table 2.2. This concludes the discussion of Brabantic.

The next paradigm is given in table 2.3. The varieties that make up this agreement paradigm are the Low Saxon varieties spoken in the north of the Netherlands (Groningen) and in locations that were in heavy contact with the northern varieties (around the lake IJsselmeer). I refer to the varieties that have the agreement paradigm in table 2.3 informally as Northern Dutch. The Northern Dutch paradigm is similar to the paradigm of Hollandic Dutch and Brabantic, except for the suffix used with the 2SG verb in SV word order: instead of *-t*, *-ən* is used as the 2SG suffix. This morpheme is also the plural suffix. Northern Dutch has PDA for 2SG; in VS word order, the 2SG verb shows zero inflection, just like the 1SG verb.

Table 2.3: Agreement paradigm Northern Dutch ($n = 15$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leev-ən	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ən	leev-ən
2PL	leev-ən	leev-ən
3PL	leev-ən	leev-ən

The next paradigm is given in table 2.4. This agreement paradigm is found in East Flemish varieties. It is similar to the paradigm of Brabantic, but in addition to PDA for 2SG, there is PDA for 3SG. The 3SG verb shows *-t* inflection in the SV word order, and zero inflection in the VS word order. Like the Brabantic varieties, the East Flemish varieties all have a 2PL pronoun that is composed of the 2SG pronoun plus a plural morpheme. Again, we see that the 2PL verb inflects as if it were a 2SG verb. I assume that this is because the 2PL pronoun triggers 2SG agreement on the verb.

Table 2.4: Agreement paradigm East Flemish ($n = 10$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-Ø
1PL	leev-ən	leev-ən
2PL	leef-t	leef-Ø
3PL	leev-ən	leev-ən

The final PDA paradigm is given in table 2.5. This agreement paradigm is found in the east of the Netherlands, more specifically the Dutch Low Saxon area. The paradigm is highly impoverished, as it uses only two agreement suffixes, *-t* and Ø. There is PDA for 2SG, 1PL, and 2PL. In all cases, the verb is inflected with the *-t* suffix in the SV word order, but shows no overt inflection in the VS word order.[1]

Table 2.5: Agreement paradigm Dutch Low Saxon ($n = 9$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leef-Ø
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

The geographical distribution of the paradigms is mapped out in figure 2.1, demonstrating that they show clear geographical clustering.

[1] In some of these dialects, the zero affix alternates with a schwa affix; in particular, the zero ending is generally used when the verb is followed by an element starting with a vowel, whereas the schwa ending is used in other contexts. This suggests that the variation is morphophonological, and not morphosyntactic, in nature. I will represent the morpheme as zero throughout the discussion.

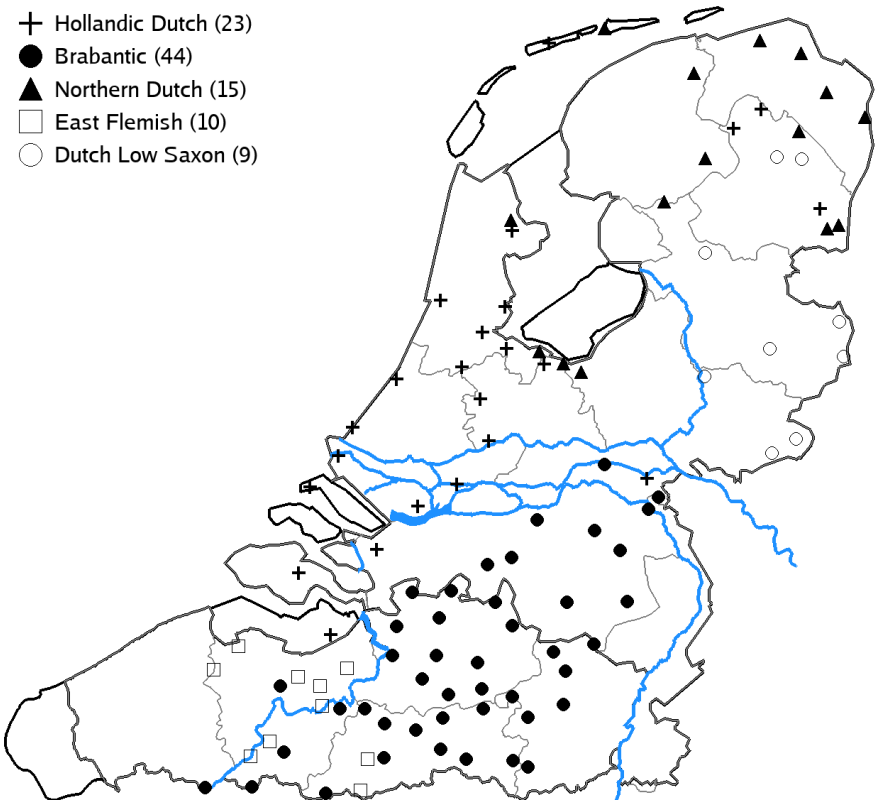


Figure 2.1: Geographical distribution of PDA paradigms

While PDA is very common and stable, it is important to point out that not every Dutch dialect has PDA. There are also dialects that have a 'full agreement' (FA) paradigm. There are three small clusters of dialects that are geographically close to the varieties with PDA, and that have similar verbal paradigms, but that do not have PDA. An example is given in table 2.6, which is found in some Hollandic dialects. In this paradigm, we expect to find PDA for 2SG, in parallel with the Hollandic PDA paradigm above. However, the 2SG verb does not show overt inflection in the SV and the VS word order at all. The absence of PDA in this paradigm is thus due to the lack of inflection on 2SG verbs. I will not discuss these types of paradigms further here, but a complete overview of FA paradigms and their geographical distribution is given in the Appendix.

Table 2.6: FA paradigm Hollandic ($n = 6$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-Ø	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

More interesting are the paradigms that do not have PDA but show a richer affix inventory than the PDA paradigms. An example of such a FA paradigm is given in table 2.7. Varieties with this paradigm are found in Groningen, Friesland, and Dutch Limburg (GFDL).[2] Note that this paradigm contains a dedicated 2SG affix (*-s(t)*), that is not found in any other paradigm. This will become relevant later on.

Table 2.7: FA paradigm GFDL ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s(t)	leef-s(t)
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leev-ə(n)
3PL	leev-ə(n)	leev-ə(n)

2.2.2 Generalisations

The different PDA paradigms and the FA paradigms do not make use of a random assembly of affixes. Instead, they show a large amount of overlap, which allows us to formulate generalisations on the affix inventory.

Descriptively, the paradigms have the following in common. First, in all paradigms, the 1SG affix is zero in both SV and VS word orders. All paradigms also share that the 3SG affix in SV word order is *-t*. Finally, with the exception of the Dutch Low Saxon dialects, all varieties have a dedicated plural affix *-ə(n)*. Considering only the PDA paradigms, we can formulate an additionial generalisation, namely that all PDA paradigms have PDA for 2SG, and that this can be extended to include 3SG (East Flemish), or 1PL and 2PL (Dutch Low Saxon).

[2]This paradigm has a low number of occurences, which is mainly due to the fact that Frisian varieties, which make up a substantial part of the FA varieties, have two verb classes for inflection of weak verbs (see e.g. Tiersma, 1985). Class I shows the inflection pattern in table 2.7, but the class II shows a different pattern. The verb 'to live' falls into the latter class, and 7 varieties show class II inflection in the data set that I use. I will nevertheless represent the inflectional pattern of the other class, as, when other verbs are considered, this makes up the most frequent FA paradigm.

Given the similarities between the agreement paradigms of these closely related varieties, it is a reasonable assumption that the affix inventories are also very similar. In fact, in the following I will demonstrate that we can construct one 'meta-affix inventory', from which each variety selects a different subset of affixes. The meta-affix inventory is mainly a theoretical construct, and resembles the notion of a diasystem (Weinreich, 1954), but potentially has roots in diachrony: it is well-known that Dutch is undergoing a process of deflection (Bennis & MacLean, 2006; Aalberse, 2009; Aalberse & Don, 2011), which could be modelled by removing an affix from the affix inventory. Possibly, variation between Dutch dialects reflects whether these varieties are more or less conservative in having undergone deflection, but further research is needed to see whether this is a viable hypothesis. Apart from this, the meta-affix inventory is a very simple way of representing the affix inventories of different varieties, and, as we will see later on in this chapter, it will serve as a useful tool in explaining PDA patterns in the different varieties and the relation to the affixes that are used in those varieties.

Before we turn to the actual affix inventory, let me be explicit about two assumptions. First, I adopt the representation of person and number in table 2.8 (Halle, 1997; Nevins, 2007; Harbour, 2016).[3] According to this representation, the feature person consists of two binary subfeatures, [Participant] and [Addressee]. First person and second person share the feature [+ Participant], while first person and third person share the feature [− Addressee]. Number is represented with the binary feature [Group].

Table 2.8: Representation of person and number

		− Group	+ Group
+ Participant	− Addressee	1SG	1PL
+ Participant	+ Addressee	2SG	2PL
− Participant	− Addressee	3SG	3PL

Furthermore, I assume that affixes are inserted according to the Superset Principle, given in (6) (cf. Caha, 2009; Starke, 2010).[4]

(6) **The Superset Principle** (Caha, 2018, p. 82)
The phonological exponent of a Vocabulary Item is inserted into a node if the item contains all (or a superset of) the grammatical features contained in the node. Insertion does not take place if the Vocabulary Item is not specified for all features contained in the node. Where several items meet the conditions for insertion, the item containing fewer features unspecified in the node must be chosen.

[3] [Participant] and [Group] are standard, but the feature [Addressee] is less so; I comment on this in section 2.4.1.

[4] The main alternative approach to insertion of vocabulary items is insertion according to the Subset Principle. I discuss this alternative, and why it does not work, in section 2.4.4.1.

According to this principle, a morpheme can only be inserted in the structure if it matches all or a superset of the features in the structure. In other words, a morpheme can be overspecified, but not underspecified. Importantly, this means that a morpheme can be specified for both the + and the − value of a binary feature. For example, an elsewhere affix that is used in a wide variety of contexts is specified for the + and − values of all features. A more specific affix is specified for a smaller number of features, and can block the use of the elsewhere affix, because the specific affix contains fewer features that are not part of the syntactic structure.

With this background in place, we can turn to identifying the items in the affix inventory of the PDA and FA paradigms discussed in the previous section. I use the subject-verb word order paradigm to motivate for which features the affixes are specified, because this corresponds to the richer agreement system. Let us start by looking at the *-t* affix, that is used with 3SG verbs in all varieties, but can be extended to all other person/number combinations except 1SG. Importantly, when a paradigm contains fewer unique affixes, the *-t* affix seems to spread to new slots in the paradigm (in line with the account of deflection I sketched above). For instance, the FA paradigm in table 2.7 has four distinct affixes, and uses *-t* for one person/number combination (3SG). Hollandic Dutch and Brabantic have three distinct affixes, and use *-t* with 3SG and 2SG. The highly impoverished paradigm of Dutch Low Saxon only has two affixes, and uses *-t* in all person/number combinations except 1SG. The expansion of the use of *-t* with each affix that is 'lost' strongly suggests that *-t* is the elsewhere morpheme, that is used when no other affix is available. I therefore assume that *-t* is specified for the full set of features and each of their possible values in table 2.8. This ensures that *-t* can be inserted everywhere, when there is no other, more specific, morpheme available. The lexical entry of *-t* is given in (7).

(7) [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -t
[+ Group] [− Group]

Based on the observation that the 1SG zero morpheme is never replaced by *-t*, I conclude that the 1SG affix is a specified morpheme (rather than the complete absence of an agreement exponent). That means that the 1SG morpheme is specified for the features that define 1SG: [+ Participant], [− Addressee], [− Group]. The lexical entry is given in (8).

(8) [+ Participant] [− Addressee] [− Group] ⟺ Ø

The affix *-ə(n)* is used as a general plural morpheme in all varieties except Dutch Low Saxon. This suggests that this affix is specified to occur in plural contexts, i.e. for the feature [+ Group]. Because *-ə(n)* can be used with all persons, it is overspecified for the person features. The lexical entry is given in (9).

(9) [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -ə(n)
[+ Group]

The Northern Dutch paradigm in table 2.3 differs slightly from the other paradigms. In this paradigm, the affix *-ən* is used with 2SG verbs in the SV word order, instead of *-t*. This can be modelled if we assume that *-ən* is the elsewhere morpheme that is maximally overspecified, and *-t* is specified to occur in third person singular contexts. The lexical entries of *-ən* and *-t* in Northern Dutch dialects are given in (10).

(10) a. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -ə(n)
[+ Group] [− Group]

b. [− Participant] [− Addressee] [− Group] ⟺ -t

The FA paradigm of the dialects spoken in Groningen, Friesland, and Dutch Limburg has an additional affix, namely *-s(t)* for 2SG. This affix is fully specified for 2SG features, corresponding to the lexical entry in (11).

(11) [+ Participant] [+ Addressee] [− Group] ⟺ -st

To summarise, the complete meta-affix inventory that Dutch dialects make use of is given in (12). Every group of dialects selects a different subset of affix from the complete affix inventory to make up the agreement paradigm in the SV word order. Hollandic Dutch, Brabantic, and East Flemish use Ø, *-ə(n)*, and *-t* as the elsewhere morpheme. Northern Dutch also uses Ø, *-ə(n)*, and *-t*, but in this variety *-ə(n)* functions as the elsewhere morpheme. The Dutch Low Saxon dialects only use Ø and *-t* as the elsewhere morpheme. The full agreement dialects spoken in Groningen, Friesland, and Dutch Limburg use all entries in (12) with *-t* as the elsewhere morpheme.

(12) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [+ Addressee] [− Group] ⟺ -st

c. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -ə(n)
[+ Group]
OR
[− Participant] [− Addressee] [− Group] ⟺ -t

d. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -t OR -ə(n)
[+ Group] [− Group]

The agreement paradigms in the VS word order can be derived, using the same affix inventories, if one or more φ-features are not used for affix insertion. In Holllandic Dutch and Brabantic, we can derive the paradigm in the VS word order by not using [Addressee] for affix insertion. The affix inventory for these varieties is given in (13). Not using the feature [Addressee] causes the Ø affix to spread from being used in a 1SG context to the 2SG context: with [Addressee] ignored, two affixes are a match to the 2SG context: Ø and *-t*. Because *-t* has a higher number of features that are not in the target structure compared to Ø, Ø will be selected. This leads to PDA for 2SG.

(13) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø
b. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] ⟺ -ə(n)
c. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

The VS agreement paradigm of Northern Dutch can also be derived when we do not use [Addressee] for affix insertion. The affix inventory of Northern Dutch is given in (14). The mechanism is the same as in Hollandic Dutch and Brabantic: if we do not use the feature [Addressee], the Ø affix matches both the 1SG and the 2SG context. The affix -ə(n) also matches the 2SG context, but Ø leaves fewer features on the affix unmatched in the context, so Ø will be selected. This causes PDA for 2SG in this variety.

(14) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø
b. [− Participant] [− Addressee] [− Group] ⟺ -t
c. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -ə(n)

In order to derive the VS agreement paradigm of East Flemish, we do not use [Participant] and [Addressee] for affix insertion. The affix inventory of East Flemish is the same as that of Hollandic Dutch and Brabantic in (13). Not using [Participant] and [Addressee] for affix insertion causes the Ø affix to spread to 2SG and 3SG as follows: the only feature we still use is [Group]. In a singular context, there are two affixes that are a match to the structure: Ø and *-t*. Because Ø is specified for fewer features than the elsewhere affix *-t*, Ø is preferred over *-t* and will be inserted in all singular contexts. This causes PDA for 2SG and 3SG.

The final paradigm is that of Dutch Low Saxon dialects. These varieties only use the two affixes in (15). The VS agreement paradigm of Dutch Low Saxon dialects follow if only [Participant] is used for affix insertion, i.e. we do not use [Addressee] and [Group]. In a [+ Participant] context, both affixes are a match to the structure. However, Ø leaves fewer features unmatched to the structure, and therefore, Ø will be inserted in all [+ Participant] contexts. This causes Ø to spread to 2SG, 1PL, and 2PL, and leads to PDA in these contexts.

(15) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø
b. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

In summary, this section showed that there is a high amount of variation in agreement paradigms in Dutch dialects. However, all major paradigms draw from the same

meta-affix inventory. Furthermore, agreement alternations between the SV and VS word order (position dependent agreement) can be derived in a uniform fashion by the pre-theoretical assumption that one or more features are not used for affix insertion, without changing the affix inventory of any of the varieties.

2.3 Towards a geometric organisation of φ-features

In the previous section, I showed there are three sets of features that need to be 'ignored' to derive the different paradigms with PDA: only [Addressee]; both [Addressee] and [Participant]; and both [Addressee] and [Group]. There is no variety that has a PDA pattern derived by removing, for instance, only [Participant] in VS word order. Assuming the affix inventory of Hollandic Dutch, Brabantic, and East Flemish in (13) (because it is the most common), not using the feature [Participant] for affix insertion in the VS word order would lead to the hypothetical paradigm in table 2.9. In this paradigm, Ø has spread to 3SG. Such a paradigm is not attested.

Table 2.9: Hypothetical agreement paradigm (no [Participant] in VS)

	SV	VS
1SG	Ø	Ø
2SG	-t	-t
3SG	-t	Ø
1PL	-ə(n)	-ə(n)
2PL	-ə(n)	-ə(n)
3PL	-ə(n)	-ə(n)

Similarly, there are no PDA paradigms that would be derived by not using [Participant] and [Group], or just [Group]. Again using the affix inventory of Hollandic, Brabantic, and East Flemish, the former would lead to the hypothetical paradigm in table 2.10. Here, Ø spreads to 3SG, and furthermore, all the singular affixes spread to their plural counterparts. This paradigm is not attested.

Table 2.10: Hypothetical agreement paradigm (no [Participant] and [Group] in VS)

	SV	VS
1SG	Ø	Ø
2SG	-t	-t
3SG	-t	Ø
1PL	-ə(n)	Ø
2PL	-ə(n)	-t
3PL	-ə(n)	Ø

The hypothetical PDA paradigm derived by not using [Group] is given in table 2.11. Here, all the plurals show PDA, because the singular affixes spread to the plural counterparts. Again, no such paradigm is attested.

Table 2.11: Hypothetical agreement paradigm (no [Group] in VS)

	SV	VS
1SG	Ø	Ø
2SG	-t	-t
3SG	-t	-t
1PL	-ə(n)	Ø
2PL	-ə(n)	-t
3PL	-ə(n)	-t

To put it differently: the analysis sketched in the previous section predicts a typology of PDA paradigms, but in the empirical data, certain types are missing. This is summarised in (16) (crossing indicates ignoring that feature for affix insertion). The question is what this tells us about the organisation of φ-features.

(16) a. ~~[Participant]~~ ~~[Addressee]~~ [Group] — not attested

b. [Participant] ~~[Addressee]~~ [Group] — attested: Hollandic Dutch, Brabantic, Northern Dutch

c. [Participant] [Addressee] ~~[Group]~~ — not attested

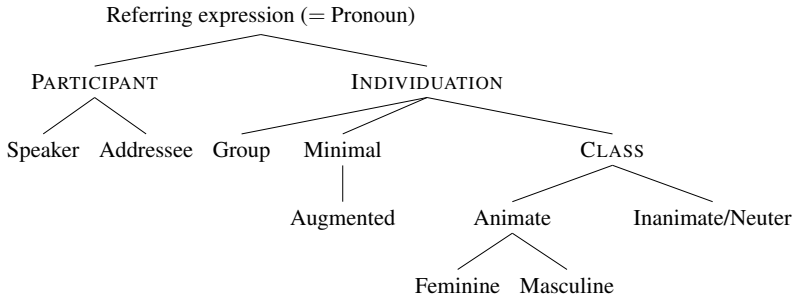
d. ~~[Participant]~~ ~~[Addressee]~~ [Group] — attested: East Flemish

e. ~~[Participant]~~ [Addressee] ~~[Group]~~ — not attested

f. [Participant] ~~[Addressee]~~ ~~[Group]~~ — attested: Dutch Low Saxon

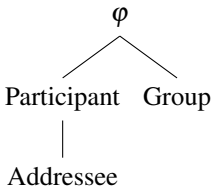
An influential proposal on φ-features is that they are organised in a feature geometry, that encodes dependency relations between features (Harley & Ritter, 2002). Based on a typological investigation of pronominal paradigms, Harley and Ritter argue that φ-features on pronouns are organised according to the geometry in (17). The geometry in (17) encodes the complete inventory of distinctions that can be made with pronouns, but specific languages only use a subset of it; which subset can be used is restricted by the way the geometry is structured. For instance, the feature [Augmented] can only be part of the feature inventory of a language if [Minimal] is also part of the feature inventory. Without going into the details, [Augmented] expresses paucal number, and [Minimal] expresses dual number. The dependency of [Augmented] on [Minimal] therefore predicts that a language can only have paucal number if it also has dual number, which appears to be the correct generalisation (Harley & Ritter, 2002; Harbour, 2014).

(17) φ-feature geometry (Harley & Ritter, 2002)



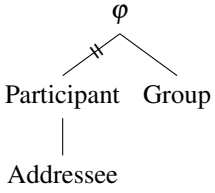
I propose that the typology of PDA patterns in (16) also follows from a geometric organisation of φ-features, in particular, the geometry in (18). I take this geometry to be a subset of the geometry in (17); the only point of divergence is that [Group] is a direct dependent of the root, instead of a dependent of the intermediate INDIVIDUATION node. In the absence of further number or gender distinctions, INDIVIDUATION is vacuous, so I assume it just does not project in that case. The geometry in (18) encodes that [Addressee] is a dependent of [Participant]. [Group] is on a separate branch, and therefore in a dependency relation to neither.

(18)



In addition, I formalise ignoring of features for affix insertion as *delinking*: the disconnecting of a feature from the geometry (cf. Harley, 1994). This results in φ-feature defectiveness of the geometry on the Probe in syntax. Because the delinked features are absent in the syntax, they will also be absent in the morphology at the points of affix insertion. Crucially, the process of delinking is restricted by the geometric organisation of φ-features; when a feature undergoes delinking, all its dependents also undergo delinking. For instance, when [Participant] undergoes delinking, [Addressee] is also delinked. This is illustrated in (19).

(19)



The feature-geometric organisation of φ-features combined with the process of delinking explains why two out of the six feature bundles in (16) are not attested, i.e. the bundles {[Addressee], [Group]} (16a), and {[Addressee]} (16e). In both of these feature bundles, [Addressee] is present, but [Participant] has undergone delinking. This is impossible given (18). The feature-geometric restriction on delinking is formalised in (20).

(20) **The feature-geometric restriction on φ-feature defectiveness:**
If a feature undergoes delinking, all its dependents undergo delinking.

In addition, the feature bundle {[Participant], [Addressee]} (16c) is not attested. This does not follow directly from the feature geometry combined with (20): [Group] is a feature without dependents, so should be able to undergo delinking on its own. However, an additional factor seems to be relevant here, namely feature complexity. Harley (1994) and Harley and Ritter (2002) assume that complexity (or markedness) of a feature is encoded by the number of nodes that are needed to represent that feature; the higher the number of nodes, the more complex the feature is. Assuming that delinking is a means to reduce complexity (see again Harley, 1994), the logical consequence is that a more complex feature delinks before a less complex feature. When we apply this metric to the features in the geometry in (18), we conclude that [Addressee] is more complex than [Participant] and [Group], because its representation requires two nodes, compared to one. This means that [Group] will only undergo delinking once [Addressee] has undergone delinking: the more complex feature delinks first. This excludes the feature bundle {[Participant], [Addressee]}, for which [Group] needs to undergo delinking when [Addressee] has not. The complexity restriction on delinking of φ-features is formulated in (21).

(21) **The complexity restriction on φ-feature defectiveness:**
Delinking targets complex features (where complexity corresponds to the number of nodes that is required for the representation of a feature). When two features are equally complex, either feature can undergo delinking.

To conclude the presentation of the data and the typology of PDA patterns, I have shown that PDA paradigms show a substantial amount of overlap, and that the attested and non-attested paradigms can be accounted for by assuming that certain features can be ignored (delinked) for the purpose of affix insertion. Furthermore, delinking is restricted by a φ-feature geometry. The φ-feature geometry that is underlying to the PDA paradigms is the same as the φ-feature geometry argued for by Harley and Ritter (2002), to the extent that they refer to the same features. This is a significant result: Harley and Ritter's geometry is based on typological variation in pronominal paradigms. The fact that the geometry based on agreement in Dutch dialects provides strong support for the existence of such a geometry in the grammar, with a rather wide-ranging impact on the organisation of the linguistic system, on a micro- and macro-variation level.

Several questions arise, too. First, what is the trigger of feature delinking? And does this happen in syntax or morphology? The answer to these questions will inform

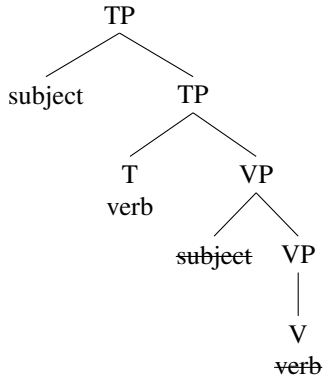
us about the place of the feature geometry in the grammar. Second, a feature geometry is generally thought to be made up of privative features, while so far, I have been using binary features. So the question is whether the same result can be achieved using privative features. This will provide insight into feature valence. These questions will be addressed in the next section.

2.4 Analysing position dependent agreement

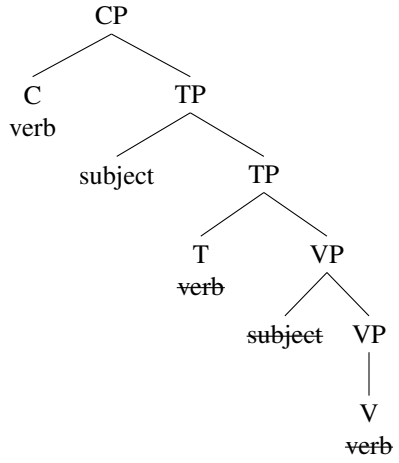
2.4.1 Prerequisites

Before discussing the questions raised in the previous section, I will lay out the prerequisites for the analysis. First, I assume that the structure of Dutch clauses with SV and VS word order is (minimally) as in (22) and (23), respectively.

(22)



(23)



An important property of these structures is that the verb is in T in the SV word order, and in C in the VS word order (Zwart, 1997). Both T and C are φ-Probes (cf. van Koppen, 2005). I assume that the verb realises the features of the head where it is spelled out. Furthermore, I propose that the Probe in C is a 'defective' Probe: a Probe that is underspecified for certain φ-features, and therefore cannot be valued for these features. Because the Probes in T and C have different sets of features, the realisation of agreement in SV and VS word order can differ, leading to PDA.

Because there are potentially two sources of φ-features in the structure, something needs to be said about the φ-features of the head where the verb is not spelled out. I assume that when the verb is in T in the SV word order, the structure only projects up to TP, so there are no φ-features in C that need to be spelled out (cf. van Koppen, 2005, p. 78). In the VS word order, matters are a bit more complex. To arrive the VS word order, the verb moves from T to C. One might therefore ask whether the φ-features on T are not also present on C because of T-to-C movement, and if so,

whether this affects agreement. There are several ways to approach these questions. First, we can assume that head movement takes place before Agree, so that the φ-features on T are unvalued when T moves to C. Because T cannot Probe out of C (it is too deeply embedded), these unvalued φ-features do not play a role in agreement. A second approach is that there is competition between the sets of φ-features of T and C at the point of affix insertion. This is the approach assumed by van Koppen (2005). According to her metric, a more specific affix will win from less specific or elsewhere affix. The previous two sections show that with all examples of PDA, an elsewhere or little specific morpheme in the SV word order is replaced by a more specific morpheme in the VS word order. This approach would therefore also lead to the observed outcome. Because we cannot distinguish between these two approaches based on the available data, I leave a further exploration of this issue for future work, and conclude that when T moves to C, the features of C are realised as agreement.

The second component of the proposal is that features are privative in syntax, and that they are translated to binary features in the course of transfer of the syntactic structure to morphology. The binary features in morphology are used for affix insertion. An immediate question that this proposal raises is how features are translated from their privative syntactic representation to a binary morphological representation. I assume that a valued privative feature [*i*F] in syntax translate to a [+ F] feature in morphology, while an unvalued privative syntactic feature [*u*F] translates to a [− F] morphological feature. Given the feature geometry argued for in the previous section, I assume a privative, syntactic representation of person as in (24). The SG/PL distinction is encoded by presence or absence of GROUP on a separate branch, as in (25).

(24) Syntactic representation of person

a. 1P

b. 2P

c. 3P

(25) Syntactic representation of number

a. SG

b. PL

To illustrate the translation process, assume a Probe has all three features [Participant], [Addressee], and [Group], i.e. a fully specified, non-defective Probe. If this Probe agrees with a 1SG pronoun, its [Participant] feature will be valued; the other features remain unvalued. When the features are transferred to morphology, a + value will be assigned to the valued [Participant] feature, giving as output [+ Participant], and a − value to the unvalued features, giving as output [− Addressee] and [− Group].

This is the binary, morphological feature representation for a 1SG. The full set of person/number combinations and their syntactic and morphological representations are given in table 2.12; note that 3SG is not specified for any feature in syntax (except the root node φ, cf. (24) and (25)). The valued/unvalued distinction in syntax maps perfectly onto the +/− distinction in morphology.

Table 2.12: Representation of φ-features in syntax and morphology

Category	Syntactic representation	Morphological representation
1SG	[PART]	[+ Participant] [− Addressee] [− Group]
2SG	[PART] [ADDR]	[+ Participant] [+ Addressee] [− Group]
3SG		[− Participant] [− Addressee] [− Group]
1PL	[PART] [GROUP]	[+ Participant] [− Addressee] [+ Group]
2PL	[PART] [ADDR] [GROUP]	[+ Participant] [+ Addressee] [+ Group]
3PL	[GROUP]	[− Participant] [− Addressee] [+ Group]

This approach is very simple, and it comes with an additional benefit: the binary feature representation that it results in allows us to capture a peculiar property of Germanic languages, i.e. the fact that they tend to show 1P/3P syncretisms (Frampton, 2002). For the Dutch modal *kunnen* ('can, to be able to'), for instance, a special form is available for 2SG but not for 1SG or 3SG (26). Another example is that in some Dutch dialects as well as German, the 1PL shows inflection identical to 3PL to the exclusion of 2PL, illustrated for Limburgian in (27). These data are compatible with the morphological feature representation in table 2.12, as they are easily captured by making reference to [± Addressee]. Approaches that do not assume the existence of [± Addressee] cannot straightforwardly account for 1P/3P syncretisms, on the other hand.[5]

(26) a. Ik kan / *kun
I can / can

b. Jij kan / kun-t
you can / can-AGR

c. Hij kan / *kun-t
he can / can-AGR
Standard Dutch

(27) a. Ver geluiv-ə
we believe-PL

b. Ger geluif-t
you.PL believe-2PL

c. Zie geluiv-ə
they believe-PL
Limburgian

Given the translation mechanism of valued and unvalued privative features to binary features in morphology, what does it mean to be a defective Probe? A defective Probe is a Probe that is underspecified for one or more φ-features. In other words, one or more features are completely absent from the Probe, and if the Goal has a valued version of one of those features, it cannot be copied to the Probe. For instance, when the Probe has an unvalued [Participant] feature, but the Goal has [Participant] and [Group] (= 1PL), the [Participant] feature on the Probe will be valued, but nothing

[5]Note furthermore that the syncretism of 1P and 3P cannot be accounted for using privative features, because there is no feature that is shared between 1P and 3P to the exclusion of 2P.

will happen to [Group]. When the features on the Probe are fed into morphology, morphology will assign a + value to [Participant]; but since it is not fed a [Group] feature, it will not create a representation of [Group] (neither + nor −). Because we now use a partial set of features to find a matching affix, this can affect which affix is selected to be used with the defective Probe. Since C is a defective Probe, but not T, and since verb is realised in T in SV word order but in C in VS word order, the outcome can be a PDA paradigm. In this implementation, the defective Probe approach formalises the pre-theoretical analysis of PDA paradigms sketched in section 2.2.2.

2.4.2 Deriving position dependent agreement

Having established how the analysis can be formalised, I will now go over each of the PDA patterns to illustrate how they are derived.

I start with the PDA paradigms of Hollandic Dutch, Brabantic, and Northern Dutch, repeated below in tables 2.13, 2.14, and 2.15. These paradigms have PDA for 2SG. The 2PL PDA pattern in Brabantic is due to the 2PL pronoun behaving like a 2SG pronoun for the purposes of agreement, so is already accounted for.

Table 2.13: Agreement paradigm Hollandic Dutch ($n = 23$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

Table 2.14: Agreement paradigm Brabantic ($n = 44$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leef-t	leef-Ø
3PL	leev-ə	leev-ə

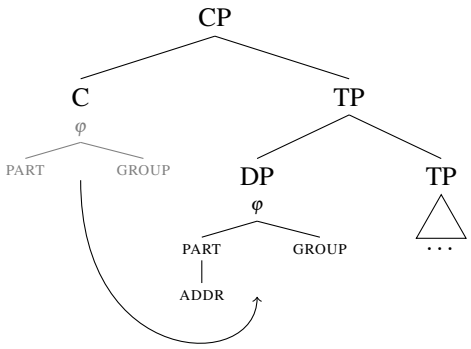
Table 2.15: Agreement paradigm Northern Dutch ($n = 15$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leev-en	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ən	leev-ən
2PL	leev-ən	leev-ən
3PL	leev-ən	leev-ən

I propose that the C Probe in Hollandic Dutch, Brabantic, and Northern Dutch, is defective for [Addressee]. This means that the C Probe does not have an unvalued version of [Addressee], and that it therefore cannot copy valued [Addressee] from the Goal, even if the Goal has that feature. This is represented in (28), where the grey (partial) feature geometry represents the unvalued features on the Probe in C, and the

black feature geometry represents the features of the subject (in this case, 2PL, because this feature bundle uses the maximal feature geometry). The arrow indicates the Agree relation between the Probe and the Goal.

(28)



When the C Probe, that is defective for [Addressee], enters an Agree relation with a second person Goal, only a subset of the Goal's features will be copied to the Probe: [Participant], and if the Goal is plural, [Group]. When the structure undergoes transfer to morphology, only the features [Participant] and [Group] will be morphologically represented in binary features. For instance, if Agree takes place with a 2SG Goal, the morphological representation would be [+ Participant] and [− Group]. Based on the morphological representation, the affix inventory is scanned to find a matching affix. The affix inventories of Hollandic Dutch and Brabantic are repeated in (29). The best match to [+ Participant] and [− Group] is Ø; *-t* also matches, but contains more features not represented in the structure, so Ø will be selected and spelled out on the verb if the verb is in C. The T head is not a defective Probe. When T Agrees with a 2SG subject, all the features of the subject are copied to T, and the resulting representation at morphology is [+ Participant], [+Addressee] and [− Group]. The affix that matches this feature representation is *-t*, which will be inserted when the verb is in T. Because a different affix is used in C and T with a 2SG subject, this results in the PDA paradigm of Hollandic Dutch and Brabantic.

(29) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] ⟺ -ə(n)

c. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

Northern Dutch has a slightly different affix inventory from Hollandic Dutch and Brabantic, repeated in (30), but the effect of the defective C Probe is very similar. Consider again what happens when the defective Probe C Agrees with a 2SG subject. Only

[Participant], but not [Addressee], are copied to the Probe; [Group] remains unvalued. The corresponding morphological representation is [+ Participant], [− Group]. The affix that is the best match to this set of features is Ø, which will be inserted when the verb is in C. T is not a defective Probe. When T Agrees with a 2SG subject, the affix that will be inserted is *-ə(n)*. In short, the defective Probe in C causes the insertion of a different affix than in T when there is Agree with a 2SG subject, leading to PDA.

(30) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø
b. [− Participant] [− Addressee] [− Group] ⟺ -t
c. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -ə(n)
[+ Group] [− Group]

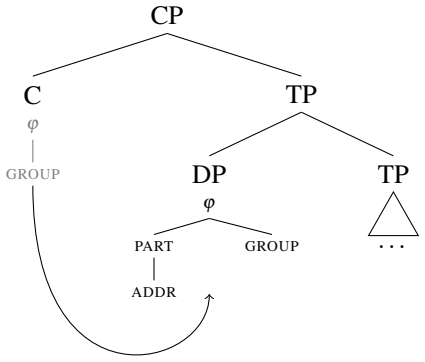
The next paradigm is from East Flemish, repeated in table 2.16. East Flemish has PDA for 2SG and 3SG (PDA for 2PL is the result of the 2PL pronoun behaving as a singular pronoun, see above).

Table 2.16: Agreement paradigm East Flemish ($n = 10$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-Ø
1PL	leev-ən	leev-ən
2PL	leef-t	leef-Ø
3PL	leev-ən	leev-ən

To account for the paradigm of East Flemish, I propose that the C Probe is defective for [Addressee] and [Participant]. In other words: C does not have these features and therefore cannot copy the value of these features from a Goal. The C Probe of East Flemish is represented in (31).

(31)



The affix inventory of East Flemish is identical to the affix inventory of Hollandic and Brabantic in (29) above. When the complete φ-Probe T Agrees with a Goal, it can copy all the features of the Goal to the Probe; at morphology, all features are assigned a binary representation, and the matching affix is inserted. This leads to the SV paradigm. The C Probe, on the other hand, can only copy [Group] from the subject; [Participant] and [Addressee] on the subject are not copied. At morphology, only [Group] will be assigned a binary representation, and therefore, only this feature will be used for affix insertion: [− Group] for singular subjects, [+ Group] for plural subjects. This means that for all the singulars, Ø will be used, as it is a better match for [− Group] than the elsewhere affix *-t*. For the plurals, *-ə(n)* is used. Because for the 2SG and the 3SG, the affix inserted in C is different from the affix inserted in T, there is PDA for these two person/number combinations in East Flemish.

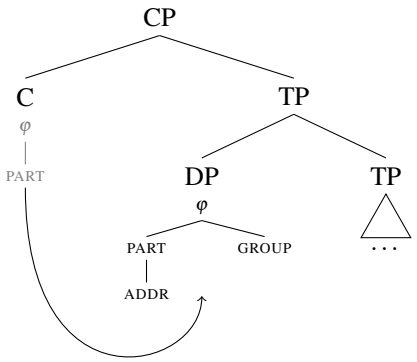
The final PDA paradigm is that of Dutch Low Saxon, repeated in table 2.17. This paradigm has PDA for 2SG, 1PL, and 2PL.

Table 2.17: Agreement paradigm Dutch Low Saxon ($n = 9$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leef-Ø
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

To derive the Dutch Low Saxon paradigm, I propose that the C Probe is defective for [Addressee] and [Group], represented in (32). C can only copy [Participant] from the subject. The affix inventory of Dutch Low saxon is given in (33). When T Agrees with the subject, it can copy all the features of the subject, leading to a complete representation at morphology which is used for affix insertion. As a result, Ø is used with a 1SG subject, and *-t* with the other subjects. C can only be valued for [Participant], and therefore, morphology will only posit a representation for [Participant]. All first persons and second persons are [+ Participant]. The affix that is the best match to [+ Participant] is Ø, which will therefore the used with first and second person subjects in VS word order. [− Participant] only matches *-t*, and this affix will be used with third person subjects. Because C is a defective Probe, the affix used in the VS word order is different from the affix used in the SV word order for 2SG, 1PL, and 2PL subjects, resulting in the PDA paradigm of Dutch Low Saxon varieties.

(32)



(33) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] ⟺ -t
[+ Group] [− Group]

In the next two section, I will return to the questions that were raised in section 2.3. I will first discuss the locus of Probe defectiveness; I will show that the evidence points to it being syntactic. Then, I will consider the question of feature valence: can the same result be achieved with a uniform representation of φ-features across grammatical modules? I argue that this is not the case, and that both the privative and the binary representation are necessary.

2.4.3 Locus of delinking

From previous discussions of PDA, roughly two views emerge on where its source is located in the grammar. The first, put forward by Ackema and Neeleman (2003) and Don et al. (2013), is that PDA is the result of a deletion operation (such as impoverishment) in morphology. The second approach is that PDA is the result of the verb being realised in different structural positions, which correlates with a different form, placing the source of PDA in the syntax; different variants of this approach are argued for by Zwart (1993, 1997), van Koppen (2005), Bennis and MacLean (2006) and Postma (2011, 2013). My proposal that PDA is the result of a defective Probe in C falls under the latter approach. In this section, I motivate that PDA is indeed syntactic.

The first argument comes from the distribution of verbs that show PDA. As we have seen, only verbs that precede the subject show PDA. Verbs following the subject, either as V2 in main clauses or verb final in embedded clauses, always show full inflection (cf. Don et al., 2013 for Dutch, and Bjorkman and Zeijlstra, 2019 for a cross-linguistic perspective on this matter). This restriction is not predicted by a morphological approach to PDA, as there is no obvious reason that only verbs that are followed by a subject undergo impoverishment (though see Ackema and Neeleman,

2003 for a proposal why this should be the case; I discuss their proposal in section 2.7.1).

The syntactic approach can explain this generalisation. There are several ways to implement this. First, we can look at the heads that contain the φ-Probes: T and C. It is generally acknowledged that there is a close connection between nominative case assignment and agreement with T, and this has led Chomsky (2001) to propose that a finite-clause T Probe cannot be defective; a defective T-probe would fail to assign nominative case, resulting in e.g. a raising construction. This explains why a verb preceded by a subject, or a clause-final embedded verb, cannot show partial agreement: these verbs spell-out T agreement. C agreement, in contrast, does not seem to have any syntactic function (at least in West Germanic languages), and it has even been referred to as 'ornamental' (Fuß, 2014), explaining why it can be partial.

Another approach is to look at the Agree relation itself. Bjorkman and Zeijlstra (2019) argue that Agree takes place primarily in an upward fashion; only if upward Agree fails, can the Probe Agree downwards. Agree between T and the subject can be upwards, because the subject is in Spec,TP. But Agree between C and the subject has to take place downwards, because the subject never moves to a position above C (recall that in SV word orders, the CP does not project). It is conceivable that C's consistent, secondary, downward Agree relation results in loss of the features that trigger the Agree relation in the first place. In summary, the syntactic approach to PDA provides several ways to account for the observation that only verbs preceding the subject show partial agreement.

The final argument to place the locus of PDA in syntax is that morphological approaches make incorrect empirical predictions on the behaviour of PDA. An important prediction for morphological approaches to morpheme alternations is that the alternation takes place based on linear adjacency: PF operates on linearised structure, and can therefore only use this structure for alternations (cf. Ackema and Neeleman, 2004, and Weisser, 2019; van Alem, 2020 for recent discussion). This means that according to morphological approaches to PDA, there is no partial agreement when the linear adjacency between the verb and the subject is disrupted; the syntactic approach predicts the opposite, as according to this approach, it is the structural position of the verb that matters, and that is not affected by disrupting the linear adjacency between the verb and the subject. It turns out that when an element intervenes between the verb and the subject, the verb still shows partial agreement, as illustrated in (34). These data form an argument against morphological approaches to PDA.

(34) a. Jij **gaa-t** dit een leuk spelletje vinden.
you go-AGR this a nice game find
'You are going to like this game.'

b. Volgens mij **ga-Ø** jij dit een leuk spelletje vinden.
according-to me go-Ø you this a nice game find
'I think that you will like this game.'

c. Volgens mij **ga-Ø** zelfs jij dit een leuk spelletje vinden.
according-to me go-Ø even you this a nice game find
'I think that even you will like this game.' Dutch

Ackema and Neeleman (2003), however, propose that impoverishment does not apply under adjacency, but within a prosodic domain; as long as two elements (here the verb and the subject) are in the same prosodic domain, intervening elements (such as focus particles) do not block the application of impoverishment. A prosodic domain is defined by referring to syntactic phrases; more specifically, in a predominantly head-initial languages like Dutch dialects, the right edge of a syntactic phrase aligns with the right edge of a prosodic phrase. So, in a structure where the verb is in C, and the subject in Spec,TP, the verb and the subject will be in the same prosodic domain, because there is no 'intervening' syntactic phrase boundary; rather, the right edge of the subject DP constitutes the right edge of a syntactic phrase, and therefore also of the prosodic phrase.[6] Focus particles that can intervene between the verb and the subject are generally assumed to modify the subject; because they do not project their own syntactic phrase, they do not introduce a prosodic phrase boundary either. The prediction is therefore that a focus particle can intervene between a verb and a subject without blocking the application of impoverishment resulting in PDA, which is borne out given (34c).

Ackema and Neeleman further support their approach to PDA with sentences where not just a focus particle, but a whole phrase intervenes between the verb and the subject. Because the right edge of a syntactic phrase corresponds to the right edge of a prosodic domain, a phrase that intervenes between the verb and the subject causes the verb and the subject to be in different prosodic domains. The prediction for these sentences is therefore that impoverishment cannot apply, and that the verb shows full agreement. According to Ackema and Neeleman's judgement, this prediction is borne out, as they find (35a) 'not perfect' but better than the variant with partial agreement on the verb (35b).

(35) a. ? Volgens mij **gaa-t** op de heetste dag van 't jaar zelfs jij naar
according-to me go-AGR on the hottest day of the year even you to
het park.
the park
'According to me, even you go on the hottest day of the year to the park.'

b. * Volgens mij **ga-Ø** op de heetste dag van 't jaar zelfs jij naar
according-to me go-Ø on the hottest day of the year even you to
het park.
the park
'According to me, even you go on the hottest day of the year to the park.' Dutch (Ackema & Neeleman, 2003, pp. 695–6)

This judgement is contested, however: according to Zonneveld (2007), similar sentences with intervention of both an adverb and a focus particle between the verb and

[6] According to Ackema and Neeleman, this is also the reason that there can only be partial agreement on the verb when the verb precedes the subject; verbs that follow a subject are in a different prosodic domain, because the subject always introduces a prosodic phrase boundary, the application of impoverishment is therefore blocked.

the subject (such as (36)) are grammatical only with partial agreement on the verb. Zonneveld suggests that the agreement on (35) is hard to judge, because the distance between the verb and the subject is unnaturally long, and because there is an interfering phonological factor: partial agreement on the verb in (35) leads to hiatus (/ɣa-ɔp/). These factors potentially contribute of ungrammaticality for (35). Since (36) does not have hiatus, and should be easier to parse because of the shorter distance between the verb and the subject, this example is a more accurate reflection of the grammar.

(36) Volgens mij **ga-Ø** vanavond zelfs jij naar het park.
according-to me go-Ø tonight even you to the park
'According to me, even you will go to the park tonight.
Dutch (Zonneveld, 2007, p. 744)

Taking Zonneveld's criticism and judgements to be valid, (36) shows that the morphological account to PDA makes the incorrect prediction that agreement should be full under intervention, even under Ackema and Neeleman (2003)'s adjustment, as the verb and the pronoun are not in the same prosodic domain. A syntactic approach to PDA can account for the agreement pattern under intervention, since syntactic agreement is unaffected by linear distance. Since the syntactic approach to PDA fares better than the morphological approach, I conclude that the former is correct.

2.4.4 Feature valence

What we have seen so far is that the typology of PDA paradigms in Dutch dialects is restricted by a φ-feature geometry made up of privative φ-features. Furthermore, the source of PDA is in the syntax, which implies that in syntax, φ-features are privative. However, I have been using binary features for affix insertion, which I assumed to take place in morphology. In this section, I consider whether the same results can be achieved under the simpler assumption that the representation of φ-features is uniform across modules. I first consider if φ-features can be privative in morphology too. Then, I evaluate a uniform binary representation of features in syntax and morphology. The outcome will be that neither of these approaches captures the full set of observations regarding PDA. Instead, I argue that we need both representations: φ-features are privative in syntax, and binary in morphology.

2.4.4.1 Privative features

Let us first consider the option of having privative φ-features in morphology. The first argument against privative features in morphology is that this would require a substantial amount of homonymy to capture regular syncretisms, which is conceptually undesirable. Furthermore, I will show that the analysis of PDA based on privative morphological φ-features makes a prediction that is not borne out empirically.

Before we get into the arguments, it is important to point out that I will evaluate privative features in morphology using the Subset Principle for affix insertion, rather than the Superset Principle that I have adopted in this thesis. According to the Subset Principle, affixes are inserted when their lexical specification matches a *subset* of the

syntactic context, rather than a superset (Harley & Noyer, 1999). In such an approach, overspecification of lexical entries is not allowed; instead, lexical entries are underspecified compared to the syntactic context. Let me illustrate insertion according to the Subset Principle with the paradigm of Hollandic Dutch (table 2.18).[7] Instead of the overspecified lexical entries that we have seen before, the Subset Principle allows lexical items to be underspecified, as in (37).

Table 2.18: Agreement paradigm Hollandic Dutch ($n = 23$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

(37)
[+ Participant] [− Addressee] [− Group]	⟺ Ø
[+ Group]	⟺ -ə
Elsewhere	⟺ -t

In this affix inventory, Ø is fully specified for the 1SG context, so nothing changes here. However, the specifications for *-ə* and *-t* are different. These morphemes are now specified for fewer or no features. The insertion mechanism, based on the Subset Principle, works as follows: *-ə* will be inserted in all contexts that have the feature [+ Group] (in addition to other features), that is, all plurals. The suffix does not match all features in the context, but that is no problem, because underspecification of the suffix is allowed. The suffix *-ə* will therefore be inserted with all plurals. The elsewhere suffix *-t* will be inserted in the left-over contexts: 2SG and 3SG.

The reason I use the Subset Principle in this section is twofold. First, insertion according to the Superset Principle does not work for the PDA paradigms with privative φ-features. The paradigms I am considering have a clear elsewhere morpheme (usually *-t*, sometimes *-ə(n)*) that can spread to new contexts. The elsewhere morpheme is specified for the complete set of possible features, i.e. the plus and minus variants of each feature. A highly specific inflectional suffix, on the other hand, is specified for the plus *or* minus variant of each feature. In other words: a more general suffix is specified for more features. In a privative system, this does not work. The reason is as follows. The elsewhere suffix is specified for the complete set of possible features. In the privative system of φ-features, the maximal specification is [Participant], [Addressee] and [Group]. Now imagine a paradigm in which the elsewhere suffix is different from the suffix used with 2PL. Because the specification for 2PL is also [Participant], [Addressee] and [Group], the affix used in this context needs

[7] I am using binary features in this illustration because using privative features here is not very straightforward, as I will elaborate on below.

to be specified for these features too. As a result, there are two morphemes with an identical features specification: the elsewhere suffix and the more specific 2PL suffix. Because the suffixes are equally specified, the insertion algorithm cannot determine which morpheme to insert. Since there are many examples of PDA paradigms where the 2PL suffix is not the elsewhere suffix (such as Hollandic Dutch above), overspecification of morphemes and insertion according to the Superset Principle is not a feasible approach to affix insertion using privative features.

The second reason that I adopt the Subset Principle to evaluate privative morphological φ-features is that a morphological approach to PDA using privative features and the Subset Principle has been proposed by Ackema and Neeleman (2003). This is useful, because it allows me to evaluate their actual assumptions and proposals, rather than this just being a theoretical exercise. I will also discuss Ackema and Neeleman's proposal in section 2.7.1.

We can now turn to the evaluation of privative features in morphology. Again, let us take the PDA paradigm of Hollandic Dutch as the starting point. The affix inventory of Hollandic Dutch, using privative features, is given in (38). In this affix inventory, every affix is represented only once, with instructions on where it should be inserted ([Participant] is the privative representation of first person, [Group] is the privative representation of plural).

(38)
	[Participant]	⟺ Ø
	[Group]	⟺ -ə
	Elsewhere	⟺ -t

However, because we use the Subset Principle for insertion, this affix inventory makes some incorrect predictions. For instance, while [Participant] matches the syntactic representation of 1SG, it is also a subset of the representation of 2SG. For this reason, Ø should be used with 2SG as well as with 1SG, but this is not correct: in the SV word order, the elsewhere morpheme *-t* is used in the 2SG context.[8]

In order to resolve this problem, an additional morpheme is required, that is specified for 2SG and that is homonymous with the elsewhere morpheme (cf. Ackema and Neeleman, 2003). The updated affix inventory is given in (39). This affix inventory ensures that *-t* is inserted with 2SG.

(39)
	[Participant]	⟺ Ø
	[Participant] [Addressee]	⟺ -t
	[Group]	⟺ -ə
	Elsewhere	⟺ -t

According to the analysis of PDA in terms of defective Probes, the C Probe is defective, which can lead to the insertion of a different morpheme. The proposal for Hollandic Dutch is that C cannot copy the feature [Addressee]. We can maintain this

[8]The other problem is that the feature specifications of both Ø and -ə are subsets of the representations of 1PL ([Participant] [Group]) and 2PL ([Participant] [Addressee] [Group]). In order to resolve this, an additional assumption about competition between affixes is needed. I will not go into this issue in more detail.

proposal here: if C does not copy the feature [Addressee] of a 2SG subject, the features in C are compatible with the specification of Ø. This leads to PDA. However, deriving the PDA paradigm using privative features comes at a cost: instead of an affix inventory consisting of three morphemes as in (38), we have to assume an affix inventory that contains four morphemes, two of which are homonymous.

While one instance of homonymy might not be hugely problematic, homonymy of this kind is needed in all PDA paradigms. This raises suspicion, in particular from the perspective of deflection: instead of losing affixes, which is descriptively the simplest way to capture the overlap between the different paradigms we find in varieties of Dutch, we would need to assume that an affix changes into the form identical to the elsewhere morpheme on a structural basis. This seems an unlikely development. In addition, in other paradigms, homonymy gets quite extreme. For instance, in the paradigm of Dutch Low Saxon (repeated in table 2.19), the affix inventory using binary features requires only the two entries given in (40).

Table 2.19: Agreement paradigm Dutch Low Saxon ($n = 9$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leef-Ø
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

(40) a. [+ Participant] [− Addressee] [− Group] $\Longleftrightarrow$ Ø

b. [+ Participant] [− Participant]
[+ Addressee] [− Addressee] $\Longleftrightarrow$ -t
[+ Group] [− Group]

To derive the Dutch Low Saxon paradigm using privative features, we would need two extra entries in the affix inventory, that are both homonymous with the elsewhere morpheme *-t*, as in (41). The reason is similar to the problem we ran into with Hollandic Dutch. If we assume only two affixes (Ø, specified as [Participant], and *-t* as the elsewhere morpheme), the SV paradigm cannot be derived: because of the Subset Principle, Ø will match all syntactic contexts that have a [Participant] feature, i.e. the first persons and the second persons. To prevent that Ø is inserted with 2SG, we need a specific 2SG morpheme; and to prevent that Ø is inserted with first and second person plural, we need a specific plural morpheme. This leads to the affix inventory in (41), which has double the amount of morphemes as the affix inventory based on binary features, where three out of four are homonymous.

(41) [Participant] $\Longleftrightarrow$ Ø
[Participant][Addressee] $\Longleftrightarrow$ -t
[Group] $\Longleftrightarrow$ -t
Elsewhere $\Longleftrightarrow$ -t

In order to derive the PDA paradigms using privative features, a systematic and substantial amount of homonymy is required in the affix inventory. Although homonymy is likely to exist incidentally, the scale on which it is needed is not compatible with the frequency and robustness of PDA in the Dutch language area. Furthermore, it is not clear that an affix inventory with a lot of homonymy is learnable.

Apart from the conceptual issues, there is an empirical issue with homonymy too. That is, we never find PDA in the cells of a paradigm for which there is a unique affix in the affix inventory. To see this, consider again the FA paradigm in table 2.7, repeated on the next page as table 2.20. This paradigm distinguishes itself from all other paradigms in that it has a unique 2SG suffix. This is typical for FA paradigms. Not a single variety with PDA, on the other hand, has a unique 2SG affix. This is illustrated geographically in figure 2.2: while PDA is very common in the Dutch language area, none of the varieties with a unique 2SG suffix has PDA.[9]

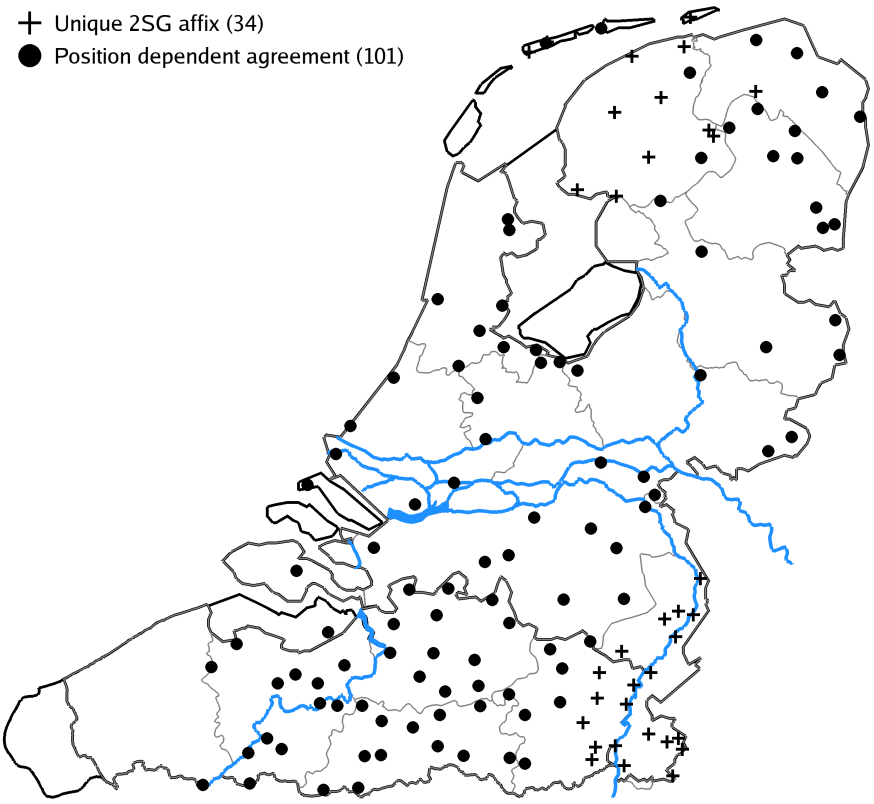


Figure 2.2: Geographical distribution unique 2SG affix and PDA

[9] See Postma (2011, 2013) for a closely related anti-correlation on PDA and the form of the 2SG pronoun.

Table 2.20: Agreement paradigm GFDL ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s(t)	leef-s(t)
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leev-ə(n)
3PL	leev-ə(n)	leev-ə(n)

The problem for the analysis of PDA based on privative φ-features is that it predicts the exact opposite: in the discussion on homonymy, I showed that we are forced to assume that cells with PDA correspond to a unique affix, in order to derive the paradigm. If this is correct, then PDA should abound when a paradigm cell corresponds to a unique morpheme. The data in figure 2.2 show the opposite. This is a strong indication that features are not privative in morphology. The binary approach to φ-features does not run into issues with homonymy and the corresponding empirical problem.

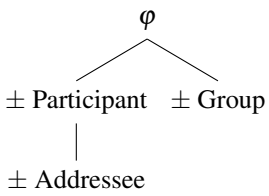
In conclusion, privative features in morphology lead to conceptual issues with homonymy and deflection, and make demonstrably incorrect predictions on where we find PDA in the paradigm. I conclude that features cannot be privative in morphology, but have to be binary.

2.4.4.2 Binary features

Having considered the option that features are privative in both syntax and morphology, let us now consider whether features can be binary in syntax and morphology.

If we adopt the (non-standard) assumption that binary features can be organised in a feature-geometry, most of the data on PDA can be accounted for. The binary feature geometry is given in (42). This geometry encodes the same dependency relations between features as the privative feature geometry that we have seen before. We can therefore maintain the analysis of PDA based on defective Probes, where defectiveness is restricted by the geometry.

(42)



However, in the PDA data, there is an additional generalisation that shows that the two values of a feature are not equal. This can be best accounted for with a privative approach to features, that inherently encodes that the two values of a feature are unequal, by making the distinction based on presence and absence.

In section 2.2.2, I showed that the different FA and PDA paradigms show a large amount of overlap. Based on this observation, I argued that these paradigms all make use of different subsets of the same meta-affix inventory. What I will show here, is that there is also a connection between the affix inventory of each variety, and the PDA paradigm of that variety. More specifically, I will show that in a given variety, a Probe is defective for a feature if the + value of that feature is not contrastive in the affix inventory.

Let me illustrate the connection based on the comparison between the FA paradigm found in Groningen, Friesland, and Dutch Limburg, repeated in table 2.21, and the PDA paradigm of Hollandic Dutch, repeated in table 2.22.

Table 2.21: Agreement paradigm GFDL ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s(t)	leef-s(t)
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leev-ə(n)
3PL	leev-ə(n)	leev-ə(n)

Table 2.22: Agreement paradigm Hollandic Dutch ($n = 23$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

The affix inventory of the FA paradigm is given in (43). What is of interest are the features that are contrastive, by which I mean that only one of the two values of that feature are referred to in the lexical representation of the affix. For example: in the representation of the elsewhere morpheme *-t*, none of the features are contrastive, because both values of every feature are part of the lexical representation of the affix. In contrast, in the representation of Ø and *-st*, all features are contrastive, because the lexical representation of the affix contains only one value of every feature. Finally, for the affix *-e(n)*, only the feature [Group] is contrastive.

(43) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [+ Addressee] [− Group] ⟺ -st

c. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] ⟺ -ə(n)

d. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

Let us now compare this to the affix inventory of Hollandic Dutch, repeated in (44). This affix inventory is the same as the affix inventory in (43), except for the absence of *-st*. The morpheme *-st* is the only morpheme where the lexical representation contains [+ Addressee] as a contrastive feature. The crucial observation is that with this contrastive feature missing in the affix inventory of Hollandic Dutch, the C Probe of

Hollandic Dutch also does not contain [Addressee], i.e. it is defective for [Addressee]. In contrast, the C Probe of Groningen, Friesland, and Dutch Limburg Dutch is not defective, i.e. can Probe for all features.

(44) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] ⟺ -ə(n)

c. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

The connection also holds when we compare Hollandic Dutch to the Dutch Low Saxon varieties. The PDA paradigm of Dutch Low Saxon is repeated in table 2.23, and the affix inventory in (45).

Table 2.23: Agreement paradigm Dutch Low Saxon ($n = 9$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leef-Ø
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

(45) a. [+ Participant] [− Addressee] [− Group] ⟺ Ø

b. [+ Participant] [− Participant] [+ Addressee] [− Addressee] [+ Group] [− Group] ⟺ -t

Comparing the affix inventory of Dutch Low Saxon to Hollandic Dutch, we see that the *-e(n)* suffix is now absent. What is also absent, is contrastive reference to the + value of [Group]. So in the affix inventory of Dutch Low Saxon, the + values of both [Addressee] and [Group] are not contrastive. And in fact, the C Probe of Dutch Low Saxon is defective for both [Addressee] and [Group].

What this comparison between affix inventories shows is that there is a correspondence between having a contrastive + value of a feature in the affix inventory, and that feature being present on the C Probe. Crucially, it is the + value of a feature that needs to be contrastive in the affix inventory; a contrastive − value is not enough. For instance, in both Hollandic Dutch and Dutch Low Saxon, the Ø morpheme has contrastive − values of [Addressee] and [Group], but this is not enough for those features to be present on the C Probe. This shows that there is an inherent inequality between the + and − values of a feature.

An inequality of this type is not compatible with a binary feature representation, according to which the two values of a feature are equal. However, it is exactly what is encoded with a privative representation of features, because such a representation makes use of presence and absence. What is more, I assumed that presence of a feature in the privative feature representation is mapped to a + value in the binary representation. It is therefore to be expected that any relation between the two is between presence and the + value, because you cannot refer to an absent feature in the privative representation. In the previous section, I demonstrated that in morphology, features have to be binary. This section shows that the privative representation is also needed for a full understanding of position dependent agreement, and I take the privative representation to be the syntactic representation of φ-features. This has the important implication that the representation of φ-features is not the same across grammatical modules: φ-features are privative features in syntax, which affects the outcome of Agree; but they are binary in morphology, at the point of spell out.

2.5 Φ-features in syntax and morphology: a cross-linguistic perspective

The conclusion from the previous section that φ-features are privative, and geometrically organised, in syntax, but binary in morphology, is not the standard approach to φ-features. In this section, I consider several other phenomena from unrelated languages that have been used to argue in favour of privative or binary φ-features. The conclusion that I will draw is that the arguments from the literature are, in fact, compatible with a non-uniform representation of φ-features: arguments for privative, geometrically organised φ-features are syntactic in nature, whereas arguments for binary φ-features are relevant to morphology. Some of the discussion in this section is based on Preminger (2017), who is, to the best of my knowledge, the first to suggest that the representation of φ-features does not have to be the same across modules; and it builds on Kučerová (2019), who argues that φ-features have different representations in syntax and semantics.

The first set of arguments I will discuss are those in favour of privative φ-features that are organised in a geometry. These arguments are typically based on phenomena that involve Agree with multiple arguments, and where the outcome of Agree (spell out of agreement morphology or clitic doubling) is determined by the φ-features of the arguments. In other words: some φ-features take priority over other φ-features in terms of Agree. Because a privative and geometric representation of φ-features inherently encodes an inequality between features, priority effects in Agree can easily be accounted for.

The first phenomenon showing priority effects is omnivorous agreement. Omnivorous agreement is agreement where the agreement controller is not selected based on its grammatical function, but on its φ-features. For instance, in Georgian (Kartvelian) (Béjar, 2003), the verb inflects as plural if the subject *or* the object (or both) is plural; agreement is controlled by the argument that is plural. An illustration is given in (46).

The plural suffix on the verb in (46) signals that either the subject, or the object, or both the subject and object, are plural, resulting in ambiguity.

(46) g-xedav-t
2.OBJ-see-PL
'we saw you' plural subject
'I saw you all/he saw you all' plural object
'we saw you all' plural subject and object
Georgian (Béjar, 2003, p. 123, Nevins, 2011, p. 941)

Another example of omnivorous agreement can be found with complementiser agreement in Nez Perce (Penutian) (Deal, 2015). In a Nez Perce sentence with one 2SG argument and one 3SG argument, complementiser agreement is always with the 2SG argument, regardless of its grammatical role; the 2SG argument controls agreement because of its φ-features. This is illustrated in (47).

(47) a. ke-**m** kaa ***pro*$_{subj}$** 'e-cewcew-téetu A.-ne
C-2P then PRO.2SG 3OBJ-telephone-TAM A.-ACC
'when you call A.'

b. ke-**m** kaa A.-nim hi-cewcew-téetu ***pro*$_{obj}$**
C-2P then A.-ERG 3SBJ-telephone-TAM PRO.2SG
'when A. calls you'
Nez Perce (Deal, 2015, p. 4)

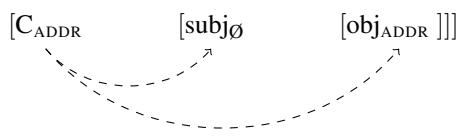
Omnivorous agreement has been analysed as follows (Béjar, 2003; Preminger, 2014; Deal, 2015). The main idea is that the Probe can be specified (or 'relativised') to look for a particular feature in the clause, for instance [Plural]. If the nearest Goal to the Probe (e.g. the subject) also has [Plural], it will value [Plural] on the Probe, resulting in the realisation of plural agreement morphology. This is schematised in (48). However, if the subject does not have [Plural], the Probe will continue its search for a next Goal. If the next Goal (e.g. the object) does have the feature [Plural], now the object's [Plural] feature can value [Plural] on the Probe, as schematised in (49). Again, the outcome is plural agreement morphology on the verb. Only if none of the Goals in the search domain of the Probe have [Plural], the outcome will be singular agreement. This is how omnivorous number agreement in Georgian (46) comes about.

(48) [V_{PL} [$subj_{PL}$ [obj_{SG}]]]

(49) [V_{PL} [$subj_{SG}$ [obj_{PL}]]]

Omnivorous person is analysed in the same way. For instance, a Probe could be relativised to look for the feature [Addressee]. If the closest Goal (here: the subject) also has [Addressee], it can value the feature on the Probe, leading to second person agreement morphology. If the closest Goal does not have [Addressee], the Probe will look for the next Goal (the object). If the object has [Addressee], then the object can

value [Addressee] on the Probe, and again the outcome will be second person agreement morphology. This is what happens in the examples from Nez Perce in (47), and is schematised in (50).[10]

(50) 

Omnivorous agreement is found in many languages, and follows the same hierarchical pattern: first and second person outrank third person (Béjar, 2003; Deal, 2015), and plural (and dual) outrank singular (Barrie, 2005; Preminger, 2014).[11] This can be modelled by assuming a privative φ-feature geometry, where first and second person, and plural, are more highly specified than third person and singular, respectively. The geometry captures the cross-linguistic pattern: for instance, because [Plural] corresponds to presence of a feature, but [Singular] does not, [Plural] can 'override' [Singular], but not the other way around. Importantly, under the assumption that Agree is syntactic (Georgi, 2014; Preminger, 2014), this implies that features must be privative and organised in a geometry in syntax as well.

The second set of phenomena that are argued to involve multiple Agree that is sensitive to φ-features are hierarchy effects, such as the Person Case Constraint (PCC). The PCC is found in many languages, and bans certain combinations of clitic objects of ditransitive verbs based on their person features. For instance, in Catalan, a clitic direct object of a ditransitive cannot be first or second person when the indirect object is a third person clitic (Bonet, 1991). The reverse, i.e. a third person direct object clitic in the context of a first or second person indirect object clitic, is fine. It is also possible for both the object clitics to be first or second person. The pattern is illustrated in (51). This particular variety of the PCC is called the 'weak' PCC; some other variants are the strong PCC (where the direct object must be third person), or the ultrastrong PCC (similar to the weak PCC, but additionally bans a first person direct object in the context of a second person indirect object) (see e.g. Nevins, 2007 for an overview of PCC variants).

(51) a. * A en Josep, me li va recomanar la Mireia.
to the Josep 1SG.ACC 3SG.DAT recommended the Mireia
'She (Mireia) recommended me to him (Josep).'

[10] It is interesting to note that a relativised Probe is essentially the opposite of a defective Probe; the relativised Probe 'wants' to Agree with a particular feature, while the defective Probe cannot Agree with a particular feature. These options should be seen as being on opposite sides on the continuum of Probe variation.

[11] Menominee (Algonquian) appears to be the only known exception; in this language, one person marker is omnivorous for third person (Trommer, 2008). Algonquian languages are known for their atypical and complex system of hierarchy effects (see e.g. Zúñiga, 2008), and also in Menominee, other person markers are omnivorous for first and second person. It seems possible that omnivorous third person in Menominee is therefore the result of a different source.

b. Te ’m van recomanar per a la feina.
2SG 1SG recommended for the job.
‘They recommended me to you for the job.’
Or: ‘They recommended you to me for the job.’

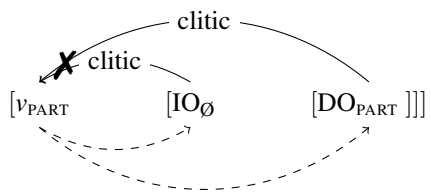
c. En Josep, me ’l va recomanar la Mireia.
the Josep 1SG.DAT 3SG.ACC recommended the Mireia
‘She (Mireia) recommended him (Josep) to me.’

Catalan (Bonet, 1991, pp. 178, 179)

Although the PCC has been analysed in a number of ways (see e.g. Anagnostopoulou, 2003; Béjar & Rezac, 2003; Nevins, 2007; Stegovec, 2020), I will discuss here the recent approach by Coon and Keine (2021). The intuition behind their analysis is that the PCC involves multiple Agree resulting in multiple clitic doubling, leading to problems with spell out.

According to Coon and Keine (2021), in a language with the PCC, *v* is a Probe that is specified to Agree with a particular feature. For example, *v* can be specified to Agree with [Participant]. As a result, *v* will keep Probing until it has found the feature [Participant]. In a ditransitive, there are two possible Goals in the search domain of the Probe: the closest Goal is the indirect object, and below that is the direct object. If the indirect object is a first or second person, and therefore has the feature [Participant], the [Participant] Probe will Agree with the indirect object and, importantly, triggers clitic doubling of that object. The Probing operation is now finished, because the Probe has found a [Participant] feature to Agree with, and the derivation continues. An indirect first or second person object therefore does not give rise to PCC effects. The other scenario is that the indirect object is a third person, and does not have a [Participant] feature. The indirect object is still the first Goal in the search domain of the Probe, so the Probe Agrees with it, and triggers clitic doubling. However, the [Participant] feature on the Probe has not been valued, so the Probe continues to search for another Goal that can value its [Participant] feature. The direct object is the second Goal. If the direct object is first or second person, and therefore has the feature [Participant], the Probe will also Agree with the direct object, and trigger clitic doubling. This is where the problem arises: there is one Probe that triggers two clitic doubling operations. According to Coon and Keine (2021), this leads to irresolvable problems with spell out: two clitics cannot cliticise onto the probing head *v* at the same time. This is schematically illustrated in (52). As a result, derivations with a third person indirect object, and a first or second person direct object, are ruled out, resulting in the weak PCC.

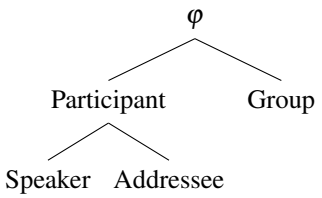
(52)



Importantly, other PCC variants can be accounted for by a different composition of the Probe. For example, the ultrastrong PCC follows if *v* is specified to probe for [Participant] and [Speaker].[12]

What this excursion into omnivorous agreement and the PCC demonstrates is that both phenomena show restrictions that are caused by Agree being restricted by one and the same φ-feature geometry, given in (53). Under the assumption that Agree is syntactic, these data provide further support for the idea that φ-features are privative and geometrically organised in syntax.

(53)



When we look at the evidence in favour of binary φ-features, it turns out that most arguments are based on morphological evidence. In particular, several morphological phenomena require reference to features that do not exist in the privative view of φ-features, because they are considered to be underspecified. These features are third person, and singular number. Nevins (2007) explicitly argues against a privative representation of φ-features by showing that reference to third person is necessary to account for certain data, but the majority of his examples are morphological (cf. Preminger, 2017). One phenomenon discussed by Nevins is 'spurious' *se* in Spanish: when a third person dative and a third person accusative clitic occur adjacent to each other, instead of the expected sequence *le lo*, the sequence *se lo* is realised. According to Nevins, this is due to a morphological dissimilation rule that says that the features on a third person dative clitic must undergo a process (that results in *se*), when it precedes a third person accusative clitic. Another phenomenon brought up by Nevins that requires reference to third person is the English verbal inflection suffix *-s*, that is only used for third person singular; under the simplest analysis, the lexical entry of *-s* is specified as [− Participant, − Plural]. Importantly, both features are not available under a privative representation of φ-features.

As Preminger (2017) points out, another argument in favour of binary features comes from verbal number suppletion in Hiaki (Uto-Aztecan) (Harley, 2014a). In Hiaki, a small set of verbs shows suppletion based on the number feature on the sole argument of an intransitive verb, or the internal argument of a transitive verb; this is illustrated with an intransitive verb in (54).

(54) a. Aapo aman **vuite**-k.
3SG there run.SG-PRF
'He ran over there.'

[12]Note that this means that languages with the ultrastrong PCC use [Speaker] rather than [Addressee] to differentiate between first and second person. This option is still in line with the structure of Harley and Ritter (2002)'s feature geometry.

b. Vempo aman **tenne**-k.
3PL there run.PL-PRF
'They ran over there.' Hiaki (Harley, 2014a, p. 236)

Importantly, the plural verb form is the default form, as this is the form that is used in e.g. impersonal passives, where there is no argument to determine the verb form:

(55) Aman yahi-wa / *yevih-wa.
there arrive.PL-PASS arrive.SG-PASS
'Arriving is happening over there.'
or: 'Someone / people / they is / are arriving over there.'
Hiaki (Harley, 2014b, p. 456)

Furthermore, verbal number suppletion is not the result of agreement: while suppletion follows an ergative-absolutive pattern, alignment of case in Hiaki is nominative-accusative, so the agreement analysis of verbal number suppletion would violate Bobaljik (2008)'s generalisation that agreement is with the unmarked case (i.e. nominative). Instead, Harley (2014a) (see also Harley et al. (2016)) proposes that verbal number suppletion should be analysed as contextual allomorphy of the verb when it is in a sisterhood relation to a [− Plural] argument. Crucially, this requires that [− Plural] is a feature that can be used for a morphological operation.

What the above arguments for binary features have in common is that they refer to morphological processes: dissimilation, affix insertion, and allomorphy. In other words, there is good evidence that in morphology, φ-features have a binary representation.[13]

To summarise what we have seen so far, multiple Agree contexts across different languages suggest that φ-features are privative and organised in a geometry, but morphological processes require that features are binary. But since Agree is a syntactic operation, and morphological processes take place outside of syntax, these conclusions are not necessarily in contradiction with each other. We can understand it when the representation of φ-features is variable across grammatical modules: privative in syntax, and binary in morphology. This is the same conclusion as was reached based on position dependent agreement in Dutch, and therefore provides further support for it.

A difference in representation of features across modules appears not to be unique to the syntax-morphology interface. Kučerová (2019) argues that the same thing applies to the syntax-semantics interface. In particular, she argues that person features have a binary value at LF in order to be semantically interpretable. Furthermore, Preminger (2017) provides several examples with the aim to demonstrate that mismatches between modules are the norm. For instance, in many cases, the agent theta-role is assigned to the argument with nominative case, so there is a relation between syntax

[13] A different argument for binary number features comes from Harbour (2011) and Kouneli (2021). They argue that in Kiowa and Kipsigis, respectively, noun class is determined by number features, and that reference to plus and minus features, as well as the absence of a feature, is required to capture all the noun classes without overgenerating. I will not discuss this argument here, because it deals with noun class, which arguably has a different internal organisation than φ-features (person, number, gender) proper.

(case) and semantics (theta roles). But there are also cases where this correspondence fails, such as with unaccusative verbs and passives, where the nominative argument is a patient. Considered against this background, the idea that the representation of φ-features is not identical across grammatical modules should not be surprising.

2.6 Extension: position dependent agreement in Standard Arabic

Apart from Dutch, another well-known case of PDA comes from Standard Arabic. In this language, number agreement fails in certain contexts with verb-subject word order. In this section, I propose an analysis of PDA in Standard Arabic based on a defective Probe, extending the account from Dutch. Standard Arabic is interesting, because in addition to person and number agreement, verbs show agreement for gender. Based on the PDA pattern of Standard Arabic, I put forward a proposal on the location of gender in the φ-feature geometry.

The main pattern of PDA in Standard Arabic is given in (56) and (57). In (56), the verb shows full 3PL feminine agreement in SV word order (full agreement, FA), but singular feminine agreement in VS (partial agreement, PA). In (57) we see the same pattern, but with a dual subject: in the SV word order, there is full agreement (3DU feminine), while in the VS word order, the verb is singular.[14]

(56) a. ʔal-fatayaat-u **qaraʔ-na** ʔal-dars-a — S V_{FA}
the-girls-NOM read-3PL.F the-lesson-ACC
'The girls read the lesson.'

b. **qaraʔ-at** ʔal-fatayaat-u ʔal-dars-a — V_{PA} S
read-3SG.F the-girls-NOM the-lesson-ACC
'The girls read the lesson.' (Soltan, 2007, p. 35)

(57) a. ʔal-bint-aani **qadim-ataa** — S V_{FA}
the-girl-DU came-3DU.F
'The two girls came.'

b. **qadim-at** al-bint-aani — V_{PA} S
came-3SG.F the-girl-DU
'The two girls came.' (Harbert & Bahloul, 2002, p. 45)

[14]Note that PDA in Standard Arabic only obtains with plural human nouns. Pronouns trigger full agreement in both word orders (see e.g. Soltan, 2007), and non-human plural nouns trigger feminine singular agreement also in both word orders (see Aoun et al., 1994). The latter observation is usually set aside as a regular idiosyncrasy of Arabic (see e.g. Alghamdi, 2015 for an analysis); I will do so too here. The absence of PDA with pronouns has been analysed in a variety of ways; see e.g. Soltan (2007) and Himmelreich (2019) for different approaches. My impression is that it is related to the fact that Standard Arabic is a *pro*-drop language, and that *pro*-drop can only be licensed by full agreement. I leave it for future research to see which of these approaches is compatible with my analysis of PDA in Standard Arabic.

Within the defective Probe approach to PDA, the PDA pattern of Standard Arabic can be explained as follows.[15] Following Wurmbrand and Haddad (2016), I assume that in a standard clause, there are two positions where the verb can be realised: T and *v*. T has an EPP feature, which can be checked by moving the subject to Spec,TP, or by moving the verb to T (see Wurmbrand and Haddad (2016) and Himmelreich (2019)). If the subject moves to Spec,TP to check the EPP feature, the verb stays in *v*. This results in SV word order. If the verb moves to T to check EPP, the subject stays *v*P-internal, resulting in VS word order. Following Wurmbrand and Haddad (2016), I assume that both T and *v* are φ-Probes. More specifically (and contra Wurmbrand and Haddad, 2016), I propose that *v* is a fully specified φ-Probe, whereas T is defective: it has person and gender features, but no number features. Finally, I assume that all Probes Agree with the subject (either via downward agreement or Spec-Head agreement),[16] but that the features on the Probe are only spelled out when the head they belong to is lexicalised by a verb.

With these assumptions in place, the derivation of SV and VS word order is as follows. If the subject moves to Spec,TP to check EPP, the verb spells out the features of *v*. Since *v* is a φ-complete Probe, this correctly predicts that we find full agreement in SV word order. This configuration is depicted in (58). The solid arrow indicates verb movement, and the dashed arrow indicates the Agree relation that will be spelled out.[17]

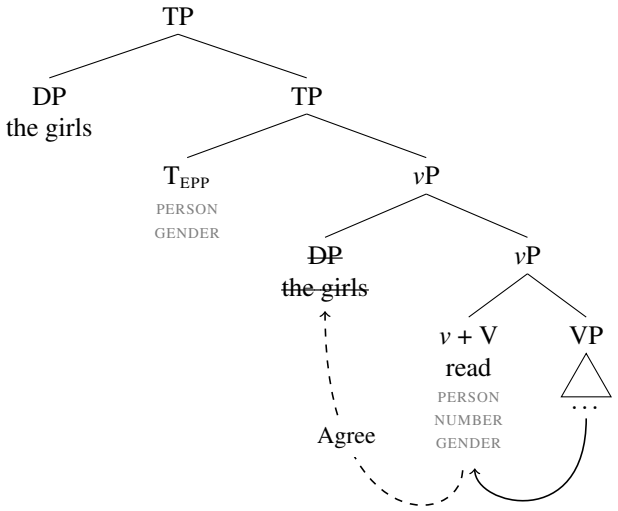
[15] It is important to point out that I am just focusing on the Probes here, and not on the intricacies of the grammar of Standard Arabic; see Fassi Fehri (1993), Aoun et al. (1994), Benmamoun (2000a), Soltan (2007), Wurmbrand and Haddad (2016) and Himmelreich (2019) for more detailed analyses.

[16] This can be formalised with the assumption that the Probe is relativised to Agree with nominative arguments only.

[17] For now, I gloss over the geometric representation of φ-features in the trees, but I will return to it below.

(58) a. ʔal-fatayaat-u **qaraʔ-na** ʔal-dars-a
the-girls-NOM read-3PL.F the-lesson-ACC
'The girls read the lesson.' (Soltan, 2007, p. 35)

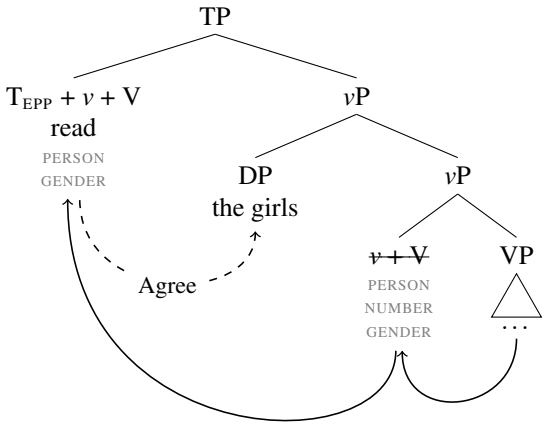
b.



If the verb moves to T to check EPP, it spells out the features of T. Because T is a defective Probe that lacks [Number], the number feature of the subject cannot be copied to the Probe, resulting in the absence of a number specification at morphology. As a result, the suffix that matches the person and gender features of the subject but that is the least marked for number features is inserted. I assume that singular number is the least marked, leading to singular agreement in VS word order. The configuration is given in (59).

(59) a. **qaraʔ-at** ʔal-fatayaat-u ʔal-dars-a
read-3SG.F the-girls-NOM the-lesson-ACC
'The girls read the lesson.' (Soltan, 2007, p. 35)

b.



In addition to the simple sentences in (56) and (57), PDA is found in sentences with two agreeing verbs, for example a progressive auxiliary and a lexical verb. The first option here is that the subject is between the auxiliary and the lexical verb; in this case, the auxiliary shows partial agreement, and the lexical verb shows full agreement (60a). The subject can also precede both verbs, in which case both show full agreement (60b). The subject cannot be preceded by both verbs (60c).

(60) a. **kanaat** aṭ-ṭaalibaat-u **ya-ʔkulna** Aux_{PA} S V_{FA}
was.3SG.F the-students.F-NOM 3-eat.PL.F
'The female students were eating.'

b. aṭ-ṭaalibaat-u **kunna** **ya-ʔkulna** S Aux_{FA} V_{FA}
the-students.F-NOM was.3PL.F 3-eat.PL.F
'The female students were eating.'
(Himmelreich, 2019, p. 5, cf. Benmamoun, 2000b)

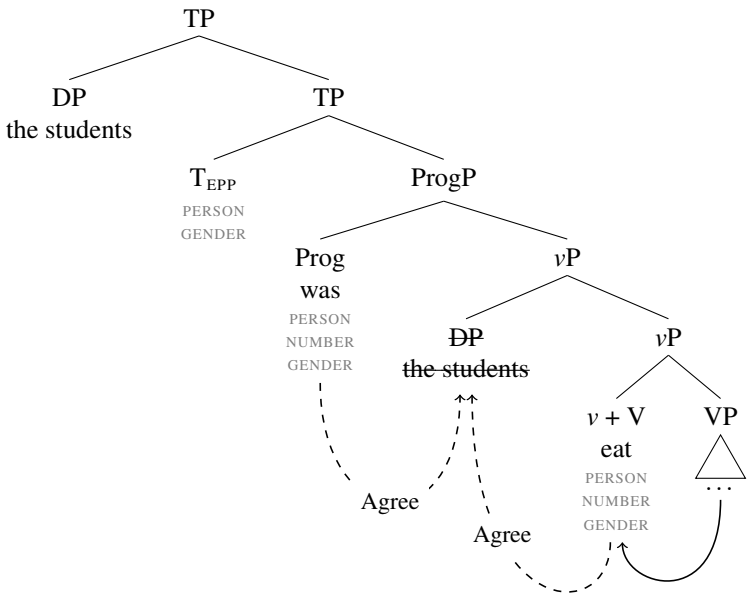
c. * kanaat / kunna ya-ʔkul-at / -na *$Aux_{FA/PA}$ $V_{FA/PA}$ S
was.3SG.F / was.3PL.F 3-eat-SG.F / -PL.F
aṭ-ṭaalibaat-u
the-students.F-NOM
'The female students were eating.' (Himmelreich, 2019, p. 5)

Following Himmelreich (2019), I assume that the progressive auxiliary is merged as the head of the functional projection ProgP between *v*P and TP, and that Prog is a φ-Probe. I propose that Prog is a non-defective Probe. The auxiliary agreement data come about as follows. Like in clauses without ProgP, T has an EPP feature that can be checked by the subject or a verb. If the subject checks EPP, it precedes both the auxiliary and the lexical verb; the verbs stay in Prog and *v*, respectively, and realise

the non-defective φ-features on those heads, resulting in full agreement on both verbs. See (61) for the configuration.

(61) a. aṭ-ṭaalibaat-u **kunna** **ya-ʔkulna**
the-students.F-NOM was.3PL.F 3-eat.PL.F
'The female students were eating.' (Himmelreich, 2019, p. 5)

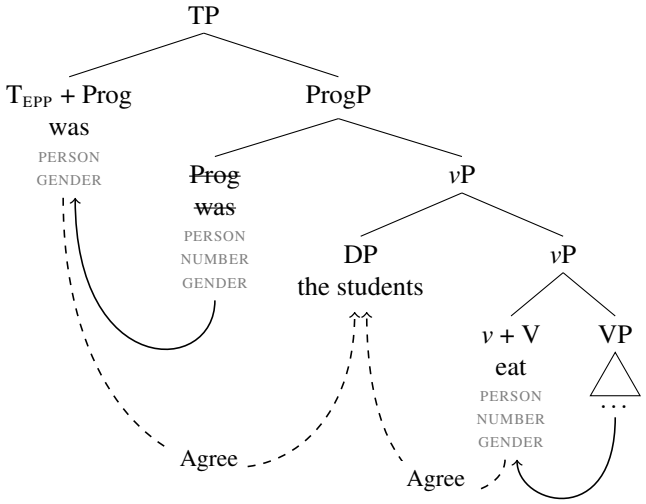
b.



Alternatively, the EPP can be checked by a verb. The auxiliary is the structurally closest verb to T, and can therefore move to T to check the EPP. The subject can stay in its *v*P internal position. Since the progressive auxiliary is in T, it will realise the φ-features on T, which is a defective set lacking number. As a result, the auxiliary shows partial agreement when it precedes the subject. The configuration is given in (62).

(62) a. **kanaat** aṭ-ṭaalibaat-u **ya-ʔkulna**
was.3SG.F the-students.F-NOM 3-eat.PL.F
'The female students were eating.' (Himmelreich, 2019, p. 5)

b.

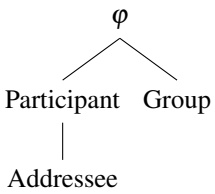


Finally, the configuration in which both verbs precede the subject (60c) is out, because the lexical verb cannot move out of the *v*P in which the subject is contained: the first head above *v*, Prog, is filled by the auxiliary. The word order auxiliary – verb – subject therefore cannot be derived.

In summary, the PDA pattern of Standard Arabic can be accounted for by the proposal that T is a defective Probe that has a person and gender feature, but no number feature. This proposal accounts for PDA in sentences with one or more agreeing verbs. The question is what this can tell us about the feature geometric organisation of φ-features, in particular the position of gender.

In the previous sections, I have presented evidence from Dutch for the following organisation of φ-features (repeated from (18)):

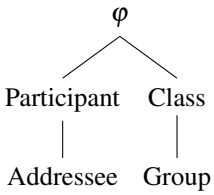
(63)



In Standard Arabic, the T Probe is defective for number. In (63), number is represented by [Group]. In order for a feature to be defective, it has to be terminal. One possibility for incorporating gender into the geometry in (63) is therefore that gender projects between φ and [Group]. This would mean that number is a dependent of

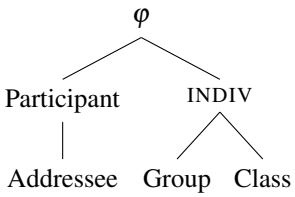
gender, as illustrated in (64) (following Harley and Ritter, 2002, I represent gender with the feature [Class]).

(64)



It is unlikely that the feature geometry is organised this way, for several reasons. First, the current organisation suggests that gender ([Class]) can only encode a two-way distinction (presence or absence of [Class]), but many languages distinguish more than two genders. Second, the geometry as it stands suggests that number distinctions can only be found in one gender, because the number feature [Group] can only be present when the gender feature [Class] is present. This is also incorrect: for instance, both Dutch neuter *meisje* ('girl'), as well as common *jongen* ('boy'), can be pluralised: *meisje-s* ('girl-s'), *jongen-s* ('boy-s'). Because both number and gender are features that can have more than two values, it is more likely that they are both dependents of one node called INDIV(IDUATION) (cf. Harley & Ritter, 2002), see (65).

(65)



This geometry is compatible with a Probe that is defective for number, because the number feature is a terminal feature. Moreover, Standard Arabic distinguishes three numbers (singular, dual, and plural), but only two genders (feminine and masculine); in order to represent the three numbers, we need an additional number feature (see e.g. Harbour, 2014 for the features involved in complex number systems). This means that the representation of number is the most complex, and will be the target of delinking, according to the complexity restriction on φ-feature defectiveness (21). This is exactly what we find. In other words, the defective Probe analysis provides an explanation for why agreement fails for number, and not for person or gender, in Standard Arabic. The geometry in (65) also overlaps with Harley and Ritter (2002)'s φ-feature geometry.[18] The defective Probe analysis of Standard Arabic therefore adds to the argument for a feature geometric representation of φ-features based on position dependent agreement.

[18] A note on INDIVIDUATION. While the Dutch data did not support the presence of the INDIVIDUATION node in the geometry, because it is vacuous, Standard Arabic does: if a language makes multiple number distinctions, or number and gender distinctions, INDIVIDUATION is projected to accommodate for this. The Dutch and Standard Arabic geometries thus overlap in the relevant sense.

2.7 Previous analyses of position dependent agreement

2.7.1 Morphological approaches

Ackema and Neeleman (2003), Postma (2011, 2013), and Don et al. (2013) propose that PDA arises in the morphology. In section 2.4.3, I already provided two arguments against a morphological approach to PDA. The first argument is that PDA is restricted to VS word orders. A morphological approach cannot easily give a principled account for this restriction. Second, I showed that PDA is not sensitive to linearity effects, which is a hallmark of morphological alternations. In this section, I will look at the morphological approaches in a bit more detail, and show that they face additional issues.

Ackema and Neeleman (2003) propose an analysis of various morphological alternations, that uses impoverishment rules that apply to linearised structures. To account for PDA in Standard Dutch (see table 2.24), Ackema and Neeleman assume the affix inventory in (66) (this is the same affix inventory as in section 2.4.4.1, example (39)). Affixes are inserted according to the Subset Principle, i.e. when the features on the affix are a subset of the features in the syntactic structure. The affix inventory, combined with the Subset Principle, derives the SV paradigm of Standard Dutch.

Table 2.24: Agreement paradigm Standard Dutch (= Hollandic Dutch)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

(66)
[Participant]	$\Longleftrightarrow$	Ø
[Participant] [Addressee]	$\Longleftrightarrow$	-t
[Group]	$\Longleftrightarrow$	-ə
Elsewhere	$\Longleftrightarrow$	-t

Ackema and Neeleman propose that PDA is the result of the application of an impoverishment rule, given in (67), that deletes the feature [Addressee] on the verb (V), when the verb is in the same domain as a subject (D) with the feature [Addressee]. The result of this rule is that a 2SG verb will not inflect with the 2SG affix *-t*, but with the 1SG affix Ø. Ackema and Neeleman's main hypothesis is that the domain of application of a rule like (67) is determined by prosody: the rule can only apply within a prosodic domain. Assuming that in a VS structure, but not in a SV structure, the subject and the verb are in the same prosodic domain, the rule applies in the VS word order, but not in the SV word order. This leads to PDA.

(67) [V PART ADDR] [D PART ADDR] ⟶ [V PART] [D PART ADDR]

In addition to the morphological issues brought up earlier, the Dutch dialect data raise a problem for Ackema and Neeleman (2003)'s approach to PDA. In the affix inventory in (66), the affix *-t* is specified twice: once as the 2SG affix, and once as the elsewhere affix. Ackema and Neeleman justify this double specification by referring to dialects, because (as we have seen) in some Dutch dialects, 2SG corresponds to a unique affix. Ackema and Neeleman assume that the homophony between the 2SG and the 3SG affix is accidental, and that they are underlyingly distinct. However, in section 2.4.4.1, I showed that in Dutch dialects, there is an anti-correlation between having a unique 2SG affix and having PDA for 2SG. Under Ackema and Neeleman's account, this anti-correlation is unpredicted; rather, their account predicts that when there is evidence for a unique 2SG affix, we expect a rule such as (67) to apply, giving rise to PDA. When there is no evidence for a unique 2SG affix (as in PDA dialects), a rule like (67) should be less likely to apply, leading to the absence of PDA. The data show the opposite pattern, which is a problem for Ackema and Neeleman's approach to PDA, and to a privative approach to φ-features in morphology more generally, as I showed in section 2.4.4.1.[19]

Next, I discuss the morphological analysis of PDA by Don et al. (2013). Using the same data set as I have in this chapter (the paradigms of *leven* ('to live') from the DynaSAND), they formulate four generalisations on PDA, and an analysis that captures those generalisations.

Before going into Don et al.'s analysis, it is relevant to point out that they use a different methodology than I have done here. In my analysis, I focused on paradigms that are relatively frequent and show geographical clustering. The idea is that the paradigms that meet these criteria reflect the grammar of a stable Dutch dialect. In addition, I have taken into account other factors that affect the outcome of the paradigm, such as allomorphy and the form of pronouns. Don et al. (2013) take a different approach and consider every paradigm as is. For that reason, their generalisations and analysis might be affected by factors external to the verbal paradigm. This seems to have an important consequence for their analysis. In particular, Don et al. argue for a hybrid approach to PDA. In this approach, PDA can be the result of the interaction of a constraint on Dutch verbal morphology, and insertion of default morphemes (more on which below), or it can be the result of impoverishment rules (see Ackema & Neeleman, 2003, and above). As far as I can see, almost all data for which they need the impoverishment analysis disappear as explananda under the methodology I used, the exception being PDA in Northern Dutch. This makes the hybrid approach suspicious, because it requires an alternative analysis to account for only one data point, that shows the same behaviour as the other examples of PDA. A unified analysis (for instance as I defend in this chapter) is preferable.[20] Setting the methodology aside,

[19] Ackema and Neeleman (2003) argue for a similar analysis for PDA in Standard Arabic (see section 2.6), proposing that it results from an impoverishment rule that deletes [Group] in VS word order. This analysis has been criticised as well (Benmamoun & Lorimor, 2006; Himmelreich, 2019), for instance on based on linearity effects: similar to Dutch PDA, Arabic PDA does not require linear adjacency of the verb and the subject, suggesting that it is syntactic.

[20] An additional issue regarding the data presented by Don et al. (2013) is that they mention only 15

I will now discuss the analysis of PDA by Don et al. Since I have already discussed Ackema and Neeleman (2003)'s analysis of PDA based on impoverishment, and take the same issues to apply to Don et al. (2013)'s implementation of it too, I will focus on the other part of their analysis in the remainder of the discussion.

Don et al. (2013) start with the formulation of four generalisations on PDA in Dutch dialects, that mostly concern the 3SG. First, they claim that 3SG never shows PDA (generalisation 1). In addition, the 3SG affix (*-t*) is always dropped in the past tense (generalisation 3), and in cells of the paradigm that show PDA, the 3SG affix is never used as the affix in VS word order (generalisation 4). (The remaining generalisation (generalisation 2) says that the VS affix is never a novel affix.) In order to capture these generalisations, they argue for the following analysis. The main proposal is that Dutch verbs cannot be 'uninflected', i.e., they need to express at least one inflection feature; this is an inviolable morphological constraint in Dutch dialects. If a verb is transferred to morphology without an inflection feature, a default morpheme (= INFL) will be inserted to make it adhere to this constraint. Don et al. work with a highly impoverished, privative model of inflection features, consisting of [Speaker] (1P), [Addressee] (2P), [Plural] (PL), and [Past] (past tense). Crucially, 3SG is not represented with a feature. This means that the default morpheme INFL is inserted with every 3SG verb in the present tense. The realisation of this morpheme is what is generally considered to be the 3SG morpheme *-t*. In past tense, however, verbs come with the feature [Past]. This voids insertion of INFL, and thus realisation of *-t*. This set of assumptions therefore accounts for generalisations 1 (no PDA with 3SG) and 3 (no *-t* in past tense).

Turning now to the derivation of PDA, recall that many PDA paradigms have PDA for 2SG, and that this is typically a *-t* to Ø alternation, where *-t* is also used for 3SG, and Ø for 1SG. Thus, there is no unique 2SG affix. Don et al. (2013) take this as evidence that [Addressee] is not an active feature in these grammars. A verb agreeing with a 2SG subject is therefore uninflected. In order to adhere to the constraint that Dutch verbs cannot be uninflected, in the SV word order, the default feature INFL will be inserted at morphology, and is subsequently spelled out as *-t*. To account for PDA, Don et al. propose that in VS word orders, 1P and 2P pronouns 'count' as an inflectional feature, because they undergo M-merger with the verb. This voids insertion of INFL in the context of a 2SG subject, and therefore the insertion of the corresponding affix *-t*, in the VS word order. Because of the varying strategies to adhere to the morphological constraint on Dutch verbs in the SV and VS word order, the result is PDA for 2SG. This special ability of 1P and 2P pronouns to undergo M-merger with the verb derives generalisation 4: because 1P and 2P essentially count as inflection, insertion of default inflection is never needed.

To account for the generalisations on PDA, the analysis requires several assumptions that are non-standard and not very well motivated, such as the constraint on verbal inflection, and M-merger of pronouns with the verb. More importantly, how-

paradigms, whereas I found over 50 unique paradigms in my analysis of the data (most of which occur only once). Because they do not say anything about the remaining data, it is hard to assess whether their analysis holds for all the paradigms. In fact, taking into account all paradigms is challenging for any analysis, which I think is another reason to generalise to the more frequent and geographically coherent ones.

ever, there is an empirical issue with the generalisations. In particular, my data show that we do find PDA for 3SG, namely in East Flemish (see table 2.4 in section 2.2). This cannot be derived by Don et al. (2013)'s analysis as it stands: a 3SG verb is uninflected, leading to insertion of INFL at morphology, which is spelled out as *-t* on the verb. To solve this, we might consider expanding the items that count as inflection to include 3SG, but this raises the question why it is not as ubiquitous as with 2SG. An alternative would be to drop the constraint that Dutch verbs cannot be uninflected, but then we cannot account for the insertion *-t* with 2SG and 3SG in the SV word order. To conclude, the analysis of PDA by Don et al. (2013) is not able to derive the full array of PDA patterns.

A different morphological approach to PDA is proposed by Postma (2011, 2013). Taking a diachronic approach, he argues that PDA is the result of a morphological reanalysis of the verb-subject cluster. Central to the analysis is Postma's observation that there is a correlation between PDA and the form of the nominative 2SG pronoun: varieties with PDA use *jij* or *gij* (and related forms) as the 2SG pronoun, but varieties that do not have PDA use *du* or *dich* as the 2SG pronoun. Recall also that non-PDA varieties generally use a unique 2SG ending like *-s(t)*, in contrast to varieties with PDA, that usually use *-t* as the 2SG affix in SV word order. The proposed reanalysis of the verb-subject cluster is as follows:

(68) leef-s du ⟶ leef-s dig ⟶ leef-dze (gi) ⟶ leef=de (gi)
(cf. Postma, 2011, p. 73)

In the first stage, the unique 2SG *-s*-based affix and the pronoun *du* are used. In the next stage, the pronoun changes to *dich*. Then, the pronoun cliticises to the verb, which results in the disappearance of *-s*, and a palatalisation of *d*, resulting in *dz*. The next step represents the outcome of the reanalysis, where *de* functions as a pronominal clitic and verbal agreement is lost completely in VS word order.[21]

This approach leaves some questions unanswered, however. First, it is not clear why the 2SG affix also changes in the SV word order, from *-s(t)* to *-t*; no diachronic reanalysis is at work here, so there is no immediate pressure for the affix to change. Second, I showed that PDA does not only occur with 2SG, but also with 3SG, 1PL, and 2PL. However, in those person/number combinations, there is no correlation between the presence of PDA and the form of the pronoun. For example, varieties with and without PDA for 1PL use a similar pronoun. This is illustrated in (69) (no PDA for 1PL) and (70) (PDA for 1PL). If PDA is always the result of diachronic reanalysis of the verbal inflection and the pronoun, this is unexpected.

(69) a. wij leev-ə
we live-AGR

b. leev-ə wij
live-AGR we

Standard Dutch

[21] Postma (2011, 2013) writes that *de* is reanalysed as agreement, but his schematic representation implies that it is a clitic.

(70) a. wie leew-t
we live-AGR

b. leew wie
live-Ø we

Losser Dutch (DynaSAND)

In short, although morphological reanalysis may have contributed to the development of PDA diachronically, it cannot be used to account for all cases of PDA in the synchronic grammar of Dutch dialects.

2.7.2 Syntactic approaches

Zwart (1993, 1997) was the first to argue for a syntactic analysis of PDA in Standard Dutch and related varieties. The idea he pursues is the following. Zwart assumes a standard clause structure consisting of C, T (in fact, Zwart assumes a Pollock (1989)-style split IP, which I will gloss over here) and V. To derive the SV word order, the verb moves to T, and from this a VS order can be derived by moving the verb to C. Crucially, in the course of verb movement from V to the higher heads, a complex syntactic object is created. So, what is in T is not just the verb, but a complex structural object consisting of V adjoined to T. If the verb is in C, the complex syntactic object consists of the V-T object adjoined to C.

As a result, what is fed to morphology is different depending on whether the verb is in T or C. In particular, when the verb is in T, it lacks the C-part of the structure. Zwart's proposal is that morphology can be sensitive to this difference. More specifically, verbs can have two paradigms, one for the $[-\,\mathrm{C}]$ structure, and one for the $[+\,\mathrm{C}]$ structure. This leads to PDA: depending on word order (i.e. the presence/absence of C), a different form is inserted.[22]

Zwart (1993, 1997)'s approach to PDA is therefore in a sense similar to the approach I defend in this chapter, in that it depends on a syntactic difference between the heads that realise the verb in SV and VS word order. However, Zwart's approach is less restrictive. Under his analysis, in principle everything is possible, i.e. there are no restrictions on the different agreement paradigms for verbs in T and C. His analysis therefore cannot account for certain observations having to do with PDA, such as the observation that the same affix inventories are used in SV and VS agreement; under my analysis, the difference between the word orders is merely that the affixes show a different distribution. Under Zwart's approach, the SV and VS paradigms could theoretically consist of completely distinct forms.

Some data that Zwart presents in favour of his approach is a PDA pattern in Lower Bavarian. In this pattern, 1PL verbs that move to T or C show a different ending (*-ma*) from 1PL verbs that stay in V (*-n*) (71). The ending *-ma* is unique in the paradigm. This pattern thus differs from the PDA patterns from Dutch in two ways. First, the agreement split is between V and T/C in Lower Bavarian, whereas in varieties of Dutch, it is between V/T and C. And second, the pattern goes against the generalisation that unique markers do not show PDA.

[22] The implementation in Zwart (1993) is slightly different, as there he assumes a lexicalist approach to morphology. The idea that there are different paradigms for verbs realised in T and C is the same, however.

(71) a. dass-ma mir noch Minga fahr-n. verb in V
that-1PL we to Munich drive-PL
'that we drive to Munich.'

b. Mir fahr-ma noch Minga. verb in T
we drive-1PL to Munich
'We are driving to Munich.'

c. Fahr-ma mir noch Minga? verb in C
drive-1PL we to Munich
'Are we driving to Munich?' (Bayer, 1984, p. 251)

Zwart's analysis of these data is based on the idea that head movement creates complex syntactic structures, that morphology can be sensitive to. He proposes that in Lower Bavarian, morphology is not sensitive to the presence or absence of C (as in the Dutch dialects), but to the presence or absence of T: if the verb moves from V to T (and from there on to C), T is present; if the verb stays in V, T is absent. The paradigm with *-ma* is used when T is present (i.e. when the verb is in T or C), and the paradigm without it is used when T is absent (i.e. when the verb is in V). So whereas the Lower Bavarian PDA pattern is easy to account for under Zwart's analysis of PDA, it is problematic for my approach, since I argued that PDA is the result of φ-defectiveness of C, which causes affixes to be inserted in unexpected contexts. My account does not capture the V vs T/C split in Lower Bavarian, nor the observations regarding the form of the 1PL morpheme.

It is, however, not obvious that the Lower Bavarian data constitute a true PDA pattern. Example (71a) shows that *-ma* is not only used as a verbal ending, but also as an ending on the complementiser. In the next chapter of this dissertation, I argue that some cases of complementiser 'agreement' are in fact clitic doubling, and that the same holds when these morphemes are used as verbal agreement endings in VS word order. Assuming that the clitic doubling analysis of complementiser agreement in Bavarian extends to the data in (71), we can formulate an alternative account of this apparent PDA pattern. Under this account, *-ma* in (71a, 71c) is a clitic that doubles the subject in Spec,TP. The verbal agreement ending *-n* is not realised, because it fully assimilates to *-ma*. In (71b), we might be dealing with 'topic doubling', similar to what has been described for Flemish dialects (van Craenenbroeck & van Koppen, 2002). An example is given in (72). In this example, the sentence-initial subject (*Marie*) is doubled by a pronoun in the middle field (*zaai*). Assuming that a similar process is at work in (71b), the morpheme *-ma* should be considered a pronominal clitic, rather than an agreement ending.[23]

(72) **Marie** muu **zaai** ie nie kommen.
Marie must she here not come
'Marie shouldn't come here.'
Wambeek Dutch (van Craenenbroeck & van Koppen, 2002, p. 282)

[23] A difference between topic doubling in Flemish and Bavarian is that in Flemish, the clause-initial pronoun can only be strong if the second pronoun is also strong; in (71b), the clause-initial pronoun is strong, but the double is weak (i.e. clitic). I leave a further investigation of this difference for future research.

The reanalysis of *-ma* as a clitic means that Lower Bavarian does not actually have PDA, and that it is not something that an account of PDA should predict or account for. Given this conclusion, the φ-defective Probe approach to PDA fares better than Zwart (1993, 1997)'s approach to PDA, as the former is more restrictive.

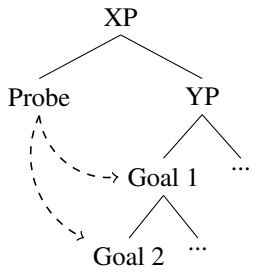
Van Koppen (2005) develops a different syntactic approach to PDA, specifically geared towards accounting for PDA in Hellendoorn Dutch. The paradigm (for the verb *goan* ('to go')) is given in table 2.25 (note that this paradigm differs from the paradigms that I analysed in this chapter, though it is close to the Dutch Low Saxon paradigm).

Table 2.25: Agreement paradigm Hellendoorn Dutch (van Koppen, 2005)

	SV	VS
1SG	goa-Ø	goa-Ø
2SG	goa-t	goa-Ø
3SG	gie-t	gie-t
1PL	goa-t	goar-ə
2PL	goa-t	goa-t
3PL	goa-t	goa-t

In this paradigm, 2SG and 1PL show PDA. Van Koppen focuses on PDA for 1PL. The central idea she pursues is that a Probe can agree with multiple Goals if they are equidistant; a configuration in which this happens is given in (73).

(73)

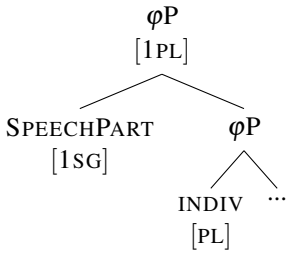


If there is agreement with more than one Goal, morphology determines which affix is inserted. What is important for our current purposes, is that a specified affix outcompetes an elsewhere affix for insertion.

Van Koppen argues, combining insights from Déchaine and Wiltschko (2002) and Harley and Ritter (2002), that pronouns are complex phrases (φPs), consisting of a Speech Participant layer (introducing the person features of the pronoun) and an Individuation layer (introducing number). The maximal projection φP is specified for the full set of features. Furthermore, van Koppen proposes that a first person pronoun is inherently singular, which means that the Speech Participant layer of a first person pronoun contains a [1P] feature and a [SG] feature. A 1PL pronoun corresponds to embedding the singular first person in a group. Structurally, this is represented with a [PL]

feature introduced by Individuation. This structure correctly captures the meaning of a 1PL pronoun, i.e. 1PL refers to a group that the (singular) speaker is a part of, not to a group of speakers (cf. Noyer, 1992; Cysouw, 2001; Siewierska, 2004). The structure of a 1PL pronoun is given in (74).

(74)



Complex pronouns are candidates for agreement with multiple Goals, since the full pronoun (φP) and the Speech Participant layer are equally close to the Probe. Van Koppen proposes that this is precisely what happens when the verb is in C: the verb agrees with both the 1PL φP and the 1SG SPEECHPART.[24] The agreement relation with SPEECHPART corresponds to a more specific affix than the agreement relation with 1PL, as there is a unique 1SG affix (Ø), while 1PL leads to insertion of the elsewhere morpheme *-t*. Therefore, the 1SG affix will be inserted instead of the 1PL affix. Assuming that the schwa that is used as 1PL agreement in VS is an allomorph of Ø, this derives PDA for 1PL in Hellendoorn Dutch.

While van Koppen's approach successfully captures PDA for 1PL in Hellendoorn Dutch, it leaves open the question of how to analyse PDA for 2SG. In addition, it is hard to generalise the analysis to other examples of PDA, as it depends on very specific assumptions about the structure of 1PL pronouns and the set of affixes that are used in a given variety. At the same time, the analysis based on defective Probes proposed in this chapter cannot account for the Hellendoorn Dutch pattern. Under the defective Probe analysis, PDA for 1PL can only be derived by the absence of [Group] on the Probe. According to generalisation (21), this implies that [Addressee] must also be absent on the Probe. Combined with the affix inventory of Hellendoorn Dutch, this would result in the Dutch Low Saxon paradigm, where we also find PDA with 2PL.

However, van Koppen's account of 1PL PDA can exist next to the defective Probe approach to PDA, and their combined force can account for PDA with both 2SG and 1PL in Hellendoorn Dutch. Under the combined analysis, the C Probe in Hellendoorn Dutch has [Participant] and [Group], so it is defective for [Addressee]. This results in PDA for 2SG: when the Probe in C agrees with a 2SG goal, only the [Participant] feature of the goal will be copied to the Probe. At morphology, this results in a 1SG interpretation, resulting in the insertion of the 1SG affix (Ø). PDA for 1PL comes about according to van Koppen's analysis: when a verb in C targets a 1PL pronoun for Agree, it establishes an agreement relation with both the full pronoun as well as with the 1SG

[24] Van Koppen proposes that the internal structure of the pronoun is not accessible to T—see also van Koppen (2007).

Speech Participant layer. Since the agreement relation with Speech Participant layer corresponds to a more specific affix, this affix will be inserted, resulting in PDA with 1PL. The fact that the Probe in C is defective has no consequences for 1PL agreement, since the [Addressee] feature is not involved here.

A remaining question is why Hellendoorn Dutch has a Probe that has both [Participant] and [Group] features, since closely related Dutch Low Saxon varieties that use the same affix inventory, have also lost [Group] as a Probe. I suggest that Hellendoorn Dutch is in an intermediate stage between Hollandic Dutch and Dutch Low Saxon. It has already lost the plural morpheme like the other Dutch Low Saxon varieties, but has not yet lost [Group] as a Probe. PDA for 1PL can be part of the paradigm, because of the option to Agree with the internal Speech Participant layer of the 1PL pronoun. However, the alternative way to derive PDA for 1PL, based on a Probe that is defective for [Addressee] and [Group], is simpler, because it requires fewer features on the Probe, and just one mechanism that gives rise to PDA in several person/number combinations. For this reason, there is a pressure to adopt the defective Probe analysis, but this will lead to PDA for 2PL as well. The expectation is therefore that the Hellendoorn Dutch pattern is not very stable, and this seems to be correct, as none of the 202 paradigms from DynaSAND overlaps with that of Hellendoorn Dutch from van Koppen (2005). Instead, the dominant pattern in Dutch Low Saxon varieties is PDA for 2SG, 1PL, and 2PL.

Finally, van Koppen's analysis of PDA for 1PL can potentially also give insight into one of the PDA paradigms that is not compatible with the defective Probe analysis. This paradigm is again highly similar to the Dutch Low Saxon paradigm, and part of the same dialect group, but instead of zero inflection in VS for 1PL, we find an *-ən* ending that is not attested elsewhere in the paradigm. The paradigm is given in table 2.26.

Table 2.26: PDA paradigm 1 ($n = 5$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leev-ən
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

Although it does not follow directly from van Koppen's analysis, this paradigm is definitely compatible with the intuition that 1PL agreement in VS word order can lead to the insertion of a special form. A potential way to formalise this is that when there is agreement with the Speech Participant layer of the pronoun, not only 1SG features are copied, but also a categorial feature from SPEECHPART, which causes insertion of a special form. Further research is needed to flesh this out in more detail, yet this is a first step into accounting for the pattern in table 2.26.

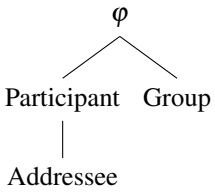
2.8 Conclusion

In this chapter, I investigated position dependent agreement (PDA) in Dutch dialects: verbal agreement that differs in subject-verb (SV) and verb-subject (VS) word order. I started by giving an empirical overview of PDA in Dutch dialects, focusing on the five most frequent PDA paradigms. Based on the empirical data, I showed that the Dutch dialects under discussion use different subsets of one shared affix inventory.

I then provided an analysis of PDA in terms of defective Probes: Probes that lack certain φ-features, and therefore cannot be valued for these features. This results in the insertion of unexpected affixes with certain person/number combinations in the agreement paradigm. For dialects with PDA, I proposed that C is a defective Probe, while T is not. Assuming that the verb is realised in T in SV word order, but in C in VS word order (Zwart, 1997), the defective Probe in C results in a difference in realisation of agreement depending on word order of the verb and the subject.

Given the three φ-features [Participant], [Addressee], and [Group], there are 6 possible defective Probes that miss one or two of those features. However, the Dutch dialect data is accounted for by only three types of defective Probes; the other three are not attested. I proposed that this can be understood if φ-features are organised according to the φ-feature geometry in (75) (cf. Harley & Ritter, 2002). A defective Probe is a Probe in which one or more features have undergone feature delinking, which is restricted by the φ-feature geometry in (75). As such, PDA provides a novel argument for a geometric organisation of φ-features.

(75)



Based on the distribution of PDA and the absence of adjacency effects on PDA, I argued that the φ-feature geometry is syntactic. This implies that φ-features are privative in syntax: [F]. However, morphological evidence on homonymy and the relation between PDA and the affix inventory shows that in morphology, features are binary: [± F]. I proposed to capture these conflicting results with the idea that privative syntactic features are translated into binary morphological features when structure is transferred from syntax to morphology. This proposal implies that syntax and morphology should be considered separate grammatical modules, not in terms of structure building, but in terms of lexicalisation of structure, and that the representation of features can vary between them (see also Preminger, 2017; Kučerová, 2019).

To conclude this chapter, I will focus on some of the consequences of the proposed distinction between the representation of φ-features in syntax and morphology. First of all, because the representation of φ-features differs across syntax and morphology, we can use feature representation as a diagnostic to locate phenomena in the

grammar. In particular, if a certain phenomenon requires reference to a feature that only has a binary representation, such as singular or third person, it must be morphological; a phenomenon that shows hierarchy effects, on the other hand, must be located in syntax. To illustrate the diagnostic, we will have a brief look at the English adnominal pronoun construction, e.g. *we linguists*. In English, this construction is impossible with third person pronouns: **they linguists*. Because banning the third person adnominal pronoun construction requires reference to third person, the diagnostic predicts that its ungrammaticality is morphological. In fact, Höhn (2020) argues that the third person adnominal pronoun construction is ungrammatical because of contextual allomorphy—a morphological explanation. If correct, the diagnostic based on feature valence makes the right prediction on the locus of the ungrammaticality of the English third person adnominal pronoun construction.

The idea that φ-features are translated to binary features for the purposes of spell out also predicts that there are differences between φ-features and features that are spelled out directly from the syntactic structure, such as case features (cf. Caha, 2009). A phenomenon with which we find such differences is syncretism. For case, it has been demonstrated that syncretism is restricted by the case hierarchy (Caha, 2009; Zompì, 2019). This means that two cases can only be syncretic if any intermediate cases on the case hierarchy show the same syncretism. For example, the nominative and the dative cannot be syncretic to the exclusion of the accusative. This type of restriction on syncretism follows under the assumption that the case hierarchy is represented in syntax as a hierarchy of projections, and spell out according to the Superset Principle: a vocabulary item that can realise both the nominative and the dative is specified for these features, and all intermediate case features. It will therefore be used for the intermediate cases as well, forcing case syncretism to adhere to the case hierarchy. Importantly, φ-features do not show restrictions on syncretism; in the domain of agreement, we can find all kinds of syncretism (see Cysouw, 2011; Harbour, 2016).[25] If φ-features were spelled out directly from the syntactic structure (i.e. the feature geometry), this would be unexpected. However, it is no problem if φ-features are spelled out based on binary features in morphology. The different behaviour of φ-features and case features in the domain of syncretism supports the idea that spell out of φ-features takes place separately from the spell out of e.g. case.

Appendix: remaining paradigms

In the data on *leven* 'to live' from the DynaSAND (Barbiers et al., 2006), I identified 15 paradigms that are relatively frequent and show clear geographical clustering. In addition to the 5 PDA paradigms that were the main focus of this chapter, these are 6 full agreement (FA) paradigms, and 4 remaining, less frequent, PDA paradigms.

The 6 FA paradigms are given below. Their geographical distribution is given in figure 2.3. These paradigms are accounted for by varying the affix inventory. No ref-

[25] Vanden Wyngaerd (2018), Moskal (2018), and Smith et al. (2019) show that there are restrictions on syncretism in the domain of pronouns, but this might be due to the structure of pronouns rather than the structure of φ-features.

erence to defective Probes is necessary, because these paradigms do not have position dependent agreement.

Table 2.27: FA paradigm 1 ($n = 6$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-Ø	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leev-ə	leev-ə
3PL	leev-ə	leev-ə

Table 2.28: FA paradigm 2 ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s(t)	leef-s(t)
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leev-ə(n)
3PL	leev-ə(n)	leev-ə(n)

Table 2.29: FA paradigm 3 ($n = 7$)

	SV	VS
1SG	lib-jə	lib-jə
2SG	lib-əst	lib-əst
3SG	lib-ət	lib-ət
1PL	lib-jə	lib-jə
2PL	lib-jə	lib-jə
3PL	lib-jə	lib-jə

Table 2.30: FA paradigm 4 ($n = 6$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s	leef-s
3SG	leef-Ø	leef-Ø
1PL	leev-ə	leev-ə
2PL	leef-Ø	leef-Ø
3PL	leev-ə	leev-ə

Table 2.31: FA paradigm 5 ($n = 5$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-Ø	leef-Ø
3SG	leef-Ø	leef-Ø
1PL	leev-ə	leev-ə
2PL	leef-Ø	leef-Ø
3PL	leev-ə	leev-ə

Table 2.32: FA paradigm 6 ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s	leef-s
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leef-t	leef-t
3PL	leev-ə	leev-ə

The 4 less frequent PDA paradigms are given in the tables below, and their geographical distribution is given in figure 2.4. These 4 paradigms do not fall out immediately for the theory proposed in this chapter, but with some additional assumptions, they can be accounted for. The first paradigm in table 2.33 was already discussed in section 2.7.2, where I suggested a potential analysis that combines the defective Probe approach to PDA with van Koppen (2005)'s approach, who argues that some types of PDA result from agreement with the internal structure of pronouns.

The paradigm in table 2.34 has PDA for 2SG and for 2PL. Assuming that C is a defective Probe that does not have [Addressee] in varieties with this paradigm would account for PDA with 2SG (in a parallel fashion to the Northern Dutch dialects), but not for PDA with 2PL, because the presence of the plural feature would still trigger

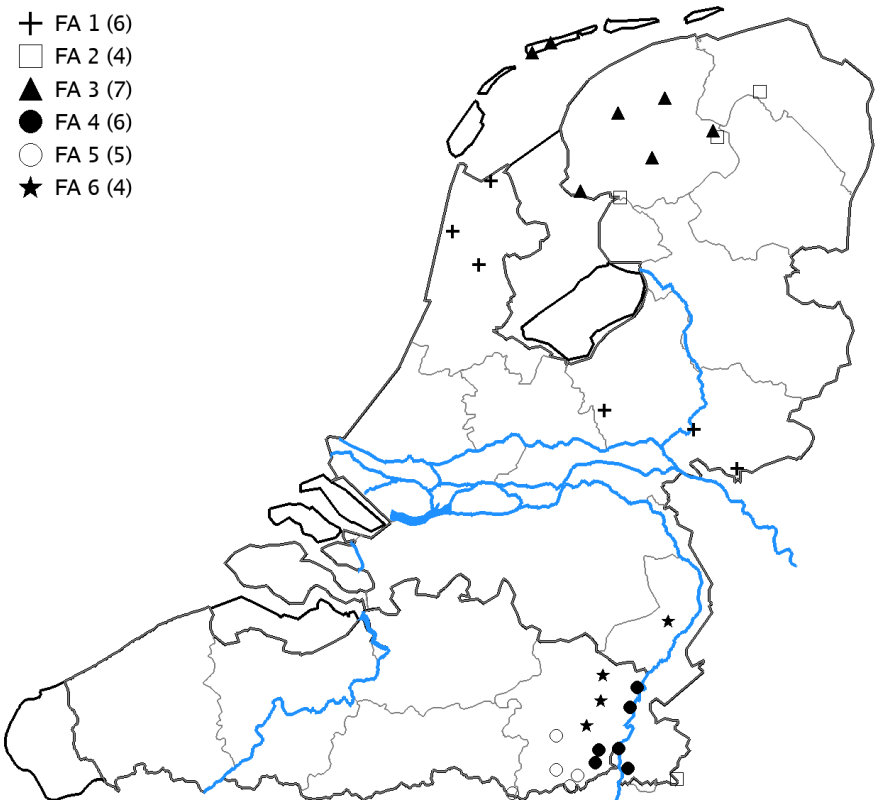


Figure 2.3: Geographical distribution of FA paradigms

insertion of *-ə(n)*. When we look at the 2PL data in more detail, we can observe that not only agreement is position dependent; in 3 out of 4 dialects, the pronoun also varies. Specifically, *jullie* is used in SV word order, and *ie* is used in VS word order. The pronoun *ie* is also used as the 2PL pronoun in neighbouring Dutch Low Saxon varieties, that have PDA with 2PL. It thus seems to be the case that the paradigm in table 2.34 reflects properties of both Northern Dutch dialects, and Dutch Low Saxon dialects, depending on word order and pronoun.

The paradigm in table 2.35 is perhaps not problematic at all, depending on the interpretation of *-ə* in 1SG. Many dialects show an alternation between *-ə* and Ø in 1SG, in particular in SV word order. VS word order typically uses Ø, presumably because of phonological factors: the 1SG pronoun starts with a vowel, which leads to deletion of *-ə*. However, some exceptions to this can be observed, i.e. in some cases *-ə* is even used in VS word order. In this light, it is not clear whether *-ə* in table 2.35 should be seen as a unique affix with its own specification, or as an allomorph of Ø. In case the latter is correct, the paradigm in table 2.35 should be treated similar

to the Hollandic Dutch paradigm in table 2.1, which was analysed with a defective Probe that lacks [Addressee]. This interpretation is also compatible with the observed regularities in other PDA paradigms, such as that the affix used in the PDA context is never a new affix. Further research into these varieties is required to confirm whether this interpretation is correct.

The final paradigm in table 2.36 has PDA with 2PL, but not with 2SG. This paradigm could come about as follows. The first thing to note is that many Limburgian varieties use a variant of *gij* as the 2PL pronoun. In neighbouring Brabantic varieties, *gij* functions as a number neutral form, that can be made plural by adding a plural ending (as discussed in section 2.2.1). It is possible that in at least some Limburgian dialects, *gij* shows the same number-neutral behaviour. This means that in terms of agreement, it behaves as if it were a 2SG pronoun. This is also compatible with the *-t* (elsewhere) affix being used with 2PL, rather than the general plural affix *-ə*. If C has a defective Probe that does not have an [Addressee] feature, then this would lead to insertion of the 1SG affix in the 2PL VS context, accounting for PDA. Assuming that this is correct, the next question is why there is no PDA in 2SG, as the 1SG affix should also be used in VS in this context. As I will argue in the next chapter, the Limburgian 2SG morpheme *-s* behaves more like a clitic than an agreement marker. If *-s* is a clitic, and thus a pronominal element, it should not be affected by the presence or absence of certain features on the Probe. This might explain why there is no PDA with 2SG in table 2.36. If the proposed account for this paradigm is on the right track, the expectation would be that it is not very stable, because it partially relies on influence from Brabantic, and it misses evidence for a defective Probe compared to other varieties that have PDA with 2SG. This in fact fits in well with the observation that the Limburgian language area shows a lot of variation in terms of agreement paradigms, as can be seen in figures 2.3 and 2.4.

Table 2.33: PDA paradigm 1 ($n = 5$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leef-t	leev-ən
2PL	leef-t	leef-Ø
3PL	leef-t	leef-t

Table 2.34: PDA paradigm 2 ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leev-ə(n)	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leef-Ø
3PL	leev-ə(n)	leev-ə(n)

Table 2.35: PDA paradigm 3 ($n = 4$)

	SV	VS
1SG	leev-ə	leev-ə
2SG	leef-t	leef-Ø
3SG	leef-t	leef-t
1PL	leev-ə(n)	leev-ə(n)
2PL	leev-ə(n)	leev-ə(n)
3PL	leev-ə(n)	leev-ə(n)

Table 2.36: PDA paradigm 4 ($n = 4$)

	SV	VS
1SG	leef-Ø	leef-Ø
2SG	leef-s	leef-s
3SG	leef-t	leef-t
1PL	leev-ə	leev-ə
2PL	leef-t	leef-Ø
3PL	leev-ə	leev-ə

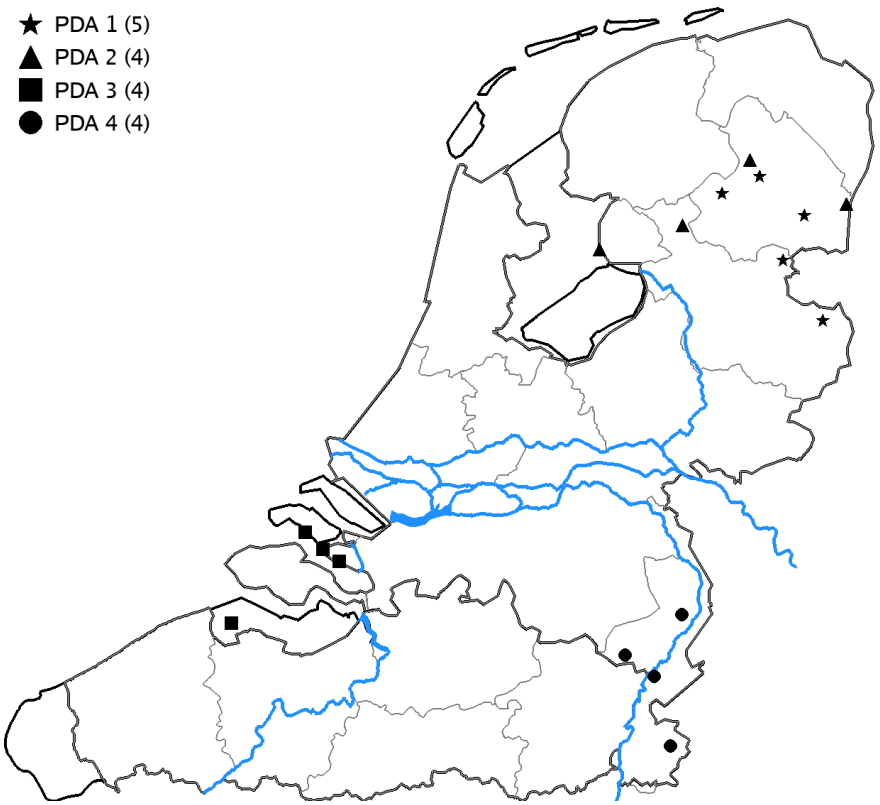


Figure 2.4: Geographical distribution of minor PDA paradigms