

Words and Features

Paula Fenger and Maria Kouneli

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1 Introduction

On the surface, one might think that features and words are two sides of the same coin. Even though this is the case in some theories of the syntax-morphology interface, it is by no means an issue that is settled. It is clear, however, that features and/or words constitute the primitives that enter the syntactic derivation, and therefore merit careful investigation.

In this chapter, we address questions related to cross-linguistic variation in the organization of features and their morphological expression in words (or morphemes), focusing on implications for syntax. Some of the questions that we consider are the following: do languages vary in their feature inventory, and if so, what are the syntactic consequences of this variation? What are the limits of variation in how features are organized in the syntax, and how they are expressed in the morphology?

Since these are broad (open-ended) questions, which can be looked at from various angles, the chapter is centered around a couple of core topics. These topics have featured in debates relating to these questions, but are by no means the only topics that could be chosen. Thus, whenever possible we point out links to other, related issues. First, in Section 2, we address basic questions about feature ontology (and specifically the privative vs. binary distinction), which is illustrated by focusing on phi-features. In Section 3 we discuss variation in how features are packaged on syntactic heads, by focusing mainly on the C and voice domain. We then very briefly discuss in Section 4 whether syntax should be able to look inside words, especially as this relates to the Mirror Principle. In Section 5, we discuss variation in how features are morphologically expressed in various languages, focusing on correlations with syntactic effects. In Section 6, we dive deeper into the question of whether variation in (internal) word structure has syntactic consequences, with an emphasis on the literature on polysynthesis and (non-)configurationality; in Section 7, we conclude.¹

¹Abbreviations follow the Leipzig glossing rules, with the following additions/modifications: DEC =

2 Feature Ontology

In this section, we focus specifically on phi features (person, number, gender), which are the features that generally participate in syntactic operations such as agreement. We will not be discussing other types of features that have been postulated in the literature (e.g. features like [topic] or [focus] relating to information structure, edge features driving intermediate movement steps etc. - see the Chapters on Information Structure, A-dependencies and A'-dependencies for discussion).

A question that our theory of features should be able to answer is the following: what is the inventory of available phi features? Is this inventory universal? It is clear that languages vary in the distinctions they make in the domains of person, number, and gender. For example, not all languages have a clusivity contrast in 1PL, a fact that is often modelled via the presence vs. absence of the relevant feature in a given language (e.g. [ADDRESSEE]/[HEARER] in Harley and Ritter 2002, Nevins 2007 a.o.). This type of analysis reflects the general consensus that there is an inventory of features, but languages vary in which features they draw from this inventory.² Thus, a more interesting question is not what the features are, but rather how features are structured.³ In this section, we focus on one debate in this domain: are phi features privative (and/or organized in geometries) or binary? As we will see, there is no straightforward answer to this question, but we go over the main arguments for binary or privative features in the domain of person and number.

The distinction between privative and binary features has been important in phonology, and especially theories of underspecification, since at least Trubetzkoy (1969). Taking vowel backness as an example, a theory employing privative features represents back vowels as vowels possessing the feature [back], while all other vowels would simply lack this feature. In a theory employing binary features, on the other hand, back vowels are specified as [+back], while other vowels could be specified as [-back] or as lacking a [+/-back] feature altogether. While privative and binary features could be used interchangeably for certain phenomena, they also make different predictions: i) in a privative system, there is a two-way contrast (presence vs. absence of a feature), while a binary system allows for a three-way contrast ([+] vs. [-] vs. absence), ii) in a binary system, rules could make reference to either the [+] or [-] value of a feature, while only the former is a possibility in a privative system.⁴

decausative, DIS.PAST = distant past, INV = inverse, PART = particle, PREP = preposition, SIM = simultaneous. In examples taken from the literature, glosses were sometimes adjusted to follow the Leipzig rules.

²For concrete recent proposals of inventories meant to capture typological generalizations, see e.g. Harbour (2016), Ackema and Neeleman (2018) on person, Harbour (2007, 2014) on number, and Kramer (2015) on gender.

³See also Adger and Harbour (2008) for a historical overview of the theory of features in linguistic theory.

⁴See Calabrese (1995), among others, for a discussion of feature markedness in relation to rule

Some of the questions that arise for phi features are thus the following: is the privative vs. binary distinction meaningful in the context of syntactic operations? If so, are features like person and number to be represented as privative or binary? Is their representation uniform across languages or do we find variation? We proceed to review some of the answers that have been given in the literature, highlighting remaining issues and debates.⁵

Starting with the representation of person, the feature geometry proposed by Harley and Ritter (2002) has been often employed (with small modifications) for analyses of syntactic phenomena such as agreement displacement (e.g. Béjar 2003) or P(erson) C(ase) C(onstraint) effects (see Anagnostopoulou 2017 for an overview). The former type of phenomenon is illustrated in (1) with data from Chirag Dargwa (Nakh-Daghestani): we see in (a) and (b) that the verb usually agrees with the subject in person, but it agrees with the object in (c), where the subject is third-person and the object is a local person (i.e. first or second person).

(1) Chirag Dargwa (Deal 2022, p.6, emphasis ours)

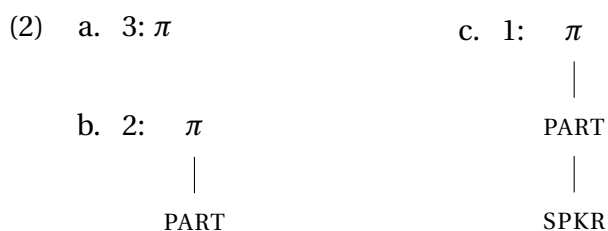
- a. dicce ʕu/ it r-iqqan-**da**
 1SG-ERG 2SG(ABS)/ 3SG(ABS) F-lead-1
 ‘I lead you/her.’
- b. ʕicce du r-iqqan-**de**
 2SG-ERG 1SG(ABS) F-lead-2
 ‘You lead me.’
- c. ite du r-iqqan-**da**
 3SG-ERG 1SG(ABS) F-lead-1
 ‘He/she leads me.’

Thus, agreement in Chirag Dargwa is driven by a preference for local person. This system contrasts with that in English and other European languages, where the verb agrees with the subject irrespective of its person. Béjar (2003) is the first one to propose that agreement systems of both the English and the Chirag Dargwa type can receive a uniform explanation once we assume: i) a more fine-grained structure of phi features, and ii) articulated probes (i.e. probes that can be ‘picky’ with respect to the person features that they are looking for). According to Béjar (2003), languages mostly vary with respect to the location of the agreement probe in the clausal spine and its exact specification. While there is some room for variation in the representation of phi features in individual languages, in her system this is restricted to whether

application.

⁵We choose to focus on person and number and exclude gender, since there is a significantly smaller body of theoretical literature on the cross-linguistic picture in this domain; we simply note that Kramer (2015), one of the most comprehensive studies of gender, argues in favor of binary representations for gender features.

third-person is completely underspecified or specified as π .⁶ What is uniform across languages, however, is the privative nature of person features and their organization in a geometry, reflecting semantic entailments among features (e.g. the presence of a [SPEAKER] feature entails the presence of a [PARTICIPANT] feature). The geometries she assumes for third, second and first person in Georgian (Kartvelian) is illustrated in (2).



Harley and Ritter (2002) developed their feature geometry in order to account for cross-linguistic variation in pronominal inventories; the motivation was, thus, primarily morphological (it was also semantic in the sense that entailment relations are captured). Béjar (2003) was the first one to show that the representation of phi features had clear effects on syntactic operations such as Agree. Her account has been very influential, and most subsequent work on agreement displacement and the PCC employs privative features organized in geometries (e.g. Béjar and Rezac 2009, Preminger 2014, Oxford 2019, Stegovec 2020, Coon and Keine 2021, Deal 2021).

Does the common (and successful) adoption of privative features in analyses of person agreement phenomena mean that syntax is never sensitive to binary person representations? The answer is not clear, since most analyses of agreement that use privative features can be easily reformulated in terms of binary features. For example, Deal (2021, fn. 42) explicitly states that her theory of variation in PCC effects is compatible with binary representations. While Béjar (2003) analyzes agreement in Georgian in terms of privative features, Nevins (2011) assumes binary person features for the same language. Similarly, Oxford (2019) and Hammerly (2020) both analyze person-driven agreement in Algonquian languages, but the former adopts privative and the latter adopts binary features. If privative and binary features are mostly interchangeable, the question is how we can choose between the two options.

Two conceptual arguments have been put forth in favor of binary person feature representations in the syntax. First, a set-based theory of features allows us to get rid of geometries, which are unmotivated extra-syntactic objects (e.g. Harbour 2016, Hammerly 2021a). Second, while the arguments for binary features in the syntax are not as strong, there is evidence for binary person representations in the morphology (e.g. syncretism of 2nd and 3rd person to the exclusion of 1st, the 3rd person

⁶There is also variation in whether languages have a [SPEAKER] or [HEARER] feature.

singular agreement suffix *-s* in English). Since binary features may be necessary for morphology, postulating the same representation in the syntax could be the most straightforward assumption.⁷

As for empirical arguments in favor of/against binary features, Nevins (2011) makes an interesting case based on an asymmetry between person and number agreement. First, while PCC effects are typologically common, he claims that Number Case Constraint (NCC) effects are unattested (this would be, for example, an ungrammatical combination of a plural indirect object and a singular direct object). Second, Nevins (2011) discusses a phenomenon that he calls ‘omnivorous number’, where a single plural morpheme can cross-reference the subject, the object, or both, as illustrated by the Georgian example in (3). Nevins’ observation is that there is no equivalent phenomenon of ‘omnivorous person’.

- (3) g- xedav -t
2OBJ- saw- PL
‘I saw y’all; we saw y’all; he saw y’all; we saw you’ Georgian (Nevins 2011, p.941)

Nevins (2011) builds on his Multiple Agree analysis of PCC effects in Nevins (2007) to argue that these observations receive a straightforward explanation if person and number features have a different representation in the syntax: person is binary, while number is privative. His work thus exemplifies an approach where the binary vs. privative distinction has syntactic consequences.

Let’s look at the gist of the argument. Suppose a probe *X* is looking for local person arguments, specified in (4a)-(4b) as [+PART]. Then, according to the theory developed in Nevins (2007), agreement with a local person will succeed in (4a), but not in (4b), because in the latter case the [-PART] feature of the intervening 3rd person blocks agreement with the lower argument. This predicts both PCC effects (*3>1 in the case of 4b) and the absence of omnivorous person, since the probe cannot agree with the lower argument if a particular type of higher argument intervenes. If number features are binary, as represented in (4c), similar predictions would be made: agreement should be blocked in (4c), for example, predicting the lack of omnivorous number (and existence of NCC effects) contrary to fact (cf. 3). The answer, according to Nevins, lies in a privative representation for number: if singular is the absence of number features, then there should be no intervention effects in number agreement, which correctly derives the attested patterns.

⁷There are two reasons to consider this assumption reasonable. First, Nevins (2008) argues for cross-modular parallelism in the domain of phi features. Second, if morphology is indeed sensitive to binary features, but features have privative representations in the syntax, theories of the morphology-syntax interface like DM need a ‘translation’ mechanism (such a mechanism is proposed by Nevins 2011 for number, as discussed later in this section); postulating binary features in the syntax allows us to dispense with such an operation.

- (4) a. 1st person over 3rd person: $X_{[+PART]}\dots [+PART, +SPKR]\dots [-PART, -SPKR]$
 b. 3rd person over 1st person: $X_{[+PART]}\dots [-PART, -SPKR]\dots [+PART, +SPKR]$
 c. Singular over plural: $Y_{[-SG]}\dots [+SG]\dots [-SG]$

While Nevins' (2011) analysis successfully derives the complementarity that we observe between person and number agreement, the arguments for binary vs. privative representations only hold insofar as one adopts his model of Multiple Agree (Nevins 2007). For example, Béjar (2011) and Coon and Keine (2021) have both provided alternative accounts of the observed asymmetry employing a Cyclic Agree model with privative representations for both person and number.⁸ It is therefore an open question whether postulating a different ontology for person vs. number features is the best explanation for the agreement differences between the two categories of phi features.

So far, we have discussed work that assumes privative representations for both person and number, as well as Nevins' (2011) account where person is binary but number is privative. One may therefore conclude that there is a consensus regarding the privacy of number features. While this is indeed a common view in the syntactic literature, Harbour (2007, 2011) and Kouneli (2021) have shown that there are languages with a number-based noun classification system which provide evidence for binary number features. For example, many Nilo-Saharan languages display a tripartite system of number marking, exemplified in (5) with data from Didinga (Surmic): some nouns are (morphologically) unmarked in the singular and form their plural with a plural suffix (a), some are unmarked in the plural and form their singular with a singulative (b), while a third class takes an affix in both singular and plural (c).

- (5) *Number marking in Didinga* (Lohitare et al. 2012)
- | | | | |
|-------------------------------|------------------------|-------------------------|-----------------|
| a. Inherently singular nouns: | keem (SG) | keem- nya (PL) | 'camp' |
| b. Inherently plural nouns: | mining- it (SG) | mining (PL) | 'spirit, ghost' |
| c. Numberless nouns: | boloth- it (SG) | boloth- nya (PL) | 'young bull' |

Kouneli (2021) shows that the three classes are semantically coherent (at least to a certain extent), with the inherently plural class containing nouns that usually appear in groups. She therefore proposes that nouns in Nilo-Saharan languages come with inherent number features (modelled as features on the nominalizing head little *n* in DM). The three classes of nouns in (5) are analyzed as in (6).

- (6) a. Inherently singular: $n_{[+SG]}$

⁸There is also the important question of whether Nevins' empirical generalization (no NCC effects, no omnivorous person) is correct. While some counterexamples have appeared in the literature (e.g. Béjar 2011, Bossi 2021 on omnivorous person and Coon et al. 2017, Keine et al. 2019 on NCC effects), it is not clear that they are robust and/or that they are problematic for Nevins' analysis. This is especially true for the documented omnivorous person patterns (e.g. Bossi 2021 shows that the Kipsigis pattern should receive a morphological explanation).

- b. Inherently plural: $n_{[-SG]}$
- c. Numberless: n

Kouneli (2021) argues that the pattern in (5) is derived as follows: singulative and plural affixes spell out a Num head which hosts interpretable [+/-SG] features (Ritter 1991 a.o.). When no number affix is present (i.e. in the singular of inherently singular nouns and in the plural of inherently plural nouns), the syntactic configuration includes a Num head with identical features to those on the little n head (e.g. a [-SG] n and a [-SG] Num head in the case of plural forms of inherently plural nouns). Kouneli (2021) argues that in this case, the post-syntactic operation of Obliteration (Pescarini 2010, Calabrese 2011, Arregi and Nevins 2012, Martinović 2017) takes place for dissimilation purposes, deleting the Num node. Binary representations of number features are crucial for this analysis, since they correctly predict three number classes (as opposed to two classes predicted by privative features), a stable property of Nilo-Saharan number systems; binary representations also allow for the Obliteration rule to refer to both positive and negative values (using α notation).

At this point, one may argue that the evidence for binary number features in Nilo-Saharan is purely morphological. Indeed, Blix (2022) does just that and provides a Nanosyntactic alternative employing privative features. Furthermore, Nevins (2011) recognizes that binary number features may be needed in the morphology, and proposes a ‘translation’ mechanism turning syntactic privative features into binary features in the morphological component (at least in certain cases). However, such a mechanism makes the wrong predictions for Nilo-Saharan: if number features are privative in the syntax, one would assume the following specifications for the three noun classes in (6):

- (7) a. Inherently singular nouns: \emptyset
- b. Inherently plural nouns: PL
- c. Numberless: \emptyset

Since both inherently singular and numberless nouns are underspecified in the syntax, any translation mechanism applying to (7) would treat them alike, and there would be no way to differentiate them in the morphology. Thus it is impossible to derive the three classes without postulating number features in the syntax as well.⁹

⁹A reviewer suggests the following alternative to (7), which employs privative features:

- (1) a. Inherently singular nouns: SG
- b. Inherently plural nouns: SG, PL
- c. Numberless: \emptyset

Note, however, that in this case both SG and PL features are used, which goes against theories like Nevins’, where singular is necessarily the absence of number features in the syntax. Furthermore, it

Agreement in Kiowa (Kiowa-Tanoan) provides an additional argument for binary number features in the syntax. Kiowa, just like Nilo-Saharan languages, has a noun classification system based on number (Harbour 2007, 2011).¹⁰ Interestingly, when a noun with a [-SG] specification appears in the singular (i.e. combines with a [+SG] Num head), then the inverse morpheme is used. This is illustrated in (8), where *óópíí* ‘fish’ - a [-SG] noun in Harbour’s (2011) analysis - appears with the inverse when used in the singular. Harbour (2007, 2011) provides additional data that show that the inverse cannot be spelling out a specific number value, but rather is used when a certain head (D in his analysis) simultaneously agrees with the [+] and [-] value of a number feature. These data are very difficult to capture in a privative system that treats singular as the absence of number features.

- (8) *óópíí-dó e-dóó*
 fish-INV 3INV-be
 ‘It’s some fish.’ Kiowa (Harbour 2011, p.564)

Summing up, there is no consensus on the privative vs. binary representation of phi features, and it is not yet clear whether syntax is sensitive to the distinction. What is interesting, however, is that there is conflicting evidence from different languages and/or phenomena; for example, there is strong evidence for binary features in Nilo-Saharan languages, but these languages are also typologically rare in marking singular overtly. This brings up the question of whether there could be cross-linguistic variation in the privative vs. binary representation of a given category.

3 How Many Features on a Head?

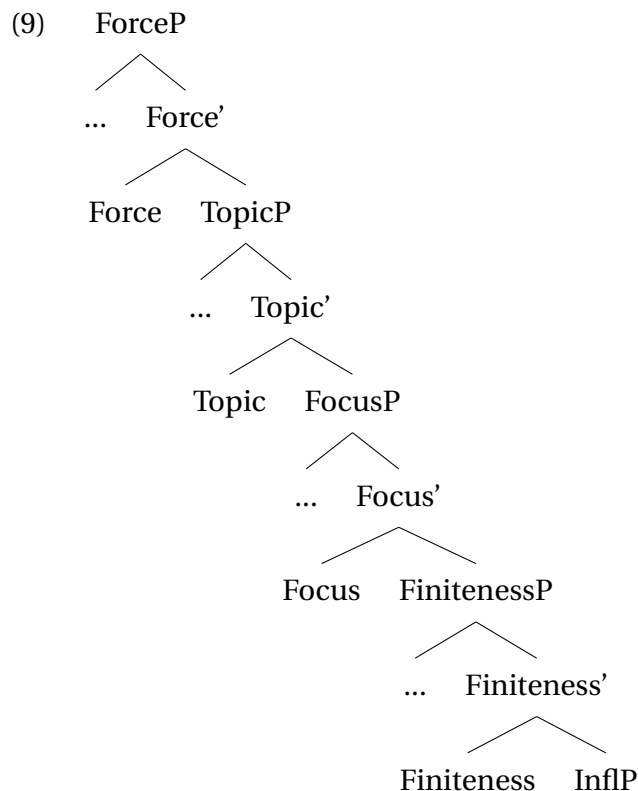
Having briefly discussed the ontology of linguistic features, in this section, we address the question of how features are organized in the clausal spine. We specifically focus on how features are ‘packaged’ on syntactic heads, where we find (at least) two analytical options: either there is a restriction of one feature per head (e.g. Kayne 2005, Starke 2018) or syntactic heads are able to host multiple features (‘bundling’; see Hsu 2021, 43-44 for references). Within the latter family of approaches, languages have been argued to vary with respect to whether features are bundled or not, leading to interesting syntactic differences.¹¹

is not clear whether the existence of both SG and PL make significantly different predictions from a binary system; if anything, four number classes are predicted to be possible (a class with just a PL feature in addition to the ones in 1), which, to my knowledge, are never attested in Nilo-Saharan.

¹⁰Kiowa, however, has a more complex system that features more than three classes. Part of the additional complexity comes from the fact that Kiowa makes a singular-dual-plural distinction, unlike most Nilo-Saharan languages, which do not have a dual.

¹¹We will be focusing on the distribution of *interpretable* features on syntactic heads. The distribution of *uninterpretable* features often reduces to the question of where agreement probes are located

In a hallmark paper on comparative syntax, Pollock (1989) proposes that what was then known as the IP should be split into at least two projections. This line of work initiated the cartographic research program, where a highly articulated structure is assumed and heads are merged in a fixed order in all languages (e.g. Rizzi 1997, Cinque 1999, Cinque and Rizzi 2009). For example, Benincà and Poletto (2004) postulate the internal structure in (9) for the CP domain.



The projections in (9) have been motivated on the basis of robust typological generalizations, as well as evidence for overt realizations of those heads in various languages (e.g. Aboh 2016). However, it is clear that very few languages - if any - provide evidence for every single projection in their grammar, leading to a long-standing debate regarding cartographic structures: are all projections universally present or is there variation?

On one view, all projections are universally present, but some heads and/or specifiers may be silent in a particular language.¹² Given how articulated these structures are, it is common for proponents of this view to also explicitly assume that each head

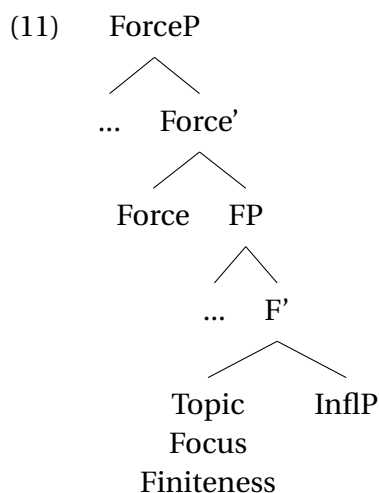
in the clause. As already mentioned in the previous section, there is work (e.g. Béjar 2003) according to which languages vary with respect to which heads are able to host these probes. See also the Chapter on Agreement and concord.

¹²Erlewine (2016) gives an argument from Anti-locality against this view: certain configurations that

may only host one feature. A formulation of this principle is given in (10), which has been recently adopted in Nanosyntactic accounts of various morphosyntactic phenomena (e.g. Taraldsen et al. 2018).

- (10) *One Feature Per Head (OFPH)* (Kayne 2005, p.212)
 ‘UG imposes a maximum of one interpretable syntactic feature per lexical item’

On a different view, what is universal is the order in which features/heads may merge in the clausal spine, but languages vary in whether each feature corresponds to one head or whether multiple features can be hosted on the same head (e.g. Giorgi and Pianesi 1997). Taking the hierarchy in (9) as an example, what this means is that there may be a language X with structures just like (9), while a language Y may have a representation as in (11), where some of the features are bundled on one head (labeled F for convenience). Note that not all bundling combinations are possible under this view, since bundling must still respect the functional sequence; [Finiteness], for example, cannot be bundled with [Topic] to the exclusion of intervening [Focus].¹³



Setting aside possible conceptual arguments for or against the two views (OFPH vs. bundling), the structures in (9) and (11) make different empirical predictions. The

are ruled out because of movement that is too local are wrongly predicted to be grammatical if silent projections (which are not backed up by LF/PF evidence) intervene.

¹³There is yet a third view, often called the *WYSIWYG* (*What You See Is What You Get*) approach, according to which features (and the heads hosting them) should only be postulated for a given language if there is evidence for them at LF/PF (e.g. Koenenman 2000, Nilsen 2003, Zeijlstra 2008, 2014). Under this view, the projections included in cartographic structures are not universally present. WYSIWYG and the bundling family of approaches usually agree on the number of heads present in the syntax (which are fewer than those present in the cartographic structures). However, bundling usually presupposes that the features are present, but simply bundled on one head; in WYSIWYG, on the other hand, there is no such claim and features are postulated only if there is evidence for them.

most obvious one comes from the different number of available heads and specifiers in the two structures, which should have effects on possible movement operations. Thus if languages vary with respect to whether they allow bundling/which features they bundle, we expect to find cross-linguistic variation in movement patterns. We illustrate here with recent work by Hsu (2017, 2021), who argues that differences in bundling of the relevant heads in the C domain can account for variation between languages with ‘strict’ vs. ‘relaxed’ V2 effects.¹⁴

It is well-known that some languages display a V2 effect: the verb must occupy the second position in the clause, being preceded by exactly one constituent. This is illustrated in (12) with an example from German (Germanic), where a subject (12a), an object (12b), or an adverb (12c) can appear in the pre-verbal position, but ungrammaticality results if two constituents precede the verb (12d). This word order pattern has received significant attention in the Germanic literature (see Holmberg 2015 for an overview), but is attested in other language families as well (see e.g. van Urk 2015 on the Nilotic language Dinka).

- (12) a. [Ich] **habe** gestern ein Buch gelesen.
 1SG.NOM have.1SG yesterday a.ACC book.ACC read.PTCP
- b. [Ein Buch] **habe** ich gestern gelesen.
 a.ACC book.ACC have.1SG 1SG.NOM yesterday read.PTCP
- c. [Gestern] **habe** ich ein Buch gelesen.
 yesterday have.1SG 1SG.NOM a.ACC book.ACC read.PTCP
- d. *[Ich] [ein Buch] **habe** gestern gelesen.
 1SG.NOM a.ACC book.ACC have.1SG yesterday read.PTCP
 ‘I read a book yesterday.’ German

The traditional analysis of V2 effects of the German type postulates V-to-C movement, followed by obligatory phrasal movement of a constituent to SpecCP (den Besten 1977, 1989). As for the discourse role of the moved constituent, it has been observed that items with a variety of information structure properties (e.g. topic or focus) can occupy SpecCP in V2 languages (see e.g. Fanselow 2009 on German and van Urk 2015 on Dinka). The traditional analysis of V2 coupled with this observation looks surprising if the underlying structure of all languages includes an articulated hierarchy like that in (9): which of those heads would the verb land on and why can only one of these multiple specifiers be occupied? The data do receive a straightforward explanation, however, if the left peripheral heads in German are bundled. A concrete proposal along these lines is developed by Hsu (2021), who argues that in German the features in (9) are bundled into one head as in (13); this way only one specifier position is available for movement.

¹⁴See also Bobaljik and Thráinsson (1998) for early work on cross-linguistic differences in the (non-)availability of multiple specifiers in the T/Agr domain.

(13) German V2 (Hsu 2017, ex. 50, p.64)

[Force/Top/Foc/FinP XP V-Force/Top/Foc/Fin⁰ [TP...V⁰

More interestingly, there are languages with ‘relaxed’ V2 effects of various sorts. A nice example (in comparison to German) comes from Ingush (Nakh-Daghestani) as described by Nichols (2011). As shown in (14), the language generally displays V2 word order. However, when a topic and a focus co-occur, V3 is allowed, as shown in (15); crucially, in this case the topicalized and focused items appear in a fixed order, which is the one predicted by the cartographic structure in (9) (Topic < Focus).¹⁵

(14) a. [Xii] **mol**=ii wa?

water drink=Q 2SG.ERG

‘Would you like a drink of water?’

b. [Muusaa] **vy** hwuona telefon jettazh.

Musa AGR.PROG 2SG.DAT telephone strike.CVB.SIM

‘Musa’s calling you / Musa’s on the phone for you.’ Ingush, (Hsu 2017, p.9)

(15) a. [Jurta jistie] [joaqqa sag] **ull** cymogazh jolazh.

town.GEN nearby AGR.old person lie.PRS sick.CVB.SIM AGR.PROG.CVB.SIM

‘In the next town an old woman is sick.’

b. [Mista xudar] [myshta] **duora**?

sour porridge how AGR.make.IPFV

‘How did they make sour porridge?’

Ingush, (Hsu 2017, p.9)

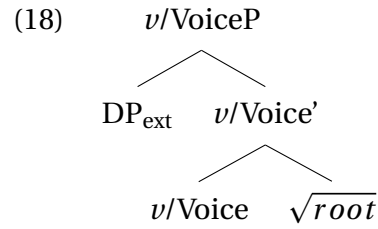
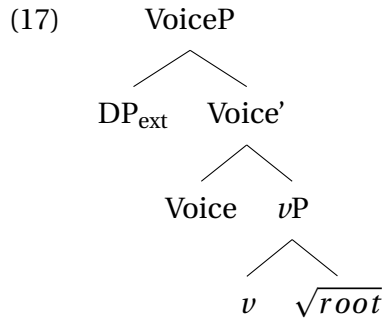
Allowing for variation in which features of the left periphery are bundled provides a straightforward way to account for the difference between German and Ingush: while all features are hosted on one head in the former, topic and focus are not bundled in the latter. A concrete proposal is offered by Hsu (2021):

(16) Ingush V2 (Hsu 2021, ex.51, p.64)

[Force/TopP XP_{top} [Foc/FinP (XP_{Foc}) V-Foc/Fin⁰ [TP... V⁰

Another domain in which bundling vs. non-bundling has been extensively used as a tool for explaining syntactic variation is the thematic domain, especially with respect to causative syntax. More specifically, there is a body of literature, often couched in the framework of DM, which argues for the presence of (at least) two heads above the verbal root: little *v*, responsible for event/causative semantics, and Voice (Kratzer 1996), responsible for introducing the external argument (Pylkkänen e.g. 2008, Marantz e.g. 2013, Harley e.g. 2013, Legate e.g. 2014, Wood e.g. 2015, Wood and Marantz e.g. 2017, Kastner e.g. 2020, Nie e.g. 2020, Tyler e.g. 2020; see also the Chapter on Voice). Pylkkänen (2008) proposes that languages vary in whether *v* and Voice are distinct heads, as in (17), or they are bundled together, as in (18).

¹⁵Germanic languages also allow V3 orders in certain cases, but the phenomenon is more restricted and has differences from V3 in languages like Ingush (see Holmberg 2015 for an overview).



In practice this means that in languages with the structure in (18), the same head will introduce both event semantics and the external argument, in contrast to languages with the structure in (17) where these functions are distributed over two heads. This difference in structure is associated with concrete syntactic effects, which are summarized as follows by Harley (2017):

- (19) *Syntactic differences between bundling and splitting languages* (Harley 2017, ex.24, p.16)
- a. Voice-bundling language:
 - (i) has relationship between verbalizing morphology and Agent introduction
 - (ii) can have relationship between internal case checking and Agent introduction
 - (iii) has a single position of exponence for verbalizing, causativizing, inchoative, and “passivizing” morphology.
 - b. Voice-splitting language:
 - (i) has agglutinating (“stacking”) passive morphology
 - (ii) can have high applicatives
 - (iii) can show causative morphology in the absence of a syntactic Causer argument.

To illustrate the variation with actual data, the structures in (17)-(18) predict that the introduction of an external argument goes hand-in-hand with both being a verb and assigning internal case in bundling languages, but not in splitting languages (as outlined in 19 above). Harley (2017) shows that this prediction is borne out, for example, for Chol (Mayan), a bundling language (Coon and Preminger 2013), and Hiaki (Uto-Aztecan), a splitting language. As can be seen in (20), the intransitive use of the verb ‘dance’ in (20a) involves non-verbal predication, while the transitive variant (where there is a DP object) in (20b) involves overt verbalizing morphology on the root. In Hiaki, on the other hand, even intransitive verbs include verbal morphology, as shown by the example in (21) where there is an intransitive morpheme present.

- (20) a. Choñkol-oñ tyi **soñ**
 PROG-ABS.1P PREP dance
 ‘I am dancing.’
- b. Choñkol **k-soñ-iñ** bals
 PROG ERG.1P-dance-V_{TR} waltz_N
 ‘I am dancing a waltz.’ Chol (Harley 2017, p.6)
- (21) Uu vaaso ham-**te-k**
 the.NOM glass break-INTR-PRF
 ‘The glass broke.’ Hiaki (Harley 2017, p.10)

Since Pykkänen’s (2008) work, there has been evidence for additional projections in the *v* domain (e.g. CausP), leading to cartographic structures (e.g. Key 2013, Sundaresan and McFadden 2017). Harley (2017) incorporates these findings into a theory of bundling, arguing that languages vary in exactly which/how many of these projections are bundled. This is of course reminiscent of the earlier discussion on V2, and illustrates how (non-)bundling has played a prominent role in accounts of syntactic variation in various domains.

Before closing this section, it is worth discussing *at which point* in the derivation bundling takes place. According to the most common view, features are merged following the functional sequence, but can be bundled on a given head in the lexicon (i.e. before entering the syntax) (e.g. Giorgi and Pianesi 1997). Hsu (2021) has recently proposed an alternative to the pre-syntactic view, arguing for a syntactic operation of Coalescence that is able to create heads with multiple features *during* the syntactic derivation. His theory aims to unify bundling phenomena of the sort discussed here with adjunction structures created by head movement.

Summing up, there is a debate on how many features a given head may host, with most work assuming (implicitly or explicitly) that bundling is possible. Variation in bundling possibilities has been used as a tool to account for cross-linguistic variation in a range of phenomena.

Having discussed how features may be organized, we now move on to discuss how features may be expressed morphologically, focusing on whether different types of morphological exponence correlate with syntactic differences. We start with the question of whether syntax manipulates morphemes or words in the next section.

4 Features or Words: The Mirror Principle

One of the questions that is relevant in light of this chapter and the relation to syntax, is whether syntax is in fact manipulating features (or morphemes), or complete words, and is related to debates on the morphology-syntax interface. Much can be

said on this topic, but one well-known argument that syntax seems to deal with decomposed words, and must look at hierarchical structure inside words comes from work related to the Mirror Principle (Baker 1985). This can be illustrated with the Quechua (Quechua family) in (22). Both words correspond to complete sentences, and both have a reciprocal and a causative morpheme, but in a different linear order.

- (22) a. Maqa **-naku** -ya **-chi** -n
 beat -RECP -DUR -CAUS -3S
 ‘He_j is causing them_i to beat each other_i’
- b. Maqa **-chi** **-naku** -rka -n
 beat -CAUS -RECP -PL -3S
 ‘They_i let someone_j beat each other_i’ Quechua, (Muysken 1981)

Crucially, as can be seen in the example, the linear order of the morphemes is important for how the arguments of the verb relate to each other. This type of data has been used in a debate on how much the morphological and syntactic module need to be able to talk to each other, cf. Di Sciullo and Williams (1984), Baker (1985). Specifically, Baker (1985) has argued that the data in (22) provide evidence that the syntax needs to see the hierarchical structure of the morphemes, and cannot deal with the undecomposed words. If the latter would be the case, the feature bundles of each of the words would be the same, and there is no information about the compositionality of the word, which is relevant for the meaning. Thus, the data in (22) have been used to argue for the following principle:

- (23) *The Mirror Principle* (Baker 1985, p.375)
 Morphological derivations must directly reflect syntactic derivations (and vice versa)

The Mirror Principle has been used as one of the starting points for frameworks where morphology and syntax are closely connected (e.g. DM or Nanosyntax), but the debate has not been settled, since there are also places where morphology seems to violate the syntactic order.¹⁶

5 Expressing Features: Affix, Clitic, Word

Having discussed whether languages have a universal feature inventory, and features in relation to morpheme order, the question remains how these features are expressed cross-linguistically: in a single or multi-word expression. The starting point

¹⁶See Myler (2021) for a recent overview of Mirror Principle violations and possible accounts thereof and Bruening (2018) for an overview of the arguments for and against syntactic operations being able to see inside words (see also the chapter on Externalization: morphology and phonology, and Externalization: Linearization).

for this section is the observation that languages seem to have different morphological templates to express features in single or multiple morpho-syntactic units, and whether these different templates are indicative of deep syntactic differences or not. The discussion in this section will mainly revolve around functional heads in the verbal domain, since there are generally more morpho-syntactic processes going on, and relates to many relevant syntactic debates. The next section will focus on languages where more material than functional heads can be expressed in a single ‘word’, i.e., polysynthetic languages.

To start, we can consider how verbal functional categories are expressed cross-linguistically. This is illustrated in (24-27) for tense, mood, and aspect morphology in languages with different morphological templates. For example, some languages express these categories in different morpho-syntactic units. Dutch (Germanic, 24) expresses clausal information through separate verbs. A language like Gungbe (Kwa, 25) also expresses TMA elements in different morpho-syntactic units, which are descriptively labeled particles.

- (24) Zonder Adriaan **zou** Bassie de schat niet **hebben kunnen vinden**
 Without Adrian would Bassie the treasure not have could find
 ‘Without Adrian Bassie could not have found the treasure’ Dutch (Fenger 2020, p.5)
- (25) Àsíbá **má ná n’ó wá** lésí dǔ gbé
 Asiba NEG FUT HAB come rice eat PART
 ‘Asiba will not habitually come in order to eat rice’ Gungbe (Aboh and Essegbey 2010, p.10)

On the other hand, languages can express various TMA morphology inside a single morpho-syntactic unit, in varying ways. Japanese (26) can express TMA morphology both as affixes, and as light verbs forming compound like structures. Latin (Romance, 27) suffixes TMA morphology, and finally Turkish (Turkic, (28) is an example of a language where TMA morphology is not just an affix, or a compound, but can be clitic-like.

- (26) hatarak **-ase -rare -tagar -i -sugi -ru**
 work -CAUS -PASS -WANT -EPEN -EXCEED -PRS
 ‘Want too much to be forced to work’ Japanese (Sugioka 1984)
- (27) [laud -a **-u -i -s -s -e -mus**]
 praise -TV -PRF -TV -PST -SUBJ -TV -1PL
 ‘Would we have been praised’ Latin, (Embick and Halle 2004)
- (28) [konuş **-ur] =du -lar]**
 speak -HAB =PST -3PL
 ‘They used to speak’ Turkish, (Kabak and Vogel 2001, 323)

The examples above might suggest that a single language only has one strategy for expressing features, and this is also how languages are descriptively classified: Japanese (or Latin, or Turkish, or Malayalam, or ...) is an agglutinating language, whereas Dutch (or Gungbe, or English, or ...) is not. However, this classification falls apart in both directions. For example, even though Latin above seems to be able to express multiple verbal features as suffixes on the verb, it can also express features periphrastically (Ackema 1995, Embick 2000, Kiparsky 2005, Bjorkman 2011, Kastner and Zu 2017), similarly to Dutch:

- (29) [laud -a -t -us] [est]
 praise -TV -PASS.PTCP -NOM is.IPFV
 's/he has been praised' Latin (Kastner and Zu 2017, p.663)

Conversely, a language like Dutch can express Tense as a suffix on the verb, even though this is not the case in the example in (24). The questions that syntacticians have dealt with in light of this variation are: how is the variation between affix, clitic, and full auxiliary modeled? If this happens in the syntax, what is the relation to head movement, and is it correlated to other syntactic effects? What is a clitic, what is an auxiliary?

5.1 Affix versus Auxiliaries

In order to answer the above questions, the focus will first be on the difference between affixes and full auxiliaries, leaving clitics aside. Since languages cannot be defined as one type of morphological template or another, the question that this literature deals with is whether this alternation between suffix, clitic, or auxiliary of the same feature is a reflex of morphology or syntax. The crucial observation that needs to be accounted for is that some morphemes can be expressed on the verb, but not when there are other morphemes present. That is, the fact that Tense in Dutch can be expressed on the verb, but not when there is a perfect present; or the alternation between (27-29). This issue has received attention in various ways in both the morphological and syntactic literature. On a more abstract level, not related to periphrasis and synthesis per se, it relates to the question whether or not words are built in the syntax or not. Since languages seem to vary so much morphologically, various proposals have been put forward that argue that word formation (specifically complex X^0 formation) is not available in the syntax, and words are epiphenomenal (Koopman and Szabolcsi 2000, Julien 2002). On the other hand, there are proposals that argue that complex heads can be built in various ways, one of them being in the syntax (Baker 1988, Halle and Marantz 1993, Embick and Noyer 2001). These proposals make different predictions: if (parts of) words are built in the syntax, it might correlate with other syntactic phenomena in a particular language.

Specifically for the alternation between periphrasis and synthesis, questions that have been discussed are: how auxiliary formation is modeled, how the synthetic-periphrastic alternation relates to (head-)movement, how the cut-off is modeled, and whether it correlates to other syntactic phenomena (Chomsky 1957, Ackema 1995, Lasnik 1995, Embick 2000, Ackerman and Stump 2004, Kiparsky 2005, Bjorkman 2011, Pietraszko 2017, Davis 2018, Calabrese 2019, Fenger 2020).

If it is a reflex of the syntax, then the question is whether languages use the same mechanism to build a synthetic or a periphrastic word or not. For example, Bjorkman (2011) argues that some auxiliary formation takes place in the syntax, on the basis of the following type of pattern, dubbed *feature intersectivity* (Ackerman and Stump 2004) or the *overflow pattern* (Bjorkman 2011). An example for Kinande (Bantu) is given in (30).

- (30) a. [tu -**ne:mu** -húma]
 1PL -PROG -hit
 ‘We are hitting’
- b. [tw -**á** -húma]
 1PL -PST -hit]
 ‘We hit (recently, not today)’
- c. *[tw -**á** -**ne:mu** -húma]
 1.PL -PST -PROG -hit]
- d. [tw -**á** -**bya**] [i -tu -**ne:mu** -húma]
 1PL -PST -AUX L -1PL -PROG -hit
 ‘We were (recently, not today) hitting.’ Kinande, (Bjorkman 2011, p.87)

The pattern is that either an aspectual marker (30a), or a tense marker (30b), can occur as an affix on the verb, but when both need to be expressed, they cannot co-occur, (30c) and the tense morpheme needs to be expressed on an auxiliary (30d). On the basis of this type of data she argues that auxiliaries cannot always be primitives in the syntax, since in examples like (30) the tense morpheme is not specified for being an auxiliary or an affix, and she argues that auxiliaries in these cases are inserted as a type of rescue operation.¹⁷ However, depending on the construction, and the language, there can be variation in auxiliary formation and whether or not an auxiliary is inserted, or should include an actual AuxP projection that selects different functional heads (Chomsky 1957, Bach 1967, Ross 1969, Akmajian and Wasow 1975, Emonds 1978, Pollock 1989, Déchaine 1993, Roberts 1998, Embick 2000, Cowper 2010, a.o.).

Different syntactic proposals, based on languages from various families, have been put forward to model this type of alternation: as a type of (failure) to Agree;

¹⁷See Pietraszko (2021) for arguments that even in cases where it looks like auxiliaries are inserted, they could in fact be selected.

morpho-syntactic unit, and should be analyzed similarly to languages that have been featured more in debates on auxiliary formation.

The final issue left in this section is related to the status of these bigger morpho-phonological units that we can see in Turkish (31), but also in languages like Japanese, or clitics in a wide variety of language. That is, what are these elements that are in between a bound affix and a freestanding element. Starting with the examples of the Turkish sort presented above, it can be shown that in the syntax such elements behave as freestanding, and can sometimes even show up as such (i.e., when other elements intervene), and it only attaches as a phonological unit later in the derivation. Thus, this has been modeled as a type of morpho-phonological merger at a late stage in the derivation, i.e., as a type of m-merger (Marantz 1988, Embick and Noyer 2001, Shwayder 2015, Fenger 2020). Apart from the discussion of these type of morpho-phonological ‘in-between’ morphemes, there is a large discussion on how to define clitics, what role they play in syntax, and whether they provide arguments for or against certain frameworks of the morphology-syntax interface (Zwicky 1977, Zwicky and Pullum 1983, van Riemsdijk 1999, Kalin and Weisser 2022). Interestingly, one of the building blocks in minimalism are elements that can be both minimal and maximal projections at the same time (Chomsky 1995). In order to investigate the consequences of this type of proposal, it has been important to investigate variation both within and across families, and within and across modules of grammar. See for example Bošković (2001, 2002) on clitics at the PF-interface in Slavic, and clitics across Italo-Romance varieties Manzini and Savoia (2005).

To summarize, this section focused on different morphological reflexes of features cross-linguistically. Despite wide surface variation, it is possible to find similar syntactic mechanisms to account for this variation, but it is important to consider both the phonological, morphological, and syntactic properties of words.

6 Polysynthesis

The remainder of this chapter is concerned with comparing languages with, on the surface, even starker morphological differences. These languages are generally discussed as ‘polysynthetic’, in that they can encode much more material than only functional heads on the same ‘word’. In the literature the question arises whether the differences we see on the surface with languages that are more isolating constitute deep syntactic differences as well. The discussion pertains to issues such as configurationality, word formation, binding, and movement. Not only is the debate whether these languages have deep syntactic differences, but also whether it is possible to even test issues related to movement or binding when all clausal material can in principle be incorporated into a single word-unit.

Examples from languages from different families that are considered polysyn-

thetic are given in (32-34). In Inuit (Eskimo-Aleut, 32) the verb word contains an adverb (*always*), negation, case, the subject and the object. In Plains Cree (Algonquian, 33), the subject is marked as agreement, and the object is incorporated. Finally (34) gives an example from an Australian language, Bininj Gun-Wok, where all arguments from a ditransitive verb and adverbial material are all included in the verb word.

- (32) uqa-limaar-vi-liu(ng)-inna-nngit-tunga
 speak-all.of-NOM-make-always-NEG-DECL.1SG
 ‘I was not always making libraries’ Inuit, (Compton and Pittman 2010, p.2168)
- (33) kisîpêk-in-iyâkan-ê-w Plains Cree
 wash-by.hand-dish-INTR-3
 ‘S/He washes a/the dish.’
- (34) aban-yawoith-warrgah-marne-ganj-ginje-ng
 1/3PL-again-wrong-BEN-meat-cook-PST.PFV
 ‘I cooked the wrong meat for them again’ Bininj Gun-Wok (Evans 2002, p.19)

The examples above illustrate various of the properties that have been ascribed to be part of languages with a polysynthetic nature (Hale 1983, Jelinek 1984, Nichols 1986, Baker 1996, Mattisen 2004, 2017, Murasugi 2014). One such property is *head-marking* (Nichols 1986): arguments of the verb such as the subject, and the object(s) must be expressed on the verb through agreement, and the arguments themselves do not have to be expressed as free-standing elements. Related to this, if an argument is not expressed through agreement, it is incorporated. This is for example shown in Plains Cree where ‘dishes’ is inside verbal morphology such as transitivity marking and agreement, and in Bininj Gun-Wok ‘meat’ is incorporated as well. Interestingly, as shown with the minimal pair in (35) in Plains Cree, the form of agreement is different when ‘dish’ is expressed as a free standing element, which can optionally be pronounced.¹⁸

- (35) kisîpêk-in-am (wiyâkan)
 wash-by.hand-3>INAN (dish)
 ‘S/He washes it (a/the dish).’ Plains Cree (Hirose 2000, :128–33)

Thus, arguments must be expressed as agreement or incorporated, and can optionally be dropped when they are freestanding, and all information can be expressed on the verb-word. However, arguments are not the only elements that can be part of the verb-word, and many more elements can be incorporated, such as adverbs, visible in (32) for Inuit and (34) for Bininj Gun-Wok. A third property that is often

¹⁸Note that this is not necessarily the case for all languages with incorporation, as some languages can have both the agreement and the incorporation in the same sentence (Baker 1996).

discussed in regard to these types of languages is free word order. That is, in a simple transitive clause, all word orders seem to be possible. This is shown for Mohawk (Iro-
quian) in (36), where a **subject**, *object*, and the verb can occur in six possible orders.

- (36) a. **sak** ra-núhwe'-s *ako-[a]tyá'tawi*
sak AGR-like-HAB AGR-dress
- b. ra-núhwe'-s **sak** *ako-[a]tyá'tawi*
AGR-like-HAB sak AGR-dress
- c. **sak** *ako-[a]tyá'tawi* ra-núhwe'-s
sak AGR-dress AGR-like-HAB
- d. *ako-[a]tyá'tawi* ra-núhwe'-s ne **sak**
AGR-dress AGR-like-HAB NE sak
- e. ra-núhwe'-s *ako-[a]tyá'tawi* ne **sak**
AGR-like-HAB AGR-dress NE sak
- f. *ako-[a]tyá'tawi* **sak** ra-núhwe'-s
AGR-dress sak AGR-like-HAB
'**Sak** likes *her dress*' Mohawk (Baker 1996, p.10, glosses simplified)

Other properties, not discussed here, can include templatic morphology and discontinuous constituents. Thus, the term 'polysynthesis' has been used to describe a wide array of phenomena, but descriptively has been used for extreme complexity in the morphology (Duponceau 1819, von Humboldt 1836, Sapir 1921, Fortescue et al. 2017). The phenomena that are found differ per language, and the examples in (32-36) only represent examples from four languages in four families. See for a recent overview on other languages and families Fortescue et al. (2017).

The major question is whether these 'morphological' languages are in fact underlyingly (i.e., syntactically) different from other, less morphological languages. Especially, because on the surface, these languages seem to be highly 'morphological', and not so much 'syntactic', since they can use a single word to express a full clause. If they are purely 'morphological', why then discuss these languages in a book on comparative syntax?

The question whether or not these languages lack in fact syntactic properties known from other languages has been discussed in various ways. One important discussion is in regard to configurationality: do these languages have a 'flatter' syntax than other languages, or are they underlyingly the same? A different, related discussion bears on the question whether the properties that one observes in these languages are coming from a single parameter in the language, or if there are a bunch of tiny differences that lead to languages looking radically different. Related to that is then also the question how to test certain syntactic processes in these languages by looking at alternating morphology. Each of these issues will be illustrated in turn.

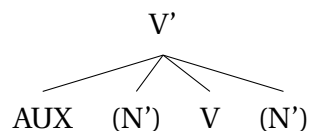
6.1 Words, Polysynthesis, and Configurationality

Much of the theoretical discussion concerns the clausal structure of polysynthetic languages: are they in fact fully configurational, similar to a language like English, are they fully non-configurational, or are they somewhere in between? Giving an answer to the question of whether each language with the label is in fact configurational or not seems hard to answer, and has been discussed for different language families, yielding different results. Specifically, there are various properties that are discussed, and sometimes the literature glosses over several subtleties. On the one hand, there have been works that argue that polysynthetic languages have a different structure from configurational languages. Proponents of this view have put forward a version of the *Dual Structure Hypothesis* (Hale 1983, Simpson 1991, Austin and Bresnan 1996), or the *Pronominal Argument Hypothesis* (Jelinek 1984), expanded on by Baker (1996). On the other hand, proposals have been put forward that many of the languages discussed are in fact configurational (Bruening 2001, Legate 2002, Adger et al. 2009).

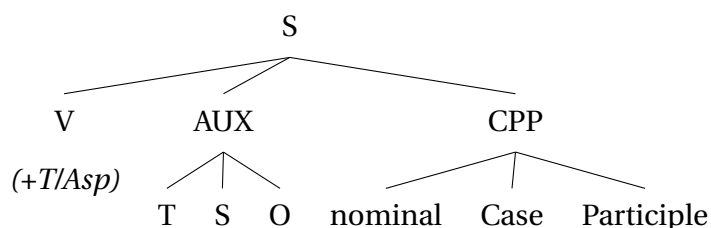
For the non-configurational approaches, there are various hypotheses that relate both to the phrase structures and to the question of macro- versus micro-parameters. Working with the Dual structure Hypothesis, there are different layers of representation for grammatical structure, roughly corresponding to lexical structure and phrase structure. The difference between a configurational language and a non-configurational language comes from differences in the mapping between lexical to phrase structure, and whether hierarchical structure plays a role at both levels. Specifically for non-configurational languages, there are less restrictions in how phrases are built (see below for parametrization of such an approach), this is exemplified by (37) for Warlpiri where the order of nouns is given in brackets. Working in a different approach, Jelinek (1984) argues that different levels of representation are not necessary, but she hypothesizes that agreement clitics take over the role of arguments of the predicate, and nominals themselves are adjuncts in the syntax. This approach is expanded on by Baker (1996), where he argues that there are *pro*'s in the argument positions, and any optional DPs can be adjuncts. The differences in phrase structure are presented in simplified forms in (37-39), for three different approaches.

(37) Phrase structure rules for Warlpiri (Hale 1983)

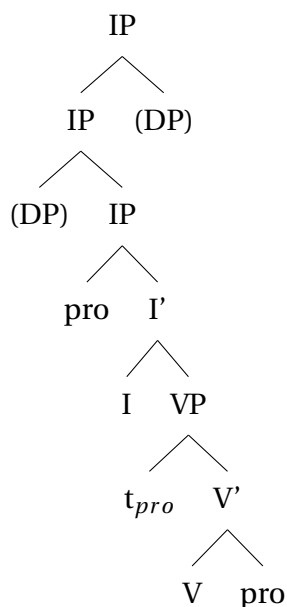
- a. $X' \rightarrow X' X$
- b. $V' \rightarrow \text{AUX } X' V X'$



(38) Structure for Warlpiri (Jelinek 1984)



(39) Structure for Mohawk (Baker 1996)



The phrase structure in (37) is flat, and the free word order is indicated by the optional placement of N's with brackets. For Jelinek, the second position is where the auxiliary in Warlpiri is, but the Verb and the Noun can have different base-generations, leading to different word orders. For the last structure, (39), the free word order comes from the fact that Nouns are adjoined as adjuncts to the IP, and are not coming from actual argument positions. In this structure there is a VP, and there is binary branching.

Observe that, based on these structures, there are different ways non-configurationality has been interpreted. In both an approach that assumes multiple layers of representation (37), and one that assumes the pronominal argument hypothesis (38), there is a fairly flat structure, with no VP constituent. In the structure proposed by Baker (1996) there is a VP constituent, and there is more hierarchy, but all arguments are expressed as *pro*, while there is freedom for DPs to be expressed as adjuncts.

These different structures make different predictions, and have been discussed in the literature for various languages. For example, the difference between having a VP constituent or not has been discussed most prominently recently in rela-

tion to Warlpiri, Passamaquody-Maliseet (Hale 1983, Dalhstrom 1986, Grafstein 1984, Rhodes 1979, Tomlin and Rhodes 1979, Leman 1999, Bruening 2001, Legate 2001, Richards 2009) by looking at binding asymmetries ¹⁹ and VP-ellipsis. For example, Richards (2009) shows that there are asymmetries between what can and cannot be elided in Passamaquody, and argues that this can be made sense of if this language has a constituent that roughly corresponds to a VP. Whether or not argument slots are filled by *pro* or actual DPs has been discussed in relation to Warlpiri, Passamaquody-Maliseet, Kiowa, and Mohawk (Baker 1996, Bruening 2001, Legate 2002, Adger et al. 2009).

The discussion has thus revolved mainly around a couple of languages from a couple of families. Moreover, a note is in order in that sometimes the debate is sketched as if it is a binary option between having a non-configurational or a configurational structure for a language. However, it already is clear from the structures in (37-39) that there are various different properties, and that each structure potentially predicts different phenomena to cluster together in a language. Each of these various predictions should then be tested and argued for (or against) to exist in a single language. This then also leads to the second question that arises with regard to these languages, and that is whether there is in fact a big difference between so-called polysynthetic languages, or if there are a bunch of minor differences that make it look like certain languages look on the surface radically different.

Two famous proposals of a macro-parametric account (where multiple properties cluster together) to non-configurational and/or polysynthetic languages have been put forward by Hale (1983) and Baker (1996). Their two versions of a parameter are given in (40-41).

(40) *The Configurationality Parameter* (Hale 1983, p.26)

- a. In configurational languages, the projection principle holds of the pair (Lexical Structure, Phrase Structure)
- b. In non-configurational languages, the projection principle holds of Lexical Structure alone

(41) *The Morphological Visibility Condition* (Baker 1996, p.17)

A phrase X is visible for θ -role assignment from a head Y only if it is coindexed with a morpheme in the word containing Y via:

- a. an agreement relationship, or
- b. a movement relationship
 - i. Yes: Mohawk, Nahuatl, Mayali, ...
 - ii. No: English, French, Chichewa, ...

¹⁹See Chapter 24 of this volume for an overview on binding relations.

First, consider the parameter proposed by Hale. As mentioned above, he assumes that there are various levels of representation, and the idea is that what is parametrized is whether a version of the projection principle holds at both levels of structure, or only at a single level. For Baker, on the other hand, the difference in languages comes from how theta-role assignment works and this is what is parametrized in languages is what can count for this assignment. Even though the parameters are discussed as macro-parameters, it does not mean that it is expected that *all* languages that are grouped as ‘non-configurational’ and/or ‘polysynthetic’ are accounted for. That is, both Hale and Baker acknowledge that there is a lot of variety in this group of languages, and that potentially some languages are different.

For example, Baker (1996) is crucially very specific about what counts and what does not count as polysynthetic. He argues that there is a one directional generalization regarding incorporation and obligatory agreement, and accounts for this with the parameter above. He specifically argues that a language can have a version of noun-incorporation, and can have subject and object agreement, but that does not mean they are polysynthetic in his sense. He argues that languages are Baker-polysynthetic when they meet multiple criteria for noun-incorporation, making it a fairly productive process in the language, and when they have obligatory subject and object agreement. He argues that languages that are Baker-polysynthetic are: Mohawk and other Northern Iroquian languages (Seneca, Tuscarora), Wichita, Kiowa, Southern Tiwa, Huauhtla Nahuatl, the Gunwinjguan languages, Chukchi. Languages that do not fall under his definition are: Warlpiri, Navajo, Salish, Choctaw, Inuit languages, and maybe the Algonquian languages.

This thus means that he assumes that languages can have various properties that look the same, but there is still a cluster of properties in a subset of languages that we might want to consider to be coming from one underlying difference. It also means that one could call this clustering of two properties (productive noun incorporation and obligatory subject and object agreement) a macro-parameter, but nothing in his proposal excludes the option that there are in fact also smaller differences at play that make languages look radically different on the surface. Interestingly, many of the languages that have been argued later on to not fit with this approach, such as Passamaquoddy Bruening (2001), or Border Lakes Ojibwe Hammerly (2021b) have been excluded by Baker to begin with.²⁰

The question of course still remains whether or not such a macro-parameter is valid or not, even for the properties that Baker is trying to group together. Legate (2001) for example has argued that even for the language most prominently discussed

²⁰In a different way, Adger et al. (2009) argue that Kiowa, one of the languages Baker argues falls in his type of polysynthesis, obeys all the properties that Hale and Baker discusses, but that the language is still configurational because it obeys mirror-principle effects, and has limited word order rigidity in some domains. Again, this means that both Baker and Adger et al. (2009) define polysynthesis and (non-)configurationality in a different way.

by Baker (1996), Mohawk, can be accounted for by assuming various micro- parameters, where each property is independent of the other and it is an accident that they are all found together in a single language. More recently, Ershova (2020) has put forward an approach to word building in Adyghe (Northwest Caucasian) that assumes there are multiple ways to build a polysynthetic word, based on the evidence of incorporation data and nominalizations. She argues that some part of the language is built through prosodic word building, following an approach developed by Compton and Pittman (2010) for Inuit (Eskimo-Aleut), and other parts of the language have a form of head movement to account for incorporation patterns.

In conclusion, the non-configurationality debate has not been settled yet, and the question of whether languages are different underlyingly still remains unanswered. Crucially, what needs to be taken into account when looking into this issue, is that there are various properties that might cluster together, and based on the theory put forward, one or the other property could come from a (partly) non-configurational syntax. Moreover, arguing for a (partly) non-configurational syntax, which predicts multiple properties to cluster together in a language, does not exclude the possibility that there are also minor differences at play that mask the underlying syntax.

6.2 Detecting Syntax through Alternating Morphemes

A large part of the theoretical discussion surrounding comparative syntax, features, and wordhood in polysynthetic languages is how and whether it is possible to detect syntactic structure and syntactic operations we find in other non-polysynthetic languages by looking at specific morphological and/or phonological alternations inside the word. Different topics in different language families have been the focus of research, some of which are briefly mentioned here.

A large amount of research focuses on whether alternations of specific morphemes are indicative of movement phenomena (different from incorporation as in Baker 1988, Li 1990); a growing body of literature focuses on movement of objects, or movement of (verbal) heads. One place where this is happening is in relation to markers that are dubbed ‘direct’ or ‘inverse’. An example, (42), is given for Ojibwe (Central Algonquian). The agreement on the verb cross-references information of two arguments, first and second person, but does not reference their grammatical role, i.e., the form of the first and third person is the same in (42a) and (42b), even though their grammatical roles are reversed. The morpheme that indicates the grammatical function of each argument is the direct in (42a), where the first person is the subject, but it is the inverse marker (42b) when the first person is the object.

- (42) a. n- wa:bm -a -g
 1- see -DIR -3PL
 ‘I see them’

- b. n- wa:bm **-igo** -g
 1- see -INV -3PL
 'They see me'

Ojibwe (Valentine 2001)

In the literature on Algonquian the theoretical debate is how to derive the alternation between direct and inverse morphology, and whether it could mean that in the inverse the object has moved to a higher position, closer to the probe of the theme marker. If that is the case, it has to mean that hierarchical structure has been changed and this should have an effect on other syntactic phenomena, related to binding conditions for example (Bruening 2001, 2009, Branigan and MacKenzie 2002, Bliss 2013, Oxford 2014, Hamilton 2015, a.o.).

This discussion, where inverse marking might indicate movement of an argument, also played a role in inverse marking in Adyghe (Northwest Caucasian), in relation to person restrictions (Driemel et al. 2021). In a different vein, agreement and ergative marking in micro-variation in Inuit languages have argued to indicate instances of object shift, similar to Germanic languages (Woolford 2017, Yuan pear).

Movement of heads, rather than arguments, has also been a topic in especially the Algonquian literature. Clause type alternations in these languages is generally expressed through different sets of agreement morphemes, and the verb forms are called independent and conjunct order. This is shown for Wampanoag in (43): The verb in the independent order, (43a) has an preverbal agreement marker, and several postverbal markers, and this is a matrix clause. In the conjunct order, (43b), in this case an embedded clause, there is only a single postverbal agreement marker.

- (43) a. **ku-nâw-uk-uwô-pan-eek**
 2-see-INV-NON1PL-PRET-PL
 'They saw you_{pl}'
- b. ... naw-uquy-**âk**-up
 see-INV-2PL-PRET
 '... (if/when/...) they saw you_{pl}' Wampanoag (Richards 2004, p.327)

The alternation between the presence or absence of the prefix, and the form of the suffix in different clause types has led to a theoretical debate of whether there is verb movement in one or the other order, and whether this movement is similar to movement phenomena found in other languages (Halle and Marantz 1993, Campana 1996, Brittain 1999, 2001, Richards 2004, Cook 2008, Lochbihler and Mathieu 2016, Bogomolets et al. 2023).

Finally, there is a strand of research that looks for domains similar to those present in the syntax, i.e., phases, by considering morpho-phonological alternations. This line of research has been used in various language families. For example, for Inuit (Eskimo-Aleut) Compton and Pittman (2010) have argued that CP and DP phase

chapter has shed some light on how variation in feature inventories, their organization and expression has played (and is still playing) a significant role in accounting for important issues in comparative syntax.

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