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Inflectional morphology

Balthasar Bickel & Johanna Nichols
University of California, Berkeley

1. Introduction

Cross-linguistic variation in the forms and categories of inflectional morphology is so great that 'inflection' cannot be defined by simply generalizing over attested inflectional systems or paradigms. Rather, we define it as those categories of morphology that are SENSITIVE TO THE GRAMMATICAL ENVIRONMENT in which they are expressed.[1] Inflection differs from derivation in that derivation is a lexical matter in which choices are independent of the grammatical environment.

The relevant grammatical environment can be either syntactic or morphological. The syntactic environment is relevant, for example, when morphological choices are determined by agreement. Many languages require determiners and adjectives to assimilate in form to the head noun in an NP, as in the following German examples:

(1) German

a.	ein	gut-er	Lehrer
	a:NOM.SG.MASC	good-NOM.SG.MASC	teacher(MASC):NOM.SG
	'a good teacher'		
b.	ein-e	gut-e	Lehrerin
	a:NOM.SG.FEM	good-NOM.SG.FEM	teacher(FEM):NOM.SG
	'a good (female) teacher'		

Morphological choice — case, number, and gender in *ein*- 'a' and *gut*- 'good' — here depends directly on the syntactic environment, specifically on the status of these words as modifiers of a head noun. By contrast, the choice of derivational categories (in this example, between *Lehrer* and *Lehrer-in*) is a purely lexical matter which specifies the reference of the head noun. The effect that derivational morphology has on syntax is at

[1] In this we follow Anderson (1992: 74-85), but we extend the definition to cover not only syntactic but also more generally grammatical sensitivity, as explained below. For a different approach to the definition of inflection, based on prototype theory, see Aikhenvald's chapter in this series.

best indirect, by reassigning words to different parts of the lexicon: the suffix *-in,* for example, reassigns *Lehrer* ‘teacher’ to the class of feminine nouns, and this property shows up in agreement. Note that it is not the the derivational suffix *-in* that triggers agreement, but the more general notion of feminine gender, which mostly includes nouns without such a suffix (e.g., *Schule* ‘school’ would trigger exactly the same determiner and adjective forms in 1b as *Lehrerin.*).

Other examples of inflectional categories sensitive to syntax are case assignment (government), tense choice in complex sentences (*consecutio temporum,* sequence of tenses), switch reference, and many more which we will review in this chapter.

Often, however, inflectional categories are sensitive not so much to the syntactic environment as to the morphological environment in which they appear. As an example of this, consider aspect in Russian, which consists of a highly irregular morphological distinction between what are called perfective and imperfective verbs. That aspect is inflectional is shown by the fact that it figures in a morphological rule: the future tense is formed analytically (periphrastically) if the verb is imperfective, but synthetically if it is perfective. For example, in the future tense the third person singular form of the imperfective verb *pit'* ‘drink’ is *budet pit'* ‘will be drinking, will drink’ whereas the same future tense of the perfective verb *vypit'* ‘drink, drink up’ is *vyp'et* ‘will drink, will drink up’. Thus, the realization of future tense forms is determined by the aspect of the verb. Aspect is part of the structural context of the future tense formation rule in the same way as gender of the head noun is part of the structural context of the agreement rules illustrated by example (1) above.

Again, derivational categories are different. German, for example, has verb morphology that is in many ways similar to that of Russian, and it even has pairs of verbs that look similar to the perfective vs. imperfective contrast of Russian; compare Russian *pit'* ‘drink (IPFV)’ vs. *vypit',* literally ‘out-drink’, i.e. ‘drink up, drink to the end, empty (PFV)’ and German *trinken* ‘drink’ vs. *aus-trinken*, literally ‘out-drink’, i.e., ‘to drink up, drink to the end, to empty’. The difference is that in German, there is no syntactic or morphological rule that refers to this opposition: all tense forms, for example, are formed in exactly the same way. The choice between *trinken* and *austrinken* is simply a lexical one, so the difference is one of derivation.

The difference between inflection and derivation often coincides with differences in morphological typology: inflection is often more transparently and more regularly marked than derivation. Also, inflectional categories are typically more general over the

lexicon than derivational categories. While these are typologically significant tendencies, they are by no means necessary or universal. Russian aspect, for example, is very opaque and irregular. Sometimes, as in the example of *pit'* and *vypit'* above, it is marked by a prefix, but sometimes it is signaled by a stem difference or by suppletion (e.g., IPFV *otcvetat'* vs. PFV *otcvesti* 'to bloom'; IPFV *govorit'* vs. PFV *skazat'* 'say'). Transparency of marking has to do not with inflection vs. derivation but with the choice between concatenative and nonconcatenative, and between flexive and nonflexive morphology, structural distinctions that will be reviewed in Section 2.

The other frequent concomitant of inflection, generality over the lexicon, is not a necessary correlate either. It is possible for inflectional categories to be restricted to a subset of lexemes. The Nakh-Daghestanian languages Chechen and Ingush, for example, limit verb agreement to about 30% of the verbs, yet the category is as sensitive to syntax as verb agreement is in English or Russian. Case morphology is sometimes different for different parts of the lexicon, e.g. following, as in some Australian languages (Silverstein 1976), a nominative-accusative schema for pronouns and an ergative-absolutive schema for nouns; and in many languages, case paradigms are often defective (lacking terms) for some nouns but not others. These and other examples will be discussed below.

In the following, we will concentrate mainly on the formal aspects of inflection — i.e. how and where inflectional categories such as case or agreement are expressed — and on how such categories interact with syntax. The content of inflectional categories is dealt with in detail in other chapters (see I.5 on mood and illocutionary force, I.6 on negation, III.4 on gender, III.5 on tense, aspect and mood and III.6 on deixis), and we limit ourselves to a brief survey of those categories that are not covered or only partially covered in this series.

The chapter is organized as follows. In Section 2 we discuss the difference between inflectional and lexical categories, review the notion of clitic, and dissect the traditional typological parameters of morphology, i.e., phonological fusion, flexivity, and semantic density (synthesis). Sections 3 through 7 are devoted to further parameters of typological variation: marking locus and position, paradigm and template structure, and obligatoriness of marking. In Section 8 we briefly review the content of some inflectional categories, and in Sections 9 and 10 we describe some of the ways in which inflection interacts with syntax, concentrating on agreement and case marking.

2. Formatives and morphological types

2.1. Words vs. formatives

At the heart of inflectional morphology are FORMATIVES. Formatives are the markers of inflectional information. They are different from WORDS in that they cannot govern or be governed by other words,[2] cannot require or undergo agreement, and cannot head phrases: formatives are morphological entities, words syntactic. In the better-known Western European languages, formatives are typically realized through bound morphology and words through phonologically independent elements. Case markers (formatives), for example, are often tightly fused endings (e.g. English *he* vs. *hi+m*), while adpositions, words which govern case and head PPs, are often free-standing units (e.g. *with him*, where *with* governs objective case on the pronoun).

However, this need not be the case, and indeed often is not. In East and Southeast Asian languages, case markers are generally realized in the form of phonologically free units, sometimes called 'particles'. In Lai Chin, a Tibeto-Burman language of Burma, for example, phonologically bound affixes all have a CV shape (i.e. they are monomoraic), whereas independent words all follow a CVC or CV: syllable canon (i.e. they are bimoraic). Case markers, unlike agreement prefixes, follow the pattern of words:

(2) Lai Chin (Tibeto-Burman; W. Burma)

Tsew Máŋ	niʔ	ʔa-ka-t̪hoʔŋ.
T.	ERG	3SG.A-1SG.P-hit

'Tsew Mang hit me.'

It is a general characteristic of these languages that the phonological notion of the word is largely at odds with grammatical considerations: not only is the case formative *niʔ* an independent phonological word, but so are both parts of the proper name it marks in the example. It is as if the rhythmical articulation of speech goes its own ways — ways that

[2] We use the term 'govern' in the traditional sense of determination by one word of the grammatical form (chiefly, inflectional categories) of another. For instance, English prepositions govern the objective case of pronouns: *with me* and not **with I*. Russian prepositions lexically govern different cases on their objects: *s* 'with' takes the instrumental (*s drugom* [with friend.INSTR] 'with a friend'), *bez* 'without' takes genitive (*bez deneg* [without money.GEN] 'without money'), and so on.

are quite distinct from the conceptual and syntactic segmentation, in which for instance *Tsew Máŋ ni?* is a single, indivisible unit.

Turning to words in the sense of syntactic units, we find variation in their phonological independence no less than for formatives. While words are often realized as free morphemes, many languages allow them to be (morpho-)phonologically incorporated into other words, and a number of languages have large sets of what are called LEXICAL AFFIXES which have their own syntactic properties (e.g., assigning specific cases and semantic roles to NPs in the clause). These are all issues of derivational morphology and compounding and are discussed in Chapters III.1 and III.2. Another common instance of phonologically bound words is cliticizing adpositions. This is a widespread phenomenon, for instance, in Slavic and Indo-Aryan languages. Many Russian prepositions, for example, are proclitic and behave much like prefixes: they are subject to word-internal voicing and pretonic vowel reduction rules, e.g., *ot=druga* [3] 'from friend:GEN.SG' is realized as [ad'drugə], just as the single-word expression *otdal* 'gave away' is realized as [ad'dal]. That prepositions are grammatical words on their own, however, is still evident from the fact that they govern case, cf. *ot=druga* in the genitive vs. *s=drugom* (phonetically, ['zdrugəm]) 'with a friend' in the instrumental case.

Words often develop into formatives through grammaticalization. It is no surprise, therefore, that there are many transitional cases where the distinction between, e.g., pronouns and agreement formatives, or between adpositions and case markers, is blurred. We will return to this question in Sections 9 and 10.

2.2. Clitics

As we saw in the preceding section, the word vs. formative distinction is a purely syntactic one and crosscuts the phonological difference between free and bound units. Traditional terminology conflates the syntactic and phonological criteria: it implies that words are both syntactically and phonologically independent units and that affixes are in both respects dependent units. With regard to the word, a distinction is often made between GRAMMATICAL WORD (in our terms, word as opposed to formative) and PHONOLOGICAL (or prosodic) WORD (free as opposed to bound unit). The same distinction

[3] Here and in the following, we mark clitic boundaries by '='; affix boundaries are marked by hyphens.

could be made for affixes as well: a GRAMMATICAL AFFIX would be a formative, a PHONOLOGICAL AFFIX any bound unit (a bound formative, a lexical affix, an incorporated noun, etc.). However, for most practical purposes it is safe to talk about formatives and affixes *tout court*. 'Formative' then refers to any inflectional exponent whether bound or free, and 'affix' refers to any bound unit whether grammatical or lexical.

A third notion besides word and affix that is often invoked is that of CLITIC. The term is used in two quite different senses. In one sense, clitics are simply PHONOLOGICALLY BOUND WORDS, i.e., syntactic units like the Russian prepositions that, as we saw above, are phonologically dependent on their objects. In the other, typologically more important but often less straightforward, sense clitics are CATEGORIALLY UNRESTRICTED BOUND FORMATIVES, i.e., formatives that are unrestricted as to the syntactic category of the word they attach to. In this they contrast with AFFIXES, which are usually more selective in what host they take. Case affixes, for example, are usually restricted to nominals, tense affixes to verbs. A clitic like the Turkish interrogative *=mi* (and its vowel-harmonic variants), by contrast, attaches to whatever word it marks as a question, regardless of that word's syntactic category, e.g., *sen=mi* 'me?' (pronoun), *yarın=mı* 'tomorrow?' (adverb) or *gördün=mü* 'did you see?' (finite verb: *gör-dü-n* 'see-PT-2SG').

An important way in which formatives can come to be categorially unrestricted is that they can be affixed to PHRASES (constituents) rather than to words, and then it does not matter what kind of word happens to be in the place at the edge of the phrase where the formative is attached. A classic example is the English genitive *-s*, which is suffixed to the right edge of an NP regardless of what element is found there. The rightmost word can even be a verb form, as in examples like [$_{NP}$ [$_{NP}$ *the guy you know*]*'s idea*]. In many languages, this pattern is more general, comprising all case markers. In the Papuan language Kâte, for example, case formatives cliticize to any word that ends an NP (NP-final words boldfaced):

(3) Kâte (Finisterre-Huon; Papua New Guinea; Pilhofer 1933)

a. [$_{NP}$ e=le **fiʔ]=ko** mi fe-naŋ! [113]
3SG=DEST house=ADL NEG climb-1PL.HORT
'Let's not climb into HIS house!'

b. [$_{NP}$ ŋiʔ **moʔ-moʔ=sawaʔ]=tsi** e-mbiŋ. [110]
man INDEF-INDEF=RESTR=ERG do-3PL.REM.PT
'Only some of the men did it.'

c. [$_{NP}$ ŋiʔ wiaʔ **e-weʔ]=tsi** dzika ki-tseyeʔ. [142]
man thing do-3SG.REM.PT=ERG sword bite-3SG.REM.VOL
'The man who did these things should be killed.'

In (3a), the adlative *=ko* is cliticized to a noun; in (3b), the ergative *=tsi* is attached to an indefinite pronoun which already hosts another clitic (*=sawaʔ* 'only'); and in (3c), we find the same ergative marker on a finite verb form, indicating the function of the internally headed relative clause.[4]

Another common type of phrasal clitic is bound articles (determiners, specifiers) that not only attach to nominals but also function as nominalizers (or relativizers) on verb forms, a phenomenon common in many North and Central American languages. Such clitics typically have phrasal scope and are not copied onto each element in the NP they modify. Phrasal scope is an important property of NP morphosyntax and we will return to it in Section 10.4. However, it is important to note that while phrasal scope is a common concomitant of clitics, this property is not a sufficient criterion for clitichood. To decide whether something is a clitic, it is imperative to carefully analyze the category structure of the language. Thus, for example, in many head-final (left-branching) languages, case markers with phrasal scope are always placed at the end of an NP, so in most instances the case markers are attached to the head noun and look like ordinary affixes. However, in many and perhaps most such languages, alternative constructions are possible where the phrase-final element is not the head noun. In Belhare, a Tibeto-Burman language of Nepal, for example, a numeral classifier[5] can occasionally follow the quantified noun, as in [$_{NP}$ *maʔi i-baŋ*] 'person one-CLASSIFIER', i.e. 'one person' (instead of the more common *ibaŋ maʔi*). Under such circumstances, a case affix still follows the last element of the NP, here the classifier: [$_{NP}$ *maʔi i-baŋ-ŋa*] 'person one-CLASSIFIER-ERG' One might therefore conclude that, as in Kâte, the ergative case marker (*-ŋa*) in this language is a clitic: it attaches to whatever word is last in the NP. However, in Belhare, every word that can be last in an NP can also head an NP on its own: classifiers, adjectives, demonstratives, nominalized verb forms are nominals just like nouns, and they have exactly the same syntactic and morphological possibilities. Since no other element can host case markers

[4] See Chapter II.3 for more on relative clauses.
[5] A numeral classifier is a formative that individuates mass nouns and makes them countable, or more generally enables a noun to combine syntactically with a numeral. The closest equivalent in English occurs with measures, as in *two glasses of water*, but in languages with rich systems of classifiers, they are not limited to mensural concepts but are typically obligatory with all nouns.

in this language, one can say that case in Belhare is categorially restricted, viz. to nominals. Therefore, Belhare case markers are not cliticized but affixed. This is different from Kâte case clitics: finite verb forms like *ewe?* '(s/he) did' in Kâte (3c) cannot head an NP by themselves; they are not nominals, and they can host case markers only if they happen to be at the end of an NP headed by a nominal.

In all of the preceding examples of clitics, the clitics attach directly to the phrase or word they modify. However, since clitics are category-neutral, this is not a necessary condition. Clitics can also be DETACHED from the element they modify. In North Wakashan languages, for example, case formatives (*=i, =χ̣a, =sa*) and determiners (*=da*) regularly attach to the preceding phrase:

(4) Kwakw'ala (Wakashan; NW America; Anderson 1985)

nep'id=i=da	gənanəm=χ̣a	guk^{w}=sa	t'isəm.
throw=SUBJ=DET	child=OBJ	house=INSTR	rock

'The child threw a rock at the house.'

While uncommon, such patterns are also occasionally attested in Australian languages (Evans 1995a).

Some languages have detached clitics whose position appears to be syntactically unconstrained: they can attach to any constituent in the clause, depending on the information structure. Such is the case in Tsakhur, discussed by Kibrik (1997), where the auxiliary complex *=wod* can adjoin to any of the three words in the following sentence.

(5) Tsakhur (Nakh-Daghestanian; NE Caucasus; Kibrik 1997: 306)

a.

MaIhaImaId-eː	Xaw	alyaʔa	=wo=d.
M.-ERG	house(IV):NOM	build	=AUX=IV

'Muhammed is building a house.'

b.

MaIhaImaId-eː	Xaw	=wo=d	alyaʔa.
M.-ERG	house(IV):NOM	=AUX=IV	build

'Muhammed is building a HOUSE.'

c.

MaIhaImaId-eː	=wo=d	Xaw	alyaʔa.
M.-ERG	=AUX=IV	house(IV):NOM	build

'MUHAMMED is building a house.'

A similar situation is found in Belhare, where the reported speech marker *=phu/=bu* can occur after any part of speech in the clause, sometimes even on two at once. While Tsakhur and Belhare illustrate unconstrained clitic placement in the clause, some languages spoken in the Kimberley region of Australia exemplify the same pattern on the NP level: case markers in these languages can appear on any element of the NP, whether it is the head or not:

(6) Gooniyandi (Bunuban; NW Australia; McGregor 1990: 227)[6]

a. ngooddoo=ngga garndiwiddi yoowooloo
that=ERG two man
'by those two men'

b. marla doomoo=ngga
fist clenched=ERG
'by a fist.'

The most frequent position for detached clitics, however, is what is traditionally called the WACKERNAGEL POSITION (named after the famous Indo-Europeanist who first described the phenomenon in 1892). This position is especially common for clause- and verb-level inflectional properties such as tense, mood, and agreement. In the best-known examples, the Wackernagel position is right after the first accented phrase or sub-constituent of it. This is characteristic, for instance, of South Slavic, Wakashan and many Uto-Aztecan languages:

(7) Luiseño (Uto-Aztecan; S. California; Steele 1976)

a. ʔiviʔ ʔawaal =up waʔi-q.
DEM dog =3SG.PRES bark-PRES
'This dog is barking.'

b. ʔiviʔ =up ʔawaal waʔi-q.
DEM =3SG.PRES dog bark-PRES
'This dog is barking.'

c. hamuʔ =up wiiwiš kwaʔ-q.
already =3SG.PRES w. eat-PRES
'She is already eating her wiwish.'

[6] McGregor (1990) calls the case clitics postpositions because they have phrasal scope. As discussed above, we restrict the term 'adposition' to syntactic words, which govern case and head adpositional phrases. See Section 10.4 for further discussion.

In (7a), the tense- and agreement-indicating clitic *=up* attaches to the first NP, in (7b) to the first subconstituent of this NP. (7c) shows that the host phrase need not be an NP, but can just as well be an adverbial phrase.

In Luiseño, and also in South Slavic languages not illustrated here (but see Spencer 1991:355ff.), the definition of the Wackernagel position rests on the prosodic criterion of accent: the first accented string, whether constituent or word. In other languages, the Wackernagel position is defined syntactically and limited to complete phrases. As a result, in such languages clitics cannot attach to sub-constituents of phrases. In Warlpiri, a Central Australian language, clitics occur after the first complete syntactic phrase:

(8) Warlpiri (Pama-Nyungan; C. Australia; Hale, *et al.* 1995 and T. Shopen, p.c.)

a. kurdu yalumpu-rlu =ka=jana jiti-rni jarntu wita
child DEM-ERG =PRES[=3SG.A]=3PL.P tease-NPT dog little

b. jarntu wita =ka=jana jiti-rni kurdu yalumpu-rlu
dog little =PRES[=3SG.A]=3PL.P tease-NPT child DEM-ERG

c. jiti-rni =ka=jana jarntu wita kurdu yalumpu-rlu
tease-NPT =PRES[=3SG.A]=3PL.P dog little child DEM-ERG

'The child is teasing the little dogs.'

In all of these examples, the clitic complex *=ka=jana* follows the first contituent, but it would not be possible for the clitics to follow part of a constituent, e.g. *kurdu* 'child' or *jarntu* 'dog' alone in (8a) and (8b), respectively.

On the level of NPs, second-position clitics are common in Wakashan languages of North America. In Nuuchahnulth (previously known as Nootka), for example, NP formatives like the definite article *=ʔi* often follow the first word of the phrase they modify:

(9) Nuuchahnulth (Wakashan; NW America; Nakayama 1997)

a. hin=aːčiƛ [$_{NP}$ minwaːʔath=ʔi]. [190]
there:MOM=go.out.to.meet British.soldier=DEF

'They went out there to to meet the British soldiers.'

b. ʔu-cḥi=nƛ [$_{NP}$ ƛułaq=ak=ʔi ḥaːk^{w}aːƛ]. [107]
her-married.to=MOM nice=very=DUR=DEF girl

'He got married to the very beautiful girl.'

Since in (9a) the head noun *minwaːʔath* ‘British soldier’ is the only word in its NP, the article cliticizes to this word. In (9b), however, the article is found on the preceding modifier *ƛuɬ=aq=ak* ‘very nice’ because this is now the first word in the NP. (Note, incidentally, that the pattern is the same on the clause level: aspectual formatives like *=nƛ* ‘momentaneous’ and entire words like *=aːčiƛ* ‘go out to meet’) are clitics in the clausal Wackernagel position.)

Wackernagel formatives are typically clitics, but not always. In many Kru languages of Western Africa, for example, negation is marked by a phonologically free, tone-bearing second-position particle *ni*:

(10) Bete (Kru; Ivory Coast; Marchese 1986:197)

ná	dībà	nì	lī	kɔ̀kɔ̀.
my	father	NEG	eat	chicken

[’should be a vertical bar]

‘My father doesn’t eat chicken.’

Similarly, what are traditionally called clitics in Tagalog are mostly free formatives in the Wackernagel position: as phonologically independent units, they do not lose stress or show any other reduction that is associated with phonological affixes or clitics (Anderson 1992: 204). As illustrated by the following example, pronominal ‘clitics’ like *siya* ‘he’ are fixed in their position:

(11) Tagalog (Schachter & Otanes 1972: 183)

a.

nakita	siya	ni	Pedro.
saw:P.VOICE	3SG.NOM	GEN	P.

‘Pedro saw him.’

b.

*nakita	ni	Pedro	siya.
saw:P.VOICE	GEN	P.	3SG.NOM

‘Pedro saw him.’

Despite this special positioning, pronouns like *siya* are phonologically independent words, not clitics

Free Wackernagel formatives often develop into bound clitics. Indeed, after pronouns, the Bete negation particle (cf. 9 above) reduces to a high tone clitic, which

triggers vowel lengthening so as to have a place for realization (i.e., ɔ̀=ˀ is realized as ɔ̀ɔ̂.)

(.12) Bete (Marchese 1986:197)

ɔ̀=ˀ nímʌ̀. [ˀ should be a vertical bar]
3SG=NEG drink
'He doesn't drink.'

In some languages, there is considerable variation in the phonological dependence of Wackernagel formatives. Consider the following examples from Toura, a Mande language spoken in the same area as Bete:

(13) Toura (Mande; Ivory Coast; Bearth 1971)

a. nɛ́ ké ló-ìī boí.
child IND go-PROGR field
'The child is going to the field.'

b. nɛ́=` lò boí.
child=ACT go:DECL field
'The child goes to the field.'

c. kó ló boí.
1PL.OPT go field.
'Let's go to the field.'

Interacting with verbal morphology, the Toura detached formatives express a variety of tense-aspect and modal notions and are placed in the Wackernagel position. Some of the formatives, such as the indicative mood particle *ké* in (13a), are phonologically free. Others, e.g. the 'actual' ('ACT') mood marker in (13b), are tonal clitics. After pronominal subjects, mood-indicating formatives are completely fused with their host (13c): compare *kó* 'we (optative)' in (13c) with *kwéé* 'we (actual, resultative)' and *kwéè* 'we (actual, ingressive)'.

2.3. Degree of fusion

In the preceding section we noted that formatives are often phonologically fused to their host, and that there is a gradient in how tightly they are fused. This is a general characteristic of morphology, and it is suitable to set up a scale of phonological fusion:[7]

(14) Fusion

ISOLATING > CONCATENATIVE > NONCONCATENATIVE

2.3.1. Isolating

At one end of the spectrum is complete isolation, where formatives are full-fledged free phonological words on their own. This is common in many Southeast Asian languages, and we saw an example in the Lai Chin ergative case marker in (2) above. Most languages, however, have at least some isolating formatives or 'particles'. They are particularly frequent as markers of negation, mood, and various evidential and illocutionary categories (modulating such parameters as the source of evidence or the firmness of assertion.)

2.3.2. Concatenative (bound)

Concatenative[8] formatives are phonologically bound and need some other word for their realization. They include inflectional desinences as well as cliticized formatives. The hallmark of concatenation is that formatives are readily segmentable. The paradigm example is Turkish number and case formatives, e.g., *ad-lar* 'name-PL', *ad-ın* 'name-GEN', *ad-lar-ın* 'name-PL-GEN', where each formative is a clear-cut sequence of phonological segments. In this regard, concatenative formatives are similar to isolated (independent) formatives. However, unlike these, concatenative formatives typically trigger some phonological and morphophonological adjustments in the word they build up together with their host. In Turkish, a well-known phonological adjustment is VOWEL HARMONY: when the stem vowels have front instead of back articulation, the affixes follow suit: *el-ler* 'hand-PL', *el-in* 'hand-GEN', *el-ler-in* 'hand-PL-GEN'. Another, cross-

[7] The scale is also useful in derivational morphology, cf. Chapter III.3. Here we focus exclusively on its application to formatives, where values on the right half of the scale are particularly prominent.

[8] An alternative term is 'agglutinative', but, as we will see in Section 2.4 below, this term traditionally has connotations that go far beyond phonological boundness. We avoid the simpler term 'bound' because it is already fucntionally overloaded in other parts of grammatical description.

linguistically very frequent, concomitant of concatenative morphology is ASSIMILATION. This involves the spreading of phonological features across formative boundaries and can be illustrated by another example from Turkish: the past tense marker *-ti* assimilates in voice to the preceding consonant, cf. *git-ti* 'go-PT' vs. *gel-di* 'come-PT'. DISSIMILATION, i.e. prohibition against the same features in adjacent segments, is less common. An example is found in Belhare, where the coronal glide in the non-past marker *-yu* forces a preceding /t/ to lose its coronal point of articulation. As a result, this stop is realized by the default consonant of the language, the glottal stop, e.g. *khaʔ-yu* 's/he'll go' from *khat-* 'go'.

Another process sometimes affecting concatenative formatives is ELISION. In Turkish, for example, stem-final /k/ is often deleted when followed by a vowel-initial suffix: e.g., *çocuk-un* 'child-GEN' is realized as /çocuːn/. Vowels are particularly prone to elision. In Belhare, for example, /i/ regularly deletes before /u/, cf. *tar-he-**ch-u**-ŋa* 'bring-PT-DL-3P-[1]EXCL', i.e. 'we (two, without you) brought it', vs. *ta-he-**chi**-ŋa* 'come-PT-DL-[1]EXCL', i.e. 'we (two, without you) came'.

A final type of effect to be noted results from general PROSODIC CONSTRAINTS. Often, epenthetic elements are inserted when the concatenation of an affix would result in a structure that violates the language's syllabic templates. In the Austronesian language Lenakel (spoken on Sulawesi in Indonesia), for example, a prefix-stem sequence like *r-va* '3SG-come' is broken up by an epenthetic vowel /ɨ/ so as to fit into the CV(C) syllable canon of the language, resulting in *r**ɨ**va* 's/he came'. Where the syllable canon is satisfied, there is no epenthesis, cf. *rɨmarhapɨk* 's/he asked' from ***r-ɨm**-arhapɨk* '3SG-PAST-ask' (Lynch 1978). Prosodic constraints can also lead to the truncation of extrasyllabic material. The Belhare temporary aspect marker *-hett*, for example, is reduced to *-het* unless there is some additional suffix whose syllable onset the second /t/ could form: cf. *ta-het* 'come-PT', i.e., 's/he is coming' vs. *ta-het**t-i*** 'come-PT-1PL', i.e., 'we are coming.'

2.3.3 Nonconcatenative

Despite (morpho)phonological adjustment rules that blur formative boundaries, concatenation results in linear strings of segmentable affixes. Nonconcatenative formatives, in contrast, are not segmentable into linear strings but are instead realized by direct modification of the stem. The best-known instance of this is morphology in Semitic and other Afroasiatic languages. In Arabic, for example, inflected word forms are the result of superimposing on a consonantal skeleton (e.g., *k-t-b* 'write') various vocalisms

indicating agreement, aspect, mood, and voice (e.g. *a-a* ‘third person singular masculine perfective active’, *a-u* ‘third person singular masculine imperfective active’), resulting in such forms as *katab* ‘he writes, wrote’ and *aktub* ‘he is/was writing’. Similar in nature but more common is the superimposition of PROSODIC FORMATIVES (tone, stress, length) onto word stems. Many Bantu languages, for example, distinguish temporal and modal values by purely tonal patterns. In Kinyarwanda (Overdulve 1987), one set of subordinate verb forms (called ‘conjunctive’, used mainly for complement and adverbial clauses) is distinguished from indicative forms by high tone on the agreement-marking prefix, another set (‘relative’, used mainly for relative clauses) by high tone on the last stem syllable: conjunctive *múkora* ‘that we work’, relative *mukorá* ‘which we work (at)’, indicative *mukora* ‘we work’ (all with agreement prefix *mu-* ‘1PL’).

A different type of non-concatenative formative involves SUBSTITUTION or REPLACEMENT of a stem segment. Replacive formatives are common, for instance, in Nilotic languages, where the plural of nouns is often formed by replacing the stem-final vowel by one of a set of plural-marking endings, e.g. in Lango (Lwo; Uganda; Noonan 1992): *bùrâ* ‘cat’ vs. *bùrê* ‘cats’ or *láŋô* ‘Lango’ vs. *láŋí* ‘Langos’. This is sometimes accompanied, as the latter example shows, by tonal substitutions and ablaut. In Ute (Uto-Aztecan; Givón 1980), substitution of an individual phonological feature is recruited for case marking, cf. nominative *ta’wácị̥* ‘man’ with devoicing of the final vowel vs. accusative *ta’wáci* ‘man’ without devoicing.

Still another type of nonconcatenative formatives is SUBTRACTIVE FORMATIVES. This is a rare phenomenon, but it is attested in the morphology of aspect in Tohono 'O'odham (previously known as Papago; Uto-Aztecan; S. California; Zepeda 1983 :59-61), e.g. *him* (IPFV) vs. *hiː* (PFV) ‘walk’, *hiːnk* (IPFV) vs. *hiːn* (PFV) ‘bark’, *ʔelpig* (IPFV) vs. *ʔelpi* (PFV) ‘peel’, *meḍ* (IPFV) vs. *meː* (PFV) ‘run’, etc. Each perfective form is derived from the imperfective by subtracting whatever happens to be the final consonant.

A final type of nonconcatenative formatives to be mentioned is REDUPLICATION. An example of this widespread phenomenon is given by Ancient Greek perfect tense forms. Under reduplication, the first consonant of the stem is repeated together with a supportive vowel /e/, e.g. *dé-deikha* ‘I have shown’ from *deíknūmi* ‘I show’, *me-mákhēmai* ‘I have fought’ from *mákhomai* ‘I fight’, *dé-drāka* ‘I have done’ from *dráō* ‘I do’, etc. Reduplication can also be analyzed as the prefixation of a syllabic skeleton *Ce-*, where the value of *C* is determined by the stem. On such a view (especially prominent in the theory of Prosodic Morphology; McCarthy & Prince 1995), reduplication would be a

(very tightly fused) concatenative affix rather than a nonconcatenative formative: the *Ce*-skeleton would be a well-segmentable prefix and the value of C would result from a simple phonological spreading rule, similar in fact to consonant harmony. Either way, it is evident that reduplication involves a tighter interlacing of formative and stem material than what is common in canonical exemplars of concatenative morphology.

This completes the scale of fusion. It is important to note that the scale applies to individual formatives, or sets of formatives, and not, as is sometimes suggested, to languages as wholes. Isolating formatives, for example, are found almost everywhere: virtually all languages have at least a few phonologically unbound particles, regardless of the kind of formatives they employ in the rest of their morphology. But mixtures of formative types can also be more intricate. For instance, while in Arabic and Kinyarwanda most verbal categories (aspect, mood, etc.) are expressed by nonconcatenative formatives, person and number inflection is realized through concatenative affixes in both languages. Given such distinctions, it clearly makes little sense to talk about concatenative or nonconcatenative languages per se. However, languages differ in the degree to which they employ one or the other type of formative, and from this point of view, Kinyarwanda is more nonconcatenative, as a whole, than, say, Turkish, which has only rudimentary and non-productive traces of nonconcatenative morphology borrowed from Arabic (Lewis 1967: 27f *et passim*).

2.4 Flexivity (variance, lexical allomorphy, inflectional classes)

Another important parameter along which formatives vary typologically is FLEXIVITY. Flexive[9] formatives come in sets of variants called ALLOMORPHS. Allomorphs are selected on lexical, i.e. item-based, principles. One example is Lango plural marking discussed above: some nouns take endings in *-ê*, some in *-í*, and so on. Conservative Indo-European languages, have sets of case allomorphs which are selected depending on the DECLENSION CLASS to which a noun belongs. Thus, the Latin genitive singular is realized

[9] The original, 19th century term is ‘(in)flectional’ (German *flektierend*), but this term is also (and nowadays more commonly) used in opposition to ‘derivational’ rather than as a concept in morphological typology. To avoid confusion of 'flexive' and 'inflectional', we use FLEXIVITY (rather than 'flection') as the abstract noun. Comrie (1981a) suggests ‘fusional’ but this conflates flexivity with phonological fusion, a distinction for which we argue below.

as -*ī* with some nouns (called *a*-, *e*- and *o*-stems) but -*s* after all others, e.g., *e*-stem *diē-ī* ‘of the day’ vs. *u*-stem *cornū-s* ‘of the horn’.

Instead of the formatives themselves, it can also be the stems that show item-based alternations in flexive morphology. In German, for example, some verbs show characteristic ABLAUT or UMLAUT patterns, where person and tense-indicating formatives trigger different vocalisms. From *tragen* ‘carry’, we get first person singular present *trage*, second person singular present *trägst*, and first person singular past *trug*, each with different stem vowels. The set of verbs exhibiting such alternations is lexically restricted (to what are traditionally called ‘strong’ verbs). Thus, other verbs (called ‘weak verbs’), such as *nagen* ‘gnaw’, show forms like *nage* (1st sing. pres.), *nagst* (2nd sing. pres.) and *nagte* (1st sing. past) without stem alternation. A similar but more complex example of this is provided by Dumi, a Tibeto-Burman language of the Himalayas (van Driem 1993). In this language, verbs divide into eleven CONJUGATION CLASSES, each characterized by a distinct ablaut pattern. A selection is illustrated in Table 1.

Table 1: Dumi non-past verb inflection (selection)

	II: *dzeːni* ‘speak’	III: *botni* ‘shout’	IV: *lɨnɨ* ‘commence’
1SG	*dzeː-tə*	*bus-tə*	*loː-tə*
1DU.INCL	*dziː-ti*	*bus-ti*	*lu-ti*
1DU.EXCL	*dziː-tɨ*	*bus-tɨ*	*lu-tɨ*
1PL.INCL	*dziː-kiti*	*boʔ-kti*	*lɨ-kti*
1PL.EXCL	*dziː-kta*	*boʔ-kta*	*lɨ-kta*

Verbs of conjugation class II (example *dzeːni* ‘speak’ in Table 1) have one stem form in the first person singular and another one in the first person dual and plural non-past. Verbs of class III (*botni* ‘shout’) have also two stems, but in this case it is the first person singular and dual that share the same stem, distinct from the first person plural. Verbs of class IV (*lɨnɨ* ‘commence’) have three different stem forms. Conjugation and declension classes are an important and frequent characteristic of inflectional paradigms, and we will return to them in Section 5.1.

The hallmark of flexive formatives is that their variation is item-based, i.e. allomorphs are selected by some but not other lexical contexts: some stem forms are selected by one (set of) formatives but not another, or follow one pattern in some words but not others, or some forms of formatives are selected by some words but not others. In contrast, NONFLEXIVE formatives are invariant across the lexicon and do not trigger

formative-specific or lexeme-specific stem alternation.[10] The kind of variation they show and that we surveyed in Section 2.3.2 above is due to general morphophonology or phonology. Note that the distinction between flexive (item-based, allomorphic) and nonflexive (general, morphophonological) variation is independent of whether the alternation-triggering context is defined morphologically or phonologically (cf. Kiparsky 1996). For instance, the Warlpiri ergative desinence is *-ngku* after disyllabic stems (cf. *kurdu-ngku* 'child-ERG') and *-rlu* after longer stems (cf. *nyumpala-rlu* 'you (dual)-ERG'; Nash 1986). Although the triggering context is phonologically defined, the allomorphy does not result from a general (morpho)phonological rule; the variation depends on a binary division of the lexicon into two inflectional classes, and the formative is thus flexive.[11] On the other hand, a general morphophonological alternation can be triggered by specific morphological structures ('cycles'): intervocalic voicing in Belhare, for example, is found only between stem-suffix boundaries (*lap* > *la**b**-u!* 'catch it!') but not between prefix-stem boundaries (*ka-**p**ira!* 'give it to me!') or in underived words (*pi**p**isiŋ* '(drinking) straw'). Because here the morphological condition is general across the lexicon rather than on a item per item basis, this is a nonflexive alternation.

Ever since the earliest attempts at morphological typology in the 19th century, the difference between flexive and nonflexive formatives is traditionally integrated into the fusion parameter. Concatenative-nonflexive formatives are then called AGGLUTINATIVE, resulting in a single scale ISOLATING > AGGLUTINATIVE > FLEXIVE > NONCONCATENATIVE (or INTROFLEXIVE). The motivation for this stems from the fact that just as nonconconcatenative formatives are less segmentable than concatenative formatives, so are flexive formatives less segmentable than nonflexive formatives: Dumi stem forms 'belong' in a sense more tightly to the formatives that select them than, say, Turkish stem-affix combinations. Dumi stem forms co-index the value of the formative: in a verb form like *lɨkti* 'we commence', the stem form *lɨ-* expresses in part the value indicated by the suffix (here 1st person plural) because it occurs only in combination with this value. One could indeed argue that the value is expressed by the stem and the affix simultaneously.

However, from a broader typological perspective, flexivity is orthogonal to fusion, and all possible combinations of values on the two parameters are attested, although not

[10] Apart from irregular verbs. Nearly every language has a few irregular or exceptional stems whose forms do not follow the morphological rules, but these are not at issue here.
[11] This kind of phonologically-based inflectional class distinction is common in many Australian languages. Examples from Papuan languages are discussed in detail by Aronoff (1994).

all are equally common. The commonest combination is FLEXIVE-CONCATENATIVE (and the traditonal notion of flexive or '(in)flecting' is often restricted to just this combination). Latin and Dumi illustrate this type: while they display lexical allomorphy of stems and/or formatives, the formatives are all more-or-less well-segmentable affixes, undergoing various morphophonological rules. Latin case declension, for example, shows patterns of assimilation and epenthesis. Thus, the Latin genitive singular *-i* desinence is lowered to *-e* after *-a* (cf. *cūra-e* 'of the care'), and *-s* is replaced by *-is* after consonants so as to avoid impossible consonant clusters (cf. *cōnsul-is* rather than **consuls* 'of the consul'). Further, *s*-final stems undergo a kind of dissimilation: before genitive *-s*, they are 'rhotacized', i.e. a stem like *flōs-* 'flower' turns into *flōr-is* 'of the flower'. Likewise, Dumi stem-suffix boundaries are subject to various morphophonological adjustement (van Driem 1993:91-95): e.g, the form *bus-tə* 'I shout' in Table 1 results from eliding stem-final /t/ in order to avoid the prosodically ill-formed **butstə* (but cf. the third-singular form *butsa* with vocalic suffix *-a*); and the stem-final glottal stop in *boʔkti* 'we (incl.) shout' and *boʔkta* 'we (excl.) shout' is the regular morphophonological variant of /t/ (itself shortened from /ts/) before /k/.

FLEXIVE-NONCONCATENATIVE formatives are abundant in Afroasiatic languages, especially in Semitic languages, and the prominent role that these languages played in early typology has motivated the label INTROFLEXIVE for just this combination of parameter values. In Semitic languages, the verb lexicon is compartmentalized into several inflectional classes traditionally called *binyanim* (singular *binyan*), and these classes determine by and large the allomorphy of tense/aspect morphology. In Modern Israeli Hebrew (Aikhenval'd 1990, Aronoff 1994), for example, the past vs. future opposition is expressed by different vowel and consonant alternations dependent on the binyan (as well as on subclasses of these): cf. *katon* 'he was small' and *yiktan* 'he will be small' in the first binyan vs. *qibbel* 'he received' vs. *yqabbel* 'he will receive' in the third binyan (*y-* is the third person masculine future agreement prefix).

FLEXIVE-ISOLATING formatives are by far the rarest combination, which is to say that lexical allomorphy is much more common within phonological (prosodic) words than across phonological word boundaries. But examples are found in some Pama-Nyungan languages. Yidiny has a set of suffixed formatives which Dixon (1977) calls non-cohering because they constitute their own phonological word, i.e. are isolating. Some of these are at the same time flexive since they show lexical allomorphy based on verbal

conjugation class: the verbal comitative,[12] for example, has three allomorphs, *-ŋa* ~ *-lmaŋa* ~*rmaŋa*. The disyllabic allomorphs are selected by what is called *l*- and *r*-stems, respectively, and they commence their own phonological word, cf., e.g., ['magil][ma'ŋaːl] 'climb.up-APPL:COM-PT' from *magi-lmaŋa-lnyu* 'climb.up-APPL:COM-PT'. The phonological autonomy of the formative is shown by the fact that it counts as its own domain for (i) stress assignment rules, according to which primary stress falls on the first or the first long-vowelled syllable of the word, and (ii) two rules that operate only in phonological words with an odd number of syllables: a penultimate lengthening and a final syllable reduction rule, both operating here on the trisyllabic sequence [ma.ŋal.nyu].

Nonflexive formatives are often isolating; and the most common type of isolating formative is nonflexive. An example is case in the Lai Chin example (2). When nonflexive formatives are concatenative, they are traditionally called AGGLUTINATIVE. This combination of parameter choices is also very common, one of the best-known examples being Turkish morphology, discussed above in Section 2.3.2.

Finally, nonflexive nonconcatenative formatives are common with suprasegmental (tonal or accental) morphology. An example is Kinyarwanda tense and mood inflection, as discussed in Section 2.3.3.

In the discussion of fusion, we noted that languages sometimes use concatenative techniques for some categories and nonconcatenative techniques for others. Similar splits are found in flexivity. Thus, while Russian case desinences are mostly dependent on lexical declension classes and are therefore flexive (e.g. dative sing. in *-u* with *o*-stems like *stol-u* 'table' but in *-e* with *a*-stems like *kryš-e* 'roof'), the dative, instrumental and locative plural formatives are invariant, nonflexive formatives (e.g. dat. pl. *stol-am* 'table', *kryš-am* 'roof').[13]

2.5 Semantic density

The difference between flexive and nonflexive is often conflated with the question of whether grammatical and semantic categories are realized through separate formatives or whether they accumulate in a single formative, i.e with question of the SEMANTIC

[12] The suffix has an applicative function; see (63) for an example. Dixon classifies this form has derivational, but on our criterion it is inflectional because its occurrence is an obligatory response to the kind of syntactic environments illustrated by (63), among others.

[13] Such splits are not random. See Plank (1999) for a preliminary survey.

DENSITY of formatives. However, there is no logical necessity for flexivity or, for that matter, phonological fusion (concatenative vs. nonconcatenative) to covary with semantic density (cf. Plank 1999). There are two dimensions of semantic density that need to be distinguished typologically. One is density on the level of the formative. This is traditionally called EXPONENCE. The other dimension is density on the level of the word. This is traditionally called SYNTHESIS. (For more on semantic density of words see Talmy, III.2 in this series.)

2.5.1 Exponence

EXPONENCE refers to the degree to which different categories, e.g. number and case, or person and tense, are grouped together in single, indivisible formatives. Two prototypes are typically distinguished: CUMULATIVE and SEPARATIVE formatives. Cumulative formatives are common in Indo-European languages, where number and case, for example, are virtually always accumulated into a single set of formatives. Thus, in Russian one gets GEN. SG. *-a* ~ *-i*, but GEN. PL. *-ov* ~ *-ø* ~*-ej* (allomorphs dependent on lexical declension class; cf. above), where there is no correspondence whatsoever between categories and parts of formatives (segments). An alternative term to cumulative is PORTMANTEAU formatives.

The opposite of cumulative formatives is separative formatives. Separative formatives encode one category at a time. In Turkish, for instance, case and number are, as we saw, each expressed by their own suffix, e.g., GEN. SG. *-ɪn*, GEN. PL. *-lar-ɪn* (all with vowel-harmonic alternations). There is some tendency for nonflexive concatenative ('agglutinative') morphology to go with separative exponence and for flexive formatives to be cumulative, but this need not be so. The Turkish first person plural ending *-k* (as in *gör-dü-k* 'see-PT-1PL', i.e. 'we saw') cumulates person and number, but is invariant across the lexicon and thus clearly nonflexive. And flexive formatives can be separative. In the preceding section we saw that Dumi person, number, and tense formatives are flexive in that they select lexically defined ablaut classes. But this does not entail that the three categories are always expressed cumulatively: in a desinence like *-tə,* for instance, *-t* marks non-past tense separatively from *-ə* for first person singular (cf. *-ø-ə* '1st person singular past'). Thus exponence type is independent of flexivity. And it is independent of fusion: although cumulative exponence is best known from bound morphology (e.g., Russian case-number exponence as mentioned above), some West African languages

have isolating (free) portmanteau formatives cumulating person agreement and tense/aspect/mood values. This is illustrated by Hausa:

(15) Hausa (Afroasiatic, West Africa; Newman 2000:569)

a. Mūsā yā tàfi Bicì.
M. 3SG.MASC:COMPL go B.
'Musa went/has gone to Bichi.'

b. yârā sun ga macījî-n?
children 3PL.COMPL see snake-ART:PL
'Did the children see the snake?'

2.5.2 Synthesis and wordhood

The second dimension of semantic density, SYNTHESIS, applies to the level of the word. It is customary to distinguish three prototypes on a scale from ANALYTIC to SYNTHETIC to POLYSYNTHETIC, measured by the number of formatives and lexical roots that are bound together in one word: one or very few formatives and at most one root in the case of analytic words, a moderate number of formatives together with one root in synthetic words, and an abundant mixture of formatives and lexical roots in polysynthetic words.

The relevant notion of word here is the GRAMMATICAL WORD, not the phonological word. The grammatical word is defined as the smallest unit of syntax, technically the terminal node or minimal projection (X^0) in phrase structure. In *He worked*, for instance, *he* and *worked* are grammatical words, one (*he*) simple, one complex (*worked*, containing the root *work* and the past tense suffix *-ed*.) The formatives that are combined into a single grammatical word (*work+ed*) cannot be interrupted by phrasal constructions. They exhibit only morphological and phonological dependencies (such as allomorphy selection and phonological fusion), but never enter into syntactic dependencies such as agreement or government. They usually have fixed morpheme order, while the ordering of grammatical words with respect to each other is commonly (though not always) freer. Typically, grammatical words are also phonologically coherent, but, as we saw in the Yidiny example in Section 2.4, the phonological word can be a smaller unit than the grammatical word. Phonological words can also be larger units than grammatical words; common examples of this arise from cliticization. Russian prepositions, for instance, form a single phonological word with the noun they govern. As we saw in Section 2.1,

however, the relationship between preposition and noun is still one between independent grammatical words, and a preposition-noun sequence does not constitute, therefore, synthesis or polysynthesis.

ANALYTIC WORDS comprise just one or a very limited number of formatives or just one lexical root, but they sometimes combine syntactically in the expression of inflectional categories. This is called PERIPHRASTIC expression. An example is the expression of tense and aspect values by means of auxiliary constructions in European languages. The English future tense (*he will go*), for instance, involves two distinct grammatical words, each comprising only one formative (the auxiliary *will*) or one root (*go*). The two words occupy variable phrase-structural positions (*Your friend will go* vs. *Will your friend go?*) and the expression is interruptible by phrasal expressions (*He will definitely go*). Note that analytic words can be phonologically bound: English auxiliaries typically cliticize to preceding words (*he'll go*).

Words such as the *have* auxiliary in English, which comprise two formatives, a tense-indicating root and an agreement marker (cf. *has* vs. *have*), are traditionally classified as analytic just like single-formative auxiliaries. The notion of SYNTHETIC WORDS is usually restricted to words with more elaborate formative sequences, but the difference between synthetic and analytic is one of degree, and any categorial distinction ultimately misses the point. When flexive formatives are involved, synthetic words typically comprise two or three formatives along with a lexical root, e.g. a verb root and formatives expressing aspect, tense and agreement or a nominal root and formatives expressing case and number. Nonflexive concatenative (i.e. 'agglutinative') morphology usually allows longer and more complex synthetic words. An extreme example of this is Turkish word forms like the one in (16), which includes no less than ten formatives suffixed to the stem *tan-* 'know'.

(16) Turkish

tan-ış-tır-ıl-a-ma-dık-lar-ın-dan-dır.
know-RECIP-CAUS-PASS-POT-NEG-NZR-PL-3POSS-ABL-3COP
'It is because they cannot be introduced to each other.'
(lit., '[it] is from their not being able to be made known to each other.')

Synthetic words mostly involve bound (concatenative or nonconcatenative) formatives, but, as pointed out before, phonologically isolating formatives can also combine into

single grammatical words and can thereby constitute complex synthetic words. Indeed, many isolating formatives in South East Asian and East Asian languages form a single grammatical word together with the lexical root they modify. In Lai Chin, for instance, a series of formatives indicating agreement, tense and mood are phonologially free, i.e. isolating, but any sequence of a verb and one or more of these formative constitutes a single, uninterruptible word from the point of view of syntax:

(17) Lai Chin (Ken Van Bik, p.c.)

a. na-tuk nhaa làay
2SG.A-hit.with.stick:Σ2 3PL.P FUT
'You will hit them.'

b. na-kan-tuk làay
2SG.A-1PL.P-hit.with.stick:Σ2 FUT
'You will hit us.'

In strings of formatives like these, the ordering of formatives is rigidly fixed *(*natuk laay nhaa*). Moroever, the third person plural object agreement marker *nhaa* is obligatory and is in direct paradigmatic opposition with the first person plural object agreement marker which is a phonologically bound prefix (*kan-*). Further, as shown by the contrast in (18), no phrasal constituent can intervene:

(18) Lai Chin (Ken Van Bik, p.c.)

a. *na-tuk nhaa, ʔùy tsaw làay.
2SG.A-hit.with.stick:Σ2 3PL.P dog FUT
Intended: 'You will hit the dogs.'

b. na-tuk nhaa làay, ʔùy tsaw.
2SG.A-hit.with.stick:Σ2 3PL.P FUT dog
'You will hit the dogs.'

These data suggest that the sequence *natuk nhaa làay* 'you will hit them' forms one single, synthetic grammatical word, just like the expression *ʔùy tsaw*, which is a single lexical item meaning 'dog'. Thus, even though at first sight one is tempted to compare the syntactic status of *làay* to that of the English auxiliary *will* and the status of *nhaa* to that of the Englihs pronoun *them*, *làay* and *nhaa* are formatives within a word, and not

grammatical words in syntactic combination. This is all completely independent of the fact that Lai Chin grammatical words often comprise several phonological words.

While synthetic forms comprise only formatives and one grammatical word (the stem), matters are different with polysynthesis, which brings together not only formatives but also incorporated stems and lexical affixes into a single word. This phenomenon is widespread in North American languages (for which it was first described by Du Ponceau in 1819), but it is also found elsewhere. The following examples of polysynthetic words are from Alaska and Papua New Guinea, respectively:

(19) Yup'ik Eskimo (Eskimo-Aleut; Alaska; Mithun 1999)
kai-pia-llru-llini-u-k
be.hungry-really-PT-apparently-IND-3DU
'The two of them were apparently really hungry.'

(20) Yimas (Lower Sepik-Ramu; Papua New Guinea; Foley 1991)
paŋkra-kaykaykay-kwalca-mpi-kulanaŋ-tal-kia-ntu-ŋkt.
1PAUC.S-quickly-rise-SEQ-walk-start-at.night-REM.PT-PAUC
'We few got up at night and quickly started to walk.'

In these verb forms, not only grammatical information like person, number and tense, but also various lexical concepts are expressed by bound morphology.

Polsynthesis often involves grammatical words that are phonologically coherent, but, as with synthesis, not necessarily. Indeed, unlike the Eskimo example in (19), a Yimas string like the one in (20) consists of several phonological words,[14] defined by stress and allophone distribution (Foley 1991: 80-87), but the string nevertheless forms a single grammatical word in syntax (i.e. a V^0 or minimal projection constituent). Its syntactic wordhood is evidenced, among other things, by the fact that the string involves purely morphological, non-syntactic dependencies: the appearance of the paucal suffix *-ŋkt,* for example, is contingent on the presence of a person-indicating prefix, here *paŋkra-* 'we few'. The suffix cannot appear if the person reference is established by means of syntactically independent pronouns rather than prefixed pronominal formatives. The first

[14] This has also been shown for polysynthetic words in the two North American languages Cree (Algonquian) and Dakota (Siouan); see Russell (1999). The analysis of Algonquian and similar languages (e.g. Kutenai) as polysynthetic has become a matter of debate, however. See, e.g., Goddard (1988) and Dryer (2000) for controversial discussion.

person paucal pronoun, for example, is incompatible with the paucal suffix because the pronoun projects its own analytic grammatical word. (First person reference is expressed here periphrastically, compensating for the lack of a corresponding synthetic form.)

(21) Yimas (Foley 1991:223)

paŋkt	ŋkul-cpul(*-ŋkt)
1PAUC	2DU.P-hit(*-PAUC)

'We few hit you two.'

If suffixing *-ŋkt* were possible here, this would mean that the second word was agreeing with the first and that the relationship between the two is therefore one of syntactic agreement. A case could then be made for analyzing the earlier Yimas expression in (20) as consisting of several grammatical words and therefore as analytic. But the fact is that the distribution of *-ŋkt* is subject to morphological rules that are operative within, rather than across, grammatical words.

One of the typologically most important characteristics of polysynthesis, identified already by Du Ponceau (1819: xxxi), is that pronominal and even lexical arguments are incorporated into their governing verb. In the Yimas word in (20), this is exemplified by the first person paucal prefix *paŋkra-* which functions as an affixed subject pronoun. In (21), the second person dual prefix *-ŋkul* functions as an incorporated object pronoun, while the subject pronoun *paŋkt* 'we few' is not incorporated. We will come back to pronoun incorporation in our discussion of agreement systems in Section 9.

3. Locus

Locus is the generic term we propose for head/dependent marking (Nichols 1986, 1992:46ff). At issue is whether various syntactic relations are marked on the head or the dependent, or both or neither, of the constituent within which the syntactic relation obtains. The syntactic relations for which marking locus has the clearest typological relevance are verb-argument relations in the clause, head-possessor or head-modifier relations in NP's, adposition-object relations in PP's, and relations between main and non-main clauses. Not only the direct marking of syntactic relations, but agreement as well, can be marked on either heads or non-heads.

The following are examples of possessive NP's with different loci of marking (Nichols 1992:49ff).

On head (HEAD MARKING):

(22) Tadzhik (Indo-European; Payne 1980:167-8)

a. xona - i surx
house EZ red
'red house'

b. xona - i padar
house EZ father
'father's house'

(23) Abkhaz (Northwest Caucasian; Hewitt 1979:116)

à-č'k°'ən yə-y˚nə̀
ART-boy 3SG-house
'the boy's house'

In (22), the formative *-i* on the head marks the relation of syntactic dependency in an NP, i.e. indicates that there is a dependent. This construction is known as *izafet* or *ezafe* in the grammatical traditions of many Turkic and Iranian languages (and glossed here as 'EZ'). In (23), the dependency relation is indicated by possessor agreement, again marked on the head. This is the inflectional category generally known as POSSESSION or POSSESSIVE AFFIXES, common in languages of Siberia and the Americas. For more on possessor agreement, see Sections 5.1 and 9.2 below.

On dependent (DEPENDENT MARKING):

(24) Chechen (Nakh-Daghestanian; Caucasus)

dee-^{n} aaxcha
father-GEN money
'father's money'

On both (DOUBLE MARKING):

(25) Nogai (Baskakov 1963:539):

men=im kullyg-ym
1SG=GEN work-1SG

'my work'

On neither (ISOLATION):

(26) !Kung (Khoisan; S. Africa; Snyman 1970:92):

dz'heu ǂxanu
woman book

'woman's book'

On neither (DETACHED MARKING):

(27) Tagalog (Austronesian; Philippines; Schachter & Otanes 1972:116, 123):

a. nasa mesa = ng libro
on table=LINK book

'the book on the table'

b. libro = ng nasa mesa
book=LINK on table

'the book on the table'

This Tagalog example is another instance of a Wackernagel-position clitic on the NP level (cf. example (9) in Section 2.2). We call this marking DETACHED because the clitic is not attached to either the head or the dependent. It is placed between the two.

Marking can also be split. Cross-linguistically common splits include dependent marking for nouns (arguments, possessors, objects of adpositions) and head marking for pronouns. In possessive NP's, an alienable/inalienable opposition is often implemented by dependent marking (or more nearly dependent marking, or less head marking) of alienable possessors and head marking (or more nearly head marking, or less dependent marking) of inalienable possession (Nichols 1988). For example, in Eastern Pomo, a closed set of kin terms takes head-marked (inalienable) possession (28a) while other nouns take dependent-marked (alienable) possession using a genitive case (28b):

(28) Eastern Pomo (Pomoan; N. California; McLendon 1975:92, 108)

a. wí-bayle
1SG-husband
'my husband'

b. wáx šaːri
1SG.GEN basket
'my basket'

Certain grammatical categories favor particular loci, and the traditional terminology for various grammatical categories contains implicit reference to locus of marking. Case, for instance, is always marked on dependents, and in fact case can be defined as dependent-marked affixal indication of clause and phrasal relations. The same information can perfectly well be marked on heads, but then it is not called case. In the following Georgian examples, the form of the first person agreement prefix indicates the role of the first person referent: subject in the first example, object in the second.

(29) Georgian (Kartvelian; Caucasus)

a. v-xedav
1SG-see
'I see (him/her/it).'

b. m-xedav
1SG.P-see
'You see me.'

In the following examples from a Mayan language, the agreement markers are glossed (as is typical among Mayanists) with case names: A = absolutive and E = ergative.

(30) Jacaltec (Mayan; Mesoamerica; Craig 1977: 122, 111)

a. x-Ø-haw-il naj
ASP-A3-E2-see 3SG
'You saw him.'

b. xc - ach w - abe
ASP-A2 E1-hear
'I heard you.'

This can be called AGREEMENT DIFFERENTIATION. Agreement differentiation also occurs in NP's, where it is another way of implementing alienable/inalienable possession, different from what we observed in (28) above. An example is Diegueño, where the choice of simple vs. extended possessive prefixes marks inalienable vs. alienable possession:

(31) Diegueño (Yuman, S. California; Langdon 1970:143)

a. ʔ-ətal^{y}
1SG-mother
'my mother'

b. ʔən^{y}-ewaː
1SG.ALIENABLE-house
'my house'

Gender and number are agreement categories which can be marked on either heads (for instance, when a verb agrees in gender and number with an argument) or dependents (when e.g. an attributive adjective agrees in gender and number with its head noun). (This is discussed in Section 9 on agreement.) Person is a category which seems to be generally associated only with head marking; dependent marking of person is found only as the effect of multi-target agreement (see the discussion of the Archi and Coahuilteco examples 68 – 69 in Section 9.2). Other categories[15] vary widely as to their locus of realization.

4. Position

By position we mean the location of an inflectional formative relative to the word or root that hosts it. The formative may precede the host, follow it, occur inside of it, be detached from it, or various combinations of these. There is a standard terminology which accounts for most of these positions together with the formative type and degree of fusion. Table 2 expands this terminology somewhat. Latin prepositions or truncated adverbs label the position categories. Types that may not be self-evident or have not been illlustrated earlier are explained and exemplified in what follows.

[15] See Section 5 for discussion of person and number categories; for gender see Chapter III.4

Table 2: Typology of positions and formatives. * = example in this section.

Position	*Formative type and/or degree of fusion*
Prae	Preposed free formative * Proclitic Prefix Initial reduplication (cf. Ancient Greek example in Section 2.3.4 for illustration)
In	Substitution (cf. Section 2.3.4) Ablaut (i.e. bare ablaut; if ablaut is triggered by an affix, the combination of affix and ablaut constitutes simulfixation, described below) Infix (including Interposition *) Endoclisis * Subtraction (cf. Tohono 'O'odham example in Section 2.3.4) Prosodic formatives (cf. Kinyarwanda example in Section 2.3.4)
Post	Final reduplication Suffix Enclitic Postposed free formative
Simul	Simulfix, simulclitic, etc. (including circumfix) *
None of the above	Detached (word or formative, cliticized or free; see Sections 2.2 and 3.1 for discussion)

Examples:

FREE FORMATIVES: Like affixes, free (or isolating) formatives are typically fixed in their position. Plural words and other grammatical number words (Dryer 1989) are often free formatives. The singular and plural words of Yapese, shown in the following examples, are in a fixed position in the nominal modifiers.

(32) Yapese (Austronesian; Dryer 1989:868 from Jensen 1977:155)

a. ea rea kaarroo neey
ART SG car this
'this car'

b. ea pi kaarroo neey
ART PL car this
'these cars'

In Tongan the number words are unique in occurring in the context ARTICLE ___ NOUN, and are therefore a word class of their own (Dryer 1989:875):

(33) Tongan (Austronesian; Dryer 1989:975 from Churchward 1953:29, 28)

a. ha fanga pulu
INDEF PL cow
'some cows'

b. ha ongo puha
INDEF DU box
'two boxes'

ENDOCLISIS: A clitic inserted into a word constitutes endoclisis. The phenomenon is rare, but well documented for Udi by Harris (2000). In (34), the person-number agreement marker is a clitic (Σ = first element of split simplex stem; see Harris for the full argument that =z= is a clitic):

(34) Udi (Nakh-Daghestanian, Caucasus; Harris 2000)

kaghuz-ax a=z=q'-e
letter-DAT Σ=1SG=receive-AOR
'I received the letter.'

INTERPOSITION: Interposition is typologically distinct subtype of infixation. In general, infixation places formatives into a phonologically or prosodically defined environment (e.g. after the stem's onset consonant(s), or after the first syllable), but in the case of interposition, the environment is more nearly morphological, reflecting petrified derivational morphology or compounding. Interposition typically involves formatives placed between the two parts of a BIPARTITE STEM. A bipartite stem is one that is discontinuous or segmentable into two parts by certain morphological processes but behaves in many respects like a simple root (Jacobsen 1980, DeLancey 1996). Interposition in verb stems is particularly known in languages spoken in the Northwestern U.S., but it is also attested in various Caucasian and Himalayan languages:

(35) Andi (Nakh-Daghestanian; Caucasus; Gudava 1959:197)

a-b-ch-o
Σ-GENDER AGREEMENT-wash-PAST
'(I/you/he/she/we/they) laundered, washed (it)'

(36) Belhare (Tibeto-Burman; Nepal)

a. la-ŋŋ-u-yakt-he.[16]
Σ-3NSG.S-dance-IPFV-PAST
'S/he was dancing.'

b. misen-ka-ni-at-ni.
Σ-1NSG.INCL.P-[3SG.A]-know-PAST-NEG
'S/he didn't recognize us (incl.).'

It is chiefly verbs that are bipartite, but bipartite nominal stems that undergo interposition are attested in Limbu (Tibeto-Burman, Nepal). The third person singular possessive form of *teːʔlphuŋ* 'garments, clothing', for instance, is *ku-deːʔl-ku-bhuŋ* (van Driem 1987: 27), with the possessive marker *ku-* occuring not only at the beginning of the word but also at the beginning of its second (etymologically separate) part. (This example also illustrates simulfixation, as is discussed just below.)

SIMULFIXATION: This term, which was first proposed by Hagège (1986:26), involves several tokens of a single morpheme, realized at different places in the word. The commonest subtype is CIRCUMFIXATION (as, e.g., the circumfix *ge-…-t* marking German participles such as *ge-lieb-t* 'loved'), but there are other options. The formatives can be both suffixes, both prefixes, or one can be internal, the other external. The Belhare perfect exemplifies concatenative simulfixes of which both pieces are postposed:

(37) Belhare

khai-ŋa-ŋŋ-ha.
go-PERF-1SG-PERF
'I've gone.'

Combinations of internal and external marking are abundant in Germanic languages, e.g. in words such as English *children*, whose plural number is marked by both ablaut (internal) and a suffix (postposed). A more complex example of this kind is found in Lak, where in some verbs gender is marked both by initial mutation (*b/d/Ø*) and internally, by ablaut of the medial consonant (*v/r*).

[16] Phonologically, these strings bracket into two prosodic words: ['laŋ]['ŋuyakthe], ['misen][ka'niatni], but syntactically, they are indivisible wholes, i.e. single grammatical words; cf. the discussion of synthesis in Section 2.4.

(38) Lak (Nakh-Daghestanian; Caucasus; Zhirkov 1955:93, 1962:418)

a. b-u-v-na

b. d-u-r-na

c. u-v-na
GENDER.AGREEMENT-go-GENDER.AGREEMENT-PT
'went' (different genders)

The Limbu example used above to illustrate interposition also illustrates simulfixation: it has one token of the possessive formative preposed and one interposed into a bipartite stem.

Where morphology is flexive, simulfixation (at least from a morphemicist perspective) amounts to affixation plus allomorphy. Indeed, affixation plus stem allomorphy is probably often the historical source of simulfixation where flexive formatives are involved.

There are also various kinds of splits in the position of formatives. The English past tense, which is marked internally (by ablaut) in strong verbs but by suffixation in weak verbs, is an example of split position. Another example is the placement of the nominalizer in Upriver Halkomelem, a Salishan language of British Columbia: the nominalizer *s-*, for example, is normally a prefix, as in (39a), but in subordinate constructions, as in (39b), it (together with possessive agreement markers) cliticizes to the preceding word, typically a demonstrative that acts as a complementizer (much like English *that*):

(39) Halkomelem (Salishan; NW America; Galloway 1993)

a. s-t'í:ləm
NZR-sing
'a song'

b. k'^{w}=əl=s k'^{w}ə́c-l-əx^{w}.
DEM=1SG.POSS=NZR see-happen-3SG.P
'that I saw him' (lit., 'my seeing him')

The apparent position of affixes in a word can be deceptive, so that what appears to be (say) an infix to the naked eye proves to be a prefix or suffix when the morphological analysis has been done. For example, Tagalog infixes have been successfully analyzed as

prefixation under prosodic constraints against closed syllables (McCarthy & Prince 1995, and Crowhurst 1989 for critical discussion): cf. *um-ibig* ‘love’ vs. *s-um-ulat* ‘write’ and *gr-um-adwet* ‘graduate’. Here, the actor-voice prefix *um-* is forced to shift to after the first onset in order to avoid the ungrammatical closed syllables *($_\sigma$um) (as in **um-sulat*, **um-gradwet*) or *($_\sigma$gum) (as in **gumradwet*).[17]

Another potential source of confusion in the analysis of affix positions is internal constituent structure within inflected and derived words. In the following examples from the Daghestanian language Kubachi Dargi, the gender formatives *b* and *w* appear both at the beginning and in the middle of the word:

(40) Kubachi Dargi (Nakh-Daghestanian; Magometov 1963:76)

a. b-e:n - ka - b-iššı-j
GENDER-in.down-GENDER-go-INF
‘insert, put in’ (B gender)

b. w-e:n - ka - w-iššı-j
GENDER-in.down-GENDER-go-INF
‘go in’ (W gender)[18]

This is not simulfixation, however, but simultaneous prefixation to both a (verbal) preverb and the verb root.

5. Paradigms

Inflectional systems are typically organized into PARADIGMS of variable size, ranging from e.g. the two-member third person singular vs. plural paradigm of English verb agreement (*goes* vs. *go*) to large case paradigms. Plank (1991:16) notes that very large case inventories are found only in languages with separative exponence and do not occur in languages with chiefly cumulative exponence.

The organization of inflectional forms into paradigms brings with it a series of properties not typically found in other parts of morphology: inflectional classes, syncretism, defectivity, suppletion, deponence, and eidemic resonance.

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[17] Following standard conventions, ‘σ’ stands for syllable and the parentheses are syllable brackets.

[18] The verb is ambitransitive, and is interpreted as transitive (semantically causative) when it agrees in the inanimate B gender but as intransitive when it agrees in the animate W gender.

5.1. Inflectional classes

Case paradigms are paradigms par excellence and display most of the important properties of paradigms. Tables 3 and 4 below show Latin and Chechen case paradigms respectively. (Gaps in some of the Latin paradigms illustrate defectivity, discussed below.)

Table 3: Latin noun paradigms

	'wolf'	'war'	'road'	'foot'	'attack'
Nom	*lupus*	*bellum*	*via*	*pēs*	*impetus*
Voc	*lupe*	--	--	--	--
Acc	*lupum*	*bellum*	*viam*	*pedem*	*impetum*
Gen	*lupī*	*bellī*	*viae*	*pedis*	--
Dat	*lupō*	*bellō*	*viae*	*pedī*	--
Abl	*lupō*	*bellō*	*viā*	*pede*	*impetū / -e*
Plural:					
Nom	*lupī*	*bella*	*viae*	*pedēs*	*impetūs*
Voc	*lupī*	--	--	--	--
Acc	*lupōs*	*bella*	*viās*	*pedēs*	*impetūs*
Gen	*lupōrum*	*bellōrum*	*viārum*	*pedum*	--
Dat	*lupīs*	*bellīs*	*viīs*	*pedibus*	--
Abl	*lupīs*	*bellīs*	*viīs*	*pedibus*	--

Table 4: Chechen noun paradigms (all-Latin no-diacritics transcription; see http://socrates.berkeley.edu/~chechen for this transcription):

	'window'	'daughter-in-law'	'mother'	'grief'	'pig'
Nom	*kor*	*nus*	*naana*	*baala*	*hwaqa*
Gen	*kuoran*	*nesan*	*neenan*	*baalin*	*hwaqin*
Dat	*kuorana*	*nesana*	*naanna*	*baalina*	*hwaqina*
Erg	*kuoruo*	*nesuo*	*naanas*	*baaluo*	*hwaquo*
All	*kuorie*	*nesie*	*neenie*	*baalie*	*hwaqie*
Ins	*kuoraca*	*nesaca*	*neenaca*	*baalica*	*hwaqica*
Lat	*kuorax*	*nesax*	*neenax*	*baaliax*	*hwaqiax*
Csn	*kuoral*	*nesal*	*neenal*	*baalial*	*hwaqial*
Plural:					
Nom	*kuorash*	*nesarii*	*naanoi*	*baalanash*	*hwaqarchii*
Gen	*kuoriin*	*nesariin*	*naanoin*	*baalaniin*	*hwaqarchiin*
Dat	*kuorashna*	*nesarshna*	*naanoshna*	*baalanashna*	*hwaqarchashna*
Erg	*kuorasha*	*nesarsha*	*naanuosha*	*baalanasha*	*hwaqarchasha*
All	*kuorashka*	*nesarshka*	*naanoshka*	*baalanashka*	*hwaqarchashka*

Ins	*kuorashca*	*nesarshca*	*naanoshca*	*baalanashca*	*hwaqarchashca*
Lat	*kuoriax*	*nesiax*	*naanoix*	*baalaniax*	*hwaqarchiax*
Csn	*kuorial*	*nesial*	*naanoil*	*baalanial*	*hwaqarchial*

The Latin nouns shown in Table 3 fall into distinct declension classes based on the considerable allomorphy of the thematic vowels (the stem-final vowels) and the endings. The Chechen nouns in Table 4 have mostly the same endings but considerable variation of stems. The noun ‘daughter-in-law’ has stem ablaut, and most nouns have stem extenders in the plural paradigms: -*ar*- in ‘daughter-in-law’, -*arch*- in ‘pig’, -*o*- in ‘mother’, -*an*- in ‘grief’. The -*i*- found in several oblique cases in the singular of ‘grief’ and ‘pig’ is another stem extender, absent in the nominative, ergative, and (synchronically, though probably not diachronically) allative. Stem extenders are lexically conditioned and carry no meaning (though they may have their origins in frozen derivational or inflectional suffixes). The Chechen system of stem extenders is a modest version of the elaborate systems found in Daghestanian languages (Kibrik 1991), distant sisters of Chechen.

The notion of DECLENSION CLASS, or more generally INFLECTIONAL CLASS, was devised traditionally to handle paradigms like the Latin ones, where at first glance there seem to be different series of endings (-*us*, -*um*, -*ī*, -*ō*; -*a*, -*am*, -*ae*; -*Ø*, -*em*, -*is*, -*ī*; etc.). In fact, though, there are two sets of differences, one resulting from thematic vowels (-*u* ~ *-*o* in ‘wolf’ vs. -*a* in ‘war’ vs. ø in ‘foot’ vs. -*u* in ‘attack’) and one resulting from differences in the endings themselves (nominative singular -*s* or -*ø* or -*m*; genitive singular -*ī* or -*(i)s*, nominative plural -*i* or -*ēs*); these two kinds of differences can also occur simultaneously (e.g. nom. sing. in ø with *a*-stems, but in -*s* or -*m* with others). The thematic vowels are rather like stem extenders; this means that the Chechen and Latin case paradigms differ in degree of morphophonemic transparency (Latin being less transparent) rather than in morphological type. A full taxonomy of variation in stem and ending adequate to typologize inflectional paradigms would be a three-way distinction of variation for both stems and endings: lexically conditioned, i.e. lexeme-based, allomorphic variation; category-based allomorphic variation, i.e. allomorphy dependent on specific inflectional categories but general across all lexemes; and no allomorphic variation.

Table 5: Typology of inflectional classes

	Formative:		
Stem:	*Lexeme-based allomorphy*	*Category-based allomorphy*	*No regular allomorphy*
Lexeme-based allomorphy	Latin nouns	Latin and Polish verbs	Chechen verbs, nouns Dumi verbs (2.3.3)
Category-based allomorphy	Arabic verbs	Newar verbs	Belhare verbs
No regular allomorphy	Polish nouns Anêm possession	Germanic weak verbs Ossetic sg./pl. case	Finnish nouns

LEXEME-BASED ALLOMORPHY OF STEMS, OR STEM CLASSES: Stem classes are present when stems differ (because of ablaut, stem extenders, stress shift, etc.) when inflected for the same category, and the differences are lexically (and not [morpho-] phonologically) conditioned. Examples are the Chechen and Latin paradigms in Tables 3 and 4 above. In Chechen, for example, the vowel ablaut in 'daughter-in-law', or the choice of stem extenders (-*ar*-, -*an*-, etc.) in the plural, is a purely lexical and unpredictable matter. In Latin, as argued above, the traditional declension classes are in fact lexical differences of thematic vowel (obscured by morphophonemics).

CATEGORY-BASED STEM ALLOMORPHY: In some languages, all stems have the same allomorphy, selected by specific morphological categories or paradigms. Belhare verbs all undergo the same stem alternations from person to person and from tense to tense. The verb *yakma* 'to stay overnight, find shelter', for example, has the two stem forms *yak*- and *yau*-, and Table 6 shows how they are distributed over a selection of forms.

Table 6: Belhare verb paradigm (selection). The *k~g* alternation is morphophonologically conditioned; -*ʔ* and -*yu* mark non-past (the allomorphy is determined by prosodic structure), -*he* past, -*ŋe* resultative, and -*kone* inconsequential.

	non-past	past	resultative	inconsequential
1sg	*yau-ʔ-ŋa*	*yag-he-ŋa*	*yau-ŋe-ŋa*	*yak-kone-ŋa*
2sg	*yau-ka*	*yag-he-ga*	*yau-ŋe-ga*	*yak-kone-ga*
3sg	*yak-yu*	*yag-he*	*yau-ŋe*	*yak-kone*

The primary stem here is *yak-*, and the secondary stem is derived from this by imposing a CVV syllable structure: the original root coda is vocalized while retaining its point of articulation and nasality/orality, e.g., *yak-* ~ *yau-* 'stay overnight', *yaŋ-* ~ *yaũ-* 'carry by hand'. Bilabials are exempted from this and remain unchanged (e.g. *lap-* 'catch'). CV roots are fitted into the CVV shape by epenthesis of /i/ or, after /i/, /u/ (e.g. *so-* ~ *soi-* 'wait', *khi-* ~ *khiu-* 'quarrel', etc.). These rules hold across the lexicon; the stem allomorphy is entirely regular and exclusively depends on the person and tense choice: the secondary stem occurs before the nonpast allmorphs *-t* and *-ʔ*, and before the resultative (and perfect) markers *-ŋe* (and *-ŋa*), among others.

NO STEM ALLOMORPHY: Stems need not behave differently when inflected for the same categories. The noun stems of Finnish, for example, and most noun stems of Polish, behave essentially alike and are essentially unchanged (except for automatic phonological and morphophonemic alternations) when inflected for case.

Table 7: Finnish noun paradigms. (Eliot 1890:26ff., Serebrennikov & Kert 1958) (Branch 1987; Sirpa Tuomainen, p.c.) Changes of consonants are due to gradation, a regular morphophonemic process. Choice of *-a* vs. *-ä* in endings is due to vowel harmony.

Singular:	'book'	'tree'	'sun'	'water'
Nominative	*kirja*	*puu*	*aurinko*	*vesi*
Accusative	*kirjan*	*puun*	*auringon*	*veden*
Genitive	*kirjan*	*puun*	*auringon*	*veden*
Essive	*kirjana*	*puuna*	*aurinkona*	*vetenä*
Partitive	*kirjaa*	*puuta*	*aurinkoa*	*vettä*
Translative	*kirjaksi*	*puuksi*	*auringoksi*	*vedeksi*
Inessive	*kirjassa*	*puussa*	*auringossa*	*vedessä*
Elative	*kirjasta*	*puusta*	*auringosta*	*vedestä*
Illative	*kirjaan*	*puuhun*	*aurinkoon*	*veteen*
Adessive	*kirjalla*	*puulla*	*auringolla*	*vedellä*
Ablative	*kirjalta*	*puulta*	*auringolta*	*vedeltä*
Allative	*kirjalle*	*puulle*	*auringolle*	*vedelle*
Instructive	*kirjoin*	*puun*	*auringon*	*veden*
Comitative	*kirjoineen*	*puineen*	*aurinkoineen*	*vesineen*
Abessive	*kirjatta*	*puutta*	*auringotta*	*vedettä*

Plural:				
Nominative	*kirjat*	*puut*	*auringot*	*vedet*
Accusative	*kirjat*	*puut*	*auringot*	*vedet*
Genitive	*kirjojen*	*puiden, puitten*	*aurinkojen*	*vetten, vesien*
Essive	*kirjoina*	*puuna*	*aurinkoina*	*vesinä*
Partitive	*kirjoja*	*puita*	*aurinkoja*	*vesiä*
Translative	*kirjoiksi*	*puiksi*	*auringoiksi*	*vesiksi*
Inessive	*kirjoissa*	*puissa*	*auringoissa*	*vesissä*
Elative	*kirjoista*	*puista*	*auringoista*	*vesistä*
Illative	*kirjoihin*	*puihin*	*aurinkoihin*	*vesiin*
Adessive	*kirjoilla*	*puilla*	*auringoilla*	*vesillä*
Ablative	*kirjoilta*	*puilta*	*auringoilta*	*vesiltä*
Allative	*kirjoille*	*puille*	*auringoille*	*vesille*
Instructive	*kirjoin*	*puin*	*auringoin*	*vesin*
Comitative	*kirjoineen*	*puineen*	*aurinkoineen*	*vesineen*
Abessive	*kirjoitta*	*puitta*	*auringoitta*	*vesittä*

Table 8: Polish noun paradigms

	‘sea’	‘field’	‘city’
Nom	*morze*	*pole*	*miasto*
Gen	*morza*	*pola*	*miasta*
Dat	*morzu*	*polu*	*miastu*
Acc	*morze*	*pole*	*miasto*
Instr	*morzem*	*polem*	*miastem*
Loc	*morzu*	*polu*	*mies´cie*
Voc	*morze*	*pole*	*miasto*
Nom pl	*morza*	*pola*	*miasta*
Gen	*mórz*	*pól*	*miast*
Dat	*morzom*	*polom*	*miastom*
Acc	*morza*	*pola*	*miasta*
Instr	*morzami*	*polami*	*miastami*
Loc	*morzach*	*polach*	*miastach*

FORMATIVE CLASSES. When inflectional formatives have lexeme-based allomorphy we have formative classes. For example, the Polish nouns shown above have different sets of endings (unlike the Finnish nouns, which have the same set of endings).[19]

[19] Proto-Slavic nouns had allomorphy of thematic vowels and much uniformity of endings, as Latin nouns did. Sound change has completely fused thematic vowel and ending, and in some forms has removed the former ending, so that by now the stem ends with the final consonant and the former thematic vowel is part of the ending.

CATEGORY-BASED FORMATIVE ALLOMORPHY: The verbs of Indo-European languages generally have different person-number agreement suffixes in the present and past tenses, but these differences are the same for all verbs (with few exceptions). For example, consider the Latin and Polish conjugations in Table 9.

Table 9: Verb paradigms in Latin and Polish

	Latin 'love'		Polish 'write'	
	Present	Perfect	Present	Past
1sg	*amo*	*amāvi*	*piszₑ¤*	*pisa…em*
2sg	*amās*	*amāvisti*	*piszesz*	*pisa…eś*
3sg	*amat*	*amāvit*	*pisze*	*pisa…*
1pl	*amāmus*	*amāvimus*	*piszemy*	*pisaliśmy*
2pl	*amātis*	*amāvistis*	*piszecie*	*pisaliście*
3pl	*amant*	*amāverunt*	*piszą¤*	*pisali*

In Latin and Polish, different agreement classes cooccur with differences in stem classes: while *amāre* 'love', a class I verb, has the stem *amā-* in the perfect (*amā-v-i*), other classes have different perfect stem forms, which are most often irregular (e.g. *agere* 'to guide': *ēg-*, *rīdēre* 'to laugh': *rīs-*, etc.). In Polish most verbs have *-e-* in most paradigm forms, as above, but a smaller (though still large) class of verbs has *-i-*: *lubie¤, lubisz, lubi*, etc. 'love'. These languages are different from Dolakha Newar (Tibeto-Burman; Nepal; Genetti 1994), where tense-based agreement allomorphy combines with stem alternations that are phonologically defined (similar in spirit to what we described for Belhare) and do not require the discrimination of arbitrary lexical classes.

Tense-based regular agreement allomorphy is to a limited degree also characteristic of Germanic languages (cf. e.g. German third person singular *lieb-t* 'loves' in the present vs. *lieb-t-e* 'loved' in the past), but stem allomorphy is restricted to a set of irregular verbs traditionally called 'strong' verbs as opposed to the regular 'weak' verbs.

NO FORMATIVE ALLOMORPHY: Finnish nouns (of which a few are shown above) all have the same set of case suffixes; and likewise for nouns in Hungarian, Turkish, and Basque. All variation there is is phonologically or morphophonologically conditioned.

Where there are inflectional classes, an important consideration is identifying the inflectional form or forms from which all or most of the others can best be predicted. This is the REFERENCE FORM(S) or PRINCIPAL PART(S) (Wurzel 1987b, 1987a, Carstairs-McCarthy 1991), and it should be included in dictionaries, glossaries, and practical

descriptions. Latin dictionaries, for example, list the nominative and genitive forms of nouns, and from these one can infer all other case forms. Thus, while in all of the following nouns the nominative ends in *-us*, they have different case paradigms, and this is predictable from the genitive form that goes together with the *-us* nominative in each case: *cāsus* 'case' has gen. *cāsūs*, *modus*'mode', *modī*, and *genus* 'gender', *generis;* cf. Table 10. Note that other case combinations, e.g. nominative and accusative, would not unambiguously identify the paradigms.

Table 10: Latin noun paradigm (singular only)

	'case'	'mode'	'gender'
Nominative	*cāsus*	*modus*	*genus*
Accusative	*cāsum*	*modum*	*genus*
Genitive	*cāsūs*	*modī*	*generis*
Dative	*cāsuī*	*modō*	*generī*
Ablative	*casū*	*modō*	*genere*

The nominative (citation form) plus the genitive (principal part), however, serve to completely identify the rest of the declension.

Case paradigms are the prototypical declension classes, but a number of languages around the Pacific Rim have declension classes defined by allomorphy of possessive inflection. Languages in our sample with this kind of declension classes are Amele (Madang family or perhaps Rai Coast-Mabuso, New Guinea; Roberts 1987), Anêm (New Britain family, New Britain; Thurston 1982), Äiwo (Reefs-Santa Cruz, southeastern Pacific; Wurm 1981), Chichimec (Otomanguean, Mexico; Lastra de Suárez 1981), Cayuvava (isolate, South America; Key 1967) and Limbu (Tibeto-Burman; Himalayas; van Driem 1987). Languages with classificatory alienable/inalienable possession might be described as having two declension classes defined by possessive inflection, but the six languages listed here have three or more declension classes usually with considerable and complex allomorphy of the possessive affixes or stem alternations triggered by these. Amele has 31 declension classes of inalienables (Roberts 1987) and Anêm about 20 created by a combination of different person-number suffixes and different stem extenders (Thurston 1982:37-8); cf. Table 11 for illustration.

Table 11: Anêm possessed noun paradigm (selection) (Thurston 1982:37). *-ng-*, *-g-*, and *-d-* in the last three words are stem extenders. The final elements are person-number suffixes.

	'water'	'child'	'leg'	'mat'
1sg	*kom-i*	*gi-ng-e*	*ti-g-a*	*mîk-d-at*
2sg	*kom-î*	*gi-ng-ê*	*ti-g-îr*	*mîk-d-ir*
3sgM	*kom-u*	*gi-ng-o*	*ti-g-î*	*mîk-d-it*
3sgF	*kom-îm*	*gi-ng-êm*	*ti-g-î*	*mîk-d-it*

5.2 Syncretism

Every one of the Latin nouns in Table 4 has at least one instance of syncretism, or falling together of case endings (e.g. dative and ablative *lupō* of 'wolf'). Chechen has virtually no syncretism in its noun paradigms though ongoing loss of nasalization, spelled *-n* in Table 3, in the genitive suffixes is causing the nominative and genitive plural to fall together in nouns such as 'daughter-in-law', 'mother', and 'pig'. Syncretism is sometimes an accident of sound change, as in the Chechen loss of nasalization producing genitive-nominative plural syncretism; but more often it seems to be driven by purely morphological considerations. It is not at all obvious that syncretizing cases are semantically or syntactically similar; for some discussion see Plank (1991:19) or Blake (1994:44ff). Hjelmslev (1935, 1937) and Jakobson (1936, 1958) assume that syncretism follows, and reveals, the basic structural components of case meanings: syncretism is often triggered by marked categories and typically affects unmarked categories; see Section 6. An instance of syncretism to which functional motivation is often attributed is the nominative-accusative syncretism of neuter nouns in Indo-European languages (as in *bellum* 'war' in Table 4). The motivation lies in the fact that neuters are almost all inanimate, hence presumably more likely to function as objects than as subjects of transitive verbs (as shown by discourse studies in many languages; see Ashby et al., in press); hence there is little need for these nouns to distinguish subject and object case forms.

Plank (1991:19-20) suggests ordering the cases of a language so as to put syncretizing forms adjacent to each other to the extent possible. This procedure yields the following order for Latin: Vocative, Nominative, Accusative, Ablative, Dative, Genitive.

5.3 Defectivity and suppletion

Some words simply lack certain paradigmatic forms. Latin *impetus* ‘attack’, in Table 4 above, forms only a few of the cases (Rhodes 1987). See also the discussion of Ingush and Bagvalal place names in Section 10. A more common kind of defectivation is lack of an entire category, or neutralization of categories, in the presence of some other: e.g. Swahili verbs lack a contrast of simple and imperfective aspect in negative forms, though they have it in affirmative forms (e.g. *w-a-soma* ‘they read’ vs. *wa-na-soma* ‘they are reading’ but only *ha-wa-soma* ‘they don’t read, they are not reading’). Category-based defectivity, or dependencies between morphological categories in general, is not random; see Aikhenvald & Dixon (1998) for a preliminary survey.

Gaps in paradigms are sometimes compensated for by (etymologically) different words. The lacking plural forms of Latin *impetus* ‘attack’, for example, are frequently supplied by *incursiōnēs* ‘attack’. When this is regular and obligatory, the result is known as SUPPLETION. Examples are the Latin past and perfect stems *tul-* and *lat-* which are in paradigmatic opposition to the infinitive stem *fer-* ‘carry’; or the English past tense *went* in opposition to the other tense forms based on *go*. Suppletion of formatives is usually called (lexical) allomorphy (cf. above).

5.4. Deponence

A deponent word lacks the usual inflectional forms for a specific paradigm and instead takes on the forms of another. Deponent verbs in Latin and Greek are stranded passives, i.e. they have only passive forms, but they are used with active syntax; an example is Latin *eum sequor* ‘I follow him, with *sequ-or* inflecting like a passive (cf. *ag-or* ‘I am being driven’) but with a transitive object *eum* ‘him’ in the accusative. This is the traditional sense of the term. Corbett (2000) shows that the phenomenon is more general and gives other examples: Russian nouns like *zhivotnoe* ‘animal’, which is a syntactic noun with the declension of an adjective; Mohawk (Iroquian) syntactic nouns with verb morphology such as *ra'swà:tha'* ‘fireman’ (lit. ‘he extinguishes’); in Belhare, a small number of syntactically transitive verbs are inflected as if they were intransitive, and vice versa (Bickel & Nichols 2001).

5.5. Eidemic resonance

As pointed out by Hockett (1987), all morphology rests fundamentally on a basic notion of resonance: parts of words resonate with each other and can therefore be extracted as meaningful formatives or morphemes. For example, English *cooks* and *runs* resonate in similar sounds /s/ and /z/, associated with the identical meaning component 'third singular subject in the present indicative', and from this we can extract a morpheme *-s*. However, forms of a paradigm often resonate with each other through alliteration, rhyme, or other paronomasia, but without entailing any consistent semantics. Rather, the resonances serve to structure paradigms, compartmentalize the lexicon, and provide psycholinguistic processing cues. Following Bickel (1995) we call this EIDEMIC RESONANCE. Eidemic resonance is probably best attested in small closed lexical paradigms such as personal pronouns, basic kin terms (e.g. *mama* and *papa;* Jakobson 1941), essential deictics, and the like, but also occurs in inflectional paradigms. In Ingush and the predominant pronunciation of lowlands Chechen, there is a closed set of deictic prefixes which are in part inflectional (Table 12).

Table 12: Chechen deictic prefixes

hwa-	toward speaker
dwa-	away from speaker
hwal-	up
wa-	down

All four have pharyngeal segments or pharyngealization (spelled "w" in this transcription) and /a/ vocalism and are monosyllabic. The local prefixes, which follow these, are varied in form and number of syllables, almost entirely lack pharyngealization, and are an open set.

6. Markedness and obligatoriness

Morphological forms are defined through paradigmatic oppositions. It is a frequent characteristic of such oppositions that one member is ZERO-MARKED, i.e. has no overt marker of its own. It is common for the nominative singular of nouns to be zero-marked

relative to the other cases; examples are the Chechen and Finnish paradigms in Section 5.1. Singular nouns are commonly zero-marked relative to plurals, as in English *river* : *rivers*. More striking are paradigms with zeroes in other places, e.g. the genitive plural of many Russian nouns (Table 13).

Table 13: Russian noun paradigm

	‘lake’		‘book’	
	Singular	Plural	Singular	Plural
Nominative	*ozero*	*ozera*	*kniga*	*knigi*
Genitive	*ozera*	*ozer*	*knigi*	*knig*
Dative	*ozeru*	*ozeram*	*knige*	*knigam*
Accusative	*ozero*	*ozera*	*knigu*	*knigi*
Instrumental	*ozerom*	*ozerami*	*knigoj*	*knigami*
Prepositional	*ozere*	*ozerax*	*knige*	*knigax*

Zero-marking is sometimes context-specific: the Belhare locative case is regularly marked by the suffix *-(C)e*, e.g. *mi-e* ‘at, to, on, in the fire’, but a few location-denoting nouns such as place names or words like *khim* ‘house, home’ or *gaũ* ‘village’ have zero-marked locatives if (and only if) they function as the goal argument of a verb of directed motion.

(41) Belhare

a. Dhankuta-ø khar-e-ŋa.
Dh.-LOC go-PT-[1SG]EXCL
‘I went to Dhankuta.’

b. Dhankuta-e yag-he-ŋa.
Dh.-LOC stay-PT-[1SG]EXCL
‘I stayed in Dhankuta.’

In (41a), the place name Dhankuta has a zero locative ending because it serves as the goal argument of the verb. In (41b), locative case must be overtly marked, in contrast, because the place name is in an adjunct rather than argument function.

In the terminology first established by the Prague School of linguistics, a member of a paradigm is UNMARKED (*merkmallos*) if it does not have a semantic or syntactic value of its own on a par with the other members of the paradigm and acquires a value only

through opposition with other forms.[20] Zero-marked nouns in English, for example, have a singular value only through opposition with nouns marked as [+plural]. Where the opposition is neutralized, as in generic statements, the zero-marked form can be used with a non-singular value. This is why *The kangaroo is native to Australia* has the same truth value as *Kangaroos are native to Australia*. Unmarkedness tends to go together with zero marking (cf. Haiman 1985:147–51), but the correlation is not universal: even though the genitive plural forms *ozer* 'of the lakes' and *knig* 'of the books' in Table 15 are zero-marked, there is no context of neutralization and indeed no reason to assume that they are functionally unmarked members of the paradigm.

Languages differ greatly in the number of contexts in which an opposition is obligatory and in which, as a corollary, the use of unmarked forms implies the opposite value of marked forms. While English obligatorily requires number marking for all but the generic statement context and reference to amorphous masses (e.g. *sugar, mud*), many languages draw the line between animate or human referents and the rest, requiring number marking only for nouns referring to animate beings. When referring to a group of girls, for example, one must say in Belhare *kaepma-chi* 'girl-PL'; use of *kaepma* would entail, as in English, reference to one single girl. By contrast a word like *phuŋ* 'flower' can have either singular or plural value, and although grammatical, *phuŋ-chi* 'flower-PL' is a rare form. Some languages go further than this, and do not require number marking in any context. This is typical for languages with numeral classifiers and many others. In Yucatec (Mayan; Mexico; Lucy 1992), for example, a word like *pèek'* 'pig(s)' or *máak* 'man, men' can have either singular or plural value. The use of an explicit plural suffix (-*ó'ob'*) is reserved for emphasis, contrast or clarification. Optional number marking is common in languages all around the Pacific Rim.

When analyzing a language, it is very important to take note of differences between contexts requiring obligatory marking and contexts allowing optional marking because it is these contexts that determine the actual value of an unmarked (and often also formally zero-marked) form in discourse. If the context requires an obligatory opposition, the unmarked form will have the opposite value of the marked form (e.g. a singular value in opposition to a marked plural form). If the opposition is optional, no such implication arises, and the unmarked form can have either value (e.g., a singular or plural value).

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[20] Such oppositions are called *privative* and are contrasted with *equipollent* oppositions where both members are equally specified.

We have so far concentrated on markedness at the level of the word. However, the concept is also important on the level of individual morphemes. Inflectional systems often produce highly specific forms from highly unspecific (unmarked) morphemes. Belhare, for example, distinguishes syntactic roles for most person and number affixes but has a general second person morpheme *-ka* (*-ga* after sonorants) and dual number marker *-ch(i)*, whose role values are established only through the morphemic context. Compare the following examples:

(42) Belhare

a. khai-chi-ga
go:NPT-DU-2
'You will go.'

b. lui-ch-u-ga
tell:NPT-DU-3[SG]P-2
'You will tell him/her.'

c. n-lui-chi-ga
3A-tell:NPT-DU-2
'He/she/they will tell you.'

Appearing alone, as in (42a), the markers refer to an intransitive S. Co-occurring with a P marker (42b), they stand for an A, and co-occuring with an A marker (42c), they signal person and number of the P.

7. Templatic vs. layered (hierarchical) morphology

Strings of inflectional formatives often have a layered, or hierarchical, or nested structure which can be represented as a branching tree or bracketed structure. Such a string is said to be CONFIGURATIONAL, i.e., it has a regular constituent structure. Dependencies between formatives are chiefly between adjacent ones, the choice of an allomorph can depend on a more inner formative but usually not on a more outward one, there is a single root or head, and in general the position of each formative depends on its function (or the function of its agreement trigger). An example is the following set from Quechuan (Stump 1996:236 citing Muysken 1986):

(43) Quechuan (S. America; Muysken 1986:636)

a. riku - na - chi - ku - n - ku
see-RECIP-CAUS-REFL-3-PL
'They$_i$ caused them to see each other$_i$.'

b. riku - chi - na - ku - n - ku
see-CAUS-RECIP-REFL-3-PL
'They$_i$ caused each other$_i$ to see them.'

c. riku - na - ku - chi - n - ku
see-RECIP-REFL-CAUS-3-PL
'They caused them$_i$ to see each other$_i$.'

The relative ordering of the reciprocal, reflexive, and causative formatives determines their relative scope and the interpretation of the verb.

Some of the clearest examples of layered structure come from multiple case marking (see Section 10.4 below, where these examples are discussed further):

(44) Huallaga Quechua (Quechuan, Peru; Weber 1989)

Haacha-wan-naw mutu-n machiita-wan
axe-COM-SIM chop-3 machete-COM
'He chops with a machete as though it were an axe.'

The ordering of the comitative ('COM') and similarity ('SIM') cases on 'axe' reflects their relative scope:

(45) [[haacha - wan] - naw]

A more complex example comes from Kayardild:

(46) Kayardild (Tangkic, Australia; Dench & Evans 1988:34-5)

maku-ntha yalawu-jarra-ntha yakura-naa-ntha
woman-OBL catch-PT-OBL fish-ABL (PRIOR)-OBL
dangka-karra-nguni-naa-ntha mijil-nguni-naa-nth.
man-GEN-INSTR-ABL (PRIOR)-OBL net-INSTR-ABL (PRIOR)-OBL
'The woman must have caught fish with the man's net.'

The case suffixes on ‘man’ in this example are assigned for the following reasons: the genitive reflects the noun’s own function as possessor; the instrumental is in agreement with ‘net’, which ‘man’ modifies; the ablative is in agreement with the verbal tense and indicates prior time reference (cf. example 65 in Section 9.1); and the oblique is in agreement with ‘woman’. Dench & Evans (1988) show that, in several of the many Australian languages exhibiting multiple case marking, local processes of metathesis, haplology, syncope, etc. superficially obscure the neat nested structure of the case strings, but these processes operate on, and thus require, the original nested assignment of the case suffixes.

Hierarchical morphology in verb agreement systems is illustrated by Abkhaz. The structure of Abkhaz prefix strings is shown in (47) and Table 14. The prefix strings include three different positions for agreement with the direct object (‘P’) or intransitive subject (‘S’), indirect object (‘IO’), and transitive subject (‘A’). The agreement morphemes used in the three different positions are essentially identical (except for minor allomorphy). In using essentially the same set of agreement morphemes and assigning different functions to different positions, Abkhaz agreement morphology is reminiscent of English clause relations, where NPs are assigned different grammatical functions by different positions in the clause (and minor case on pronouns). Abkhaz could thus be said to have word-internal configurationality.

(47) Structure of Abkhaz prefix strings (TAM = tense-aspect-mood):
S/P-IO-PREVERB-A-stem-TAM-FINAL

The S, P, IO, and A slots are filled with markers from a general person and number paradigm, as given in Table 14 (adapted from Hewitt 1979).

Table 14: Abkhaz verb agreement

1sg	*s(ə)- ~ z(ə)-*
2sgM	*w(ə)-*
2sgF	*b(ə)-*
3sgHUMAN	*d(ə)-* (only in S/P slot)
3sgM	*y(ə)-*
3sgF	*l(ə)-* (only in IO and A slots)
3sgNONHUMAN	*y(ə)- ~ (n)a-*
1pl	*ħ(a)- ~ aħ- ~ aa-*

2pl	*š°(ə)- ž°(ə)-*
3pl	*y(ə)- ~ r- ~d(ə)-*

In the following examples, the function of *b(ə)-* 'you (fem. sg.)' is determined by its position:

(48) Abkhaz (Northwest Caucasian; Hewitt 1979)

a. bzə̀ya bə-z-bò-yt'. [105]
well 2SG.F-1SG-see-FIN
'I love you.'

b. b-ca-r, də-b-bò-n. [173]
2SG.F-go-if 3SG.HUM-2SG.F-see-FIN
'If you had gone, you would have seen him.'

In (48a), *bə-* is in the S/P position of a transitive verb form, whence in object function. In the form *bcar* 'if you had gone' in (48b) *b-* is again in the S/P position, but since the verb is intransitive, it is assigned the S function. In the transitive form *dəbbòn* 'you would have seen him/her', *b-* follows another agreement marker and this shows that it is in the A slot, therefore in transitive subject function.

Layered morphology contrasts typologically with what is called *templatic* morphology (Simpson & Withgott 1986; see also Spencer 1991:208ff., Stump 1996, Hyman 2000). In templatic morphology the structure of the string of formatives is flat and departs in a number of ways from layered structure: there can be more than one root or head, dependencies can obtain between non-adjacent formatives, allomorphy can be sensitive to more outward formatives, and the position of formatives in the string can be determined by their categories, or by phonological principles, rather than their syntactic or semantic functions.

Templatic morphology is characteristic, for example, of verb agreement in Algonquian, Bantu and Kiranti languages, where it regulates the sequence of inflectional formatives Table 15 illustrates the templatic structure of Belhare (Kiranti) intransitive verbs (see Bickel 2001, for a complete analysis):

Table 15: Belhare intransitive verb agreement of selected tense/aspect/mood forms (pf = prefix position, sf = suffix position, Σ = stem).

pf1	pf2	Σ	sf1	sf2	sf3	sf4	sf5
mi- ‘3NSG’	*N-* ‘3NSG’		*-yuk* ‘DEF’	*-(h)e ~ -att* ‘PT’	*-chi* ‘DU’	*-n(i)* ‘NEG’	*-ŋ(a)* ‘EXCL’
	N- ~ miN- ‘NEG’		*-yakt ~-ya(u)* ‘IPFV’	*-t ~ -yuk* ‘NPT’	*-i* ‘1/2PL’		*-k(a(k))* ‘2’
				-a ‘SUBJ’			

As is typical for templatic morphology, there are many long-distance dependencies across several affix positions. For instance, the allomorphy of the past tense marker *-he ~ -att* in suffix position sf2 is regulated by whether or not there is a negation marker in sf4 (*-n(i)*), and these are often not adjacent (e.g. *nta-**at**-chi-**n*** ‘we two didn’t come’, with an intervening sf3 filler *-chi* ‘DUAL’). The appearance of the negative prefix in pf2 is contingent upon the simultaneous presence of the sf4 negation marker. (There are transitive negative forms with only the sf4 negation marker, but none with only the pf2 marker.)

In templatic morphology there is often a tendency for different affix positions to be characterized by the same categories: e.g. in Table 14, all fillers of the sf1 and sf2 slots are tense, aspect, mood markers and all fillers of the sf5 position are person markers. However, positions are not always homogeneous. The pf2 position, for instance, includes both person and negation markers. The rationale for assigning morphemes to templatic position is purely formal: fillers of the same position cannot co-occur in the same string. Therefore, a third person nonsingular negative form, as in (49a) requires the use of the pf1 filler *mi-* because it is impossible to have the pf2 markers *N-* ‘3NSG’ (as in 49b) and *N-* ‘NEG’ (as in 49c) simultaneously present:

(49) Belhare

a. mi-n-ta-at-ni
3NSG-NEG-come-PT-NEG
‘They didn’t come’

b. n-ta-he
3NSG-come-PT
‘they came’

c. n-ta-at-ni
NEG-come-PT-NEG
‘s/hedidn’t come’

The ordering does not reflect any syntactic functions, as it does in the hierarchical morphology of Abkhaz, but is purely morphological (and arbitrary). Occasionally, this leads to functionally indeterminate structures, as in Maithili, where the ordering of non-nominative, honorificity-indicating agreement suffixes is rigidly fixed and allows for a variety of interpretations:

(50) Maithili (Y.P. Yādava, p.c.)
dekhau-l-i-au-nh
show-PT-1NOM-2NONHON-3HON
'I showed him/her to you.'
'I showed you to him/her.'
'I showed his/her X to you.'

The sequence *-i-au-nh* is the only one that is possible in Maithili with three simultaneous agreement markers, and this is largely due to prosodic constraints requiring verbal desinences to consist of an end-stressed light-heavy syllable sequence (Bickel et al. 1999). It is probably not uncommon for templatic morphology to be determined or to be historically motivated by prosodic and other phonological principles, but research on this area has just begun; cf., e.g., Hyman (2000) on the sonority hierarchy as a driving source for suffix ordering in Bantu.

However, templatic vs. layered properties are likely to hold of individual formatives rather than of the entire string. Judging from examples in the literature, templatic properties seem to be typical of formative strings that include inflectional elements, are head-marking or detached, and are in Prae or Wackernagel position, though sometimes (as in the Belhare example mentioned above) they are in Post position. Layered properties are most common in suffixed formatives (though in Abkhaz, above, a prefix string is layered) and in dependent-marking morphology, with Australian multiple case marking surely the most extreme example. We tentatively raise these generalizations as hypotheses.

Regardless of whether formatives follow the principles of templatic or layered arrangement, they tend to abide by universal ordering principles, which interact with whatever other syntactic, morphological or phonological principles determines formative order in the given language:

(51) Universal affix ordering in layered morphology

a. verbs: voice/aspect > modality > status/tense > evidentials/illocutionary force
(Foley & Valin 1984, Valin & LaPolla 1997, Bybee 1985)

b. nouns: number > case
(Greenberg 1963)

These principles are often seen as absolute universals, but there are exceptions (e.g. Limbu orders aspect after tense), and their status rather seems to be one of DEFAULT PRINCIPLES that apply only in the absence of overriding constraints.

8. Inflectional categories

Categories that are commonly inflectional and treated in other chapters of this book include gender, deixis, tense, aspect, mood, illocutionary force, and voice oppositions of various kinds. Nominalization, causative, reflexive, reciprocal, middle, and negation are categories which, if not always strictly inflectional, at least frequently have their overt marking worked into inflectional paradigms. Two common inflectional categories treated elsewhere in this chapter are agreement and case (Section 6.2). The rest of this section briefly describes three major inflectional categories that are covered only partially or not at all elsewhere in this chapter or this series.

8.1. Person

Person concerns the grammaticalization of conceptual distinctions between participants involved in speech activities. From a pragmatic point of view, many such distinctions play a role in communication, e.g., the difference between those persons who actually attend a speech act and those who are merely referred to, between those to whom an utterance is targeted and those who happen to hear it as bystanders it, etc. (see Levinson 1988 for an analysis of such notions). Grammars typically conflate such distinctions and usually reduce the system to three terms grammaticalizing the roles of speaker (first person), addressee (second person) and other (third person), respectively. While this triad is the most common system worldwide, other ways of dividing up the

conceptual space of person are also found, and we briefly discuss them in the following. Note, however, that person systems other than the standard triad often apply to verbs only, or pronouns only; it is not uncommon to find splits here across parts of speech.

8.1.1 Exclusive vs. inclusive

Many languages distinguish between an exclusive and inclusive conception of the first person, and in many cases these are subcategories of plural (or dual) number marking. An example is found in So, a language spoken in the Uganda-Kenya border area

Table 16: So pronouns (Kulyak; E. Africa; Serzisko 1989)

	Singular	Plural
1	*aya*	exclusive (of addressee): *inia* inclusive (of addressee): *isia*
2	*piya*	*pitia*
3	*ica*	*itia*

Exclusive here refers to the speaker and his or her group, but excluding the addressee(s), i.e. it is [+ speaker, - addressee]. The inclusive forms, by contrast, explictly include the addressee(s) along with the speaker and his or her group in the notion of ‘we’, i.e. [+speaker, +addressee].

Some languages treat the exclusive vs. inclusive distinction on a par with the basic second vs. third distinction rather than as a subcategory of plural first persons. In such a system, exclusive and inclusive have singular values, just as the other persons do. Table 17 is an example from Belhare intransitive verb agreement (cf. Table 14 for the templatic arrangement of affixes, and Table 6 for a sample paradigm in the singular).

Table 17: Belhare intransitive verb agreement

	Singular	Dual	Plural
EXCL	*-ŋa*	*-chi-ŋa*	*-i-ŋa*
INCL		*-chi*	*-i*
2	*-ga*	*-chi-ga*	*-i-ga*
3	*Ø-*	*N-Σ-chi*	*N-*

For the exclusive this works without complications, since restricting the reference of ‘[+speaker, –addressee]’ to one person simply means reference to the speaker (‘[+speaker]’), i.e. the first person singular. Such systems are typical of the Kiranti

language family to which Belhare belongs. The inclusive, by contrast, does not allow a true singular value because it comprises both the speaker and the addressee (i.e. [+speaker, +addressee]) and thus requires at least two referents. While Kiranti languages sidestep this issue by not having an overt inclusive marker at all, many languages of North America and Northern Australia use a different kind of number system to accommodate the inclusive as a basic person category: instead of distinguishing singular vs. non-singular, these languages distinguish MINIMAL vs. AUGMENTED number (McKay quoted by Dixon 1980). Examples are also found in several North American languages (e.g., in the Siouan or Uto-Aztecan families), although they are not always recognized as such:

Table 18: Ute subject agreement (Uto-Aztecan; N. America, Givón 1980)[21]

	Minimal	Augmented
EXCL	*-n*	*-nu̥mu̥*
INCL	*-ramḭ*	*-rawḭ*
2	*-m*	*-amu̥*
3 visible anim	*-ʔa*	*-amu̥*
3 invisible anim	*-ʔu*	*-amu̥*
3 visible inanim	*-aχ*	*-aχ*
3 invisible anim	*-ux*	*-ux*

Minimal means singular for exclusive (*-n* 'I'), second person(*-m* 'you [sg.]'), and third person, but for the inclusive person minimal entails dual number reference, viz. *-ramḭ* 'you and me'. Augmented is plural for all persons (*-rawḭ* 'you and us', *-nu̥mu̥* 'we, excluding you'). In Northern Australian languages, a third term, UNIT AUGMENTED, is sometimes distinguished. This translates as trial for the inclusive and dual for the other persons, as in Rembarrnga:

Table 19: Rembarrnga pronouns (N. Australia; Dixon 1980)

	Minimal	Unit augmented	Augmented
EXCL	*ŋənə*	*ya-rr-parraʔ*	*ya-rrə*
INCL	*yəkkə*	*ŋa-rrkorr-parraʔ*	*ŋa-korrə*
2	*kə*	*na-korr-parraʔ*	*na-korrə*
3 masc	*nawə*	*pa-rr-parraʔ*	*pa-rrə*
3 fem.	*ŋatə*	*pa-rr-parraʔ*	*pa-rrə*

[21] The transcription is adapted here to IPA.

The diagnostic feature of augmented number systems is an additional dual or trial number found only with first person inclusive forms. When the description leads one to positing such an additional number, a reanalysis in terms of augmentation is usually called for (cf. Dixon 1980).

It is important to note that in all of these systems in which inclusive and exclusive are independent person categories there really is no generalized first person singular concept, no term corresponding to English *I* or So *aya*. Reference to speaker alone is always achieved indirectly by minimizing or singularizing the category of the exclusive person. Only in languages where inclusive/exclusive is a subtype of first person plural (as in So), and of course in languages like English which lack any inclusive/exclusive distinction, is there a true generalized first person singular pronoun.

8.1.2 Epistemic source: the conjunct person

While the distinction between first and second person as indexes to the speaker and addressee, respectively, is the most common type worldwide, recent research has established that this is not the only one possible. A few languages in Asia and South America have grammaticalized a completely different categorization, at least in verb agreement. One person, usually labeled 'CONJUNCT',[22] refers to the speaker in statements and to the addressee in questions (excluding rhetorical questions, which are really statements in function). Thus, the conjunct person form *wonā* in Newar, the Tibeto-Burman language of the Nepalese capital Kathmandu, can mean 'I went' or 'did you go?'. This is in opposition to what is called a DISJUNCT form, *wona*, which is used for all other situations, i.e. meaning 'you went' or 's/he went' or 'did s/he go?' or, where this makes sense in context, 'did I go?'. What is at the functional core of the conjunct person category is the indexing of the EPISTEMIC AUTHORITY, i.e. the person who the speaker supposes or claims to have direct and personal knowledge of the situation (Hargreaves 1990, 1991). In statements the epistemic authority is the speaker if he or she is a participant of the situation; in questions it is the addressee if he or she plays a role in the

[22] The term is from A. Hale's (1980) pioneering description of the phenomenon in Newar. The less then ideally transparent terminology derives from the use of conjunct forms in reported speech where the form marks coreference (referential 'conjunction') of the subject with the speaker referent reported in the matrix clause (i.e. it has the same effect as a logophoric marker, on which see Section 9.1.4). Alternative terms found in the literature are 'locutor', 'egophoric', 'subjective', and 'congruent'; cf. Curnow (2000).

situation. If the epistemic authority plays no role in the situation, the form is coded as disjunct.

Conjunct/disjunct systems are sometimes geared toward agents in the sense of volitional instigators of situations. In Newar (A. Hale 1980, Hargreaves 1991) and some other Tibeto-Burman languages, conjunct person marking generally applies only to such referents and therefore only to volitional or controlled verbs.[23] In other languages, however, the distinction applies to other arguments as well, and one occasionally finds it applied to both actors and undergoers marked differently. The South American language Awa Pit, for instance, has agreement differentiation (cf. Section 3) in conjunct marking:

(52) Awa Pit (Barbacoan; Ecuador and Columbia; Curnow 2000)

a. kɨn-ka=na, na=na Santos=ta izh-ta-w.
dawn-when=TOP 1SG[NOM]=TOP S.=ACC see-PT-CONJUNCT.SUBJECT
'At dawn I saw Santos.'

b. shi ayuk=ta=ma libro ta-ta-w?
what inside=LOC=Q book put-PT=CONJUNCT.SUBJECT
'Under what did you put the book?'

c. Juan=na (na=wa) izh-tɨ-s.
J.=TOP 1SG=ACC see-PT-CONJUNCT.UNDERGOER
'Juan saw me.'

d. nu=wa=na mɨn=ma pyan-tɨ-s?
2SG=ACC=TOP who=Q hit-PT-CONJUNCT.UNDERGOER
'Who hit you?'

e. pɨna alu ki-matɨ-zi.
very rain do-PFV-PT-DISJUNCT
'It rained heavily.'

In (52a) and (52b), the verb is marked for a conjunct person subject: in (52a), a statement, it indexes the speake; in (52b), a question, it indexes the addressee. The examples in (52c) and (52d) illustrate the conjunct person in undergoer function, again once in a statement (52c) and once in a question (52d). (52e) exemplifies disjunct marking, which signals that the conjunct person is neither subject nor personally affected by the situation.

[23] In Tibetan at least, this has to do with the historical source of the distinction, which is an epistemological category focused on agency. See DeLancey (1990, 1992) and Bickel (2000b) for discussion of this, and Dickinson (2000) for a study of mirativity and conjunct person in Tsafiki (Barbacoan; Ecuador).

8.1.3 Person and the indexability hierarchy

In most languages, the person triad and the conjunct/disjunct opposition are not disjointed sets of terms but form a tightly structured hierarchy which is responsible for various morphosyntactic effects. At the core of the hierarchy is the distinction between speech act participants and third person referents, but the hierarchy is often elaborated in distinguishing, among third persons, between human and non-human referents, or between animate and inanimate referents. Sometimes other parameters, such as anaphoricity or definiteness, gender, kinship, number, possession, size, discreteness or segmentability, affect the structure of the hierarchy as well. The hierarchy has many effects ranging from number differentiation to splits in case-marking patterns, and we will review several of them in the remaining sections of this chapter. We refer to the hierarchy as the INDEXABILITY HIERARCHY since its basic variable is the ease to which a referent can be identified — or 'indexed' — from within the speech act situation. Identification is easiest for speaker and addressee, which are necessarily co-present, and is it is easier for human referents than for other animates because humans tend to be topics in ordinary discourse and are therefore better accessible cognitively. Singular and individualized referents are generally easier to unambiguously point at than groups or masses, whence in many languages they figure higher on the indexability hierarchy. sAlternative terms like 'animacy', 'agency', 'generic topicality', 'egocentricity', or 'empathy hierarchy' that have been proposed in the literature (cf. among many others, Comrie 1981a, DeLancey 1981, Givón 1994)[24] capture some but not other aspects of the hierarchy. Note, however, that there is considerable (but at present ill-understood) cross-linguistic variation in the details of how the hierarchy is set up among third person referents, and different parameters may prove relevant in different languages.

While such details vary, one way of distinguishing among non-speech-act participants is particularly noteworthy from a typological point of view: some languages expand the indexability hierarchy beyond the traditional person triad and add a FOURTH or OBVIATIVE and sometimes even a FIFTH or FURTHER OBVIATIVE person.[25] Such extensions are best known in Algonquian languages but they are also attested in a few other North American

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[24] The hierarchy was first extensively discussed by Silverstein (1976), but there are many precursors, to say nothing of the very fact that person categories are referred to by the numbers 1, 2, 3 in both the Graeco-Roman and the Indic linguistic traditions (although in different order: for the Indian grammarians, the speaker was '3').

[25] Note that the label 'fourth person' is sometimes used in different sense. In descriptions of Eskimo languages, for example, it is the traditional label for reflexives. See Section 9.4 for discussion.

languages. In Algonquian languages semantic roles are assigned by what are known as DIRECT and INVERSE scenario markers: a direct marker signals that the A argument is higher on the indexability hierarchy than the P argument, while an inverse marker establishes the reverse role assignment, with a person lower on the hierarchy acting on a person higher. This mechanism applies equally to positions high in the hierarchy, such as the difference between first and third person, and to positions low in the hierarchy, such as the difference between third and fourth person. Compare the examples in (53a,b) with those in (53c,d):

(53) Plains Cree (Algonquian; N. America; Dahlstrom 1986)

a. eː-waːpam-aː-yaːhk-ik.
DET-see-DIR-1PL.EXCL-3PL (CONJ)
'We^{excl} see them.'

b. eː-waːpam-iko-yaːhk-ik.
DET-see-INV-1PL.EXCL-3PL (CONJ)
'They see us^{excl}.'

c. eː-waːpam-aː-t.
DET-see-DIR-3[SG][-4SG] (CONJ)
'He sees him^{obv}.'

d. eː-waːpam-iko-t.
DET-see-INV-3[SG][-4SG] (CONJ)
'He^{obv} sees him.'

In (53a), the direct marker *-aː* signals that a first person acts on a third person. In (53b) this is reversed and it is the third, person that acts on the the first. This is exactly parallel to (53c) and (53d), respectively, but here the relationship is between a first person and a fourth (obviative) person (zero-marked here): in (53c) this relationship is direct, whence the third or proximate person acts on the forth; in (53d) the relationship is inverse, whence the fourth person acts on the third. The parallelism between 1:3 and 3:4 suggests that the the obviative person is truly an extension of the indexability hierarchy and is indeed a FOURTH person.

Determining which referent is third and which one is fourth (obviative) depends by and large on topicality or other prominence in discourse. But there are also purely syntactic factors involved: a possessor, for instance, is always higher on the hierarchy than its possessed object (Wolfart 1978). Algonquian languages differ in how syntactic and discourse factors compete in determining person assignment (Rhodes 1990, Mithun 1999: 76f).

Scenarios involving speech act participants only ('I saw you', 'you saw me') often enjoy a special status on the hierarchy. Sometimes speech act participants are ranked: in Plains Cree, for instance, the second person takes preference over the first in triggering

person marking (in independent mood forms). But the inverse/direct marking does not apply in scenarios with first and second person participants only, and instead there are portmanteau morphemes signaling '1>2' (-*iti*) or '2>1' (-*i*) (where '>' indicates a transitive relationship with the first term as subject and the second as object).[26] Portmanteau morphemes for these person sets are a widespread phenomenon worldwide (as noted by, among others, Hagège 1982: 107, Heath 1991, 1998, Bickel 2000b, Jacquesson 2000). Kiranti and many other Tibeto-Burman languages, for instance, have dedicated agreement markers for the '1>2' relation (e.g. Belhare *nise-na* (see-1>2) 'I saw you'). Some languages, such as the Indo-Aryan language Maithili, neutralize scenarios here and have only one form covering both '1>2' and '2>1' relations (e.g. *dekhl-i* 'I saw you$^{hon.}$' or 'You$^{hon.}$ saw me'; Bickel, *et al.* 1999). The reason for blurring the nature of the relationship or coding it by a portmanteau morpheme is probably, as Heath (1991: 86) suggests, that such scenarios are "doubly dangerous" since "they not only combine the most pragmatically sensitive pronominals" but "also combine them into a syntagmatic structure and thereby necessarily focus on the speaker–addressee relationship."

Another type of person that is often specially marked is GENERIC or nonspecific person. English uses second person pronouns in this function, e.g. *You win a few, you lose a few*. Some languages have a dedicated generic person form which is grammatically third person in verb agreement, e.g. German *man*, French *on*, Hausa *a(n)* (Newman 2000: 486), or the Slave (Athabaskan) prefix *ts'*- (Rice 2000: 187). In other languages it is the first person inclusive category that is used for generic reference. For instance, the Belhare form *hiu-t-i* 'can-NPT-1PL[INCL]' can either specifically mean 'us' including the addressee(s), or it can be meant in the generic sense of 'one can (do this)'.

8.2. Number[27]

Number is, minimally, an opposition of SINGULAR to PLURAL. Less common numbers are DUAL (two individuals), TRIAL (three individuals), and PAUCAL (a few individuals). Old Church Slavic makes a singular/dual/plural opposition in nouns, pronouns, adjectives, and verbs:

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[26] Alternatively, one could analyze -*iti* and -*i* as markers of inverse and direct relations, specialized for scenarios involving only speech act participants (Dahlstrom 1986). For discussion, see Bickel 1995.
[27] Corbett (in press) promises to be exhaustive and authoritative on matters of number.

Table 20: Old Church Slavic number paradigm (Huntley 1993:140)

‘woman’	Singular	Dual	Plual
Vocative	*ženo*		
Nominative	*žena*	*ženě*	*ženy*
Accusative	*ženo¤*	*ženě*	*ženy*
Genitive	*ženy*	*ženu*	*žen=*
Dative	*ženě*	*ženama*	*ženam=*
Instrumental	*ženojo¤*	*ženama*	*ženami*
Locative	*ženě*	*ženu*	*ženax=*

In a number of languages verbs make an aspectual or aspect-like distinction of single vs. multiple action, often in addition to singular vs. nonsingular agreement. An example from Chechen is in Table 20A. (In the terminology used there, simulfactive = single action, iterative = multiple action.)

Table 20A. The Chechen verb 'drive'. 1x = once, Nx = many times.

	Simulfactive	Iterative
Singular	*loaxku* ‘one drives one 1x’	*loexku* ‘one drives one Nx’
Plural	*loallu* ‘one drives many 1x’	*loellu* ‘one drives many Nx’

Number-like categories include DISTRIBUTIVES (which imply a plurality of separate individuals) and COLLECTIVES (which imply a number of individuals viewed as a set).

Number often shares formatives or at least paradigms and position slots with person, and number agreement is systematically marked in the great majority of languages having person agreement on the verb. On other parts of speech, number is more likely to be optional or missing entirely. It is fairly common for number not to be marked overtly on nouns. It may be marked instead on an article or plural word (illustrated for Yapese and Tongan in (32)-(33) above), and many languages have number marking on verbs although the nouns with which the verbs agree in number have no overt number marking themselves; an example of such a language is Lakhota (Siouan, N. America). In a number of languages, verbs make more number distinctions than nouns (e.g. verbs in Yimas distinguish singular/dual/paucal/plural while nouns distinguish only singular/dual/plural). Where present in a language, number marking is likely to be optional on nouns, especially those in the lower reaches of the indexability hierarchy; or it may be available only to animate or human nouns or other high-indexability nouns.

Personal pronouns are more likely than nouns to make number distinctions, and pronominal formatives more likely to distinguish number than independent pronouns. These and other patterns of optionality and limitation in number categories are briefly reviewed in Nichols (1992:144ff).

An unusual marking of number is INVERSE NUMBER marking in the Kiowa-Tanoan languages (Wonderly, *et al.* 1954, Watkins & McKenzie 1984:78ff.), in which nouns have inherent number, every noun being either singular or plural, and inverse marking switches singular to plural and vice versa.

Number intersects with person in various ways, and this has impacts on the referential value of number categories. One instance of this is the effect of exclusive vs. inclusive distinctions on number, which in some cases yields, as we saw in Section 8.1, a distinction between minimal and augmented rather than between singular and plural. Another effect is that nonsingular in the first person usually means 'the speaker and his/her group' rather than a multitude of simultaneous speakers (Jespersen 1924: 192). Some languages allow this use of nonsingular forms with other nouns as well. Belhare *ama-chi* (or Nepali *āmā-hāru*), for instance, does not refer to several mothers but rather to 'my mother and her people (e.g. sisters, friends, etc., depending on the situation). This type of nonsingular number, known as ASSOCIATIVE number, is a distinct category of its own in a few languages (Corbett & Mithun 1996): in Hungarian, it is marked by the suffix *-ék* (*Jánosek* 'John and his associates, John 'n them)', distinct from the ordinary plural *-ok* (*Jánosok* 'several Johns'). Similar contrasts are found in Pomoan and Eskimo languages. Associative numbers are usually confined to names, kin terms, titles, and occupations and do not usually extend to common nouns. However, with inanimate nouns, a similar notion is sometimes expressed by ECHO WORDS, in which a word is repeated with some mutation. In many Eurasian languages, this involves replacing the initial consonant, cf. Nepali *raksi-saksi* 'raksi (a distilled alcoholic beverage) and things that go with it (snacks, etc.) or are similar in kind (beer, etc.)' with default mutation to /s/, or Turkish *çocuk-mocuk* 'children and all that goes with them (toys, games, etc.)' with default mutation to /m/. Most South Asian languages extend echo word formation to other parts of speech, e.g., Hindi *nahā-vahā* 'bathe and do whatever belongs to this (dry, get dressed again etc.)' or *jaldi-valdi* 'fast, etc.' In these cases, the semantic effect is sometimes more generally one of inspecificity than of association. See Abbi (1994: 27 - 33) for a discussion of semantic variation in South Asian echo words.

8.3. Deixis

Languages whose verb morphology is at all complex are likely to have a formative slot for what is often called deixis. (The term ‘deixis’ can be used to describe the semantics of several verbal categories, notably person and tense, but here we use it for dedicated and fairly literal spatial deictic formatives; for more on deixis in general, see Chapter III.6.) The essence of deictic formatives is a distinction like 'toward speaker' vs. 'away from speaker', which is grammaticalized and obligatory in some languages. Often deixis of this kind is bound up with person markers and with applicatives, benefactives, indirect objects, and/or possessors of objects. In various languages of the Caucasus, for instance, deixis is literally deictic ('hither', 'thither') with motion verbs, lexicalized in some verbs, and in others sensitive to the person of the goal, the indirect object or the possessor of the S/P. Ingush has deictic prefixes sensitive to the person of the goal or indirect object (the same as the first two listed for Chechen in Table 12, Section 5.5):

(54) Ingush (Nakh-Daghestanian)

a. Muusaa hwa-qeachar
Musa DX-arrive.WP
‘Musa has arrived.’
(Speaker and hearer are in the same place and Musa arrives there.)

b. Muusaa hwo jolcha dwa-qeachar=ii?
Musa 2s be.PPL.OBL DX-arrive=Q
‘Did Musa get to your place?’
(M. has left speaker's place to go to hearer's place.)

c. Muusaa hwo jolcha hwa-qeachar=ii?
Musa 2s be.PPL.OBL DX-arrive=Q
‘Has Musa arrived at your place?’ (Musa has come from somewhere else.)

d. Muusaa Suultaan volcha dwa-qeachar=ii?
Musa Sultan be.PPL.OBL DX-arrive=Q
‘Did Musa get to Sultan’s place?’

e. Muusaa Suultaan volcha hwa-qeachar=ii?
Musa Sultan be.PPL.OBL DX-arrive=Q
‘Did Musa get to Sultan’s place?’ (Hearer lives at Sultan’s place.)

Similarly, Hausa has a productive mechanism that puts verbs in a conjugational class (called ‘grade 6’) that expresses direction towards, or sometimes benefit for the speaker; cf. *fitō* ‘come out’ (vs. *fìta* ‘go out’) or *cīwō* ‘win’ with the characteristic *o* theme characteristic of this class (Newman 2000:661-4).

In many Tibeto-Burman languages, deictic formatives have developed into direct vs. inverse markers regulating the assignment of grammatical roles to referents in a way similar to what was illustrated for Plains Cree in (53) (DeLancey 1980, 1981):

(55) Nocte (Baric; Tibeto-Burman; NE India; Das Gupta 1971)

a. ka-t-a
move.downhill-PT-3[SG]
‘He went down.’

b. ka-t-**h**-a
move.downhill-PT-TOWARD.HERE-3[SG]
‘He came down.’

(56) Nocte (Das Gupta 1971; Weidert 1985)

a. hetho-ʌŋ
teach-1s
‘I teach him/her/them’

b. hetho-**h**-ʌŋ
teach-INV-1s
‘They/you teach me’

In example (55b), the suffix -*h* indicates spatial deixis, but in (56b) the ‘toward here’ direction is more abstract, involving the direction of the teaching event toward the speaker. The use of -*h* in (55b) is equivalent to the function of an inverse marker indicating that the actor (here ‘they’ or ‘you’) is lower on the indexability hierarchy than the undergoer (‘I’).

9. Agreement and related phenomena

Agreement is the phenomenon by which a word carries morphological features that originate somewhere else. There are two fundamentally different types, based on where the features originate: head-driven and dependent-driven agreement.

9.1. Head-driven agreement

Head-driven agreement consists in percolating features from the phrasal head to its dependents, e.g., from the noun heading a noun phrase to some or all of its dependents. The result of this is dependent marking in the sense defined in Section 3. Consider (1) in the introductory section, from German, or the following example from the Papuan language Watam:

(57) Watam (Lower Sepik-Ramu; Papua New Guinea; Foley 1999)

a. markum wawar an
pig:SG white:SG this:SG
'this white pig'

b. markumb wabrir and
pig:PL white:PL this:PL
'these white pigs'

Here, the number features (singular and plural) on the head noun are matched by the forms of the dependent adjective and the article following it. In some languages, this kind of agreement affects not only adjectives and determiners but also embedded adpositional or case-marked nominal phrases. Agreeing adpositions are common, for example, in Bantu and Indo-Aryan languages. In the following Hindi examples, 'of' agrees in gender with the head noun of the NP:

(58) Hindi (Indo-European; South Asia)

a. laṛk-õ =k-ā kamr-ā
boy-PL.OBL of-MASC.SG room(MASC)-SG.NOM
'the room of the boys'

b. laṛk-õ =k-e kamr-e
boy-PL.OBL of-MASC.PL room(MASC)-PL.NOM
'the rooms of the boys'

Agreeing case markers are illustrated by Awngi, a Cushitic language; agreement is again in gender:

(57) Awngi (Cushitic; Ethiopia; Hetzron 1995)

a. murí-t ɣuna
village-GEN.FEM woman
'the woman of the village'

b. murí-w aqí
village-GEN.MASC man
'the man of the village'

As for the features involved in noun-driven agreement, the most common ones are gender, number, and case. Gender agreement is widespread in Eurasian and African languages; it is illustrated by the agreement morphology in the Hindi and Awngi examples above, and further shown by the following examples from a Bantu language of Eastern Africa. (Following Bantuist tradition, gender markers are glossed by Roman numerals):

(60) Kinyarwanda (Bantu; Rwanda)

a. u-ru-shíingé ru-níni
DET-XI-needle XI-big
'the/a big needle'

b. u-bw-áato bu-níni
DET-XIV-boat XIV-big
'the/a big boat'

Case agreement is illustrated by the following example:

(61) Southern Sierra Miwok (Utian; California; Broadbent 1964)

a. cyty-ʔ naŋːa-ʔ
good-NOM man-NOM
'a/the good man'

b. ʔi-s-ʔok cylːa-s
that-INSTR-that awl-INSTR
'with that awl'

Case agreement is also characteristic of conservative Indo-European (e.g., Polish or Icelandic), and it is also widespread in western Uralic languages. In Indo-European, it is generally fused with number and/or gender agreement. Case agreement sometimes extends to case-marked NP subconstituents, a phenomenon known as CASE STACKING or SUFFIXAUFNAHME and further discussed in Section 10.4 below.

A feature less commonly found in NP agreement is definiteness, which is characteristic of Semitic languages and to a limited degree also of many Germanic languages (e.g. Swedish):

(62) Modern Hebrew (Semitic; Israel; Givón 1990: 477)

ha-yeled		ha-rishon	ha-gadol	ha-ze
DEF-child(MASC.SG)	DEF-first:MASC.SG	DEF-big:MASC.SG	DEF-this:MASC.SG	

'this first big boy.'

What is notoriously absent from head-driven agreement is person features, probably because personal pronouns rarely head complex phrases. A marginal exception is found with expressions like *I myself, you yourself,* etc.. In Swahili such a pattern extends to the quantifier *-ote* 'all' which behaves in some respects like an adjective and agrees in person with its head, e.g. *sisi s-ote* 'all of us', *ninyi ny-ote* 'all of you', *wao w-ote* 'all of them'. Person features are very prominent, by contrast, in dependent-driven agreement, which will be discussed in the next section.

Non-nominal phrases are less susceptible to head-driven agreement. In verb complexes, one sometimes encounters transitivity agreement. In the Australian language Yidiny, for example, a verb can be part of a complex predicate only if it agrees in transitivity with the head verb. For this reason, the intrinsically intransitive verb *dyaraː-* 'go' receives a comitative applicative marker that increases its valence and thus allows the verb to match the valence of the head verb *guwa-* 'put':

(63) Yidiny (Pama-Nyungan; NE Australia; Dixon 1977: 252)

guwal	dyaraː-l	gali-ŋal-nyu,	bulmba. [522]
name[ABS]	put-PT	go-APPL:COM-PT	place[ABS]

'[He] gave names to all the places as he went along.'

On the VP and clause level, head-driven agreement is equally rare. When it occurs, it often involves tense. An example of this is presented by Luiseño (cf. also the examples in (7) in Section 2.2 above):

(64) Luiseño (Uto-Aztecan; S. California; Steele 1990)

noo =n=il	čaqalaqi-quṣ	hengeemal-i. [3]
1SG =1SG=PT	tickle-PT	boy-ACC

'I was tickling the boy.'

In this sentence, the cliticized auxiliary *=nil* '1st person singular past tense' agrees in tense with the tense choice on the lexical verb *čaqalaqiquṣ* 'tickled' (and in person and number with the subject pronoun *noo* 'I'). A less common variety of tense agreement is characteristic of some Tangkic languages of Northern Australia. In these languages, the agreement carriers are not auxiliaries but tense-indicating case markers on NPs inside the VP. Past tense on the verb, for example, triggers ablative case, which in this function has a 'prior event' value:

(65) Kayardild (Tangkic; N. Australia; Evans 1995b)

dangka-a	raa-jarra	bijarrba-na	wumburu-nguni-na
man-NOM	spear-PT	dugong[-ACC]-ABL (PRIOR)	spear-INSTR-ABL (PRIOR)

'The man speared the dugong with a spear.'

9.2. Dependent-driven agreement

Dependent-driven agreement is the mirror image of head-driven agreement. In the examples above, agreement features were determined by the phrasal head, e.g., by inherent gender of the noun heading an NP or by the tense-marking on a verb. In dependent-driven agreement, agreement features are determined by a dependent and are then matched by the head's inflection. Classical examples are the registration of possessors on the head noun in an NP, or the registration of arguments on a verb. The following Belhare examples illustrate both:

(66) Belhare

a. ŋka-ha a-tak
1SG-GEN 1SG.POSS-friend
'my friend'

b. un-chik-ŋa ŋka ma-ŋ-ni-at-ni.
3-NS-ERG 1SG[ABS] 1SG.P-3NS.A-see-NEG
'They didn't see me.'

In (66a), the head *tak* 'friend' of the NP registers the person and number of its possessive dependent. In (66b), the verb *ni-* 'see, know' agrees with both the A-argument *unchikŋa* 'they' and the P-argument *ŋka* 'me'.

Dependent-driven agreement is largely limited to NPs and clauses, and is not usually found in other constituents. An exception is adpositional phrases. These often develop from topological noun constructions like Belhare *khim u-tem* 'house its-top', i.e. 'on the house', and consequently it is not surprising that in a number of languages grammaticalized adpositions agree with their objects. The following Abkhaz examples show postpositions ((67a-b) and, for comparison, a noun phrase ((67c)).

(67) Abkhaz (Northwest Caucasian; Abkhazia)[28]

c. ̀Axra =yə-zə̀ (Hewitt 1979: 113)
Axra =3SG-for
'for Axra'

b. a-y˚n =a-q'nə̀. (Hewitt 1979: 103)
DET-house =3SG.NHUM-at
'at home'

c. apsnə́ a-ps a-bá-ra. (Comrie 1981b: 233)
Abkhazia 3SG.NHUM-soul 3SG.NHUM-see-ABSTRACT
'Abkhazia's beauty' (literally 'Abkhazia its-soul its-sight')

Abkhaz postpositions differ from nouns in that they trigger vowel elision to avoid hiatus (cf. *ay˚nə̀* 'the house' as the base form in (67b)). Nouns, as in example (67c), only optionally induce vowel elision in connected speech (Hewitt 1979: 267).

In dependent-driven agreement, usually only one element is the target of agreement, viz. the head. This is different from head-driven agreement, where features sometimes

[28] Grave and acute accent are used in different sources to mark the same thing: stress.

percolate to all elements in the phrase, e.g., to all subconstituents (determiners, adjective, genitival NPs) of an NP. Dependent-driven agreement with multiple targets is uncommon, but it is attested on the clause level in Archi (and a few other Daghestanian languges):

(68) Archi (Nakh-Daghestanian; NE Caucasus; Kibrik 1994:349)

a. buwa-mu **b**-ez dit:a**b**u χ:°alli a**b**u.
father-ERG III-1SG.DAT early:III bread(III):ABS.SG make:III
'Father made the bread for me early.'

b. nena**b**u χ:°alli a**b**u.
1INCL.ERG:III bread(III):ABS.SG make:III
'We made the bread.'

In (68a), the absolutive argument *χ:°alli* 'bread' is in gender III and this feature is matched by nearly all constituents of the clause, including not only the head of the clause, i.e. the predicate (*abu* 'made-it') but also other dependents such as adverbs (*dit:abu* 'early') and pronominal arguments (*bez* 'me'). Whether or not a constituent undergoes agreement depends on the availability of morphological slots on it. Nouns do not have such a slot, which is why *buwamu* 'father' in (68a) does not show agreement, unlike the pronoun *nenabu* 'we(incl.)' in (68b). (Note that agreement markers are infixed in most instances.). Another case of multiple agreement targets is found in Coahuilteco, an extinct language isolate of southern Texas. In this language, subject agreement is manifested on the verb and on dependent object NPs (including embedded clauses). Thus, both the verb form and the shape of the accusative suffix are determined by the person of the subject referent:

(69) Coahuilteco (isolate; N. America; Troike 1981)

a. Dios tupo:**-n** naxo-xt'e:wal wako:.
God DEM-ACC.1 1pS-annoy CAUS
'We annoyed God.'

b. Dios tupo:-**m** xa-ka:wa xo e?
God DEM-ACC.2 2S-love AUX Q
'Do you love God?'

c. Dios tupo:**-t** a-pa-k'tace:y.
God DEM-ACC.3 3S-SUB-pray:PL
'that (all) pray to God.'

These facts show that dependent-driven agreement is not necessarily restricted to head marking of the agreement morphology, although that is certainly the commonest pattern worldwide.

It is sometimes argued that complementizers are heads of complement clauses, and it is therefore natural that complementizers are occasionally targets of agreement marking. This happens in a few Germanic languages (West Flemish, Bavarian) and in the Australian language Kalkatungu:

(70) Kalkatungu (Pama-Nyungan; N. Australia; Blake 1979: 62)

maṛapai	iŋka-n̲a	ŋkaṛa-a	a-**i**	waṯukati-ji.
woman[-ABS]	go-PT	yam-DAT	COMP-3SG.S/A	dig-ANTIPASS

'The woman went to dig yams.'

(71) Bavarian German (Bayer 1983/84, Getty 1995)

Ihr	soll-ds	song	ob-**ds**	ihr	kumm-ds.
2PL	should-2PL	say:INF	whether-2PL	2PL	come-2PL

'You should say whether you are coming.'

Dependent-driven agreement is by and large limited to features specifying referents, and this is why CROSS-REFERENCE is often used as an alternative term. Typical examples involve inflection of nouns or verbs for person, number, and gender of referents. Examples where non-referential features like case are involved are less common, but the phenomenon is attested in some Indo-Aryan languages, e.g., in Maithili (Bickel & Yādava 2000) or in Kashmiri (Wali & Koul 1997). Maithili has two sets of agreement markers, nominative and non-nominative. The nominative set indicates agreement with an NP in the nominative; the other set is used for NPs in any other case (and also PPs or referents in the wider discourse context).

(72) Maithili (Indo-Aryan; S. Asia; Bickel & Yādava 2000)

a.

o	ḍar-l-**aith**.
3HON.REM.NOM	be.afraid-PT-3HON.NOM

'He was afraid.'

b. hunkā ḍar lag-l-**ainh**.
3HON.REM.DAT fear feel-PT-3HON.NONNOM
'He was afraid.'

c. o kitāb nahi paḍh-l-**aith**.
3HON.REM.NOM book[NOM] NEG read-PT-3HON.NOM
'He didn't read the book.'

d. hunkā=sã kitāb nahi paḍha-l ge-l-**ainh**.
3HON.REM.OBL=ABL book[NOM] NEG read-P AUX:PASS-PT-3H.NONNOM
'The book was not read by him.'

Note that the distinction is purely one of case and cuts across grammatical relations and semantic roles: subjects in (72a) and (72b) can trigger either agreement type, depending on their case (which in turn depends on the syntactic construction used); agents in (72c) and (72d) show both possibilities, again dependent on case. Other instances of case-differentiating agreement are found in a few Nakh-Dagestanian languages, which have cliticized case-inflecting pronominals that now serve as agreement markers (cf. Holisky & Gagua 1994 on Batsbi/Tsova-Tush and Schulze-Fürhoff 1994 and Harris 2000 on Udi).

As in head-driven agreement, clause-level categories such as tense or mood hardly ever figure in dependent-driven agreement. One exception is interrogative mood, which is sometimes triggered by interrogative dependents. This is obligatory in Greenlandic Eskimo (Sadock 1984) and Hausa (Newman 2000:493), and is an optional possibility in Japanese (Hinds 1984):

(73) West Greenlandic Eskimo (Eskimo-Aleut; Greenland; Sadock 1984: 200)
kina maanii-ppa?
who be.here-3SG.INTERROGATIVE
'Who is here?'

In these languages, interrogative mood also appears in polar (yes/no) questions, where it is not triggered by question words. The Papuan language Tauya, by contrast, has a dedicated mood (-*ne*) for parametric ('WH') questions, distinct from the mood marking polar questions (-*nae* ~ -*nayae*). Thus, the parametric mood only appears as the result of agreement:

(74) Tauya (Adelbert Range; Papua New Guinea;McDonald 1990)

we fofe-ʔe-ne?
who come-3SG.FUT-PARAMETRIC.INTERROGATIVE
'Who will come?'

9.3 Variation in dependent-driven agreement

Dependent-driven agreement, especially on the clause level, is often sensitive to the nature of the relationship between the dependent and the head. One distinction is that between grammatical and pronominal agreement.[29] Grammatical agreement involves a relationship between the verb and argument NPs. This is illustrated by the examples in (66b) and (72) above, or, indeed, by the subject agreement found in the English translations of these examples. Pronominal agreement, by contrast, does not involve a relationship between verb and argument NPs. Instead, the agreement morphology absorbs argument positions and consequently the agreement-triggering NPs can no longer overtly appear in these positions. This is the case, for example, in Celtic languages:

(75) Irish (McCloskey & K. Hale 1984)

a. chuirfinn (*mé) isteach ar an phost sin.
put:1SG.COND 1SG in on ART job DEM
'I would apply for that job.'

b. churfeadh Eoghan isteach ar an phost sin.
put:COND E. in on ART job DEM
'Owen would apply for that job.'

In (75a), the verb is inflected for first person singular. This absorbs the subject argument position, and therefore no NP (*mé* 'I') can fill this position in the clause. If the verb is not inflected for person and number, as in (75b), subject NPs can occur overtly. Similar patterns are found all over the world, e.g. in many languages of the Americas (cf. Popjes & Popjes 1986 on a Jê language, Abbot 1991 on a Carib language, and Galloway 1993 on a Salishan language).

[29] This distinction has a long tradition (but terminology varies). The idea was first introduced by Du Ponceau (1819) and von Humboldt (1836) and had a veritable renaissance in the mid-eighties of the last century (cf., among others, Jelinek 1984, Mithun 1985, Van Valin 1985, Bresnan & Mchombo 1987).

The ban on overt agreement-triggering NPs is often not general but concerns a specific phrase-structural position reserved for true arguments. In Chichewa, object NPs can co-occur with pronominal agreement markers if they are moved out of their canonical postverbal argument position into topic (or afterthought) position:

(76) Chichewa (Bantu; E. Africa; Bresnan & Mchombo 1987)

a. ??ndi-kufúná kutí [$_{VP}$ mu-wa-páts-é a-lenje] mphâtso.
1SG.S-want COMP 2SG.A-3.PL(II).P-give-SUB II-hunter gift
'I want you to give them a gift, the hunters.'

b. ndi-kufúná kutí [$_{VP}$ mu-wa-páts-é mphâtso] a-lenje.
1SG.S-want COMP 2SG.A-3PL(II).P-give-SUB gift II-hunter
'I want you to give them a gift, the hunters.'

(76a) is ill-formed because the primary object *alenje* 'the hunters' occupies the VP-internal argument position that is already filled by the agreement marker *wa-*, which denotes a class II (= plural animate) noun in primary object ('P') function.[30] Moving the NP into an afterthought (or fronted topic) position as in (76b) resolves this problem. A similar possibility is given in many Amazonian languages, e.g. in Yagua (Peba-Yagua family; Everett 1989) or Maxakalí (Jê):

(77) Maxakalí (Jê; Amazonas; Rodrigues 1999)

a. pɨtʃap tʃɨpep.
duck arrive
'The duck arrives.'

b. ʔɨ̃-tʃɨpep pɨtʃap
3-arrive duck
'The duck arrives.'

Maxakalí has verb-final clauses and syntactic argument positions are therefore normally before the verb. When NPs appear in these positions, there is no verb agreement, as shown by (77a). Outside of argument positions, in contrast, NPs are compatible with pronominal verb agreement, as in (77b). When NPs are removed from argument positions in this way, their relation to agreement markers is no longer one of feature-matching. Instead, it is one of anaphoric resumption, just like the relationship between a pronoun

[30] The notion 'primary object' is discussed in Chapter I.4.

and a coreferential lexical NP. It is in this sense that pronominal agreement markers function, as the name suggests, as PRONOMINAL ARGUMENTS themselves, i.e. they are grammatical words on their own (in the sense discussed above in Section 2) and could thus as well be analyzed as clitics.

The diagnostic feature of pronominal agreement is that NPs in the same argument role as the agreement markers are BANNED FROM SYNTACTIC ARGUMENT (ACTANT) POSITIONS IN THE CLAUSE. Whether or not overt NPs occur at all somewhere in the sentence is a different issue. In most languages, NPs are completely optional in all positions, regardless of whether the language has grammatical agreement (e.g., Latin, Belhare or Maithili) or pronominal agreement (e.g., Maxakalí, Yagua, or Chichewa).

Through grammaticalization, pronominal agreement systems often develop into grammatical agreement systems over time (Givón 1976, 1984), and there are therefore transitional systems. This is typical for Romance and Slavic languages, where dialects or registers differ in how well they tolerate the co-occurrence of object NPs and agreement clitics. The development of grammaticalized agreement typically starts with specific and animate referents before it generalizes to other referents — i.e. it follows the INDEXABILITY HIERARCHY discussed in Section 5.1.

(78) Spoken Iberian Spanish (Bossong 1998)[31]

a. lo= has visto a mi hermano?
3SG.MASC.DAT have:2SG seen DAT my brother
'Have you seen my brother?'

b. (*lo=) has visto un hombre?
3SG.MASC.DAT have:2SG seen a man
'Have you seen a man?'

In (78a), agreement is obligatory and fully grammaticalized in the spoken language, but this rule does not carry over to non-specific (or inanimate) NPs, as shown in (78b). In Abkhaz, grammatical agreement covers all but non-human and plural NPs in S or P role. Thus, while singular human NPs trigger regular agreement, plural or singular non-human NPs trigger S/P-agreement only if they are moved away from their canonical preverbal position:

[31] We use 'dative' as the standard gloss for primary object markers, and 'accusative' for direct object markers. See Section 10.2 and Chapter I.4 for discussion.

(79) Abkhaz (Northwest Caucasian; Anderson 1974)

a. a-ph˚əs d-žac˚’ad.
ART-woman 3SG.HUM.S-sit.up:PT
‘The woman sat up.’

b. a-qac˚a-k˚a nxayd.
ART-man-PL work:PRES
‘The men are working.’

c. a-qac˚a-k˚a waxc˚’a yə-nxayd.
ART-man-PL today 3PL.S-work:PRES
‘The men are working today.’

In (79a) and (79b), the subject NPs are in regular argument position but only the singular NP in (79a) triggers (grammatical) agreement. However, if the plural (or, in other examples, non-human) NP appears in another than its canonical preverbal position, as it does in (79c), it triggers agreement. As we saw above, such behavior is typical of pronominal agreement.

The cutoff point between grammatical and pronominal agreement can be at various places on the indexability hierarchy, and it is often subject to discourse factors. In Swahili, for example, object NPs can occur in argument position, but whether or not they trigger grammatical agreement is a matter of discourse prominence, empathy, and sometimes even just politeness (T. Bearth, p.c.). Similar situations, where referential and discourse factors regulate the appearance of (part of) the agreement morphology, are found, for example, in Northern Athabaskan (e.g., Rice 1989: 1016 – 30), in some Western Austronesian languages (Mithun 1994, Himmelmann 1999), and in various Australian languages (Dixon 1980: 365ff). Referential factors are also often crucial for the distribution of dependent-driven agreement in NPs. In many languages, for instance Turkish or Belhare, nominal agreement is found only if the possessor has specific reference (which is also a matter of indexability):

(80) Turkish (Lewis 1967)

a. üniversite profesör-ler-i
university professor-PL-3POSS
‘the professors of the university’

b. üniversite profesör-ler
university professor-PL
'university professors'

Grammatical agreement systems are all based on relating features in the agreement trigger and features expressed by the agreement morphology. In most cases, this relation consists in unifying (or merging) the features so as to create one single referential expression: even though in e.g. *he walk-s* there are two different referential indexes, one implied by the NP and one implied by the agreement desinence *-s*, there is only one single referent expressed. Likewise, in the Spanish example (78a), though there are both an agreement clitic *lo=* and an NP in object function (*a mi hermano*), the two expressions merge into a single referential value. And in the Abkhaz example (79a), the reference of *aph˚əs* 'the woman' and the reference of *d-* 'she' are likewise unified semantically. These are what we call INTEGRATIVE agreement systems.

In addition, there also exist ASSOCIATIVE agreement systems (Bickel 2000a), which employ different ways of relating features. In associative systems, which are characteristic of many Tibeto-Burman and Australian languages, the features of the agreement trigger enter into a variety of relations with the features expressed by agreement morphology. A particularly rich example is found in Lai Chin:

(81) Lai Chin (Tibeto-Burman; W. Burma; Bickel 2000a)

a. a-maʔ a-niː.
3[SG]-DEM 3[SG]S-laugh:Σ1
'S/he laughs.' (identity)

b. a-háw daʔ nà-n-raːʔʔ
3[SG]-who Q 2-PL.S-come:Σ1
'Who of you came?' (part of)

c. tsóːn piak tuː niʔ[32] làw ka-thloʔ véː.
teacher ERG field 1[SG]A[-3SG.U]-work:Σ2 even
'Even as a teacher I can work the field.' (apposition)

d. ka-lùŋ na-r̥ìŋ.
1[SG]POSS-heart 2[SG]S-suspicious:Σ1
'I suspect you' (other relation)

[32] In keeping with the isolating morphology of this languages, words like these are unitary from the point of view of syntax and lexicon but not from the point of view of phonology. Spaces demarcate phonological, not grammatical, word boundaries.

Only in example (81a) do features merge into unified reference to a single third person. In (81b), the subject argument *aháw* ‘who’ represents a subset of the referents expressed by the corresponding subject agreement prefix *nàn-* ‘you (pl.)’. In (81c), the subject *tsoːn piak tuː niʔ* ‘teacher’ is understood as a copredicate of the subject (A) prefix *ka-* ‘I’. The most complex relation is found in (81d), where the subject NP, of which *r̥ìŋ* ‘be suspicious, be green’ is predicated, is *kalùŋ* ‘my heart’. As a subject, this NP triggers agreement in the corresponding subject agreement slot on the verb. However, it is not the third person singular feature of this NP (nor the possessor’s features) that are registered there, but rather the features of the referent with regard to whom the predication holds, here *na-* ‘you (sg.)’.

In systems like these, the feature specification in the verb agreement morphology is independent of the specifications in the agreement-triggering NPs. The two feature sets are then related to each other through the agreement relation itself, and this is done in the various ways indicated in (81) above. Integrative systems, by contrast, involve one unitary set of features and the agreement relation merely assures this unity; it does not create it.

9.4. Long-distance agreement

The agreement systems surveyed so far all have in common that they are bound within the phrase in which they are morphologically manifested: in all examples above, agreement never extended beyond the clauses or NPs containing the agreement triggers (whether heads or dependents). But this need not be so, and in the following we review some counterexamples.

Maithili, for example, has raising constructions involving finite verbs. The embedded verb (*bhajetāh* ‘becomes’) agrees in person (third), honorific degree (high) and case (nominative) with the raised NP in the matrix (*Harījī* ‘Hari’):

(82) Maithili (Indo-Aryan; S. Asia; Yadava 1999, Bickel & Yādava 2000)

Harī-jī	lag-ait	ch-aith	[je	__	bimār	bha-je-t-āh].
H.-H:NOM	seem-IPFV.PART	AUX-3H.NOM	COMP		sick	be-TEL-FUT-3H.NOM

‘Hari seems to become sick.’

While such examples may be explained by appealing to an underlying structure in which the agreement trigger is in the lower clause (symbolized by '__' in (82)), this is implausible with other kinds of long-distance agreement. Relevant examples are found in New Guinea Highlands languages, such as Fore (also cf. Haiman 1998 for a concise overview of the closely related language Hua):

(83) Fore (East New Guinea Highlands; Papua New Guinea; Scott 1978)

kan-aː-gí-rá	a-ga-us-e.
come-3SG.DS-DEP-1DU.AS	3SG.P-see-1DU.A-DECL

'He is coming and we see him.'

Here, the verb in the dependent (chained) clause ('he is coming') agrees with the first person main clause subject ('we'), but there is no way in which this subject could ever occur, even at the most abstract underlying level, in the dependent clause itself. It is more likely that ANTICIPATORY AGREEMENT ('AS'), as it is called in the literature of these languages, results from cliticizing subject pronouns on preceding clauses. Consistent with this origin, anticipatory agreement is always final in the verbal desinence.

Apart from verbal inflection, case too is sometimes subject to long-distance agreement. This is illustrated by what are known in Indo-European linguistics as conjunct participles (*participia coniuncta*). In the following example from Ancient Greek, nominative case choice on the participial clause in (83a) is determined by the nominative case on the shared subject (*egṓ* 'I') in the matrix clause. The accusative on the participle *légonta* 'speaking' in (83b) is triggered by its subject that is coreferential with *me* 'me' in the matrix clause.

(84) Ancient Greek

a.

egṑ	eréō	hōs	[eû	epistá-men-os]. (Herod. *Hist*. IX 42)
1SG.**NOM**	speak:1SG.FUT	PTCL	well	understand-MED.IPFV.PART-**NOM**.SG

'I will speak out because I understand it well.'

b.

pollakhoû	dḗ	me	epéskhe
often	PTCL	1SG.**ACC**	stop:3SG.IMPERF

[légo-nt-a	metaksú]. (Plat. *Apol*. 40b)
talk-ACT.IPFV.PART-**ACC**.SG	in.the.middle

'[The oracle] has often stopped me when I was in the middle of talking.'

Similar constructions are common in Australian languages (Bickel 1991:170f, 1999). In the following example from Yukulta, ergative case on the supine *karnajurluya* ‘in order to light’ indicates coreference of its subject with the matrix clause NP of the same case (*dankaya* ‘man’):

(85) Yukulta (Tangkic, N. Australia; Keen 1983:247, cited from Evans 1995)

danka-ya =karri ngida karna-ja [makurrarra-wurla-ya karna-jurlu-ya].
man-ERG =3>3PRES wood light-ACT wallaby-PROPR-ERG light-PURP-ERG
‘The man lit the fire in order to cook the wallaby.’

The only difference is that case formatives stack onto all members of nominalized constituents in Yukulta (so that ‘wallaby’ and ‘light’ have ergative suffixes in agreement with ‘man’ as well as bearing case suffixes that indicate their own clause functions), but not in Greek — a typological distinction to which we will return in Section 10.4.

In all of the preceding examples, the agreement target was in the dependent clause. The mirror image of this is also found. In this case, the main verb is the agreement target, agreeing with an argument in a dependent clause. In Belhare, the relevant argument is in S or P function:

(86) Belhare (Bickel, in press)

a. [na-kha khoŋ-ma] n-nu-yu.
DEM-NSG play-INF 3NSG.S-may-NPT
‘They may be playing.’

b. [ŋka lu-ma] nui-ʔ-ŋa.
1SG tell-INF may-NPT-[1SG]EXCL.S
‘I may be told.’

Such examples are closely related to raising or control constructions. The main difference is that the agreement-triggering NP typically remains in the lower clause. Therefore, an alternative word order to (85b), ??*[luma] ŋka nuiʔŋa*, where the pronoun appears in the matrix clause, is only barely acceptable. This is particularly remarkable since Belhare has virtually no other word order constraints and no other syntactic regulations on the appearance or non-appearance of overt NPs.

Apart from person and number features, long-distance agreement of this kind can also affect valence features. In Belhare, some matrix verbs agree in transitivity with the embedded verb. In (87a), the embedded verb is intransitive, and so is the matrix verb. In (87b), both verbs are transitive:

(87) Belhare (Bickel, in press)

a. [ta-ma] kond-he-ŋa.
come-INF want-PT-[1SG]EXCL.S
'I wanted to come.'

b. [lu-ma] kond-he-ŋ-chi-ŋ.
tell-INF want-PT-1SG.A-3NS.P-1SG.A
'I wanted to tell them.' or 'I wanted them to be told (by x).'

(Note that in the transitive version, only the object inflection represents long-distance agreement: the P-markers (-*chi* in (87b)) agree with the lower object. The A-markers, by contrast, are local agreement devices, simply registering the A-argument of the matrix verb (*konma* 'to want'); whether or not they are coreferential wth the lower A is a matter of pragmatics.

Valence agreement is also found in Nepali (Indo-Aryan) and in Chechen and Ingush (Nakh-Daghestanian), but in these languages, agreement goes beyond transitivity and extends to the specific case frame associated with the lower verb (Bickel & Nichols 2001). Consider the following examples from Nepali:

(88) Nepali (Indo-Aryan; Nepal; Bickel & Yādava 2000)

a. mai-le Hindi paḍh-na lāg-ẽ.
1SG-ERG H.[-NOM] study-INF take.up-1SG.PT
'I took up studying Hindi.'

b. ma-lāī yo kitāb man par-na lāg-yo.
1SG-DAT this book[NOM] liking occur-INF take.up-3SG.PT
'I began to like this book.'

The matrix verb *lāgnu* 'to begin, to take up' agrees in valence with its complement: in (88a), the lower verb governs an ergative-nominative case frame; in (88b), there is a dative-nominative frame. This information is copied onto the matrix verb, which therefore shows the agreement characteristics of the respective frames: in the ergative-

nominative frame, the verb agrees with the A argument (the ergative NP *maile* 'I'), while in the dative-nominative frame, it agrees with the P argument (the nominative NP *yo kitāb* 'this book').

9.5. Morphological reference tracking

With the exception of anticipatory subject agreement as in the Fore example (83), long-distance agreement requires argument sharing between two clauses: the agreement-triggering argument in one clause (the matrix clause in Maithili, Greek, and Yukulta, the dependent clause in Belhare, Nepali, and Chechen) is referentially shared by the clause containing the agreement target. Some languages have developed specialized morphological devices to encode just this kind of long-distance agreement through argument coreference.

Eskimoan languages have a distinct set of coreference-indicating agreement markers, traditionally known as 'fourth person' or 'reflexive' desinences.[33] These appear on subordinate verb forms and indicate the role and number of an argument that is coreferential with the S or A argument in the matrix clause:

(89) Central Yup'ik Eskimo (Eskimo-Aleut; Alaska; Reed *et al.* 1977)

a. angun aterte-ller-mini alinge-llru-uq. [289]
man:SG.ABS drift.with.the.current-WHEN-**3SG.S.REFL** be.afraid-PT-3SG.S
'When the man drifted with the current, he was afraid.'

b. tang-ller-miniu tuntuvak angun aya-llru-uq. [288]
see-WHEN-**3SG.A.REFL**:3SG.P moose:SG.ABS man:SG.ABS go.away-PT-3SG.S
'When he saw the moose, the man went away.'

c. angute-m tange-llr-ani tuntuvak aya-llru-uq. [288]
man-SG.ERG see-WHEN-3SG.A:**3SG.P.REFL** moose:SG.ABS go.away-PT-3SG.S
'When the man saw the moose, it went away.'

In (89a), the suffix *-mini* indicates not only that the subordinate subject (*aŋun* 'the man') is a third person singular referent but that the same referent is also subject in the matrix clause. Similarly, in (89b), *-miniu* registers the features of the lower clause A argument

[33] Not to be confused with '4th' person in the sense of obviative, as discussed in Section 8.1.3.

and at the same of the coreferential matrix clause subject (again, *aŋun* ‘the man’). In (89c), *-ani* registers the features of the subordinate object (*tuntuvak* ‘the moose’), and at the same time indicates that these features also characterize the matrix clause subject.

Note that there is no constraint in Yup’ik Eskimo on whether or not shared NPs appear overtly in the subordinate or in the matrix clause. This is different from the argument-sharing examples we looked at in the preceding section, where overt arguments are typically banned from the clause in which long-distance agreement is marked (the subordinate clause in Maithili, Greek and Yukulta; the matrix clause in Belhare, Nepali and Chechen). In Yup’ik Eskimo there is no need for such an obligatory syntactic gap since coreference is already indicated by the morphology. Thus, the Eskimo system is a morphological, rather than syntactic, reference-tracking device. As such, it is comparable to other overt means of signalling cross-clause coreference, e.g., LOGOPHORIC PRONOUNS or REFLEXIVE PRONOUNS used across clauses.

Logophoric pronouns are endemic in African languages, but they are also occasionally attested in other languages (e.g., the defective Ancient Greek pronoun paradigms based on the root *sph-* had similar uses; cf. Bickel 1991:161). Logophoric pronouns indicate coreference of a lower NP to an information source implied by the matrix clause. This is typically a person whose speech, thoughts, or feelings are reported. An example from the Bantu language Babungo:

(90) Babungo (Bantu; Cameroon; Schaub 1985:111f)

a. ŋwə́ gì lāa yì táa jwî.
3SG say:PFV COMP LOG N.FUT come
‘He$_i$ said that he$_i$ will come.’

b. Làmbí kə́ə lāa à fá' yáa yì.
L. want:IPFV COMP 2SG work like LOG
‘Lambi$_i$ wants you to work like him$_i$.’

Cross-clause reflexivization is similar to logophoricity, but the antecedent is not limited to subjects of information verbs. The following example from Ingush has long-distance reflexivization into subordinate clauses controlled by the subjects of the main-clause verbs ‘leave’ and ‘want’. (91b) would have a logophoric pronoun in a language like Babungo (cf. (90b)), but (91a) could not.

(91) Ingush (Nakh-Daghestanian; N. Caucasus)

a. Suona shie bwarjga-vejcha, hwa'aaravealar Muusaa.
1SG.DAT 3SG.**REFL** eye V.see.CONV DX -out-went Musa
'When I saw him$_i$, Musa$_i$ left'

b. Suona diezac, cuo sej nanna novq'ostal dar
1SG.DAT not want 3SG.ERG 1SG.**REFL**.GEN mother.DAT help do.NZR
'I don't want him to help my mother.'

The only differences between logophorics and reflexives on the one hand, and the Yup'ik Eskimo system on the other, are that (i) the formatives are affixed in the Yup'ik Eskimo verb endings, but free in the case of pronouns, and (ii) the Eskimo system is limited to a choice between S, A and P coreference, whereas logophoric and reflexive pronouns are usually unrestricted as to the function they assume in the embedded clause. Indeed, in the Babungo example (90b), it is an adjunct (*yáa yì* 'like LOG') whose reference is marked as being identical with that of the matrix subject. A case in between is illustrated by the Nigerian language Gokana, where verbs are inflected for logophoricity without however indicating the function of the coreferential NP in the embedded clause:[34]

(92) Gokana (Cross-River; Nigeria; Hyman & Comrie 1981)

Lébàreè kɔ aè div-èè e.
L. say 3SG hit-LOG 3SG.P
'Lebare$_i$ said that he$_i$ hit him$_j$.' or 'Lebare$_i$ said that he$_j$ hit him$_i$.'

The function of the coreferential argument in the matrix clause is limited, like in other logophoric systems, to information sources (here the person whose speech is reported, Lebare).

While in Gokana the function of the coreferential arguments is specified only in the matrix clause, and only by the pragmatic notion of information source, matters are different with the universally most common morphological technique for tracking referents across clauses: SWITCH REFERENCE (Jacobsen 1967, Haiman & Munro 1983). Switch reference is especially widespread in North American and Papuan languages. In its fullest form, a switch-reference system comprises two dependent verb paradigms, one

[34] Historically, the inflectional desinence derives from a cliticized logophoric pronoun.

signalling coreference of subjects (S or A) across clauses (‘SS’ for ‘same-subject’), the other signalling disjoint reference (‘DS’ for ‘different subject’). This is illustrated by the Papuan language Kobon:

(93) Kobon (East New Guinea Highlands; Papua New Guinea; Davies 1981:185)

a. yad kaj pak-em ram ud ar-nab-in.
1SG pig strike-1SG.SS house take go-FUT-1SG
‘I will kill a pig and take it home.’

b. yad kaj pak-nö ne ram ud ar-nab-ön.
1SG pig kill-1SG.DS 2SG house take go-FUT-2SG.
‘I will kill a pig and you will take it home.’

Following widespread principles of iconicity and economy (Haiman 1985), same-subject forms are often nonfinite. Thus, in the commonest variety of switch-reference morphology, only different-subject forms inflect for person and number of the subject in the dependent clause. This type of morphology is illustrated by the following example from Kâte, another Papuan language:

(94) Kâte (Finisterre-Huon; Papua New Guinea: Pilhofer 1933:138)

la fisi-pie fahale-lâ yâpeʔ-yopa-pie mafa-yeŋiʔ
go arrive-3SG.DS. SEQ rise-SS.SEQ chase.away-3PL.P-3SG.DS.SEQ stuff-3PL.POSS
behe-lâ wise-pie fiuʔ lo-fâle-mbiŋ.
throw.away-SS.SEQ flee-3PL.DS.SEQ illicitly take-all-3PL.REM.PT
‘When they$_i$ (the foreigners) arrived, they$_j$ (the villagers) got up and chased them away. They$_i$ threw away their stuff and fled. Then, they$_j$ stole [their stuff].’

In this example, different-subject forms (e.g., *fisipie* ‘they arrived and’) register the subject features in their clause, while same-subject forms are nonfinite (e.g., *fahalelâ* ‘having risen’).

Note that there is much typological variation in the precise definition of what argument is monitored by a switch-reference system, especially whether it is the subject (in the sense of the S or A argument) or the topic or the agent. In describing such systems, it is important to pay close attention to how the forms are actually used in spontaneous discourse. Recent work on North American languages, for instance, has shown that what may be monitored by the system is sometimes not so much sameness of

referents, but sameness of events (Mithun 1999: 269-71); for Papuan languages, spatial and modal categories are often as important as referential ones (cf. e.g., Roberts 1987:303ff); and for African languages expectations about event continuation (relative novelty) have been noted as relevant (Contini-Morava 1989). At least one language is known to have distinct morphology that tracks location changes (the Angan language Angaataha spoken in Papua New Guinea; Huisman 1973). Finally, many chaining forms in Papuan languages also monitor sameness or difference of time: both the different subject and the same subject forms in the Kâte example in (94) also register difference of time in the form of what are glossed here as 'sequential' markers. Other forms of the language are reserved for 'sameness' of time. These are usually glossed as 'simultaneous' forms.

These findings call for further research in the typology of reference-tracking devices, and Pilhofer's (1933) earlier terminology distinguishing between *Durchgangsform* ('continuity form') and *Wechselform* ('switch form') proves to be more appropriate as a generic term than 'same subject' and 'different subject'. What is monitored by such continuity and switch forms, then, can be any discursive or referential category: subject, topic, agent, space, mood, time, or events.[35] Languages may have specific forms specizalized for one of these categories, or they may have semantically general forms that can be used for a range of such categories in discourse.

10. Case and adpositions

Case is dependent marking of the syntactic roles of nominals, on those nominals, by formatives. The following example from Virgil's *Aeneid* shows case-inflected nouns in circumstances of heavy scrambling where the case inflection is crucial to comprehension.

(95) Latin (Verg., *Aen.* 1, 1-3; '/' marks line boundaries)

Arma	virum=que	cano,	Troiae	qui	primus
arms:ACC.PL	man:ACC.PL=and	sing:1SG.PRES	T:GEN.SG	who:NOM.SG	first:NOM.SG

ab oris	/Italiam	fato	profugus	Lavinia=que	
from coast:ABL.PL	I:ACC.SG	fate:ABL.SG	fugitive:NOM.SG	L.:N.ACC.PL=and	

venit	/ litora.
come:3SG.PERF	shore:ACC.PL

[35] See Bickel (1991: Ch. 6) for a preliminary sketch of such a typology.

‘Of arms and the man I sing, who, fugitive by fate, first came from the coasts of Troy to Italy and the Lavinian shores.’

Except perhaps for the first clause (*arma virumque cano*, lit. ‘arms and the man I sing’), word order here obeys rhythmical more than syntactic concerns, but the case marking signals clearly which elements belong together: the genitive *Troiae* ‘of Troia’ belongs to the head noun *ora* ‘coast’, here in the ablative required by the preposition *ab* ‘from’. The nominative on *primus* ‘first’ and *profugus* ‘fugitive’ signals that these expressions refer to the subject referent (*virum … qui* ‘the man who’) as copredicates, literally meaning ‘as the first’ and ‘as a fugitive’, respectively. The accusatives *Italiam* ‘to Italy’ and *litora* ‘to the shores’ are accusatives of direction, and although they occur in completely different positions in the clause, they both specify the goal of the main verb *venit* ‘he came’ and are joined together by the enclitic coordinator =*que*. *Litora* itself is modified by the denominal adjective *Lavinia* ‘Lavinian, of the city of Lavinium’ that precedes the verb but whose neuter acusative plural ending unambiguously establishes where it belongs syntactically. (Note that the clitic conjunction =*que* ‘and’ follows the first element, i.e. the adjective, of the discontinous NP *Lavinia=que … litora*, just like the NP-level Wackernagel clitic discussed in Section 2.2). Without case inflection, the syntax of these verses would be difficult to recover.

And case-inflected and/or adposition-marked nominals, without verbs, frame, or indeed even explicit argument structure, can be used alone in verbless sentences or self-standing utterances with perfect intelligibility (Nichols 1993, Weiss 1993):

(96) Russian

My	ix	i	granatami,	i	iz	avtomatov,	i
1PL.NOM	3PL.ACC	and	grenade:PL.INSTR	and	from	submachine-gun:PL.GEN	and

štykami
bayonet:PL.INSTR

‘We [attacked] them with grenades, from submachine guns, with bayonets.’

Case frames suggest possible verbs or verb meanings, e.g., ‘attack’ or ‘strike’ or ‘shell’ or ‘destroy’ in the first part (*my ix granatami* ‘we them with grenades’), or ‘stab’, ‘strike’, or ‘destroy’ in the second (*iz avtomatov* ‘from submachine-guns’), but the scenario is detailed enough even without verbs; and it is possible that verbs are not even there

conceptually. Similarly, Nepali envelopes are often addressed with the sender's name in the ergative case and the addressee's in the dative; Russian envelopes regularly have the addressee's name in the dative case. Telegram style in Russian leaves out prepositions but retains the case they govern on their objects.

Prototypically, case formatives are suffixes. Also prototypically, dependent marking on nominals IS case, marking either the role of a specific NP, or, much less commonly, the role of two NPs at once. The latter is attested, for instance, in Yurok, where the case suffix *-ac* on the pronouns *nek* 1s' and *ke'l* '2s' signals that the referent of the pronoun is undergoer and that there is an actor further below the indexability hierarchy, i.e. a third person. The suffix has thus a function similar to an inverse marker (see Section 8.1.3),but here it is a case suffix:

(97) Yurok (Algic, northern California; Robins 1958:21)

a. yoʔ nek**-ac** ki ne-woh-p-eʔn
3SG 1SG-**INV** FUT 2-see-1SG.P-3SG.A
'He will see me.'

b. keʔl nek ki ne-woh-p-aʔ
2SG 1SG FUT 2-see-1SG.P-2SG.A
'You will see me.'

Dependent marking of anything other than case, e.g., gender, number, or person, involves agreement (see Section 9). Of course gender, as well as number and occasionally other categories, can have fused exponence with case, and thereby be dependent-marking secondarily. Fused case-number exponence is illustrated in the Latin and Chechen paradigms above, and in addition fusion with gender is shown in the Latin adjectival paradigms in Table 22.

Table 22: Latin adjectival denclension (singular only)

Latin 'good'	Masculine	Neuter	Feminine
Nominative	*bonus*	*bonum*	*bona*
Accusative	*bonum*	*bonum*	*bonam*
Genitive	*bonī*	*bonī*	*bonae*
Dative	*bonō*	*bonō*	*bonae*
Ablative	*bonō*	*bonō*	*bonā*

10.1. Case inventories

Cases inventories range from two cases to dozens, and are usually displayed in paradigms (see Section 4.1 above for some case paradigms). The various case-inflecting words of a language do not necessarily all have the same inventory of cases. In many languages of the Pama-Nyungan family of Australia, nouns have ergative case paradigms while personal pronouns have three-way or accusative paradigms. The following examples from Warrgamay show the three possibilities in one language.

Table 23: Warrgamay (Pama-Nyungan, Australia; Dixon 1980:287, 329)

	'woman'	1SG	1PL
A	*ŋulmburu-ŋgu*	*ŋaja*	*ŋali*
S	*ŋulmburu*	*ŋayba*	*ŋali*
P	*ŋulmburu*	*ŋanya*	*ŋali-nya*
Type:	Ergative	3-way	Accusative

The distribution of alignment across parts of speech is motivated by expectations of agency on the indexability hierarchy (Silverstein 1976, DeLancey 1981).

Apart from these well-motivated splits in morphological alignment, there are many instances where different words or word classes have different inventories or numbers of cases. In Chechen, for instance, nouns distinguish eight basic cases while attributive adjectives distinguish only nominative vs. oblique. In Chechen, Ingush, and many other Nakh-Daghestanian languages, place names and other local nouns are often adverbs or oblique case forms in origin, and they tend to have defective declension and restricted syntactic functions. Ingush *aatagh* 'bottom of canyon or ravine; river in valley' forms no oblique cases and can be used chiefly as location, goal, and object:

(98) Ingush. (J, V are gender prefixes.)

a. So aatagh jaax (location)
1SG canyon J.live.PRS
'I live in the canyon.'

b. So aatagh vaxar (goal)
1SG canyon V.go.WP
'I went down into the canyon.'

c. Yz ch'woagha xoza aatagh jy (predicate nominal)
DEM very pretty canyon J.be.PRS
'This is a very pretty canyon.'

d. Suona aatagh dagajoagha (object of experiential verb)
1SG.DAT canyon D.remember-J.AUX.PRS
'I remember the canyon.'

In (98c) *aatagh* has a modifying adjective in the nominative case, and in (98c) and (98d) it triggers gender agreement in the verb, and both of these properties show that it is a nominative case. In (98a) and (98b), on the other hand, it is an adverb. Hence its paradigm is a two-case one (with morphological syncretism between the cases, though as argued just above they are morphosyntactically distinct cases, and as shown below is a case form in other paradigms as well):

(99) Ingush
Nominative *aatagh*
Adverb *aatagh*

Daniel (2000) describes for Bagvalal (Nakh-Daghestanian) a word class midway between nouns and adverbs, with a highly defective declension lacking a nominative.

In Russian, a number of nouns distinguish, in addition to the basic six cases of Russian, a second prepositional (or locative) case and/or a second genitive (or partitive) case. It might be said that the vast majority of Russian nouns (including all derived nouns) syncretize these two but a number of (underived) nouns distinguish one or the other of them. A very few nouns distinguish a separate 'counting case' used on nouns quantified by the numerals 2, 3, or 4, and the vast majority use the genitive for this purpose. (The 'counting case' differs from the genitive only in stress placement.) These various minor cases are found only on nouns; pronouns and adjectives distinguish only the basic six cases. These Russian examples differ from the others discussed in this section in that they are almost always judged to be 'extra' cases in a few paradigms rather than defectivity of the others.

There are two arenas where case inflection and nominal derivation approach each other. One involves adverbs functioning more or less as parts of case paradigms, as in some Nakh-Daghestanian languages. In Ingush, anumber of nouns have adverbs which

are almost like members of the case paradigm, except that they are idiosyncratic in their formation and semantics and have no number inflection, unlike cases. Examples are *c'agha* 'home(wards), at home' from *c'aa* 'house'; *leatta* 'on the ground' from *leatta* 'earth'; *mettel* 'in ... language' from *mott* 'language'; *mettie* 'in/at (some) place' from *mottig* 'place', *berzal* '(turn) into a wolf' from *bordz* 'wolf', *wura* 'in the morning' from *wiirie* 'morning', and others, including the syncretic *aatagh* 'in/to the valley' in the defective paradigm illustrated in (97) . The obverse of this phenomenon is lexicalization of case forms as adverbs. Russian *doma* 'home, at home' and *domoj* 'home, homewards' are an old genitive and dative, respectively, which are now simply adverbs derived from *dom* 'house, building'.

The other approximation of case and derivation involves genitive cases. Since they are often, and in many languages exclusively, adnominal (used as possessors or other modifiers of nouns), they can easily be lexicalized as denominal adjectives. This is common in Chechen, where e.g. *dechigan* 'wood.GEN' is lexicalized as *dechkan* 'wooden', *deshin* 'gold.GEN' as 'golden', and so on. The obverse of this derivation is one common in Slavic languages where a derived possessive adjective (roughly comparable to such adjectives as *fatherly*) displaces the genitive case in some or most of its functions (Corbett 1987).

10. 2 Terminology

Standard schemas exist for names of cases in elaborate case systems; see Mel'čuk 1986, Hjelmslev 1935, and grammars of various Nakh-Daghestanian and Uralic languages. In such languages the local cases tend to fall into neat series based on topography and directionality vs. rest: inessive ('in'), illative ('into'), elative ('out of'); adessive ('on, at'), allative ('onto'), ablative ('away from'); superessive ('on top of'), superlative ('onto the top of'), superelative ('off the top'); etc. There is less uniformity of opinion and practice concerning terminology for the more grammatical cases and in smaller case systems. Cases are usually named for what is taken to be their primary function. *Nominative* is the classical term for the basic case or citation form, and the term is still used in this sense in most Greek-derived and Russian-derived grammatical and linguistic traditions, while many western linguists use it only for S=A subject cases and use *absolutive* for S=P cases. *Accusative* and *ergative* are standard for P and A cases

respectively. *Dative* is commonly used for a case marking indirect objects and often some subject-like experiencers. The term is also sometimes used for primary objects, which comprise the P of monotransitives and the Goal argument of ditransitives (see Dryer's chapter in this series), while *accusative* is the traditional label for direct objects, which comprise the P of monotransitives and the Theme of ditransitives. *Genitive* is most common for the default adnominal case, though *possessive* is also found. The greatest difficulties and inconsistencies arise in the labeling of general location, goal, and source cases (in languages without elaborate local series, and sometimes coexisting with local series in languages with large case inventories), and the cases used on second and oblique objects. The terms *essive* and *lative*, for generic location (or state) and goal cases, are common. There is no comparable generic label for a source case, though *ablative* is probably most common (unless there is a local series with a dedicated ablative beside an allative and adessive). Cases of second objects are even harder to label. Consider these examples from Ingush, where the case is called *lative* by the Berkeley Ingush project and *xottalura duozhar* 'joining case, combining, conjunctive' in Ingush (*veschestvennyj padezh* 'substantive case' in Russian):

(100) Ingush

a. zhwalii leattagh hwadzh jeaqqar
dog ground.LAT scent J.take.WP
'The dog sniffed the ground.'

b. so cynagh qiitar
1SG 3SG.LAT understand.WP
'I understood him.'

The case is used on the second object in (a) and on the first object of a two-argument non-transitive verb in (b). These are its primary functions. Primary or dedicated second-object and/or oblique-object cases are not commonly recognized in case terminology, but they may be fairly common in case systems.

10.3. Case vs. adposition

Cases and adpositions differ little in syntactic functions; their primary difference lies in the fact that case markers are formatives (and therefore do not themselves govern cases) while adpositions are words (and, in languages with cases, typically govern cases). By this definition, the cliticized (or at least tightly bound) adposition-like case markers of Japanese, Polynesian languages, and Kwakwala are case formatives, as they do not govern cases or any other formative.

(101) Japanese postposed case formatives (partial list)

wa	topic
ga	nominative[36]
o	accusative
ni	dative
no	genitive

(102) Japanese (Blake 1994:10)

sensei	ga	Tasaku	ni	hon	o	yatta
teacher	NOM	T.	DAT	book	ACC	gave

The teacher gave Tasaku a book

(103) Maori preposed case formatives (Bauer 1993:260) (partial list)

ø	Subject (of transitive or intransitive verb)
i	Direct object
ki	Direct object, indirect object, instrument.
moo / maa	Indirect object, benefactive, possession
o	Possession
e	Agent (passive, neuter, stative, and actor-emphatic clauses)

(104) Maori (Bauer 1993:272) (TA = tense-aspect, ART = article)

I	hoatu	ahau	i	te	maaripi	ki	tana	hoa	maa	Hone
TA	give	1SG	DO	ART	knife	IO	GEN.3SG	friend	BEN	John

'I gave the knife to John's friend for John.'

[36] The nominative, however, is not the citation form; that is the bare noun without any case formative.

In languages with case suffixes, postpositions, and frequent head-final order in NP's, it is common for postpositions to cliticize or otherwise attach to the case-suffixed head noun. In Ingush, for example, the postpositions *=t'y* 'on' and *=chy* 'in', and no others, regularly cliticize to their objects. Cliticization is shown by the reduction of their vocalism to schwa (here spelled "y") and and the reduction of the preceding case suffix from the usual dative *-aa* to *-a*. (104c) shows a non-cliticized postposition; it takes the regular dative ending and has non-schwa vocalism /e/ in its tonic syllable.

(105) Ingush

a. kerta=t'y
head on
'on the head'

b. kerta=chy
head in
'in the head'

c. kertaa t'ehwazhjka
head.DAT behind
'behind the head'

These Ingush postpositions are still postpositions on the evidence of their government of cases (albeit often with truncated endings). They are well on the way to turning into case suffixes, however, and this is a common fate of cliticized postpositions. Distinguishing between cases and bound postpositions can be a subtle matter; some recent discussion concerning Daghestanian languages can be found in Friedman 1992, Comrie & Polinsky 1998, and on Indo-Aryan in Masica 1991:231ff. The 'in' and 'on' series of cases of Lak in Table 24 are typical. The series suffix is added to the oblique stem and the local suffix to that. The series suffix is the evident former stem of a postposition and the local endings are subsequent additions or suffixal morphology of the original postposition. The postpositions must have governed the oblique stem (which was once a case in a small case system).

Table 24: Lak (Nakh-Dagestanian) case suffixes (Friedman 1992:117). Case names are generated by a combinatorial process from basic Latin elements provided by Friedman; bracketed ones exceed our competence in latter-day Latin morphophonemics and we have left them as raw strings. Hyphens in case desinences separate series suffix from local suffix. G = gender marker.

Inessive	-v-(u)	‘in’, ‘into’
Elative	-v-a(tu)	‘out of’
[in-prolative]	-v-ux	‘through’
[in-vialative]	-v-uxch’in	‘through’
Illative	-v-un	‘into’
[in-directive]	-v-unGaj	‘in the direction of, toward’
Adessive	-j	‘on’
Ablative	-j-a	‘from’, ‘off of’
Superprolative	-j-x	‘along, across’
Supervialative	-j-xch’in	‘along, via’
[super-lative]	-j-un	‘to’, ‘onto’
Superdirective	-j-unGaj	‘toward’

10.4 Assignment of cases and adpositions

The appearance of a particular case on a particular word may be due to any of several factors. Cases of arguments are lexically governed by verbs, as are cases on objects of adpositions. Usually there are default cases for argument relations; in Latin, for example, the default subject case is nominative, the default direct object case accusative, and the default indirect object case dative. There is usually a default case for adnominal relations, almost always called genitive. Languages vary in the frequency and variety of their non-default cases, conservative Indo-European languages being particularly rich in non-default clause-level cases. Non-default cases have been known in the literature variously as *quirky*, *semantic*, or *concrete*. In Russian, for instance, nearly every oblique case, and nearly every basic preposition, appears on some object of some verb. Usually there are syntactic differences between arguments in default and non-default cases. In Russian, oblique objects have the word order and prosodic properties of direct objects, and probably all of their pragmatic and discourse properties, but they lack a number of conspicuous morphosyntactic properties of direct objects such as the possibility of

figuring as subject of passive, replacement of accusative case by genitive under negation, and others. In (106ab) the direct object (*knigi* ‘books’) of the verb can be in the genitive when the verb is negated; in (106cd) the instrumental object (*biznesom* ‘with/by business’) of the oblique-object verb *zanimat’sja* ‘be engaged in, be occupied with’ cannot be replaced by the genitive under negation, although it too is governed by the verb and as much part of the VP as the ordinary accusative object *knigi* in (106a).

(106) Russian

a. Ja chitaju knigi
1SG.NOM read:1SG book.ACCpl
‘I read books.’

b. Ja ne chitaju knig
1SG.NOM NEG read book.GENpl
‘I don’t read books.’

c. On zanimaetsja biznesom
3s is.engaged business.INS
‘He is engaged in business.’

d. * On ne zanimaetsja biznesa
3s NEG is.engaged business.GEN
Intended: ‘He isn’t engaged in business.’

Cases on goals and locations are often semi-governed or partly governed by the verb. A goal may be marked with a directional case and a location with a non-directional case. A number of European languages use the same preposition for goals and locations, differentiating them only by the case taken by the preposition: accusative if the verb is transitive or motion is involved, and the basic non-directional case taken by that preposition if not.

(107) Russian

a. Nina poshla v sad
Nina went in orchard.ACC
‘Nina went into the orchard.’

b. deti byli v sadu
children were in orchard.PRP
‘The children were in the orchard.’

On adverbial constituents of various kinds, the choice of case and/or adposition is semantically based. The examples below show the instrumental case used on a semantic instrument in Chechen and a preposition on a semantic reason in English.

(108) Chechen

cuo q'oolamaca jaazdo
3SG.ERG pencil.INS write
'S/he writes with a pencil.'

(109) The picnic was cancelled **because of** rain.

Case assignment in NP's follows different principles. (Indeed, many case-using languages use no adnominal cases in NP's, resorting to possessive inflection on the head noun instead: examples are Hungarian and several other Uralic languages, and Nanai and other Tungusic languages.) The typical situation in NP's is that there is a default adnominal case with wide usage, usually called *genitive*. It is used in possessive, quantified, relational, and various other NP's.

(110) Russian

a. brat Mashi
brother Masha.GEN
'Masha's brother'

b. chashka chaja
cup tea.GEN
'a cup of tea'

c. konec vojny
end war.GEN
'the end of the war'

d. cena benzina
price/value gasoline.GEN
'the price of gasoline'

Various other adnominal relations, often rather idiosyncratically, may take other cases and/or adpositions.

(111) Russian

a. luchshij iz nix
best.one from them
'the best of them', 'the best one of them'

b. banka iz-pod varen'ja
jar from-under jam
'a jam jar (empty jar that had jam in it)'

c. cena krasote
price/value beauty.DAT
'the value of beauty'

Some of these idiosyncratic case choices, e.g. (111b, c) above, are largely determined by the head noun, and therefore may be analogs to verbal government of non-default object cases in clauses. Others, e.g. (111a) above, seem to be semantically motivated and may be more analogous to adverbials in clauses. Nominalized verbs of course tend to inherit case and/or adposition government from the verb, though the extent to which this occurs and the constraints on it vary (see Koptjevskaja-Tamm 1993 and Chapter III.8).

Like cases, adpositions can be governed (default or non-default), oblique, or semantic, and they can be governed by verbs as well as adnominal (appearing on the non-head nominal in an NP). Many different cases occur with adpositions in Indo-European languages, an unusual state of affairs cross-linguistically. Where adpositions are nominal in origin they tend to take the genitive case (or the typical adnominal morphology of the language, e.g. possessive inflection in head-marking languages). Other cases are sometimes found, however: in Chechen and Ingush, adpositions take the dative case, which is an object case and not adnominal. Where a verb governs an adposition, it is likely to determine the case taken by the adverb as well (in languages that have such choices). For instance, Russian *serdit'sja* 'get angry' takes *na* 'at, on' plus the accusative, one of the two cases governed by this preposition. Since *na* governs two different cases, the restriction to only one of them with this verb must be due to the verb.

10.5. Spreading and stacking

Cases and adpositions can also appear on words secondarily, i.e. not because they are directly assigned but because they are assigned to some other word with which the host

stands in some syntactic relationship. There are two types of secondary case assignment: SPREADING and STACKING. Both contrast with INERT behavior, where no secondary cases appear. Inert behavior is the simplest situation and the most common type cross-linguistically.

Copying and agreement of cases and adpositions can generically be called SPREADING. Spreading of cases within the NP is common in Indo-European languages:

(112) Russian

a. novuju knigu
new.ACCsg book.ACCsg
'a/the new book'

b. bol'shogo doma
large.GENsg house.GENsg
'a/the large house'

(113) Latin

a. ascia nova
axe.NOM new.NOM
'a/the new axe'

b. asciā novā
axe.ABL new. ABL
'with a/the new axe'

In a language with inert cases, case would be marked only once for the NP here. In Belhare, for example, Latin *asciā novā* 'with the new axe' would translate as *uchoũat phendikŋa*, where the instrumental case suffix *-ŋa* appears only once on the head; in fact spreading would be ungrammatical (**uchũatna phendikŋa* 'new-INSTR axe-INSTR')

When case is INERT, it has SCOPE over the whole phrase. Although the instrumental is not marked on the adjective in a Belhare NP, the adjective is still in the scope of this case marker, and it therefore refers to the quality the instrument 'axe' here. The adjective does not constitute an independent nominative NP. Because of their phrasal scope, inert case markers are sometimes analyzed as cliticized adpositions, on the assumption that phrasal scope means that markers are attached to the whole NP (a phrase) rather than to the head noun (a word). However, if carried through its logical conclusion, such an analysis would suggest, counterintuitively, that the English plural is a cliticized postposition: it too has

phrasal scope and the plural does not spread onto adjectives (as it does in German, cf. *gross-e Häuser* vs. *big-ø house-s*, where *gross* ‘big’ is marked as plural in German: cf. *gross-es Haus* in the singular). Phrasal scope is a result of morphological inertness; it does not require adpositions, i.e. syntactically independent words.

Spreading of adpositions within NP’s is rare. An example is preposition repetition in Old Russian (Klenin 1989):

(114) Old Russian

a. **za** ego djadeju **za** Matfeěm"
after his uncle.INS after Matthew.INS
‘after his uncle Matthew'

b. **pro** kolokol" **pro** nemec'skyi
about bell.ACC about German.ACC
‘about (the) German bell’

In (a), *Matfeěm”* is in apposition to *djadeju* ‘uncle’, and in (b) *nemec’skyi* ‘German’ is an adjective modifying *kolokol”* ‘bell’ and agreeing with it in gender and number. In both the preposition preceding the head noun spreads to its modifier.

NP-internal spreading can be subject to various restrictions. In Finnic languages, spreading is limited to only some of the cases and found on only some adjectives. In Ingush, all oblique cases SYNCRETIZE (i.e. have the same form) in the attributive paradigm, which is to say that in spreading all oblique cases syncretize:

(115) Ingush

Nominative	*dika*	*sag*
Genitive	*dikacha*	*saga*
Dative	*dikacha*	*sagaa*
Ergative	*dikacha*	*saguo*
Allative	*dikacha*	*sagaga*
etc.	‘good	person’

VP-internal spreading is exemplified by preposition-prefix ‘concord’ in early Slavic languages or modern German:

(116) German

durch das Sieb **durch**-drücken
through the sieve through-press
'press through the sieve'

Finally, clause-internal case spreading occurs on various kinds of predicate nominals:

(117) Russian

a. Natasha vernulas' domoj ochen' golodnaja
N.NOM returned home very hungry.**NOM**sg
'Natasha came back home very hungry'

b. Sosedi vernuli Natashu domoj ochen' golodnuju
neighbors returned N.ACC home very hungry.**ACC**sg
'the neighbors brought Natasha back home hungry'

Especially in languages with exclusively or chiefly integrative agreement (discussed above in Section 9), words meaning 'like' and 'as' may require spreading of cases, adpositions, or both. (Such words are traditionally called conjunctions, though their part of speech needs more investigation. They tend to have the same word order as adpositions and to cooccur with cases in case languages, as adpositions do, but unlike adpositions they usually do not govern cases.) In Russian they take preposition spreading at least under some circumstances:

(118) Russian

a. podxod **k** jazyku kak **k** sisteme
approach to language.DAT as to system.DAT
'approach to language as a system' (lit. 'as to a system')

b. On govoril **ob** hetom sobytii kak **o** chem-to vazhnom
he talked about this.PRP event.PRP as about something.PRP important.PRP
'He always talked about this event as something important.' (lit. 'as about something important')

Spreading of bare cases is attested, though infrequently and in bookish language, in Ingush:

(119) Ingush (Pacchahw Liir I.IV.2.126, with consultant's emendation)

Hwa	menna	ordanjg				
2s.GEN	drunk	rabble				
boqqaghchaarna	'a	t'ychuux	shei	wunazhta	sanna	
elder.PL.DAT	&	shout at	3pREFL.GEN	servant.PL.DAT	like	

'Your drunken rabble shout at their elders as though at their servants'

(= 'Your disorder'd rabble Make servants of their betters'; *King Lear* I.IV.)

It is also found in German, but native speaker judgments vary somewhat:

(120) German

Wer	würde	einen	Computer	als	Menschen	(?Mensch)	betrachten?
who	would	a:ACC	C.:**ACC**	as	human.being:**ACC**	human.being:**NOM**	consider

'Who would think of a computer as human being?'

Languages with associative agreement typically lack such 'conjunctions' (Bickel 2000a); their function is covered by appositional interpretations of the agreement mechanism. See Lai Chin examples (81) in Section 9.3.

It is common for case to be inert on continuous NP's but spreading on discontinuous NP's. In many languages, case agreement is found only when the phrase is discontinuous, i.e., interrupted by other sentential material that does not belong to the phrase. This is true of many Australian languages:

(121) Warlpiri (Pama-Nyungan; C. Australia; Hale, *et al.* 1995)

a. [$_{NP}$ [$_{N}$ maliki] [$_{A}$ wiri-ngki]] =ji yarlku-rnu.
dog big-ERG =[PERF-]1sP bite-PT

'A big dog bit me.'

b. [$_{N}$ maliki-rli] =ji yarlku-rnu [$_{A}$ wiri-ngki].
dog-ERG =[PERF-]1sP bite-PT big-ERG

'A big dog bit me.'

In (121a) the NP is continuous, so there is no case agreement, but in (121b) case agreement is a mandatory means for identifying the discontinuous parts of the NP.

Stacking of cases within NP's is not uncommon; for surveys see Plank (1995). Often one of the cases is due to copying and one to assignment, e.g. Old Georgian:

(122) Old Georgian (Kartvelian; Fähnrich 1991:197)

a. saxl - man israeyl - isa - man
house-ERG Israel -GEN-ERG
'the house of Israel'

b. arkw dze - ta israeyl - isa - ta
speak son-OBLpl Israel-GEN-OBLpl
'speak to the sons of Israel'

The genitive case in both examples is assigned by the adnominal construction, and the ergative in (a) and the oblique in (b) is assigned to 'house' and 'son' and spreads to 'Israel'. Since stacking is most common in adnominal constructions, cross-linguistically it is the genitive case — the universal default adnominal case — that is most prone to have another stacked onto it.

Clause-level stacking of case suffixes is illustrated by Huallaga Quechua and Kayardild. The Quechuan example involves copredicatives, as is relatively common; the Kayardild one has ordinary clause members.

(123) Huallaga Quechua (Quechuan, Peru; Weber 1989:221) (= (44) in Section 7)

Haacha-wan-naw mutu-n machiita-wan
axe-COM-SIM chop-3 machete-COM
'He chops with a machete as though it were an axe.'

(124) Kayardild (Tangkic, Australia; Dench & Evans 1988:34-5)[37] (=46) in Section 7)

maku-ntha yalawu-jarra-ntha yakura-naa-ntha
woman-OBL catch-PT-OBL fish-ABL (PRIOR)-OBL
dangka-karra-nguni-naa-ntha mijil-nguni-naa-nth.
man-GEN-INSTR-ABL (PRIOR)-OBL net-INSTR-ABL (PRIOR)-OBL
'The woman must have caught fish with the man's net.'

Stacking of syntactic words appears to be less common than stacking of cases. The spreading of Russian adpositions illustrated in (118) results in conjunction-preposition stacking. Prepositions, however, cannot stack in Russian. Where two prepositions would be assigned by the syntax, the first is deleted. This happens in time expressions:

[37] For glossing of cases and the interlinear (PRIOR) see ex. (38) above.

(125) Russian

on prishel (*v) bez chetverti sem'
he came at without quarter 7
'he came at five minutes to 7'

where *v* 'in' would ordinarily be assigned to this kind of time adverbial, and here its object happens to be a more or less fixed expression starting with a preposition, *bez chetverti* ... 'a quarter to ...'. Perhaps this is preposition stacking with obligatory syncope.[38]

Table 25 summarizes the behavior of formatives and words with regard to assignment, spreading, and stacking.

Table 25: Behavior of words and formatives with regard to assignment, spreading, and stacking. Blanks mean that we have no examples of that phenomenon.

		Syntactic word	*Formative*
Assigned (inert):	NP	Engl. *of*, etc.	adnominal genitive
	CLAUSE	Engl. *to* on IO etc.	case on arguments
Spreading:	NP	Old Russian prep.	IE case agreement
	CLAUSE	IE prep./preverb	IE predicate nominals
Stacking	NP		Old Georgian, etc.
	CLAUSE	IE prep./preverb	Kayardild modal case

11. Conclusions

Morphological typology played a pioneering role in the development of typology in the 19th century, but in the second half of the last century, the traditional approaches came under heavy criticism for conflating parameters (cf. the discussion in Section 2), and the field was often questioned for its general usefulness (e.g. Comrie 1981a). However, advances in the theoretical understanding of the WORD — specifically, the systematic break-down of this notion into phonological and grammatical words — have made it now

[38] At one time preposition stacking must have been possible in Russian, for there exist compound prepositions such as *iz-za* 'because of' (lit. 'from - behind'), *iz-pod* (illustrated in (111b) above), lit. 'from-under'. Both govern the genitive (as *iz* does) and not the instrumental (as *za* and *pod* do).

possible to put morphological typology on a more precise foundation. We hope this chapter has shown that such a typology can improve descriptive analysis by giving close attention to all parameters along which inflectional morphology varies.

Further Reading

General surveys of theoretical issues in inflectional morphology are Spencer (1991) and Carstairs-McCarthy (1992). Spencer (1991) in particular contains a helpful discussion of the interaction of syntax and morphology, which has been one of the traditional controversies of grammatical theory. See also Anderson (1992) and Stump (in press).

Some of the typological distinctions we draw here are treated under various technical terms in generative frameworks, which are not always easy to recognize: much discussion of synthesis and notions of wordhood (Section 2) is currently covered by literature on complex predicates, e.g. Alsina *et al.* (1997) or Ackerman & Webelhuth (1998) and on what is called the principle of lexical integrity (e.g., Mohanan 1995, Bresnan & Mchombo 1995). On the phonological word, see in particular Hall & Kleinhenz (1999); on grammatical word notions, see Di Sciullo & Williams (1987). The properties of layered morphology as distinct from templatic morphology (Section 7) are attributed to the ‘Mirror Principle’, which states that the sequence of morphological operations mirrors syntactic tree and scope structure (Baker 1985). See Alsina (1999) Rice (2000), and Stump (in press) for some recent controversial discussion. Pronominal agreement markers (Section 9) are typically analyzed in terms of movement from syntactic argument positions to their morphological host. Grammatical agreement is analyzed, by contrast, as ‘base-generation’ of markers (clitics, affixes) at the host; since such markers co-occur with NPs, the phenonemon is then also referred to as ‘clitic doubling’ in the literature. See Spencer (1991: 384-90) for a useful summary.

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Abbrevations and symbols

Letters

A (followed by numeral, e.g. A3)	Absolutive agreement marker (Mayan languages)
A	A (syntactic relation of transitive actor; see Dryer, this series)
ABL (PRIOR)	Ablative case in agreement with past tense of verb (Kayardild; see (46))
ABL	Ablative case
ABS	Absolutive case
ACC	Accusative case
ACT	Actual mood
ADL	Adlative
AOR	Aorist tense
APPL	Applicative
ART	Article
ASP	Aspect
AUX	Auxiliary
BEN	Benefactive
CAUS	Causative
COM	Comitative case
COMP	Complementizer
COMPL	Completive aspect
COND	Conditional
CONJ	Conjunct mode
CONV	Converb
COP	Copula
DAT	Dative case
DECL	Declarative
DEF	Definite
DEM	Demonstrative
DEP	Dependent verb form

DEST	Destinative case
DET	Determiner
DET	Determinator (in Cree verb forms)
DIR	Direct transitive relation
DO	Direct object marker
DS	Different subject
DU	Dual number
DUR	Durative
DX	Deictic prefix
E (followed by numeral, e.g. E3)	Ergative agreement marker (Mayan languages)
ERG	Ergative case
EXCL	Exclusive
EZ	Ezafe, izafet (see Sec. 3)
FEM	Feminine gender
FIN	Finite form
FUT	Future tense
GEN	Genitive case
GENDER	Gender agreement markers (Nakh-Daghestanian languages)
HON	Honorific
HORT	Hortative
HUM	Human
IMPERF	Imperfect tense
INCL	Inclusive
IND	Indicative mood
INDEF	Indefinite
INF	Infinitive
INS	Instrumental case
INSTR	Instrumental case
INV	Inverse transitive relation
IO	Indirect object marker
IPFV	Imperfective aspect
LAT	Lative case
LINK	Linker (see Sec. 3)
LOC	Locative (case or adposition)
LOG	Logophoric pronoun
MASC	Masculine
MED	Medium, middle voice
MOM	Momentaneous aspect
NEG	Negative, negation
NHUM	Nonhuman
NOM	Nominative case
NONHON	Nonhonorific
NPT	Nonpast
NSG	Nonsingular (neutralizing a dual vs. plural contrast)

NZR	Nominalizer
OBJ	Object marker
OBL	Oblique case
obv	Obviative (see Sec. 8.1.3)
OPT	Optative mood
PART	Participle
P	P (transtive object syntactic relation; see Dryer, this series)
PASS	Passive
PAUC	Paucal
PERF	Perfect tense
PFV	Perfective aspect
PL	Plural
POSS	Possessive
POT	Potential
PPL	Participle
PRES	Present tense
PROGR	Progressive (tense, aspecft)
PROPR	Proprietive
PRP	Prepositional case
PRS	Present tense
PT	Past tense
PTCL	Particle
PURP	Purposive converb, supine
Q	Interrogative, question marker
RECIP	Reciprocal
REFL	Reflexive
REM	remote
RESTR	restrictive focus (‘only, just’)
S	S (intransitive subject syntactic relation; see Dryer, this series)
SEQ	Sequential
SG	Singular
SIM	Similarity case (‘like’)
SS	Same subject
SUB	Subjunctive
SUBJ	Subject marker
TA	Tense-aspect marker
TEL	Telic
TOP	Topic
WP	Witnessed past

Numerals

1	First person

2	Second person
3	Third person
4	Fourth (obviative) person
1SG	First person singular
3PL	Third person plural
(etc.)	

Roman numerals: Gender classes in Nakh-Daghestanian and Bantu languages

Symbols

.	Separates elements of interlinear that correspond to a single morpheme in the original.
ø	zero marking
-	Affix boundary
=	Clitic boundary
(M), (F), etc.	Gender (masculine, feminine, etc.) of noun. (Gender as agreement category is not in parentheses.)
Σ	First element of bipartite verb stem
σ	Syllable (annotates left bracket in prosodic transcriptions)
[ ]	Glosses in square brackets are zero-marked

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